

## Function monitoring of ultrasonic gas meters

# Prevention is better than cure: UniGuard diagnostic software

UniGuard is a software tool that helps to easily check the operational reliability of the ultrasonic gas meters from Elster-Instromet. Thanks to the user-friendly interface, even a computer layman can carry out a complete diagnostic run of an ultrasonic gas meter in just a few minutes.

For reasons of operational safety, system operators can now carry out periodic function checks themselves without difficulty. Regular use of this software enables any malfunctions to be detected before they develop into a real problem. The long-term stability of the ultrasonic gas meter can also be monitored. With UniGuard, you can calculate physical parameters such as the velocity of sound, density, calorific value, etc. in accordance with the universally recognised standards AGA 8/10 and ISO 6976.

The software is based on a self-explanatory sequence comprising just seven steps.

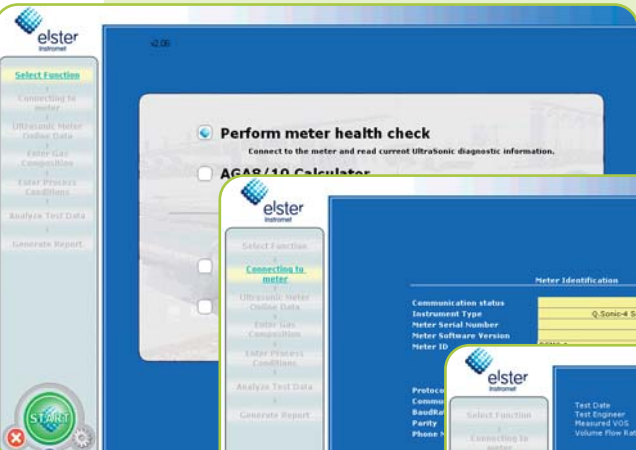
UniGuard is available free from Elster-Instromet and can be used for all gas meters with Series II, IV or IV.a electronics. Simply register in the Docuthek to download the UniGuard software: [www.docuthek.com](http://www.docuthek.com) (select: Elster-Instromet).

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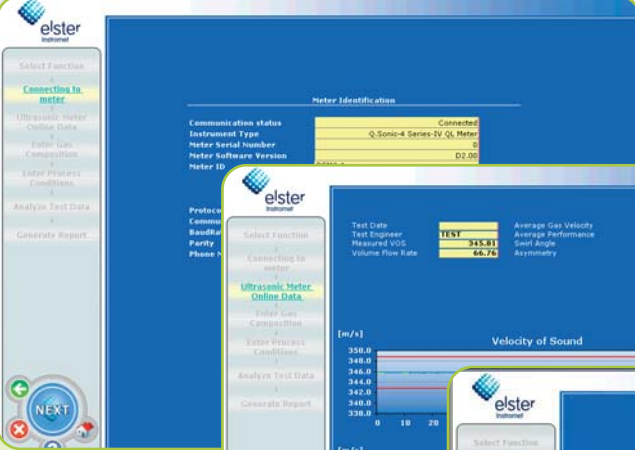
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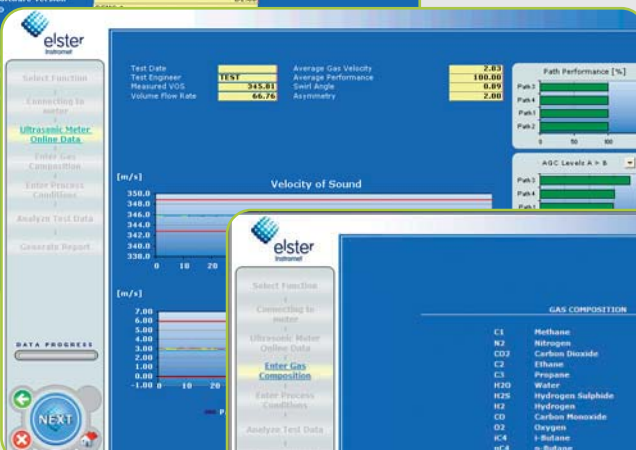
**Step 1:** A preselection is made.



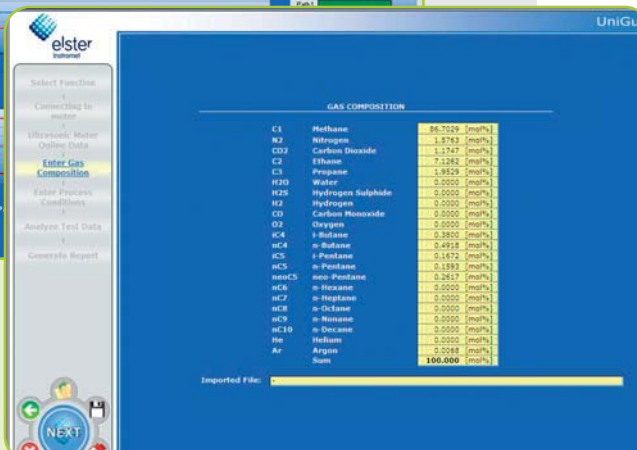
**Step 2:** The screen requests various user entries in order to establish the connection to the meter.



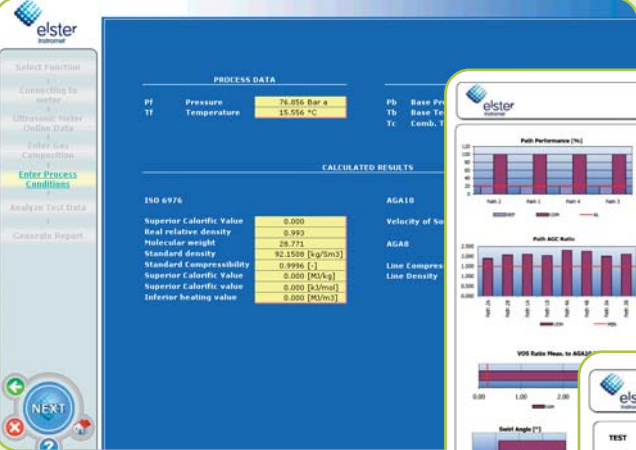
**Step 3:** During the subsequent data transmission to the meter, a first brief overview of the meter performance is shown. UniGuard then begins with a two-minute recording of the diagnostic data for an extensive calculation of the meter performance.




**Step 4:** Here you can enter the current gas composition in order to compare the measured velocity of sound with the calculated one.



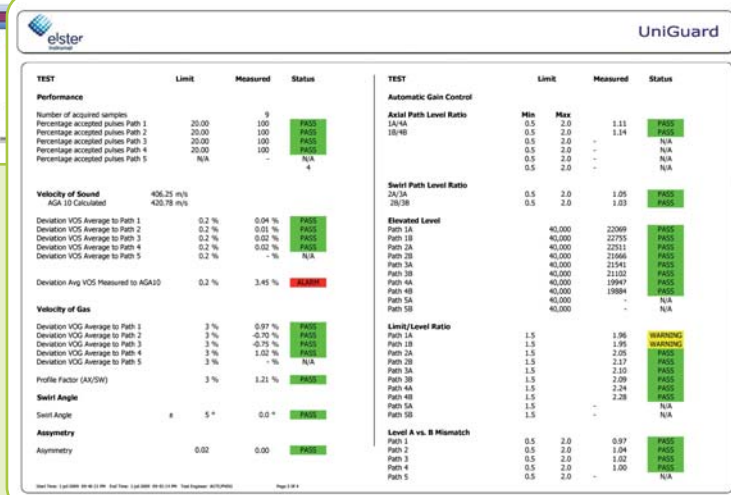
**Step 5:** The user can now enter the given process conditions.



**Step 6:** UniGuard supplies a graphic performance overview from the data with the given limit values.



**Step 7:** Here you can already see the corresponding detailed reports (graphic + numerical) to be saved or printed. Among other things, the user can easily assess the meter performance thanks to the traffic light marking system used. Green means that the meter is functioning properly, yellow that the corresponding parameters should be monitored, and red that an extensive analysis of the diagnostic values concerned is required.



TEST	Limit	Measured	Status	TEST	Limit	Measured	Status
<b>Performance</b>				<b>Automatic Gain Control</b>			
Number of acquired samples		9		<b>Axial Path Level Ratio</b>	Min	Max	
Percentage accepted pulses Path 1	20,00	100	PASS	IA/IA	0,5	2,0	1,11
Percentage accepted pulses Path 2	20,00	100	PASS	10/10	0,5	2,0	1,14
Percentage accepted pulses Path 3	20,00	100	PASS		0,5	2,0	-
Percentage accepted pulses Path 4	20,00	100	PASS		0,5	2,0	-
Percentage accepted pulses Path 5	N/A	-	N/A		0,5	2,0	-
			4		0,5	2,0	-
<b>Velocity of Sound</b>	406,25 m/s			<b>Swirl Path Level Ratio</b>			
AGA 10 Calculated	420,78 m/s			2A/2A	0,5	2,0	1,05
Deviation VOS Average to Path 1	0,2 %	0,04 %	PASS	2B/2B	0,5	2,0	1,03
Deviation VOS Average to Path 2	0,2 %	0,01 %	PASS				
Deviation VOS Average to Path 3	0,2 %	0,02 %	PASS	<b>Elevated Level</b>			
Deviation VOS Average to Path 4	0,2 %	-	N/A	Path 1A	40,000	22009	PASS
Deviation VOS Average to Path 5	0,2 %	-	N/A	Path 1B	40,000	22775	PASS
				Path 2A	40,000	22511	PASS
Deviation Avg VOS Measured to AGA10	0,2 %	3,45 %	WARNING	Path 2B	40,000	21966	PASS
				Path 2C	40,000	21941	PASS
<b>Velocity of Gas</b>				Path 3A	40,000	2102	PASS
Deviation VOG Average to Path 1	3 %	0,97 %	PASS	Path 3B	40,000	19947	PASS
Deviation VOG Average to Path 2	3 %	-0,70 %	PASS	Path 4B	40,000	18884	PASS
Deviation VOG Average to Path 3	3 %	-0,75 %	PASS	Path 5A	40,000	-	N/A
Deviation VOG Average to Path 4	3 %	1,02 %	PASS	Path 5B	40,000	-	N/A
Deviation VOG Average to Path 5	3 %	-	N/A				
Profile Factor (AA/2A)	3 %	1,21 %	PASS	<b>Level/Level Ratio</b>			
<b>Swirl Angle</b>				Path 1A	1,5	1,96	WARNING
Swirl Angle	8	5*	0,0*	Path 1B	1,5	1,95	WARNING
				Path 2A	1,5	2,05	PASS
<b>Asymmetry</b>				Path 2B	1,5	2,17	PASS
Asymmetry	0,02	0,00	PASS	Path 3A	1,5	2,10	PASS
				Path 3B	1,5	2,28	PASS
				Path 4B	1,5	2,24	PASS
				Path 5A	1,5	2,28	PASS
				Path 5B	1,5	-	N/A
					1,5	-	N/A
				<b>Level A vs. B Mismatch</b>			
				Path 1	0,5	2,0	0,97
				Path 2	0,5	2,0	1,04
				Path 3	0,5	2,0	1,02
				Path 4	0,5	2,0	1,00
				Path 5	0,5	2,0	-