EXTREME
RANGE WIRELESS
SMART-VALVE

STREGA

EXTREME RANGE WIRELESS SMART-VALVE

- Wireless battery-operated valve
- Ultra-low consumption with exclusive corrosion proof design
- Secure operation with top-down encryption (AES128 + VPN)
- 10+ years battery autonomy
- Fraud resistant with tamper
- License free operation (868MHz, 433MHz, 915-928MHz)
- IoT ready (compliant with all Internet of Things platforms)
- Bi-directional deep indoor wireless communication
- Extreme range links: 15+ km Line of Sight, 2+ km in urban area, 12+ floors inside buildings

The **STREGA LoRaWAN wireless smart valve** allows Water or District Cooling Utilities to eliminate manual shutoffs at customer locations. It provides a secure and immediate solution for operators 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 from the gateway/concentrator with an exceptional obstacles 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
- ➤ **Accurate:** Open/Close feedback resent to the gateway/concentrator
- ➤ **Top-down secure communication:** data are encrypted between valve and concentrator (AES128) and between concentrator and the Control Center (VPN)
- ➤ **Industrial grade:** brass design with high pressure operation
- ➤ **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
- ➤ **Mobile Control:** operate your valve from your smartphone

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.

A Gateway/Concentrator is required to filter and receive the signals coming from hundreds of smart valves while gathering and control the local devices. This Gateway will in return communicate in secure VPN or MQTT link to the main central Control Room for monitoring and control.

The **STREGA LoRaWAN smart valve** is communicating through standard LoRaWAN Class A 1.02 protocol with no extra proprietary overhead: it permits a seamless integration with any LoRaWAN gateway brands from the market: Cloudgate, CISCO, Multitech, Kerlink, etc.
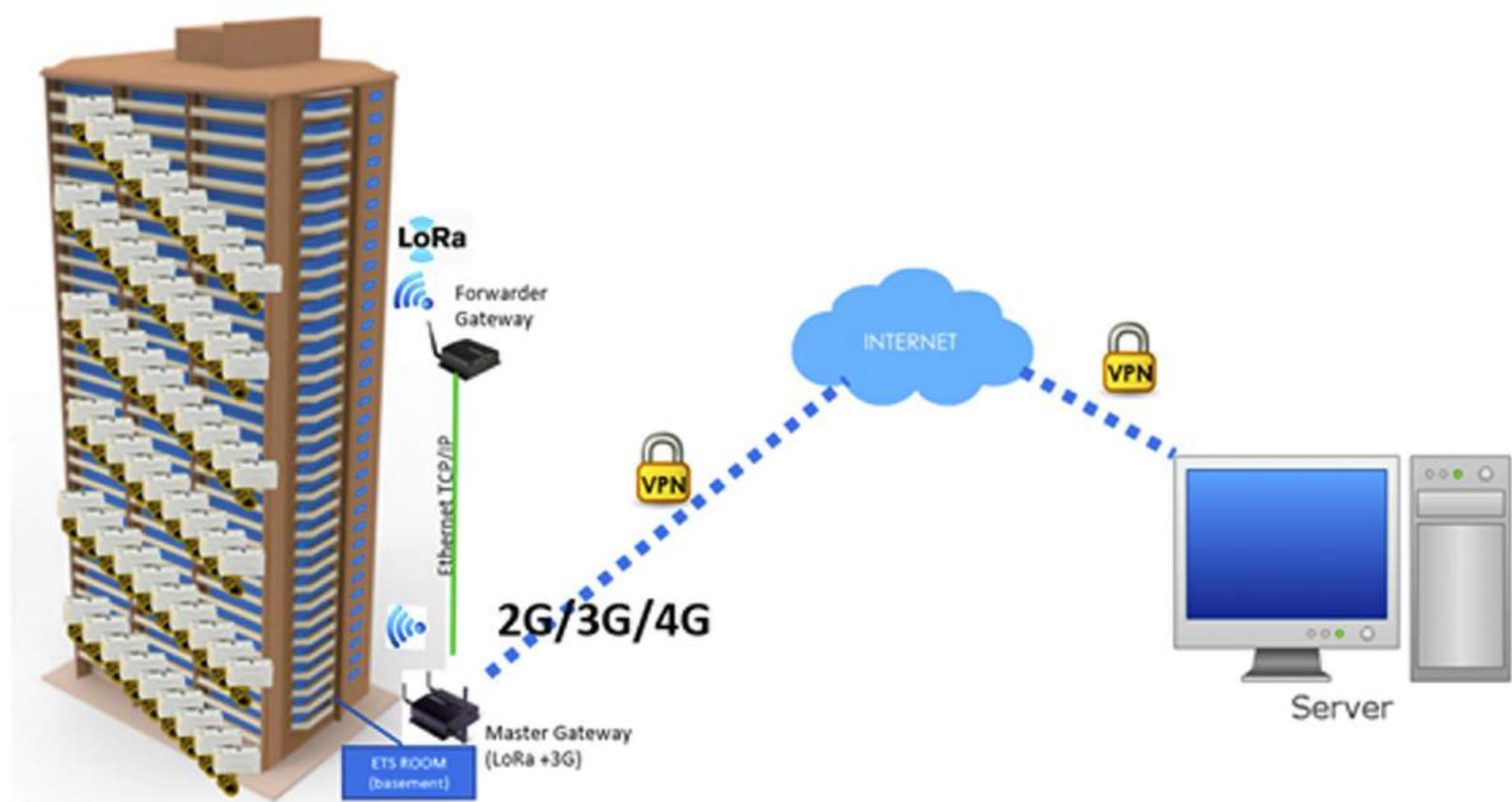
The valve

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

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.

SMART VALVE opens or closes water supply in a flat from a Control Center remotely

CONTROL CENTER — VPN — INTERNET — VPN — 2G/3G/4G — LoRa — AES128 — CONCENTRATOR — SMART VALVE

Water Municipalities

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 to avoid frozen pipes, leakage detection shutoff or for customers not paying their water usage.

Prepaid water and Network optimization

Some cities in the world continue to grow at historic rates and basic services like water supply and sanitation are struggling to keep up. Sparked by the continuing challenges experienced by water utilities to connect poor communities to their networks, and to recover the costs of water supply, there has been a notable surge of interest in the use and implications of pre-paid meters for water supply service provision. Customer can use water as much as the loaded credit and the valve will shut off the supply when the prepaid amount of water has been reached.

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.

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.

Automatic Network Flushing

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. Fire protection and land development codes often require oversized water mains which compounds the problem.

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.

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.

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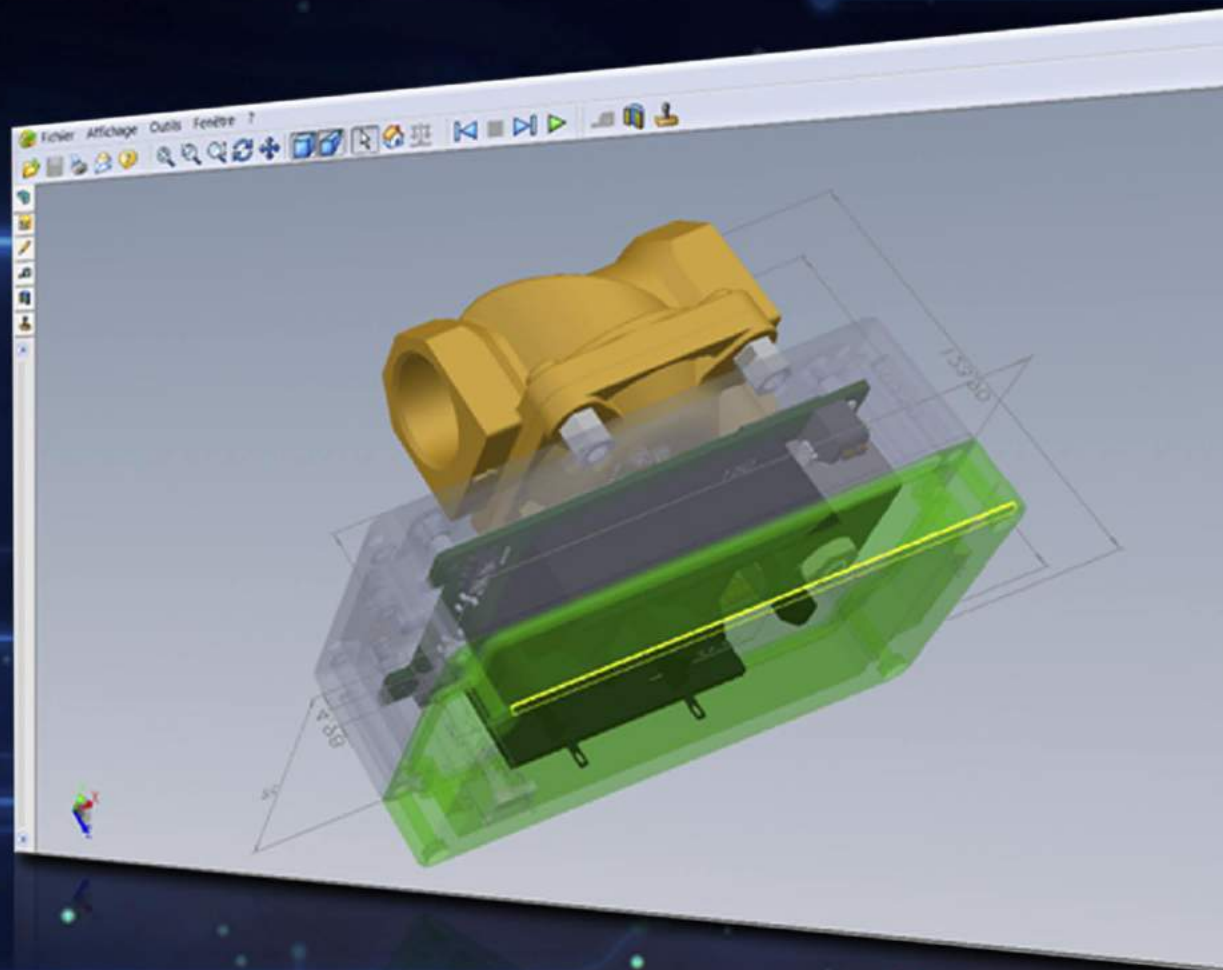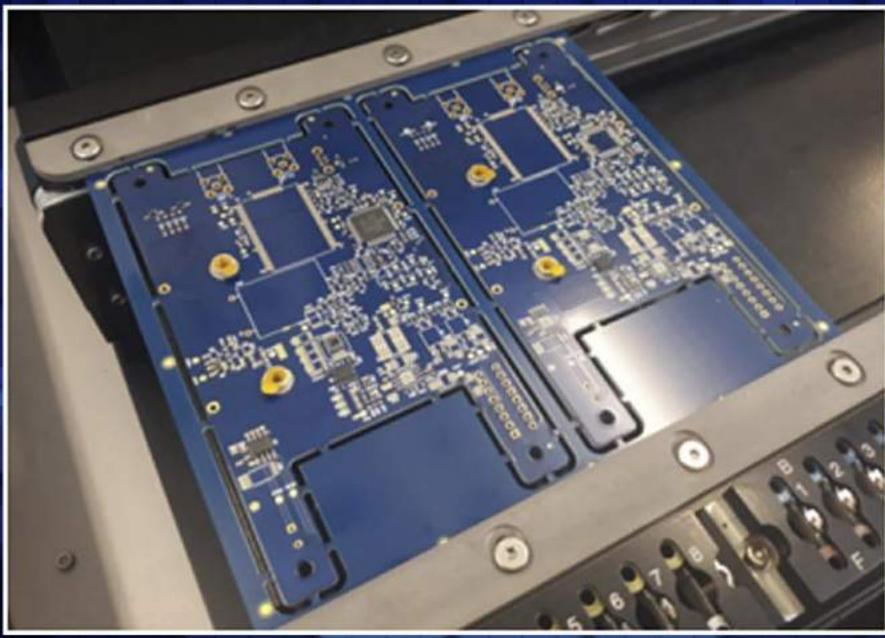
STREGA: IIoT specialists

Much is written about consumer IoT, but the Industrial Internet of Things (IIoT) is different and that is where STREGA is active.

STREGA has been created in 2011 by a team of IT and industrial communication specialists, having a long-time expertise in the Industrial Automation market. With more than 25 years of experience in SCADA and wireless communication business, the STREGA team is active in the development of advanced vertical electronics solutions.

STREGA ha tested its valves in real industrial environment to provide the very most reliable product on the market. And because we have acquired significant expertise in industrial automation and harsh environment operation, our smart valves are fully designed to match the highest constraints.

In the field of remote access and IIoT networks – where products are constantly improving – we are very much experts into latest generation communication: MQTT, LoRaWAN, VPN,...

Some of the most salient features distinguishing the Industrial Internet of Things (IIoT) from the consumer version are its need for ruggedized hardware devices, the unique connectivity and power requirements that its use-cases require, and its more sophisticated requirments for advanced cyber-security. IIoT is where STREGA is good at !

SPECIFICATIONS

Product ID	Ultra-long range wireless smart valve with deep indoor signal propagation	Smart Operation	Preloaded schedulers, automatic Open/Close on DI conditions, etc.
Body and cover	Brass alloy	Radio technology	Standard LPWAN LoRaWAN 1.02 Class A 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 >12 floors inside building
Seal material	NBR (Water at max temp. 70°C; Air with max temp. 90°C; Mineral oils and their derivatives, hydrocarbons; methane; ethane; propane; butane; kerosene & fuel oil)	Security	Unique 128-bit AES enhanced with 3-levels encryption keys
Maximum fluid viscosity	25 cSt (mm²/s)	Max. smart-valves per concentrator	128-1000 depending on duty cycles
Maximum allowable pressure	DN15 to DN32: 25 bars (PN25) DN40 to DN80: 20 bars (PN20)	Max. smart-valves per project	Not limited (each valve has a unique ID key)
Minimum differential pressure	0.15 bar	Frequency	License free 868 MHz, 433 MHz and 915 to 928 MHz (North America and Australia)
Maximum differential pressure	10 bar	Maximum output power	20dBm
Connection	G – ISO 228	Date rate	290 bps – 50 Kbps
Fluid t°	-10°C...+140°C	Data Read	Valve Open/Close status – battery level – device ID – enclosure tampering, flow meter, alarm, RSSI...
Working t°	-20°C...+70°C	Data Write	Open/Close command – transmit frequency...
Sections	DN15, DN20, DN25, DN32, DN40, DN50, DN65, DN80	Tamper	Enclosure opening/closing is immediately reported to the Concentrator
Media	Liquids, compressed air, oil-free or dry neutral gases	Power Supply	Lithium batteries and/or external (i.e. solar panel): 9-60-VDC
Duty Cycle	100% continuous rating	Autonomy	10+ years*
Manual override	Press buttons for local Open/-Close	External DI reading	Sealing gland (option)
Digital Inputs	Optional 2 inputs for leak detection, flow pulse counting, alarms...	Antenna	Embedded
IP protection	IP68 with optional transparent hard lube potting	Reference	STR-SV-DNxx (xx for section size)

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