YUSHI

# PR21

## Pulse Generator and Receiver

## Product Introduction

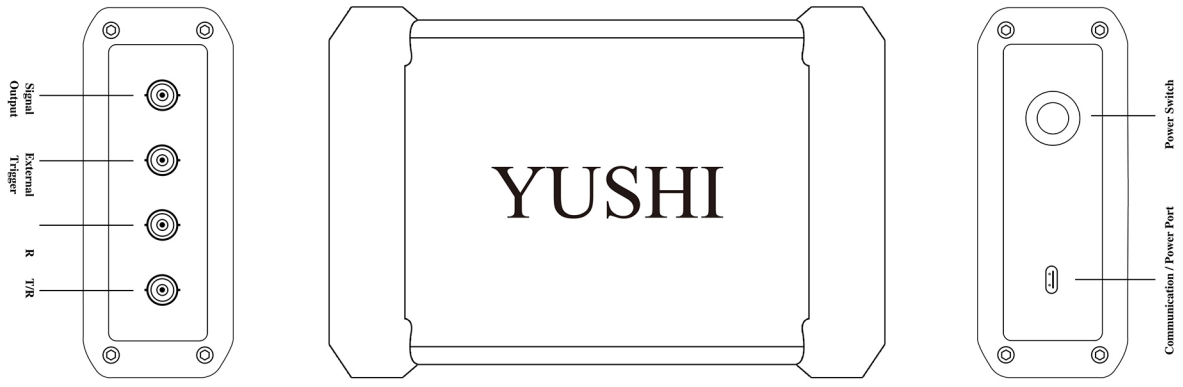
The PR21, developed and manufactured by YUSHI INSTRUMENTS, is a high-performance computer-controlled ultrasonic pulse generator and receiver.The instrument is connected to a computer and an oscilloscope for use, assisting in ultrasonic flaw detection, thickness measurement,and probe testing, etc. It has a wide range of applications in non-destructive testing (NDT) and material analysis.

The pulse generator and receiver PR21 includes a Windows-based control software, allowing users to select trigger sources, transmit voltage, repetition frequency, and pulse width. Additionally, it enables switching between single/dual-crystal modes, adjusting damping and gain to meet different user requirements.The open SDK software package also allows users to develop custom applications on various mainstream Windows systems.




## Advantages and Characteristics

◎ 25V~200V transmit voltage: 8 levels adjustable
◎ 30Ω~500Ω damping value: 8 levels adjustable
◎ 15~1000ns adjustable pulse width: 5ns steps
◎ 0~60dB receive gain range
◎ 20Hz-2kHz repetition frequency
◎ Supports single transmit/receive mode and pulse echo mode




## Windows-Based Control Software

The control software for the ultrasonic pulser-receiver requires no additional installation or configuration. Users can run the executable file directly without going through complex setup procedures. Featuring a simple and user-friendly interface, the software allows for quick parameter configuration based on actual needs. Additionally, users can save the current parameter settings to a file. When used next time, simply loading the file will instantly restore the previous configuration status.

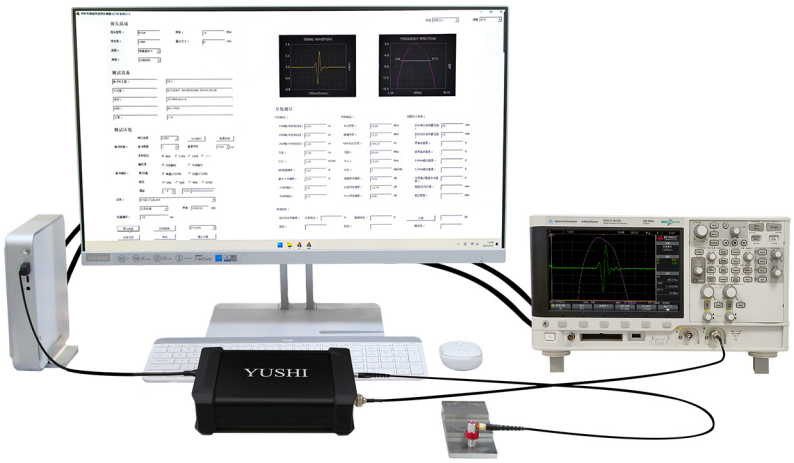
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## Pulse Generator and Receiver

## Building an Ideal Test Platform

The ultrasonic pulse generator and receiver can be connected to a computer and an oscilloscope, and with the help of the instrument's built-in control software, it can realize a variety of ultrasonic-related applications, including ultrasonic flaw detection, material thickness measurement, transducer performance analysis, and material property evaluation , etc. Additionally, the system can be used with dedicated ultrasonic transducer testing software to build a complete ultrasonic transducer testing system.




## Application of Testing Platforms in the Field of Non-Destructive Testing (NDT)

### Probe Performance Testing

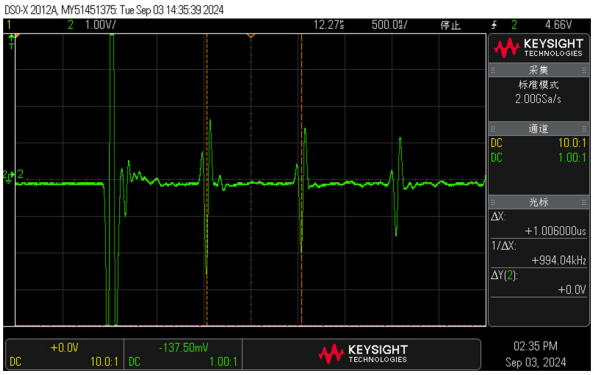
In the ultrasonic testing process, probe performance directly affects the accuracy and reliability of the test results. The testing platform can analyze the probe's echo signals in both the time-domain and frequency-domain under working conditions, thereby evaluating its performance.

### Material Analysis

By using the principle of ultrasonic pulse reflection,the mechanical properties and quality can be evaluated by measuring the speed of ultrasonic propagation in the material.This method is widely used in the field of materials engineering, particularly in material evaluation and quality control.

### Ultrasonic Flaw Detection and Thickness Measurement

This system utilizes the ultrasonic pulse-echo reflection principle and performs flaw detection and thickness measurement by analyzing the echo waveform. Specifically, flaw detection is carried out by evaluating waveform characteristics to determine the presence, size, and location of defects. While thickness measurement calculates the workpiece thickness based on the known sound velocity of the material and the time interval between two echo signals.



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## Control Parameters

| | Control Parameters | Range | Stepping |
|---|---|---|---|
| Transmitting Area | Transmitting Voltage | 25V、50V、75V、100V、125V、150V、175V、200V | Chose |
| | Pulse Width | 15～1000ns | 5ns |
| | Repetition Rate(Internal Trigger) | 20Hz、50Hz、100Hz、200Hz、500Hz、800Hz、1KHz、2KHz | Chose |
| | Trigger Source | Internal Trigger, External Trigger | Chose |
| Receiving Area | Single/ Dual Element | Single Element(Pulse Echo),Dual Element(Penetration) | Chose |
| | Damping | 30Ω、39Ω、43Ω、50Ω、65Ω、83Ω、100Ω、500Ω | Chose |
| | Gain | 0~60dB | 1dB |

## Technical Specifications

| | |
|---|---|
| Pulse Type | Negative Square Wave Pulse |
| Rise Time | 3.5ns (Typical) |
| Band Width | 1.5～30MHz（-3dB） |
| Working Method | Single Element（Pulse Echo）or Dual Element（Penetration） |
| Triggering Mode | Internal Trigger: 4Hz-2KHz; External Trigger: 0-5KHz |
| Synchronous Output | 3V, 100ns, Compatible with TTL and CMOS |
| External Trigger | Positive Pulse 3-5V; Rising Edge Triggered |
| Input Impedance | 500Ω (Dual Element) |
| Output Impedance | 50Ω |
| Output Voltage | ±5V |

## Host Specifications

| | | | |
|---|---|---|---|
| Outline Size | 18.4cm*12.6cm*5cm | Operating Temperature | 0-55°C |
| Weight | 568g | Power Supply | 5V USB，5W |

## Standard Configuration

| | | | |
|---|---|---|---|
| Host Machine PR21 | 1 | Connecting Cable BNC to BNC | 2 |
| Communication USB | 1 | USB Type-C data cable | 1 |
| Control Software（Stored in USB Flash Drive） | 1 | | |