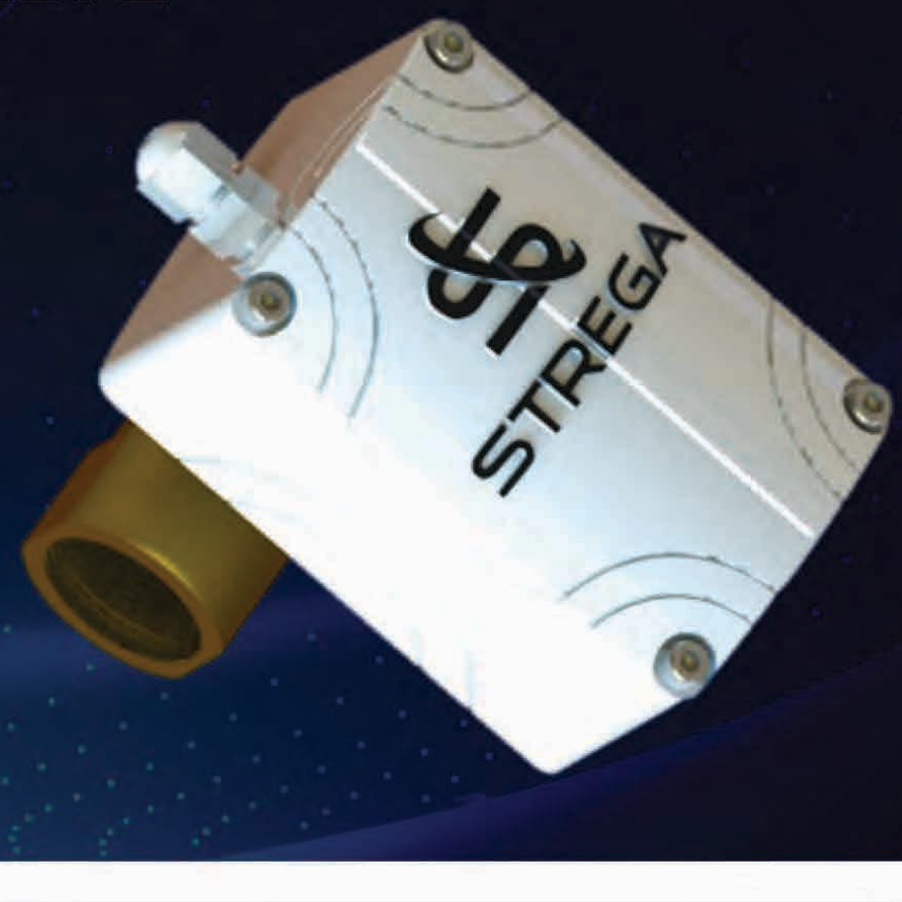
STREGA

EXTREME RANGE WIRELESS SMART-VALVE

www.stregatechnologies.com

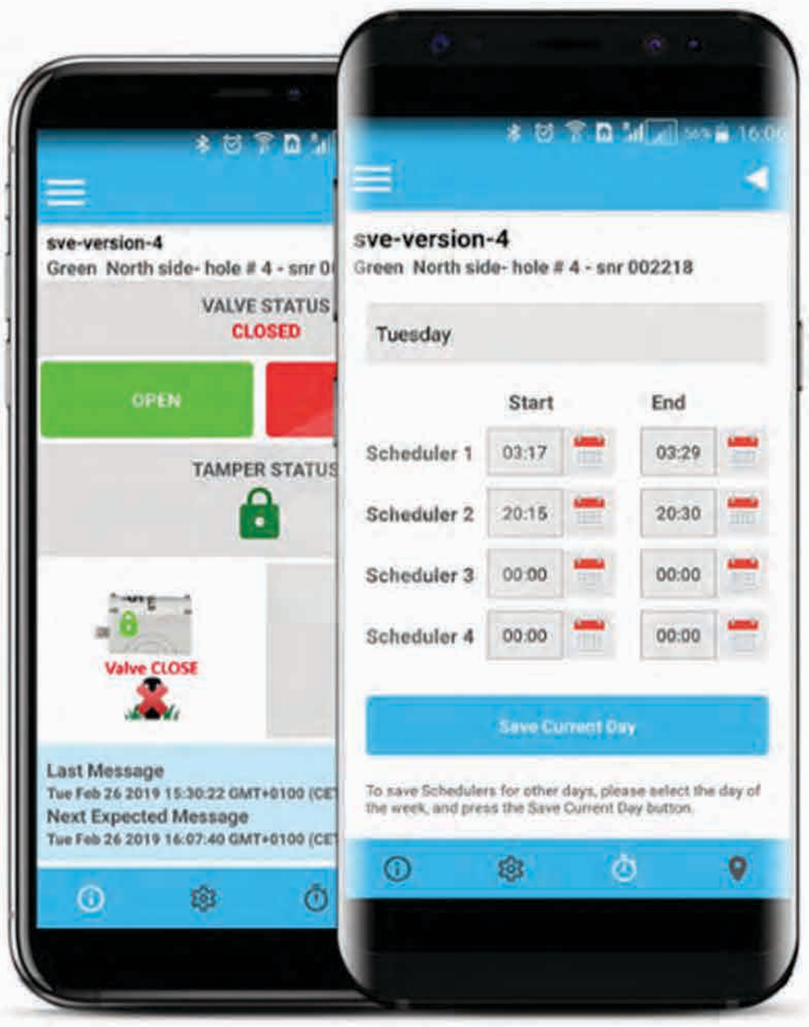
EXTREME RANGE WIRELESS SMART-VALVE

- Extreme range links: 15+ km Line of Sight, 2+ km in urban area, 12+ floors inside buildings
- Ultra-low consumption with 10+ years autonomy
- From 1/8“to 3” pipe size
- Fits many fluids, compressed air and gas
- Industrial grade (high temp and pressure)
- Secure operation with top-down encryption (AES128 + VPN)
- Fraud resistant with tamper
- License free operation (no SIM card required)
- IoT ready (compliant with all Internet of Things platforms)



The **STREGA LoRaWAN wireless smart valve** allows Water Utilities and Property Managers to eliminate manual shutoffs at customer locations. It provides a secure and immediate solution to remotely turn water service off/on at those services lines that are either difficult to reach, or where the utility is looking to reduce the costs associated with expensive back and forth of maintenance personal to customer locations.

STREGA LoRaWAN wireless smart valve is an all-in-one battery-operated valve with embedded **LoRa LPWAN** wireless technology. With its ultra-low-power consumption, the valve can operate on batteries during 10+ years. It communicates over extreme long distances with an exceptional obstacle’s penetration.



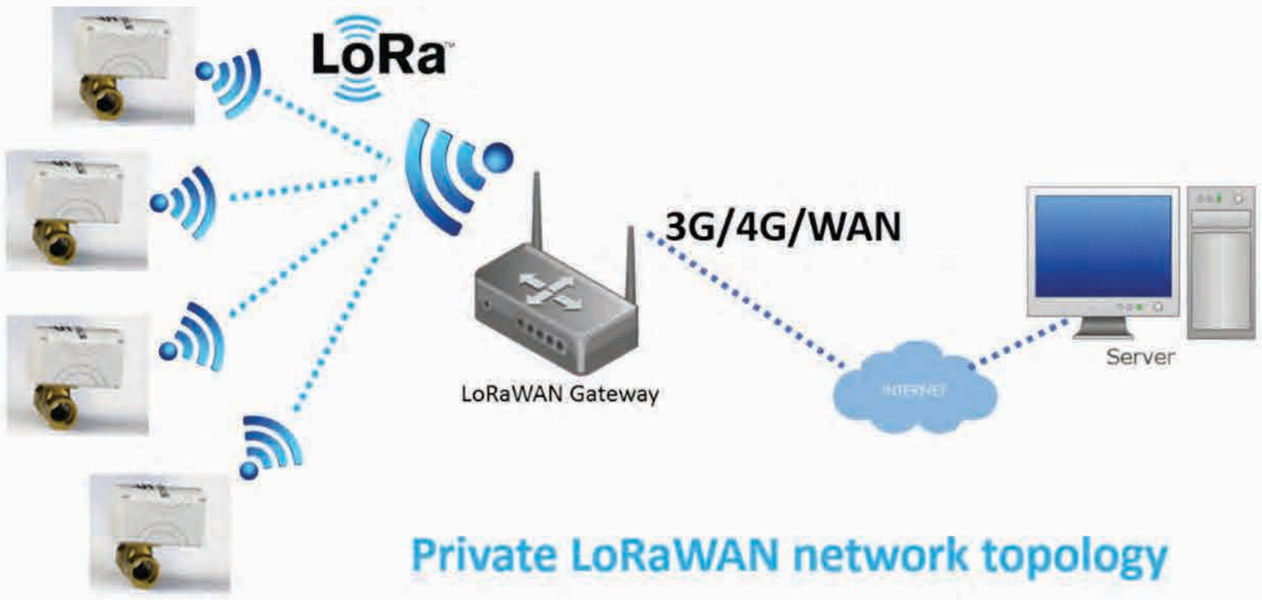
Operate your valve securely from your smartphone

- **Extreme range links:** strong signal penetration (even within urban area or inside buildings)
- **Low consumption:** ultra-low power with 10+ years autonomy
- **Smart operation:** abnormal flow or leak detection can trigger closing of the valve
- **Automatic operation:** Open/Close can be performed at programmed intervals
- **Industrial grade:** brass design with high pressure operation
- **High and Low temperature:** fluid can be up to 140°C (284°F)
- **Exclusive design:** mechanical parts are never in contact with the fluid to avoid any possible corrosion
- **Tampering:** any misuse is immediately reported to the gateway
- **Multi-dimensions:** available from 1/8” to 3” pipe size
- **Private and Public networks:** LoRaWAN 1.02 compliant
- **Mobile Control:** operate your valve from your smartphone

LoRaWAN™

LoRaWAN Wireless Technology

The STREGA smart valve is benefitting from the latest Industrial IoT wireless techniques: STREGA has selected LoRaWAN technology which provides ultra-low consumption as well as extreme range signal propagation. While other wireless technologies like Bluetooth©, ZigBee©, WIFI, Wireless M-Bus or even Cellular are either greedy in energy or require repeaters to operate on sufficient distances, LoRa gives years of autonomy and exceptional obstacles penetration, even inside a building.



Private LoRaWAN network topology

The **STREGA Smart-Valve** can run on private as well as public operated LoRaWAN network. Following strictly the LoRaWAN 1.02 standards, it complies with any good indoor or outdoor LoRa gateways such as MultiTech, CloudGate, Kerlink, Cisco, Gemtek, Lorix One, Tektelic, EveryNet, MatchX and many more...

Working with public LoRaWAN Operators and Network Servers, the technology will provide a seamless integration on more than 100+ LoRa infrastructures such as Orange, Comcast, Senet, Objenious, Du, Ooredoo, Meshed, NNNCo, ThingPark Actility, LORIOT, TTN, Digita, ElevenX, Du, Lattelecom, X-Telia, among many others...

LoRaWAN network Operator topology

The Valve

STREGA is using state-of-the art valves that are produced for various industrial fields where the control of fluid is necessary.The high quality of the raw materials used, the precision of the parts, the hard tests carried out during manufacturing process and final testing, together with the large monthly quantity of valves produced are a guarantee of reliability. The unique design of the STREGA smart valve has been carefully studied to ensure ultra-low power requirements as well as high pressure operation.



Applications

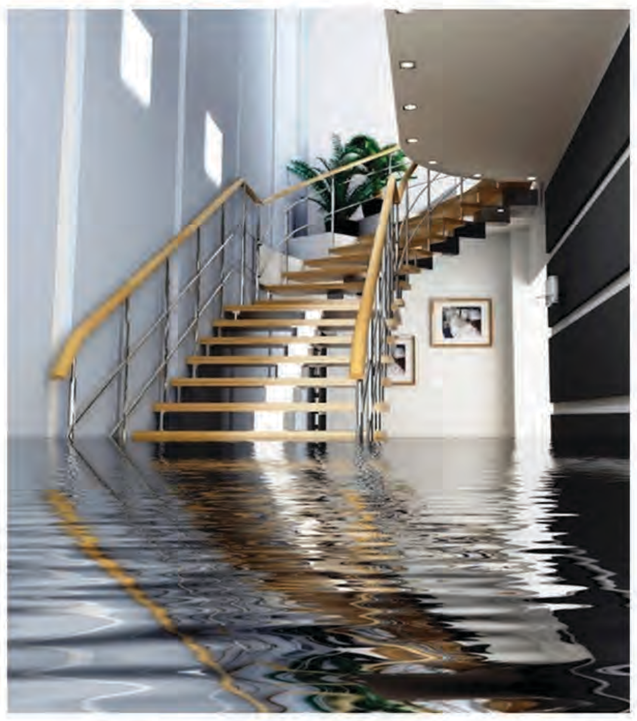
Water Distribution

STREGA LoRa wireless smart valve can help water municipalities to optimize their network by remotely closing pipes before water is reaching users. It makes even more sense at entry points: a Control Center can switch off a valve when a customer is not paying his water usage bill, rather than sending an operator for a manual close (then again for reopening the valve...). A smart management of Open/Close operations can even be performed automatically by the SCADA center when a bill is paid.

Future smart cities require smart utility meter devices. One particularly challenging part is to associate water meter in combination with automatic valve closing. While water meter manufacturers have adopted low power wireless M-Bus technology long back, none of them have looked at its direct counterpart: the valve. At many places, there is no energy supply available, so devices need to be battery powered. In many countries worldwide, new environmental legislations require the utility companies to take active measures against wasting water in case of leaks.

Leak Detection

Water utilities might not often think of it, but water leaks contribute to a significant portion of home repair costs each year.



Floods and water damage can be stressful and costly for everyone.

There are many causes of water damage including things like household flooding, faulty plumbing, appliance failures, leaky fixtures, and irrigation system problems. While many people underestimate the risk of water damage to their homes, statistics from the insurance industry cast a light on the reality of how water can impact what is, for most people, the largest financial investment they will make in their lifetime.

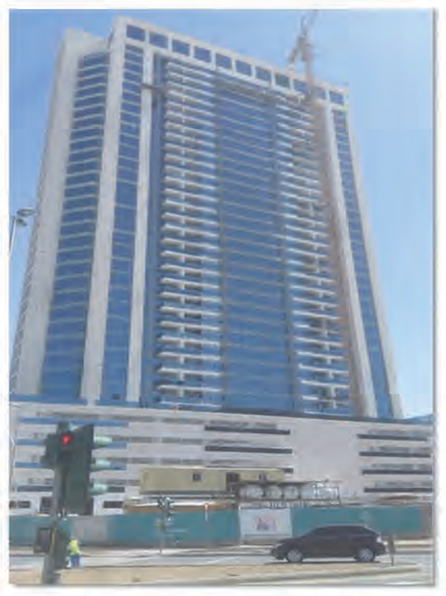
Water leaks that cause damage may be more insidious than is initially obvious. A water line crack as small as 1/8 of an inch can leak as much as hundreds of liters/gallons of water daily.

Combining the STREGA Valve with wireless leak sensors or more sophisticated calculations coming from water meter values will prevent further damages by shutting off mains before it is too late.

District Cooling

STREGA LoRa wireless smart valve can help District Cooling companies to shut down cooling water supply in secondary side chilled water distribution. A Control Center will command the operation of the valve remotely and switch it off when a customer is not paying his chilled water usage bill, rather than sending an operator for a manual close (then again for reopening the valve...).A smart management of Open/Close operations can even be performed automatically by the SCADA center when a bill is paid.

An abnormal usage of cooling water can nowadays be detected from the BTU meters at Control Room level. This can trigger an automatic shutoff of the valve at remote location without the need to send maintenance personal for this action.



This building has 546 x Smart--Valves installed using wireless LoRaWAN: chilled water at 5°C is supplied to tenant's fan coil units (FCU)

District Heating

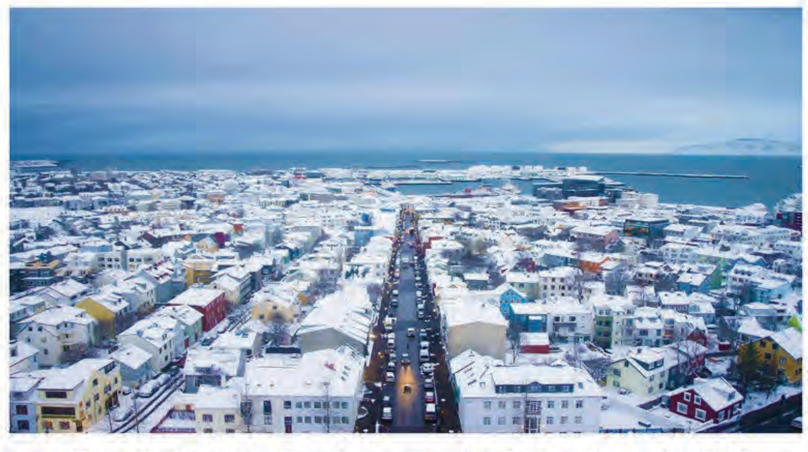
District heating (also known as heat networks or teleheating) is a system for distributing heat generated in a centralized location for residential and commercial heating requirements such as space heating and water heating.

The **STREGA LoRa wireless smart-valve** can help District Heating companies to shut down warm water in an unoccupied building to save heating energy or for maintenance purposes. A Control Center will command the operation of the valve remotely.

District heating is a heating system consisting of a pipe network, filled with hot water, and heat sources (from residual heat or a heating plant). The hot water is circulated by pumps, from the heating plant to the client and back again to the heating plant. A heat exchanger at the customer transfers the heat from the district heating network to the building's own heating and hot water systems. The return water continues out through the return pipe and is pumped back to the heating plant, where it again is heated.

The temperature of supply water ranges from 65-120°C and return between 25-75°C. The most common methods of producing hot water for a district heating system are geothermal heat, heat pumps, gas or oil combustion, cogeneration, electric boilers, biomass plants, etc.

The **STREGA Smart-Valve** can operate warm water up to 140°C (280°F) making remote shutoff seamless, even at these hot temperature levels.



District heating has become the favored method of heating in many cities in Europe like in Reykjavik, Iceland.

Automatic Network Flushing

The **STREGA LoRaWAN smart valve** contains a real--time clock with embedded programmable schedulers: each valve can activate opening or closing of the valve at dedicated period and timing.

A STREGA Smart-Valve installed below ground surface into a chamber for automatic pipe flushing

The automatic flushing is carried out without human presence and at preprogrammed intervals by performing the opening and closing operation to drain the water to the river or the rainwater network.

But there are even more burning issues, as some urban service providers still have a low network penetration and are unable to provide continuous 24-hours a day supply to their existing customers. As a result, many urban dwellers are forced to rely on more expensive alternatives such as private wells or boreholes, where they face heightened risks of potential contamination while paying much more per cubic meter of water than they would if they had access to functioning piped water supply networks. The STREGA smart-valves can be turned off automatically at certain periods of the day allowing the network to cope with optimum pressure and flow per district to district.

It is not sufficient to have the chance to own an excellent resource to distribute quality water. Slowing the flow, or stagnation of water in different parts of a network is a recurring problem for many water utilities: it is complicated to store water without altering its qualities. A network of very old pipes or a poorly designed network destroys this splendid original gift ... Only regular purges can evacuate contaminations. Problems associated with water quality degradation are particularly acute with dead-end or cul-de-sac lines and low-demand portions of water distribution systems.

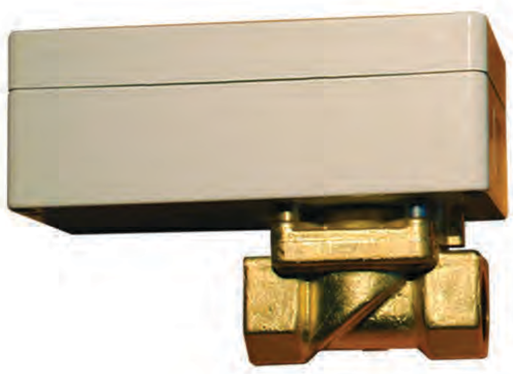
Automatic purge is a method of circulating the water in a network and to avoid stagnation on branches that are not very stressed, a source of contamination by the time of exposure to the various deposits that are bacterial vectors.

With its imbedded schedulers, the **STREGA LoRaWAN smart valve** can automatically drain lines to maintain water quality in a non-meshed network arm.

DN80 (3”) “all-in-one” edition

DN65 (2”1/2) “segregated” edition

DN20 (3/4”) “segregated” edition



DN20 (3/4”) “all-in-one” edition

*The **STREGA Smart-Valves** are available in “all-in-one” or “segregated” form factors. In this case, the maximum cable length between the valve and the LoRaWAN enclosure is 20 meters (65 ft).*

SPECIFICATIONS

Product ID	*Extreme range wireless LoRaWAN valve*	*Smart Operation*	*Preloaded schedulers, automatic Open/Close on DI conditions, etc.*
Body and cover	*brass*	*Radio technology*	*Standard LPWAN LoRaWAN 1.02 Class A& C with no proprietary overhead – star-of-stars topology*
Armature, plunger and core	*Stainless steel*	*Range*	*>15 km LOS (line of sight) >2 km in urban environment >22 floors inside building*
Seal material	*NBR-FPM-EDPM*	*Encryption*	*128-bit AES enhanced 3-levels encryption keys*
Max. fluid viscosity	*25 cSt (mm²/s)*	*Max. SV per gateway*	*128-1000 depending on duty cycles*
Max. allowable pressure	*DN10 to DN32: 25 bars (PN25) DN40 to DN65: 20 bars (PN20)*	*Max. smart-valves per project*	*not limited (each valve has a unique ID key)*
Min.differential pressure	*0.15 bar*	*Frequency(License free)*	*EU868 (Europe, Middle East), US915 (North America) AS923 (Australia, NZ, Asia,...)*
Max. differential pressure	*10 bar*	*Maximum output power*	*+18.5dBm*
Threads	*BSPP or NPT*	*Data rate*	*290 bps – 50 Kbps*
Fluid t°	*-10°C...+55°C / 14°F... 131°F (NBR) -20°C... +140°C / -4°F... 284°F (EPDM)*	*Data Read*	*Valve Open/Close status – battery level – device ID – enclosure tampering,analog value, alarm, RSSI...*
Working t°	*-20°C...+70°C / -4°F...158°F*	*Data Write*	*Open/Close command – transmit frequency...*
Sections	*DN10, DN13, DN15, DN20, DN25, DN32, DN40, DN50, DN65, DN80 (from 1/8" to 3")*	*Tamper*	*Enclosure opening/closing immediately reported to the Concentrator*
Media	*Liquids, compressed air, oil-free or dry neutral gases*	*Inputs/Outputs*	*2 Digital Inputs (dry contacts) 1 Analog Input (0-10VDC) 1 moisture sensor input Ambient Temperature Ambient hygrometry*
Duty Cycle	*100% continuous rating*	*Power supply*	*Replaceable Lithium batteries and/or external 9-60VDC*
Manual override	*Press buttons for local Open/Close or via Magnet*	*Autonomy*	*10+ years**
Form factor	*All-in-one or segregated (with cable disconnection detection)*	*Antenna*	*Internal with +2.1 dB Gain*
IP protection	*IP68*	*Reference*	*STR-SV-DNxx (xx for section size)*

** battery life depends on Rx/Tx frequency and Open/Close frequency*

STREGA

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