

# Flowmeter Systems and Performance Services

## About Accusonic

Accusonic, a division of ADS LLC, designs and manufactures multi-path transit-time flow measurement systems which are renowned for their precise accuracy and reliability in difficult operating environments. Accusonic flowmeters can be found in hydroelectric and thermal power plants, water and wastewater treatment facilities, sewage collection systems, and other types of water conveyance pipelines and channels. Since 1967, Accusonic has installed thousands of systems worldwide, and offers a full range of services including installation and startup, system verification, turbine performance testing services, and field training.



### DESCRIPTION

Accusonic offers a wide range of flowmeter systems and performance services for use on a variety of applications within the power generation, water and wastewater industries. The flowmeter systems use the multiple chordal path transit-time method to measure flow velocities at discrete elevations in the measurement section. Real-time flowrates are determined by integrating the flow velocity profile, thus achieving accuracy of up to  $\pm 0.5\%$  of flowrate. Accusonic flow efficiency systems and services, which utilize high-accuracy flowmeters, provide real-time and historical operational data for system and plant improvements.

Accusonic delivered its first multiple-path system in 1967. Since then over 3,500 systems have been installed in pipelines up to 15 meters in diameter and in open channels up to 180 meters wide. A wide range of transducers are available to accommodate installations in virtually any pipe or channel. Typical industries include:

- **Hydro Power Plants**
- **Thermal Power Plants**
- **Water Transport and Treatment**
- **Wastewater Treatment, Collection Systems, and CSOs**
- **Irrigation and Waterways**

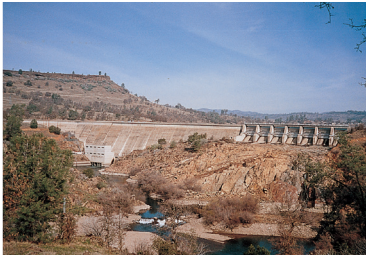


# ACCUSONIC®

# CAPABILITIES SUMMARY

## *Hydropower*

Accusonic multiple-path flowmeter systems have been installed in hundreds of hydroelectric penstocks and low-head intakes worldwide. Installations include those in buried and exposed penstocks, pumped-storage plants, and new and existing plants. Systems are used to



determine unit performance curves, establish dispatch guidelines, document plant discharge, and evaluate upgrade projects on a before and after basis. Accusonic

flowmeter systems are in use on an on-going basis in a majority of the large hydroelectric projects operated by the U.S. Bureau of Reclamation (USBR) and U.S. Army Corps of Engineers (USACE) in the United States.

## *Fossil and Nuclear Power*

Accusonic flowmeters are installed at numerous power plants on a variety of applications including condenser performance monitoring

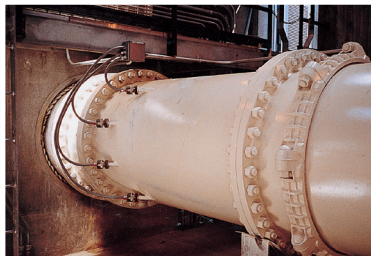


and thermal loading of cooling towers and receiving waters. The systems are used by utilities to improve plant operating efficiency, assist in the reduction of heat rate,

scheduling maintenance and document compliance with aspects of Section 316 (b) of the Clean Water Act.

## *Water Transport and Treatment*

Major water distribution projects and municipal systems, including the California Aqueduct, Central Arizona Project, New York City DEP,



City of Chicago, Los Angeles Department of Water and Power and Metropolitan Water District of So. California, have selected Accusonic as their supplier for large pipe and

channel flowmeter systems. The systems display, record, and output data for both local and remote (via telemetry) data collection.

## *Wastewater Treatment, Collection Systems, and CSOs*

NPDES and related regulations require accurate measurement of major wastewater and Combined Sewer Overflow (CSO) discharges. The multiple-path method is particularly well suited for compound sites that flow from partially full to surcharged and provides high-accuracy data over the full range of flows. Accusonic flowmeters also provide bi-directional flow measurement capability, which makes them ideal for monitoring tidally influenced



sites or conduits subject to reverse-flow conditions. Accusonic flowmeters have been installed in treatment plants, discharge tunnels, CSOs, and sewer pipes up to 7 meters in diameter. Intrinsically safe transducers are available for installations in hazardous environments.

## *Irrigation and Waterways*

Irrigation districts and large water projects use Accusonic flowmeters for accurate accounting of canal flows. With open-channel flow measurement accuracy up to  $\pm 1.5\%$ , Accusonic meters are excellent in system control and revenue billing applications. Users such as the U.S. Geological Survey and U.S. Bureau of Reclamation have installed

Accusonic systems in rivers up to 500 meters wide as part of their nationwide river monitoring system. Accusonic low frequency, high-power transducers are designed for operation in silt-laden and wide rivers. Over 400 river systems have been installed throughout the world.





## ***MONITORING SYSTEMS AND PERFORMANCE SERVICES***

In addition to precision flow measurement, Accusonic offers associated technical products and services to support hydropower, thermal power, water resource, and wastewater project requirements. These include fully integrated data collection, monitoring and analysis systems for pumps, turbines, condensers, and hydraulic conveyance works. Systems are designed for application where maximizing efficiency and ensuring continued high performance are primary concerns.

The benefits of many years of on-site, worldwide experience are passed on to our customers through comprehensive support and technical services. Customer service is our first priority. Accusonic offers world-class expertise and know-how to solve difficult flow measurement and process problems in demanding project environments.

### ***Flow Efficiency Monitoring Systems***

The Accusonic Model 7730 Flow-Efficiency Monitoring System offers continuous online monitoring of multiple hydro unit operations and logging water-to-wire efficiencies actually attained on a day-to-day basis. Data collected over time with this system can provide key operating performance information that enables overall plant and unit operating efficiencies to be improved and documented in an effective manner.

### ***Penstock Leak Detection System***

Penstock leaks can be detected quickly and easily by establishing a communications link between flowmeters placed at opposite ends of



the pipeline. The system continuously compares flows at both ends. If the difference exceeds a preset threshold, an alarm contact is actuated, providing a valve closure

signal. Penstock and entire hydropower plants have been protected in this manner against catastrophic ruptures as well as smaller leaks.

## ***Turbine Efficiency Monitoring Systems (TEMS)***

The Accusonic TEMS is used as a temporary test for measurement of hydro-turbine (or pump) efficiency. The system collects data from the flowmeter, power meter, and pressure sensors and computes unit efficiency in real-time. The system is used to improve plant operation and to provide contractually accepted pre- and post-upgrade performance data, and is designed to meet ASME PTC18 and IEC 60041 test codes.



### ***Field Service and Acceptance Testing***

Accusonic field engineers are available on a world-wide basis to install equipment or perform field tests. A network of offices and representatives in 28 countries provide prompt support services for our installations. Our turbine performance test team is available to conduct acceptance tests in accordance with ASME and IEC hydro test code standards on Kaplan, Francis, and Pelton turbines.



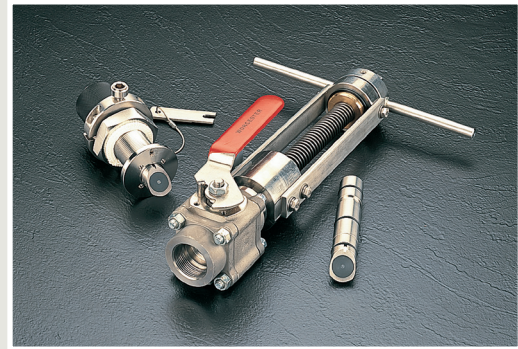


# CAPABILITIES SUMMARY

## PRODUCT SUMMARY



**Model 8510 Flowmeter**  
In NEMA 4X (IP66) Enclosure



**Model 7601 / 7641 Fully Removable**  
Transducer with Feedthrough Assembly  
and Jacking Mechanism



**Models 7657 / 7658**  
Internal Mount Transducers



Open Channel Installation in Trapezoidal Canal



Internal Mount Installation on Penstock Pipe



Feedthrough Installation on Penstock Pipe