

Intelligent Device Management: Device Setup

Device setup (aka configuration or parameterization) can be carried out using a handheld communicator in the field, a laptop in the workshop, or from intelligent device management software as part of asset management solution. Electronic Device Description Language (EDDL) is the technology used by device manufacturers to define how the system shall display the device setup parameters to the technician. EDDL makes setup of smart transmitters and other intelligent devices easier thanks to user guidance such as wizards, illustrative images, and help text, and provides unparalleled consistency of use.

Device Configuration

For FOUNDATION fieldbus and PROFIBUS the whole configuration for many devices are stored together in the system database. The entire configuration for a device is downloaded at a click of a button. This is also possible for HART devices on 4-20 mA systems which have HART interface in the I/O cards or have a multiplexer. In most 4-20 mA systems, HART devices are configured one by one, one parameter at the time using a handheld field communicator.

Apart from device setup, EDDL plays a central role in the configuration of function block control strategies in FOUNDATION fieldbus devices.

FOUNDATION fieldbus

Information in FOUNDATION fieldbus devices is organized in different kinds of blocks:

- Resource block
- Transducer blocks
- Function blocks

Each device has one resource block and one or more transducer and function blocks. Function blocks are the control strategy. There is one transducer block associated with each sensor or transducer.

Each block has some device setup information (and some diagnostics information). In the past, this made configuration of fieldbus devices cumbersome as setup information in different blocks did not appear on the same page in the device management software (the technician had to know which block to look at for each function to be configured). However, now EDDL "device level access" (aka "cross-block") makes FOUNDATION fieldbus devices easier to use by displaying all setup information on one page. Technicians will not have to worry about different kinds of blocks.

Function blocks

Function blocks (the control strategy) are normally configured from the DCS engineering station, by system engineers, not instrument technicians. Functionality such as changing unit, range, and damping is set in the Analog Input (AI) block which is a function block accessed from the DCS, not from the device management software. Note that range is typically not set or used for Fieldbus transmitters (see separate white paper on calibration). Similarly settings such as "fault state" (not to be confused with fail safe) is set in the AO function block from the DCS, not from the device management software.

Table 1 differences between positioner fault-state and actuator fail-safe

Fail-Safe	Fault-State
In control valve actuator	AO function block
Mechanical (spring-return)	Configured (from DCS)
Control valve goes to fail-safe	Control valve sent to fault-state

Fail-Safe	Fault-State
on loss of air or bus power	on loss of communication or sensor failure etc.

The control strategy AI and AO function blocks are tied to a chosen transducer block (in turn associated with a sensor or actuator) through a "channel". The channel selection is by default invalid and must be configured from the DCS. In the past the channels were selected by number (code) which had to be looked up in a manual to identify the right sensor. However, EDDL 'enumeration' now identifies sensors in plain text making selection easier.

The AI block L_TYPE (linearization) and AO block SHED_OPTS (rarely used) are two other parameters which have invalid values by default, but system templates should take care of it.

A device may have additional function blocks for PID control, arithmetic, selection, switching, alarming, and limiting etc. that can be linked together and execute as the control strategy, but that is beyond the scope of this white paper.

Transducer and Resource blocks

Transducer blocks and the resource blocks are for configuration of the device itself, normally handled from the intelligent device management software. A device may have several transducer blocks including for example: sensor transducer block, actuator transducer block, display transducer block, and other transducer blocks for special features such as advanced diagnostics, flow computer etc.

Some parameters require the block to first be put into a specific mode (e.g. Manual or Out of Service) before it can be written (a protection to not inadvertently bump the output). Knowing which parameter, and what mode, was an obstacle when configuring Fieldbus devices online in the past (for offline configuration there is no such mechanism, until the time of download). However, now the EDDL wizard takes care of the mode switching automatically, simply informing the technicians what steps are about to be taken and offering the opportunity to abort or proceed.

Range and unit

FOUNDATION fieldbus is digital so range is generally not used in the transmitter itself, only the unit must be set. This avoids mismatch between transmitter and system. The unit is typically set in the transmitter AI function block (XD_SCALE parameter), therefore not configured from the intelligent device management software, its set from the DCS engineering console. Typically the transmitter internally copies the unit from AI block to its transducer block parameters automatically to avoid mismatch (it copies the range too since the range is used in some applications such as DP flow or DP level). However, beware that there are exceptions. Some rare transmitters need unit/range to be set manually in both its AI block and transducer block, and they must match for the device to work.

In the past some control systems presented the technician with hundreds of options when selecting the engineering unit. This made finding the unit more difficult. This caused delays. A classic mistake was to select "C" (Columb) instead of "degC" (Celsius) for temperature transmitters. However, control systems now use EDDL 'conditionals' to only display the units valid for the selected input, reducing the chances of mistakes.

Display Transducer Block

Some devices have a very 'rigid' display philosophy where the technician simply select display from a list of predefined variables from the transducer block such as raw PV, sensor temperature, PV in percentage, or converted PV etc. but not parameters from other function blocks in the device. Other devices are totally configurable allowing the technician to select any parameter from any block in

the device, which in turn enables the possibility of linking an output from another device to the input of a function block in the indicating device which can then be displayed.

PROFIBUS

PROFIBUS groups data in blocks (slots) somewhat similar to FOUNDATION fieldbus. This will not be explained again. In PROFIBUS the resource block is instead called physical block. However, the PROFIBUS "function blocks" are very different from FOUNDATION fieldbus function blocks in that PROFIBUS function blocks don't perform control, cannot be linked together to form a control strategy, and the execution is not scheduled.

HART

HART devices really use analog 4-20 mA for control. Therefore the range needs to be configured to scale the analog end-points (see white paper on calibration). It's important to ensure the range in the transmitter matches the range in the system, or else indication will be wrong and control and alarms will not work. Five point loop test is used to ensure there is a match.

WirelessHART

WirelessHART is digital so no range need to be configured, but unit has to be set. The network ID and join key for the network the device shall connect to must be configured, which is done over the wire to not compromise security. Update period must also be set in the device.

Device Integration

Plants have a mix of simple and sophisticated (complex) devices from different manufacturers using different communication protocols. The setup requirements depend on the type of device:

- Pressure transmitter: transfer function (linear/square root)
- Temperature transmitter: sensor type, sensor connection
- Valve positioner: travel (linear/rotary), actuator size, action (single/double), fail (open/close)
- Radar level transmitter: echo tuning, antenna type, tank shape and dimensions
- Guided wave radar level transmitter: measurement mode (level/interface), dielectric constant, echo tuning, probe type, tank shape and dimensions
- Flowmeter, Coriolis: flow direction
- Flowmeter, magnetic: flowtube calibration number (K-factor), line size
- Flowmeter, vortex: fluid (liquid/gas/steam), joining pipe ID, K-factor
- Variable Speed Drive: motor parameters, mode, ramp rates, skip frequencies, etc.

4-20 mA/HART devices also need to set a range. FOUNDATION fieldbus, PROFIBUS, and WirelessHART only need to set a unit (see separate white paper on calibration).

Poor Hosts

The original DD technology from 1992 made it possible to setup all devices using the same handheld field communicator or laptop software. Before DD only proprietary handhelds and software existed.

The most basic content of a DD file is the *Device Definition* describing the blocks and the parameters in the device, including limits, options, and help etc. The original DD technology also included *Business Logic* such as "wizards" (aka "methods") which is a kind of script created by the device manufacturer to guide the technician through more sophisticated setup procedures, for instance radar level transmitter echo tuning. Wizards and conditionals thus make setup easy. Wizards, conditionals, and help are explained further in the section on EDDL. However, not all devices provided wizards in their DD file and not all intelligent device management software supported wizards. That is, on many systems and for many types of devices, sophisticated setup in the past was not so easy. Lack of wizards was not a problem with the original DD technology itself; it was poor implementation in many early products.

For most devices, setup is a simple matter of selecting some options from drop down lists, or keying in values. However, for other devices, the manufacturer may chose to display setup information graphically, such as radar level transmitter echo curve to enable better fine tuning of the device setup. This was not supported by original DD technology. Thus setup of some device types was not supported using original DD technology.

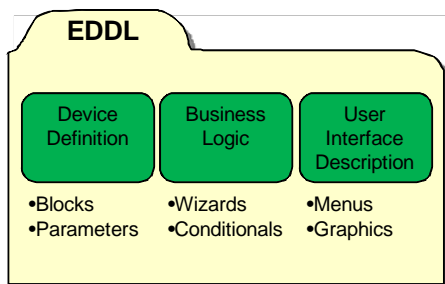


Figure 1 Not all systems supported Business Logic, and the User Interface Description was not introduced until 2006.

The EDDL enhancement done in 2006 is a *User Interface Description* which includes graphics such as trend charts, waveform graphs, dial gages, bargraphs, bar charts, and tables etc. Graphics, menu system, wizards, and conditionals are now mandatory for all FOUNDATION fieldbus and HART compliant host systems.

Device Configuration Made Easy

EDDL technology provides a vast array of possibilities for the device manufacturer to organize the setup page and make the device user-friendly, and also to add graphics such as waveforms for radar level transmitter echo curve etc. Depending on the type of device, the manufacturer uses different EDDL elements. No device uses all EDDL capabilities. EDDL supports setup for simple as well as sophisticated (complex) devices. Below are a few examples of devices to give an idea of what device manufacturers have done to make their devices easy and fast to configure. Thanks to EDDL wizards, device setup for FOUNDATION fieldbus is now just as easy as 4-20 mA/HART.

Temperature Transmitter Setup

A temperature transmitter is a relatively simple device, but temperature transmitter configuration has some interesting parameter dependencies. For example, for a RTD sensor such as a Pt100 it is possible to use 2-, 3-, 4- wire, or differential connection whereas a thermocouple such as type-K can only be connected as single (2-wire) or differential. Therefore, if thermocouple type-K has been chosen, the connection options 3-wire and 4-wire are not shown. Similarly, the minimum and maximum range values depend on the type of sensor and engineering unit chosen. These kinds of dependencies are common in many devices. Theoretically it could be possible for a technician to make a selection that does not work. The device manufacturers have experts intimately familiar with these dependencies and they build this know-how into EDDL to prevent invalid selections or out of limit values thus avoiding time consuming error resolution.

Some devices are provided with EDDL that include setup wizard that take the technician through a setup procedure step-by-step. These procedures are designed in such a way that the technician is not confused by parameters irrelevant to setup by not displaying those. A wizard starts with some fundamental choices, and in the next step the technician is only presented with the choices and options that are applicable and valid based on the selection in the prior step and so on in several steps until the setup is completed. A simple temperature transmitter wizard has only three steps while the setup wizard for a more sophisticated device such as a variable speed drive having more than a thousand parameters have six or more steps. In addition to making setup easier, a wizard also reduces the risk of important settings being omitted or wrong thus saving hours of chasing problems unnecessarily. Lastly, devices typically have internal checks that either prevent invalid selections or

alerts the technician to an invalid entry and some devices with internal dependencies automatically refresh related parameters in order to prevent invalid selections.

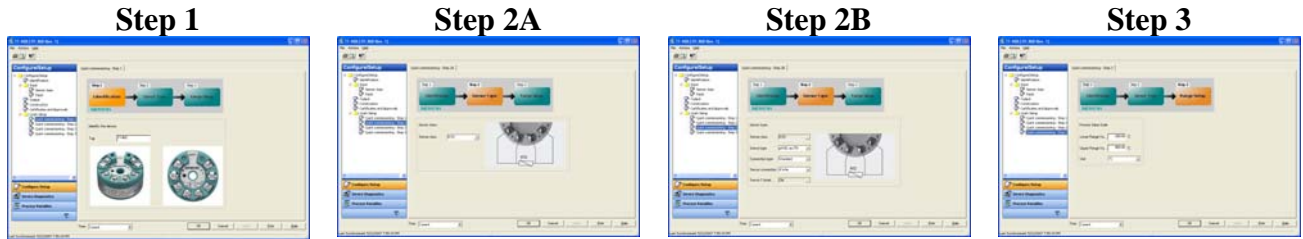


Figure 2 step-by-step setup wizard

Similarly, the technician is presented with guiding images that depend on prior selections. For example, in the case of a temperature transmitter the technician is presented with a different wiring diagram depending on the sensor and connection selection done in the prior step.

Radar Level Transmitter Setup

A radar level transmitter is a sophisticated device that requires more advanced configuration than for example pressure or temperature transmitters. EDDL enables the echo curve to be plotted in a graph to spot false echoes. False echoes can then be eliminated at a click of a button. It should be noted that the tools for pan and zoom are the same for any graph or chart used for any device by any manufacturer using any communication protocol for setup or diagnostics. This consistency makes the EDDL-based software very easy to use. No other technology and no amount of style-guides can provide this level of consistency of use. That is, the same buttons and clicks are used to examine a radar echo curve during setup as when diagnosing a valve positioner step response curve.

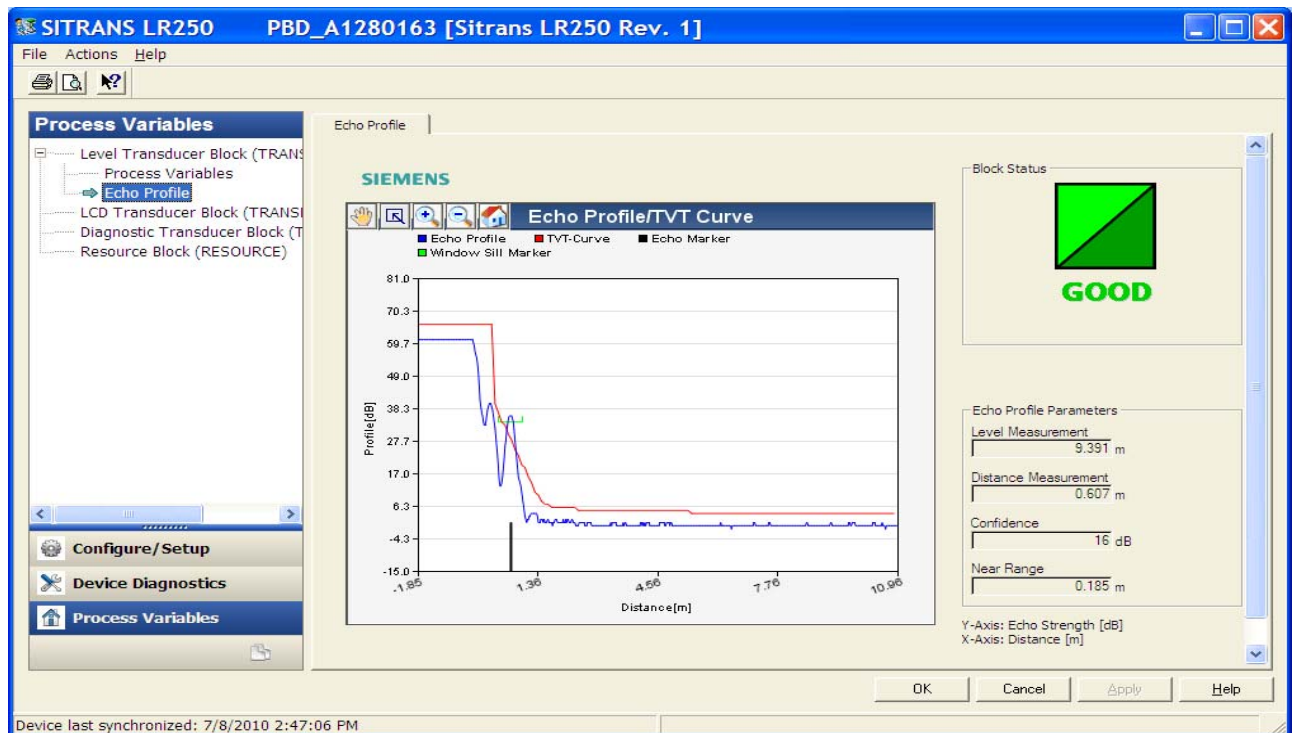


Figure 3 A radar level transmitter echo curve is a multi-pen waveform graph

Large data sets are edited in tables

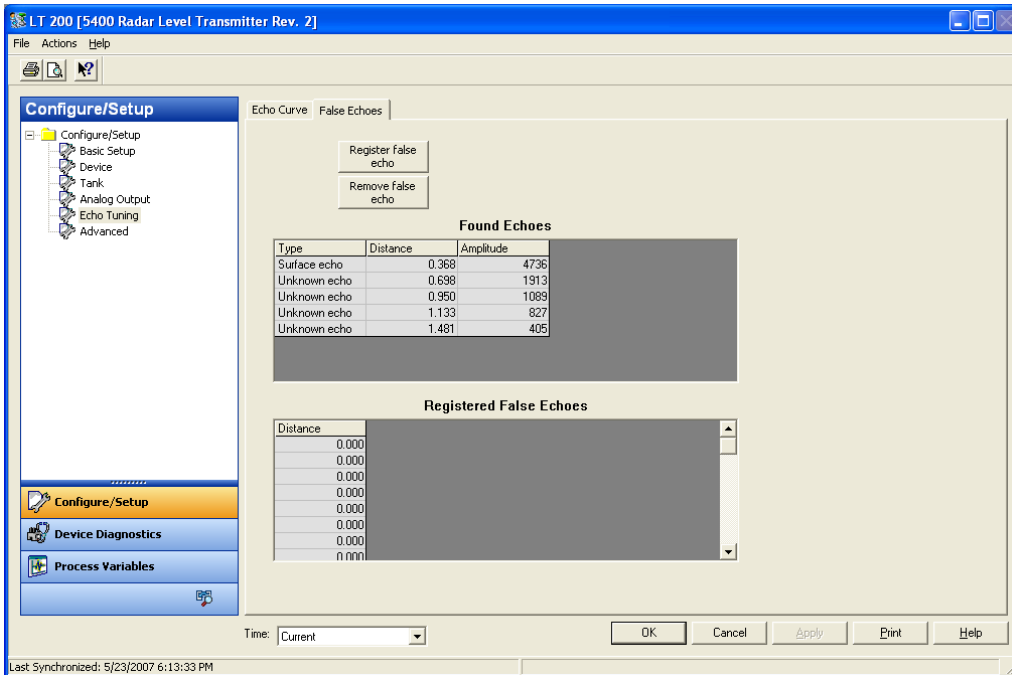


Figure 4 Large amount of information in data series made easy to overview using table format such as radar echoes

The tank strapping table is an example of array-like data best edited in a spreadsheet-like grid.

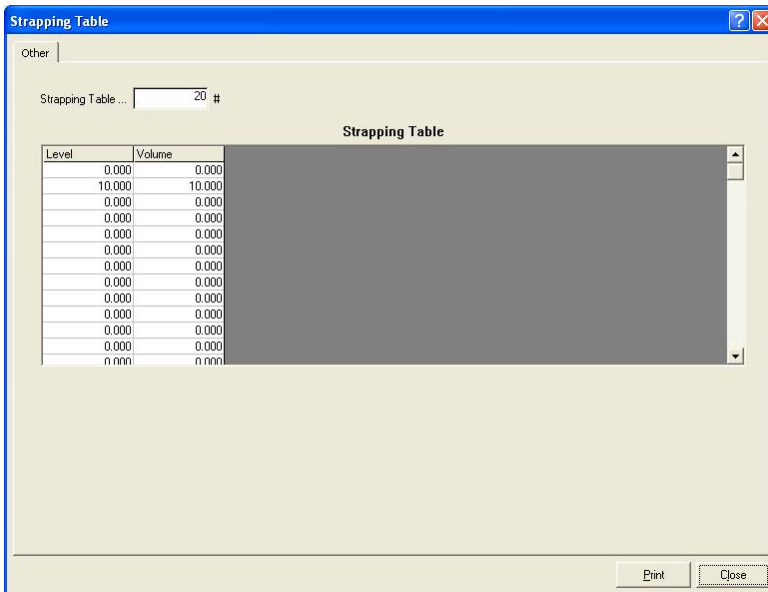


Figure 5 Edit large amounts of information in table format such as strapping table

A setup wizard guides the technician step-by-step

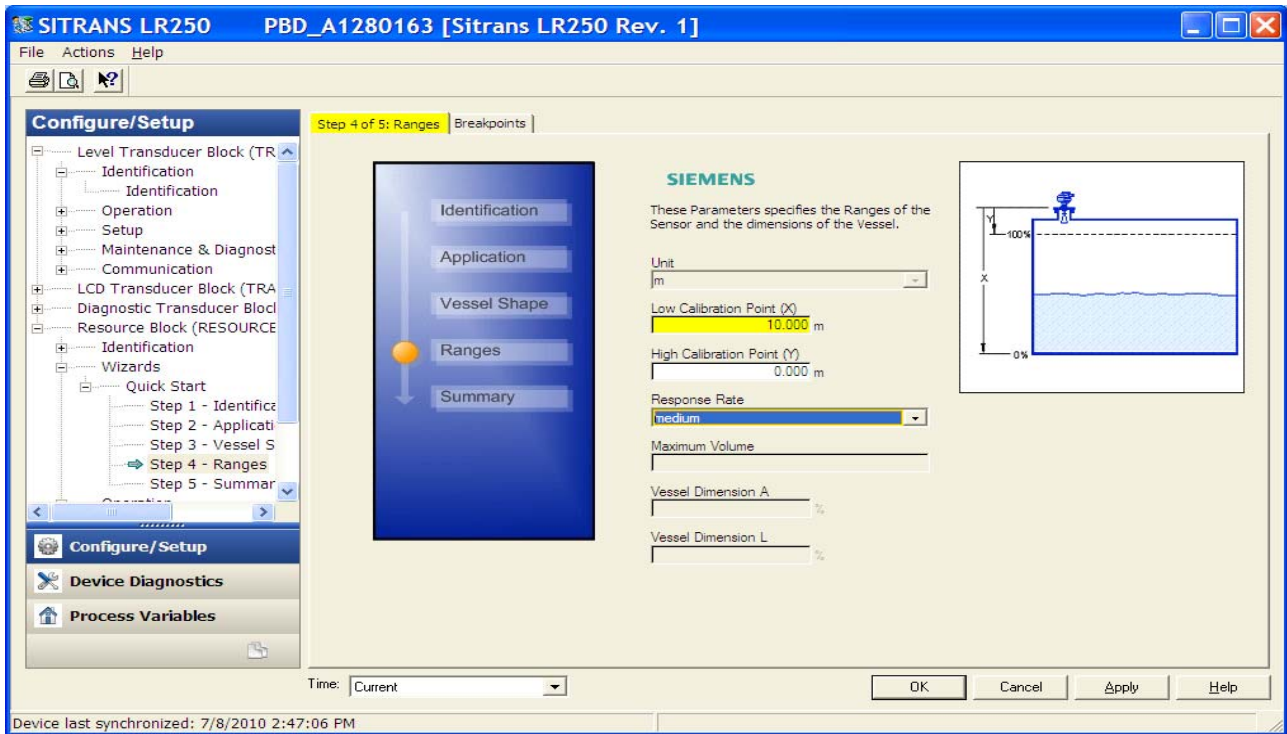


Figure 6 Wizards and graphics make setup of complex devices easy

Handheld Field Communicator

Handheld field communicators are based on EDDL because EDDL is operating system independent. EDDL makes it possible for the handheld to work with many different types of devices from different manufacturers using HART or FOUNDATION fieldbus protocols. A small portable handheld is also able to display graphics and therefore also enables setup of sophisticated devices. That is, there is no need to lug a laptop computer into the field in order to do setup or configuration right next to the device. This ability to work in the field with a small lightweight handheld field communicator certified for live work in hazardous areas saves lots of time and is highly valued by field technicians. This capability is not provided by any other device integration technology.



Figure 7 handheld field communicator

A handheld field communicator is also able to display a waveform such as the radar echo curve

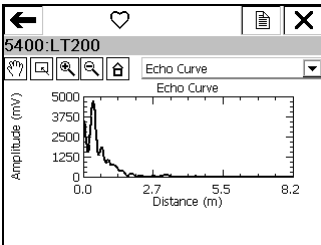


Figure 8 Graph visualizes waveform such as radar echo curve

Images, help text, and other user guidance is available in the handheld field communicator just as in a workstation software.

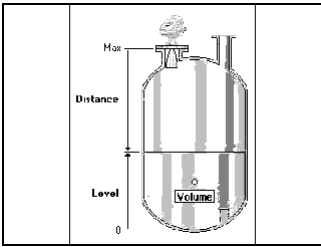


Figure 9 Image help in the interpretation of setup parameters such as tank geometry

Even tables display in the handheld communicator.

Level	Volume
0.000	0.000
10.000	10.000
0.000	0.000
0.000	0.000
0.000	0.000
0.000	0.000
0.000	0.000
0.000	0.000

Figure 10 Edit large amounts of information in table format such as strapping table

Of course, if somebody wants to use a laptop in the field to get a larger screen, this is also possible as there are several applications for different protocols suitable for laptops that support EDDL.

Guided Wave Radar Level Transmitter Setup

A Guided Wave Radar (GWR) level transmitter is a sophisticated device that requires advanced configuration similar to a (free space) radar level transmitter. Images are used to unambiguously illustrate where the dimension parameters are taken in order to avoid confusion with regards to length and height.

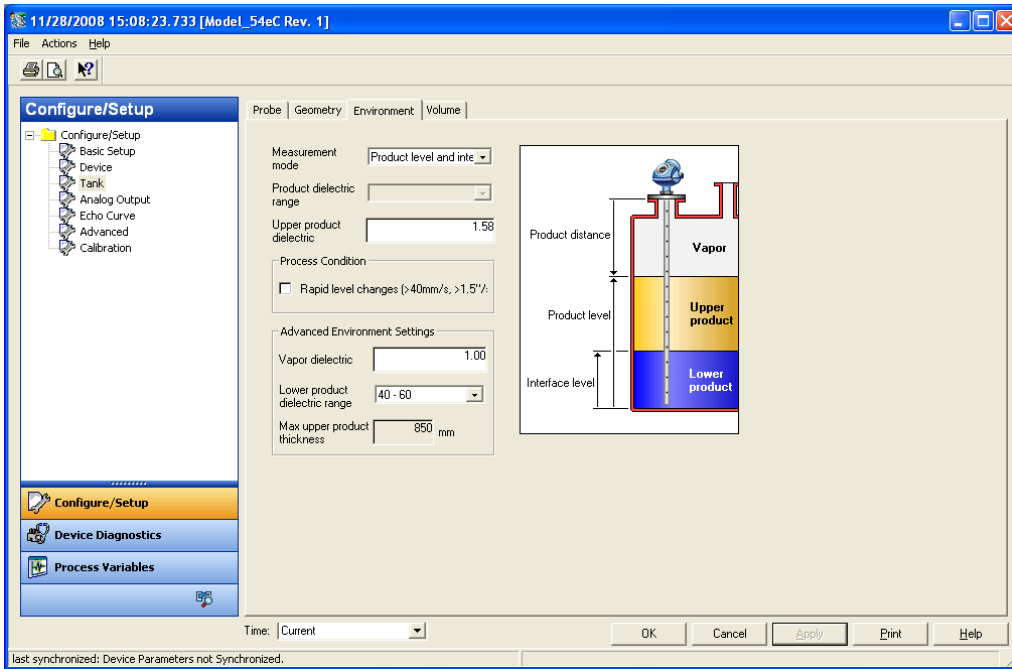


Figure 11 Graph visualizes waveform such as radar echo curve

The device manufacturer uses EDDL 'conditionals' to ensure the setup page in the device management software 'hides' parameters which are not applicable based on prior selection. For instance, if a standard probe is chosen, no additional information need to be entered, and cannot be entered. While if custom probe is selected, the additional information can be keyed in. This ensures the technician is not wasting time trying to find and enter useless information.

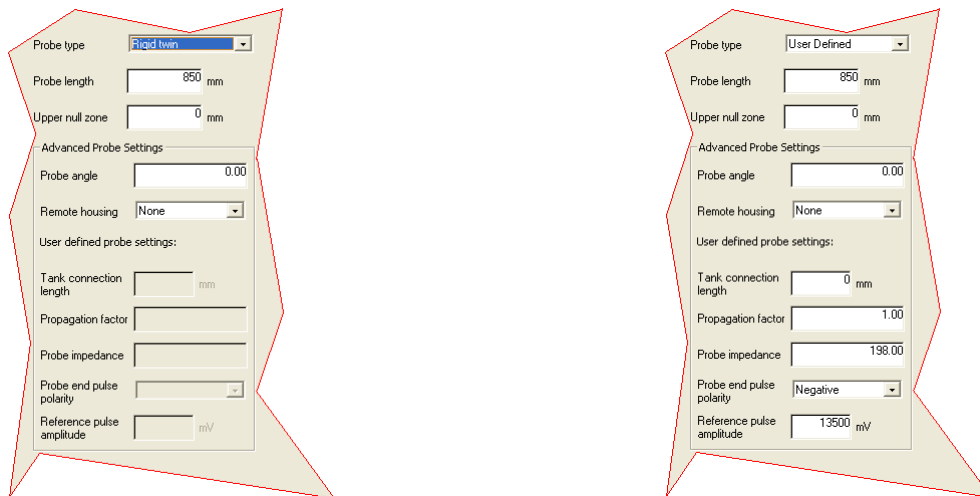


Figure 12 EDDL conditionals ensure technician does not waste time on information not required

Echo analysis and tuning

An EDDL waveform is used to display multiple plots in the same graph, such as:

- echo curve
- surface threshold
- interface threshold
- reference threshold
- hold-off distance (null zone)
- zero reference
- probe end

Enhanced EDDL allows combined viewing of the echo curve, amplitude thresholds (such as the surface threshold, interface threshold and the reference threshold).

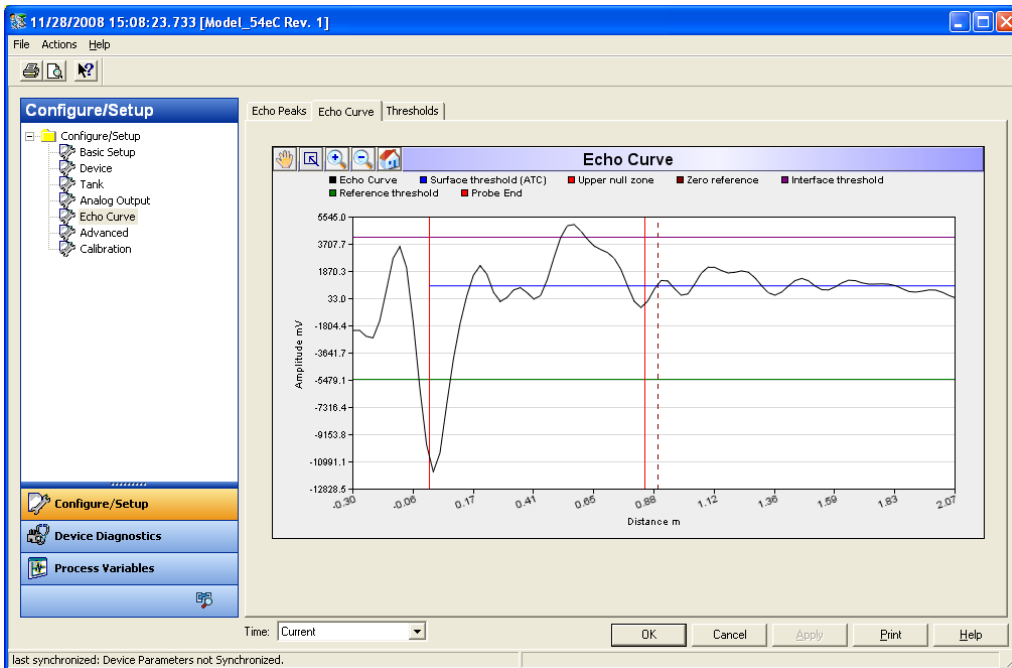


Figure 13: The echo curve presents all visible echoes and multiple waveforms for thresholds

Measure and learn wizards

Using EDDL, manufacturers provide wizards that take the technician step-by-step through the setup process.

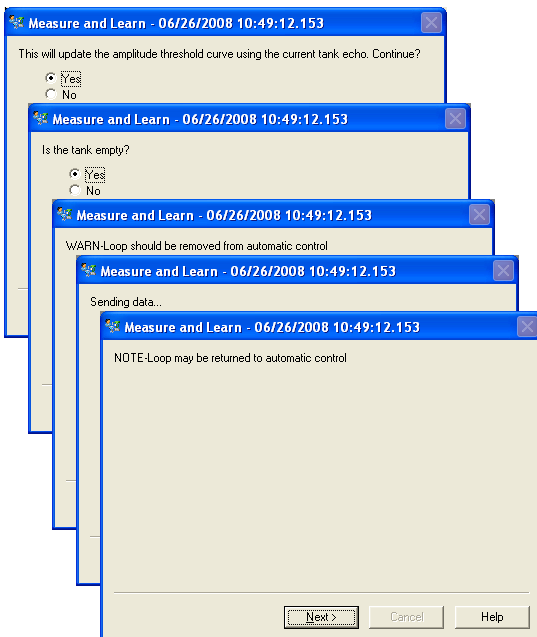


Figure 14: A wizard can take the technician step-by-step through the setup process

Expert know-how

Experience and application know-how from the manufacturer is provided in the form of illustrations and help text.

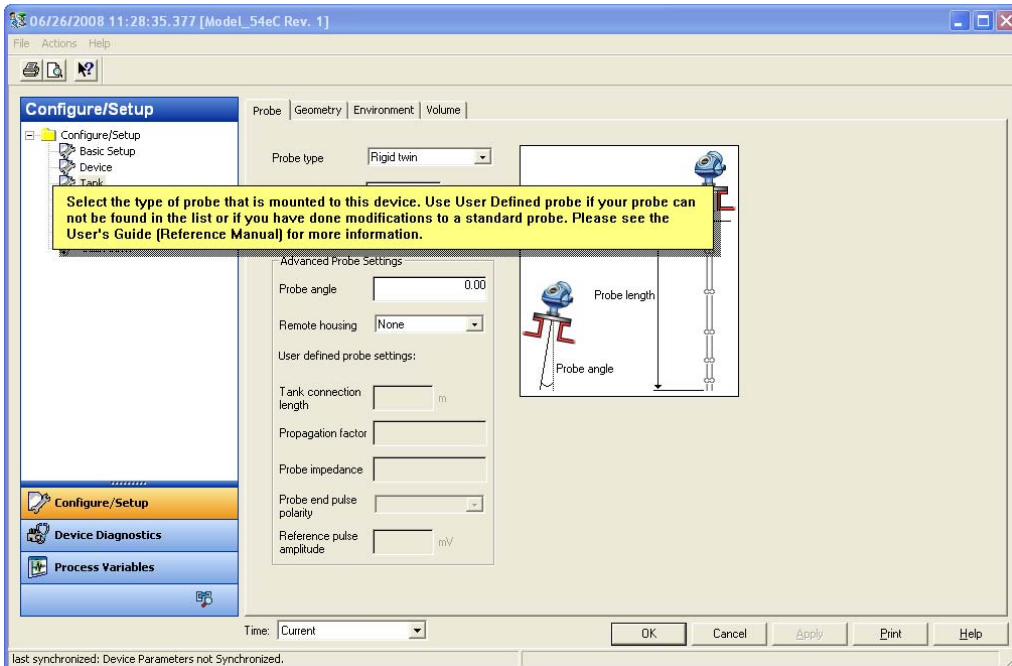


Figure 15: Expert know-how and documentation can be included via EDDL.

Valve Positioner Setup

Intelligent positioners do not require mechanical linkage adjustment. Instead the EDDL wizard invokes firmware embedded in the positioner which fully strokes the actuator to find the open and closed position automatically. Automatic travel calibration ("stroking") and servo tuning are wizards initiated by the technician at the click of a button.

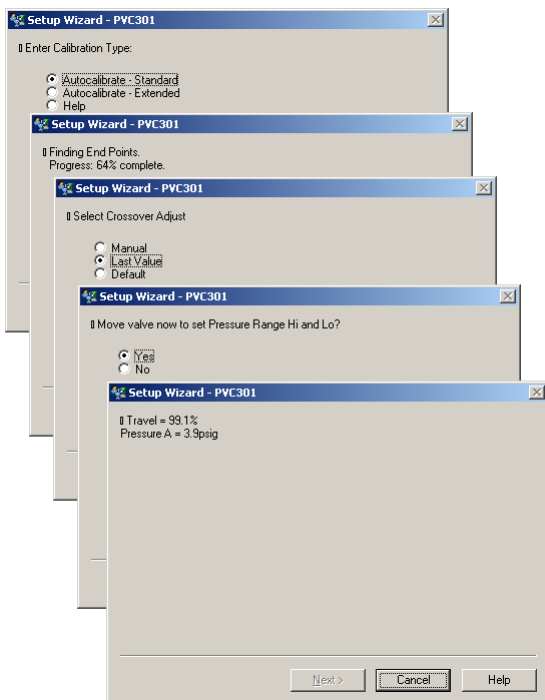


Figure 16 valve positioner automatic travel calibration wizard

Similarly, for a 4-20 mA positioner (with HART) to operate at 4-12 mA or 12-20 mA (i.e. split range) is not achieved by mechanical adjustment but by current loop configuration.

Valve flow characterization requires a large set of array-like data which is easiest edited in a spreadsheet-like table having columns for setpoint and corresponding valve position.

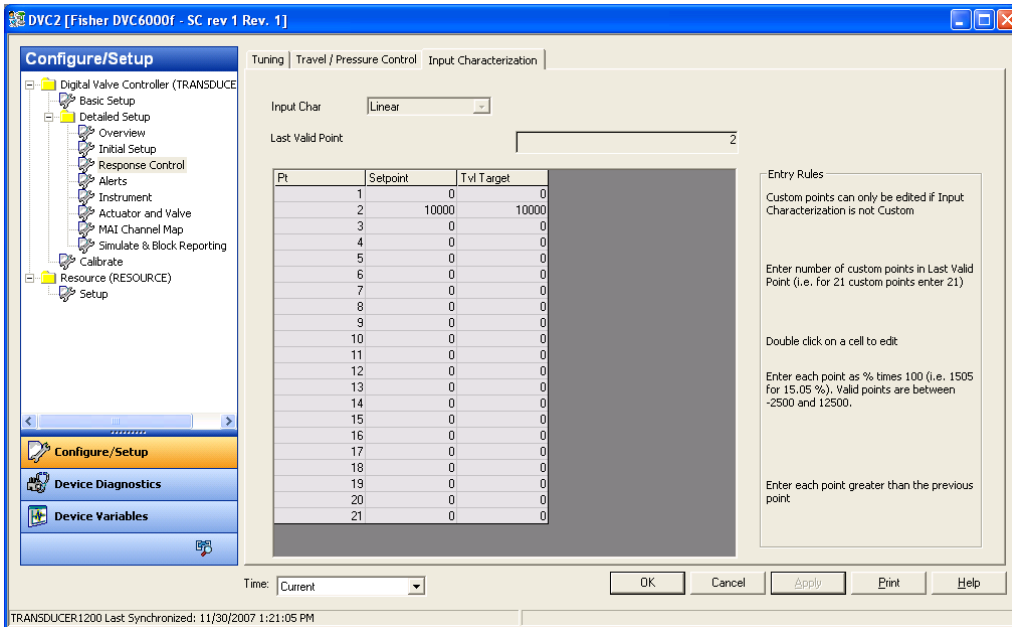


Figure 17 Edit large amounts of information in table format such as flow characterization and refer to explaining text

The positioner manufacturer provide guidance in the form of text explaining the rules for data entry to reduce the need to reach for a manual.

Variable Speed Drive Setup

Setup parameters are labeled with readable descriptions rather than cryptic mnemonics or just the numbered registers of the past. Help text and illustrations give plant technicians access to the know-how of the drive manufacturer's specialists.

A drive is a sophisticated device, and depending on the application there are many settings to be made. However, EDDL wizards created by the drive manufacturers' experts guide the technician. For instance, technicians can choose fan/pump, compressor, conveyor, or general application and then follow the wizard step-by-step in entering only the required information. The wizard shows only valid options based on prior selections, and verifies entered values. The technicians are not misled or confused by irrelevant settings, and they cannot miss required entries. Time is saved by reducing mistakes.

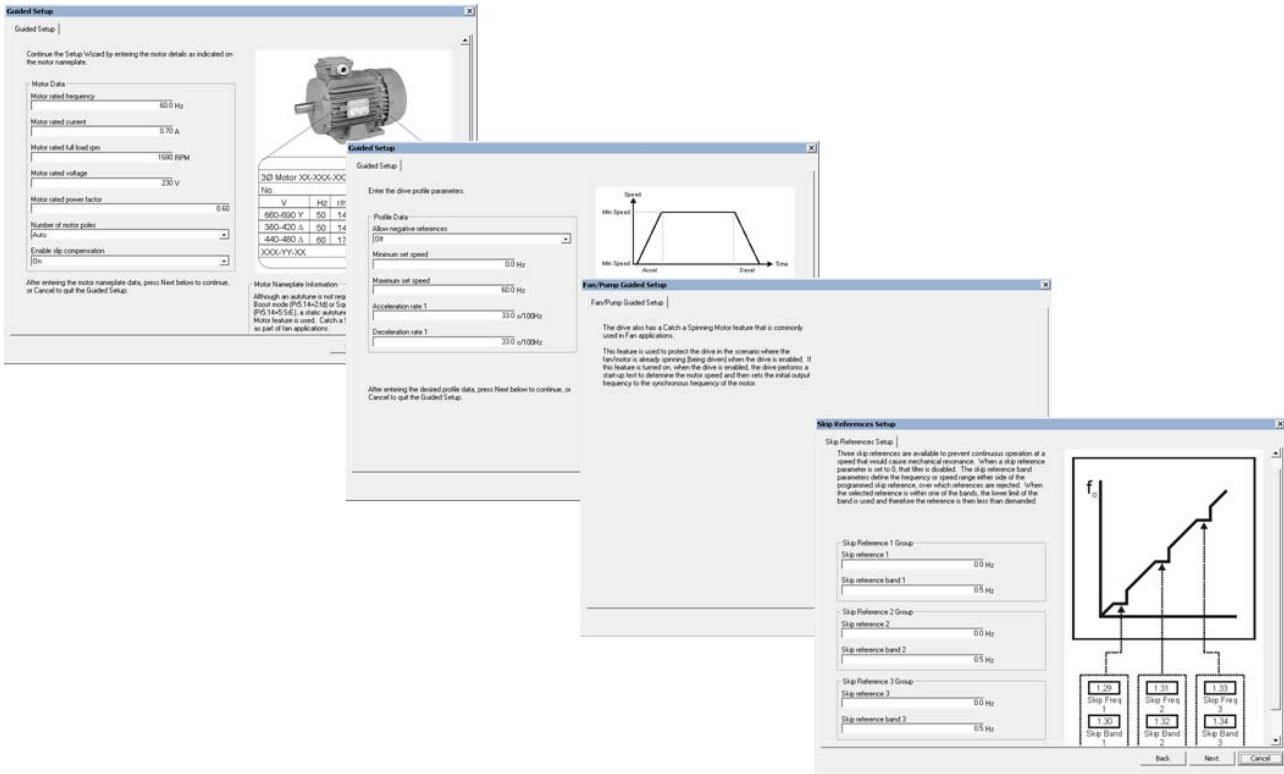


Figure 18 EDDL wizards with help text and illustrations created by the drive manufacturer's expert guide the technician step-by-step

Beyond Setup

Software and communicators based on EDDL assist the technician in setting up and configuring devices correctly and as quickly as possible.

Context Sensitive Help

The device manufacturer's experts build their know-how about their device into help text associated with all parameters and wizards etc. The technician can easily access this expert help simply by clicking on the parameter in question, and the help text will appear. This saves the technician the trouble of having to search through large manuals. The easily available help makes setup faster.

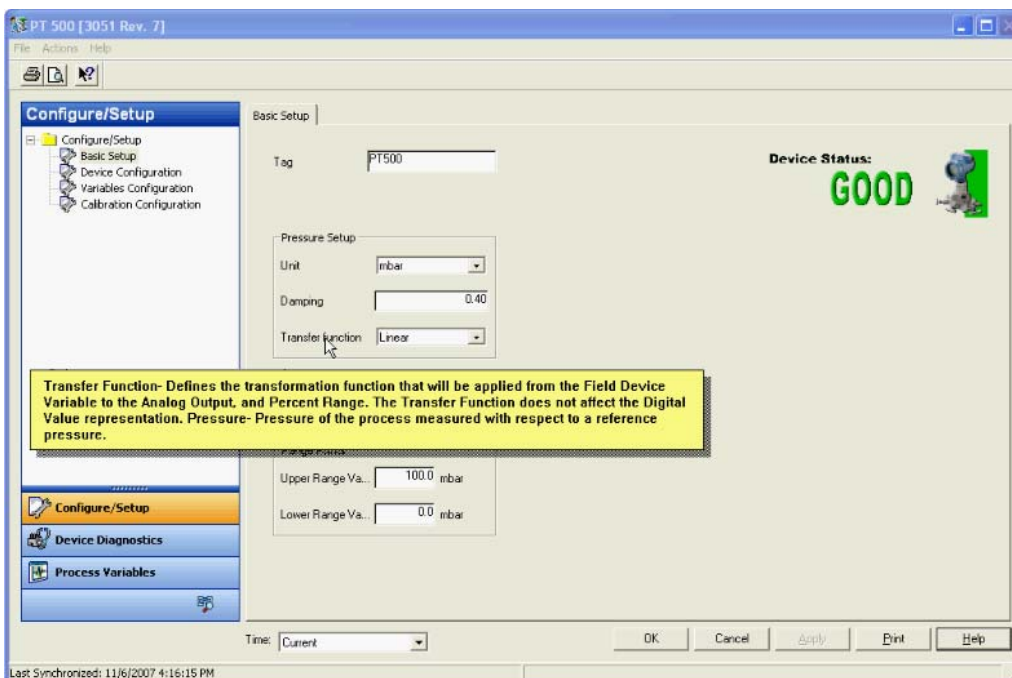


Figure 19 context sensitive help available for every parameter, wizard, and menu etc.

Manual

A softcopy of the manual, as well as other documents related to the device type or plant location, for the device can easily be called up at a click of a button.

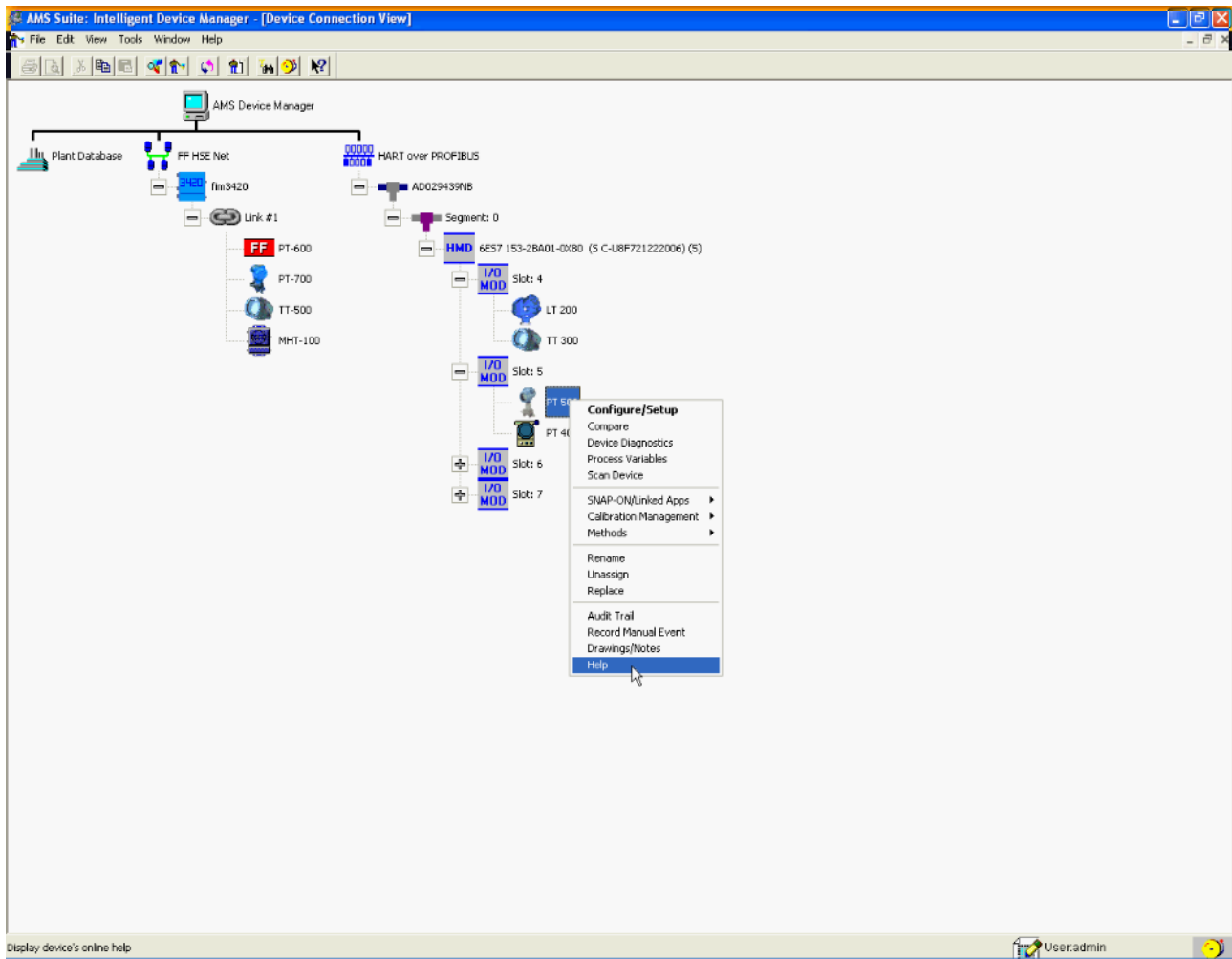


Figure 20 softcopy manual accessed at the click of a button

Once the softcopy manual is opened it is possible to navigate from the table of contents or search for specific words and using all the features in Adobe Acrobat to quickly find the answer.

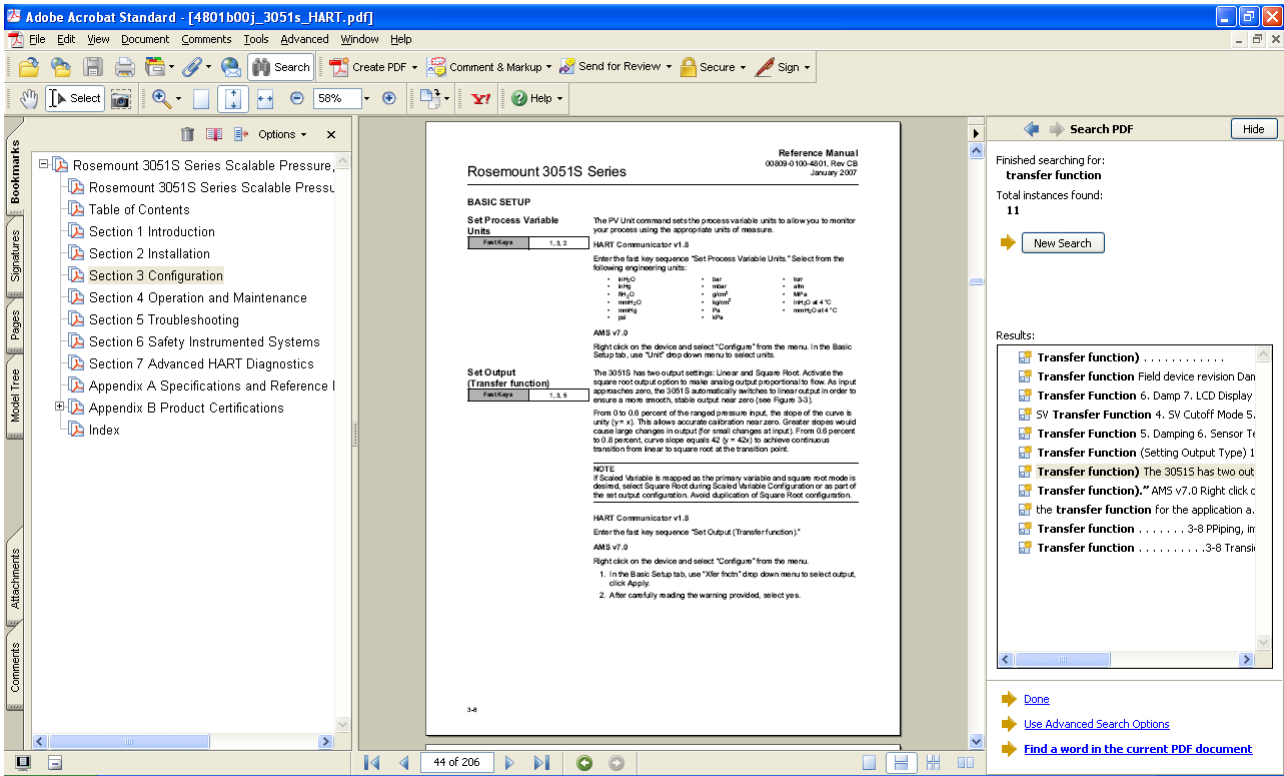


Figure 21 softcopy manual can be navigated or searched

Audit Trail and Configuration Reconciliation

Audit trail, that is, log of all changes made to the device configuration is available for all devices using EDDL, not just some. Similarly, configuration reconciliation, that is, ability to compare the configuration stored in the database against the configuration of the device as found in the device memory is possible for all devices using EDDL, not just some. Any discrepancies are highlighted and can be copied over at a click of a button.

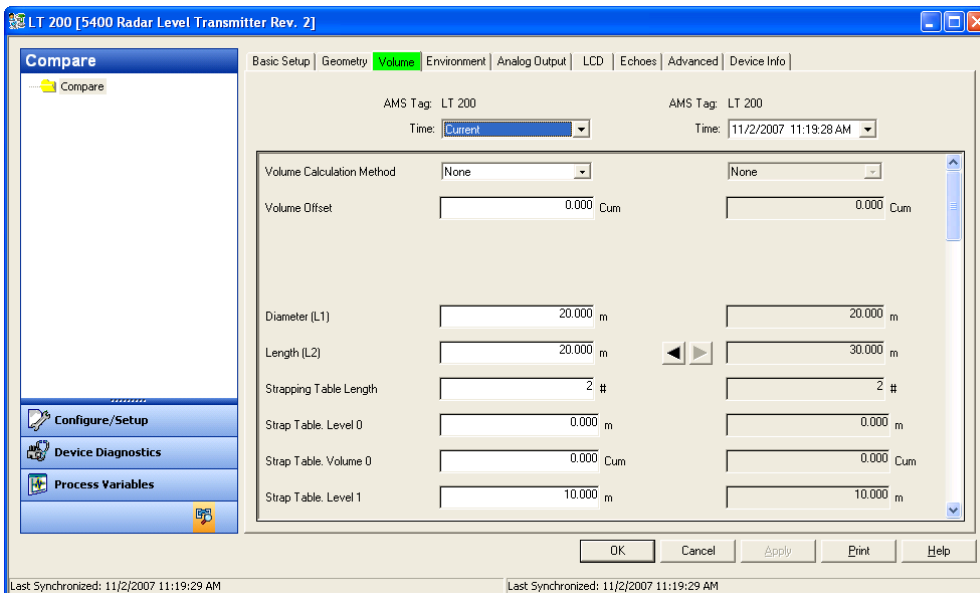


Figure 22 configuration in database and in actual device memory are easily compared side-by-side

Print

Printing of the device configuration is available for all devices using EDDL, not just some.

PT 500 (3051 Rev. 7)		
AMS Tag:	PT 500 (Current) 11/2/2007 12:28:32 PM	PT 500 (Previous) 11/2/2007 12:27:59 PM
Basic Setup		
Tag	PT 500	PT 500
Upper Sensor Limit	821.0 mbar	821.0 mbar
Lower Sensor Limit	-251.0 mbar	-251.0 mbar
Damping	0.40 s	0.40 s
Transfer Function	Linear	Linear
Unit	mbar	mbar
Primary Variable	Pressure	Pressure
Upper Range Value	821.0 mbar	821.0 mbar
Lower Range Value	0.0 mbar	0.0 mbar
Date	6/10/2006 12:00:00 AM	6/10/2006 12:00:00 AM
Descriptor	EDDLC	EDDLC
Message	Sensor Temperature	Sensor Temperature
2nd Variable	Scaled Variable	Scaled Variable
3rd Variable		
Sensor		
Sensor ID#	3082316	3082316
Measurement	Diff (DP1)	Diff (DP1)
Module type	2	2
Upper Trim Point	821.0 mbar	821.0 mbar
Lower Trim Point	0.0 mbar	0.0 mbar
Upper Sensor Limit	821.0 mbar	821.0 mbar
Lower Sensor Limit	821.0 mbar	821.0 mbar
Process Connector	Couplant	Couplant
Process Conn. Inlet	316 SST	316 SST
Isolation Material	316 SST	316 SST
O Ring Material	PTFE	PTFE
Diap. Vent. Matl.	316 SST	316 SST
Fill Fluid	Silicone oil	Silicone oil
Remote Seal		
Type	None	None
Diaphragm Material	None	None
Seal Fill Fluid	None	None
Number	None	None
Process Input		
Unit	mbar	mbar
Transfer Function	Linear	Linear
Damping	0.40 s	0.40 s
Unit	mbar	mbar
Analog Output		
Upper Range Value	821.0 mbar	821.0 mbar
Lower Range Value	0.0 mbar	0.0 mbar
Min span	5.7 mbar	5.7 mbar
Alarm Selection	Hi	Hi
High Alarm	25.10 mA	25.10 mA
Low Alarm	3.72 mA	3.72 mA
High Saturation	20.00 mA	20.00 mA
Low Saturation	3.00 mA	3.00 mA
Alert Mode	Off	Off
High Alert Value	821.0 mbar	821.0 mbar
Low Alert Value	821.0 mbar	821.0 mbar
Alert Mode	Off	Off
High Alert Value	65.0 degC	65.0 degC
Low Alert Value	-40.0 degC	-40.0 degC
Shut Temp LSL		
Shut Temp USL		
Scaled Variable		
Units	°DEFLT	°DEFLT

Figure 23 Print-out of device configuration

Export to Excel

Export of the device configuration is available for all devices using EDDL, not just some.

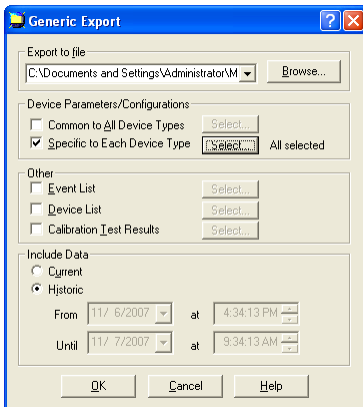


Figure 24 configuration and other device data can be exported to Excel

Data in the device or database is decoded using EDDL and exported in XML format which is easily opened in spreadsheets such as Microsoft Excel.

DevType	DevRev	Protocol	HartDeviceld	Name	Name2	Name3	ControlModule	Name4	Label	Value	Units
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Polling Address	0	
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Date	01.01.2000	
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Tag	LT200	
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Descriptor		
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Message		
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Enable Burst Mode	Off	
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Burst Mode Command Number	PV	
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Length Unit	m	
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Velocity Unit	m/s	
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Volume Unit	Cum	
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Temperature Unit	degC	
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	PV is	Level	
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	SV is	Distance	
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	TV is	Level Rate	
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	4V is	Signal Strength	
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Damping value	2.0	s
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Response Preambles	5	
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Tank Type	Horizontal Cylinder	
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Tank Bottom Type	Flat	
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Tank Height (R)	12.000	m
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Pipe measurement	Pipe measurement disabled	
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Pipe Inner Diameter	0.100	m
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Min Level Offset (C)	0.000	m
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Calibration Distance	0.000	m
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Distance Offset (G)	0.000	m
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Volume Calculation Method	Strapping Table	
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Volume Offset	0.000	Cum
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M			
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Diameter (L1)	12.000	m
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Length (L2)	20.000	m
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Strapping Table Length	20	#
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Strap Table. Level 0	0.000	m
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Strap Table. Volume 0	0.000	Cum
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Strap Table. Level 1	10.000	m
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Strap Table. Volume 1	10.000	Cum
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Strap Table. Level 2	0.000	m
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Strap Table. Volume 2	0.000	Cum
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Strap Table. Level 3	0.000	m
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Strap Table. Volume 3	0.000	Cum
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Strap Table. Level 4	0.000	m
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Strap Table. Volume 4	0.000	Cum
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Strap Table. Level 5	0.000	m
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Strap Table. Volume 5	0.000	Cum
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Strap Table. Level 6	0.000	m
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Strap Table. Volume 6	0.000	Cum
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Strap Table. Level 7	0.000	m
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Strap Table. Volume 7	0.000	Cum
5400 Radar Level Transmitter	2	HART	4447	EDDL DEMO BAHRAIN	MULTAQA	ET 200M	ET 200M	ET 200M	Strap Table. Level 8	0.000	m

Figure 25 Exported data opens in Excel

Once configuration is opened in Excel, it is possible to sort, filter, and compare etc. using all features of Excel.

OPC Server Configuration

EDDL is also used by the device management software to automatically configure its OPC server, which in turn enables other applications to access information in the devices.

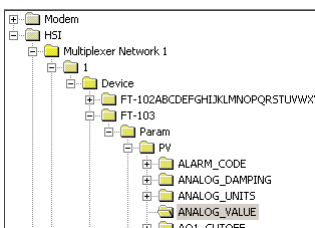


Figure 26 EDDL is used to automatically configure an OPC server to access all device information

Consistency of Use

Because EDDL is a text file from which the device page graphics is rendered by the device management software, the settings and help are rendered the same way for all devices regardless of protocol, manufacturer, or type. This consistency achieved thanks to EDDL makes device setup easier and intuitive (see separate technical white paper on consistency of use). No other technologies can provide a comparable result.

Conclusion

For plants that are looking for an easy solution to managing multiple types and versions of devices, EDDL technology is a perfect match. New systems shall support EDDL. Plants should upgrade www.eddl.org

existing DD systems to EDDL with enhancements to enjoy the greater ease of use afforded by the standard graphical display. That is, one technology is sufficient, there is no need to master two technologies, two sets of device integration files, and two or more ways of performing tasks with the devices. EDDL supports advanced setup of sophisticated devices. EDDL is therefore the logical choice for device integration technology. Using only one technology for all software and systems is a fundamental NAMUR 105 requirement. Upgrade to EDDL is simple and does not require change of skills. Just copy and paste EDDL files like you copy DD files today, no software installation has to be learnt.

References

EDDL Brochure and Technical Description on www.eddl.org site

Jonas Berge, "Fieldbuses for Process Control: Engineering, Operation, and Maintenance", ISA, 2002, ISBN 1-55617-760-7

NAMUR NE 105, "Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices", Version: 24.08.2004