



Intrinsically Safe Thickness Gauge with CorDEX CONNECT™

November 2011

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Protection concepts



INTRINSICALLY SAFE

- Limits the available electrical energy in a device to nonincendive levels so that sparks cannot occur which could cause an explosive atmosphere to ignite
- Product must be designed from initial concept through manufacture to be intrinsically safe

FLAMEPROOF

- Also referred to as "explosionproof"
- Contains an explosion within a device
- Controls expanding hot gas allowing it to cool through flamepaths
- Prevents secondary ignition of surrounding plant

Pipeline and tank applications



Those maintaining infrastructure face two unavoidable realities:

Corrosion and Erosion



CORROSION:

Corrosion on a pipeline wall or a storage tank can be triggered by:

- Contaminants in the materials
- Operating conditions where the pipe or tank is located
- Microorganisms living on the surface wall





Wall thinning is the natural result of pressure or movement of materials through curved portions of pipelines

Regular inspections provide an accurate idea of equipment integrity, and are critical for preventative maintenance planning

Safe area thickness gauge



DISADVANTAGES

- Typically generate excitation pulse in excess of 100V
- Use unprotected piezo transducers which can create 1kV across terminals
- Use unprotected electronics and batteries
- Non-certified plastics can create static spark

ADVANTAGES

- Accurate
- Feature rich
- Many transducer options

UT5000 Intrinsically safe thickness gauge





- All electronic components protected
- Power across the device controlled to be safe even after a failure in one protection system
- Manufactured from anti-static polymers to reduce explosion risk
- Matched pulser /transducer operates at much lower voltage than non-IS
- Protected transducer cannot create a spark, even if impacted when removed from UT device



INTRODUCING THE NEXT GENERATION of Intrinsically Safe Thickness Gauges for Hazardous Environments





Intrinsically Safe - Zone 1:







- ATEX and IECEx Certified
- Zone 1 IIC T4 hazardous areas

IN THE FIELD:

No hot work permit required in Zone 1 environments





Advanced Testing Technologies:

- Corrosion Mode Continuous, real time measurements are logged with Min-Max-Average thickness readings
- MultiECHO[™] Technology Brackets four echoes before providing a reading, reducing intermittent readings caused by irregular echoes

IN THE FIELD:

Better, more accurate information about areas of potential weakness





Predictive Maintenance Features:

- RFID scanner tags each reading with the location, date and time
- Stores 1000 readings
- Download readings to your PC
- CorDEX CONNECT™ database and reporting software



IN THE FIELD:

Collect data about multiple locations over time, then move to your PC to analyze and track as part of your predictive maintenance program



General Features:

- Raised Buttons
- Ergonomic Shape
- Shock Resistant Skin
- Full color, 3.1 inch display with backlight
- Drop-down material velocity selection tables

IN THE FIELD:

Rugged design, simple and fast to operate, easy to read; it will stand up to the harshest of work environments





Core Test Features:

- Accurate to +/- 0.05mm (0.02in)
- Dual-element Transducer
 - Standard pulse rate of 2MHz, adjustable up to 8MHz
 - Frequency 4MHz
 - 3mm (0.11in) up to 100mm (3.9in)



IN THE FIELD:

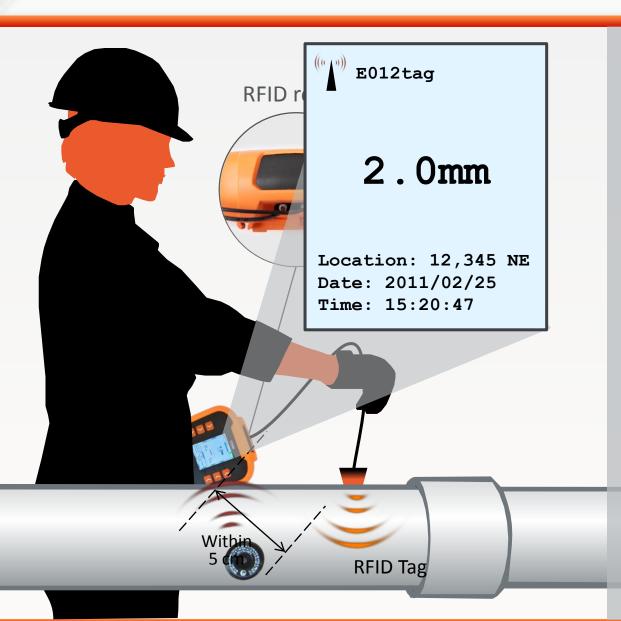
Gives engineers and technicians the flexibility and resolution they need





RFID – How it works and why you need it





As the UT5000 nears the RFID tag, the tag transmits its unique signature to the device.

That data is automatically linked to the date and the time when the measurement is logged.

Note:

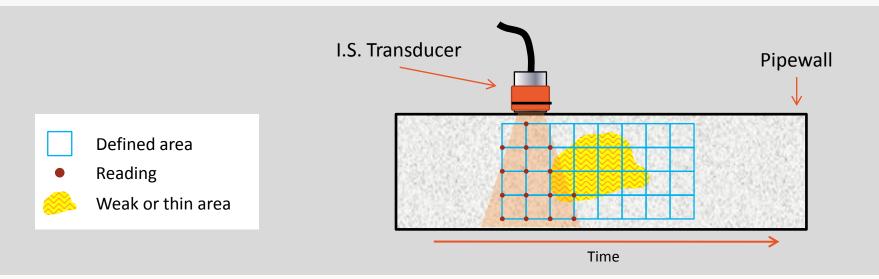




Specific Features - Corrosion Mode



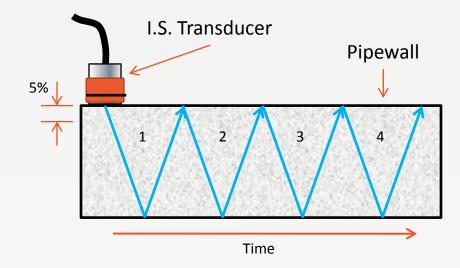
- Corrosion mode enables continuous readings over a user-defined area
- In manual mode UT5000 takes one reading at a time
- Corrosion Mode's measurement frequency is user defined from 1 to 8 times per second
- Capture detail about a weak or thinning area



Specific Features - MultiECHO™ Technology



- MultiECHO™ is selectable
 ON/OFF within UT5000 firmware
- UT5000 scans echoes for up to four returns within 5% of one another, removing any spurious reading and bracketing actual readings
- UT5000 measures the accepted readings and averages providing a highly accurate thickness reading

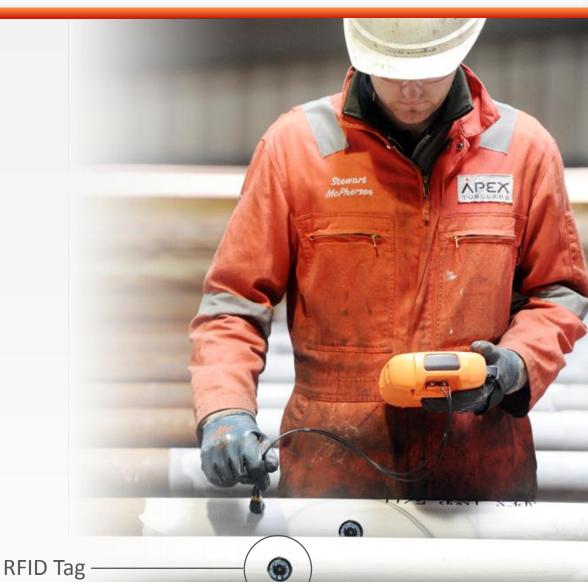


Using MultiECHO™, four readings are required before UT5000 displays a value. With MultiECHO™, an inspector can be sure the reading stored is accurate and unaffected by couplant or surface interference

Corrosion Mode and MultiECHO™

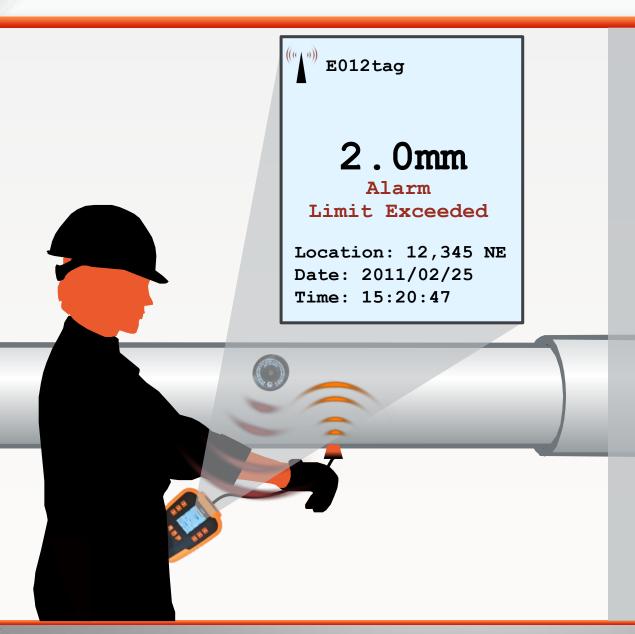


Corrosion Mode and MultiECHO™ Technology are even more effective when used together



CorDEX Corrosion Mode and MultiECHO™





Mode: Standard

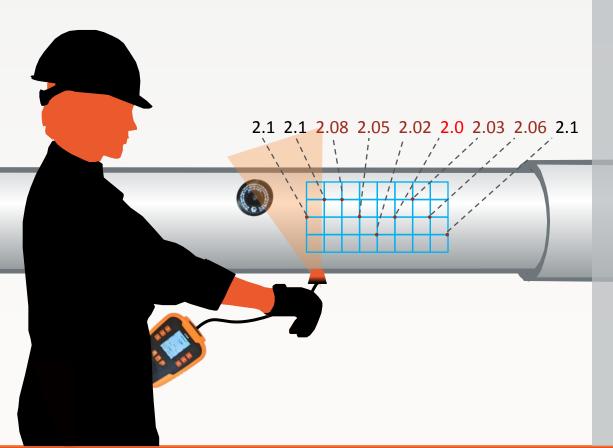
While holding the transducer and taking a reading in **Standard Mode**, we notice a problem. This is shown by "Alarm Limit Exceeded" displayed on the screen. We now know that the thickness of this pipe in this spot is below the standard limit.



Note:

Corrosion Mode and MultiECHO™



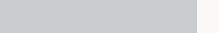


Mode: Corrosion

After switching to

Corrosion Mode we

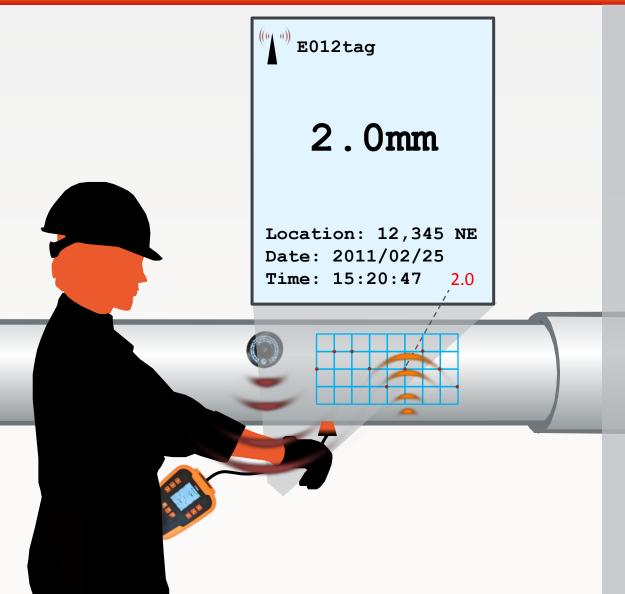
trace an area to define
the dimension of the
thinning spot. Then
make multiple readings
throughout the area.



Note:

Corrosion Mode and MultiECHO™





Mode: MultiECHO™

Now we switch to

MultiECHO™ mode

and we receive a

super- accurate

reading about a

specific spot.







Predictive Maintenance Tools



CorDEX CONNECT™ is an integrated predictive maintenance system

CorDEX CONNECT™







- RFID tags every thickness measurement with the specific location, date and time
- CorDEX CONNECT™ collects and organizes the data
- Gives the engineer a comprehensive view of the pipeline at any specific location

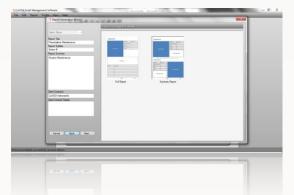
CorDEX CONNECT™ Gives you power over data



CorDEX CONNECT™

- Collects, links, and displays information about a single point in the field
- Enables deeper analysis than data that resides only on the device
- Improves reporting by presenting data in printable charts and graphs
- Reduces the chance of human error because the device records and tags up to 1000 readings
- Integrate photos to enhance reports or work orders
- Export data as a .csv file to Microsoft Excel or other database programs









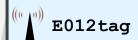
Let's take a look how

CorDEX CONNECTTM

displays captured data







2.0mm

Location: 12,345 NE

Date: 2011/02/25

Time: 15:20:47

As part of your regular maintenance inspections you'll take the UT5000 to a *location where you've* placed an RFID tag.

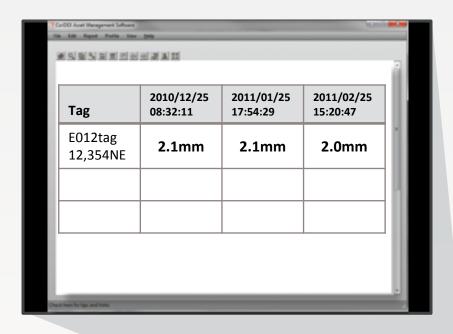
On the screen, we clearly see this RFID tag's data.



Note:







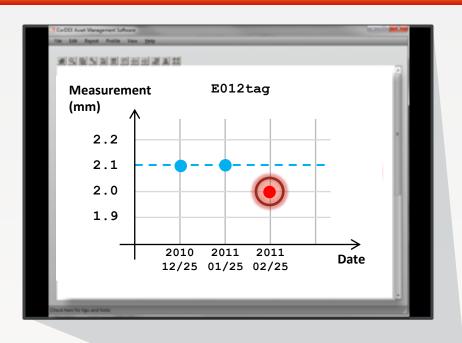
Using a custom cable that comes with the device you will connect the UT5000 to a PC.

CorDEX CONNECT™ software will download and organize all collected data.



Note:





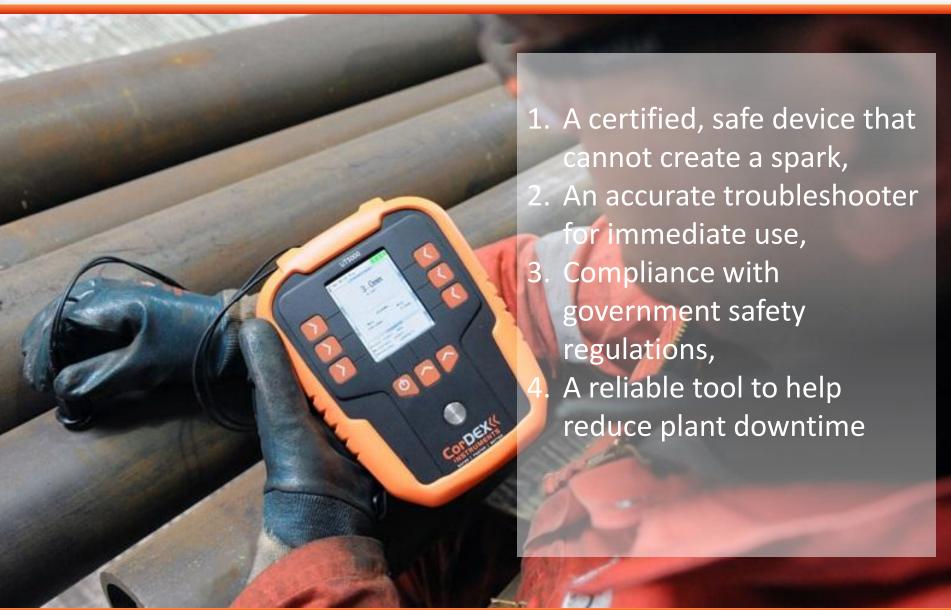
CONNECT™ can generate charts with trend lines. If the trend lines fall below a particular 'threshold', they are highlighted in red signifying danger.



Note:

What does UT5000 give us?





RECAP - Key features



- Intrinsically safe thickness gauge, will not ignite explosive atmosphere
- Can be used immediately with no hot work permit
- RFID tag reader
- Stores 1000 measurement points
- Built-in material velocity tables
- Corrosion Mode (continuous reading)
- MultiEcho™
- USB data download to CorDEX Connect software
- CorDEX Connect reports and graphs offer time versus thickness data for genuine predictive maintenance decisions



