The Elster-Instromet Supervisory Suite (ISS):

More than SCADA

The Elster-Instromet Supervisory Suite (ISS) provides total system solutions for all your gas/liquid metering and control applications. Typical supervisory 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 can be supplemented with special "System Expert" or "Performance Monitoring" features to signal metering equipment drifts and/or maintenance or recalibration needs. All these features have been developed in harmony with other high-end Elster-Instromet products like Q.Sonic ultrasonic flow meters, EnCal 3000 gas chromatographs and Model 2000 flow computers. Calculations for use specifically in metering such as ISO6976, SGERG, AGA8, NX19, AGA10 and various other thermodynamical properties are embedded. ISS 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.

Process visualisation and control

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 the user all the necessary information to check the 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. Using industry standard PLC equipment in combination with the 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 supervisory suite.

Web interfaces

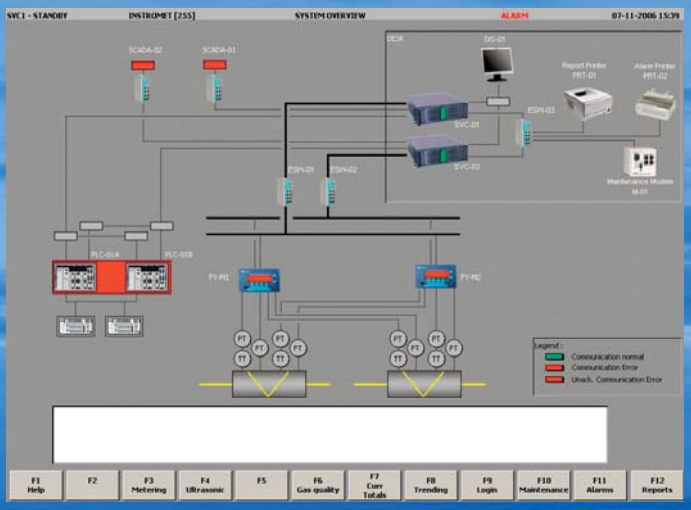
Web interfacing allows the process graphics to be visible on your entire company network. The web interface is available in two variants: view-only and full operation. The view-only website is ideal for maintenance engineers who can quickly check the metering system from their desk. They can view exactly 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. 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.

Expert system and performance monitoring

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. The combination of "Expert System" functionalities and "Performance Monitoring" offers the user great benefits. This is one of the major strengths of the Elster-Instromet ISS package where it excels. ISS will analyse process conditions and continuously monitor the performance of your metering system. Using a combination of Elster-Instromet Q.Sonic ultrasonic meters, an EnCal 3000 gas chromatograph and the usual pressure and temperature transmitters in conjunction with a Model 2000 flow computer, 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 misalignments in any of these components. In addition to this check, many more performance monitoring features may be available depending on your metering system.

Calibration, verification and validation

With 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



Screenshot of ISS communication diagram

Screenshot of ISS US-meter detailed stream

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.

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. Standard systems include daily and monthly production reports but any other type of report can be made available.

Trend chart recorder

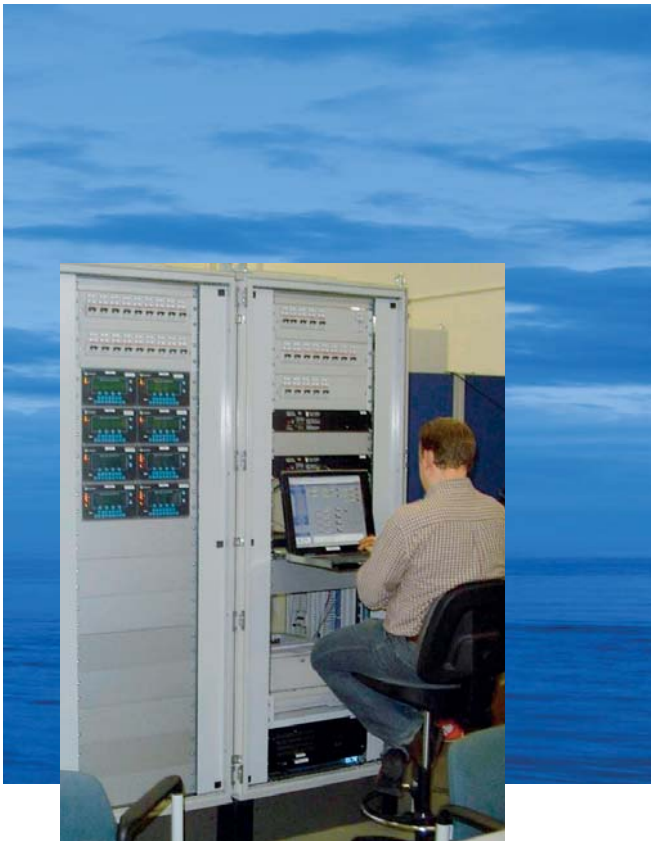
Trending is a very powerful tool for analysis of process or metering conditions. This function is available in all ISS supervisory systems. It is comparable to a chart recorder that can be used to analyse process conditions in real time or for the past year. Up to five process variables or pens to be 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.

Connectivity and real-time communication

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. 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.



SuperGuard installed in a cabinet with flow computers

Jurgen de Wijs j.d.wijs@elster-instromet.com
Henk Meerdink h.meerdink@elster-instromet.nl