Finding Your Cost-Effective Level Solution
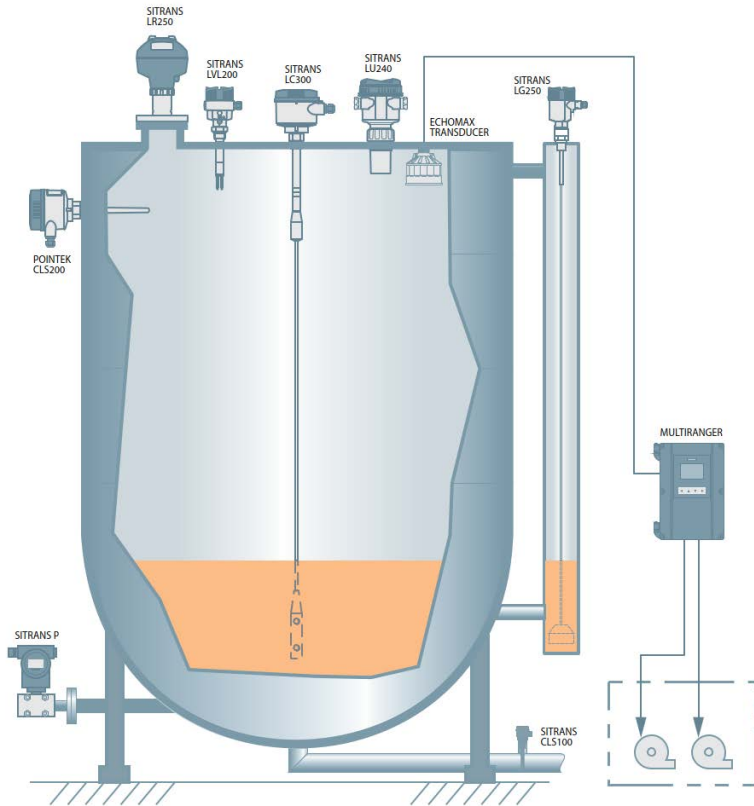
Siemens Process Instruments Update
Lesman Instruments 4/21/2020

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Ext.

Technical Consultant

Measurement Solutions:
Process Instrumentation Optimizes Industrial Processes

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PD PA Process Instrumentation Portfolio

Flow
- Magnetic
- Clamp-on ultrasonic
- In-line ultrasonic
- Coriolis
- Vortex

Level
- Capacitance
- Radar
- Guided wave radar
- Ultrasonic

Pressure / Temperature / Positioners
- Pressure
- Temperature
- Digital Electro-Pneumatic positioners

Weighing
- Dynamic and Static Weighing
- Process Protection

Services
- Local support
- Start-up
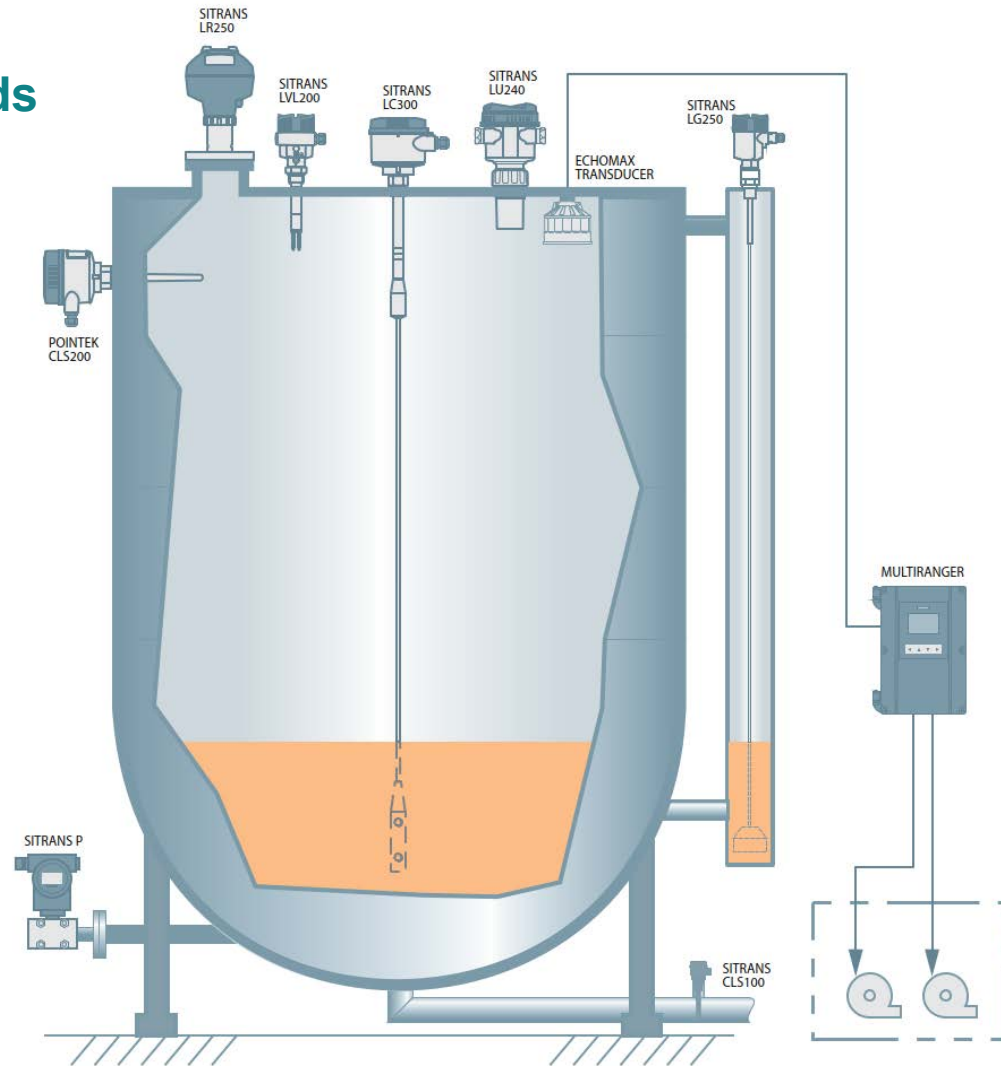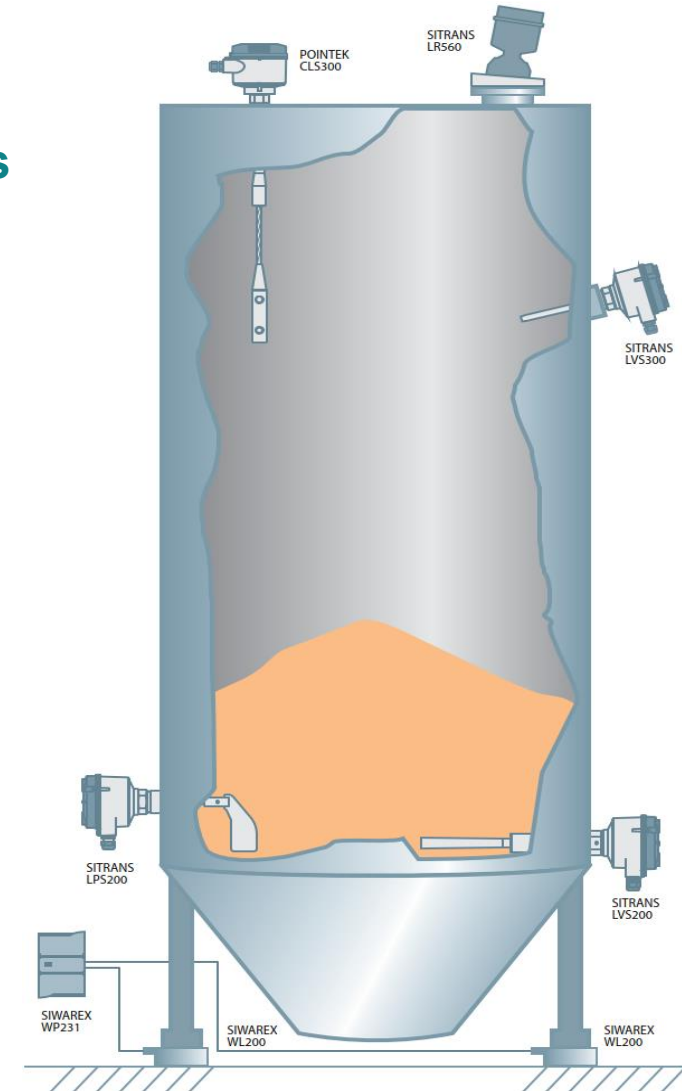- Calibration
- Troubleshooting
- Training

Right Technology for the Application & Industry

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Liquids

Solids

SITRANS LR250
SITRANS LVL200
SITRANS LC300
SITRANS LU240
SITRANS LG250
ECHOMAX TRANSDUCER
POINTEK CLS200
SITRANS P
MULTIRANGER
SITRANS CLS100

POINTEK CLS300
SITRANS LR560
SITRANS LVS300
SITRANS LPS200
SITRANS LVS200
SIWAREX WP231
SIWAREX WL200
SIWAREX WL200

Application Challenges: When is it Best to Use Radar?

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- High Temperature (>100°C)

- Certain Vapors

- Severe Dust

- Light density Foam

- Absolute Vacuum

- Long Range (>100')

- **These are Radar applications**
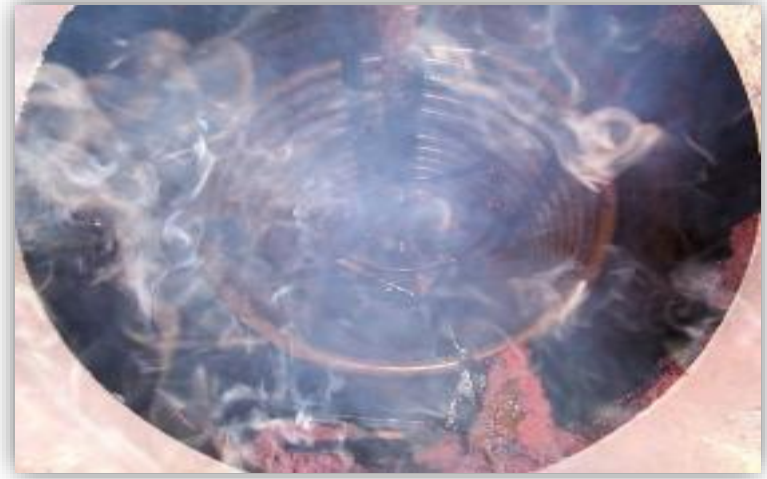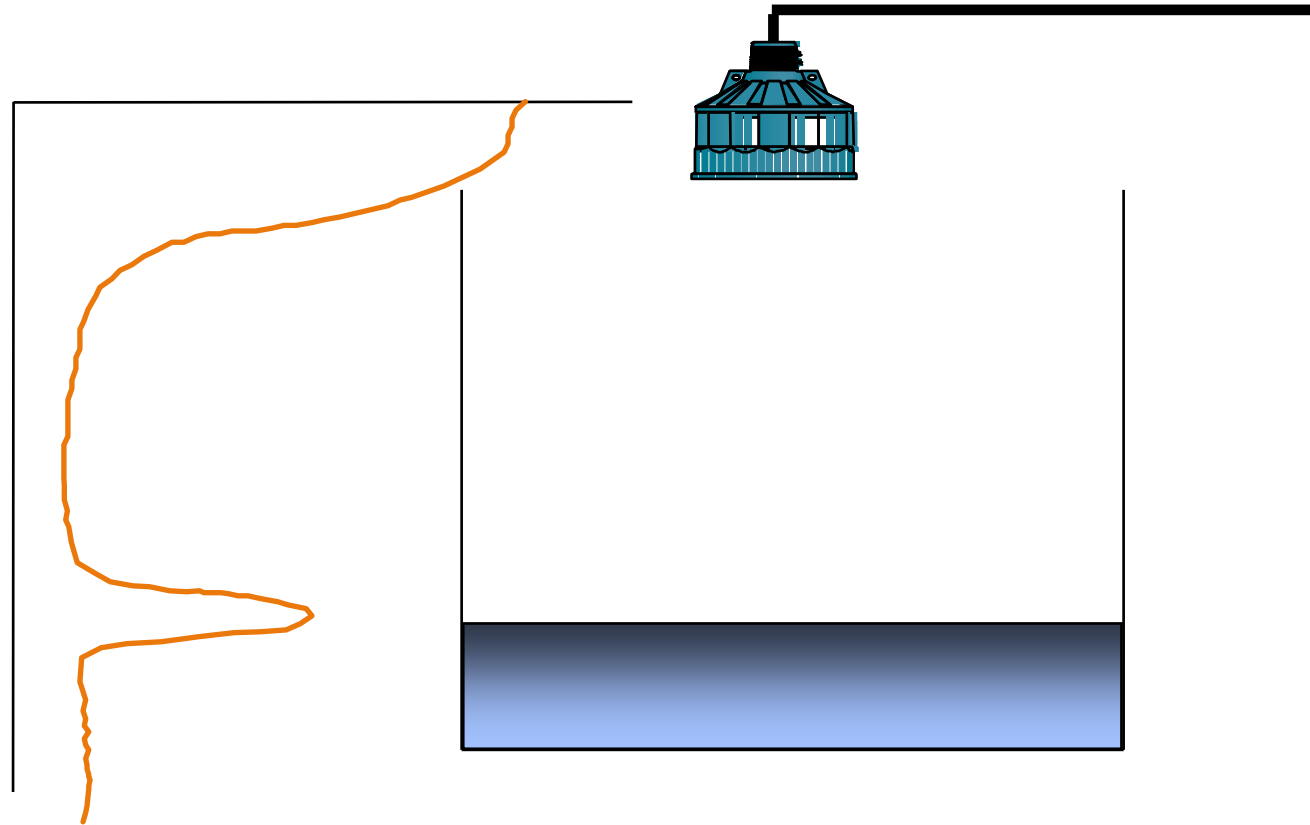
Why Ultrasonics?

- **Accuracy**

- **Easy installation and local setup**

- **Submergence detection**

- **Self-cleaning action transducers**

- **Speed of response**

- **Local control or back up for a PLC/DCS**

- **Proven and trusted >300,000 HR200's in USA**

- **Sonic Intelligence Echo Processing**

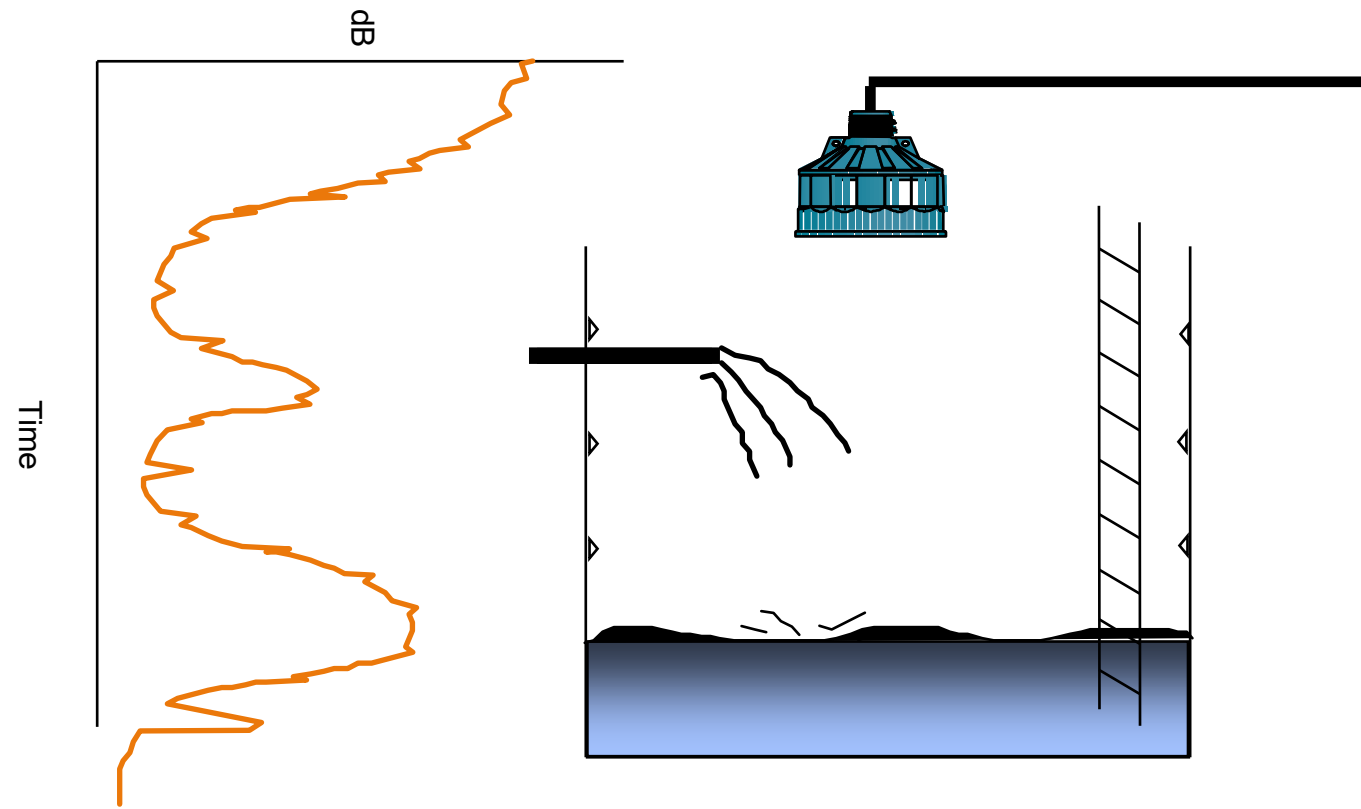- **Siemens is the global leader in ultrasonics**
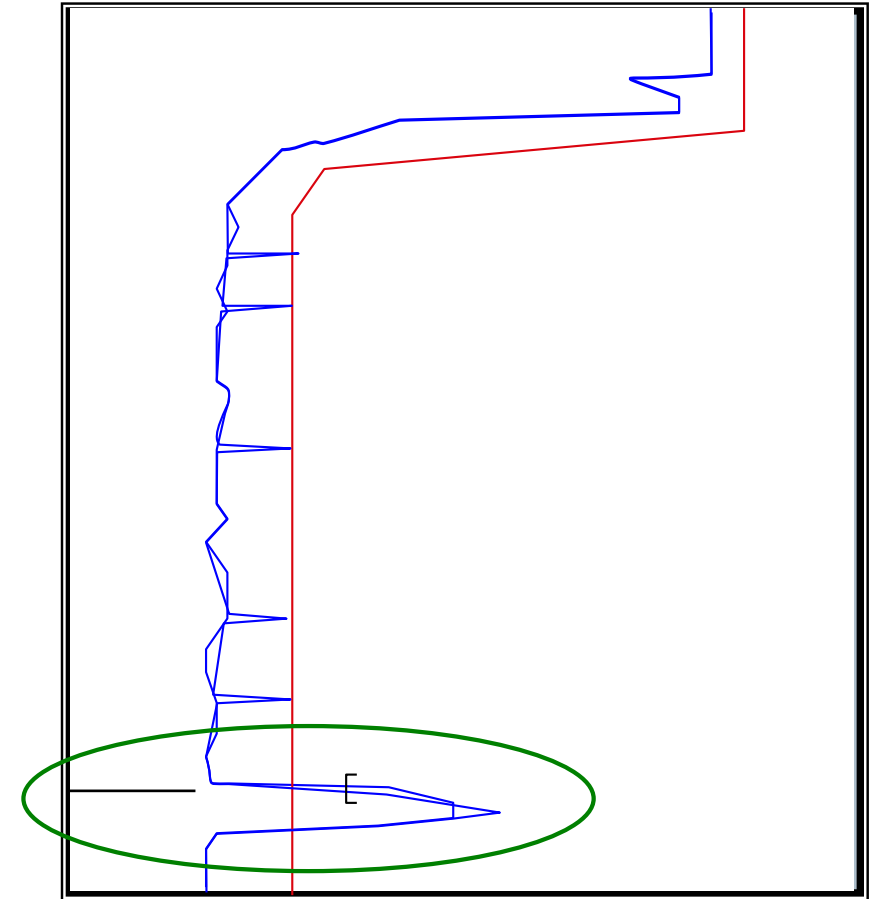
Echo processing

The ideal situation:

Echo processing

The real situation:

Siemens "Sonic & Process Intelligence"
How it works – radar and ultrasonic echo profiles

1. The Pulse

2. The Return Signal

3. Form the Profile

4. Filtering

5. TVT

6. Echo Algorithms

7. Echo Selection

Unrestricted © Siemens Industry, Inc. 2020
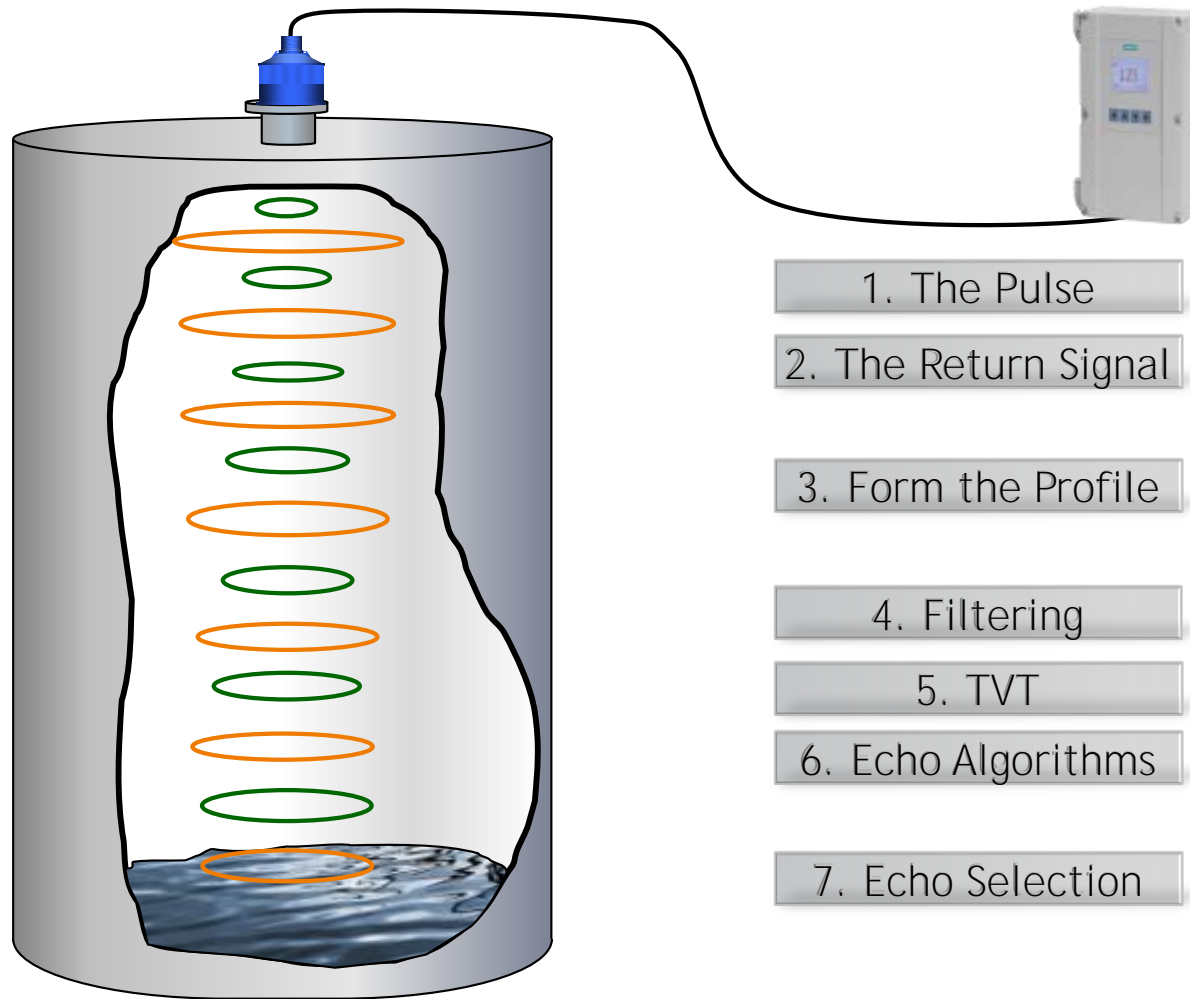
Siemens "Sonic & Process Intelligence" – Dynamic TVT

- Changes in process conditions directly impact the signal strength
  - Foam, Steam, Agitation, Dust

- With a fixed threshold, as signal strength degrades, it is possible for the unit to lose sight of the material level entirely (Loss of Echo)

- Our dynamic TVT adjusts itself with each shot maintaining a lock on the material level as the signal strength decreases
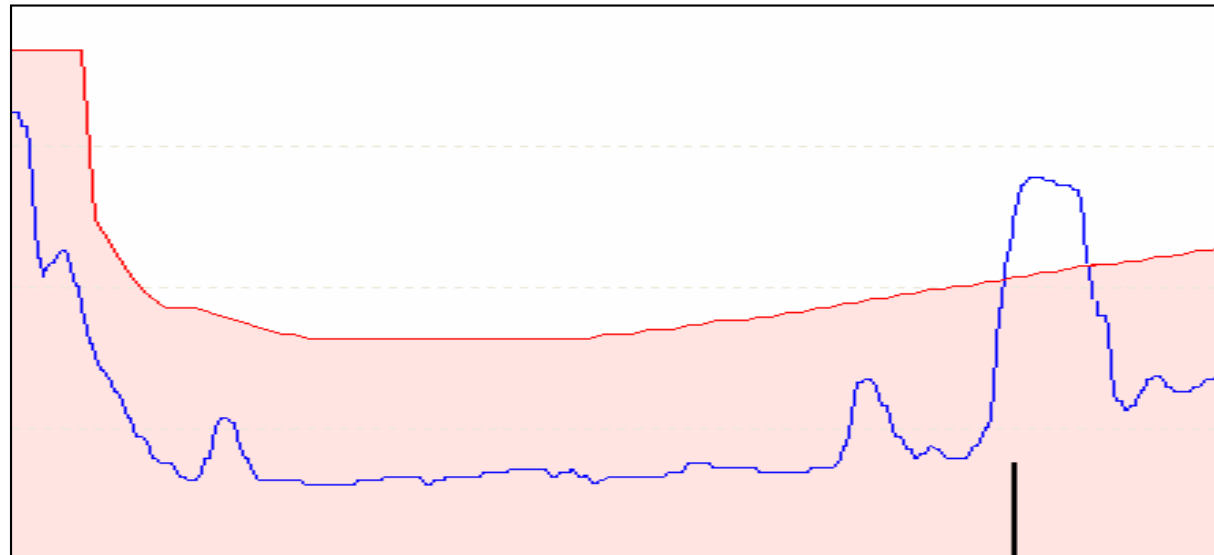
Siemens "Sonic & Process Intelligence" –
Multi-shot sampling/ number of shots

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- Preset number of shots varies from product to product
- Increasing the shots improves confidence and reduces noise floor, however, it may also slow measurement reporting.

- Spike Filter

- Narrow Echo Filter

  *Be careful when using the Narrow Echo Filter in liquids applications as the true echo may be as narrow as the false echoes.

Narrow Echo

Spikes
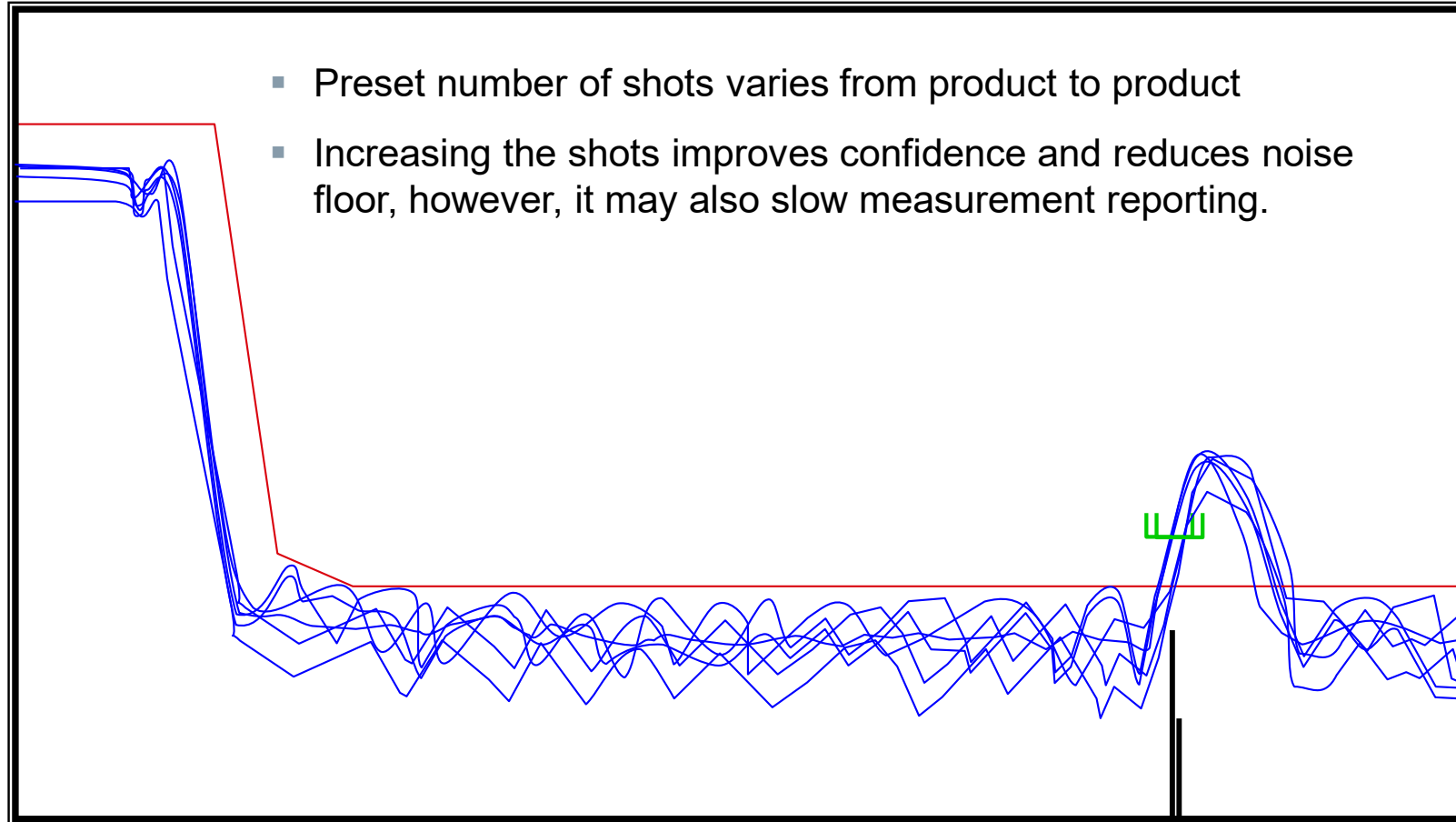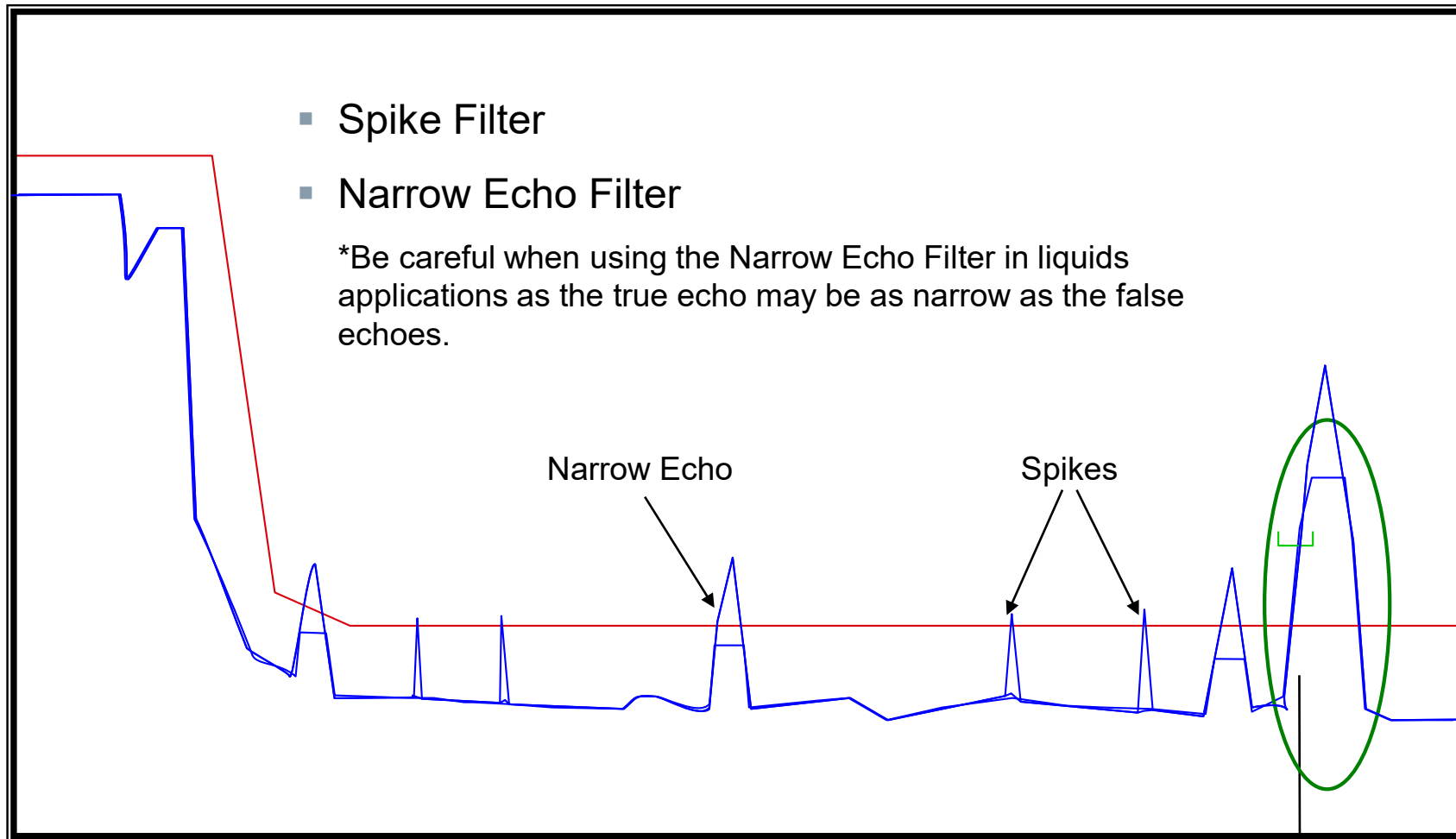
Development project: The challenge

Add a modern, easy to use interface to industry standard product

- Update to a product originally introduced in 1987
- Use PI common interface with menu driven programming and Quick Start Wizards
- Updated Communications options
- Backward compatible with >300,000 units in the field for easy customer upgrade and easy sales

HydroRanger 200 and MultiRanger 200
Key features and benefits

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Top highlights

Feature / Function		Benefit
• Improved HMI	▶	• Easy to use
• Graphical Quick Start wizards	▶	• Fast commissioning
• Sonic Intelligence	▶	• Stable and reliable measurements
• Isolated wiring compartment and removable terminal blocks	▶	• More space for wiring plus improved connections
• Improved PROFIBUS DPV1 connectivity	▶	• Increased interaction with the number one industrial communication protocol.

HydroRanger 200 and MultiRanger 200
Technical specifications

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Product data overview

	HydroRanger 200 and MultiRanger 200
Features	Versatile ultrasonic level controller for up to six pumps with control, differential control, and open channel flow monitoring for short-to medium range applications in wide range of industries.
Range	1 to 50 ft., transducer and material dependent
Accuracy	6 mm (0.24") or 0.25% of maximum range (whichever is greater)
Communications/ outputs	RS-485 with Modbus RTU or ASCII. Compatible with SIMATIC PDM via Modbus RTU. Optional SmartLinx cards for PROFIBUS DPV1, and DeviceNet
Approvals	CE, cCSAus, UL, FM, MCERTS, RCM

Fast and easy retrofit
Non-contact level measurement - center channel (total level of 2 influent channels)

Hydroranger 200 HMI with new with PROFIBUS DPV1 and new GSD

Existing unit had a PROFIBUS DPV0. New model is compatible with both.

Set address on card as found

Customer: Wastewater treatment plant

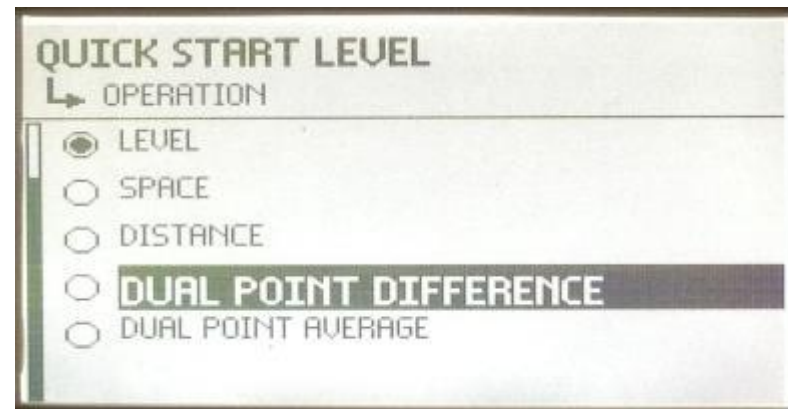Industry: Water / Wastewater Industry

Benefits for the customer:

- Instrument Tech installed and configured in minutes simply using Quick Start Wizard
- Loved the removable terminal, which made wiring a snap

Quick Start Wizards

Quick Start Wizards for Level, Volume, Flow, and Pump Control
We've added Dual Point Difference and Average and support for 6 relays

If the device is a single point unit, some selector parameters will not be visible unless Differential or Average operation is selected.

Measurement View 1/2

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View 1/2 shows primary reading, measurement point, all control and DI related states and level indicator

Reading Type

Point Identifier

Primary Reading

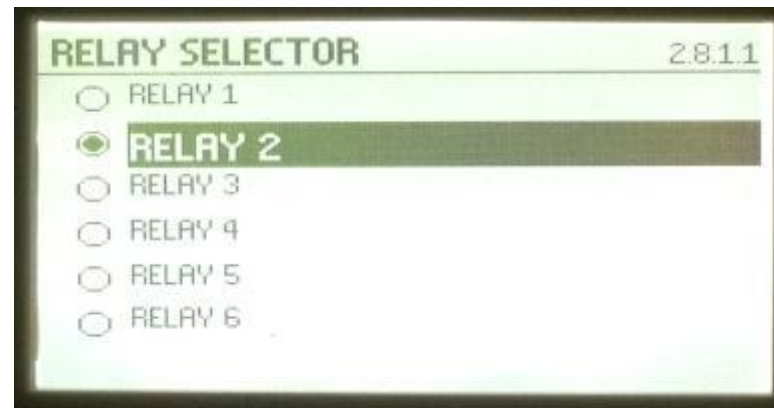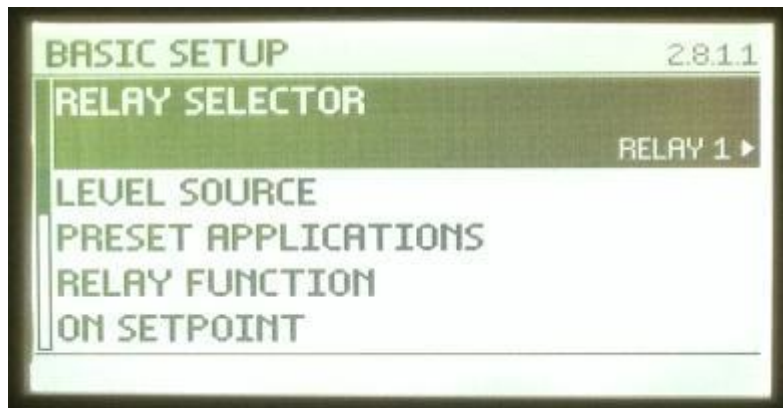**Level alarm status high and high-high**

Relay Status

Digital Input Status

In run mode, you can switch between these views using the arrow keys, you can switch between these views using the up and down arrow keys.

Selector Parameters

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When certain parameters apply to more than one input or output, a selector parameter is used in each sub-menu.

To view or change a parameter that applies to a different input or output in the same sub-menu , be sure to set the correct I/O in the selector parameter.

If the device is a single point unit, some selector parameters will not be visible unless Differential or Average operation is selected.

Echo Profile

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An Echo Profile can be viewed directly on the device display. Echo and signal quality can be quickly assessed.

Measurement Values

TVT

Echo Profile

C: 30   A: BLF   D: 1.881

Take a new measurement

Exit to Parameter menu

4.56
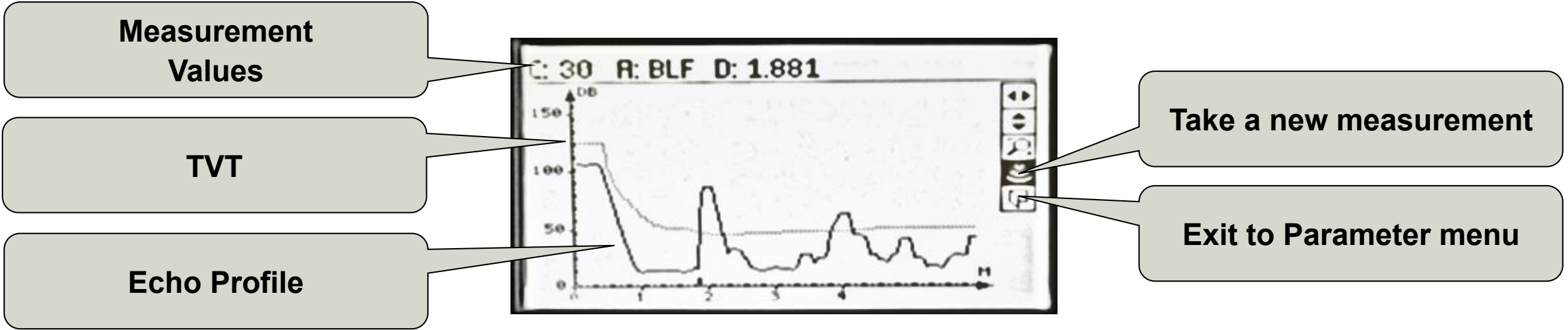
If the device is a dual point unit, be sure to choose the appropriate Transducer in the Selector parameter in the Diagnostics menu

Technical Specifications

- Communications

  - On-Board All Models

    - RS-232 with MODBUS RTU or ASCII via RJ-11 connector

    - RS-485 with MODBUS RTU or ASCII via Terminal Block (3-wire)

  - Optional Smartlinx Cards

    - Ethernet TCP I/P – Full Read and Write

    - Modbus TCP I/P

    - ProfiNet

    - PROFIBUS DP – V0 or V1

    - DeviceNet

Key features and benefits
SITRANS Probe LU240

SITRANS Probe LU

SIEMENS

Top highlights

Feature / Function		Benefit
• Latest Process Intelligence echo processing	▶	• Reliable accuracy, repeatability
• Process Temperature available as a measurement value	▶	• Level and ==temperature== measurement in one instrument
• Low start up current (3.5mA) and operation down to 10.5 volts	▶	• Compatibility with all intrinsically safe barriers and improved life time in solar or battery systems
• Reduced blanking/near range specification (200mm or 7.87 inches)	▶	• Measure closer in tight places
• Optional, removable advanced segment HMI with 4 local push buttons	▶	• Easy to read and easy to use menus

SITRANS UL Ultrasonic Portfolio For Liquids

SITRANS LUT400 | MultiRanger200 HydroRanger200 | SITRANS Probe LU240 | SITRANS Probe LU

	SITRANS LUT400	MultiRanger100/200 HydroRanger200	SITRANS Probe LU240	SITRANS Probe LU
	High accuracy and data logging	Differential measurement and six control relays	HART 7 communications	PROFIBUS PA communications
Order No.	7ML5050	7ML5033/7ML5034	7ML511	7ML5221
	SITRANS LUT400 are compact, single point, long range ultrasonic controllers for continuous level or volume measurement of liquids, slurries, and solids, and high accuracy monitoring of open channel flow.	MultiRanger/HydroRanger are versatile short- to medium-range ultrasonic single and multi-vessel level monitor/controllers for virtually any application in a wide range of industries.	SITRANS Probe LU240 is a cost-effective, compact, intelligent level solution for liquid chemical inventory, monitoring small process vessels, and level monitoring measurement in the environmental industry.	SITRANS Probe LU is a 2-wire loop-powered level measurement transmitter for measuring storage vessels, filter beds, and open channel flow in the water and wastewater, food, and chemical industries.

SITRANS UL Ultrasonic Portfolio For Liquids

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SITRANS LUT400

MultiRanger200
HydroRanger200

SITRANS Probe LU240

SITRANS Probe LU

	SITRANS LUT400	MultiRanger100/200 HydroRanger200	SITRANS Probe LU240	SITRANS Probe LU
Key features	• Digital receiver for high performance and reliability in noisy applications • Intuitive ease of use • Advanced pump, alarm, and flow control features with three relays • Integrated datalogger • Real time clock with daylight saving time and energy-saving algorithms	• Range of models for simple level measurement or pump control to more complex for differential level, open channel measurement, advanced pump control, alarming, and gate control • Auto False-Echo Suppression to avoid false echoes from fixed obstructions • Intuitive ease of use • Six relays	• Maintenance-free active face technology keeps the sensor clean • IP68 fully potted option with its fully encapsulated PVDF sensor is resistant to corrosion, chemicals and extreme shock • State-of-the-art Process Intelligence echo processing • Battery and solar-powered friendly, with low start-up current and 10.5-volt operation • Reduced blanking distance • 4-button user interface or remote configuration	• Superior functionality and plug-and-play performance • Programming via PC software or infrared handheld programmer • IP68 rated • Level, volume, and flow measurement • -40 to 85 °C (-40 to 185 °F) • PVDF or ETFE transducer for chemical compatibility
Communications or outputs	• HART: EDDs for SIMATIC PDM, Emerson AMS Device Manager, and Field Communicator 375, plus SITRANS DTM for FDTs • USB: Integrated web browser for local programming	• RS-485 with Modbus RTU or ASCII • Compatible with SIMATIC PDM via Modbus RTU, PROFINET, or PROFIBUS • SmartLinx cards for PROFINET, Modbus TCP/IP, Ethernet/IP, PROFIBUS DP, DeviceNet	• HART 7 • EDD for SIMATIC PDM for remote configuration and diagnostics • FDT such as PACTware or Fieldcare via SITRANS DTM	• PROFIBUS PA • EDD for SIMATIC PDM for remote configuration and diagnostics

Mounting Considerations for Radar and Ultrasonic

Ladder

Tank support braces

1 2 3 4
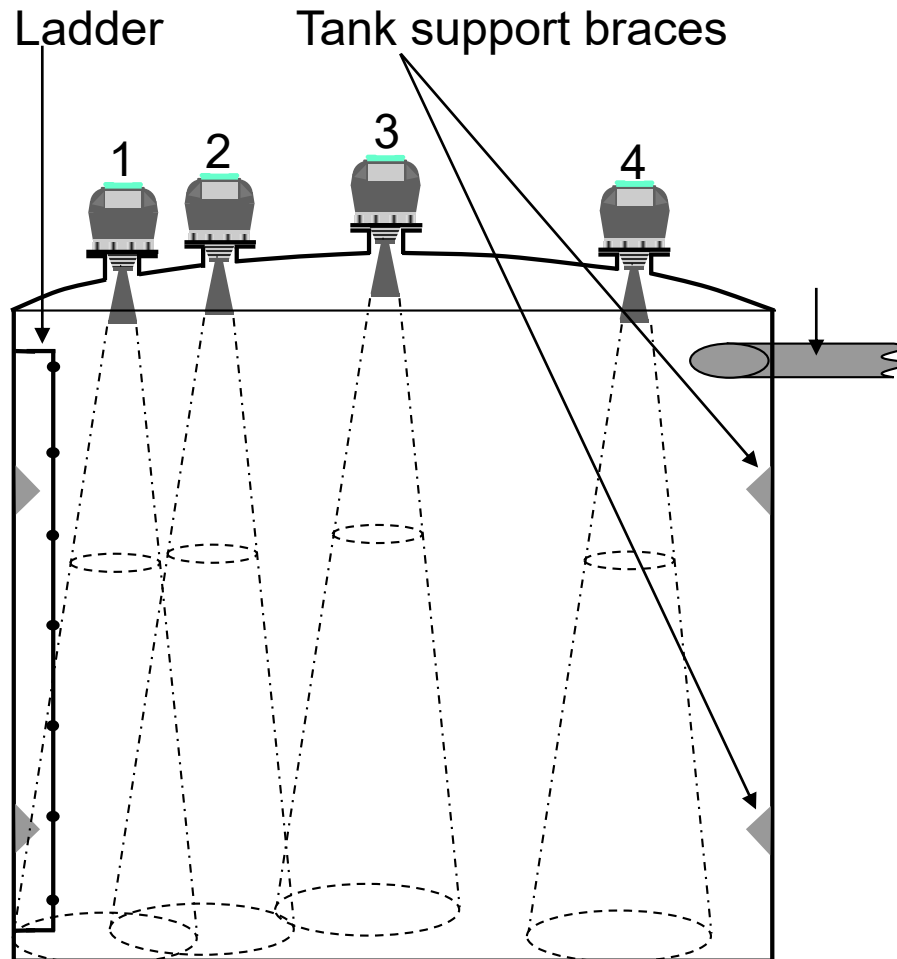
- **Mounting location: Very important information when selecting which configuration and process connenctions required for the proper selection of level technology**

- **General Rule: Sart with, for every ten feet in height you would want to have 1ft from side wall or obstructions**

  No Worries, not every application will meet this rule, however through some algorthiums, different beam angles and technology we can find the proper solution and technolgy

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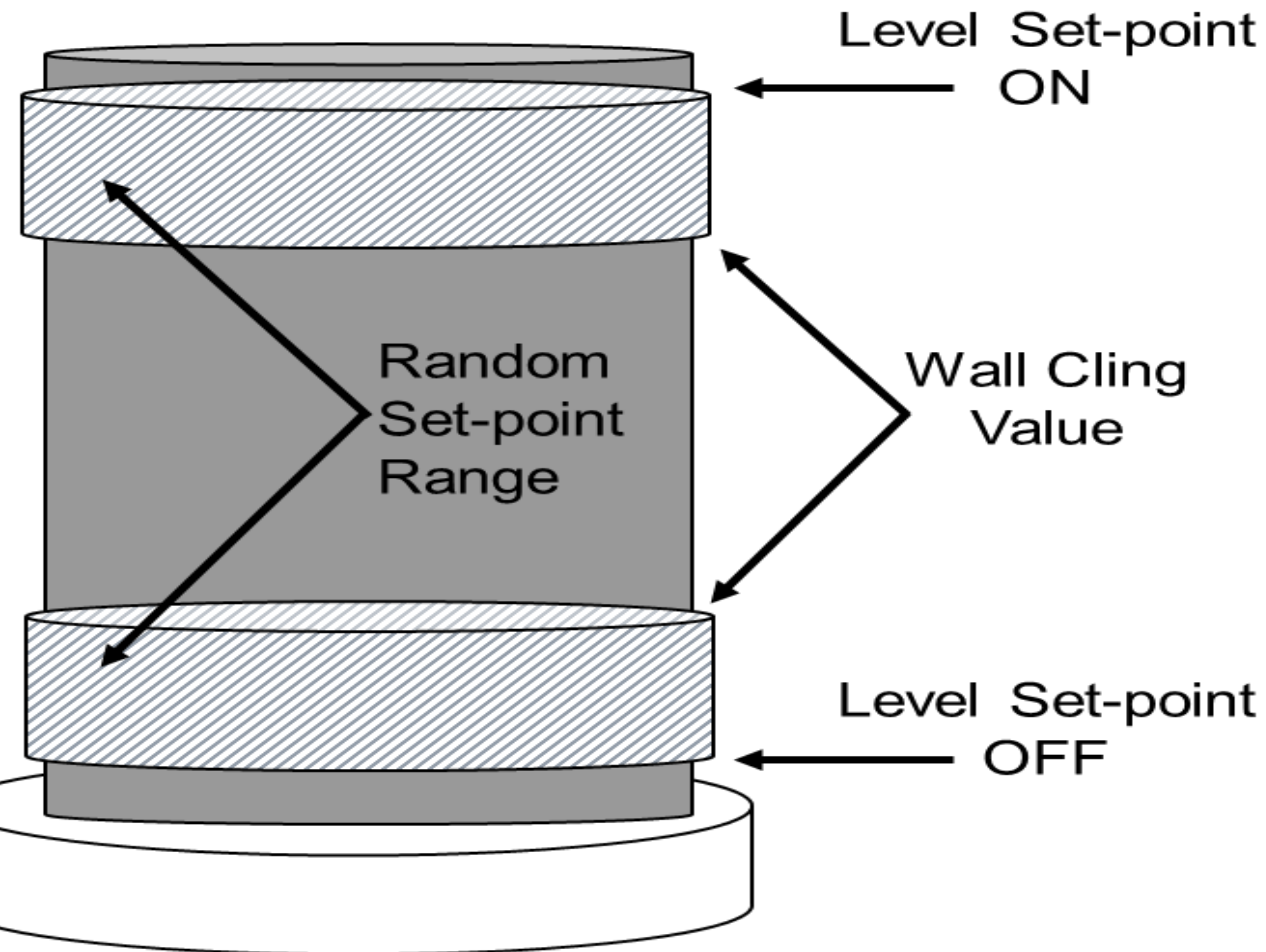
Pump Control Modifiers

- P136 – Wall "Cling" Reduction
  - Varies the upper and lower set points to reduce material buildup on the walls
  - This value is the range in which the set points are allowed to deviate in percent or units.
  - The relay set points ON and OFF values are randomly varied inside the rage to ensure that the material level does not consistently stop at the same point.
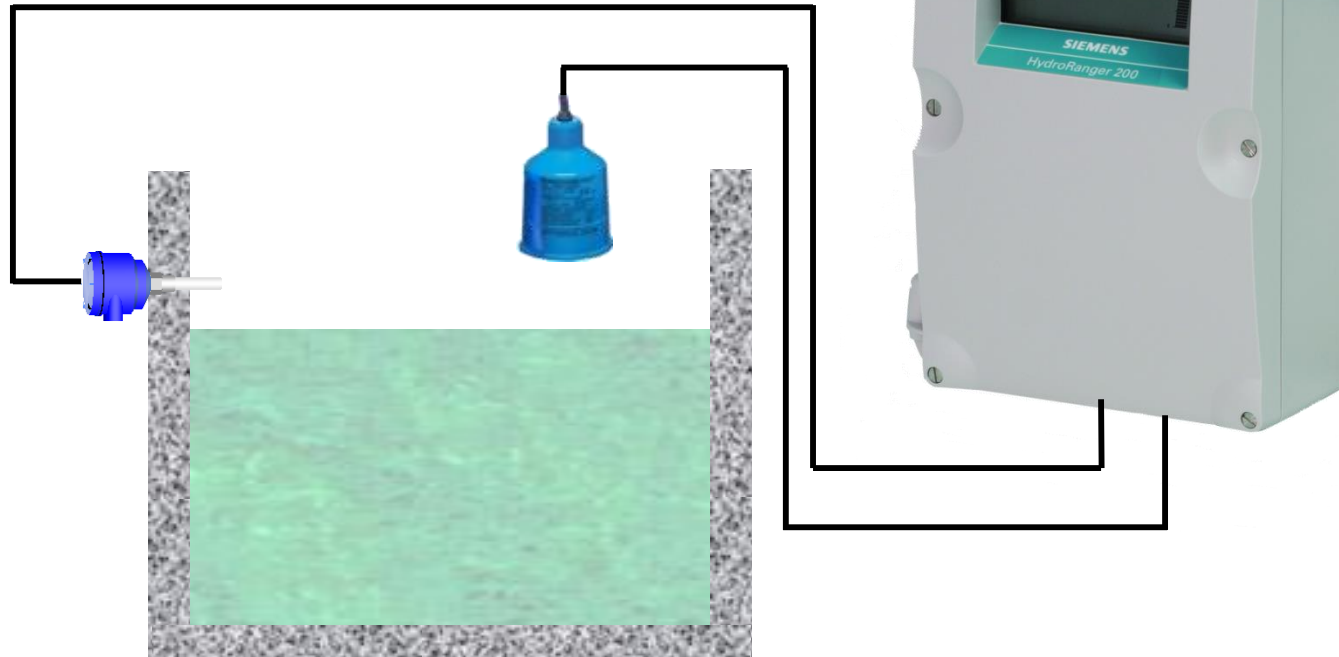 - Reduces Wet Well maintenance

Discrete Inputs

- Two Discrete Inputs
- Drives Current Output to pre-determined state
- Display and Relays follow accordingly

SITRANS LUT400 - Control

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## Energy Saving

- Pump control operates normally during off-peak hours

- Lead-time pumping empties vessel before peak period begins

- During peak energy periods, on and off points adjusted

  - On points move higher

  - Off point moves higher and closer to on point

- 5 peak periods supported

- Customer Testimonial

  - *"The SITRANS LUT400 has the potential to save us millions of pounds annually"*

Normal Operation

ON Pump 2 —

ON Pump 1 —

OFF —

Peak Period Operation

— ON Pump 2

— ON Pump 1

— OFF
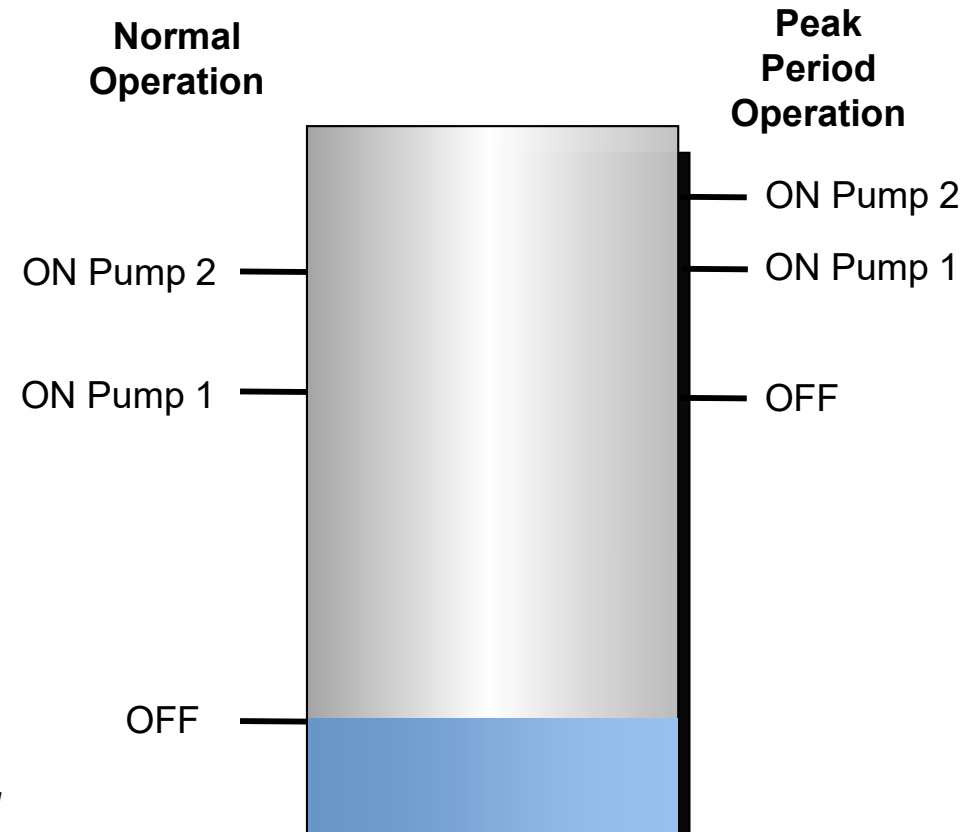
The SITRANS LUT400 saves our customers money

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With all of the different technologies available, how do you decide:

Which is the best for my application?

SIEMENS

1. **What is the material to measure? Liquid, slurry, or solids?**

2. **What is the dielectric constant (dK) of the material?**

3. **What are the temperature and pressure ranges?**

4. **What is the Area Classification? (general purpose, intrinsically safe, explosion proof)**

5. **What material is the vessel made of?**

6. **Who is my local Lesman Instruments contact?**

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NEW

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Mobile support siemens Industry Support App

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Globally supported

Online Traceability

Up to 5 year total warranty available

Siemens Process Instrumentation
New Reduced Rates!

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Years of Extension x 2 = % Adder		
1 year extension 3 years of total warranty	GWK:PI-ExWarr-03	Now 2% of Sale Price previously 6%
2 years extension 4 years of total warranty	GWK:PI-ExWarr-04	Now 4% of Sale Price previously 8%
3 years extension 5 years of total warranty	GWK:PI-ExWarr-05	Now 6% of Sale Price previously 10%

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