

SMARTLINK® MRV

Intelligent MICRO-RATIO® Valve Series



- **Precise and repeatable flow control** optimizes fuel efficiency, enables accurate temperature control and lowers burner emissions.
- **SMARTLINK® MRV is an electronic parallel positioning system** for air/fuel ratio control; for use in industrial applications providing a high degree of precision, repeatability and durability.
- **Synchronous control** of up to four valves with conventional signal from the user's process controller.
- **Direct coupled valve and actuator assembly** includes weatherproof housing with integrated position feedback and heavy duty planetary gearheads for reliable, long life operation.
- **Compact, robust design** mounts in any orientation.
- **Each SMARTLINK® Valve is adjustable** to 0.1 degrees accuracy.
- **UL and CE approved** electronics and software for air-fuel ratio control
- **Stores a 22 point user-customized profile** for each valve.
- **Factory Mutual (FM) approved** as non-incendive for Hazardous Locations Class I, Division 2 and ATEX and IEC Ex approval; standard actuator is also NEMA 4X, Class II, Division 2 approved
- **Maintenance-free operation**; no lubrication required. No valve packing to adjust.
- **Electronic passcode protection** eliminates valve profile tampering.
- **Simple set-up**; no PC required.
- **Standby, purge and light off positions** can be defined independent of valve profiles.

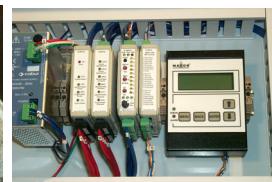
Product Description

The MAXON SMARTLINK® MICRO-RATIO® Valve (MRV) is an industrial parallel positioning system for combustion applications providing a high degree of precision, repeatability, tamper resistance, and durability. In addition, SMARTLINK® MRV interfaces with all burner management and flame safety systems, simplifying retrofit applications. The system is simple to set-up and does not require a personal computer in the field for commissioning.

SMARTLINK® MRV includes 1, 2, 3, or 4 Valve Actuators directly coupled to flow control valves, and a Control Interface unit which serves as a commissioning interface and "gateway" between the Valve Actuators and the user's process controller, PLC, or distributed control system (DCS).

The SMARTLINK® **Valve Actuator** design is an industrial, factory-calibrated assembly. It incorporates a precision, planetary gear-head with integrated position feedback and a stepper motor for continuous duty control of various valves. Each valve actuator is powered by 24VDC and includes a digital position control loop and a digital interface that ensures reliable operation even in electrically noisy environments. The small footprint, weatherproof enclosure and Class I, Division 2 approvals, and superior position control performance make this product a high performance, cheaper alternative to pneumatic equipment.

The SMARTLINK® MRV **Control Interface** is a DIN rail-mounted digital hub that electronically "links" and synchronizes valve movement for precision air/fuel ratio control. Front-mounted switches and indicators are provided for displaying alarms, system configuration, and valve characterization. The Control Interface also provides a precision 4-20 mA firing rate feedback signal. Optional equipment includes MAXON Relay Input and Output Interfaces, a User Display, universal power supply, factory-wired panel assemblies, and several NEMA 4X enclosures.



SMARTLINK® gas butterfly valve (left), air butterfly valve (center) and ball valve (right) assemblies

Inside view of SMARTLINK® Actuator, showing planetary gearheads

Control Interface with optional User Display, Relay Input, Output and Network Interfaces in pre-wired panel assembly

Typical applications

SMARTLINK® MRV is designed for precision control of industrial combustion systems, boiler combustion systems, and related heating process flows. The rugged industrial package adds value to many heating and manufacturing processes by providing highly accurate, characterizable flow control with enhanced, digital intelligence.

Typical applications include:

- Simple burner ratio controls
- Low NOx and low CO burner controls
- Control of combustion systems on processes sensitive to products of combustion
- Control of complex burners with staging or flue gas recirculation
- Precise control of process flows like feed water, atmosphere gases, and even product feeds
- Accurate flow control of metered processes and process heaters for liquids and gases

Design and Application Details

Principle of Operation

The SMARTLINK® MRV System synchronously positions 1, 2, 3, or 4 valves with 0.1-degree precision and repeatability. During ignition sequencing, SMARTLINK® works with the user's burner management system to drive the system to user-defined standby, purge, and light-off positions. After burner ignition, the user's process (or temperature) controller drives SMARTLINK® MRV with a 4-20 mA firing rate command.

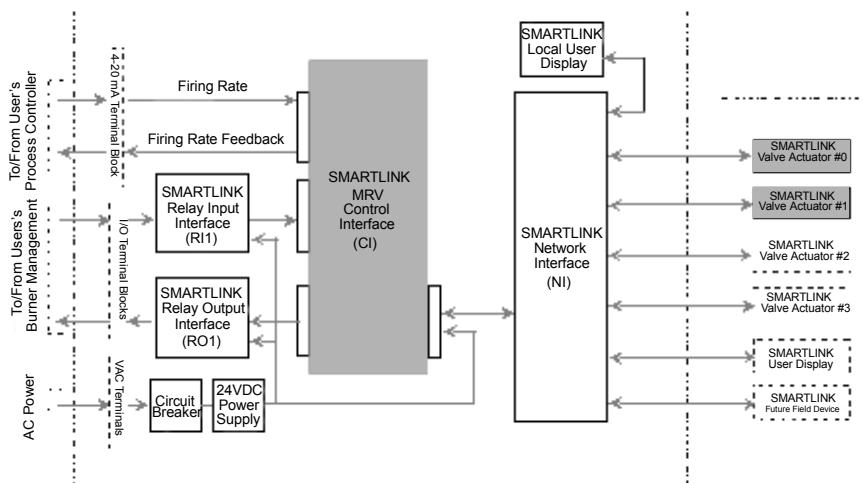
The Valve Actuators perform a high-speed control loop to achieve their position setpoints without overshoot. Valve positions are continuously transmitted digitally by the valve actuator over the communications network to the control interface for verification of proper valve position. The control interface also provides a 4-20 mA output signal that represents actual burner firing rate for process monitoring. This 4-20 mA output is also used to indicate the actual position of the valve selected during the commissioning process.

The Control Interface stores a 22 point, user-commissioned position profile for each valve and translates the firing rate command into synchronized, digital position commands that are sent to the Valve Actuators over a dedicated communications network.

The SMARTLINK® MRV Control Interface also includes a set of switches and indicators to allow the following functions:

- 1) Customize the position profile and commission each valve for precision burner tuning
- 2) Display the operating mode of the system and indicate alarm/fault codes
- 3) Display and change system operating parameters (such as loss of signal operation and valve speed)
- 4) Electronically lock the device to prevent tampering
- 5) Locally control burner firing rate in a manual mode

An optional User Display with a 4-line x 20-character LCD is available to easily commission the system locally or hundreds of feet away near the burner or field instrumentation. The User Display shows all alarm and fault conditions (as text messages), time stamps the last 6 shutdown events, performs system/valve maintenance functions, stores up to 5 system profiles, and restores the system profile if the Control Interface is replaced.



Notes:

1. Non-shaded blocks indicate optional MAXON-supplied equipment
2. Shaded blocks indicate SMARTLINK® MRV required components