Shenzhen Vkining Electronics Co., Ltd

VK7015W WIFI Wireless DAQ

VK7015W WIFI wireless 24 bit data acquisition card

——Precise Accurate Fast Reliable

Introduction:

The VK7015W is a WiFi-free high-speed data acquisition card with 16-channel input, 24-bit resolution, single-channel maximum sampling rate of 32ksps, 16-channel synchronous total of 512ksps, precision pre-gain amplification, and integrated IEPE/ICP hardware support. This product adopts a number of high-precision 24-bit ADC units and the pre-amplification module developed by our company over the years, which makes this product with the advantages of high speed, high resolution, high precision, ultra-low noise, high suppression ratio, wide measurement range, low temperature drift, suitable for various occasions of precision and high rate acquisition.

Transmission communication using TCP/IP and original exchange communication protocol and built-in anti-packet loss algorithm, can ensure long-term data without losing stable transmission collection.

The acquisition card is extended to series version, LAN wired VK7015N, USB VK7015H.

VK7015W acquisition card all components are industrial grade, adopt full metal shield, can adapt to the industrial interference strong application, and has the advantages of moisture-proof, shock-proof and anti-interference.

Features:

- **High precision and resolution : 24Bit**
- **High speed : single channel up to 32ksps**
- **16 channels 512ksps in total**
- **Support SD storage : online / offline**
- **IEPE / ICP : 2 / 4mA ICP / IEPE sensor**
- **Input range : 0 ~ ± 10V Eight gear switching**
- **Multi-trigger modes : IO /analog /timing/software**
- **DAC output (optional) : 0 ~ + / - 10V analog**
- **Electrical isolation : Ethernet/power supply isolation**
- **Metal shielding shell : strong anti-interference ability**

Application:

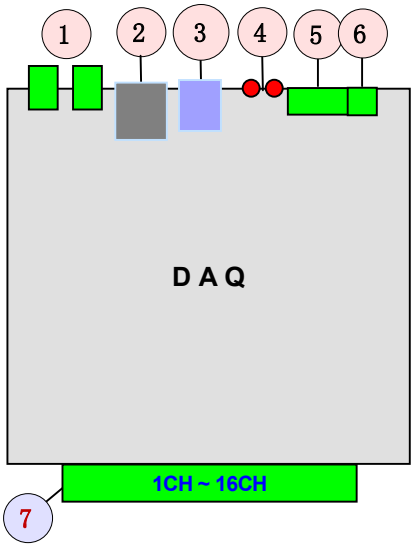
- Multi card data acquisition
- High resolution signal measurement
- **Signal trigger acquisition system**
- **Internet of things information system**

Schematic diagram of port:

1. **WIFI antenna**
2. **USB/Power supply port**
3. **SD card holder**
4. **L E D indicator**
5. **Digital IO port**

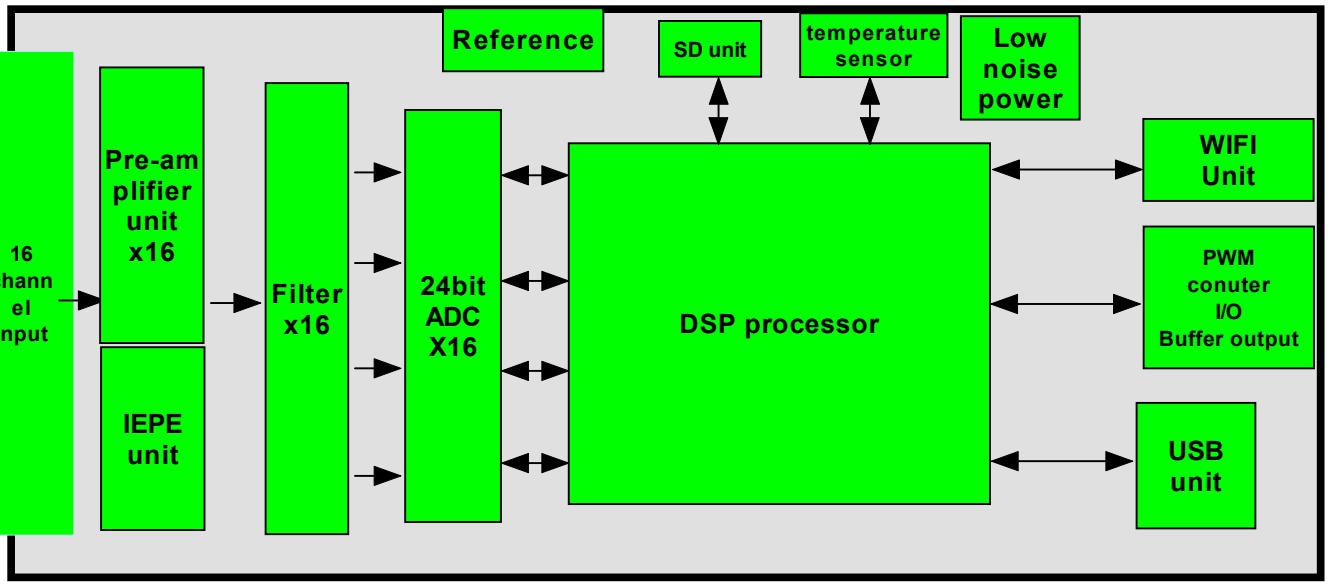
DGND	DIO4 /CNT	DIO3 /PWM2	DIO2 /PWM1	DIO1	VCC

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	Item	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 providedriving current within 100mA	
	DIO1	• DIO1——Configure as digital I / O port	
	DIO2/ PWM1	• DIO2——Configure as digital I / O port • PWM1——Configured as PWM output port	One of 2
	DIO3/ PWM2	• DIO3——Configure as digital I / O port • PWM2——Configured 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	500mA @ADC mode 850mA @IEPE mode	
6-30V Supply port voltage	V	8-24	5~40
6-30V Supply port current	mA	230mA@12V 130mA@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	

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/°C	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 (* 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	

Note1: Effective resolution is all ADC characteristics: the last bits of the ADC bounce back and forth, and the first bits that don't bounce are the significant bits.
The runout bit is not a random runout but a normal distribution, so it can reflect the effective significance of the actual 24-bit physical resolution when using digital filtering.

Note2: The background noise of ADC and the effective resolution corresponding tothe sampling rate should be considered in the signal acquisition

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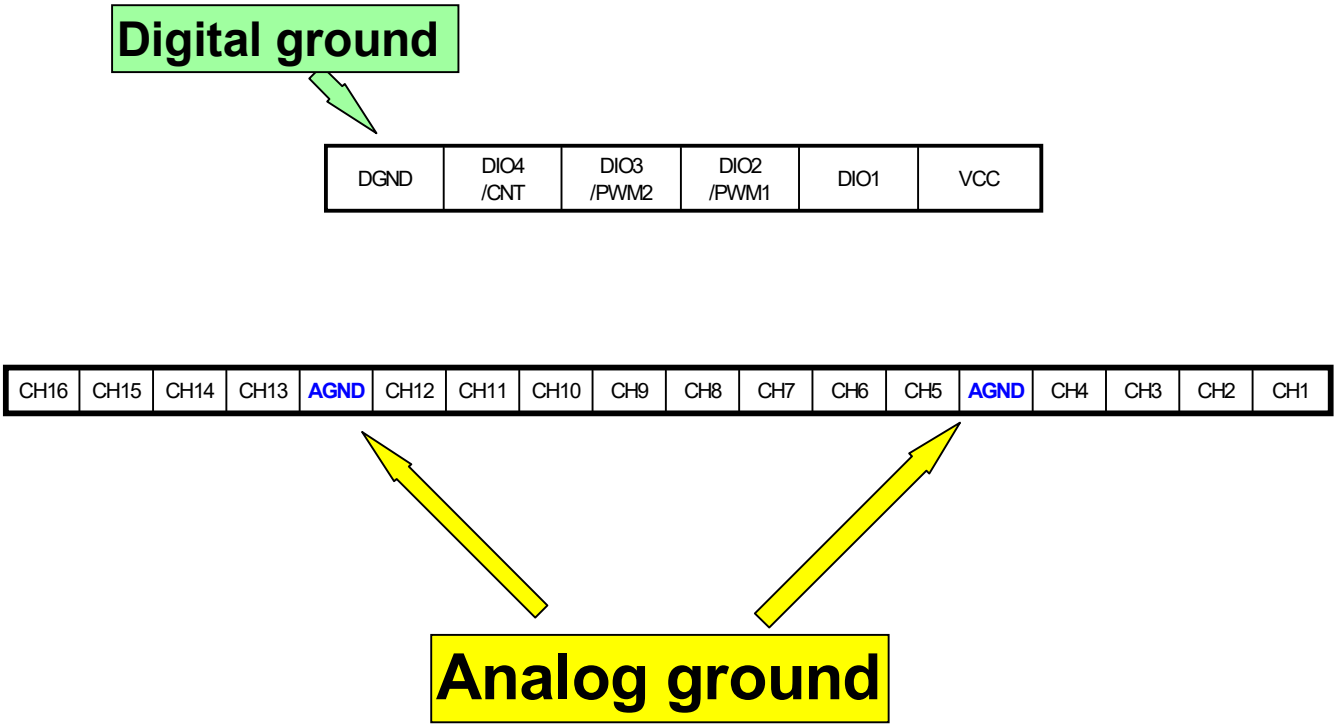
Precautions for use

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.

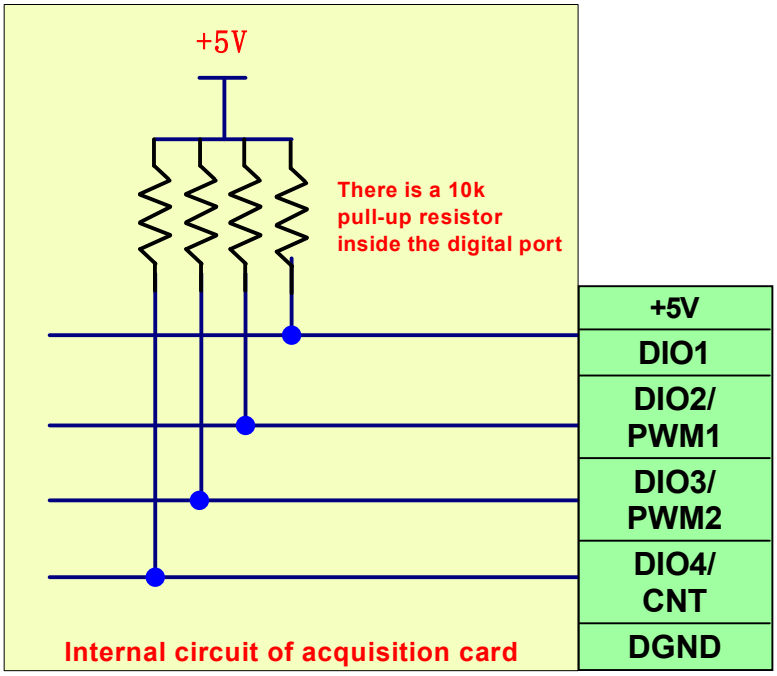


IEPE mode description

- This acquisition card integrates IEPE / ICP hardware function support.
- 24V power supply unit, constant current drive and receiving unit areintegrated in 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.

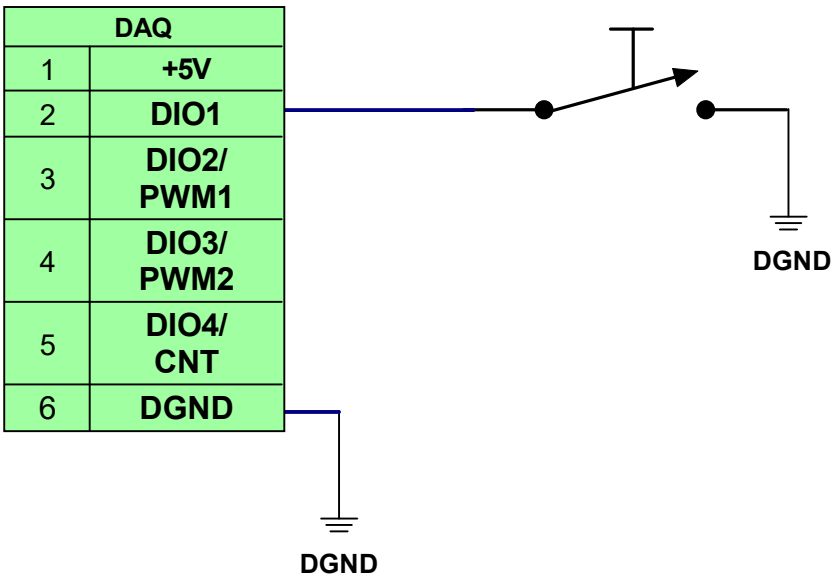
Application of digital port as input

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



Key input use

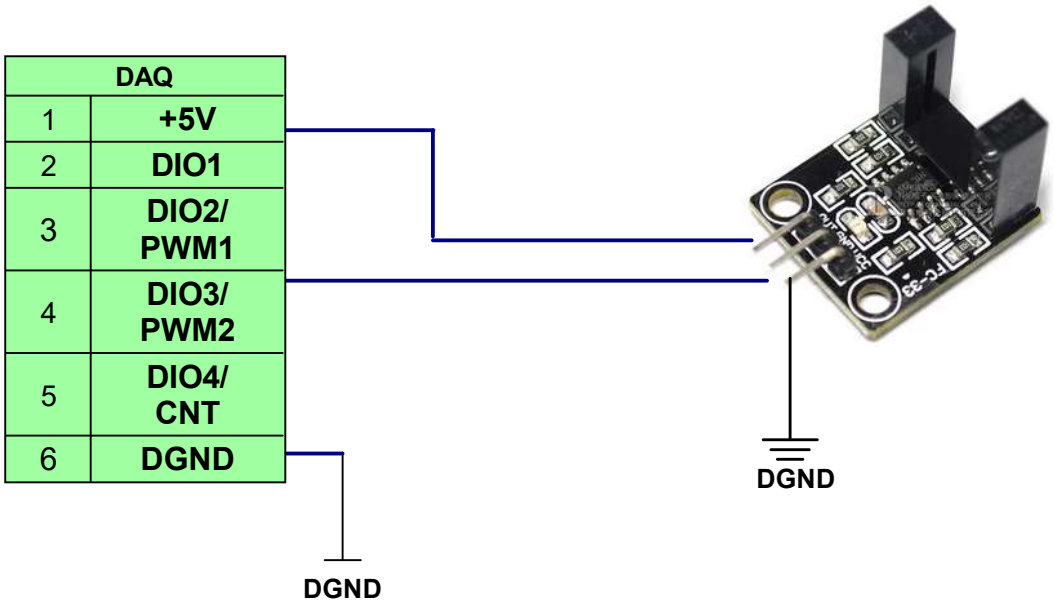
When the acquisition card is used as input, it has a pull-up resistance inside, which is more convenient to use



*All ground wires in the diagram must be connected or they cannot form a loop

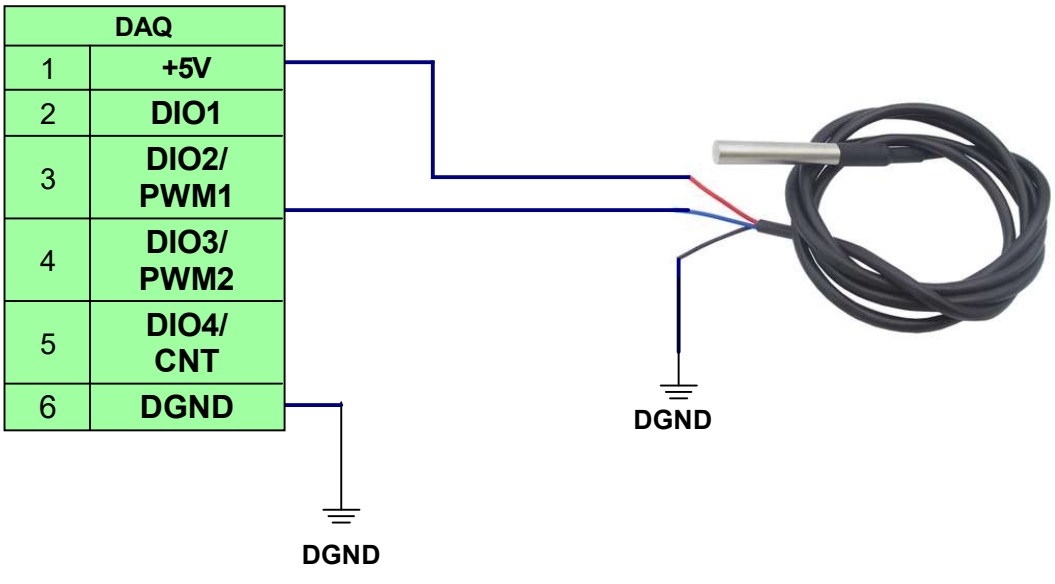
Sensor input with internal 5V power supply

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

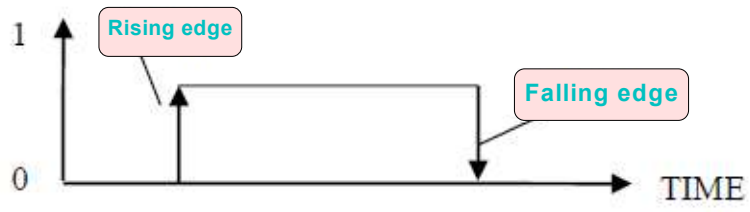
Any digital port of the acquisition card can be connected with 18B20 digital temperature sensor to directly read out the temperature valuev



External trigger acquisition mode

Trigger acquisition - mode 1: P0.4 trigger n acquisition

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

*Note : For details of software operation, refer to < vk7015 LAN series (TCP) operation examples pdf>, Chapter 3 "3. Setting the sampling method and mode"

External acquisition clock mode

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

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

*Note: Software operation details refer to <VK7015 LAN series (TCP) operation example.pdf>, Section 3. "3. Setting Sampling Methods and Modes"

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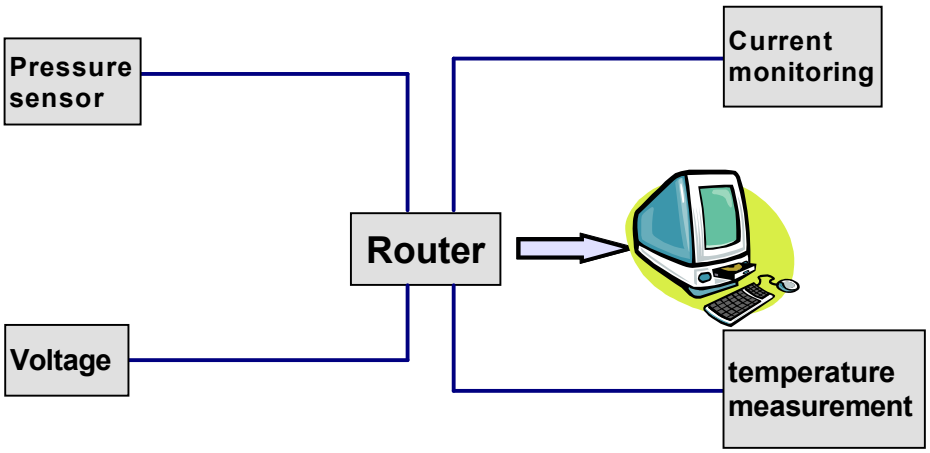
Multiple front-end acquisition at the same time

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.



LED light status and indication

Power status indicator (next to USB port)

Indicates the status of the network interface

	Bright	OFF	Twinkle
Red light	Data not sent	Normal	
Blue light	In data transmission	No transmission	In data transmission

Built-in wireless routing unit parameters

Item		
Wireless Protocol	IEEE802.11 b/g/n	*
Wireless Rate	Max 150Mbps	
Digital Port	+-200（Internal Protected Circuit)	
RF power	MAX 18dbm	
Wireless transmission distance	100 m（Open space）	

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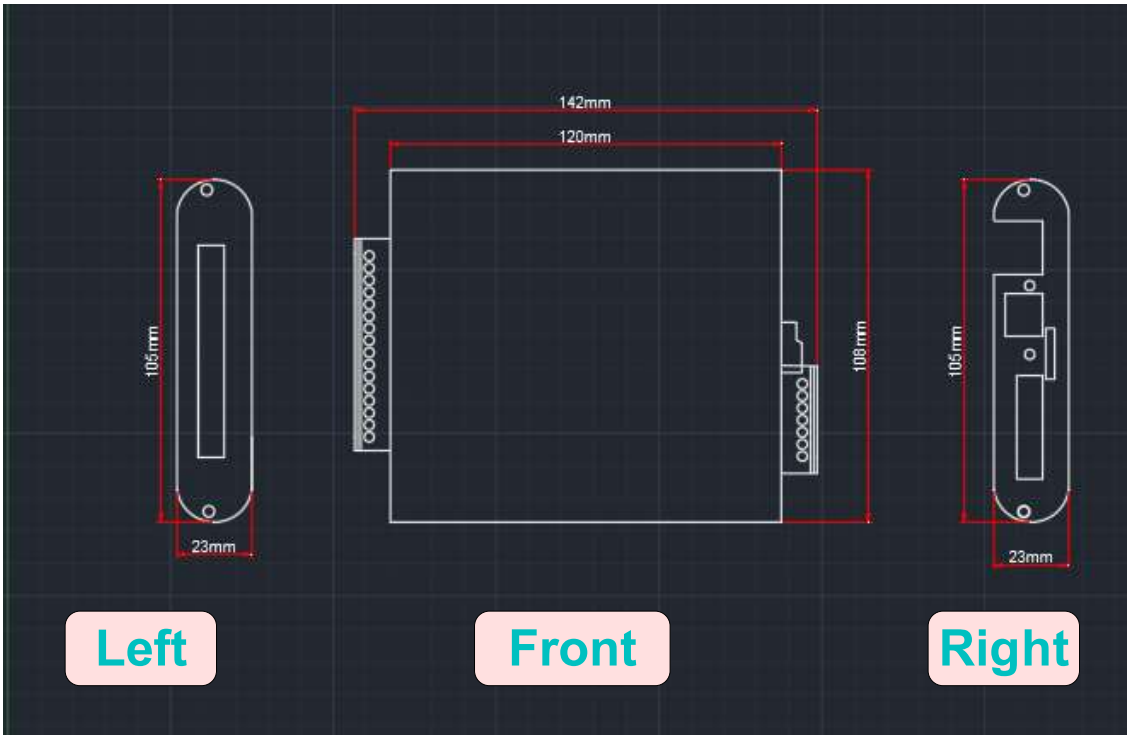
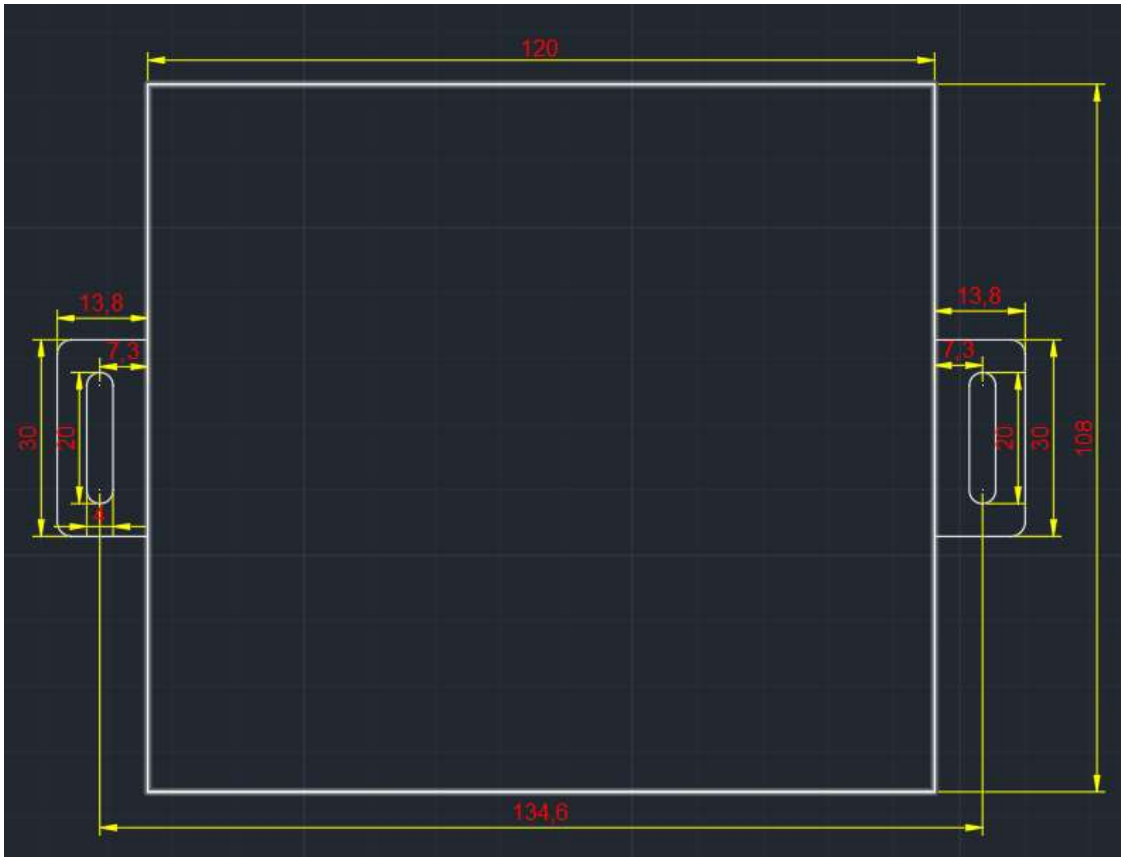
Dimension drawing

Normal version



With ear mount version



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