Shenzhen Vkining Electronics Co., Ltd

VK7015 USB/Ethernet 24 bit data acquisition card

——Precise Accurate Fast Reliable

VK7015 USB/Ethernet DAQ

Introduction:

VK7015 is an USB/Ethernet high speed data acquisition card with 16-channel input, 24-bit resolution, single-channel maximum sampling rate of 32 ksps 16-channel synchronization total 512 ksps, precise pre-gain amplification, integrated IEPE/ICP hardware support. This product uses a number of high-precision 24-bit ADC units and pre-amplifier modules developed with the company for many years. This makes the product have the advantages of high speed, high resolution, high precision, ultra-low noise, high rejection ratio, wide measurement range, low temperature drift, and is suitable for various occasions of precision and high speed collection.

The LAN communication uses TCP/IP, the original exchange protocol and built-in anti-loss packet algorithm, which can guarantee the stable transmission and collection of data without loss for a long time.

The card has been expanded to Series version-WIFI VK7015W.All the components of VK7015 pickup and collection card are of industrial grade, with full metal shield, which can be used in strong industrial interference situations, and has the advantages of moisture, shock and interference resistance.

Features:

- High pre cision an d resolution : 24Bit
- High speed : single channel up t o 32ksps
- 16 channe ls 512ksps in total
- Sup port SD storage : onl ine / offline
- IEPE / ICP : 2 / 4mA ICP / IEPE sensor
- Input range : 0 ~ ± 10V Eightg ear switching
- Multi-trigg er modes : IO /analog /timing/ software
- DAC output (opt ional) : 0 ~ + / - 10V analog
- Electrical isolation : Ethernet/power supply isolation
- Metal shielding shell : strong anti-interference ability

Application:

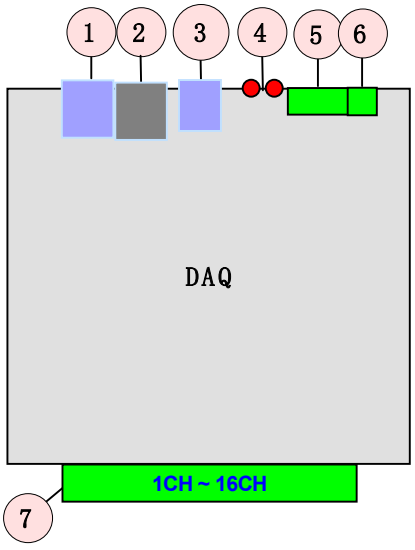
- Multi card data acquisition
- High resolution signal measurement
- High resolution signal measurement
- Internet of things information system

Schematic diagram of port:

1. LAN prot
2. USB/Power supply port
3. SD card holder
4. LED indicator
5. Digital IO port

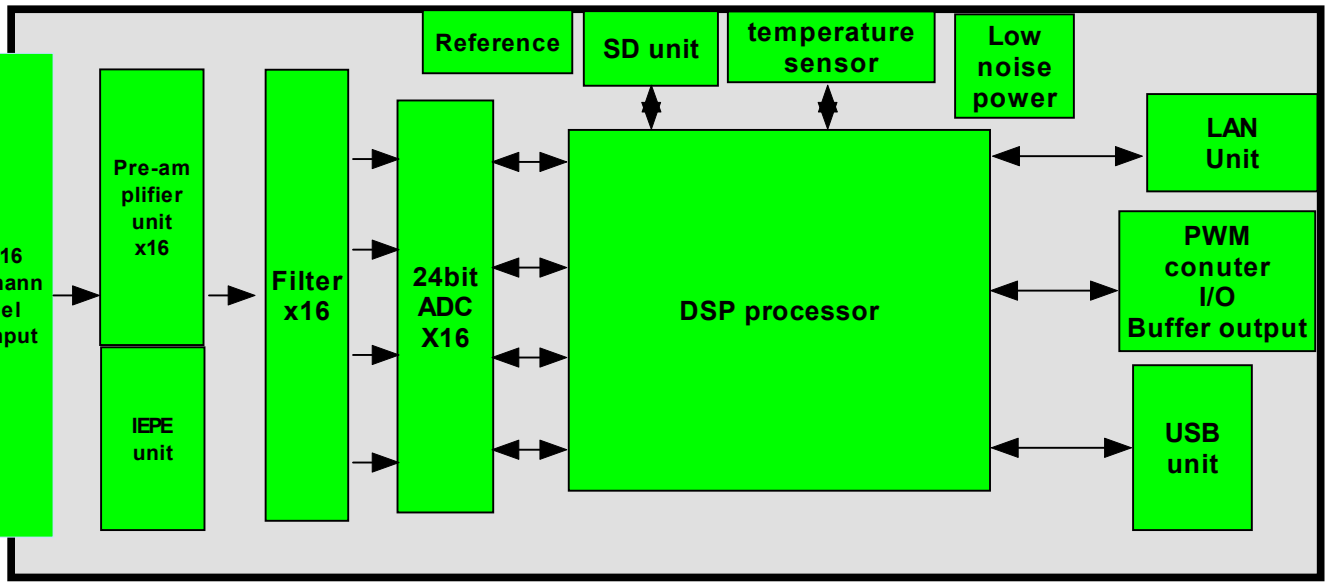
DGND	DIO4 /CNT	DIO3 /PWM2	DIO2 /PWM1	DIO1	VCC

6. 6~24V Power
7. Analog input interface



CH16	CH15	CH14	CH13	AGND	CH12	CH11	CH10	CH9	CH8	CH7	CH6	CH5	AGND	CH4	CH3	CH2	CH1

Block diagram



Port function

Number	Name	Function	Note
8	CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8, CH9, CH10, CH11, CH12, CH13, CH14, CH15, CH16	Analog input interface +/-10V input range.	
2	VCC	• The digital power supply is 5V, which can provide driving current within 100mA	
	DIO1	• DIO1——Configure as digital I/O port	
	DIO2/ PWM1	• DIO2——Configure as digital I/O port • PWM1——Con figure d as PWM output port	One of 2
	DIO3/ PWM2	• DIO3——Configure as digital I/O port • PWM2——Configure d as PWM output port	One of 2
	DIO4/ CNT	• DIO4——Configure as digital I / O port • CNT——Configure as counter / frequency meter input port • Ext Trig——Configure external trigger acquisition	One of 3
	DGND	Digital ground	

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Electrical parameters

Item	Unit	Typical	Note
USB supply voltage:	V	5	4.5~5.5
USB supply current:	mA	350mA @ADC mode 700mA @IEPE mode	
6-30V Supply port voltage	V	8-24	5~40
6-30V Supply port current	mA	188mA@12V 96mA@24V	
ADC analog port input voltage	V		-10V ~ +10V
ADC analog port signal bandwidth	Hz	30k(-3db) 15k(-0.5db) 10k(-0.1db)	
ADC anti aliasing filter frequency response		0.2 * fs @ -3db 0.5 * fs @ -10db	(fs = sample rate)
Anti aliasing filter type		Sinc3	
IEPE/ICP voltage (Optional)	V	24	22~26
IEPE/ICP Current (Optional)	mA	4	3.8~4.3
Digital port input VL Low level	V	0	-0.3~1
Digital port input VH high level	V	3.3	2~5.5
Digital port output voltage	V	3.3	3.2~3.4
Digital port output drive current (output VH)	mA	10	
Digital port input current (@5V input voltage)	uA	170	
ADC Maximum sampling rate	ksps		32ksps (16-channel synchronization)
PWM frequency(DIO2/PWM1、DIO3/PWM2 port)	Hz		0~100k
PWM duty(DIO2/PWM1、DIO3/PWM2 port)	%		0~100
Counter input maximum frequency(DIO4/CNT port)	Hz		100K
Counter enter maximum count value		2^64	
working temperature	centigrade		-40~ 85
Storage temperature	centigrade		-40~ 105
Physical dimensions (length, width and height)	mm	120*108*26	Excluding connector

Absolute maximum value for safe use

Item	Unit		
USB power supply	V	-1~+6	*If the absolute maximum value is exceeded, the device may be damaged and irreparable damage may be caused
ADC analog port	V	+-200 （Internal protection circuit)	
Digital Port	V	+-200 （Internal protection circuit)	
DAC output	V	-1~+6	
All port static inputs（ESD）	V	2000	

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ADC analog conversion unit

ADC detailed electrical parameters			
Item	Unit	Typical	Note
Differential input common mode rejection ratio(CMRR)	dB	130	
Input bias current	nA	1	
Input bias voltage	uv	10	
Input equivalent voltage noise	nVp-p	200	When the input range is + - 10V, the maximum value is 400
Input equivalent current noise	pAp-p	1	The maximum value is 2
Equivalent input capacitance	pF	400	
Input resistance	MΩ	1	
Maximum temperature drift of amplification unit	ppm/℃	6	

Input range vs noise			
Program set	**Corresponding measurement range**	**Background noise**	**NOTE**
0	-10V~+10V	0.2mV	ADC background noise is white noise, which will be superimposed on the measurement results (*note 2)
1	-5V~+5V	0.17mV	
2	-2.5V~+2.5V	0.15mV	
3	-1.25V~+1.25V	0.1mV	
4	-600mV~+600mV	75uV	
5	-300mV~+300mV	45uV	
6	-150mV~+150mV	45uV	
7	-75mV~+75mV	40uV	

Sample rate vs effective resolution		
sampling rate	**Effective resolution (*note 1)**	**Note**
1 ~ 2Ksps	21bit	When the sampling rate is high, the greater the noise of ADC and surrounding internal devices, so as to reduce the effective resolution(*note2)
2K~8Ksps	19bit	
8k~32Ksps	17bit	

note 1: The effective resolution is all ADC characteristics

note 2: For signal acquisition, the background noise of ADC and the effective resolution corresponding to the sampling rate shall be considered at the same time

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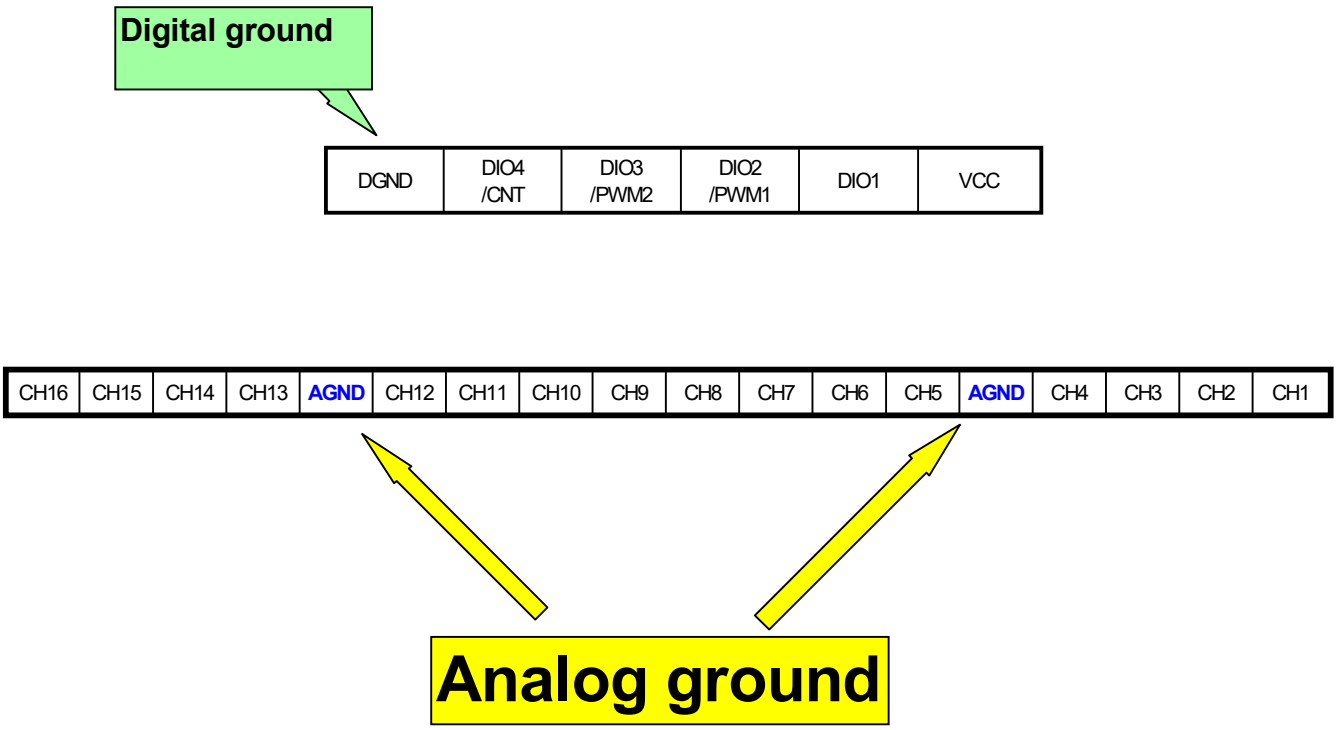
Precautions for use

Digital and analog ground

ADC acquisition side are used with analog ground (AGND), thus removed from the digital input to the analog input digital interference.

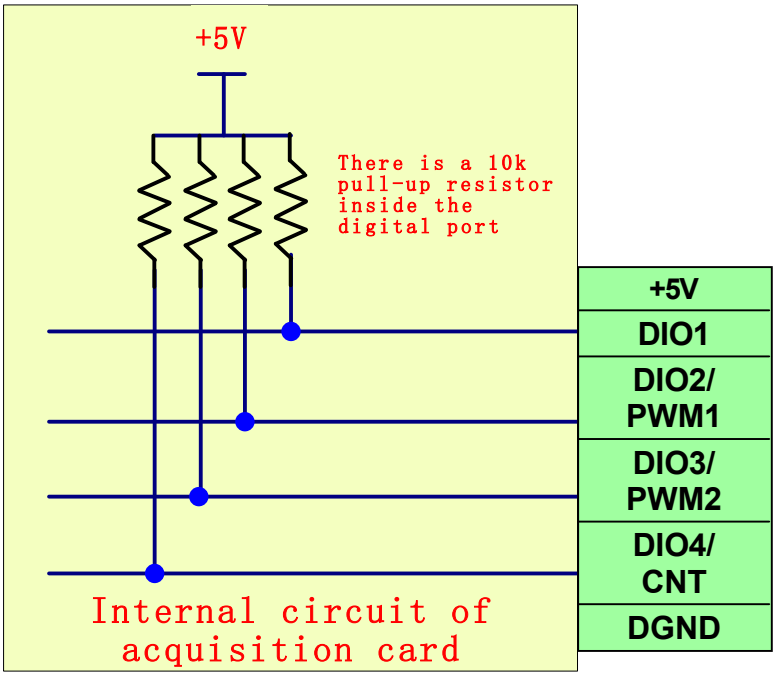


IEPE mode description

- This acquisition card integrates IEPE / ICP hardware function support.
- 24V power supply unit, constant current drive and receiving unit areintegratedin the truck, and each channel can be switched to common "analoginput mode" or"IEPE mode" through software settings.
- In IEPE mode, the output is 24V 4mA (compatible with 2mA), and the relative ADC input is AC coupled input.
- 16 channels can be switched and controlled independently.

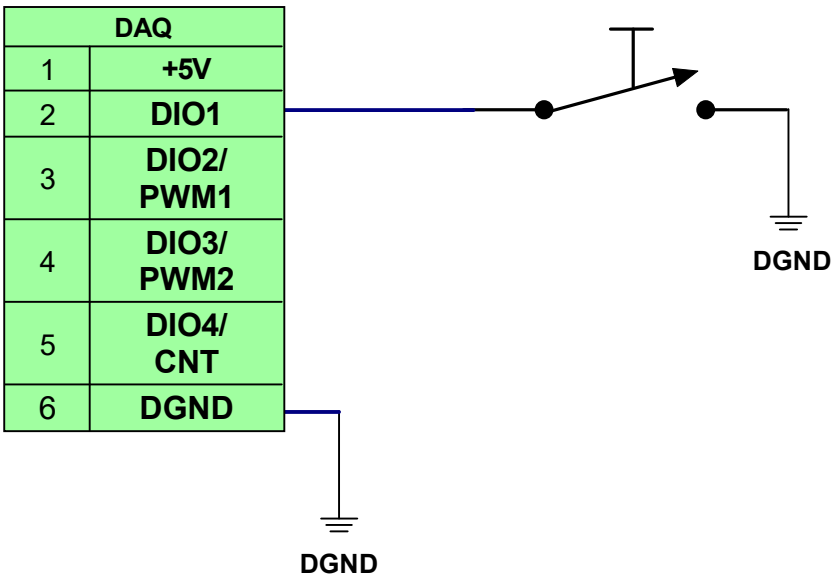
Application of digital port as input

When the acquisition card is used as input, it has a pull-up resistance inside, which is more convenient to use



Key input use

When the acquisition card is used as input, it has a pull-up resistance inside, which is more convenient to use



*All ground wires in the drawing must be connected or no loop can be formed

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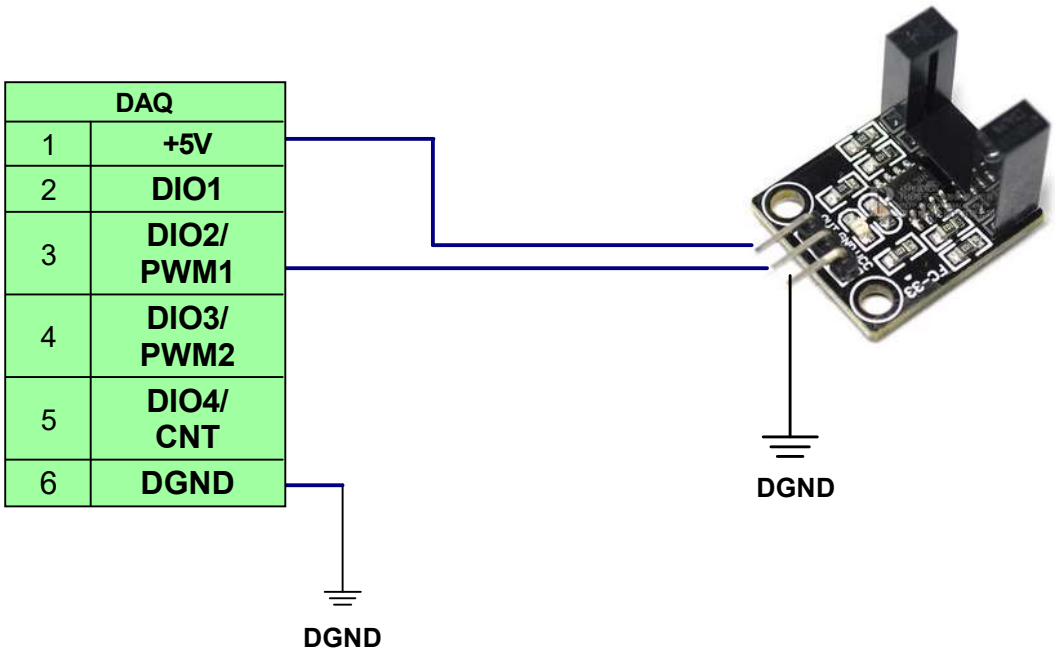
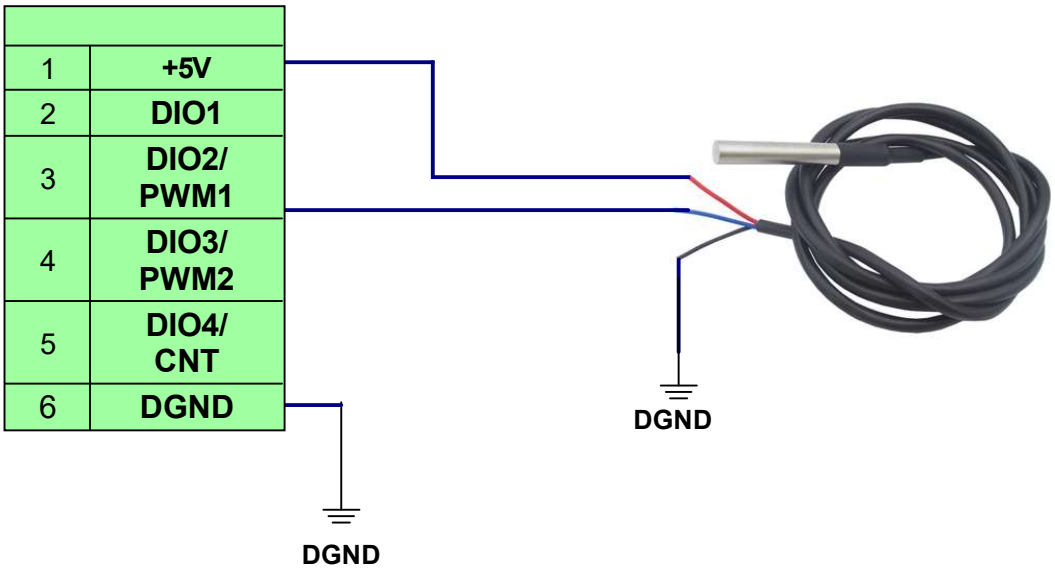
Sensor input with internal 5V power supply

When the acquisition card is used as input, it has a pull-up resistance inside, which is more convenient to use



Connected digital temperature sensor

Any digital port of the acquisition card can be connected with 18B20 digital temperature sensor to directly read out the temperature value



External trigger acquisition mode

When the acquisition card is used as input, it has a pull-up resistance inside, which is more convenient to use

DAQ	
1	+5V
2	DIO1
3	DIO2/ PWM1
4	DIO3/ PWM2
5	DIO4/ Ext Trig
6	DGND

Operation process:
1,Set n acquisition as 500 data points and sampling rate
2,Put P0 4 set to IO trigger n acquisition mode,,
3,Then, P0.05 Each falling edge of 4 will trigger a continuous acquisition of 500 data points at a time

External acquisition clock mode

Trigger acquisition - mode 2: P0.4 as the acquisition clock input port foracquisition

DAQ	
1	+5V
2	DIO1
3	DIO2/ PWM1
4	DIO3/ PWM2
5	DIO4/ Ext Trig
6	DGND

Operation process:
1,Put P0 4 set IO to ADC sampling clock mode,
2,P0. 4 input one data for each pulse collector The maximum input frequency is 100kHz;Input 1K pulses and output 1K groups of collected data

LED status and indication

Power status indicator (next to USB interface)

Network interface status indication

	Bright	OFF	Twinkle
Green light	Good connection	Not connected	
Yellow light		No transmission	Transmitting

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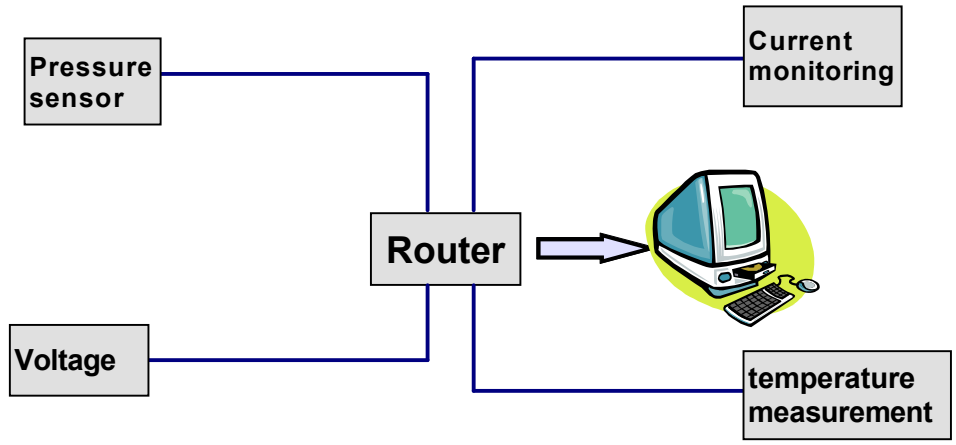
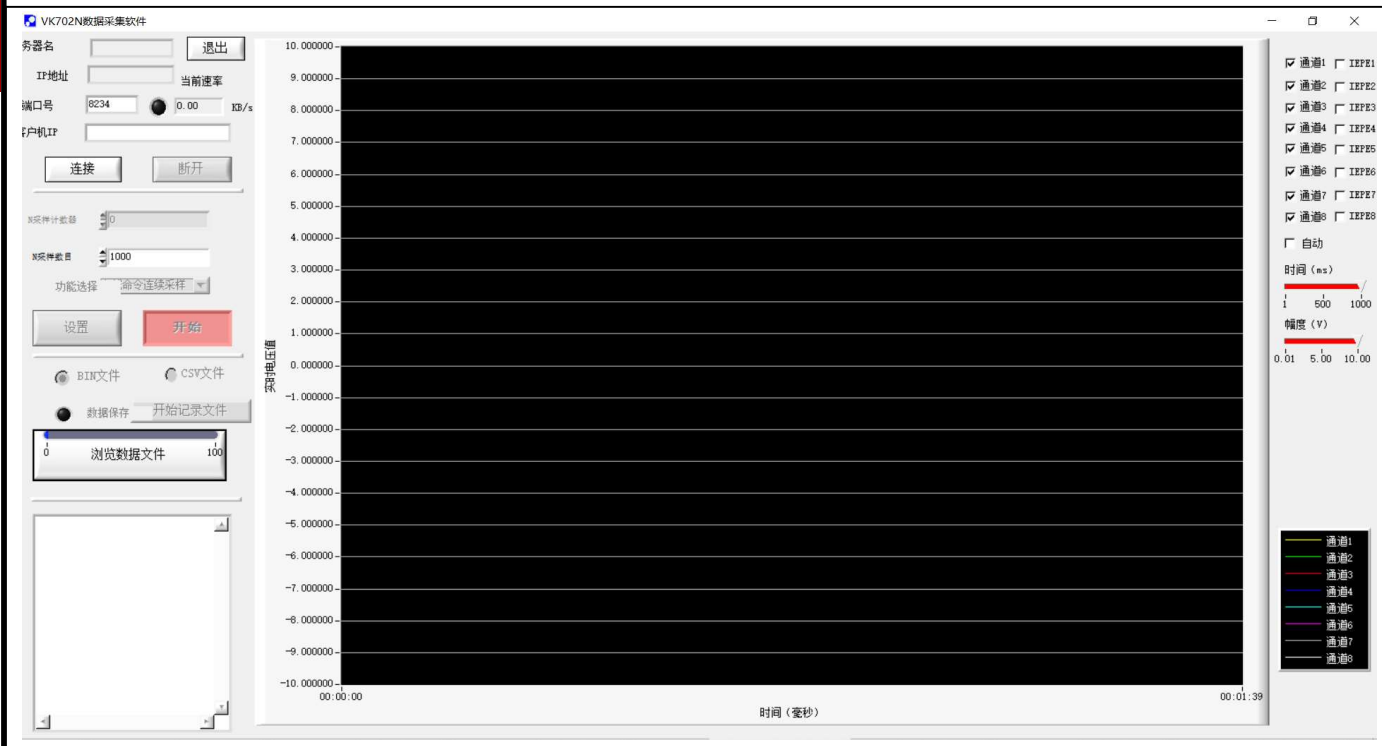
Multiple front-end acquisition at the same time

The acquisition system supports time-sharing acquisition of multiple acquisition front ends by one acquisition terminal, which can easily build a multi-point measurement and monitoring system. One transceiver can support 255 acquisition front ends at most.



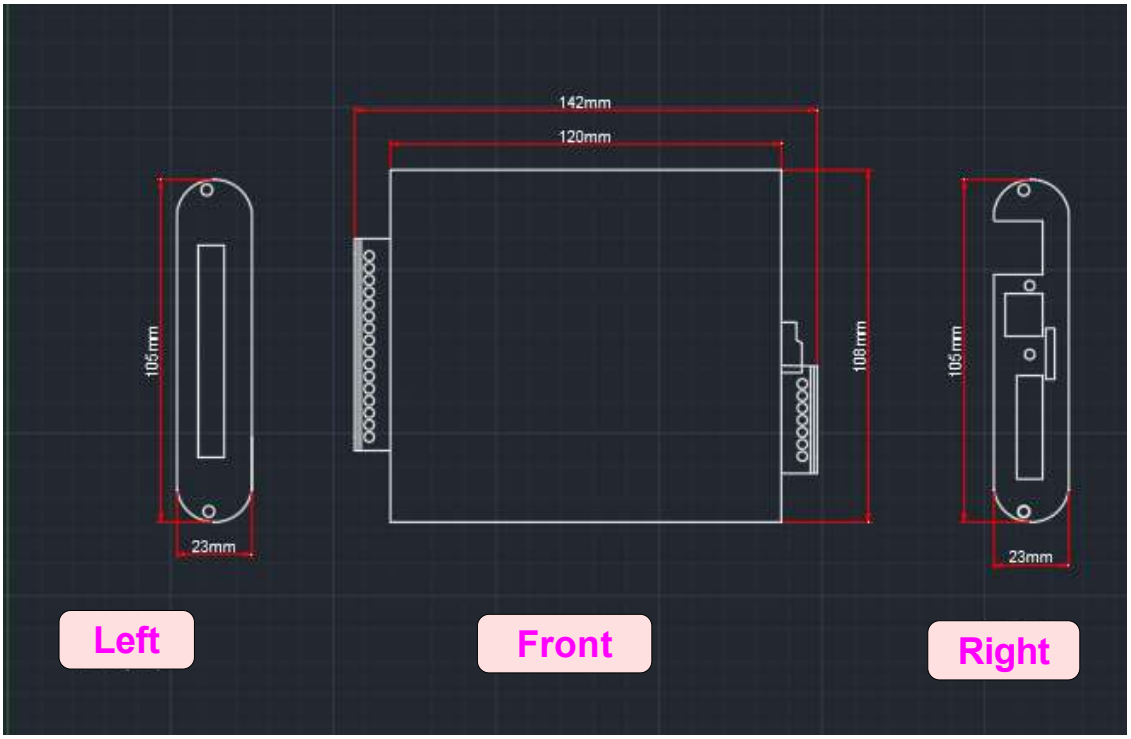
PC software

The collector vk702nh-Pro can work with separate power supply. It uses TCP / IP protocol for data transmission through network cable to exchange data with various receiving terminals.We are equipped with corresponding test software to facilitate users to test and use directly.

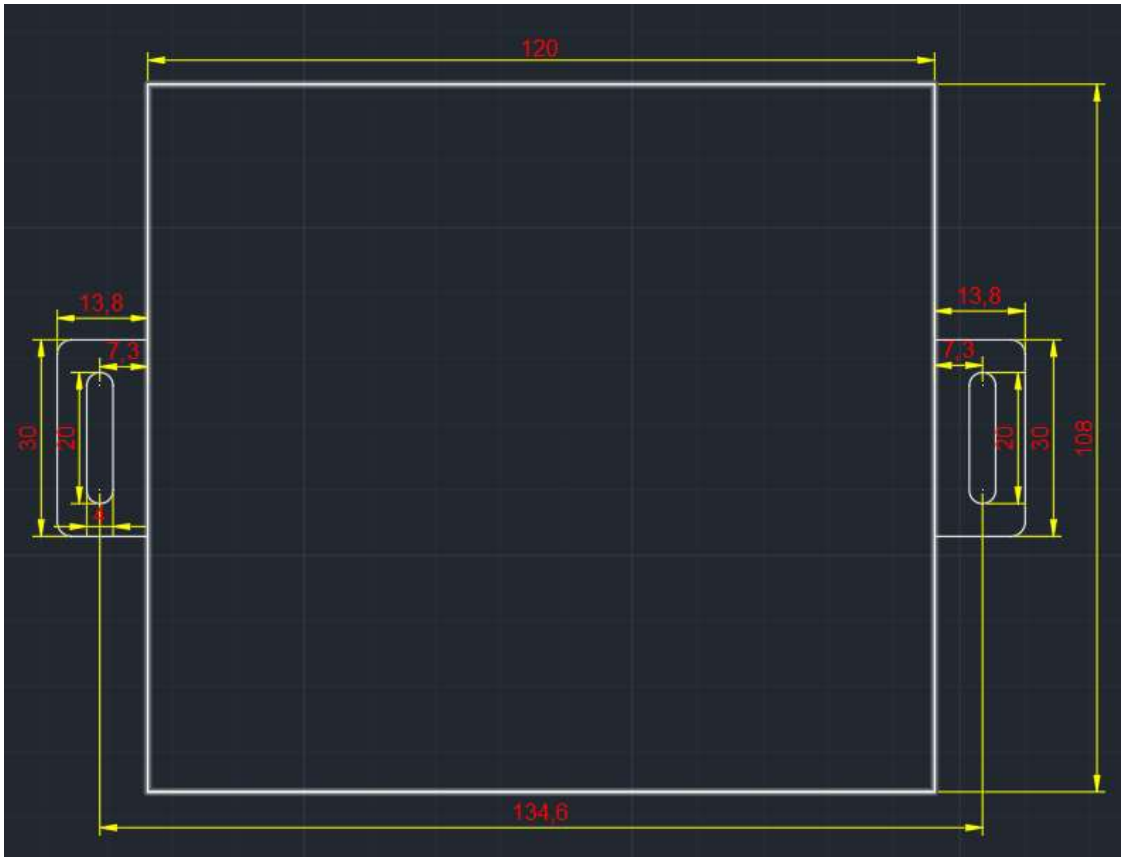


Dimension drawing

Normal version



With ear mount version



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