

SDT270

the evolution of ultrasound



SDT270
The evolution of
ultrasound



SDT270... The Evolution

The **SDT270** represents the evolution of ultrasound for PdM professionals. Sporting many firsts, the SDT270 is consistent with our mission to design progressive and smart instruments

SDT270

the evolution of ultrasound



SDT270 is a portable ultrasound instrument for PdM professionals

The SDT270 is an innovative ultrasound instrument that sports several "Firsts". The SDT270 is the first portable ultrasound instrument designed for predictive maintenance (PdM) that has both built-in temperature measurement and laser tachometer for measurement and capture of both temperature and rotational speed data. SDT270 is the first portable ultrasound instrument to incorporate a mini SQL database on board. This feature allows planned surveyed data collection, and unplanned "on-the-fly" database creation.

Finally, record ultrasound wave files that are clear, accurate, and comparable

SDT270 is the first ultrasound instrument to record ultrasound wave files with True Amplitude making it possible for the first time to maintain a database of accurate sound files that can be compared, trended, and analyzed. The SDT270 captures up to 250,000 samples of an ultrasound signal every second. The result is clear, accurate and comparable time signals stored in its massive internal memory for analysis using Ultranalysis Suite Software (UAS).

SDT manufactures great ultrasound instruments. It is our reputation as a product and applications support company that has awarded us so many loyal ultrasound customers over the past three decades. The logical evolution to support our product

SDT270... The Evolution

The **SDT270 Platform** consists of combinations of hardware and software building blocks. Endless functionality is realized by configuring these building blocks with your SDT270 to create an Ultrasonic Solution unique to your needs

SDT270

the evolution of ultrasound

is to design the first portable ultrasound instrument for PdM that is IP (Internet Protocol) addressable. With this feature our customers have the power to connect their SDT270 to any web enabled PC and allow our ultrasound experts to interact live for the purposes of training, trouble-shooting, firmware updating, and sharing of ultrasound data. How innovative.

2 input channels to measure ultrasound, RPM, temperature, and acceleration

The SDT270 incorporates 2-channel sequential measurement functionality. This means two sensor inputs instead of one, as well as temperature and RPM measurement onboard. Wouldn't it be useful to have a portable ultrasound instrument that can collect ultrasound, acceleration, temperature, and rotational data sequentially, without having to plug or unplug a single sensor?

All this and ATEX rated too

The SDT270 is available as an ATEX certified instrument. For PdM specialists working in potentially explosive atmospheres you now have access to an evolutionary and powerful portable ultrasound instrument.

Clearly, there is considerable power available to you in the

SDT270. However, SDT's core principle of modular building block design remains. Like its predecessor, the SDT170, this new instrument is upgradable. You can start with as much, or as little functionality as required and build upon your instrument as dictated by the growth of your ultrasound program, or the availability of budget.

SDT's "Building Blocks" concept provide customized solutions defined by applications.

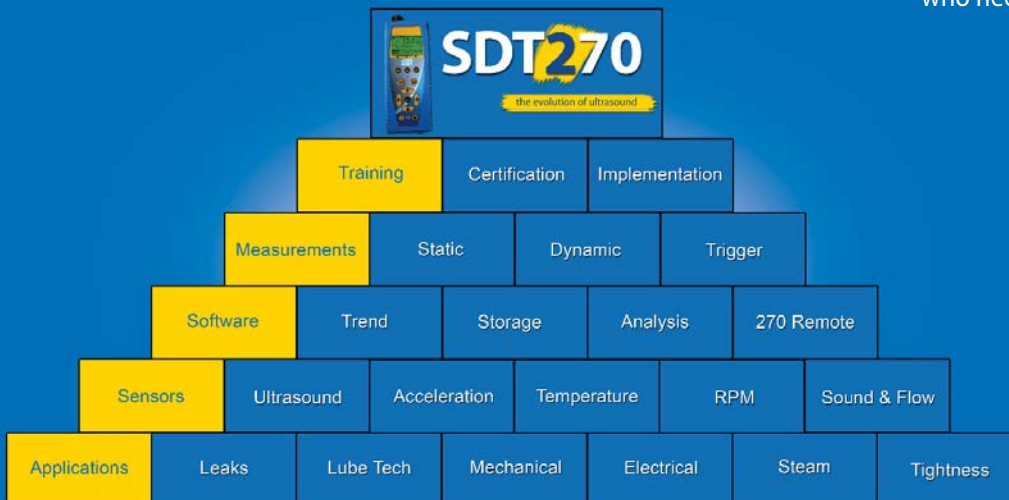
The SDT270 follows our reputation for intelligent instrument design. The Hardware Platform concept was first introduced more than ten years ago in the SDT170. Ultrasound inspectors continue to applaud its versatility today. SDT's "building blocks" concept combines options for hardware functionality and flexibility, software for trending and analysis, and sensors and accessories that promote ergonomics, operator safety, and ease of inspection.

Applications drive the need for a flexible hardware platform. Ultrasound inspection is so useful for so many PdM tasks, but not every inspector needs to perform every inspection. It makes no sense to build six different detectors - One for every inspection - When you can offer a value proposition as versatile as SDT's Building Blocks concept.

The SDT270 in combination with the Ultranalysis software Suite squares the circle of maintaining simplicity for those who need it, while providing at the same time, sophistication for those who want it.

SDT270... Building Blocks

The **SDT270** in combination with UAS Suite squares the circle of maintaining simplicity for those who need it while providing at the same time, sophistication for those who want it



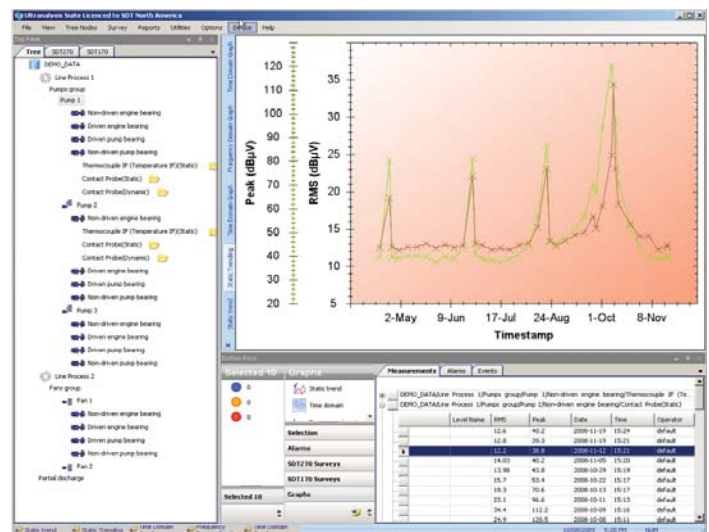
Building Block 1: Hardware Keys

“Software is the new hardware” is a familiar concept for anyone who stays current with technology. The SDT270 is packed full of features for every imaginable inspection but not every feature is needed by every inspector. Rather than build multiple instruments we use software to create one hardware platform with many faces. Like a chameleon, the SDT270 adapts to your changing environment. With the power of hardware keys SDT puts you firmly in control.

Use hardware keys to customize the features of your SDT270. From a simple leak detector configuration that provides digital decibel metering to a sophisticated mechanical inspection kit with dynamic wave file recording, accelerometer, RPM and temperature measurements. Add in a mini onboard SQL database and you have the power to control the features you need today and the option to add more features later.

Building Block 2: Software Ultranalysis™ Suite (UAS)

With all the powerful new measurement capabilities of the SDT270, an equally powerful database management software helps manage data, provide alarms, produce trends, and analyze ultrasound signals. The Ultranalysis Software Suite was created for just this purpose. UAS forms a synergistic partnership between your SDT270, your PC, and your PdM team.



UAS is an entirely new software designed specifically to:

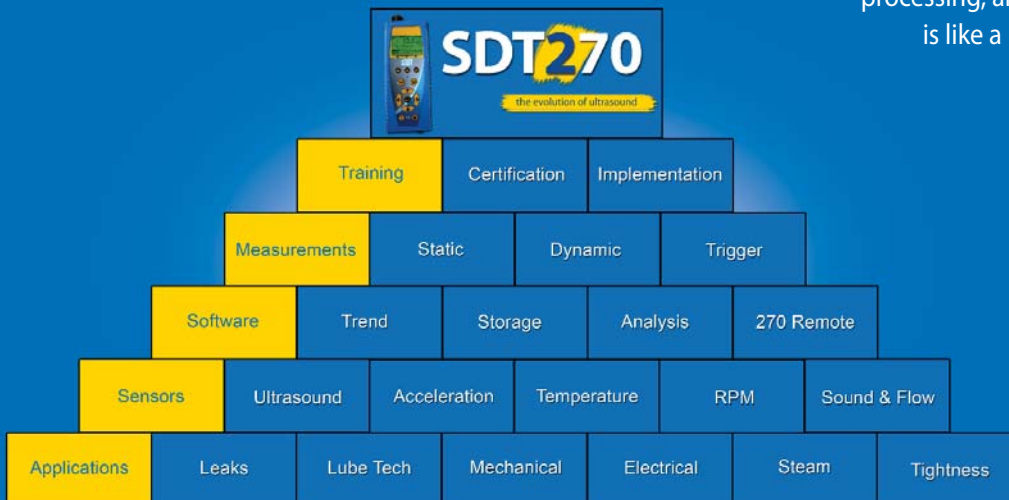
- Replace SDT's well known DataManager software
- Enhance the operation of the existing users of SDT170s
- Provide a software to support the power of the SDT270
- Serve as a multi-purpose bridge between instrument and PC

For those familiar with SDT DataManager 2.0, UAS will appear unfamiliar at first, but you will soon appreciate this new structure, look, and feel. Here are a few things new in UAS

- A familiar “Windowed” user work space
- Tree structure database
- Single and Multiple User Licenses Available
- Powerful graphics and data analysis with Multiple alarms
- Same machine in multiple surveys
- Simple network operation

SDT270... Building Blocks

Perhaps the most important piece of the PdM puzzle is finding a way to manage the collection, processing, and analysis of data. **Ultranalysis** Suite is like a library for your ultrasonic information.



UAS is fundamentally used as a database to manage the collection, processing, and analysis of data. It is a place to store and organize info in such a way as to make it easy to retrieve.

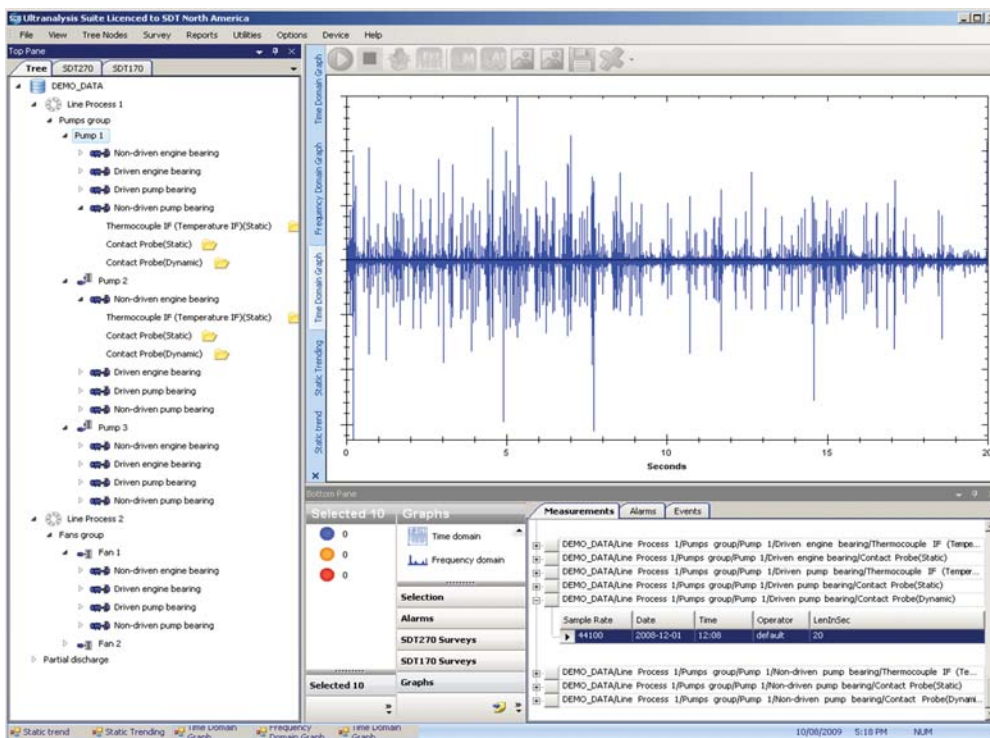
The software features three basic working panes. Through this common layout you have control of your entire database. The top pane has three tabbed views. One tab displays the tree structured database. Two additional tabs organize individual surveys for either the SDT270 or SDT170 instrument.

The main window displays data analysis and trends. Graphic representation of dB μ V data plotted over time reveals static trends of your plant's machines while dynamic data is shown in either the time or frequency domain.

The bottom pane is the control console for UAS. Assign sensors, alarms, and measurement intervals to measurement categories. Sorts data using virtually any imaginable filter. For instance, run a sort based on last measured points for a survey, or even better, produce a list of points that were missed in the last survey, and categorized as "past due".

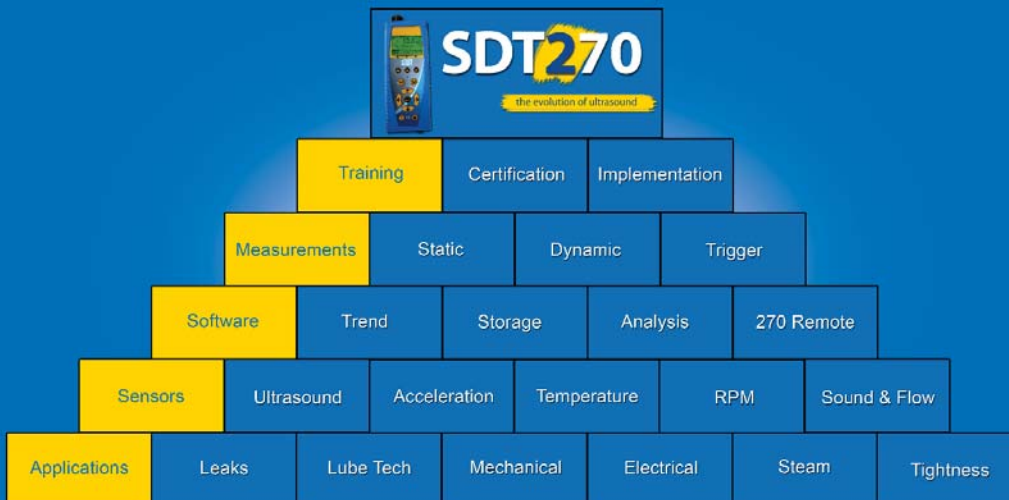
This workspace is a great way to produce sort lists based on similar machines. For instance a group of sludge pumps in a water treatment plant can be filtered so you can see their pertinent data simultaneously. By lining up a group of similar machines inspectors quickly see the benchmark and spot anomalies which is tremendously useful if alarms have yet to be established.

UAS communicates directly with the SDT270 using a common USB port. Each SDT270 has its own IP address so UAS also serves as a portal to SDT where firmware checkups and updates are installed automatically, or on demand.



Building Blocks to Apps

The Building Blocks of the **SDT270**; Hardware
Keys, Management and Analysis Software,
Sensors, Training...
All driven by YOUR APPLICATIONS



Building Block 3: Sensors

The third building block of the SDT270 Platform is sensors and accessories. The SDT270 Basic Kit in combination with SDT sensors and accessories makes possible every imaginable configuration of kits for any application inspection.

The long list of sensors and accessories that enhance SDT instruments is a testament to our global reputation as an ultrasound innovator. Thoughtful design means creating sensors that are application driven. To be truly innovative a sensor must solve a problem, produce results with greater speed than alternatives, improve comfort and reduce fatigue for the inspector, all the while enhancing safety for everyone. Finally, the sensor must be well designed to withstand the daily rigour of the factory floor. We have accomplished this in spades!

To help get you started SDT assembled a menu of kits designed around the foundation of some common ultrasound applications (leak detection, bearing monitoring, electrical inspections, steam trap evaluations). Our recommendations ensure your SDT270 kit has the necessary components to maximize your inspections whether they be basic leak detection or complex bearing monitoring.

Application Driven Kits

An understanding of the different kit options is essential to realizing the SDT270's power. We incorporated the core instrument with a menu of building blocks based on popular application driven kits. Of course we understand

that ultrasound inspectors are a free spirited breed. For free-wheeling inspectors who already know what they need, want, and expect from an ultrasound instrument, SDT provides the flexibility for you to build your own ultrasound kit.

- Leak Surveyor
- Lube Technician
- Mechanical Inspector
- Electrical Inspector
- Tightness Testing
- Steam Trap Inspector
- Custom: Build Your Own SDT270 Kit

The basic configuration for each SDT270 appears in the table. From there, add the building blocks that expand your equipment's functionality, versatility, and sophistication. In the chart on the following page is our recommended list of applications configured with Hardware Keys, Software, Sensors, Accessories,

and Support Plans. A Check Mark (✓) means it's part of the recommended kit and the lightning bolt symbol (⚡) means it is a suggested, and strongly recommended component. If you don't find what you are looking for, simply customize your own kit.

SDT 270 Basic Kit Includes	
SDT270 Static Decibel Reading Key	✓
Internal US Sensor	✓
Headphones	✓
Carrying Case	✓
Internal Battery	✓
Universal Battery Loader	✓
Operator's Manual on CD	✓
2 Year Warranty	✓
Annual Support and Calibration Plan	⚡
Implementation Training	⚡
Extended Warranty	⚡



Recommended Minimum Kit Configuration by Application

Applications	Leak Surveyor		Lube Technician		Mechanical Inspector			Electrical Inspector		Steam Trap Inspector		Tightness Testing	
	Basic	Pro	Basic	Pro	Basic	Trend	Pro	Basic	Pro	Basic	Pro	Basic	Pro
Hardware Keys													
Static Reading (SR)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Storage													
Storage/Download to .txt		✓											✓
Storage/Upload/Download				✓		✓							
Dynamic Reading/Storage/Download to (.txt & .wav)													
Dynamic Reading/Storage/Up-Download to UAS							✓		✓		✓		
Acceleration							✓						
Temperature				✓			✓			✓	✓		
Tachometer				✓			✓						
UAS Ultranalysis™ Software Suite													
UAS Single License Static				✓		✓							
UAS Network License Static													
UAS Single License Dynamic							✓		✓		✓		
UAS Network License Dynamic													
UAS Demo License Dynamic													
SDT270 Remote Control													
Sensors, Accessories, Support Plan, Training, Extended Warranty													
Internal US Sensor	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Flexible Sensor	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
Extended Distance	✓	✓						✓	✓				✓
Parabolic Sensor		✓						✓	✓				✓
Needle Probe RS			✓	✓	✓	✓	✓			✓	✓		
Magnetic Sensor								✓	✓				
Threaded Sensor													
Acoustic Lube Adaptor			✓	✓			✓						
Bi-sonic 200mW Transmitter												✓	✓
Multi Transmitter SDT8MS													✓
dBA Noise Sensor													
Mass Flow Sensor													
Thermocouple Interface													
Belt Holster													
UAS SoftCare™ Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SDT270 SoundCare™ Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Implementation Training	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



Technical Specification

SDT270 Measurement Unit

SDT270 Measurement Unit	
Function	Multi Function Ultrasound Detector
Display	Graphic LCD with Backlighting (128 x 64)
Keypad	12 Function Keys
Built-in Sensors	<ul style="list-style-type: none"> Airborne Ultrasound Sensor Infrared Temperature Sensor (activated by hardware key) Tachometer with Laser Sight (activated by hardware key)
External Sensors	Through specific connector (LEMO 7 pin connector)
Data Logger	With SDT270 Basic + Storage + Static download to .txt : <ul style="list-style-type: none"> 20 Measurement Nodes (measurement points) Total 4000 Measurements (measurements data) All other SDT270 versions used in combination with Ultranalysis Suite : <ul style="list-style-type: none"> Static measurements (dBμV, °C/F, RPM, dBA, SCFM, SCCM): 10,000+ measurement nodes with static data Dynamic measurements (wave recording) : 13 minutes (for example 260 recordings of 3 seconds)
Communication	USB Interface and Software for transferring data from SDT270 to the PC : UltrAnalysis Suite (UAS)
Power Supply Autonomy: Nominal Capacity: Life Span: Protection: Recharge Time: Performance:	Rechargeable battery: 8 cell, 4.8V 4400mAh, NiMH (Nickel Metal Hydride) <ul style="list-style-type: none"> 8 hours (use of backlight reduces autonomy) 4.4 Ah 500-1000 proper charge/discharge cycles Short-circuit, reverse polarity and temperature protected 6 to 7 hours. Recharge only with approved SDT charger For optimum performance, this battery pack is equipped with an electronic management system that tracks digital serial number, capacity, and temperature management
Auto Power Down	Auto power down after preset time
Operating Temperature	-15°C to +60°C / 14°F to 140°F
Housing	Extruded aluminum
Weight	830 grams / 29.3 ounces (includes battery and holster)
Dimensions	226 x 90 x 40 mm / 8.90 x 3.54 x 1.57 inches (LxWxH)
Holster	Rubber cover, resistant to hydrocarbons (fluoro silicone)
Headphones	130dB, noise isolating type
Battery Charger Power Supply: Output Voltage: Current: Protection: Status Indicator: Isolation: Weight: Housing:	<ul style="list-style-type: none"> Specific for SDT270 NiMH battery pack. For optimum performance this charger is microprocessor controlled 230VAC or 110VAC +15%/-10% 50/60Hz 4.0 or 8.5 V DC (depends on operating mode) 1000 mA maximum Temperature Protected, Limit set at 60°C/140°F Two colour LED type Double Isolation 300 grams / 10.6 ounces PPE

SDT270 Keypad

1. On/Off
2. Backlight
3. Enter/Validate
4. Up/Down Navigation
5. Left/Right Navigation
6. Hold/Lock Data
7. Store Data
8. Action Buttons

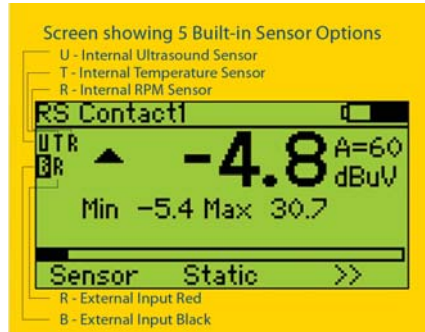


SDT is committed to continued research and development of all our products. The specifications printed herein are therefore subject to change without notice. 2009-10-03

SDT270

Technical Specification SDT270 Built-in Sensors

The SDT270 has unmatched features built-in. The front side of the instrument features an internal airborne ultrasound sensor and two measurements channel inputs to which can be connected several external sensors. These include all SDT ultrasound sensors (parabolic, flexible, needle probe RS, magnetic, and threaded) and all "non-ultrasonic sensors (Mass Flow Sensor, external RPM, external temperature,



dBa and accelerometer).

A laser sight, a non contact temperature sensor, and a non contact tachometer are built-in options. These sensors are locked on the standard SDT270 but are activated by hardware building blocks should you wish to use them.

The sensors are denoted by "U T R B R" as shown on the screen shot here.

SDT270 Built-In Sensors

Airborne Ultrasound Sensor

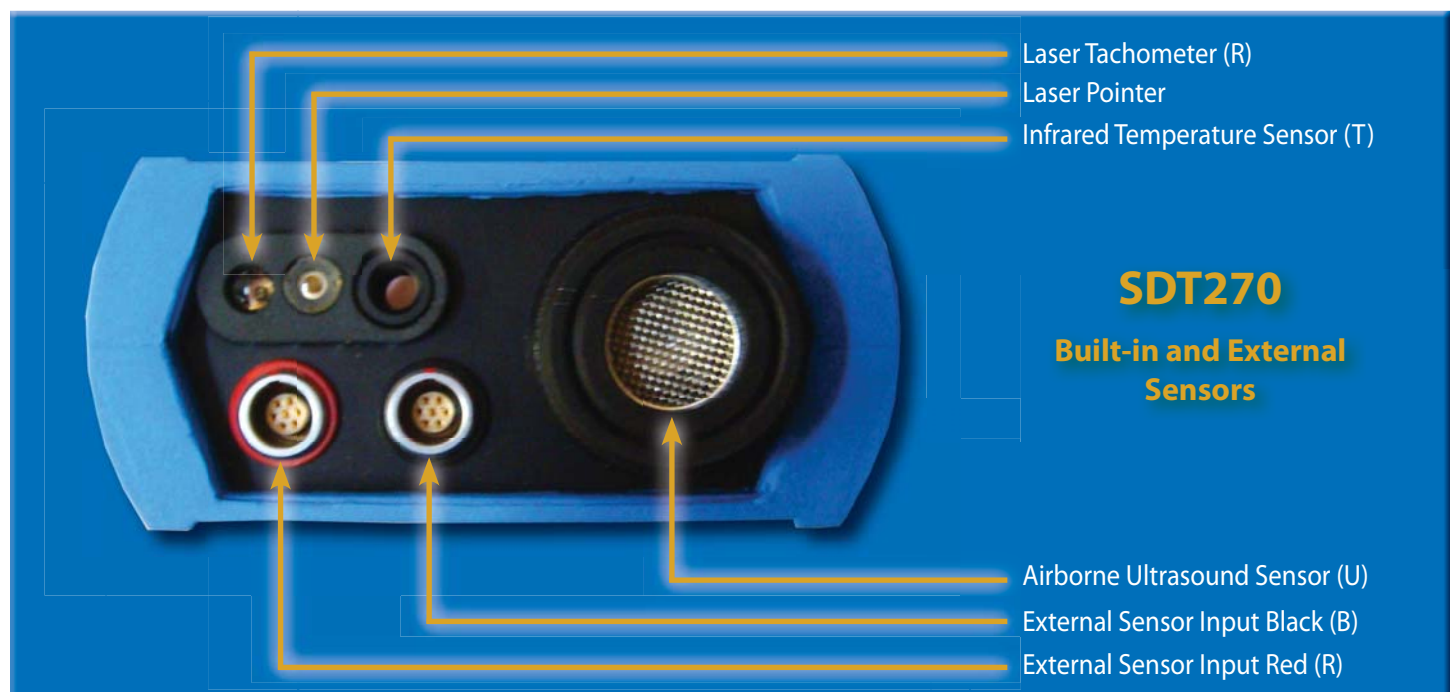
- | | |
|-------------------|---------------------------------|
| Function & Type: | • Open ultrasonic sensor |
| Bandwidth: | • +/- 2kHz at -6dB |
| Frequency: | • 40kHz +/- 1kHz |
| Sensitivity: | • -65dB re 1V/ μ b at 40kHz |
| Total Beam Angle: | • 55° typical at -6dB |

Laser Tachometer

- | | |
|------------------------|--|
| Measurement Modes: | • RPM and RPS Optically; Count & Time: RPM & RPS, Metres, Yards, Feet, per min & sec |
| Speed Range: | • 30-30,000 RPM or equivalent in RPS |
| Optical Range: | • 50mm - 2000mm / 1.9" - 78.74" |
| Minimal Optical Angle: | • 45° |
| Light Source: | • Red Spot Laser Class II |

Non-Contact Temperature

- | | |
|------------------------------|---|
| Function & Type: | • Temperature Sensor (infrared temperature probe) |
| Object Temp Measuring Range: | • -70°C to +380°C / -94°F to 716°F |
| Accuracy: | • 0.5°C |
| Response Time: | • TBD |
| Spectral Response: | • 8-14 Microns Nominal |
| Emissivity: | • Adjustable from 1 to 100% |
| Spot to Target Ratio | • 1:6 |



SDT270 External Sensors

Flexible Sensor



The Flexible Sensor facilitates the need to keep inspectors safe while performing inspections of compressed air lines, electrical panels, steam systems, and mechanical components. This super sensitive sensor can be flexed in any shape to access hard to reach places. Three different lengths serve to keep inspector's hands at a safe distance from moving parts and hot surfaces.

Parabolic Sensor



The Parabolic Sensor is designed to detect sources of ultrasound over great distances. The unique shape concentrates direct waves only making this sensor the most directional of all. A powerful class II laser sight aids in pinpointing the origin of the signal. This sensor is most efficient beyond 8 metres (8.75 yards). Closer distances should be detected with the EDS

Needle Probe RS



The Needle Probe RS is a resonant sensor designed for accurate measurement of structure borne ultrasound waves. A great deal of research went into designing this robust and repeatable contact probe. The primary use of the needle probe is for mechanical data collection but it uses extend beyond bearings to include steam traps, pneumatics, and much more. It doesn't have to rotate to be measured with ultrasound.

Extended Distance



The EDS combines design and function to overcome the problem of distance. The tapered cone shape captures ultrasound waves and focuses them directly to the built-in airborne ultrasound sensor of the SDT270. Detection of air leaks, electrical faults, and other airborne phenomena can be detected from up to 10 times the distance. The EDS focuses both direct and reflected sound waves making it slightly less directional than the parabolic.

Threaded Sensor



The Threaded Probe RS is a resonant sensor designed for accurate measurement of structure borne ultrasound waves in permanent mounted applications. A great deal of research went into designing this robust and repeatable contact probe. This probe also connects up with the Acoustic Lube Adaptor for condition based re-lubrication of motor bearings.

Magnetic Sensor



The versatility of the SDT270 is enhanced with the Magnetic Sensor. Useful for slow speed bearings, leak testing hydraulic systems, pneumatics, and steam traps, listening for electrical faults inside electrical panels, and hand-free re-lubrication of electric motor bearings. Its compact size and rugged stainless steel shell matches the longevity of all the products in the SDT sensor lineup.

Bi-sonic 200mW Transmitter



The 200mW Bi-sonic Transmitter is useful for checking tightness of smaller volumes or for spot checks after primary inspections of larger volumes. Its dual frequency transmission guarantees 100% fill and zero standing waves. Useful for checking diesel engine air intake systems, tube and shell leaks on boilers and heat exchangers, and more.

Acoustic Lube Adaptor



Condition based lubrication is the standard since SDT introduced the Acoustic Lube Adaptor in 2001. Connect your grease gun to you SDT ultrasound sensor and hear the changes take effect as you pump grease to the bearing. The static and dynamic data measured by the SDT270 is an accurate indicator of bearing grease condition and requirements.

dBA Noise Sensor



The SDT A-weighted sound pressure measurement microphone is used in combination with the SDT270 instrument. Useful for verifying safe noise levels in factories controlled by Occupational Safety and Hazard rules for ambient noise.

Multi Transmitter 8-Zone



Ultrasonic transmitters generate dual high frequency signals that are small enough to pass through very small leaks. When the transmitter is placed inside a volume the entire space is flooded with ultrasound waves. Use the SDT270 with Flexible Sensor to scan seams and seals to verify tightness. This unit is useful for cars, trucks, buses, ships, trains, hospital clean rooms, and building envelope.

Thermocouple Interface



This digital thermocouple interface allows any 'J' or 'K' type thermocouple to be connected via channel 1 or 2 of the SDT270 making contact temperature measurements and data storage possible. Off the shelf thermocouples of any make or brand will work.

Mass Flow Sensor



Plug this low flow mass air flow sensor into either channel of the SDT270 and your ultrasound detector becomes a flow measuring instrument. Measure SCFM or SCCM. Being careful to capture 100% of the flow from a compressed air leak, inspectors can estimate the potential cost savings of repairing compressed air leaks.

SDT Training Programmes



"Investing in ultrasound equipment without investing in training is like buying a Corvette and driving it in first gear; you can make it roll but you will never make it perform."



From the classroom...



Invest in training of your inspectors and get the most from your Ultrasound Programme

Why invest in training?

Companies that invest in training enjoy a higher level of interest and participation across more departments while implementing inspections for more applications. Not only do the programmes endure, but the return on investment is almost immediate.

Training is the foundation of an effective, and enduring ultrasound inspection program. SDT has been in the ultrasound training business for more than 20 years. We recognize that every company is different and every inspector unique.

Certification training

SDT's certification training courses are 2½ days and consist of a comprehensive mix of theoretical and practical learning. The intent is to provide the maximum transfer of knowledge and skills identified by ASNT Recommended Practice No SNT-TC-1A for level 1&2 inspectors. Students are exposed to ultrasound theory as it applies to the many applications they will encounter in the factory environment.

Certification training is offered in both public and private settings. Public classes are a mix of inspectors from many companies resulting in an idea exchange that is productive and enriching. Private classes are held at your site and are equally rewarding since the instructor can address issues specific to your facility. Your SDT Partner can discuss both options and help you decide which one fits your needs.

Implementation training

SDT's implementation training is a multi-stage on-site consult by an SDT approved corporate training specialist. Companies that invest in implementation training form a strategic alliance with a global team of ultrasound coaches committed to getting your ultrasound programme on the right track from day one. The curriculum is customized to the your needs, applications, and goals.

The first stage of training involves gaining an understanding of ultrasound technology and how it applies to applications. From there our experts work with you to develop an effective strategy for your program including definition of goals, development of inspection procedures, software training and database setup, and a metric for measuring the success of the program.

The second stage of implementation is a follow up site visit 3-6 months after start up. This allows you to re-evaluate your programme and answer questions. It is also an opportunity to refresh inspector's knowledge and train any new hires.

Our objective.. Your expectation

- Promote inspector confidence
- Provide a deeper understanding of ultrasound technology and how it applies to the many PdM applications that challenge our clients
- Ensure inspectors meet the standard level of knowledge and expertise
- Uphold the unique and significant place of ultrasound inspection in Predictive and Preventative Maintenance programmes.

Technical Support Services

Protect your investment with SDT's flexible suite of support services

SDT Technical Support Services are here to ensure that your SDT products and software operate to the standard you expect and that you benefit from the most current firmware and software. SDT designed a versatile suite of support services aimed at helping you reach the goals of your ultrasound programme. Our support contracts protect your technology investment. We focus on maintaining your ultrasound assets so you can focus on maintaining your company's assets.

SDT SoundCare™ Service Plan

Our products carry a basic two year warranty which covers:

- Parts and Labour
- Performance Guarantee
- Global Coverage

SDT's SoundCare™ Service provides extended care for your hardware beyond the standard manufacturer's warranty. Choose either a three or five year coverage and enjoy trouble free operation for the life cycle of your equipment. Benefits include:

- Performance guarantee
- Firmware updates
- Support by e-mail, phone, and remote access
- Annual calibration of SDT270 and accessories
- Parts coverage
- Labour coverage
- Accessory coverage
- Sensor coverage
- Repetitive repair warranty
- Replacement guarantee
- Global Coverage

Call for more details or speak with your Authorized SDT Partner today.

SDT SoftCare™ Support Plan

To help you get the most from your Ultranalysis™ Software Suite we include with every UAS™ license:

- 6 months e-mail support
- 6 months software updates
- Access to online user's group

To help maximize your UAS experience SDT developed SoftCare™, a comprehensive and cost-effective plan that provides timely access to software updates and extensive technical support resources that ensure operational efficiency. Choose either a three or five year coverage and enjoy these benefits:

- Unlimited e-mail support
- Unlimited telephone support
- Unlimited remote access support
- Unlimited access to online user's group
- Unlimited software updates

SDT Ultrasound Systems

PO Box 682, Cobourg ON Canada K9A4R5
Tel - 905-377-1313 Fax - 905-377-1402
Toll Free Canada & USA 1-800-667-5325
Toll Free Fax Line 1-800-224-1546
www.sdtnorthamerica.com
info@sdtnorthamerica.com

Your SDT Certified Partner