

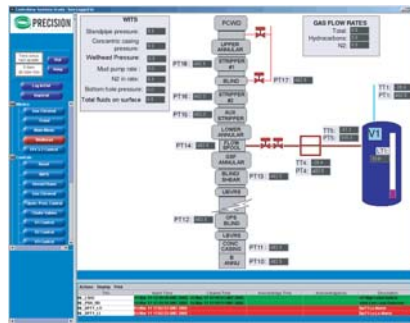
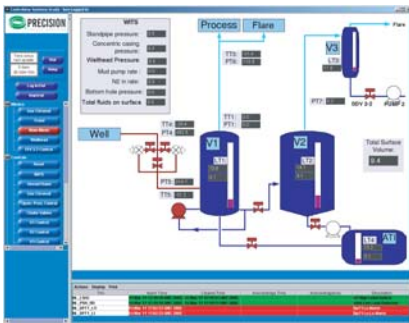
Totally Integrated Support for Drilling Operations UBD (Under Balance Drilling)

Controlstar Systems Ltd combined process control and WITS (Well head Information Transfer System) provides a total support package for Drilling operations, it was initially developed to support Under Balanced Drilling (UBD) operations. Although fully integrated the WITS and Process Servers are in fact two cooperating independent programs. This program separation is a robust solution with the additional advantage that the WITS and Process Systems can be offered separately. The first complete package was used on a Shell exploration well in the Dutch sector, based on the Santa Fe 'Monarch' Jack up. The 10.000 PSI separation process was monitored and controlled by a single Controlstar®; the unit, which also provided flow measurement for the main gas components using the AGA8 function with data from an online Gas Chromatograph. The Controlstar® also calculated in real time the gas velocities for erosion prediction in the process; these calculations also used the AGA8 function to accurately establish the velocities at a number of points in the process. Using the predicted velocities a simple SCADA based 'expert' program continuously advised the operators of the preferred control settings necessary to avoid the onset of erosion. Controlstar Systems integrated this sophisticated process control system with a powerful and user configurable WITS Server and MMI's. The WITS Server supports the distributed MMI's for the platform together with an onshore MMI in the client's operational centre.



The 'Monarch' on location

The WITS and Process System are two cooperating but independent programs, facilitating modular solutions that precisely match the requirements;



The System I/O includes Intrinsic Safe (Ex ib) and Flameproof (Ex d) I/O and PA segments

The system can handle a range of I/O based on Profibus DP-V1, both Turck Banners Intrinsically Safe 'Excom' remote I/O system, and the Bartec's range of explosion proof I/O modules have already been integrated. These two I/O systems can coexist with the Controlstar's® own CAN I/O. Digital measurements and control variables from Hart instrumentation are also supported through the Turck Banner 'Excom' I/O system. The combined I/O is configured using Controlstar Systems unique 'Fusion' tool, this allows a fully integrated control, SCADA and telemetry system to be built using a single powerful licence free tool. This offers unrivalled flexibility for the system design engineer. The ease of configuration for the whole package (including the WITS) allows an on site engineer to immediately respond to changing operational needs.

The Controlstar® supports Profibus DP-V1, giving connectivity to Intrinsically Safe, Flameproof, and PA equipment.

Hart instrument integration uses the 'pass through' capability of the Turck Banner Excom range of I/O; providing connectivity to the massive existing range of Hart instruments and actuators.

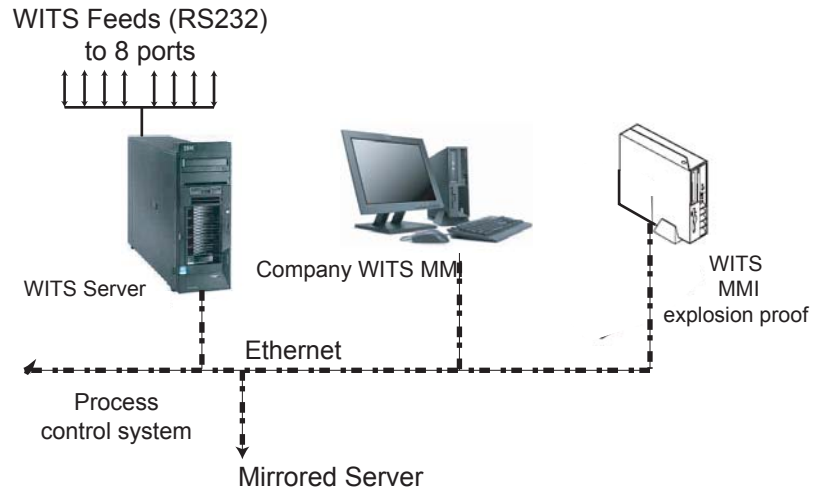


Turck Banners
Excom I.S. I/O

A Well head Information Transfer System (WITS)

Controlstar System Ltd WITS Server is a flexible 8-port serial device (all ports can both receive and transmit WITS data streams), each port is user configurable. The WITS Server allows standard serial and WITS over TCP/IP Connectivity. It supports an optional remote mirrored server. The WITS hardware includes Raid. Controlstar Systems Ltd has enhanced it's own SCADA to provide online configuration facilities for the individual drilling engineers; process displays and specialised display elements such as trends facilities can be combined according to the individual users preference. Each users MMI configuration settings can be protected by password. The administrative user can readily configure the routing of the individual WITS data elements between the different ports; if necessary the data elements can be renamed. The functionality of the Controlstar® unit itself has been extended to generate and receive WITS based packages either over a standard serial link or as TCP/IP packages via Ethernet. The Controlstar® itself can be used as an easily configurable WITS Gateway for data. The configuration of the WITS Gateway function is supported through Controlstar System Ltd's own Licence free 'Fusion' tool.

WITS BLOCK SCHEMATIC



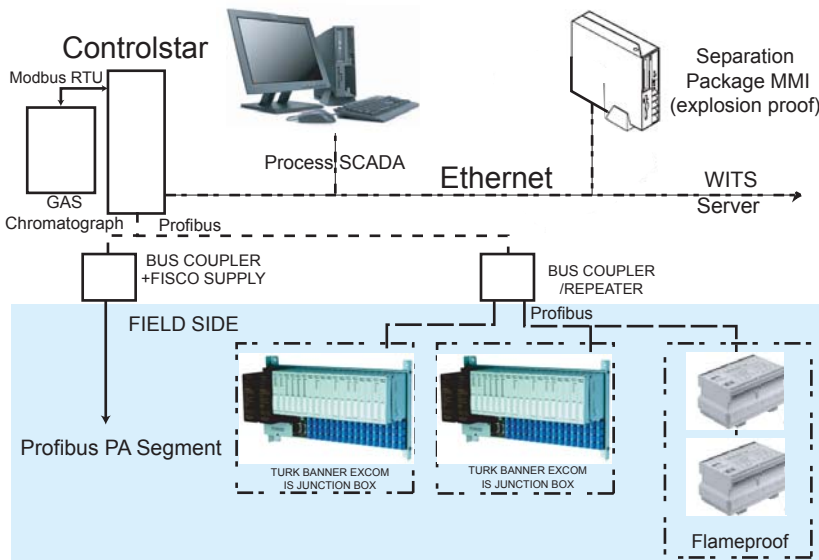
The Process and WITS servers have a mirrored server capability. Providing information security and communication efficiency.

The WITS and the Process Servers support multiple MMI's. Each solution is a scalable system, which can evolve with the application .

Data naming and routing is user configurable, supporting 'on the fly' responses to changing operational needs.

The mimic and trend screens are configurable, and password protected; each user can tune his view of the operations.

FUNCTION BLOCK TECHNOLOGY; THE AGA8 and AGA3 BLOCKS



The Controlstar® uses a unique function block technology which means powerful control algorithms can be developed by none programmers; simply using a straightforward drafting tool; when the system is 'live' the control algorithm drawings are available via the SCADA which displays the real time state of the logic, the measured and the control variables. These real time control algorithms together with the standard SCADA trends, events and alarms provides diagnostic support which is unambiguous and easy to understand. The Controlstar® AGA8 Function block uses the 'Detailed Characterisation Method'; The AGA8 block has been validated against the AGA standard. The operator interface allows either manual entry of the gas fractions, or each block can collect 'live' data directly from a Gas Chromatograph, at present a Modbus RTU interface is available, and the system supports a range of Daniel Chromatographs.

The AGA3 Function block supports the Rosemount Annubar flow element; the high turn down ratio of this device ensures that accurate measurement of flow is possible in less than ideal conditions. The 10.000 PSI separation process is controlled by a single Controlstar®; with the unit providing flow measurement using AGA8 and an online Gas Chromatograph.

The Controlstar® provides a WITS interface, AGA8, AGA3, Gas Chromatograph connectivity, and erosion prediction.

The 'Fusion' configuration program supports the complete system, this is a powerful and free configuration tool that minimises training, and maximises engineering productivity.

A Total flow measurement capability, which is configurable and can be integrated with the control algorithms.