Daniel® SeniorSonic™ Gas Flow Meters
The Premier Ultrasonic Meter for Custody Transfer Applications

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Assures high measurement accuracy and repeatability

The Daniel SeniorSonic gas flow meter with Mark III™ electronics saves you time and money. Lost and unaccounted for gas is reduced by exceptional low flow accuracy and linearity throughout the calibrated flow range. Time is saved by a best-in-class audit trail. Mark III electronics can pinpoint alarms, events and configuration changes in a matter of seconds. Best of all, operating the Daniel SeniorSonic gas flow meter is easy with the Windows® based Daniel Customer User Ultrasonic (CUI) software.

Applications include:

- Custody transfer
- Natural gas power plants
- Large industrial suppliers
- City gates
- Transmission systems
- Underground storage sites
- Pipeline balancing
- Alternative check metering

Features include:

- Unsurpassed measurement accuracy
- Superior low-flow capabilities
- Rangeability exceeds 50:1 within ± 0.1%
- Comprehensive audit trail
- Superior "dirty versus clean" operation
- Proven long term stability
- Proven field reliability
- Extensive diagnostic and alarm system
- Dual communications ports with Modbus® protocol
- Low power consumption
- Sophisticated digital noise reduction without the need for transducer substitution
- Extractable transducers
- Compatible with all Daniel ultrasonic meters
- Powerful Windows®-based interface software

**Meets or exceeds
AGA-9 requirements**

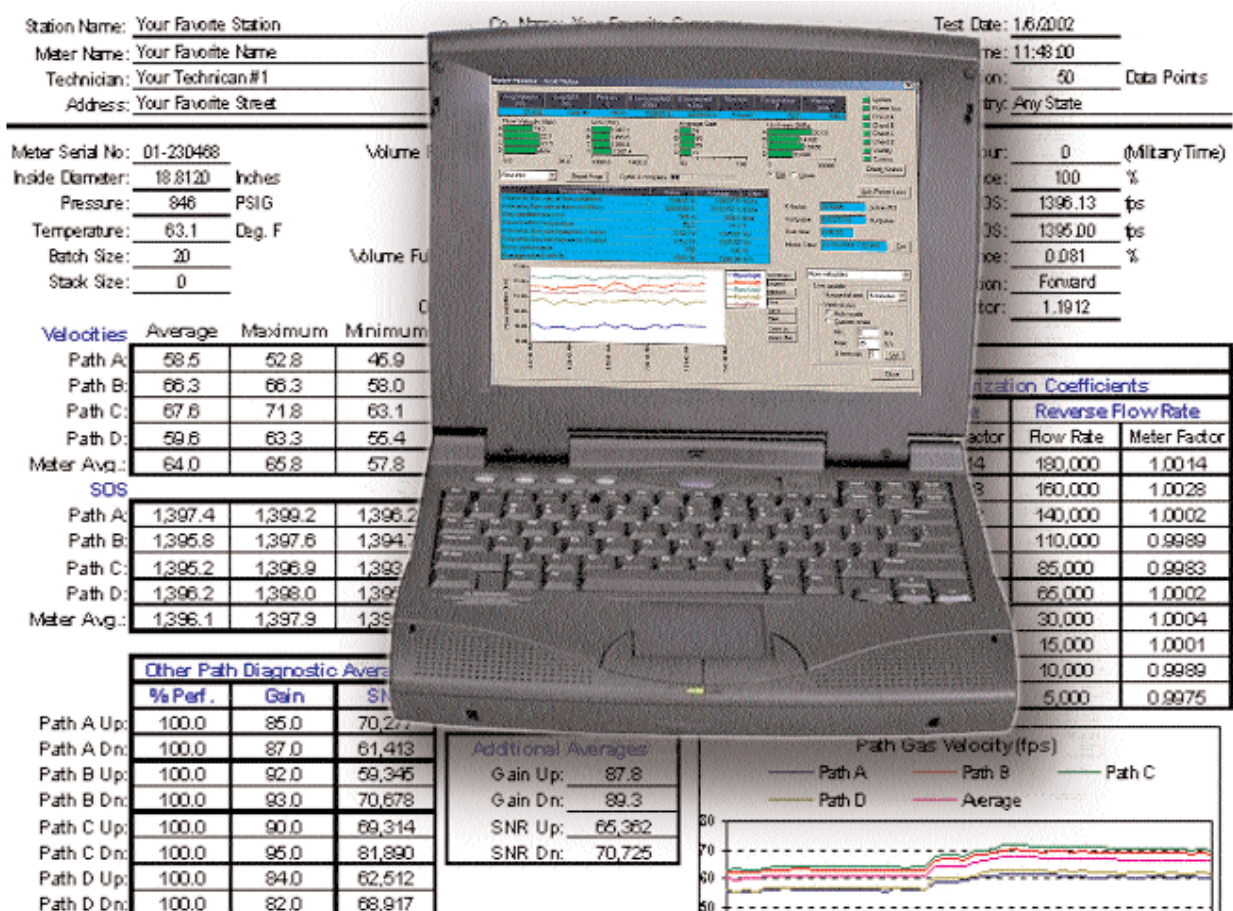# Customer Ultrasonic Interface (CUI) Software

Quick and easy access to information is key in taking advantage of today's technology

Daniel CUI software sets a new industry standard for real-time ultrasonic flowmeter monitoring. The Daniel**®** SeniorSonic™ flow meter features such as audit trail, extensive alarm reporting, flexible I/O, automatic meter configuration comparison and validation, digital wave-form viewing and the new piece-wise linearization are very easy to access with the CUI platform. A single monitor screen presents virtually all live data simultaneously in an easy-to-understand format.

The Daniel CUI automatically develops file folders and names for all stored data to insure consistency and ease of access for all technicians. An unlimited meter directory table can be shared between technicians to speed execution of CUI, especially important where multiple technician support for sites is required. CUI has comprehensive built-in help and supports direct and remote access via a phone line or radio.

Excel**®** -based spreadsheet reporting dramatically simplifies the periodic inspection process, and makes trending of data for long-term meter performance verification simple and accurate. This spreadsheet includes automatic meter configuration collection, graphing of all key data, continuous alarm monitoring, and a built-in SOS calculator for comparison of meter versus computed SOS. Gas composition can either be manually entered, or imported from a Daniel 2350 Gas Chromatograph controller file. Several "wizards" simplify field startup, analog calibration, frequency out-put testing and other commonly performed functions.

Daniel Ultrasonic Meter Test and Inspection Report Summary

Station Name: Your Favorite Station
Meter Name: Your Favorite Name
Technician: Your Technican #1
Address: Your Favorite Street

Test Date: 1.6.2002
me: 11:48:00
on: 50   Data Points
try: Any State

Meter Serial No: 01-230468
Inside Diameter: 18.8120 Inches
Pressure: 846 PSIG
Temperature: 63.1 Deg. F
Batch Size: 20
Stack Size: 0

Volume F

Volume Fu

our: 0 (Military Time)
ce: 100 %
OS: 1396.13 fps
OS: 1395.00 fps
ce: 0.081 %
ion: Forward
tor: 1.1912

Velocities

	Average	Maximum	Minimum
Path A	58.5	52.8	45.9
Path B	66.3	66.3	58.0
Path C	67.6	71.8	63.1
Path D	59.6	63.3	55.4
Meter Avg.:	64.0	65.8	57.8

SOS

Path A	1,397.4	1,399.2	1,396.2
Path B	1,395.8	1,397.6	1,394.7
Path C	1,395.2	1,396.9	1,393
Path D	1,396.2	1,398.0	1,39
Meter Avg.:	1,396.1	1,397.9	1,39

ization Coefficients

	Reverse Flow Rate	
actor	Flow Rate	Meter Factor
14	180,000	1.0014
3	160,000	1.0028
	140,000	1.0002
	110,000	0.9989
	85,000	0.9983
	65,000	1.0002
	30,000	1.0004
	15,000	1.0001
	10,000	0.9989
	5,000	0.9975

Other Path Diagnostic Avera

	% Perf.	Gain	SN
Path A Up:	100.0	85.0	70,2
Path A Dn:	100.0	87.0	61,413
Path B Up:	100.0	92.0	59,345
Path B Dn:	100.0	93.0	70,678
Path C Up:	100.0	90.0	69,314
Path C Dn:	100.0	95.0	81,890
Path D Up:	100.0	84.0	62,512
Path D Dn:	100.0	82.0	68,917

Additional Averages

Gain Up:	87.8
Gain Dn:	89.3
SNR Up:	65,362
SNR Dn:	70,725

Path Gas Velocity (fps)

Path A   Path B   Path C
Path D   Aerage

New Interface Software

Daniel's Customer Ultrasonic Interface (CUI) software provides the most advanced diagnostic software with each SeniorSonic meter. Daniel offers two versions of CUI software, Standard or Deluxe. This Windows®-based Customer Ultrasonic Interface software has been specifically designed to simplify monitoring and diagnosing the SeniorSonic meter. It is compatible with all previously shipped Daniel SeniorSonic meters. Some of the many features of the Standard version include:

- **Comprehensive monitor screen**
- **Field start-up wizard**
- **Audit/Alarm/History retrieval**
- **Supports Ethernet with Mark III**
- **Automatic naming and organized file saving**
- **Digital wave form viewing**
- **Maintenance log summary in Excel®**
- **Trending of maintenance logs**
- **Configuration comparison with exception summary**
- **Remote dial-up support**
- **Flow calibration (analog and frequency) wizards**
- **Unlimited meter directory support**

CUI 3.0 Deluxe Edition
Adds the following to CUI Standard:

Features:
- Maintenance log file merging
- Internal speed of sound calculator
- Supports Ethernet with Mark III
- AGA 10 SOS calculations supports connection to Ethernet enables Mark III

Benefits:
- Simplify long term trending of meter performance parameters
- Simplify SOS comparisons and integrates results into maintenance log files
- Faster access via Ethernet

Precision manufacturing is essential

The geometry of each meter body is critical to accurate measurement. Daniel's reputation for manufacturing excellence and painstaking quality assurance procedures is well known. Each meter body is subjected to rigorous testing and measurement throughout the manufacturing process.

Transducer "J" mount assembly

In keeping with its commitment to continual improvement, Daniel has replaced the transducer mounting assembly in Ultrasonic Meters, 6 inch and larger, with a new "J" mount design in meter pressure ratings up to ANSI 600 lb. A "K" mount version is available for ANSI 900 lb. and 1500 lb. designs.

This new design is more compact with threaded connections for a more secure, moisture resistant assembly. Although reducing the number of parts in the assembly, the "J" mount maintains its Intrinsic Safety rating. The "J" Mount is designed for use with a single global cordset and is incorporated on all Daniel Ultrasonic meters.

A new extractor tool fits easily with this new design to continue to provide a safe method of on-line transducer removal while the meter is under pressure. Previous extractor tools can be easily upgraded.

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