

ULTRAVISION 3.8R13

Technical Guidelines



UltraVision®, a complete UT and Phased Array inspection package!

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IMPORTANT MESSAGE

UltraVision[®] Classic 3.8R13 is the latest UltraVision release in UltraVision Classic software. This new version incorporates a series of new features and improvements as described in the Product Bulletin document.

Zetec is committed to the highest levels of product quality. Some limitations and remaining anomalies were detected during the validation campaign and are listed in this document.

If using UltraVision Classic 3.8R13 you detect any other limitations or remaining anomalies not included in this document, please contact us at the address: <u>Support-UTProducts@zetec.com</u>. Detailed information about the problem will help our software team to expedite the correction process.

Sectorial View Improvement

DGS (Distance-Gain-Size curves)

DGS curves can be generated for each combination of specimen geometry and probe configuration, using either phased array or conventional probes.

DGS (Distance/Gain/Size) is a sizing technique that relates the amplitude of the echo from a reflector to that of a flat bottom hold at the same depth or distance. DGS curves include the effect of beam spreading and material attenuation.

The DGS Simulation Tool

To create a DGS simulation:

- 1. Select the correct probe to create the curves.
- 2. From Advanced Calculator, set your wedge to Contact.
- 3. From the All Commands menu, enable the DGS Simulation Tool.



4. Select the **DGS Simulation** tab from the **Default Channel** selection window.



The DGS Simulation is displayed:

 Focalization Bements ⇒ DGS Simulation → Parameters 	All Commands
UT Start 10.	00 mm
UT End 10	00,00 mm
Number of calculated points (Logarithmic sampling)	
FBH Diameters 3,20; 2,30; 1,60); 1,10; 0,90 mm
Simulate	
All focal laws	
O Current focal law	\sim
Calculate	
Calculate button disabled becaus Export	e:No focal laws present
	1000,000
ne	
8	
4 4	
8	
<u>e</u> _	
	100mm 200
	100 200 700

- 5. *Only when in online mode*: Click **Replace** to apply the probe and wedge changes.
- 6. Select your curve parameters.

Adapt the **UT Start** and **UT End** to the UT range of your specimen. You can add new FBH diameters by entering them manually and using a ";" as a separator between variables.

7. Click **Calculate**.

The Tool will create one curve per FBH.

8. **Export** the curves in a **.dgs** file.

DGS	FBH Diameter 0.90 mm v	Position	Amplitude
		(mm)	(dB)
Display	Reference value (dB) 0.0	10,00	36,1
		13,59	32,7
	Apply material attenuation	18,48	31,1
	Material attenuation (dB/m) 6.0	25,12	30,9
		34,15	33,0
		46,42	36,6
	63,10	41,4	

Note: This is the end of the simulation which can be performed either online or offline. The next steps must be performed online.

9. From Ultrasound Settings, under the TCG tab, select DGS in the type drop-down list.



10. Click **Import** and select the DGS curve txt file. The DGS points are loaded into the UT Setting.

Ultrasound Settings	;				
Channel Defa	ult Channel 🗸 🗸	Add Delete Azimuthal R: -5,00	\sim		
Law	General Gates TCG	Digitizer Pulser/Receiver Probe Alarms	I/O Transmitter	Receiver	
Calculator	DGS	✓ FBH Diameter 0,90 mm ✓	Position	Amplitude	
🗹 All Laws			(mm)	(db)	Import
		Reference value (dB) 0.0 ≑	10,00	39,3	Emert
Linear			13,59	35,6	Export
Time		Apply material attenuation	18,48	30,5	
Reversal		Material attenuation (dB/m) 0,0	25,12	28,8	
			34.15	30.0	v

11. The DGS curves can be displayed on an A-Scan view by checking the **Display** box. Click in the view to activate.



- 12. The **FBH Diameter** drop-down list allows you to select the curve displayed in the table for the current law.
- 13. The **Material Attenuation (dB/m)** applied can be modified. The new curves can then be exported in a new .dgs file.
- 14. The DGS curves are saved with the setup and the data file. A new selection of information fields has been developed to help the analysis of the DGS curves in **Predefined Selections**, (found in Information Groups 1 to 4):

	Information Groups	-, 10	I X		
	Predefined Selections *	Regular	Mode •		
	ter Group 1 ter Group 2 ter Group 3 ter Group 4				
	Clear All	Ok (Cancel		
Information Grou	ns		_		×
Predefined Se	lections -		Rec	ular Mod	
Processi Processi Oursors Oursors	al Correction ics			jului mou	^
	DGSRefF8HMin] : Lower FBH diameter at referer DGSRefFBHMax] : Upper FBH diameter at refere DGSRefFBHEQ] : Equivalent reflector size at refe DGSMeasFBHMin] : Lower FBH diameter at mea DGSMeasFBHMax] : Upper FBH diameter at mea DGSMeasFBHEQ] : Equivalent reflector size at m GS FBHMin] : Lower FBH diameter for most critica GS FBHMax] : Upper FBH diameter for most critica GS FBHC] : Equivalent reflector size for most critica GS FBHC] : Equivalent reflector size for most critical GS fladexPos] : Index axis position for most critical GS USoundPos] : Ultrasound axis position for most 'lanes	nce intersection rence intersection sure intersection sure intersection sure intersection easure intersectio el echo inside volu al echo inside volu echo inside volun echo inside volun t critical echo insi	n metric contour metric contour olumetric contour retric contour de volumetric c	r bur contour	
	DGSRefFBHMin] : Lower FBH diameter at referer DGSRefFBHMax] : Upper FBH diameter at refere DGSRefFBHEQ] : Equivalent reflector size at refe DGSMeasFBHMin] : Lower FBH diameter at mea DGSMeasFBHMax] : Upper FBH diameter at mea DGSMeasFBHEQ] : Equivalent reflector size at m GS FBHMin] : Lower FBH diameter for most critica GS FBHMax] : Upper FBH diameter for most critica GS FBHMax] : Upper FBH diameter for most critica GS FBHMax] : Upper FBH diameter for most critica GS ScanPos] : Scan axis position for most critical GS USoundPos] : Ultrasound axis position for most 'lanes	nce intersection nce intersection rence intersection sure intersection easure intersection easure intersection easure intersection echo inside volu echo inside volun echo inside volun echo inside volun echo inside volun t critical echo insi	n metric contour imetric contour olumetric contour etric contour de volumetric c	r our contour Cancel	~

Weld and Corrosion Propose Setup

Corrosion Propose Setup

- 1. From the Specimen Settings menu, select a Flat or a Cylindrical specimen.
- 2. Set Thickness less than or equal to 25.4 mm (1in.).
- 3. Click **Propose Setup** at the bottom of the **Specimen Settings** menu, as shown below.



4. Select the probe to use for your Paintbrush configuration. The **Corrosion Propose Setup** gives access to several linear configurations using the Paintbrush with different probes as shown in

the figure below:

propose	Setup	>	<
Setup	Creator		
Availa	able Setups :	Paintbrush - 5M48x10-REG V	
Setup Rem - Lin - 5M - Ta - Lou - Ele - Sk - PA - Ele	o Content aining Thickne ear (4&x10-REG & 1 rget Paintbrush ngitudinal 0 deg ments 1 - 32 A ew 90 deg . Connection 1- ment Numberin	Partbush - 5M42x10.REG Pairtbush - 5M42x10.REG Pairtbush - 5M42x10.ALT Pairtbush - 5M42x10.ALT <	

The Propose Setups with regular and alternate probes are an easy way to set up a Paintbrush when using a dual linear array type probe (refer to probe catalog for details). Two probe wirings are available:

- **Regular**: the first element pulses and the 33-element receives and so on (this wiring scheme is not compatible TOPAZ¹⁶)
- Alternate: first element pulses and the second element receives, and so on.



The **Corrosion Propose Setup** also sets up a linear sweep and a layout of views to be ready rapidly for corrosion inspection.



Weld Propose Setup

- 1. From the Specimen Settings menu, select a Plate Butt Weld, Pipe Butt Weld and Pipe Axial Weld specimens.
- Set the diameters, thickness and weld of your specimen. Weld Propose Setup is available for Plate Butt Weld, Pipe Butt Weld and Pipe Axial Weld 12.5mm (0.5 inch) and 152.7mm (6 inches).
- 3. Click **Propose Setup** at the bottom of the **Specimen Settings** menu, as shown below:



4. Select the PA-TOFD or 2D-Matrix probe configuration for your specimen and designed to work with a Weld Crawler.



Paintbrush support on ZIRCON

The Paintbrush, previously supported only on TOPAZ, is now supported by ZIRCON. UltraVision will autodetect the Paintbrush as soon as it is connected to the ZIRCON. From this point, accepting will load the Paintbrush as the current mechanical sequence.

Mechanical Set	tings													,	x
Sequence na	ame: Default	Sequence	~	New	Delete	U 🗌	se Alternate a	axis							^
Sequence	Encoders Se	quence Contro	ols												
Type: Paintbrush v Fire on: Internal clock v O Range Stop Dimensions Advanced								dvanced	1						
Axis	Encoder	Start		Range	Stop	Resolution	Speed	Unit		Preset Mode	Preset Value	Save Data			
Scan Axis	Paintb 🗸	0,00	Get	200,00	200,00	1,00	25,00	mm	\sim	None 🗠	50,00	- ~	Set	Apply	
Index Axis	Paintb Y	0,00	Get	100,00	100,00	1,00	25,00	mm	\sim	None 🗠	25,65	- ~	Set		
<)	- - -

You can set your mechanical **Sequence** and **Resolution** as you would for a raster scan.

Advanced Paintbrush Settings allows you to set Reference Offsets of the Paintbrush to the specimen.



Time Reversal on TOPAZ³²

- 1. From the **Calculator**, under the **Probe** tab, select your probe. Make sure that you use **Longitudinal Waves**.
- 2. From the **Calculator**, under the **Wedge** tab, select your wedge. Generally, **Time Reversal** is used in **Immersion**; you can select this option from the **Wedge type** drop-down list.
- 3. From the **Calculator**, under the **Beam Angles** tab, set the **Type** to **Linear** and the **Refraction Angle** to 0°. Time Reversal is designed to work longitudinal linear 0-degree laws.
- 4. Click **Replace**.
- 5. Check the **Time Reversal** box in the **Ultrasound Settings** menu to have the Time Reversal tab displayed and to have Time Reversal enabled.

Ultrasound Settings									
Channel Defa	ult Channel	~	Add	De	elete Linear I	.1 : 1-32	`	~	
Law	General Gate	es TCG	Digitize	Pulser/	Receiver Probe	e Alarms I/O	Time	Reversal	
Calculator	Interface Ga	ate			Time Reversa	I Parameters		Utilities	
All Laws	Start:	0.00	mm		Profiling Iterati	ion: 5	\sim	Create/Reset Profiling Channel	
	Stop:	29,60	mm f	rom	Profiling Gain:	20,0	dB	Display Delay Pane	Apply
Linear	Threshold:	10,0	%	41501					Арру
⊡ Time Reversal	Detection:	Crossin	g	~	Improved P	rofiling			

Pause Mode

Pause mode gives you access to the data recorded in analysis mode. The Soft Gates, Data cursor, and the info fields will then be available. When activating Pause mode, the layout will also change to Analysis, but the Analysis layout can be changed while in Pause.

Pause mode is available in Setup mode and in Inspection mode. You can activate it using the Pause button in the UltraVision Manager, as shown in the figure below. When in Pause, the button switches to Resume to leave the Pause mode. When resuming, the layout switches back to Inspection (or Setup) and the data displayed before the pause is still displayed.



Uncorrected C-Scan View

- 1. Select your probe and wedge, and set an azimuthal sweep. This view **Type** is only available with azimuthal sweep.
- 2. Create a gate. This View Type is only available with a gate activated.
- 3. From the **Pane Settings,** open the **Contents** pane.



4. Select the gate you want to display this view. Select **Uncorrected Amplitude C-Scan** for this gate.

It might also be useful to accompany this view with a Sectorial Scan for its law selector.



Readback Mode

- 1. From the **Tools** menu, select **Options**.
- 2. From Application, select the Inspection tab.

Options	
Application General Encoder Status Bar View Information Report Amplitude Inspecton Log File Indication Table G-Current Document	 ☑ Rebuild Online Views With Stored Data □ Readback Data File On Save ☑ Pause Mode With Analysis Features

The **Readback Data File On Save** is unchecked by default. When checked, the just-saved data file will automatically open each time you save a copy.

Compound Scan

1. From the **Calculator**, under the **Beam angles** tab, set the type to **Compound**.



It is now possible to define the resolution for the compound scan generation (this replaces the option **Sparse/Dense** available in previous versions).

The increment in aperture element will now be a function of the number of focal laws and the length of the probe to cover.

Quality

All work is done in accordance with ZETEC Quality standards program, which complies with 10CFR50 Appendix B, ISO 9001:2008 and ISO/IEC 17025:2005.



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