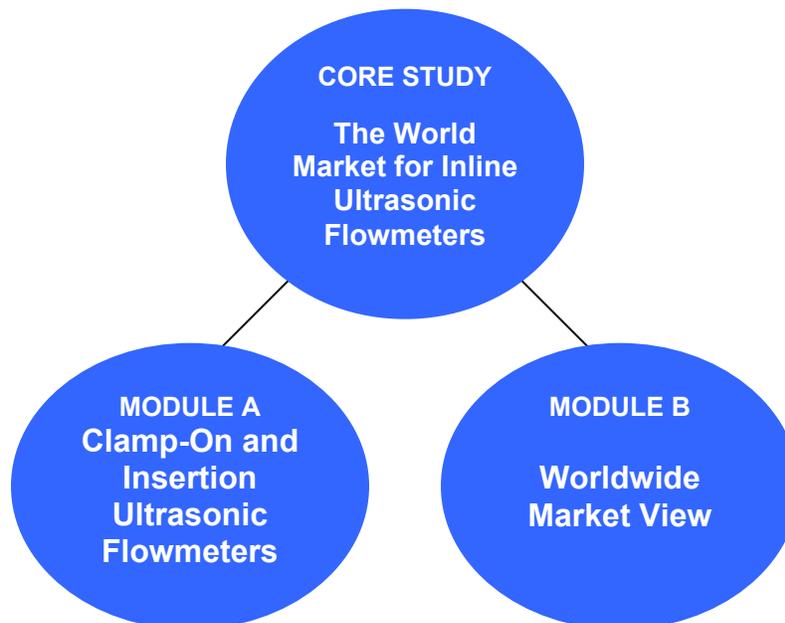


The World Market for Ultrasonic Flowmeters, 4th Edition

For the first time, Flow Research has divided the study of this fast-growing market into three: a Core Study and two Modules. The Inline, Clamp-On, and Insertion markets are each analyzed separately.

Overview



**Publication Date:
March 2013**



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Worldwide Ultrasonic Flowmeter Studies

Flow Research has completed a new set of three market studies on the worldwide ultrasonic flowmeter market. A primary goal was to determine the size of the ultrasonic flowmeter market in 2011, and to forecast market size through 2016. The three studies are called:

- **Core Study:** *The World Market for Inline Ultrasonic Flowmeters*
- **Module A:** *The World Market for Clamp-On and Insertion Ultrasonic Flowmeters*
- **Module B:** *Worldwide Market View*

The three studies identify the following global elements:

- Market size and market shares for all types of ultrasonic flowmeters in 2011 by region
- Market growth and forecasts for all types of ultrasonic flowmeters through 2016
- Industries and applications where ultrasonic flowmeters are used, and areas of new market growth
- Product analyses for the main companies selling into the ultrasonic flowmeter market
- Strategies to manufacturers for selling into the ultrasonic flowmeter market
- Company profiles of the main suppliers of ultrasonic flowmeters

As stated above, one goal of these studies was to determine the size of the ultrasonic flowmeter market worldwide in 2011. This market continues to be one of the fastest growing flowmeter markets, which is driven in part by the expanding market for custody transfer of natural gas. Ultrasonic flowmeters excel in this segment of the industrial process applications spectrum.

These studies address the key issues in the ultrasonic flowmeter market, including:

- Growth in the transit time ultrasonic flowmeter market by number of paths
- Shipments of inline ultrasonic flowmeters by revenues and units
- Shipments of clamp-on and insertion ultrasonic flowmeters by revenues and units
- Comparison of portable vs. fixed clamp-on ultrasonic flowmeters
- The expanding use of ultrasonic flowmeters for custody transfer of natural gas
- The emerging market for ultrasonic flowmeters in steam flow measurement
- The market for Doppler and hybrid ultrasonic flowmeters
- Mergers and acquisitions in the ultrasonic flowmeter market
- New entrants into the ultrasonic flowmeter market

Transit Time and Doppler Flowmeters

One important issue is the contrast in growth between **transit time** and **Doppler** flowmeters. While Doppler flowmeters remain one of the best solutions for dirty liquids, transit time flowmeters have been showing faster growth in recent years. Much of the new product development is going into transit time meters. Transit time flowmeters are typically more accurate than Doppler meters, and multipath transit time meters are becoming widely used for custody transfer of natural gas. This study also looks at growth in the **hybrid** ultrasonic market.

This study analyzes the market for **multipath** ultrasonic meters for both gas and liquid, and segments this market by number of paths. The ultrasonic flowmeter market for custody transfer of natural gas is the fastest growing market within flow, with the possible exception of multiphase meters. Multipath meters for petroleum liquids are also showing significant growth.

Steam flow measurement is a new frontier for ultrasonic flowmeters. Currently, this market is dominated by differential pressure (DP) and vortex flowmeters, each of which can handle the unique flow measurement difficulties that the different steam types present. However, as the technology improves, this is becoming a growth area for ultrasonic flowmeters. Steam flow measurement is growing in importance as companies look to increase energy efficiency and cut energy costs. The high accuracy and reliability of ultrasonic meters make them an attractive option for some steam flow applications.

Background of Technology

There are two main types of ultrasonic flowmeters: transit time and Doppler. A transit time ultrasonic flowmeter has both a sender and a receiver. It sends two ultrasonic signals across a pipe at an angle: one with the flow, and one against the flow. The meter then measures the “transit time” of each signal. When the ultrasonic signal travels with the flow, it travels faster than when it travels against the flow. The difference between the two transit times is proportional to flowrate.

Doppler flowmeters also send an ultrasonic signal across a pipe. However, instead of tracking the time the signal takes to cross to the other side, a Doppler flowmeter relies on having the signal deflected by particles in the flowstream. These particles are traveling at the same speed as the flow. As the signal passes through the stream, its frequency shifts in proportion to the mean velocity of the fluid. A receiver detects the reflected signal and measures its frequency. The meter calculates flow by comparing the generated and detected frequencies. Doppler ultrasonic flowmeters are good solutions for measuring the flow of dirty liquids or slurries. They are not used to measure gas or steam flow.

Ultrasonic flowmeters were first introduced for industrial use in 1963 by Tokyo Keiki (which later became Tokimec, then became Tokyo Keiki once again) in Japan. Tokyo Keiki is located in Tokyo, Japan. In 1972, Controlotron (Hauppauge, New York) became the first U.S. manufacturer to market ultrasonic flowmeters in the United States. In the late 1970s and early 1980s, both Panametrics (now part of GE Sensing) and Ultraflux experimented with the use of ultrasonic flowmeters to measure gas flow.

Initially, ultrasonic flowmeters were not well understood, and were sometimes misapplied. Many technological improvements have been made in the past 10 years, and the limitations of ultrasonic meters are better understood. Advances in transit time technology have broadened the types of liquids that transit time flowmeters can be used on. Many transit time meters today can

handle liquids containing some impurities, and ultrasonic flowmeters have become a preferred measurement technology in the natural gas industry.

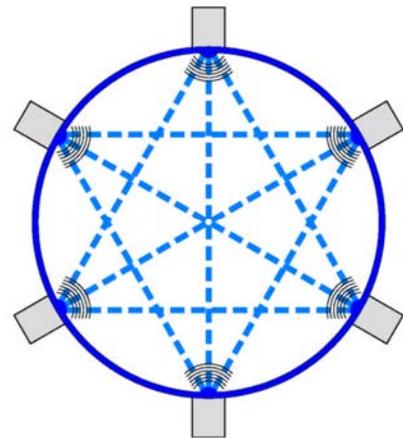
Rationale for Study

Since completing our first ultrasonic study in 2001, we have been following this market very closely. (We published the 2nd Edition of this study in 2003, and the 3rd Edition in 2008.) We have placed ultrasonic technology with others - such as Coriolis and electromagnetic - within the “new technology” group of flowmeters. User interest and market growth are both especially significant within the new-tech process control instrumentation arena. Many of these developments have been described in our quarterly report, *Market Barometer*. Each issue of *Market Barometer* includes an update on the ultrasonic flowmeter market.

This new study builds on the knowledge we have gained over the years since our last full treatment of the subject, but also represents a completely fresh look at the market. **By dividing the study into a Core Study and two Modules, we have analyzed the inline, clamp-on, and insertion markets separately.** This enables us to separate out unit price and unit quantity data for each technology, and to provide a completely separate analysis for each of these three fundamentally different ultrasonic flowmeter types.

In flowmeter terminology, a path is defined as the route of travel between two ultrasonic transducers. The term ‘path’ is critical in ultrasonic technology, because many ultrasonic flowmeters have been developed with multiple paths. Some ultrasonic meters have a single path, requiring one pair of transducers, and some have dual paths, requiring two transducer pairs. An important group of ultrasonic flowmeters have three or more paths, and are called multipath. Many of these multipath meters are used for custody transfer applications.

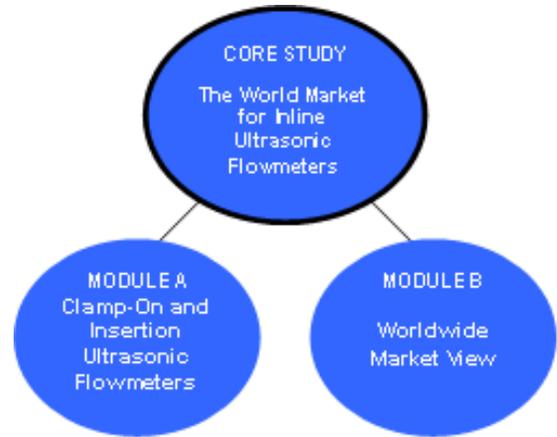
Another term that is now in common use is ‘chord’. Mathematically speaking, a chord is a straight line within a circle whose points lie on the circumference. However, the term ‘chord’ is also used by some ultrasonic manufacturers to refer to the route of travel between two transducers. In this way, a chord is like a path. However, a chord is considered to be the route of travel between a transducer and a wall or reflector when the signal is bounced off a wall or a reflector. So in this sense, an ultrasonic signal that bounces off a wall or reflector to a receiving transducer has one path and two chords. One chord is the path of the signal from Transducer A to the pipe wall or reflector, and the second chord is the path of the signal from the pipe wall or reflector to transducer B.



*Flowmeter with 18 non-parallel paths
(end-view image only shows half the total
number of paths)*

Core Study

The World Market for Inline Ultrasonic Flowmeters



Publication Date: October 2012

www.FlowUltrasonic.com

Inline (Core) Study Segmentation

All segmentation is divided by the eight geographic regions, with forecast data provided through 2016. The segmentation for the inline ultrasonic flowmeter study is as follows:

Geographic Segmentation

- North America (United States and Canada)
- Western Europe
- Eastern Europe/FSU
- Mideast/Africa
- Japan
- China
- Rest of Asia
- Latin America (Mexico, Central and South America)

What's in this for my company?

- See the emerging applications and where the growth is
- Understand world and regional markets
- Get to know your real competition
- Learn what other suppliers manufacture, where, and for whom
- The best information creates the best decisions

Average Selling Price of Inline Ultrasonic Flowmeters by Region

- North America (United States and Canada)
- Western Europe
- Eastern Europe/FSU
- Mideast/Africa
- Japan
- China
- Rest of Asia
- Latin America (Mexico, Central and South America)

Ultrasonic Flowmeters by Technology Type

This study focuses on the following kinds of inline ultrasonic flowmeters:

- Single Path/Dual Path transit time
- Multipath transit time

Multipath Transit Time Ultrasonic Flowmeters by Number of Paths

Shipments of multipath transit time ultrasonic flowmeters are segmented by four categories:

- 3-path transit time
- 4-path transit time
- 5-path transit time
- 6 or more paths transit time

Doppler Ultrasonic Flowmeters

Shipments of clamp-on and insertion Doppler ultrasonic flowmeters are segmented by region with forecasts to 2016.

Hybrid Ultrasonic Flowmeters

Shipments of clamp-on and insertion hybrid ultrasonic flowmeters are segmented by region with forecasts to 2016.

Inline Ultrasonic Flowmeters by Mounting Type

This study distinguishes between inline flowmeter mounting types as follows:

- Wafer
- Flanged
- Other (e.g., socket weld, compression)

Inline Ultrasonic Flowmeters by Fluid Type

- Petroleum Liquids
- Non-petroleum Liquids
- Gas
- Steam

Inline Ultrasonic Flowmeters by Line Size

- < 2 inch
- 2 - 4 inches
- > 4 - 8 inches
- > 8 - 12 inches
- > 12 - 24 inches
- > 24 inches

Inline Ultrasonic Flowmeters by Intelligence Level

- Smart
- Conventional

Smart Inline Ultrasonic Flowmeters by Communication Protocol

- HART
- Foundation Fieldbus™
- Profibus®
- Modbus
- Proprietary digital
- Ethernet
- Other

Inline Ultrasonic Flowmeters for Gas Applications

- Custody Transfer: Natural Gas (transportation/transmission/pipeline)
- Check Metering
- Process Measurement
- Flare/Stack Gas Flow Measurement
- Other

Inline Ultrasonic Flowmeters for Liquid Applications

- Custody Transfer: petroleum Liquids
- Custody Transfer: Non-Petroleum Liquids
- Check Metering
- Process Measurement
- District Energy
- Other

Inline Ultrasonic Flowmeters by Industry

- Oil & Gas Production, Transportation, and Distribution
- Refining
- Chemical
- Pharmaceutical
- Food & Beverage
- Pulp & Paper
- Metals & Mining
- Power
- Water & Wastewater
- Other



Inline Ultrasonic Flowmeters by Sales Channel

- Direct Sales
- Independent Representatives
- Distributors
- E-Business

Ultrasonic Flowmeters by Customer Type

- End-Users
- Original Equipment Manufacturers (OEMs)
- Systems Integrators
- Engineers/Consultants
- Resellers

Market Shares of Inline Ultrasonic Flowmeter Manufacturers

- Worldwide
- For each geographic region
- Single and Dual Path Ultrasonic Meters
- Multipath Ultrasonic Meters

Strategies for Success

- Strategies for selling into the competitive inline ultrasonic flowmeter market

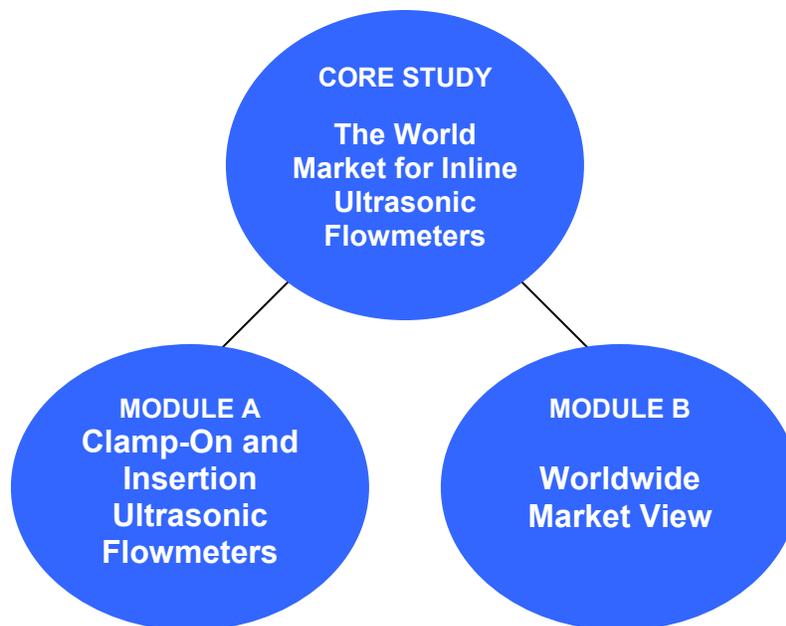
Company Profiles

- Business profiles of the main suppliers of ultrasonic flowmeters
- Histories, current organization, overall product line summaries
- Ultrasonic flowmeter product line descriptions
- Company strategies

Publication Date

Core Study: The World Market for Inline Ultrasonic Flowmeters was published in October 2012.

See the following pages for information on Module A of this study. Module A addresses the clamp-on and insertion portions of the worldwide ultrasonic flowmeter market.





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Christian Doppler

The Flow Research *Founding Sponsor Program*

To produce studies that most closely match our clients' needs, Flow Research instituted the Founding Sponsor Program. This program enables companies who wish to participate at a high level in a study's research to influence its scope and segmentation. In addition, Founding Sponsors receive regular updates from Flow Research on study progress, and receive a significant discount on the standard retail price of the study.

Procedure: Early in the planning phase of a study, Founding Sponsors receive a proposal that includes the proposed segmentation. Founding Sponsors can propose additional segmentation, and can also suggest changes to the proposed segmentation. While the decision to adopt particular segmentation ultimately lies with Flow Research, and is based on input from all contributors, we will do our best to accommodate the specific needs of each of our clients.

During the research phase of a study, Flow Research will issue regular reports that provide updates on the progress of the research. These reports will be sent to Founding Sponsors, who are then invited to provide any additional input or comments into the study.

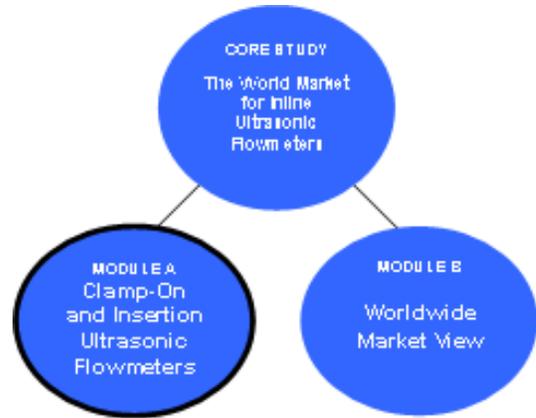
Being a Founding Sponsor requires making an early commitment to purchase the study. However, in return, Founding Sponsors receive a significant discount off the regular price of the study. Payment can be made either in one amount at the beginning of the study, or split into two, with the second payment due upon delivery of the study.

For additional details, or to find out how the Founding Sponsor program applies to any particular study, please contact Flow Research. We look forward to working with you!

If you have any questions about the Founding Sponsor program, please contact Norm Weeks at +1 781 245-3200, or norm@flowresearch.com.

Module A

The World Market for Clamp-On and Insertion Ultrasonic Flowmeters



Publication Date: April 2012

www.FlowUltrasonic.com

Module A: Segmentation of the Clamp-On and Insertion Study

The study, **Module A: *The World Market for Clamp-On and Insertion Ultrasonic Flowmeters***, contains its own set of segmentation designed to provide a comprehensive view of this portion of ultrasonic flowmeter technology and markets. There is segmentation that addresses the unique qualities of these two ultrasonic flowmeter designs. Study segmentation specific to clamp-on and insertion design types is outlined below.

All segmentation is divided by the eight geographic regions, with forecast data provided through 2016. The segmentation for the clamp-on and insertion ultrasonic flowmeter study is as follows:

Clamp-On Ultrasonic Flowmeters

Geographic Segmentation

- North America (United States and Canada)
- Western Europe
- Eastern Europe/FSU
- Mideast/Africa
- Japan
- China
- Rest of Asia
- Latin America (Mexico, Central and South America)

What's in this for my company?

- See the emerging applications and where the growth is
- Understand world and regional markets
- Get to know your real competition
- Learn what other suppliers manufacture, where, and for whom
- The best information creates the best decisions

Average Selling Price of Clamp-On Ultrasonic Flowmeters by Region

- North America (United States and Canada)
- Western Europe
- Eastern Europe/FSU
- Mideast/Africa
- Japan
- China
- Rest of Asia
- Latin America (Mexico, Central and South America)

Clamp-On Ultrasonic Flowmeters by Technology Type

Revenue and unit data are provided for the following three basic types of ultrasonic flowmeters:

- Single / Dual path transit time
- Doppler
- Hybrid

Clamp-On Ultrasonic Flowmeters by Mounting Type

This study distinguishes between mounting types for clamp-on ultrasonic flowmeters as follows:

- Portable clamp-on
- Fixed clamp-on

Clamp-On Ultrasonic Flowmeters by Fluid Type

- Petroleum Liquids
- Non-petroleum Liquids
- Gas
- Steam

Clamp-On Ultrasonic Flowmeters by Industry

- Oil & Gas Production, Transportation, and Distribution
- Refining
- Chemical
- Pharmaceutical
- Food & Beverage
- Pulp & Paper
- Metals & Mining
- Power
- Water & Wastewater
- Other

Clamp-On and Insertion Ultrasonic Flowmeters by Sales Channel

- Direct Sales
- Independent Representatives
- Distributors
- E-Business

Clamp-On and Insertion Ultrasonic Flowmeters by Customer Type

- End-Users
- Original Equipment Manufacturers (OEMs)
- Systems Integrators
- Engineers/Consultants
- Resellers

Insertion Ultrasonic Flowmeters

Geographic Segmentation

- North America (United States and Canada)
- Western Europe
- Eastern Europe/FSU
- Mideast/Africa
- Japan
- China
- Rest of Asia
- Latin America (Mexico, Central and South America)

Average Selling Price of Insertion Ultrasonic Flowmeters by Region

- North America (United States and Canada)
- Western Europe
- Eastern Europe/FSU
- Mideast/Africa
- Japan
- China
- Rest of Asia
- Latin America (Mexico, Central and South America)

Insertion Ultrasonic Flowmeters by Technology Type

Revenue and unit data are provided for the following four basic types of ultrasonic flowmeters:

- Single / Dual path transit time
- Multipath transit time
- Doppler
- Hybrid

Insertion Ultrasonic Flowmeters by Fluid Type

- Petroleum Liquids
- Non-petroleum Liquids
- Gas
- Steam

Insertion Ultrasonic Flowmeters by Industry

- Oil & Gas Production, Transportation, and Distribution
- Refining
- Chemical
- Food & Beverage
- Pharmaceutical
- Pulp & Paper
- Metals & Mining
- Power
- Water & Wastewater
- Other

Market Shares of Clamp-On and Insertion Ultrasonic Flowmeter Manufacturers

- Worldwide
- For each geographic region

Strategies for Success

- Strategies for selling into the clamp-On and insertion ultrasonic flowmeter markets

Company Profiles

- Business profiles of the main suppliers of ultrasonic flowmeters
- Histories, current organization, overall product line summaries
- Ultrasonic flowmeter product line descriptions
- Company strategies

Publication Date

Module A: The World Market for Clamp-On and Insertion Flowmeters, was published in April 2012.



Dr. Jesse Yoder, Flow Research president, stands by a natural gas pipeline used for calibration purposes at CEESI in Garner, Iowa.

Overview: The World Market for Ultrasonic Flowmeters, 4th Edition
Flow Research, Inc.

Worldwide Market View

What is Module B? The Core Study and Module A divide the market into three separate submarkets:

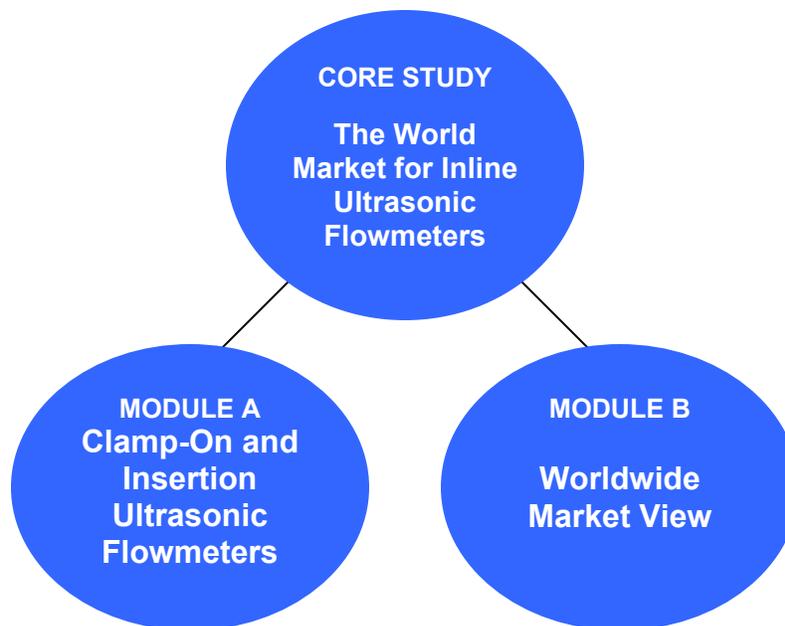
- Inline ultrasonic flowmeters
- Clamp-on ultrasonic flowmeters
- Insertion ultrasonic flowmeters

The Core Study and Module A are designed for companies that are active in these markets, and who need to understand the detailed segmentation that exists in these studies. They may choose to bring out products that are aimed at particular segments, such as multipath flowmeters, cryogenic flowmeters, or custody transfer of natural gas.

Module B puts all these three submarkets into a single market. So if you need to know the geographic breakout of the entire market, rather than the geographic breakout for only clamp-on meters, then Module B provides that answer. Likewise, if you need to know the segmentation by fluid type or by industry for the total market, you can find the answers in Module B. Module B is indispensable because it analyzes the entire market. The Core Study and Module A are also indispensable because they provide segmentation detail not available in Module B.

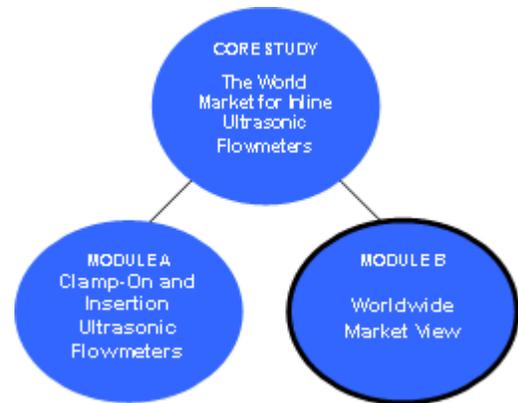
You See Both the Forest and the Trees

We are presenting these three studies to you to enable you to see both the forest and the trees when it comes to the ultrasonic flowmeter market. So far as we know, no one else has ever attempted such a comprehensive analysis of the worldwide ultrasonic flowmeter market.



Module B

Worldwide Market View



Publication Date: March 2013

www.FlowUltrasonic.com

Module B: Worldwide Data Segmentation

The study, **Module B: Worldwide Market View**, contains its own set of segmentation based upon the worldwide findings of the Core Study and Module A. This volume is designed to provide a comprehensive view of the entire ultrasonic flowmeter market, and combines the most important segmentation data of the inline (spoolpiece), insertion, and clamp-on components of this market.

Creating separate modules for the ultrasonic study has proved very enlightening. The inline market is quite different from the clamp-on and insertion markets. This applies to applications, industries, price points, and many other factors. By isolating the inline (spoolpiece) market from the clamp-on and insertion markets, we have been able to create a much more compelling and informative analysis. Multipath inline ultrasonic flowmeters are especially important in the fast-growing market for custody transfer of natural gas, which is highlighted in the Core Study.

Module B puts all the data together into a single picture of the entire ultrasonic market worldwide, including inline, clamp-on, and insertion flowmeters. If you are looking for the big picture of the market, this may be the only study you need. If you also want the detailed segmentation contained in the Core Study and Module A, then this is the perfect companion to those two studies.

In Module B, the fundamental segmentation of single and dual path transit time, multipath transit time, Doppler, and hybrid is segmented by the eight geographic regions, with forecast data provided through 2016. The remaining data is provided on a worldwide basis. The study segmentation data in Module B is outlined below.

Geographic Segmentation

- North America (United States and Canada)
- Western Europe
- Eastern Europe/FSU
- Mideast/Africa
- Japan
- China
- Rest of Asia
- Latin America (Mexico, Central and South America)



Average Selling Price of All Ultrasonic Flowmeters by Region

- North America (United States and Canada)
- Western Europe
- Eastern Europe/FSU
- Mideast/Africa
- Japan
- China
- Rest of Asia
- Latin America (Mexico, Central and South America)

All Ultrasonic Flowmeters by Technology Type by Region

- Transit Time - Single/Dual Path
- Transit Time - Multipath
- Doppler
- Hybrid



All Ultrasonic Flowmeters by Fluid Type

- Petroleum Liquids
- Non-petroleum Liquids
- Gas
- Steam

All Ultrasonic Flowmeters by Industry Worldwide

- Oil & Gas Production, Transportation, and Distribution
- Refining
- Chemical
- Pharmaceutical
- Food & Beverage
- Pulp & Paper
- Metals & Mining
- Power
- Water & Wastewater
- Other



All Ultrasonic Flowmeters by Sales Channels Worldwide

- Direct Sales
- Independent Representatives
- Distributors
- E-Business

All Ultrasonic Flowmeters by Customer Type Worldwide

- End-Users
- Original Equipment Manufacturers (OEMs)
- Systems Integrators
- Engineers/Consultants
- Resellers



Market Shares of Ultrasonic Flowmeter Manufacturers

- Worldwide
- Inline
- Clamp-on
- Insertion

Strategies for Success

- Strategies for selling into the competitive ultrasonic flowmeter market

Company Profiles

- Business profiles of the main suppliers of ultrasonic flowmeters
- Histories, current organization, overall product line summaries
- Ultrasonic flowmeter product line descriptions
- Company strategies

The following is a partial list of the ultrasonic suppliers profiled in these studies:

- | | |
|-------------------------------------|-------------------------|
| • Cameron Measurement Systems | • Micronics |
| • Elis Plzen | • OVAL Corporation |
| • Elster – Instromet | • Racine Federated Inc. |
| • Emerson Daniel | • SICK Maihak |
| • Endress+Hauser | • Siemens |
| • Flexim | • Spirax Sarco-EMCO |
| • FMC Energy Systems | • Thermo Fisher |
| • Fuji Electric | • Tokyo Keiki |
| • General Electric (GE Measurement) | • Tokyo Keiso |
| • IDEX (Accusonic, Faure Herman) | • Ultraflux |
| • KROHNE | |

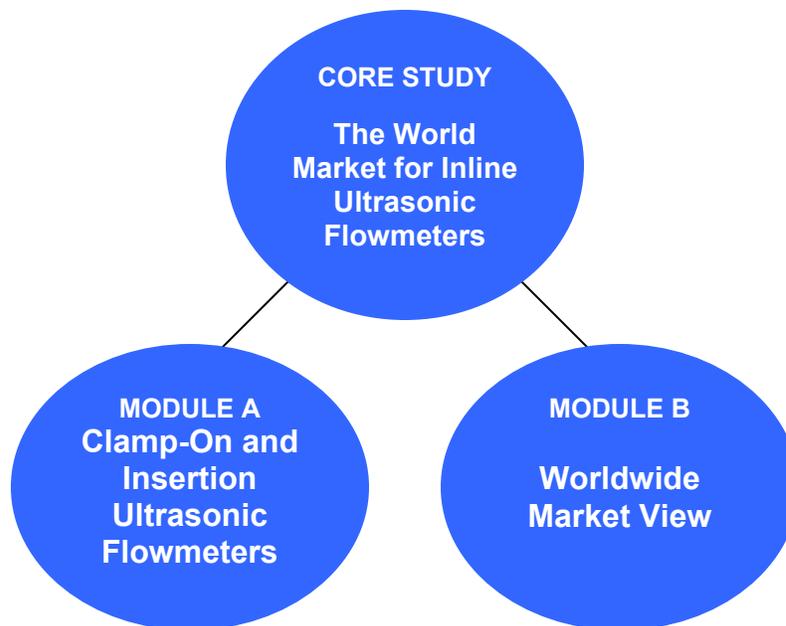
Publication Date

Module B: Worldwide Market View was published in March 2013.

The World Market for Ultrasonic Flowmeters, 4th Edition

Five reasons to order this study today!

1. It contains over 1,300 pages of data and research on the inline, clamp-on, and insertion ultrasonic flowmeter markets.
2. It is the only market research study available that clearly separates the data on the inline, clamp-on, and insertion ultrasonic flowmeter markets.
3. It is backed up by 20 years of research into the ultrasonic and other flowmeter markets.
4. It completely analyzes the ultrasonic flowmeter market, including market size, market forecasts, market shares, strategies for success, and supplier profiles.
5. It is brought to you by Flow Research, the world's leading market research company on flowmeters and instrumentation.



Background



Dr. Jesse Yoder is President of Flow Research Inc., a company he founded in 1998. Dr. Yoder has 25 years' experience as a writer and analyst in process control and instrumentation. Since 1990, he has written more than 140 market research studies, most of them in the area of flow and instrumentation. Dr. Yoder has also written more than 180 articles on flow and instrumentation for trade journals. Links to these can be found at www.flowarticles.com.

Some of the recent and currently scheduled Flow Research studies are listed on the next page.

Flow Research specializes in instrumentation, and conducts **market research studies** in a wide variety of instrumentation areas that can be purchased by anyone interested in the topics. We create these studies through interviews with suppliers, distributors, and end-users. Topics include all of the flowmeter technologies - both new and traditional - as well as temperature sensors, temperature transmitters, infrared thermometers and thermal imagers, pressure transmitters, and selected API-certified valves.

We also conduct **custom projects** for companies who are looking to expand their product line, merge with or acquire another company, or understand their customer needs better. We are very experienced at doing user surveys that reveal hidden problems, emerging applications, and new product requirements. We gather the data and analyze it in light of our wealth of data on instrumentation. We then formulate strategies that help you achieve your goals.

We work with companies individually to **formulate strategies** that will help them succeed in an increasingly complex world. Dr. Yoder has been working in process control since 1986 and creating market research studies since 1990. He and his team have studied hundreds of companies during this time and have advised most of the top flowmeter suppliers on market and product strategies.

Staff Profiles

Belinda Burum, Vice President and Editor, worked in journalism and advertising before entering high tech 18 years ago as a writer, marketing communications manager, and customer references consultant. She joined Flow Research in 2002, and since then has worked on many projects. In addition to her work on market studies, Belinda is editor of the *Energy Monitor* and the *Market Barometer*.

Norman Weeks, Market Analyst, joined Flow Research in November 2004 after a 24-year stint with Verizon. At Verizon, Norm specialized in creating innovative and deliverable customer-specific solutions, product management, and product marketing. He is a fulltime market analyst for Flow Research, has completed many studies, and also serves as associate editor of the *Market Barometer* and the *Energy Monitor*.

Leslie Buchanan, Research Associate, joined Flow Research in March 2010. She serves as a customer liaison, manages the contacts database, does research and writing for some Flow Research studies and publications, and develops and implements standards for publication formats.

Vicki Tuck joined Flow Research in June, 2012. As an administrative assistant, she has experience in both the fast-paced law firms of Boston, and in various nonprofit organizations.

Christina Glaser, Research Analyst and Programmer, has worked as a software consultant, programmer, and web developer since 1992. She joined Flow Research in October 2010 and takes an active role in keeping our company websites current.

Flow Research studies contribute to an ongoing view of the flowmeter market

Listed below is a summary of Flow Research studies in process and studies completed during the last few years in the area of process control instrumentation. Conducting these studies has contributed to our understanding of the flowmeter technologies included in *Volume X: The World Market for Flowmeters, 4th Edition*. These studies are further described at www.flowstudies.com.

Recent and currently scheduled Flow Research studies:

Volume I: The World Market for Coriolis Flowmeters, 4th Edition (Q1 2013)
Volume II: The World Market for Magnetic Flowmeters, 5th Edition (Q3 2013)
Volume III: The World Market for Ultrasonic Flowmeters, 4th Edition (March 2013)
Volume IV: The World Market for Vortex Flowmeters, 3rd Edition (July 2010)
Volume V: The World Market for DP Flowmeters and Primary Elements (January 2007)
Volume VI: Worldwide Survey of Flowmeter Users, 2nd Edition (January 2006)
Volume VII: The World Market for Positive Displacement Flowmeters (March 2012)
Volume VIII: The World Market for Turbine Flowmeters (January 2012)
Volume IX: The World Market for Pressure Transmitters, 3rd Edition (August 2011)
Volume X: The World Market for Flowmeters, 4th Edition (January 2013)
Volume XI: The World Market for Natural Gas and Gas Flow Measurement (Q3/Q4 2011)
Volume XII: The World Market for Steam Flow Measurement (March 2008)
Volume XIII: The World Market for Mass Flow Controllers, 2nd Edition (May 2012)
Volume IV: The World Market for Thermal Flowmeters (October 2009)
Volume XV: The World Market for Liquid Analytical Instruments (February 2011)
Volume XVI: The World Market for Oil Flow Measurement (Q4 2012/Q1 2013)

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The World Market for Ultrasonic Flowmeters, 4th Edition



Oman Gas Company; Photo by Flow Research



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Why Flow Research?

- We specialize in flowmeter markets and technologies
- We have researched all flowmeter types
- We study suppliers, distributors, and end-users
- Our worldwide network of contacts provides a unique perspective
- Our mission is to supply the data to help your business succeed

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