

# 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 infrequently or continuously, Rotork products will operate reliably and efficiently.

### › Quality-driven global manufacturing

We offer products that have been designed with over 60 years of industry and application knowledge.

Our research and development ensures cutting edge products are available for multiple applications across multiple industries.

### › Customer focused service and worldwide support

Rotork solve customer challenges and develop new solutions that are tailored to the needs of our clients.

We offer dedicated, expert service and support from initial inquiry, to product installation, to long-term after sales care.

### › 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

Rotork products offer improved efficiency, assured safety and environmental protection across sectors such as the Power, Oil & Gas, Water & Wastewater, HVAC, Marine, Mining, Pulp & Paper, Food & Beverage, Pharmaceutical and Chemical sectors.

## Market leaders and technical innovators

We have been the recognised market leader in flow control for over 60 years.

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

## Global presence, local service

We are a global company with local support.

Manufacturing sites, service centres and sales offices throughout the world provide unrivalled customer services, fast delivery and ongoing, accessible support.

## Environmental Social and Governance is at the heart of our business

We have a range of policies in place that support our performance across environmental, social and governance topics. The majority of our policies are publicly available.

# Comprehensive solutions for modern plant control and monitoring

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

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 is 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.

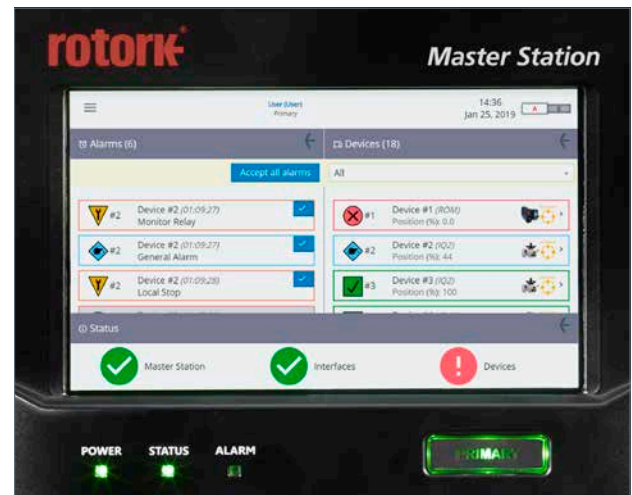
### Up to three field networks on one Rotork *Master Station*

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.

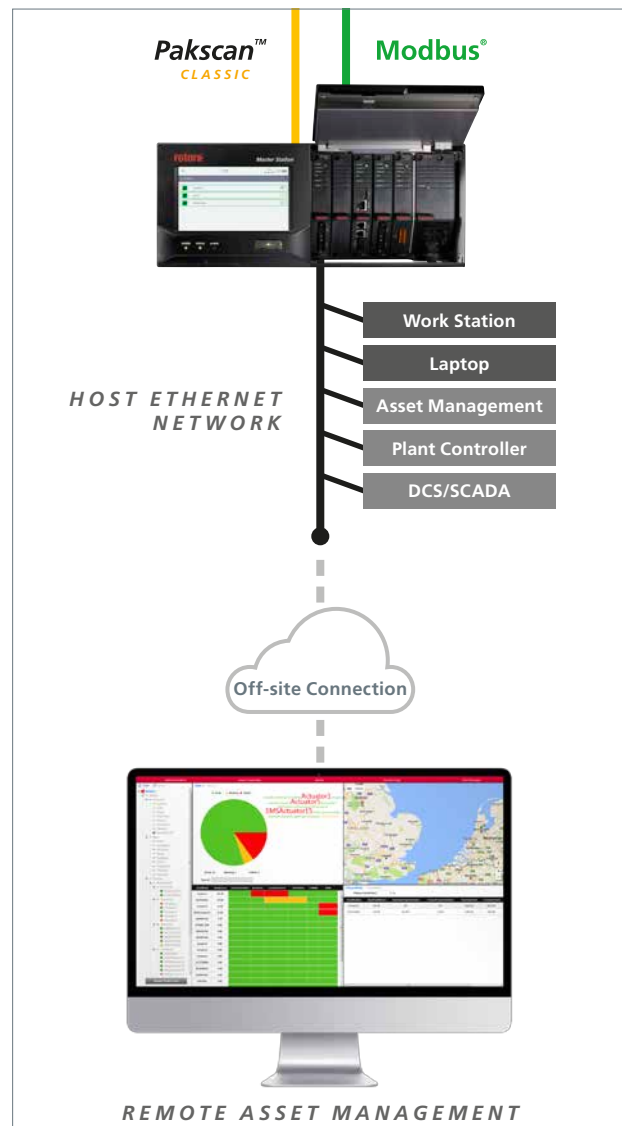
### Asset management and data logging

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 Site Services

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 offers 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 network



### ■ 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

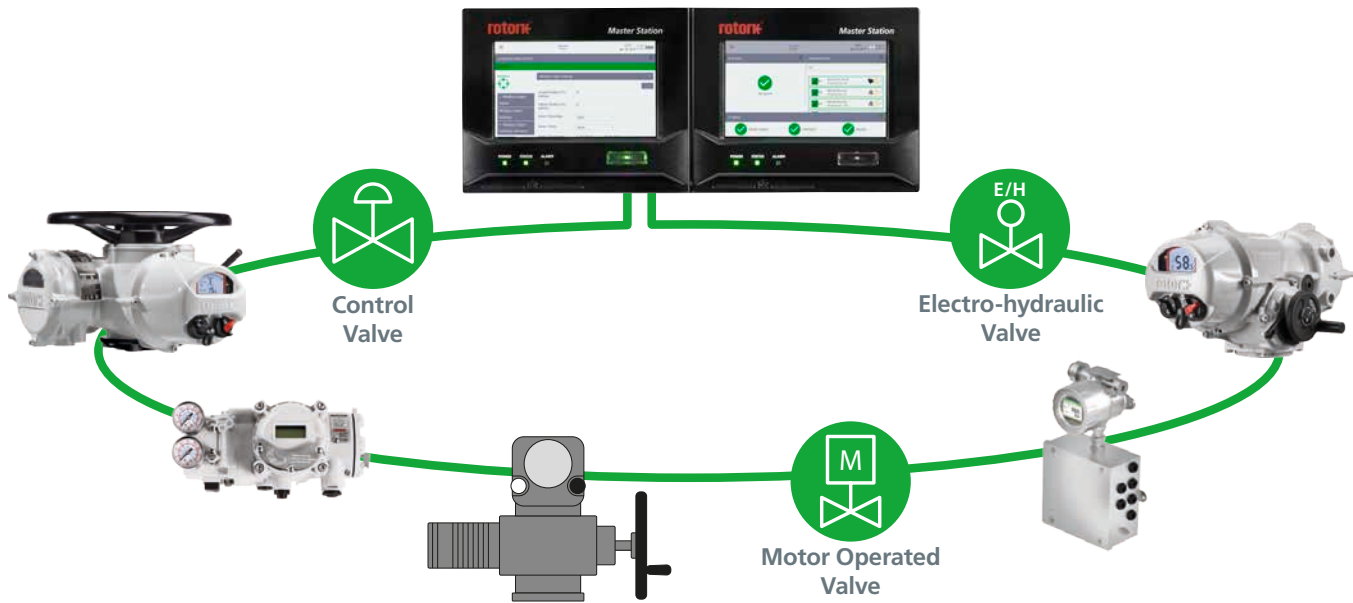
Actuators can be used as a hub or a dedicated General Purpose Field Control Unit (GPFCU) can also be used as digital and analogue I/O, providing the interfaces to connect other actuator types and additional plant control devices into the network.

# 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 network



### ■ 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.

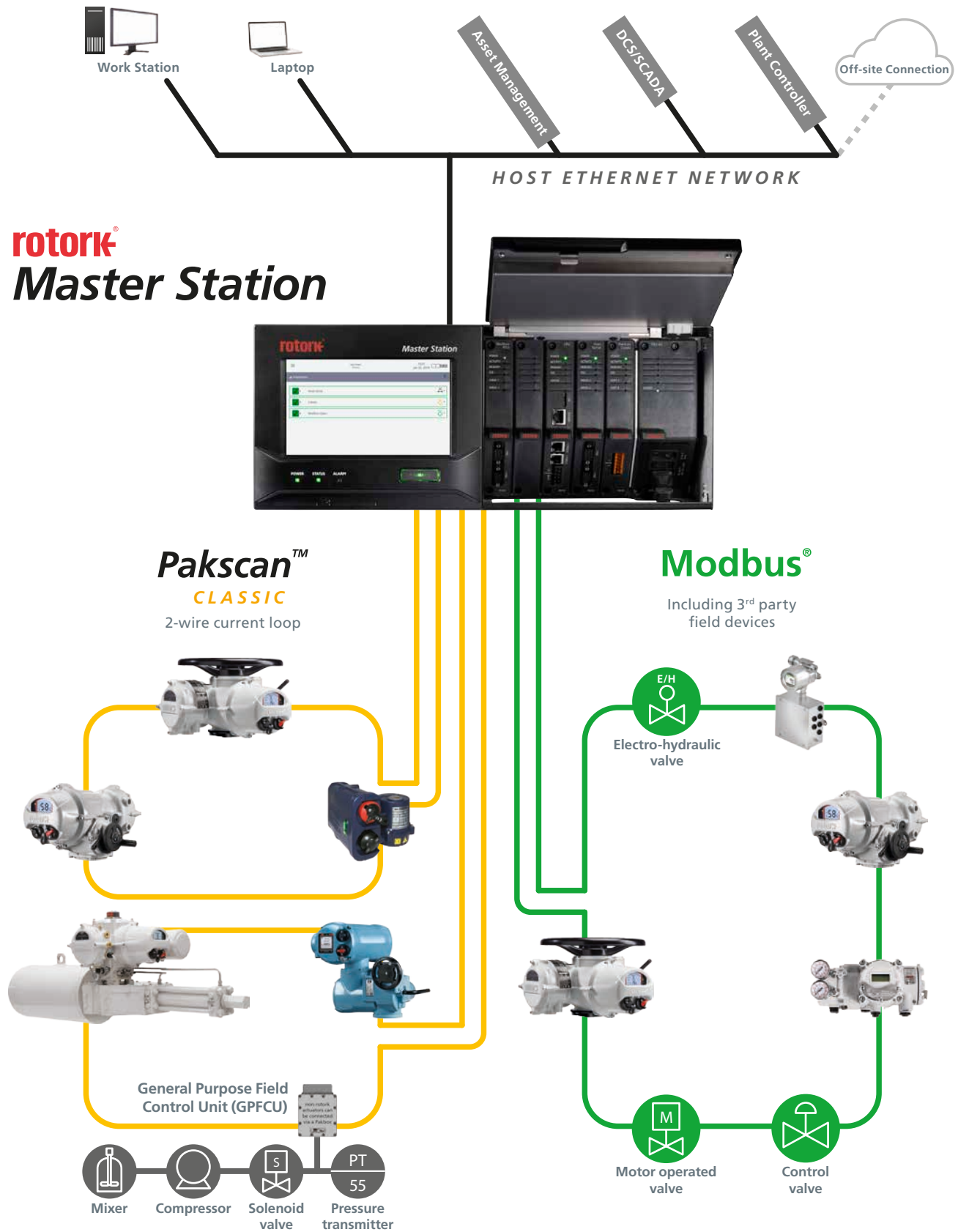
#### Additional devices

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 Site Services

Rotork understands the value of prompt, punctual and superior site services. Rotork Site Services have specialist expertise, insight and experience in service support for mission-critical flow control and instrumentation solutions for oil and gas, water and wastewater, power, chemical process and industrial applications. We offer global frontline support backed by dedicated in-house experts.

Our service solutions increase plant efficiency and reduce maintenance costs, while workshop services return equipment to as-new condition. Our experience and understanding of the flow control industry means we have extensive insight and ideas of what we can do to provide significant value to our customers and their operations.

Rotork Site Services is comprised of two main areas; Lifetime Management and Site Services. Lifetime Management is the suite of services within Rotork Site Services which help you manage the risk associated with aging assets and includes our Reliability Services offering. Site Services comprises essential actuator service, repair, maintenance and upgrades.

Rotork has specialist expertise, insight and experience in flow control.

We provide insight into how we can deliver value to our customers.

Our service solutions increase plant efficiency and reduce maintenance costs.



## Rotork Site Services

### Lifetime Management

The services available within Lifetime Management offer a complete solution to managing the risks associated with the life cycle of your equipment and their obsolescence (which compromise reliable performance and valuable uptime).

The aim of Lifetime Management is to provide you with constant support and minimum- to- no disruption to your production flow. It is a customisable service, offering designed to seamlessly maintain and improve your assets. We manage the inherent risks associated with advances in technology, component obsolescence and ageing equipment for you. We are committed to helping customers maximise the continuous, fault-free operation and working life of their actuators. Supporting the continuous and reliable operation of your plant allows for improved performance and increases in valuable uptime.

#### Lifetime Management covers:

- Reliability Services
  - Basic - health check
  - Standard - planned maintenance
  - Premium - enhanced maintenance
- Upgrade services (retrofit)
- Planned shutdown support
- Life cycle services
- Overhauls/refurbishment
- Customised spares programme
- Intelligent Asset Management (iAM) reporting



### Site Services

Site Services provides the essential on-site actuator service, repair, maintenance and upgrades as part of our service offering, plus the commissioning of new actuators and applications. It includes off-site work completed at a Rotork support centre including recertification, automation, testing and product selection.

Our decades of experience in the industrial actuation and flow control markets means that customers can rely on us to understand their problems and to deliver reliable, economic solutions. Rotork's talented and experienced engineers have an in-depth understanding of the problems that are faced in the field and they know how to fix them.

On sites where providing evidence of valid asset certification is a legal requirement, Rotork engineers can carry out the necessary OEM level inspections and provide the statutory paperwork to comply with regulations.

- Field support
- Planned shutdown support
- Actuator workshop overhaul
- Valve automation services
  - On-site
  - Off-site
- Global support



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[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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