DEEPSOUND

PAUT Automation System Equipment

High Performance · Customized Design
Research & Development

DEEPSOUND
R5

Key Advantages

01

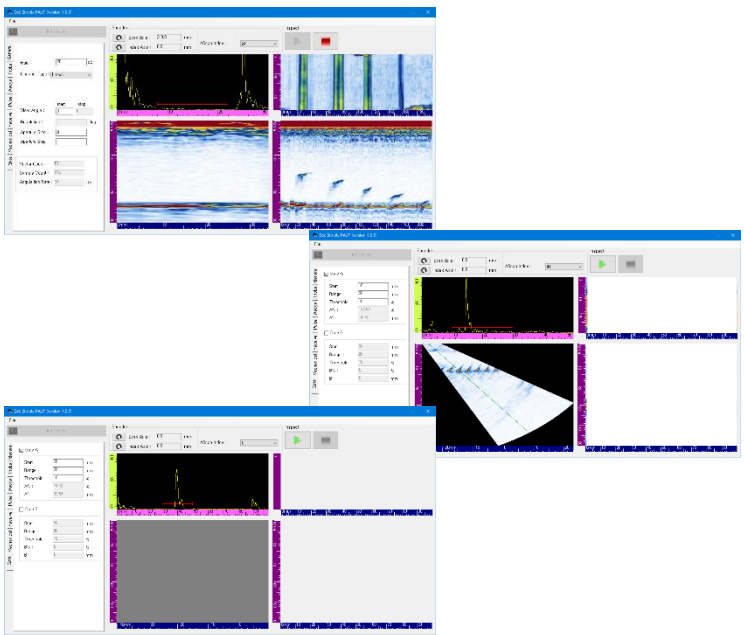
Optimized Design for Industrial Automation

02

Versatile I/O Ports with High Compatibility

03

Advanced R&D Analysis Software Support (DSK)



System Architecture

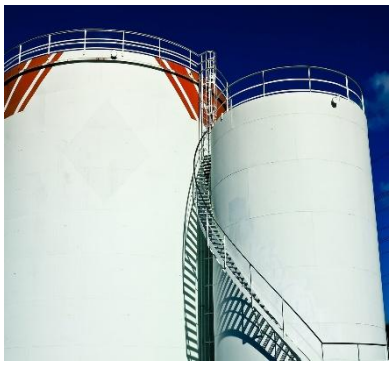
DEEPSOUND R5

- Rack-mount design (19″ rack)
- PAUT Up to 32 channels, 128 elements, UT 4 Port
- Multi-board configuration supported
- Expandable via I/O Port
- DSK (Software Development Kit) for custom program & research

Application

Automated Inspection System

Development and Research



Industrial Environment

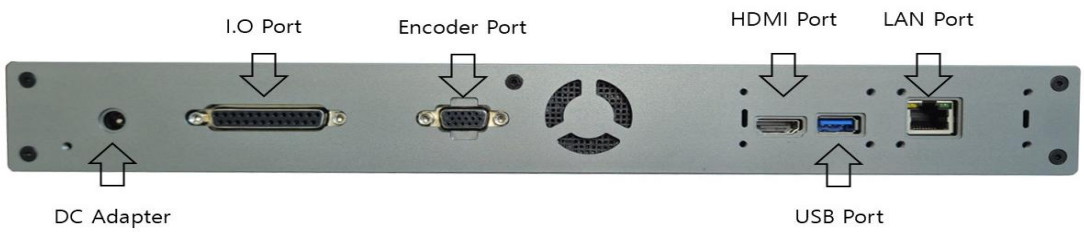
The DEEPSOUND R5 is optimized for automated inspection systems and R&D laboratories.

I/O Configuration

FRONT PORTS

PAUT (32CH/128El) **Single UT (4port)**

The R5 front panel is equipped with PAUT, UT, Status LED, and a Power Button. It supports connections with ultrasonic probes and enables users to easily monitor the data link status with the master PC.



REAR PORTS

LAN Pott **USB 3.0 Port** **HDMI Port** **Encoder Port** **I.O Port**

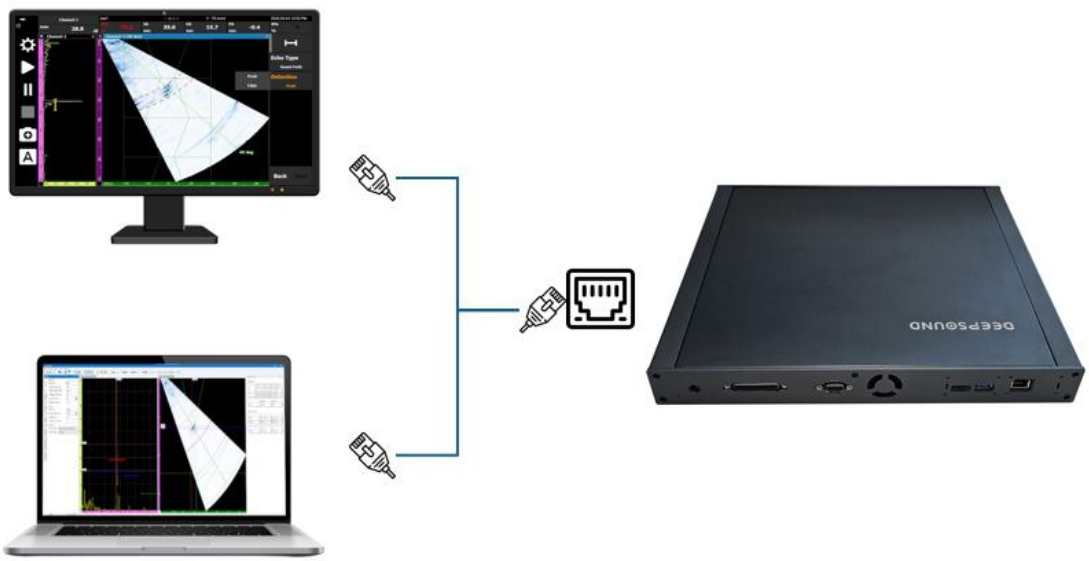
The R5 rear panel provides multiple connectivity options, including an I/O port for integration with external hardware and an HDMI port for direct monitor connection and control.

Features

Standalone Operation

The DEEPSOUND R5 features an HDMI port.

- Built-in PC
- Runs Programs without external PC



Remote PC Integration

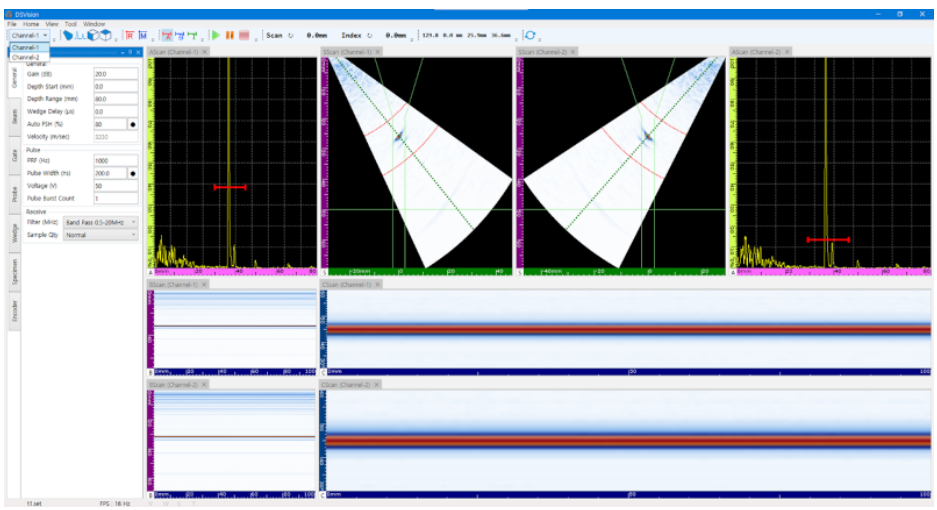
The DEEPSOUND R5 features an LAN Port

- Connect via LAN port to desktop PCs or laptops
- Run inspection software remotely
- Ideal for heavy CPU workloads and flexible work environments

Features

MOUNTED MULTI-BOARD

The DEEPSOUND R5 supports a flexible multi-board configuration designed for the 19” rack system.
This allows users to expand channels and build custom solutions tailored to various inspection requirements.

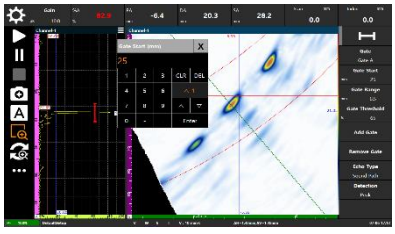


Advanced Software Visualization

The DEEPSOUND R5 software provides multi-mode signal visualization, including A-Scan, B-Scan, and C-Scan.
Users can easily analyze flaw detection results with clear data representation, ensuring accurate and efficient inspections.

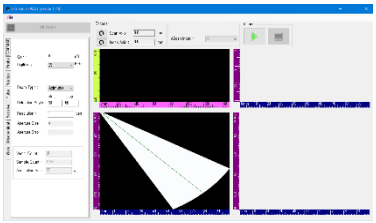
Features

Remote Access



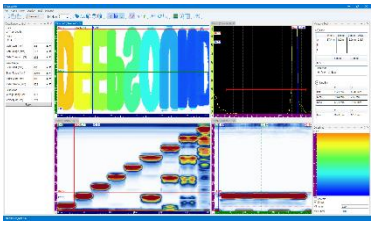
Access R5 via LAN to run and monitor programs on remote PCs and laptops.

DSK Support



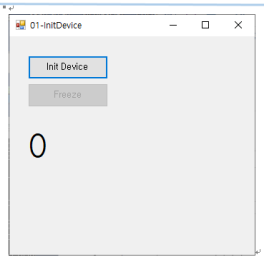
Integrate with DEEPSOUND Software Development Kit for rapid automation and customization.

Configurable UI



Users can freely configure and customize the UI for specific workflows.

Features



The code for resetting is as follows. It is in the same format as the Start project.

```
public Form1()
{
    InitializeComponent();

    Dsk.InitDsk();

    Dsk.LogInfo($"DSK version => {Dsk.GetVersion()}");

    Load += Form1_Load;
    FormClosed += Form1_FormClosed;

}
```

The following code is for the "Init Device" button.

```
private void button1_Click(object sender, EventArgs e)
{
    Dsk.InitDevice();

    Dsk.SetCallbackFrame(DskCallback);

    button1.Enabled = false;
    button2.Enabled = true;
}
```

NDT ultrasonic testing uses the encoder to locate positions or generate an image from a set position.
The Inspection project is an example of using the encoder.

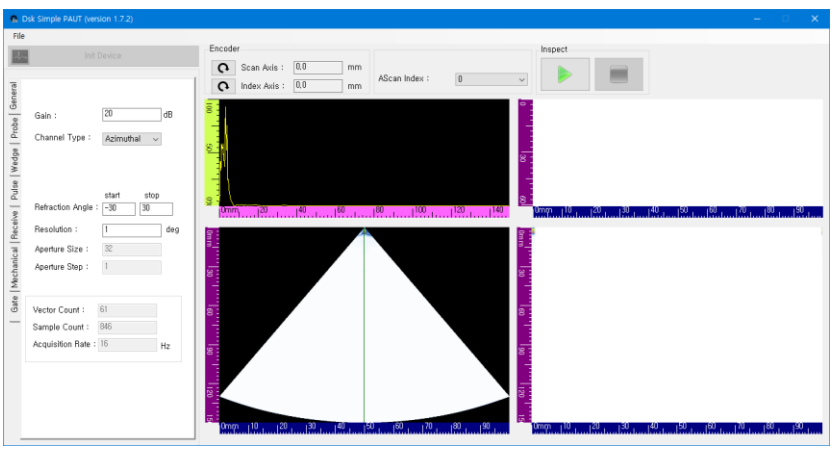
```
void SetParameters()
{
    SScanImageWidth = Dsk.GetSScanWidth();
    SScanImageHeight = Dsk.GetSScanHeight();

    VectorCount = Dsk.GetVectorCount();
    SampleCountPerVector = Dsk.GetSampleCountPerVector();

    // set encoder
    double resolution = 100;   // steps / mm
    Dsk.SetScanEncoder(0, 100, 1, resolution, false);
}
```

The code shown above is an example of using the SetScanEncoder function to initialize the scan encoder. The order of the SetScanEncoder parameters are as follows.

- Start position (mm)
- Stop position (mm)
- Step (mm)
- Encoder pulse count per mm
- Reverse flag

The code above gets an image from 0mm to 100mm by 1mm increments, by using an encoder that generates 100 pulse counts per mm.
The SetScanEncoder function initializes the encoder. To actually use the encoder, inspection mode must be set up.

- UploadInspectionModeStart : Starts inspection mode. **The Callback function calls the image when the encoder is at the predetermined position.**
- UploadInspectionModeStop : **Generates an image** and calls the Callback function regardless of the encoder's position.



Flexible Development with DSK

The DEEPSOUND R5 provides a comprehensive Software Development Kit (DSK) with tutorials, APIs, and sample codes.

- Customize PAUT & UT operations programmatically
- Integrate encoder and inspection control
- Build and deploy specialized solutions with ease

This toolkit ensures developers and researchers have the freedom to create applications optimized for their own inspection workflows.

Specifications

General

Dimensions(WxHxD)	349 x 310 x 42mm(With Case)
Weight (With Case)	1.2kg

Connectivity

Ethernet	Fast Gigabit
HDMI	X1
USB Port	USB 3.0 x1
Probe Port	IPEX 160p PA Connector x1
UT Port	Lemo 00 UT Connector x4
Encoder Port	3-axis Encoder input x1

Environmental

Operating Temperature	0 – 60℃
Storage Temperature Range	-20 – 80℃

PA/UT Configuration

Effective Digitizing	100MHz
Max PRF	30kHz
Refresh Rate	30Hz
A-scan Height	300%

Phased-Array

PAUT Channel Configurations	32:128PR
Scan Type	Linear, Sectorial, Conventional, TOFD
Focal Law	Unlimited
Channel Group	Up to 8 Channels
Focusing Mode	True-depth, Sound path

Data Specifications

Maximum Number of A-scan Data Point	Up to 16384
Rectification	RF, Full wave
Filtering	Selection of Low-pass, Band-pass, High-pass
Video Filtering	Smoothing

Acoustic Specifications

Pulser	Voltage	25V ~ 160V (5V Step)
	Pulse Shape	Bipolar Pulse
	Pulse Width	50nsec ~ 2,000nsec
Receiver	Gain Range	0dB ~ 90dB
	Band Width	0.5 ~ 20MHz
	Sample Resolution	16bit
	Dynamic Sample Focusing	Yes

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