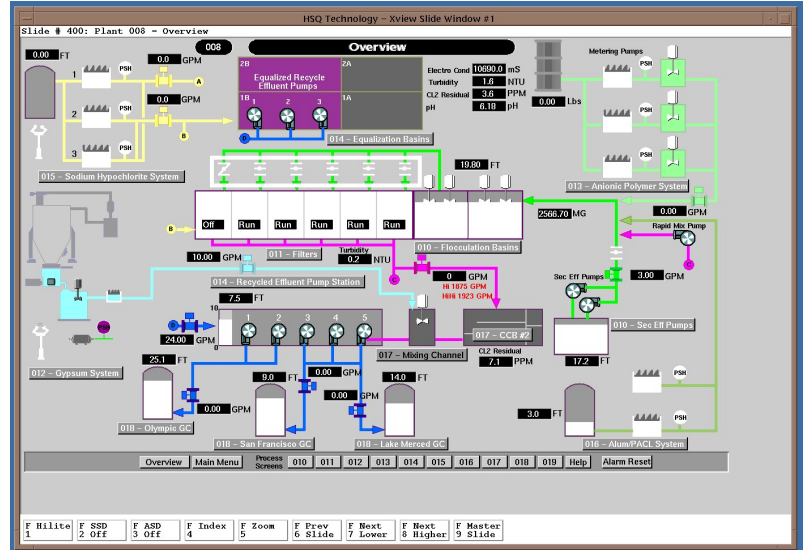


M.I.S.E.R.

SCADA and Automation Software for Industrial Control Management

- M.** Maximum system performance
- I.** Information monitoring & control
- S.** Safe & secure platform
- E.** Executes rapid data flow
- R.** Resources utilized efficiently



OVERVIEW

HSQ provides SCADA and automation control systems based on field proven MISER software and hardware. MISER is designed for mission critical monitoring and control of distributed utility and transportation facilities and systems. MISER includes a real-time distributed database engine, system-wide clock, host server redundancy an open-standards graphical user interface, alarm processing, live and historical trending, short and long term historical database, real-time and historical data retrieval/report generator, distributed control logic processing, and remote site supervisory control and data acquisition communications.

MISER servers and workstations use high performance, RISC-based, 64-bit HP servers running OpenVMS. For MISER, workstations also use high performance personal computers running Microsoft® Windows® or Windows Server. MISER systems use TCP/IP, Modbus, and DNP3, as well as other protocols for networking. RAID arrays, server, and network redundancy are also supported for high availability, mission critical control, and data management.

TECHNICAL BENEFITS

Ease of Use

MISER allows supervisors, operators, and technicians to create and deploy robust graphical representations of telemetry monitoring processes and equipment.

GUI

MISER workstations run the HSQ XView graphical user interface software, and XWindows/Motif operator interface. XView is available on workstations with OpenVMS or Windows. XView provides object oriented graphical slide windows for users to view data and execute supervisory control actions. XView stations include XDraw, and integrated graphics development facility.

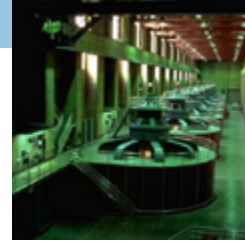
MISER workstations run the HSQ graphical user interface client software suite. This suite consists of the MISER programs View, ALRM, Draw, WinPFS, VisualCI, and Trend. These programs are native Windows software packages, which are available to run Intel®-based workstations running Microsoft Windows 7 or 10 or Windows Server 2008 r2 x64 and later.

Standard Symbol Library

MISER comes equipped with an object-oriented symbol library containing the most commonly used symbols for your industry. For added flexibility and customization, you can use the tools in XDraw to create new buttons and graphics. XDraw comes with an extensive array of geometric shapes and options that allow you to easily create detailed graphics, animations, and controls for your SCADA application.

Intuitive Point and Click Interface

Because MISER runs on Windows, it already has the advantage of being familiar to most system users.



Allows Embedded OLE Documents

MISER allows you to embed third-party documents into your presentation slides, including spreadsheets, presentations, animations, PDF files, AutoCAD® drawings, and many others.

Searchable, Context Sensitive Online Help

MISER ships with an integrated, context-sensitive online help library that provides quick and accurate answers.

DATABASE MANAGEMENT

Distributed Real-Time Database

The MISER database can be fully distributed. This redundancy ensures no loss of data or performance should a system failure occur. Automatic restoration of data upon power up or failure correction is supported. Further, all system configuration work can be performed from one location and propagated system-wide, provided security constraints are met. This feature provides a powerful and efficient environment for system configuration and maintenance.

Powerful Database Management

The MISER database structure is compatible with the most popular database systems including Oracle®, MySQL®, and Microsoft Access, to name just a few.

SQL Data Interchange

Data is transferred between computers using standard messaging formats. This feature provides a reliable and accurate method for transmitting MISER data to database servers and MISER workstations.

Data Export

Use the database management tools to export data to almost any format, including ASCII, CSV, Microsoft Excel and many others.

MISER ODBC Bridge

MISER ODBC Bridge links the MISER application with other relational databases used in your SCADA infrastructure. The MISER system communicates over the MISER ODBC Bridge with relational database servers using the TCP/IP socket.

DEVELOPMENT TOOLS

Powerful Visual Control Language

Using an optional tool, VisualCL, the user is able to create custom computational or control algorithms using a simple, graphical language.

Combined with robust debugging and error detection tools, it is easy to create and put complex time and/or event driven algorithms online. Additionally, with VisualCL, the algorithm can be configured to run on any computer node in the system, including an RTU. High-level language programs may be integrated through a standard API for more complex tasks.

This feature provides a common tool for creating computations and control functions across all MISER platforms. Using this editor, the user develops algorithms and control strategies by selecting predefined function blocks from a menu. These blocks are then linked to database points and other blocks by drawing the connections graphically on the workstation display. Debugging and compiler tools are included. The compiled code can be maintained from any MISER workstation and is automatically downloaded to the target node when the algorithm file is loaded by the user.

When running Microsoft Windows-based MISER, VisualCL is a native MDI Win32 software package and is both an OLE container and server. Being an OLE container allows VisualCL to embed other non-MISER third-party applications into any VisualCL window.

API for Special Applications

MISER runs on an open system fully compliant with IEEE POSIX (Portable Operating System Interface) 1003.1, 1003.1b, and 1003.2. The operating system environment supports the following features:

- Client/Server architecture
- OSF/Motif Graphical User Interface
- X/Open BASE specifications defined in XPG4
- TCP/IP and other major network interface protocols
- XWindow system for both runtime and development environments
- Host-Terminal mode of operation for an essentially unlimited number of nodes



MISER and its operating system fully support a wide range of object-oriented programming tools for applications development. These include Runtime Libraries (string manipulation, I/O support, mathematical functions, etc.), Program Debugger, and System-Code Debugger. Application development tools also include C and Fortran compilers, debuggers, etc.

Symbol Library Development Tools

View slide graphics development is handled by the HSQ XDraw program. The XDraw program provides the capability to build complex static and dynamic symbols using various drawing tools, and by applying predefined symbols from symbol libraries. AutoCAD drawings and bitmapped graphic files can be imported for us as symbol images and slide backgrounds. XDraw provides the facilities to define target fields and dynamic symbols and to link them to SCADA database point attributes for dynamic data value/state and alarm status display, and command action selection. XDraw supports advanced display features, including layering, pan, zoom, declutter, animation, and target linked command scripts.

The XDraw program allows you to run any slide in View mode, where the slide becomes live, working with your live MISER system. This feature allows you to test your slides with the live MISER system without having to save the slide and then enter the XView program to display the slide.

XDraw is also a native MDI Win32 software package, and is both an OLE container and server. Being an OLE container allows XDraw to embed other non-MISER third-party applications into any XDraw window.

XDraw gives you the flexibility to create and tailor the graphics interface to your unique user interface needs for each system and operation.

Import for Popular Image Formats

Import popular image formats such as BMP, GIF, JPG (JPEG), DXF, TIFF, PNG, or XPM. Create animated symbols using the powerful features of XDraw. This allows you to easily create animated symbols and shapes for use on your slides.

RELIABILITY

Field Proven – Nearly Forty Years in Service

The MISER software is extremely reliable with better than 99.9% uptime.

Client/Server Architecture

MISER supports a true client/server architecture. XView performs display processing locally on the workstation, receiving only data from the MISER server engine. XView keeps slide display files resident on the workstation hard disk drive, so call up times are typically less than one second. Current real-time data is saved by XView in a local copy of the MISER database, so slides come up with current data immediately. Once initialized, MISERnet updates the workstation database with data changes as they are processed by the server nodes. This client-server architecture, combined with the efficient COS data propagation methods used by MISERnet, maximizes overall network efficiency.

Full Redundancy and Automatic Failover

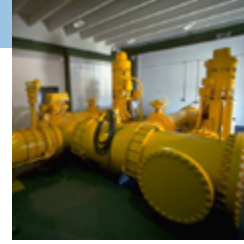
When one member of this redundant pair fails, the other member automatically resumes normal operation. Given the time-stamping and buffering capabilities of the HSQ RTUs, data is preserved through this process as all RTUs keep each time-stamped data change until that change is successfully communicated to and acknowledged by the SCADA servers.

High Availability

To provide high system availability of the MISERnet server functions, a redundant pair of hot backup servers can be provided. The online server continuously updates the backup server with current data, and automatically fails over to the backup server should the primary server fails. Periodic wellness messages are passed between the primary and backup servers; failure to communicate initiates failover.

Distributed System

The MISER SCADA servers are configured to eliminate any single point of failure. Each server is a physical and functional duplicate of the other, storing independent copies of current values, historical data, graphics, and control algorithms.



Low Bandwidth Application

HSQ MISER software has been optimized to function with low bandwidth links and currently operates over links as slow as 1200 bps using its distributed database capabilities.

Automatic Data Recovery

It is standard practice both in the MISER HMI as well as in all HSQ RTU models to time stamp each data change as it occurs at the source of collection (i.e., in the RTU for field I/O), and to buffer that change to ensure that it is properly transmitted to its end destinations (graphics displays and/or historical databases).

This is particularly important on systems with any significant time latency issues. For example, many wireless communication systems, depending on their topology and functionality, may introduce delays into the reporting process of many seconds, or even greater than a minute.

In addition, should the network experience an outage which prevents the SCADA computers from communicating with one or more RTUs, these units will continue to store locally acquired data for a user configurable time duration until network communications are restored, at which point the data automatically backfills with time stamps that reflect the changes when they actually occurred rather than when the HMI finally received the changes.

By time stamping data at the source, then preserving that information in the communications protocol, historical records will still accurately reflect discrete event sequences, and calculated values in reports (i.e., integration of flow values to produce volumes delivered) will not be subject to errors introduced by any time latency present in a wireless network.

SECURITY

Flexible Security Configuration per User or Function

MISER provides a number of useful security features (in addition to the access security mechanisms embedded within Microsoft Windows Server). User accounts are implemented as roaming profiles that are available at any operator console or workstation. A valid username and password are required to gain access to any system software function. Users are also assigned a functional access level (1-255) that determines what functions a user may perform

when logged on to the MISER system. Typically, this mechanism is used to determine which users have read-only access to the system databases, which users can control equipment, and which users can modify and configure the system databases.

Point Segmentation and Area of Responsibility

MISER provides the capability to assign a point database segment number to each MISER point. Up to thirty-two segments are possible. These assignments are viewable, and may be entered or modified using the MISER point database editor, XDPT/WinDPT. Entries take effect immediately upon being saved to the online point database.

User accesses to MISER points are restricted to database segments associated with the user's assigned area of responsibility. Additionally, areas of responsibilities determine which point alarms appear in the user's alarm display, and which point alarms the user shall be allowed to acknowledge.

Slide Segmentation and Area of Responsibility

MISER provides the capability to assign a slide segmentation mask to each XView/View (the MISER HMI schematic display utility) graphics slide. Up to thirty-two segments are possible, and multiple segments may be assigned to each slide. These assignments are viewable, and may be entered or modified using the MISER slide database editor, XDRAW/Draw. Entries take effect immediately upon being saved to the MISER slide databases.

User accesses to MISER slides are restricted to the segment numbers associated with the user's area of responsibility does not map into the segmentation mask of a MISER slide, that slide will not appear in the XView/View slide index, and cannot be selected via keyboard input.

User Account Logins and Areas of Responsibility

User login accounts may be assigned any combination of areas of responsibility. These assignments are viewable, and may be entered or modified using the MISER UAL program. Entries take effect after the next user login.

These capabilities allow any MISER system to extend to new areas, using its distributed networking capabilities, while at the same time presenting only the appropriate subset of data to personnel in correspondence with their individual responsibilities.



SCALABILITY

Seamless expansion from small, single-user systems through large, multi-user networks.

Modular, Extensible Client-Server Architecture

The MISER distributed, client/server architecture provides maximum flexibility for system design and integration. You can deploy a single MISER workstation or implement an enterprise-level SCADA management system with multiple servers and clients.

COMMUNICATIONS

MISERnet

At the core of MISER is MISERnet, a real-time distributed database server engine. MISERnet servers distribute data to client nodes, which can be other servers or workstations. MISERnet also provides the master host communications with distributed and remote RTUs or controllers. It also receives supervisory control commands from servers and workstations, and then communicates these to RTUs and controllers. MISERnet collects, stores, and passes time-stamped Change-of-State (COS) data change events to the MISER historical database.

Open TCP/IP Internetworking – LAN/WAN

MISERnet conforms to the ISO/OSI layered network protocol model. MISERnet servers and workstations interoperate at the application layer using MISER net Message Protocol. Standard TCP/IP is used for all transport/network layers. Ethernet and most standard serial link protocols are supported. MISERnet servers normally interconnect via Ethernet Local Area Network (LAN). All data rates and media types are supported. Server and workstation connections via serial data channels are also supported using standard protocols, such as Point-to-Point Protocol (PPP). The efficiency of COS processing and the MISERnet Message Protocol provide exceptional performance over low data rate serial channels. Use of the OSI layered networking model and open standard protocols allows MISERnet to operate on any open network without conflict with other traffic and software sharing the network.

Remote User Access

Securely access your SCADA system from virtually anywhere in the world. MISER includes remote access via modem or LAN/WAN.

Supports Many Communications Protocols

In addition to the HSQ communication protocols, MISER supports many popular third-party protocols, such as those from Allen-Bradley, Modicon, and GE. MISER also supports Modbus RTU and Modbus TCP/IP. In all, thirty vendor protocols are supported and additional custom emulations can be prepared as needed.

Communication Media

MISER communicates with your monitoring devices over a variety of media, such as: Copper and Fiber, Dial-up, Leased Line, ISDN, Frame Relay, Radio – VHF, UHF, 960 MAS, Spread Spectrum, Microwave, WAN Packet Radio, Satellite, and Wi-Fi (802.11x).

ALARM MANAGEMENT

Multiple Alarm Windows are available. These have filtering, configurable flash/beep, and colors for up to thirty-one priorities of alarm. The displayed fields are easily configurable. Alarms can require acknowledgment on entering an alarm state, entering and leaving an alarm state, or not at all. In the case where something is going to be in alarm for a long time, the alarm can be acknowledged and then removed; meaning the alarm does not display, but once the item has come out of the alarm state, the next time it goes into alarm it will alarm as usual.

User Defined Audible Alert, Temporary Silence

Alarm noise can be canceled without acknowledging the alarm. Various levels of alarms can be independently disabled (a summary shows which alarms are disabled and who disabled them). Alarms for any tag or tags can be disabled. Alarm noise can be turned off by alarm priority for particular View sessions.

Prioritized Sorting

Alarms can be sorted by priority and even color coded so alarm states are distinguishable.



Auto Graphic Display on Alarm Event

With the “Selected Slide Display” and “Automatic Slide Display” features, points that are in alarm can be displayed automatically or manually by clicking on the target.

Alarm/Event Message Logging

All alarms and system events are recorded in the system log for retrieval later. Each entry is time-stamped with the date and time of occurrence.

Remote Notification

With the MISERTalk communication protocol, you can receive remote notification of alarms to your cell phone, email or other devices. You can also acknowledge these alarms using MISERTalk. MISERTalk uses voice prompts to make announcements and you use the telephone keypad to silence alarms, acknowledge alarms, or shut down MISERTalk.

BUSINESS BENEFITS

Excellent ROI

MISER provides the best return on investment (ROI) with minimal downtime, flexible solutions, and an expert support staff.

Proven Track Record

With more than 200 successful MISER installations and nearly forty years of experience in public works projects, MISER has a proven track record with 99.9% uptime.

Backwards Compatibility

Newer versions of MISER are backwards compatible with older software and hardware installations, making it easier than ever to upgrade.

Integration with Popular Software Applications

Using third-party application with MISER has never been easier. You can link drawings, spreadsheets, documents, or virtually any file type directly into MISER using any of the MISER applications.

Trending and Data Analysis

Real-time trends advance on a time schedule configurable in seconds per pixel. Up to eight tags can be trended. Tags can be trended with time offsets, so a tag can now be compared with the same tag from the previous day, or several tags can be trended six months ago, etc.

Event Time Stamps

Data from field devices that do not assign time-stamps is given a time-stamp by MISER when the point data leaves the field. These time-stamps are useful in event correlation.

Compatibility with Many Popular Reporting Packages

MISER is compatible with many popular reporting packages such as Crystal Reports®.

Change-of-State (COS) Reporting

Change-of-State information is stored in the database for use later in trending, analysis, and event correlation. Sequence-of-Events (SOE)

MISER supports time tagging of events at the source with one millisecond resolution. This represents the true time of the event not just the time of acquisition by MISER. When faced with a rapidly cascading series of events, SOE greatly facilitates identification of the originating event.

Data Quality Flags

Data points are from field units are assigned data quality flags based on the status that is reported from the field unit.

Distributed Acquisition Servers Polling or Scanning

MISER can poll each device on the SCADA system, retrieving information on points that have changed, or it can scan each device, retrieving information on all points, regardless of any COS.

Support

HSQ employs a full-time support staff on both the east and west coasts, tailored to your needs. HSQ also offers optional 24x7 support, as well as, optional maintenance and training contracts and software upgrades.