UT340 ULTRASONIC PULSER RECEIVER

How To Achieve

- wide bandwidth and low noise at the same time
- resolution of small flaws in advanced materials
- optimum performance with any transducer

Low-Noise ➤ High-Frequency ➤ Square Wave

Problem Solved

The only 1 to 150MHz tunable square wave pulser receiver

25 years of proven performance in nuclear, aerospace, and materials science applications

UTEX SCIENTIFIC

NDT | SOFTWARE | **HARDWARE** | SYSTEMS

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Inherently different from all other pulser receivers

MAXIMIZE TRANSDUCER PERFORMANCE

Double the output of most transducers through precise pulse tuning. Accurately match the excitation requirements of any transducer at high power levels.

The powerful pulse, exceptionally wide bandwidth and quiet performance have made the UT340 an industry standard reference instrument for the past 25 years.

DETECT VERY LOW AMPLITUDE SIGNALS

Small amplitude signals can only be detected by a low noise receiver. Even at high gain settings, the UT340 maintains the highest possible signal to noise ratio. This enables detection of small reflectors in highly attenuating materials.

RESOLVE THE SMALLEST OF INDICATIONS

Echoes that are close to each other can only be resolved if you have both a wide bandwidth and high frequency receiver. The UT340 excels at discriminating thin layers in complex laminates and measuring microscopic indications in advanced materials.

ACCOMPLISH THE MOST DEMANDING INSPECTIONS

Precise pulse tuning, low noise amplifiers and wide bandwidth in one instrument are unique to the UT340. Whether it is in the laboratory or on the factory floor, modern materials and processes demand this level of performance.

PULSER

The UT340 controls pulse width in steps as small as 0.2 nanoseconds and pulse voltage in steps of 2 Volts. This precise control enables the UT340 to match the excitation characteristics of any transducer, dramatically increasing its energy output. A full 350 µJ of energy is available to excite transducers up to 500 Volts.

The pulse output of the UT340 is perfectly stable enabling very high-speed scanning. There is no drop in transducer output energy with increasing PRF, even at the highest pulse repetition rates of 20 kHz.

With its ultra-fast rise time (< 2.0 ns standard or optional 1.0 ns fast pulse), the UT340 can easily drive transducers from 1 MHz up to 150 MHz center frequency.

RECEIVER

In conventional instrument designs, input signals are first attenuated and then reamplified by a fixed gain stage. UT340 has no attenuators. This unique design offers dramatic signal to noise improvements at all gain settings.

UT340's low-noise, wide-bandwidth receiver characteristics improve inspection sensitivity throughout the 63 dB gain adjustment range.

Where are people using the UT340?

Aerospace

- Carbon fiber laminates, components and structures
- Turbine blade manufacturing and refurbishment

Power Generation

- In-situ inspection of reactor pressure tubes
- Nuclear tubing wall thickness measurement and flaw detection including welded seals

Semiconductor Manufacturing

- Sputtering target metal purity and thickness mapping
- Acoustic microscopy of dies and packaged chips

Metals Manufacturing

- Refractory metals for aerospace and defense
- Aerospace alloy billets and forgings
- Bearing and tool steel alloys
- Metallurgy: ultrasonic characterization of lab samples to compliment etch, polish and microscopy

Oil and Gas

- Valves and headers for sub-sea and terrestrial infrastructure

Materials Characterization

- Elastic moduli
- Grain size
- Heat treatment depth

Food and Pharmaceuticals

- Lab and in-line monitoring of materials properties and particle sizes

Polymer Manufacturing

- Real-time analysis of polymer melt characteristics

FILTERS

Common ultrasonic instruments typically offer a handful of selectable band-pass filters. The UT340 is different. It features a separate low-pass and high-pass filter that can be continuously adjusted to match any signal need.

LOW-PASS FILTER:

Useful for investigations where the full 150 MHz bandwidth of the UT340 is not required. The filter's broad range (20-150 MHz), makes it useful for noise reduction and as a precision fequency based attenuator.

HIGH-PASS FILTER:

Useful for increasing spatial resolution when using broadband ultrasonic transducers. This filter also dramatically decreases amplifier recovery time when working with signals closer to the initial pulse.

BAND-PASS FILTER:

Combining both low pass and high pass filters creates a band-pass filter around the frequency of interest. This reduces unwanted signals, improves signal-to noise ratio in the band-pass frequency range, and provides ultra-flat and ripple-free response.

UT340 Specifications

PULSER SPECIFICATIONS

		STANDARD	FAST
PULSE SPECIFICATION	Rise Time	<2.0 ns	<1.0 ns
	Fall Time	<2.0 ns	<1.0 ns
	Load Impedance	50 ohms	50 ohms
	Minimum Load Impedance	Capacitive to 10 Amps	Capacitive to 5.2 Amps
PULSE VOLTAGE CONTROL	Minimum Output Voltage	100 V	100 V
	Maximum Output Voltage	500 V	250 V
	Voltage Increment	2 V	2 V
PULSE WIDTH CONTROL	Pulse Width Minimum	5.0 ns	2.0 ns
	Pulse Width Maximum	80 ns	80 ns
	Pulse Width Resolution	0.20 - 0.50 ns	0.20 - 0.50 ns
	Pulse Width Accuracy	10%	10%
PRF CONTROL	PRF Minimum	200 Hz	200 Hz
	PRF Maximum	20 kHz	20 kHz

RECEIVER SPECIFICATIONS

GAIN SPECIFICATION	Bandwidth (-3 dB)	1 MHz to 150 MHz
	Input Impedance	50 ohms
	Equivalent Input Noise	100 uV p-p max
	Maximum Output Level	0 dBm
	Output Headroom	6 dB
GAIN CONTROL	Voltage Gain Minimum	0 dB
	Voltage Gain Maximum	63 dB
	Gain Increment	1 dB
	LOW-PASS FILTER	**HIGH-PASS FILTER**
Frequency Range	20 MHz - 150 MHz	1 MHz - 20 MHz
Cutoff Slope	12 dB/octave	12 dB/octave
Frequency Increment	1 MHz	1 MHz
Passband Ripple	none	none
Filter Bypass?	Yes	Yes

INTERFACES
RS-232 Serial Port USB via included adapter cable
User Input/Output
Four programmable digital inputs and outputs Two sets of programmable relay contacts

DIMENSIONS AND WEIGHT	
Height	Rackmount: 2U 86.6 mm (3.5 in) | Desktop: 104 mm (4.1 in)
Width	Rackmount: 482 mm (19 in) incl. side handles Desktop: 428.6 mm (17 in)
Depth	507 mm (20 in) - including front panel BNC connectors protruding 14mm and back panel cord wraps protruding 25mm
Weight	13.7 kg (30.1 lbs)

SOFTWARE
Software control available via InspectionWare or IW CScan Windows 10 application (included) ASCII text commands via RS-232 from your own software or PLC

UTEX is here to help.

UTEX Scientific Instruments Inc.
2319 Dunwin Drive, Unit 8
Mississaugua, Ontario, Canada
L5L 1A3

Tel: 905-828-1313 or 1-800-663-8839
Fax: 905-828-0360
Email: saless-info@utex.com

www.utex.com