

# ISS

## Elster-Instromet Supervisory Suite

### Applications

Measurement and control system for gas and liquid metering installations

### Brief information

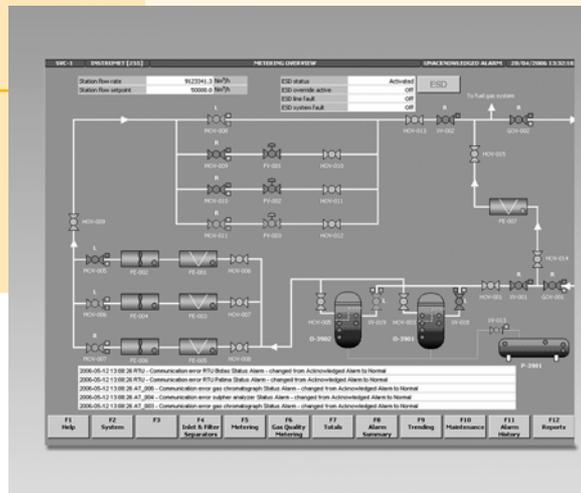
The Elster-Instromet Supervisory Suite or ISS Elster-Instromet provides total solutions for supervisory systems for all your metering applications. Typical applications are metering stations ranging from single stream stations to stations with up to 100 streams, control systems for high pressure calibration facilities and remote metering applications where stations are interrogated via a cellular network and data is concentrated in a central pipeline monitoring system.

ISS is more than a SCADA or DCS package. ISS has been developed specifically for gas/liquid metering applications where accurate calculations, data processing, reporting and advanced communication capabilities are of the utmost importance.

ISS is based on Microsoft Excel and therefore provides optimal numerical accuracy (up to 64-bit floating numbers) and calculation efficiency. Calculations for use specifically in metering such as ISO6976, SGERG, AGA8, NX19, AGA10 and various other thermodynamical properties are part of the ISS package.

A supervisory system can consist of a single supervisory computer or can be dual redundant. In the latter case, two supervisory computers operate in a hot standby configuration. For situations where multiple operator terminals are required, a true redundant client/server system is available supporting a virtually unlimited number of operator terminals and a web-based operator interface.

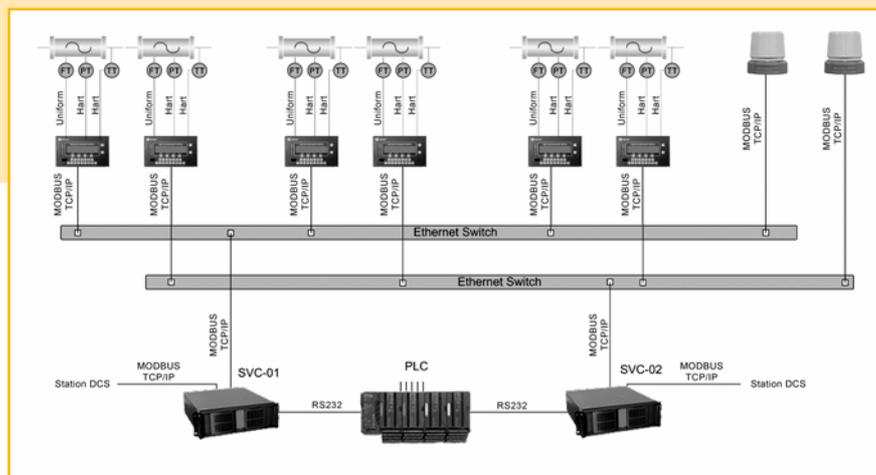
With performance monitoring, your metering system is continuously validated. The performance monitoring software will signal if metering equipment has drifted and requires maintenance or recalibration. The performance monitoring features within ISS are developed in close cooperation with all product development specialists for products such as the Q.Sonic ultrasonic meter, EnCal 3000 gas chromatograph and Model 2000 flow computer.



### Main features

- Based on Microsoft Excel
- Web interface for viewing only or full control
- Integrated performance monitoring for Elster-Instromet ultrasonic meters
- Expert system available providing solutions instead of alarms
- E-mail or SMS generation on alarms or events
- Validation/calibration system with database and control charts
- Extensive protocol support: Modbus, Modbus TCP/IP, OPC, Hart, etc.

# ISS: Elster-Instromet Supervisory Suite



Example system configuration for redundant ISS system

## Process visualisation

Advanced graphics provide an easy overview of your metering station. Process data such as flow rates, pressures and temperatures are shown in real-time and will be refreshed typically every second. Overview screens give you all the necessary information to check your metering system at a glance, but without overloading operators with too much information. Detailed screens will give more information for diagnostic and fault finding purposes. All display pages are arranged in a logical hierarchy, which ensures that operation of the supervisory software is simple and easy to learn. Operation is easy using mouse, function keys or touch screen (when available). Security levels can restrict access to some parts of the system. Operators may only have viewing access to screens with important settings whereas maintenance technicians are allowed to actually change these settings.

## View-only web interface

Web interfacing allows the process graphics to be visible on your entire company network. The web interface is available in two variants: view-only and full operation. The view-only website is ideal for maintenance engineers who can quickly check the metering system from their desk. They can view exactly the same graphics as shown on the supervisory computer but operation of the system is not possible. They can download production reports in Microsoft Excel format and also log files.

## Full operation web interface

The full operation website is available in the client/server ISS system. The web interface is the primary interface for the metering system and allows full control. A virtually unlimited number of operator terminals can be connected. Users can open the maximum number of windows available, ideal for operator rooms where multiple screens are available. For example: one screen can always show the metering overview, another screen can show the alarm summary and a third screen can be used to view other elements of the supervisory system. Security can be based on login or on location. For example: login is not required on systems in the control room. Computers outside the control room require login and have only limited access.

## Process control

Using industry standard PLC equipment in combination with our ISS package enables advanced process control solutions. These control systems range from simple valve control to systems with fully automatic run switching based on flow or metering run status, or a combination of both. Control systems for auxiliary systems such as boilers, pressure reduction, stations etc. can also be included in the control component of the supervisory system.

## Performance monitoring

The Elster-Instromet ISS package really excels in this area. Combining the knowledge of product specialists

from the Elster-Instromet group and advanced computation possibilities of the ISS package gives you true advantages. The ISS system will analyse process conditions and continuously monitor the performance of your metering system. Using a combination of Elster-Instromet Q.Sonic meters, an ENCAL 3000 gas chromatograph and the usual pressure and temperature transmitters, the performance of all these components is continuously checked using Velocity of Sound comparisons. These VOS comparisons are performed continuously during normal operation and will indicate maladjustment of any of these components. In addition to this check, many more performance monitoring features may be available depending on your metering system.

## Expert System

The expert system bridges the gap between alarm system and solution-providing systems. Reducing the number of alarms is considered a very important safety aspect. When too many alarms are generated, important alarms are overlooked. The Elster-Instromet ISS package can be extended with an expert system, which will not generate alarms but provide a solution to problems. Maintenance technicians can integrate and maintain their specialist knowledge in the expert system so that it is available for all users. Having spent many hours diagnosing a problem, a model troubleshooting procedure, a so-called "advice", can be created in the expert system using a simple rule builder. This advice can include procedures and maintenance information. If this specific problem occurs again, the corresponding rectification procedure is instantly available and the problem can be resolved quickly.



## Calibration, verification and validation

Using the Elster-Instromet ISS package you can maintain a calibration and validation track record of your metering system. Using the normal user interface, maintenance engineers are guided through the procedure to perform a transmitter validation by a graphical sequence shown on the supervisory computer display. If the validation results are outside the limits, a calibration is recommended by the system. The system will then request for a second validation to end up with the typical as-found and as-left calibration results. All validation and calibration results are stored in a database and can be shown in control charts.

Validation and calibration modules are available for pressure, temperature, differential pressure, specific gravity, flow computer calculation checks, gas chromatographs and many more.

## Real-time communication

The real-time communication driver of the Elster-Instromet ISS package will handle communication in various industry standard protocols. Serial MODBUS in all possible variants is supported. MODBUS over TCP/IP will handle communication with network enabled equipment such as our Model 2000 flow computer or Encal 3000 gas chromatograph.

Direct digital communication with SMART transmitters using the HART protocol is also supported. Process variables can be obtained from transmitters in full digital accuracy. This will allow virtual flow computer applications. In this case there is no separate flow computer: all flow rate calculations and flow totalisation is performed in the ISS supervisory system.

Virtually any text-based serial communication protocol is supported by our ISS software so interfacing to a wide range of equipment is possible, e.g. GPS time sources, laboratory equipment, such as DVM's and many more.



**Built-in performance monitoring for ultrasonic meters**

## Connectivity

Since ISS runs on the Microsoft Windows platform and supports a wide range of communication options, it is ideally geared towards information exchange with MES applications within your company.

Many companies have production or management information systems that rely on production information from the metering system. Using our wide range of communication protocols and our extensive experience, virtually any information exchange problem can be solved. Information can be exchanged using OPC, Modbus TCP/IP, XML and SQL protocols.

## Billing and reporting

Billing and reporting forms the heart of the fiscal metering installation. ISS will process data from flow computers with full precision ensuring data processing without rounding errors. Since Microsoft Excel is the basis for the ISS software package, all of Excel's flexible reporting functions are available in ISS too. The daily report for example includes the hourly production values and the daily production values in tabular format. Reports can be automatically printed and are also stored on disk. Reports on disk may be reprinted or can be copied onto a CD-ROM for processing elsewhere. Although numbers on the report are shown as rounded numbers, the Excel report file contains the actual full precision numbers – another advantage of the ISS system. Standard systems include daily and monthly production reports but any other type of report can be made available.

## Trend chart recorder

Trending is a very powerful tool for

analysis of process or metering conditions. This function is available in all ISS supervisory systems. It is comparable to a chart recorder that can be used to analyse process conditions in real time or for the past year. Up to five process variables or pens to be displayed on a trend chart display can be selected. The ISS supervisory system will register all process variables continuously and not only the five pens selected in the trending display. Using a separately available trend conversion tool you can convert the trending database into a CSV file for offline analysis.

## Alarms and events

Alarms and events are a powerful feature to signal certain process conditions or faults. Using our performance monitoring features, latent metering accuracy problems can also be reported as alarms and even forwarded as e-mails or SMS messages. The Alarm and Event function in ISS is fully configurable and very flexible. Alarms are assigned to groups and have priorities. They can be automatically suppressed in certain situations such as low flow to avoid spurious alarms. Using alarm suppression, the operator may disable a single alarm or a group of alarms when certain parts of the installation are out of service for maintenance purposes.

Alarms can be displayed in a summary display or in a historical display. They are stored in log files that can be downloaded for more detailed analysis.



**Supervisory system cabinet**

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## Product range

SuperGuard	<ul style="list-style-type: none"> <li>- Pre-configured system featuring all standard functions of ISS. The application displays are tailored to the specific application. Additional displays are available on request.</li> <li>- Support for reporting, trending and performance monitoring (for ultrasonic meters only)</li> <li>- Supports up to 4 streams (turbine, ultrasonic or orifice)</li> <li>- Supports run switching on the basis of flow or stream status, or a combination of both. More advanced run switching or other control functions are available on request.</li> <li>- Support for view-only website</li> <li>- Support for 1 process gas chromatograph</li> <li>- Runs on computers with 15" TFT touch panel display, single HDD and DVD-RW writer</li> </ul>
ISS single	<ul style="list-style-type: none"> <li>- Completely customized system designed to meet specific customer requirements. All ISS features can be made available in the application.</li> <li>- Support for unlimited number of streams in all possible combinations</li> <li>- Support for virtual flow computer</li> <li>- Support for run switching, flow balancing and much more. The control component is designed specifically to meet the specific application.</li> <li>- Support for view-only website</li> <li>- Support for virtually unlimited number of gas chromatographs or other gas analyser equipment.</li> <li>- Runs on 19" rack mounted industrial server computers with redundant hot-swappable hard disks in RAID 0 configuration (mirroring).</li> <li>- Availability 99.9%</li> </ul>
ISS redundant	<ul style="list-style-type: none"> <li>- Two ISS Supervisory computers operate in a hot standby configuration to provide the highest availability.</li> <li>- Availability 99.99%</li> <li>- Other specifications are identical to ISS single.</li> </ul>
ISS client-server	<ul style="list-style-type: none"> <li>- Two ISS supervisory computers operate in a hot standby configuration as a server system to provide the highest availability.</li> <li>- Availability 99.99%</li> <li>- Web-based operator interface supporting full control of the metering control system</li> <li>- Support for virtually unlimited number of operator terminals</li> <li>- Other specifications are identical to ISS redundant</li> </ul>



SuperGuard installed in a wall-mounted cabinet with flow computers



Control room with redundant ISS operator station

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## Your contacts

Elster-Instromet GmbH  
Steinern Str. 19 - 21  
55252 Mainz-Kastel, Germany  
Tel. +49 6134 605 0  
Fax +49 6134 605 223  
www.elster-instromet.com  
info@elster-instromet.com

Elster-Instromet N.V.  
Rijkmakerlaan 9  
2910 Essen, Belgium  
Tel. +32 3 670 0700  
Fax +32 3 667 6940

American Meter Company  
132 Welsh Road, Suite 140  
Horsham, PA 19044, USA  
Tel. +12 15 830 1800  
Fax +12 15 830 1890  
www.americanmeter.com

For your local contact refer to  
www.elster-instromet.com