

# rotork®

Keeping the World Flowing  
for Future Generations

## rotork® Master Station

**Pakscan™**  
CLASSIC  
2-Wire Current Loop



**Pakscan™** Modbus®  
CLASSIC

Intelligent Supervisory Control for  
Valve Actuators and Plant Equipment

## Reliability in critical flow control applications



### › **Reliable operation** when it matters

Assured reliability for critical applications and environments. Whether used 24/7 or infrequently, Rotork products will operate reliably and efficiently when called upon.

### › **Quality-driven** global manufacturing

Products designed with 60 years of industry and application knowledge. Research and development across all our facilities ensures cutting edge products are available for every application.

### › **Customer-focused service** worldwide support

Solving customer challenges and developing new solutions. From initial enquiry through to product installation, long-term after-sales care and Client Support Programmes (CSP).

### › **Low cost** of ownership

Long-term reliability prolongs service life. Rotork helps to reduce long term cost of ownership and provides greater efficiency to process and plant.

# rotork® Master Station

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## › Comprehensive product range serving multiple industries

Improved efficiency, assured safety and environmental protection.

Rotork products and services are used throughout industry inclusive of Power, Oil & Gas, Water & Wastewater, HVAC, Marine, Mining, Pulp & Paper, Food and Beverage, Pharmaceutical and Chemical industries around the world.

## › Global presence local service

Global company with local support.

Manufacturing sites, service centres, sales offices and *Centres of Excellence* throughout the world provide unrivalled customer services and fast delivery.

## › Market leader technical innovator

The recognised market leader for 60 years.

Our customers have relied upon Rotork for innovative solutions to safely manage the flow of liquids, gases and powders.

## › Corporate social responsibility

A responsible business leads to being the best business.

We are socially, ethically, environmentally responsible and committed to embedding CSR across all our processes and ways of working.

# Comprehensive solutions for modern plant control and monitoring

- › **Rotork *Master Station* with intuitive touch screen** user interface
- › **Up to three separate field networks** on one Rotork *Master Station*
- › **Multiple host (Ethernet and serial)** connectivity
- › **Asset management** and data logging
- › **Built-in** redundancy support
- › Existing *Pakscan* systems **upgradeable to Rotork *Master Station***
- › All *Pakscan* field networks **open to third party devices**
- › **Efficient low cost install** with minimum cost of ownership
- › **Over 170,000 existing installed** *Pakscan* field devices
- › Backed by **Rotork global support**

The Rotork *Master Station* and *Pakscan* Classic current loop network system is the world leader in actuation control automation, providing comprehensive solutions for modern plant control and monitoring.

Now with 30 years installed experience, *Pakscan* based systems have found preference and success in many diverse applications and all industry sectors, continuing to be at the forefront of network technology and helping to control over 170,000 field units.

Building on the success of the previous Master Station formats, the Rotork *Master Station* and its field networks have been designed for use in all industries and applications where robust and reliable plant control and monitoring is required.

High levels of innovation, intelligent design and ongoing Rotork global support ensures your operation will always run smoothly, efficiently and effectively.

The system allows for backward compatibility with existing *Pakscan* systems and support for an Open Modbus RTU field network enables easy integration of other third party devices.

# rotork® Master Station



## Pakscan™ CLASSIC

Pakscan current loop field network

## Modbus®

Open Modbus field network



# Rotork Master Station



The Rotork *Master Station* provides the high integrity link from the Distributed Control System (DCS) to the devices in the field.

It comes complete with a large touch screen interface to allow operators and engineers to see exactly what is happening to the system and the field devices at any time.

A hot standby Rotork *Master Station* allows for continued availability of the system in the event of a component failure. Host ports allow connection to multiple host systems at the same time with redundant communication links where necessary. In the event of a fault occurring, the changeover to the standby is seamless without loss of data and control.

## Rotork Master Station Features

- Single, dual and hot standby Rotork *Master Station* options
- Fully hot standby Rotork *Master Station* where all interfaces are replicated i.e. CPU, power supplies, display, network interfaces and control interfaces
- Multiple host port connectivity, Modbus TCP (Ethernet) as standard with optional Modbus RTU (serial)
- No specialist software required to configure the system. Can be configured fully via the touch screen interface or web interface
- Large touch screen interface and web pages share the same intuitive menu structure focused on providing quick device set up, interrogation and issue resolution
- Dedicated service port to maintain separation between configuration, maintenance or monitoring systems and systems for controlling the process
- Choice of mounting options, 19" rack or panel mount
- Industry standard NAMUR NE107 diagnostics indication
- Modular design enables multiple field networks to operate from one Rotork *Master Station*
- Two field networks – *Pakscan* Classic and Modbus
- Logging of host messages, field unit commands and status changes
- Network time synchronisation (NTP) capability
- Multiple language support
- Compatible with existing and legacy Rotork actuators
- Standardised Modbus host database for all field network options
- Backwards compatible for existing *Pakscan* IIE and P3 Master Station systems
- Standalone operation possible if the DCS or host system is unavailable
- Power supply module 100 – 240 VAC ( $\pm 10\%$ ), 50/60 Hz
- Up to 240 channel CPU options

# System Features

## Intuitive User Interface

The Rotork *Master Station* has a large, easy to use touch screen interface and built-in web pages sharing the same intuitive user interface. The user interface is focused on providing quick device set up, interrogation and issue resolution for both the Rotork *Master Station* and field devices. NAMUR NE107 diagnostic icons are utilised for easy recognition of device status.

No specialist software is required to configure the system, which can be achieved fully via the touch screen interface or web interface.

Using the intuitive user interface, the status of all field devices can be viewed, field devices can be controlled and configurations can be updated.

A dedicated service Ethernet port is available to maintain separation between configuration and monitoring systems and systems for controlling the process.

The hot standby option has two displays, one for each side.

The Rotork *Master Station* continuously checks itself, the field networks and the field device alarms and is able to alert the local operators to the exact nature of a problem, should one occur. This is especially useful during commissioning. It is also useful during normal operation if a loop fault occurs, as the system can pinpoint the type and location of the fault.

## Up to three field networks on one Rotork *Master Station*

It is possible to operate multiple field networks from one Rotork *Master Station* because of the modular design.

In addition to the *Pakscan* Classic current loop network, the user can install an additional *Pakscan* Classic network and a Modbus field network module in the four available Add In Module (AIM) slots.

The maximum of 240 field devices can be split between these networks to ensure the optimum network is utilised in defined areas of the plant.

In addition to actuators and valves, the field networks are capable of controlling and monitoring various field devices like mixers, pumps and transmitters using the third party device connection mechanism for each network.



## System Features

### Built-in redundancy support

Along with single and dual configurations, the Rotork *Master Station* can be supplied in a hot standby configuration with built-in redundancy support. All interfaces are duplicated (CPU, power supplies, display, network interfaces, control interfaces) in the standby master, which is able to take control in the event of a failure in the primary. There is no single point of failure.

Network communications are secure with fault tolerance, allowing continued operation of the plant when a fault exists within the system. There are built-in diagnostic features with automatic fault location indication for operations and maintenance staff.

### Multiple Host Connectivity

Rotork *Master Stations* are supplied fully pre-configured, providing easy integration with proven communications to all major DCS and PLC suppliers with industry standard Modbus TCP, and optional Modbus RTU protocols.

Multiple host communications capability and a choice of multiple databases are provided for maximum data transfer efficiency. The Ethernet service port and a touch screen display allow local stand alone operation in the event of non-availability of the DCS.

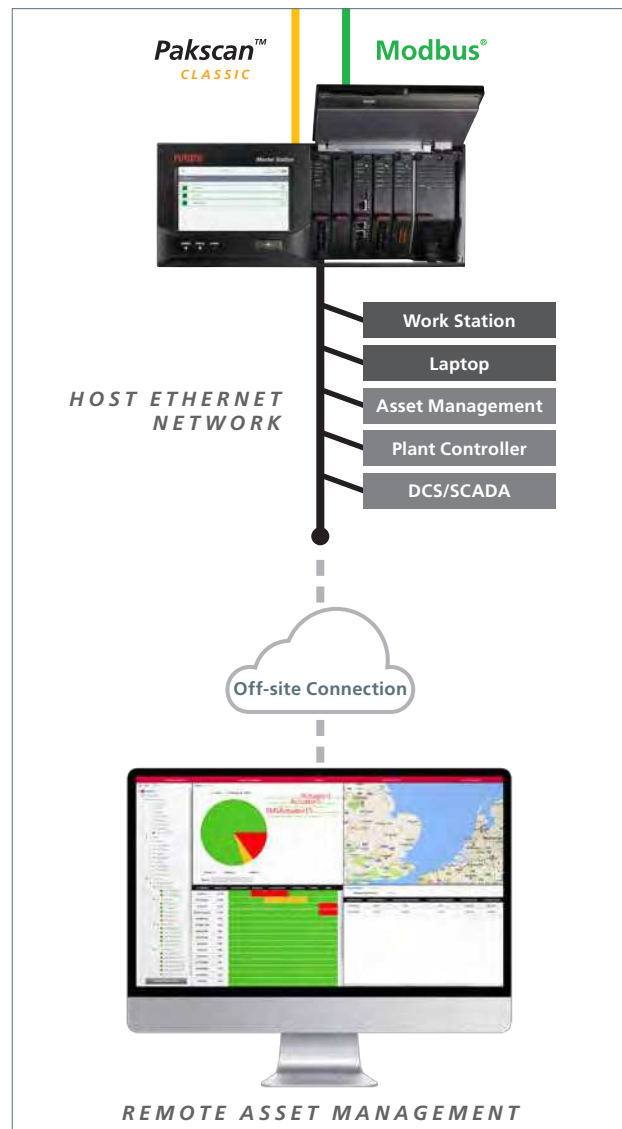
### Asset Management and Data Logging

The Rotork *Master Station* has many features to enable the management of the assets connected to it. Whether the interest is in condition based monitoring or predictive maintenance, it is all possible with the Rotork *Master Station*.

Field device alarms and status are readily available through the user interface for on-screen analysis and to the Modbus database for communication to the higher level system, be that a DCS/PLC or asset management system.

Features for maintenance also include host message logging, field unit command / status change logs and the extraction of the torque profile which is the most useful factor in determining the condition of the valve connected to the actuator. This can aid the user in the planning of valve maintenance.

For ensuring events are synchronised to the same time as the rest of the plant, a network time synchronisation (NTP) capability is included.





## System Features



### Efficient Low Cost Install with Minimum Cost of Ownership

Direct cost reductions are made by using a single twisted pair cable instead of expensive multicore cable and a direct reduction in engineering effort and associated costs are made due to simple network design. The wired control loops can operate on long loop lengths without external repeaters. Savings include reduced time and labour cost for installation and commissioning.

With a choice of mounting options, 19" rack or panel mount, and wiring accessible from the front using standard connections, installation is simple.

The Rotork *Master Station* monitors the full network at all times providing increased information from individual field devices and permitting optimised and correctly scheduled maintenance of the valves and actuators. Reduced down time losses lead to increased plant productivity.

No expensive specialist software or licenses are required for configuration and diagnostic troubleshooting. The user interface can be used either directly at the Rotork *Master Station* via a large touch screen display or via the web interface (using a standard web browser).

### Existing Pakscan Networks Upgradeable to Rotork *Master Station* control

Rotork *Master Station* has backwards compatibility with *Pakscan* IIE and P3 systems for field and host connectivity.

An existing *Master Station* system running the *Pakscan* Classic current loop network can be upgraded to a Rotork *Master Station*, with no change to the field devices and network wiring.

### All Field Networks Open to Third Party Devices

The Rotork *Master Station* and its networks support all Rotork products either directly or indirectly. Support for third party devices from other manufacturers is also available within the system.

Each field network has a method for inclusion of these devices and any other Rotork products that do not have a direct network interface. Rotork actuators can also be used as a hub for connection of digital I/O into the various networks.

### Backed by Rotork Global Support

Rotork provides service and commissioning support from all our global offices. We provide online documentation that will assist commissioning, service and maintenance teams. No specialist software is required to support or operate the Rotork *Master Station* and our service teams are fully trained in a variety of networks, ensuring we have expertise available globally.

Rotork offer training for customers in the Rotork *Master Station* and *Pakscan* networks, both in-house and on-site.

There is support for multiple languages within the Rotork *Master Station* to aid local operators.

## Network Options

The Rotork *Master Station* has a modular design enabling multiple Add In Modules (AIMs) to be fitted. Four slots are available for AIMs. In a hot standby *Master Station* the AIMs are duplicated on the standby side.

The AIMs can either be for host or field network communications. There are one host communication module and two field communication AIMs available.

### Host Serial AIM

For applications that require the connection to the host system to be a serial Modbus RTU, two 9-way D-type connections individually selectable between RS-232 and RS-485.

### Field AIMs

The two field communication AIMs are for the *Pakscan Classic* and Modbus field networks.





### ■ Pakscan Classic field network Add In Module (AIM)

#### Proven Control System

The Pakscan Classic redundant loop network has been the network of choice for actuator control for over 30 years. Using robust current loop technology, up to 20 km loop lengths and 240 field devices are possible.

#### Fault Tolerance

Redundant loop ensures plant operability in the event of cable break or earth fault. Each actuator field control unit has a loopback circuitry that switches in the event of a fault providing continued loop connection on the 2-wire system. Current loop technology provides high noise immunity.

#### Efficient Low Cost Installation

Standard low cost twisted pair instrumentation cable (one pair) is required for the network loop and there are no requirements for external repeaters or network termination.

#### Actuator Control Over Distance

Utilising 'Report by Exception', provides efficient data reporting at low baud rates required for long distance current loop communications. Up to 20 km loop lengths and the control and monitoring of up to 240 devices are possible with no limitation on the distance between devices.

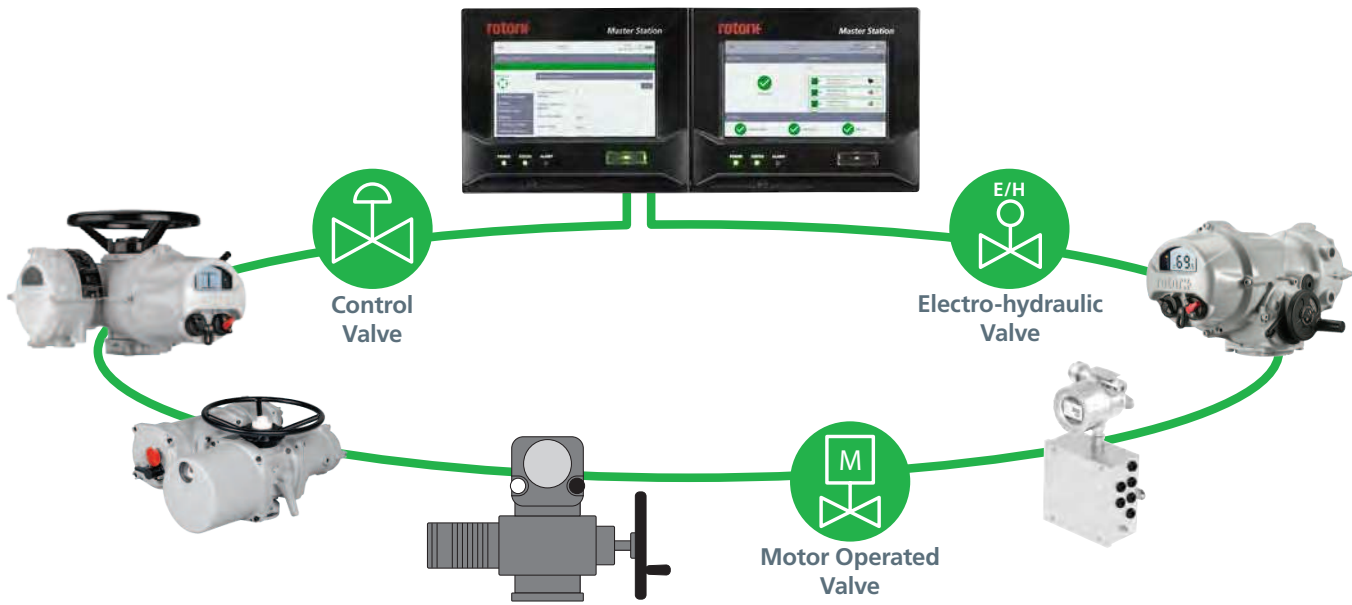
#### Additional Devices

Actuators can be used as a hub or a dedicated General Purpose Field Control Unit (GPFCU) can also be used as digital and analogue I/O, providing the interfaces to connect other actuator types and additional plant control devices into the network.

# Pakscan<sup>TM</sup>

## CLASSIC

- Long loop length, up to 20 km
- Redundant, single fault tolerant, loop
- High noise immunity, current loop
- Up to 240 field devices, on a single highway
- No external repeaters, highway terminators or biasing
- Open to third party devices
- Fast scan time due to 'report by exception' protocol
- Standard instrumentation cable



### ■ Modbus field network Add In Module (AIM)

#### Industry Standard Networking

In addition to the Rotork designed network option, the Rotork *Master Station* also offers a Modbus network all the way down to the field devices. The Modbus RTU network is an RS-485 voltage based network in accordance with the Modbus serial standard. Network baud rate is selectable up to 115k200, distance dependant, and network termination can be achieved within the actuator.

#### Multiple Network Topologies

Standard single and dual topologies are available and an additional loop network arrangement to improve distance capabilities and for more efficient redundant cabling is also available. For the loop network, a distance of up to 1.2 km between devices is possible.

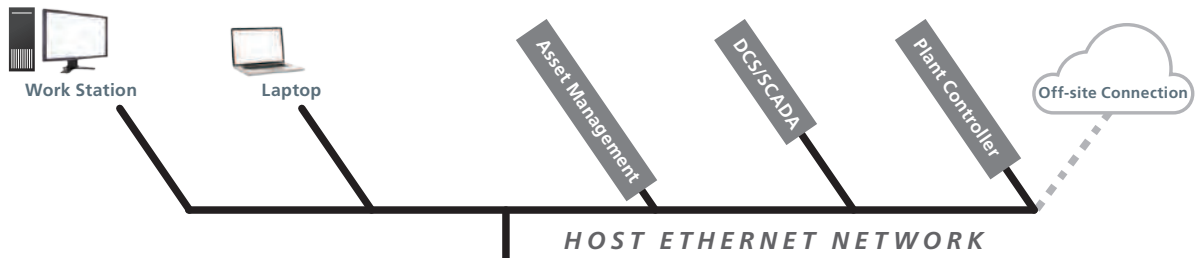
#### Additional Devices

Non-Rotork Modbus devices can be integrated into the Modbus network. Contact Rotork for support on specific devices and for further information.

# Modbus®

- RS485 2-wire RTU communication
- International open standard
- Single and dual redundant options
- Up to 115 kbps
- Redundant loop topology available

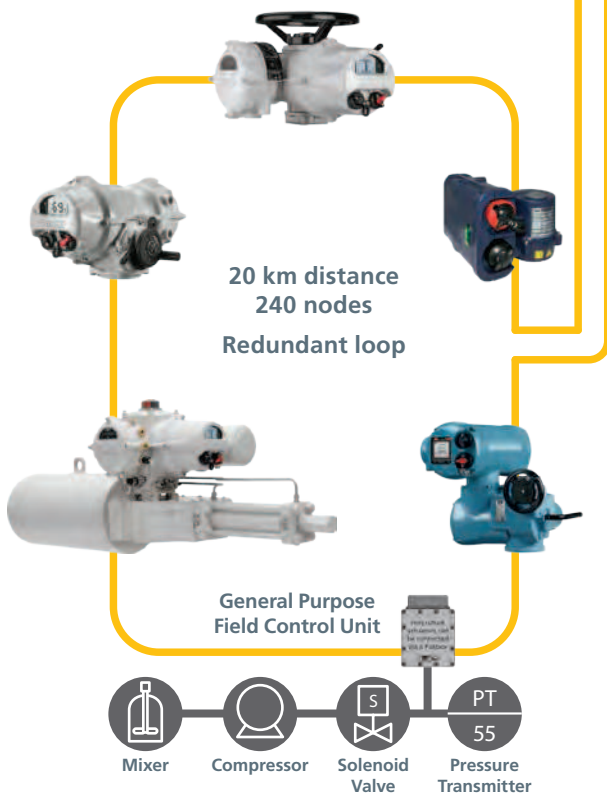
# System Overview



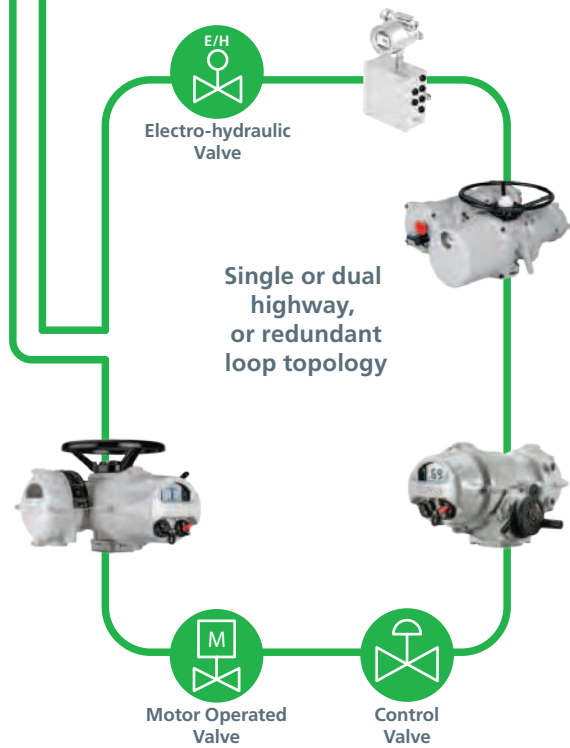
## rotork® Master Station



### Pakscan™ CLASSIC 2-Wire Current Loop



### Modbus® Including 3<sup>rd</sup> Party Field Devices



## Client Support and Site Services

# rotork®

Rotork products are recognised as the best-in-class for reliability and safety in the most demanding applications. To maintain this hard-earned leadership position, Rotork is committed to helping clients maximise the continuous, fault-free operation and working life of all their actuators.

With established worldwide service centres we are able to offer same-day or next-day service to the majority of our customers. Our Rotork factory trained engineers have skills in both multi-purpose and industry specific applications and carry spare parts and specialist test equipment with them. Our operations utilise a documented Quality Management system established in accordance with ISO9001.

Rotork aims to be your number one choice for taking care of fault diagnosis, service repairs, scheduled maintenance and system integration needs.

See [PUB056-013](#) for further details.

Rotork has expertise and specialist knowledge of every aspect of flow control.

Our service solutions increase plant efficiency and reduce maintenance costs.

Workshop services return equipment to as-new condition.



## Client Support and Site Services

### Global Service and Support

Rotork understands the value of prompt and punctual customer site services and aims to supply our customers with superior flow control solutions, by providing high quality, innovative products and superior service – **on time, every time.**

Whether you have an actuator requiring on-site servicing, a custom design service requirement or a new actuator installation, we can deliver the fastest turnaround with the least plant disruption.

### Accreditation and Assurance

Rotork is accredited with all major safety authorities around the world, providing our clients with reassurance and peace of mind.

Rotork's engineering teams are experts in the design and implementation of actuation solutions for all circumstances and environments. Our global knowledge base draws upon previous installations and environmental situations.

Our track record and commitment to undertaken engineering projects is second to none. Rotork is trusted by major utility and industrial companies to design, install and maintain their actuation stock. We keep their plants operating at peak efficiency, helping them to be more profitable and at the same time meet ever tightening industry watchdog requirements.

Using accredited project managers we have the knowledge and expertise to design, build and install any standard or custom actuator installation for you, on time and in budget.

### Asset Management

Rotork is a corporate member of the Institute of Asset Management, the professional body for whole life management of physical assets.



***Giving You Peace of Mind,  
Guaranteed Quality and  
Improving Your Site Efficiency***



### Actuator Workshop Overhaul

- Supporting Rotork and non-Rotork products
- Workshop facilities including torque testing and re-coating
- Large OEM stock in all workshops
- Fully trained and experienced service engineers
- Loan actuator facilities

### Field Support

- Site repairs and commissioning
- Upgrades
- Fault finding and maintenance
- Call-out with fully equipped service vehicles

### Client Support Programme (CSP)

- Select a level of service tailored for you – gold, silver or bronze
- Improves production throughput
- Reduces the cost of maintenance year-on-year
- Allows customers to manage the challenge of 'Risk vs Budget' in maintenance operations
- Lifecycle management includes planned and predictive maintenance with a focus on equipment reliability and availability as well as asset management
- Generated reports detail cost savings and performance improvements

### Planned Shutdown Support

- Preventative maintenance
- On-site overhaul and testing
- OEM spares and support
- Support for Rotork and non-Rotork products
- Achieve tight shutdown return to service targets
- Project management and supervision

### Valve Automation Centres

- Actuator upgrade
- Manual valve automation
- Control and automation
- System integration

# rotork®

[www.rotork.com](http://www.rotork.com)

A full listing of our worldwide sales and service network is available on our website.

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Rotork is a corporate member of the Institute of Asset Management



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