ПРОГРАММЫ

Технические характеристики

на Experion SCADA

Experion SCADA

Experion$^{®}$ SCADA is a powerful software platform incorporating innovative technology for human machine interface (HMI) and supervisory control and data acquisition (SCADA). Experion is a complete SCADA solution that provides a highly scalable, integrated, multi-server SCADA system with the highest level of reliability, safety and security. Experion"s Equipment concept provides simplified SCADA configuration with a superior operator experience. Experion PKS Orion – The Knowledge to Make it Possible.

Key Benefits

- **Reduced total cost of ownership with radically simplified configuration** – Up front configuration design reduced by up to 80% and the effort to add new instances of equipment reduced from hours to minutes.

- **A superior experience for operators & pipeline controllers** – Performing some tasks that previously took operators hours can now be performed in minutes with task-based Equipment filters.

- **Experion HMI** incorporates features developed from extensive consideration of human factors by the Abnormal Situation Management$^{®}$ Consortium.

- **Advanced alarm management** capabilities are incorporated - including alarm tracker, dynamic alarm suppression and alarm shelving, minimizing the impact of alarm flood situations.

- A single polling engine to collect Electronic Flow Meter (EFM) custody transfer logs alongside regular process data.

- Cost effective; easy to configure; easy to maintain gas operations applications such as pipeline linepack and leak detection hosted within Experion.

- A turnkey approach to bringing major benefits of virtualization to SCADA users.

- The ultimate in scalability with the Honeywell patented Distributed System Architecture.

Simplified SCADA Configuration with Experion Equipment Templating

Total cost of ownership is a key criteria when selecting a SCADA system: The cost to initially configure as well as the cost to expand over time. Experion Equipment templates radically simplify both aspects by enabling configuration by equipment rather than by points.
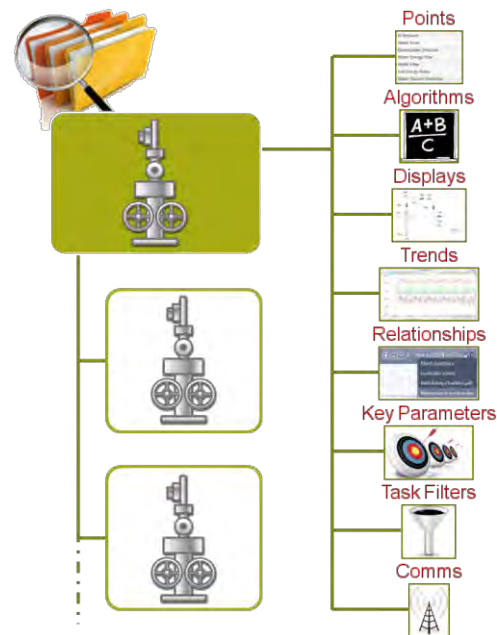

Figure 1, Experion Equipment Templates

Experion Equipment templates are more comprehensive than traditional methods by including all the related SCADA configuration of that equipment type:

- All the SCADA points
- any calculations
- display elements
- trend definitions
- relationships such as what is upstream or downstream
- the key parameters for this equipment
- the operations task based filters
- even the SCADA communication settings to the RTU or PLC

Instead of building and maintaining hundreds of points and displays, you build a wellhead, a pipeline compressor or a pump set by defining just the few unique fields for that instance of that equipment type. The entire SCADA configuration for a wellhead then takes minutes rather than hours.

By having libraries of equipment templates that can be imported and exported, organizations can standardize on best practice even across multiple sites.

Equipment templating is an optional feature and can be used alongside traditional point and display building.

Superior Operation with the Experion Equipment Display

The Equipment Display within the Experion HMI is automatically generated based on Equipment configured and is driven by the information contained in the Equipment templates. Features of the Equipment Display include:

- Tabular displays of similar equipment showing the key parameters for each
- Selectable filtering to provide task based views. For example, show me the wells that are underperforming. Or, show me all my compressors.
- Filter by Assets in addition to task.
- Spanning all Equipment in the Operator''s scope of responsibility across all DSA servers.
- Drilling through to individual Equipment for closer monitoring or control with:
  - o Tabular style presentation of parameters.
  - o Custom HMIWeb displays.
  - o Links to configured trend sets
  - o Links to related Equipment and applications
  - o A banner listing KPIs and the alarm status of the Equipment aggregated from individual alarms.

- New Equipment automatically appears with no further configuration.
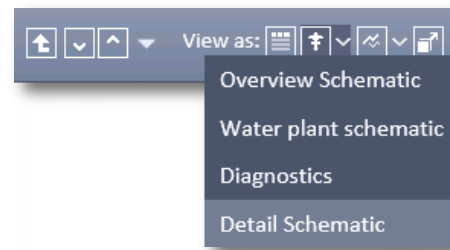
Figure 2, Selecting Current View in Equipment Display

This dashboard-style auto generated content allows an operator or pipeline controller to efficiently manage thousands of individual pieces of equipment freeing up time for more value adding tasks. As best practice evolves, templates are easily updated with the latest task definitions, trends, displays. Every operator then becomes your best operator.
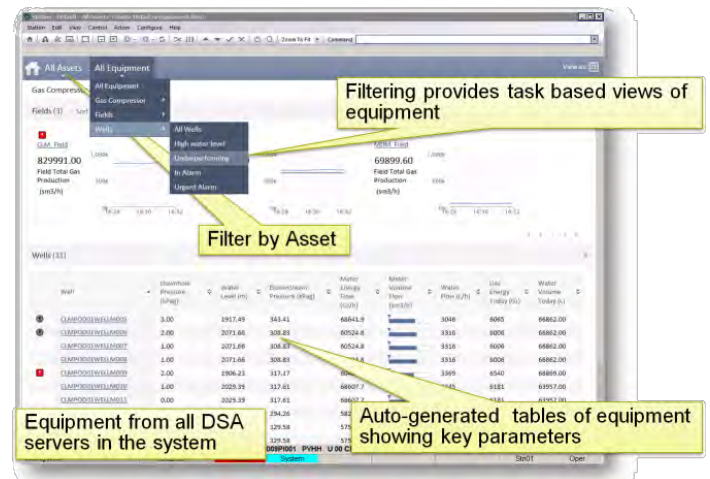
Figure 3, Equipment Display

Powerful Core SCADA Features

With out-of-the-box functionality, users simply configure the platform instead of building it from the ground up. Operations can begin soon after point and hardware configuration is complete.

Other core components include:

- **Operator Interface** – The Experion HMI incorporates features developed from extensive consideration of human factors
- **Real-time database** – The server database is intuitive to understand using object-oriented technology and provides high-speed access to data for internal systems and applications such as operator stations and external applications such as corporate systems, simulation and nominations systems.

- **Open connectivity** – The platform incorporates, as standard, open technologies to simplify integration with business and information systems. These technologies include SQL access via an ODBC driver, Microsoft Excel Data Exchange, Visual Basic scripting, OPC DA, HDA and A&E Client interfaces, OPC Data Display Client and OPC DA, HDA and A&E servers for read/write access to the database.

- **Advanced system infrastructure** – The platform includes, as standard, a complete infrastructure with an advanced alarm/event management subsystem, built-in system displays, configurable reports, extensive history collection and standard system trends.

- **SCADA interfaces** – An array of standard RTU/Controller drivers are provided with the platform. In addition, this can be expanded to include the vast array of MatrikonOPC drivers via easy interfacing with Experion SCADA.

- **EFM Custody Transfer** historical data log collection and export to gas management systems like Flow-Cal.

- **On-board History Collection** – Experion PKS has a fully functional advanced built-in historian. Very long term history storage is supported. History files can be automatically archived on external media then restored and accessed transparently when needed. History is stored in a highly efficient format with pre-calculated aggregates. History data is available for use across every Experion Station for trend displays, reports, custom displays, applications, spreadsheets, ODBC-compliant databases as well as OPC HDA Clients. Retrieval and display of data is almost instantaneous even if a trend duration is months or years. History data is also transparently accessible across DSA servers without any re-historization.

- **A Versatile Operator Interface** – Flex Station uses cached access to SCADA data. This real-time caching mechanism is highly efficient and supports deployment of large numbers of stations on widely distributed systems. Remote Access is supported via Windows Remote Desktop Services enabling engineering and troubleshooting from remote locations including low bandwidth connections. The HMI is designed to facilitate compliance with API RP 1165 and related regulations.

- **SCADA Server Redundancy** – A redundant Experion SCADA Server provides a high availability service by enabling a pair of similarly configured servers to support each other in a primary/backup fashion acquiring data from the RTUs/controllers and serving data to clients.

- **Backup Control Center** – Control Centers must be ready for the unexpected, especially in consideration of new government regulations and industry standards addressing critical infrastructure protection

- **Scalability** – As system requirements change over the lifecycle of the system, so can the platform. Multi-parameter SCADA points, each with up to 8 scanned parameters, up to 300,000 points per server; up to 60 Flex Stations per server and unlimited casual connections through eServer; Up to 5,000 RTUs/Controllers per server; And the ultimate scalability option, Experion's Distributed System Architecture (DSA) allowing up to 60 Experion SCADA servers to operate as one whether located together or remote from each other without any duplicated configuration;

- **Reporting** – Experion SCADA provides many built-in reporting functions to help document or analyze process and system data and events. Reporting can be customized further with Microsoft Excel Data Exchange.
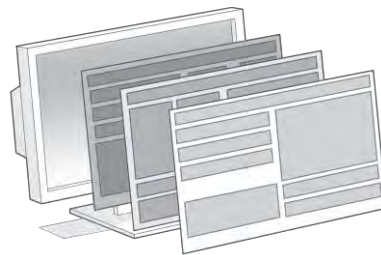
Effective Operator Interface Design

The Experion HMI incorporates features developed from extensive consideration of human factors by the Abnormal Situation Management consortium. Operators' situational awareness is optimized, fatigue minimized and quick identification and response to abnormal situations promoted. These features are available both in standard system displays and user built displays where the HMIWeb Solution Pack library is used, and includes:

- Use of bright colors exclusively for alarms and process data drawing the operator's focus.

- Animation that is used exclusively to bring process-critical or safety-related information to the foreground and to the attention of operators.

- Tabbed navigation with indication of active alarms

- Pan and Zoom displays with a thumbnail view for situational awareness across the full display by including active alarms.

- Advanced shapes for temperature, pressure, level and flow analog values and controllers.

For more information refer to the *Experion HMI PIN*.

Innovative Alarm Management Features

Effective management of alarms, particularly in alarm flood situations, is a key aspect of operator/pipeline controller effectiveness and the basis of alarm management standards and

recommended practices such as EEMUA Publication 191, ISA-18.2 and API RP 1167.

Experion alarm management is the state of the art in optimal alarm workflow with a complete built in and customizable alarm management user interface with rich features to filter, sort and add comments to alarms. In addition, alarms can be routed to other users via e-mail and SMS.

Alarm Tracker is the next generation alarm interface - a step change improvement from the tabular alarm summary leveraging the innate benefits of our ability to process patterns. Alarm Tracker dramatically reduces the time needed to diagnose and resolve process upsets.

Figure 4, Alarm Tracker

Dynamic Alarm Suppression provides a very easy to implement method of suppressing alarms based on preconfigured rules.

Alarm Shelving enables operators to immediately temporarily remove problem alarms from their view so they don't impact other critical activities they are performing.

Alarm Help functionality provides quick access to information on the cause of the alarm, the alarm impact potential and the recommended actions to address the alarm.
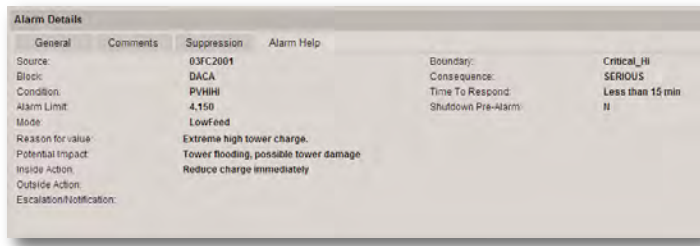

Figure 5, Alarm Help Tab in Experion Alarm Summary

Alarm Configuration Manager (ACM) is a Honeywell product that is separate but complementary to Experion. The key feature of ACM is its capacity to act as the master alarm database by "holding" designed alarm settings along with their documentation such as the causes, consequences and operator actions. Through audit and enforcement, ACM provides a "safety net" to ensure that changes are temporary and the engineered alarm configuration is always restored. ACM connects with Experion's Asset Model to store different alarm settings for different planned operating modes. ACM also provides tools that support work processes for alarm rationalization and maintenance.

The *Experion System Status display* provides operators with one place to review the health and status of all system components and unlike some SCADA systems, at the same time keeping this separate from the Alarm Summary.

For more information refer to the *Experion Alarm PIN*.

Advanced Trending

Experion HMI trend capabilities include integrated events, zoom box, up to 32 parameters in a single trend, auto-scaling and drag and drop configuration. *Trend with Events* is a powerful view for diagnosing process upsets. Events are represented by icons that are displayed along with process data with a fully synchronized event window. If an upset occurs in the process data, the user can visualize any events or actions that occurred at the same time.
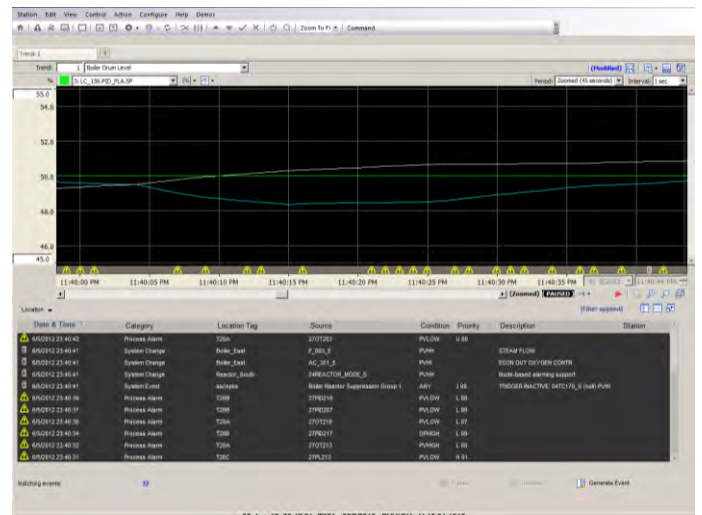

Figure 6, Trend with Events

Trends can be preconfigured or created on the fly by operators by dragging and dropping parameters from system- and user-built displays.

In addition to the system trend display, a fully functional trend object is available for use in custom displays.
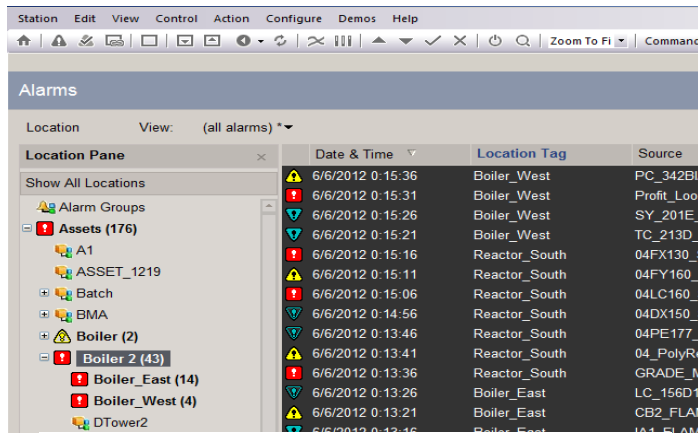

Figure 7, Alarm Summary Asset Model

A Comprehensive Set of Built in Displays

The Experion HMI includes a comprehensive set of built in displays. This includes the alarm summary, trend, system status, operating groups, point detail, faceplates, loop tuning and an extensive set of configuration and diagnostic displays.

The alarm summary has a navigation tree that shows all assets within the operator's scope of responsibility in a hierarchy with their current aggregated alarm state, and a single click shows all alarms.

The comprehensive set of system displays reduces the amount of configuration required on an Experion system and is another way Experion minimizes the cost of ownership for a SCADA system.
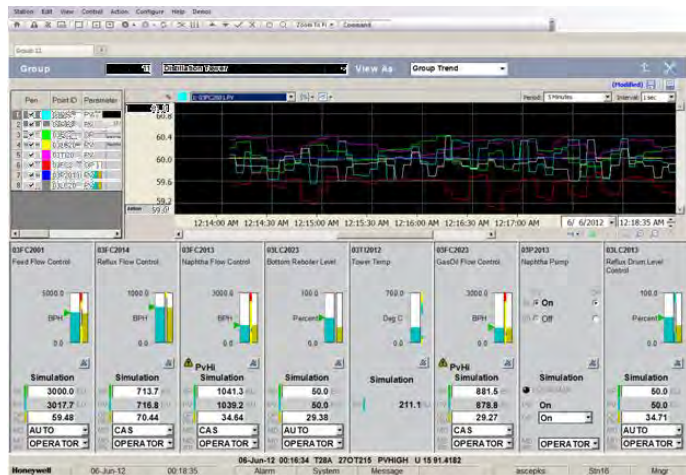

Figure 8, Operating Group with Integrated Trend

Operator Roles and Scope of Responsibility

Experion offers the choice of setting the access level at either the Station or the user, based on their account. With Station based security, the access level is set for the Station and applies to all users. This is ideal for locations occupied 24/7 such as a control room. User based security requires logging in with an account and allows changes to be tracked based on the user. This includes the use of Users and Groups from the Microsoft Operating System.

Aligning with physical assets, the hierarchical Asset Model is Experion's organizational structure. Components like points belong to a particular asset. Users and Stations are then assigned access rights, (read only, read/write etc), to one or more assets.

Intuitive Configuration Environment

Configuration Studio hosts all the Experion configuration tools in a single ordered location. Configuration Studio exposes configuration activities as tasks rather than tools to the user. E.g., 'Build SCADA Points', 'Configure Equipment Templates'. Changes to configuration can be made while the Experion system is on-line. All configuration data is stored on the Experion SCADA server and takes advantage of its redundancy capabilities to provide increased robustness.

Figure 9, Configuration Studio
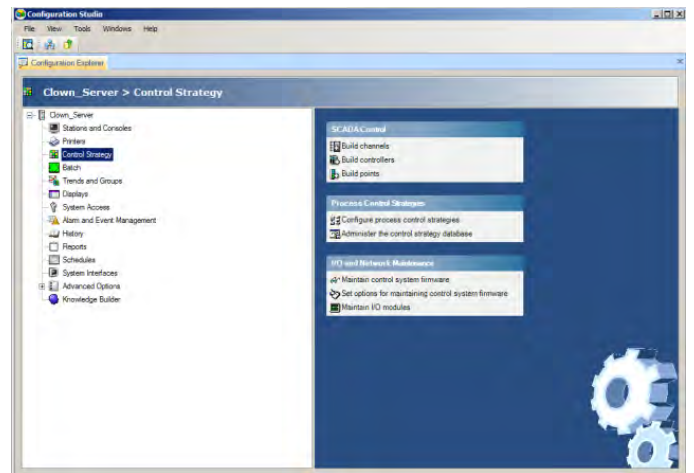
Included in Configuration Studio is the HMIWeb Display Builder. This is the object oriented tool for building and maintaining Experion user displays. It includes an object browser to easily navigate and make changes, property window to enter and view parameters and a structured list of shapes. Shapes can be dragged and dropped to quickly engineer new displays and modify existing ones.
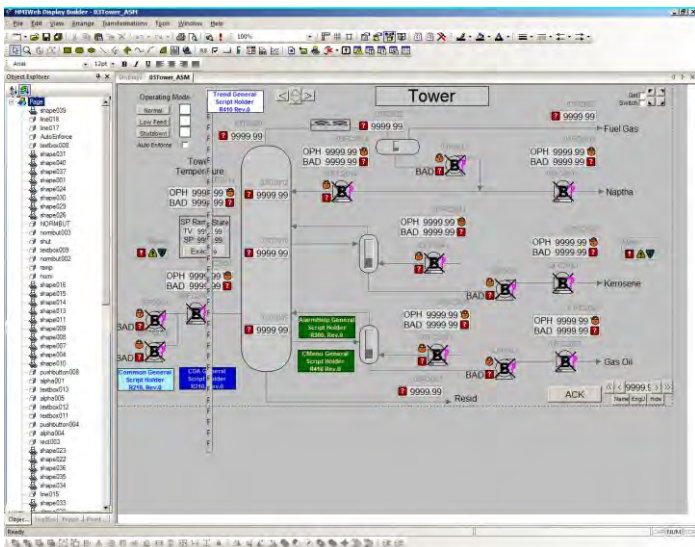
Figure 10, HMIWeb Display Builder

Experion Distributed System Architecture

Honeywell's patented Distributed System Architecture provides unmatched scalability and performance by seamlessly integrating alarms and process data from multiple Experion systems. DSA provides maximum flexibility in system design and superior integration capabilities whether applied within a site or across different geographical locations, between similar or different Experion releases.

DSA provides the lowest possible installed and total cost of ownership by requiring almost no configuration initially or on an on-going basis. It removes the need for duplicate databases, data specific configuration or gateways between systems.

Highly optimized for fast data transfer, DSA does not require expensive high performance or dedicated networks and is supported over microwave and satellite links.

Transparent, highly secure access to remote data and alarms for operator and control applications delivers one virtual control system.

Flexibility and minimum scope of loss is guaranteed with independently engineered and secured clusters, integrated into a single virtual control system for operations.

Expansions or new assets can be commissioned with new Experion clusters integrated via DSA with a minimum of cost, leaving other clusters at their existing release, by leveraging DSA's four-functional release span of interoperability.

Four-release interoperability is extremely powerful when users upgrade to later releases by allowing portions of a large

integrated system to be transparently migrated on-process in the least disruptive, step-wise manner possible.

For more information refer to the *Experion Distributed System Architecture PIN*.

Cyber Security

At Honeywell, protecting our customer's control systems against cyber threats is a continuous process rather than a single solution.

- 'Design for Security' development process
- External security certifications
- Corporate managed product security incident response
- Tightly integrated Application Whitelisting solution
- Full suite of vendor-agnostic cyber security services

Integrated Gas Operations Suite for Pipelines

The Experion Gas Operations Suite provides the following features for the gas industry:

- Server based flow compensation calculations
- Gas Quality calculations
- Linepack
- A basic leak detection solution
- Pipeline Compressor Maps

These applications are hosted as part of the Experion server. Experion Equipment templates are used as the building blocks of the applications. As the pipeline is being defined using the pipeline, route, segment and nodeEquipment templates, so are the applications being configured and aspects like Linepack being calculated.

This also means the applications are visualized using the Equipment display and relationships can be configured between equipment. For example, when at the pipeline compressor, you want to see the Compressor Map.
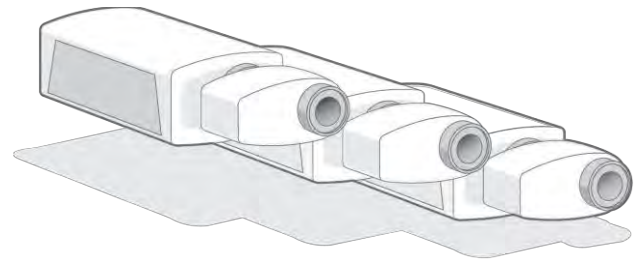
Flow Calculations and Gas Quality calculates the flow of natural gas through orifice, turbine and ultrasonic meters.

- Instantaneous mass flow, volumetric flow and energy flow for natural gas using equations defined in AGA reports 3,5,7,8, and 9
- ISO heating value and Wobbe Index per ISO6976/1999 standards
- Gross heating value per GPA 2172
- Gas supercompressibility using AGA Report No.8 or NX-19 methods

Linepack automatically calculates pack for individual pipeline segments configured in the pipeline model and rolls them up to regional and pipeline totals.

- Linepack for Maximum Allowable Operating Pressure (MAOP)
- Linepack maximum, minimum, delta and rate-of-change
- Storage, retrieval and trending of historical pack data

Figure 11, Pipeline Routs Linepack Summary

Pipeline Leak Detection is an effective, easy to configure and maintain leak detection solution for natural gas pipelines.

- Combines multiple leak detection algorithms to permit detection of slow leaks as well as ruptures
- Detects leaks under unsteady-state pipeline pressure conditions
- Provides estimate of leak location
- Visual tools to assist with assessment of potential leaks

Compressor Map is a visual tool to evaluate a compressor's operating point against manufacturer's published compressor data, operating limits and peak efficiency curves.

- Displays the compressor operating point in real time
- Generates alarms automatically on approach to surge or choke conditions
- Multiple map types per compressor
- Import of compressor manufacturer's performance data

Video as a Sensor

Honeywell's Digital Video Manager (DVM) monitors process and safety conditions and is the industry's only enterprise-grade digital video solution for process control systems. With a Smart Surveillance platform and Honeywell's integrated approach to process management, intuitive intelligence empowers process operators to do more with less.

DVM was specifically designed to integrate at the database level so alarms, events and digital recording triggers are native to Experion. DVM adds another dimension of situational awareness for improved response time and decision-making with video and process information on the same screen.

DVM's network based architecture and integration abilities deliver far more benefits than traditional CCTV systems.

- Improve incident response times by providing contextual information with process alarms to operators and pipeline controllers via seamless integration with Experion.
- Improve operational efficiencies with the addition of cameras on remote sites reducing the need for field visits while ensuring that all field activities are monitored.

For more information refer to the *Digital Video Manager PIN*.

Integrated Industrial Physical Security

Experion Industrial Security is a modular platform that can be expanded to provide centralized management of video data, access control, perimeter intrusion, pipeline protection and workforce management.
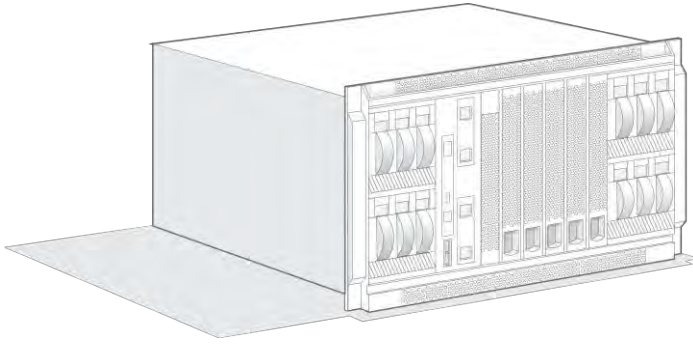
For more information refer to the *Experion Industrial Security PIN*.

Experion Virtualization Benefits

Experion Virtualization Solutions lead the industry with a turnkey approach to bringing major benefits of virtualization to SCADA users for new projects and existing installations alike. For new projects, new paradigms are enabled for greater project flexibility and for existing systems; there are major lifecycle management advantages.

For more information refer to the *Experion Virtualization PIN*.

Experion Backup Control Center Solution

One of Honeywell's growing range of virtualization-enabled solutions, the Experion Backup Control Center automates the key elements of disaster recovery, making it possible for industrial operations to provide faster, more reliable and more affordable disaster recovery protection than previously possible.

Now more than ever, Control Centers must be ready for the unexpected, especially in consideration of new government regulations and industry standards such as those put forth by the National Institute of Standards and Technology (NIST) and North American Electric Reliability Corporation (NERC) addressing critical infrastructure protection. Companies need to take measures protecting their facilities against a total outage. In an industrial operation, Backup Control Centers are used in the event that a Primary Control Center becomes inoperable and control functions must be switched to a backup location.

Experion Backup Control Center simplifies and automates the key elements of disaster recovery:

- Setting up and testing disaster recovery plans
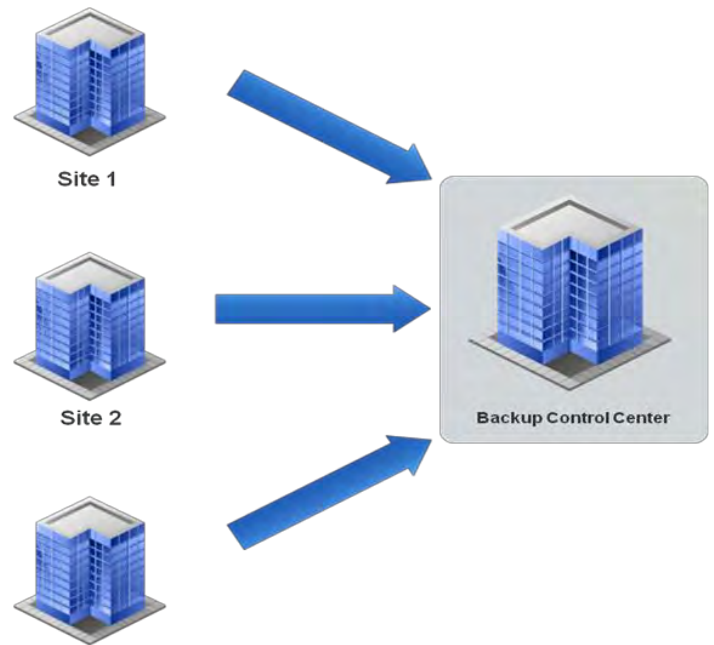- Executing failover when a Control Center disaster occurs

- Failing back to the primary datacenter

Honeywell's innovative Backup Control Center approach uses central storage to centralize all of the virtual machines in a common storage environment. This storage is then replicated from one site to another. The site recovery manager software contains all of the procedures for both tests and failovers. Failover combinations with this approach include:

- One-to-One: single backup site dedicated to a single primary site
- Many-to-One: single backup site protecting multiple primary sites
- Bidirectional Protection: Control Centers protecting each other

For more information refer to the *Experion Backup Control Center Solution PIN*.

По вопросам продаж и поддержки обращайтесь:

Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48

Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курган (3522)50-90-47
Курск (4712)77-13-04
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
Ноябрьск(3496)41-32-12

Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Пермь (342)205-81-47
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (**812)309-46-40
Саранск (8342)22-96-24
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35

Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Улан-Удэ (3012)59-97-51
Ульяновск (8422)24-23-59
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70   **К**азахстан +7(7172)727-132   **К**иргизия +996(312)96-26-47

сайт: www.honeywell.nt-rt.ru || эл. почта: hwn@nt-rt.ru