



# PRODUCTS AND SOLUTIONS FOR WATER TREATMENT

- SURGE PROTECTION DEVICES
- SIGNAL CONVERTERS AND ISOLATORS
- DISPLAYS AND FRONT PANEL DEVICES
- ENERGY EFFICIENCY DEVICES
- DATA ACQUISITION
- PUMPS CONTROL
- DATALOGGING AND ALARM MANAGEMENT
- WIRELESS COMMUNICATION
- TELECONTROL AND SMART GRIDS
- REMOTE MAINTENANCE

# EFFICIENCY AND INNOVATION FOR WATER AND WASTEWATER TREATMENT





**SENECA** is an **italian company** specialized in electric and electronic interfaces manufacturing, present in the automation market for over 25 years. Thanks to its modern production lines and plants, based in Padova, the production has reached now a volume of hundreds of thousands pieces per year.

In **water treatment** SENECA can offer a wide range of products - one of the widest choice in the market – in relation to: **signal conditioning and protection**, plants **remote controls, data acquisition, energy efficiency and energy monitoring** applications.

**Remote control** devices allows plant managers to get **datalogging** of each field parameter, analysis of power network conditions, delivery of alarm **messages in case** of breakdown and faulty conditions, **data exchange** over different protocols, real time data transmission using 3G+ modem, VPN technology and multilevel password security. SENECA instruments provide value-added solutions in the entire water cycle applications, such as: **remote control of water withdrawal and pumping stations; management of uplift and treatment stations; distribution networks, relaunch wells, basins, booster plants and water towers supervision.**

SENECA devices can be easily integrated and connected to other international producers devices by means of technical standard and widespread protocols.

In this document you can find a summary of SENECA products and solutions, all available in our stocks.

For more info please consult our web site at [www.seneca.it](http://www.seneca.it) or our product catalogue.

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**DRINKING WATER  
TREATMENT CYCLE**



**WATER  
DESPATCHMENT**



**WASTE WATER  
TREATMENT CYCLE**

**IRRIGATION GRIDS**

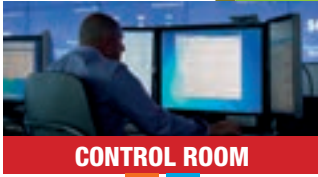
1 2 3 4

**TREATMENT PLANTS**

1 2 3 4

**WATER TANKS BOOSTER**

1 2 3 4



**CONTROL ROOM**

1 2

**WITHDRAWAL / PUMPING STATIONS**

1 2 3 4

# A WIDE RANGE OF PRODUCTS FOR WATER TREATMENT

## 1 - DATA ACQUISITION AND AUTOMATION

## 2 - INDUSTRIAL COMMUNICATION AND REMOTE CONTROL



I/Os remote systems with ModBUS, TCP-IP, CANopen protocol  
**Z-PC Series**



**Pump Controller S6001-PC**



**Datalogger / Alarm management MYALARM2, Z-GPRS2/3 Series**



**RTU Straton S6001-RTU, Z-MINI-RTU, Z-PASS2-S**



**IEC 61131 / Process CPU Z-TWS4, Z-TWS11, Z-TWS5, Z-FLOWCOMPUTER**



**HMI Human Machine Interface VISUAL, Display S401**

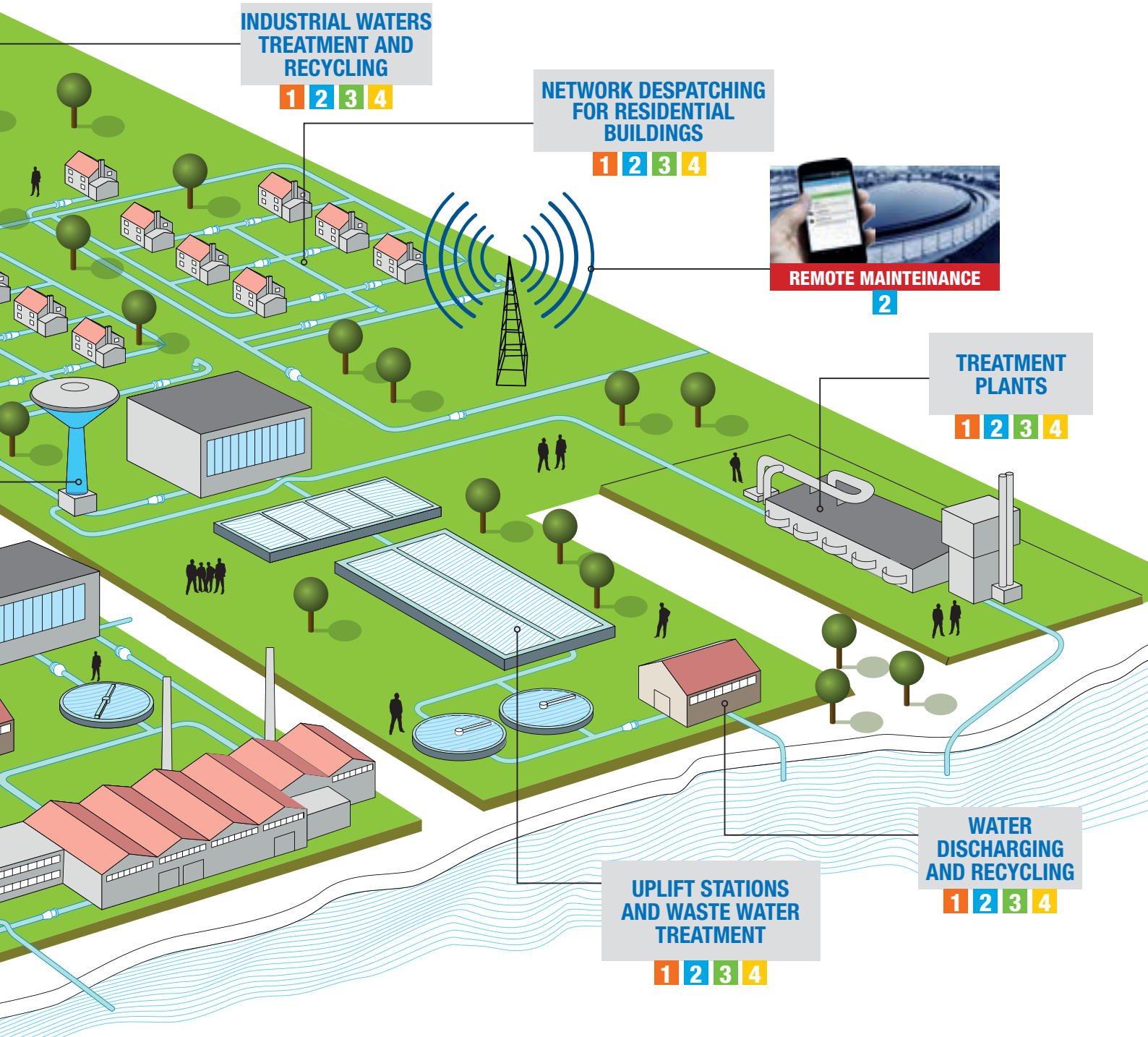


**Networking and Remote Maintenance Z-KEY, Z-PASS1/2, Z-MODEM, Serial / USB / opticals converters**



**Radio Modules Z-LINK1-NM, Z-AIR, RM169, RTURADIO**





### 3 - ENERGY AND ELECTRIC MEASUREMENT



**Power Meters**  
S203, S604, S711 Series



**Energy Counters**  
S500 Series



**Current Transformers**  
T201 Series



**Digital Multimeter  
Process Calibrator**  
TEST-4



**Multistandard Signal  
Converters and Isolators**  
Z Series



**Surge Protections**  
S400 Series



**Compact Signal Converters  
and Isolators**  
K Series



**Displays, Totalizers,  
Batch controllers**  
S Series

### 4 - INSTRUMENTATION FOR CONTROL PANEL

«Water is the  
primary principle»

Thales of Miletus (c.620 BCE - c.546 BCE)





# From the electric component to the full remote control solution

SENECA has been developing products and solutions for many years in the water industry and the multi-utilities sector.

We can offer our customers specific solutions granted by our experience and our reliable devices compliant to the international standards, with affordable costs and short time deliveries.



## SURGE PROTECTION DEVICES

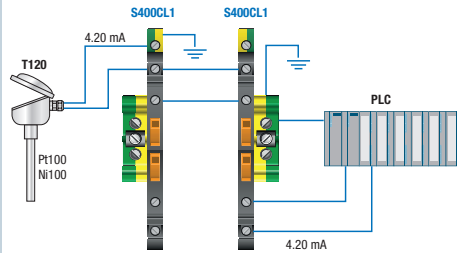


- Overvoltages interferences suppression
- High level of protection against atmospheric phenomena, network maneuvers and parasite interferences
- Compliant to risk and safety analysis

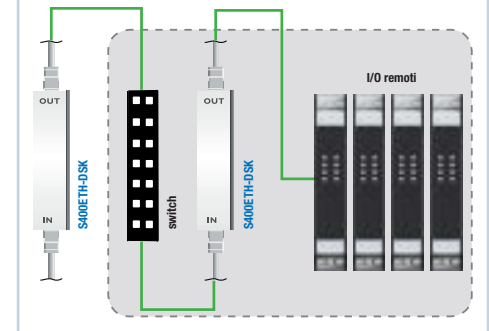
Surge Protection Devices are fundamental to protect electric and electronic devices from impulsive and temporary overvoltages due to network maneuvers or atmospheric phenomena. SENECA S400 Serie includes: protections against overvoltages in ICT networks with high speed data transmission and high level dispersing power; protection devices for measurement and control devices applied to digital and analog signals; protection devices (SPD type 2,3) for industrial power supply.

### APPLICATION NOTES

#### Protection on an analogue measurement device



#### Protection on IT signal



For more information see the General Catalogue corresponding section or read the QR code.

## SIGNAL CONVERTERS AND ISOLATORS



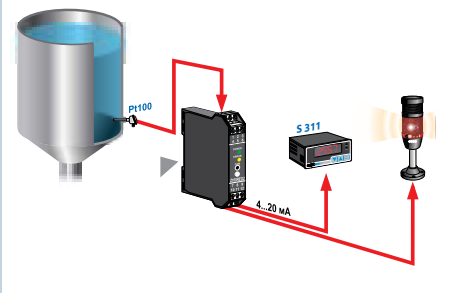
- Electrically Standardization of Signals
- Signal filtering and amplification
- Galvanic Isolation
- Highest quality signals
- Quick wiring
- Optimized management of electrical loads

SENECA offers a wide range of electric and electronic interfaces, signal transmitters and electric panel components.

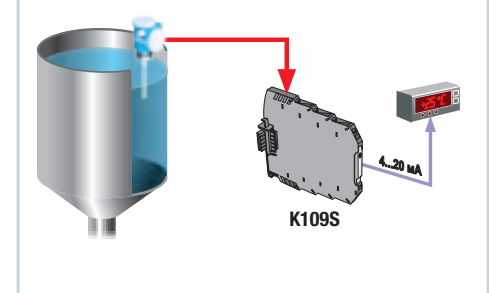
Available for several standard of supply voltages, our signal converters meet the most common needs in the market regarding signal interfacing and conditioning, by isolating electric and process signals with galvanic separation. The electric protection for an automation and telecontrol systems is guaranteed by latest technologies compliant to specific regulations. Signal converters and isolators can avoid interferences, overvoltages, overcurrents, faults related to sensors, actuators, drives, emergency power systems.

### APPLICATION NOTES

#### Analog signal acquisition, transmission and duplication in 2 independent signal



#### Conversion, isolation and analog signal re-transmission from a 2-wires technique sensor



For more information see the General Catalogue corresponding section or read the QR code.



## FRONT PANEL INSTRUMENTATION



- Scalable display from 4 to 11 digits
- Analog, digital and sensor inputs
- Output re-transmission
- ModBUS interface
- Relay Alarms
- Multiple display of instantaneous, integrated and totalized values
- Software or front button programming

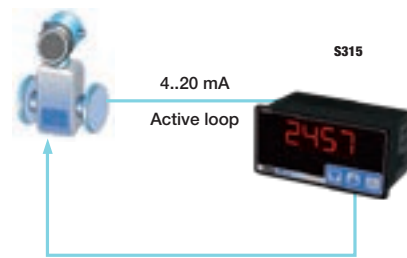
For every need of visualization SENECA proposes S Line, a digital LED indicators family featuring high brightness and high accuracy. S-Line is suitable for a wide range of measurement tasks and optimized for rear panel instrumentation.

Available in different power sizes, input types and display, indicators/totalizers also perform advanced functions for alarm management, threshold control and data retransmission. In the water cycle front panel instrumentation allows visualization of pressure, flow, level, electricity consumption, totalized values calculation pulse inputs from counters, and signal retransmission to the PLC.

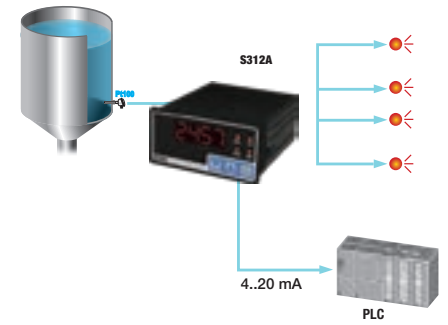
### APPLICATION NOTES

#### Visualization of analog signal from transducer with active loop

Vmax = 30 V



#### Visualization and signal retransmission of with output alarm



For more information see the General Catalogue corresponding section or read the QR code.

## ENERGY EFFICIENCY DEVICES



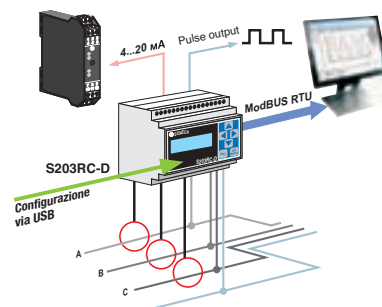
- Energy / Power data analysis, counting, conversion and acquisition
- Reliability and ease of use
- Savings and Energy Efficiency
- Plant and equipment costs management
- Energy consumption measurement

The SENECA proposal for energy efficiency and electrical measurements includes consumption monitoring systems such as Modbus / Ethernet multifunction power meters with web server, harmonics analysis, Rogowski sensors and energy counters with Modbus / Ethernet / M-BUS protocols also available with MID certification.

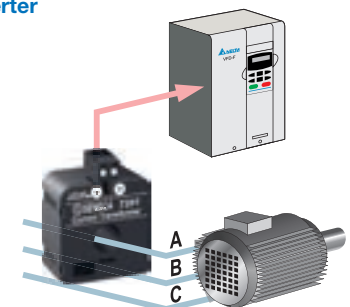
SENECA also provides a complete range of AC / DC current transformers based on a patented magnetic measuring principle or on Hall effect and modular signal converters for electric measurements.

### APPLICATION NOTES

#### Power Meters with three-phase input for use with Rogowski coils



#### Conversion of the output current from the electric motor into a 0-10V signal for inverter



For more information see the General Catalogue corresponding section or read the QR code.

## DATA ACQUISITION



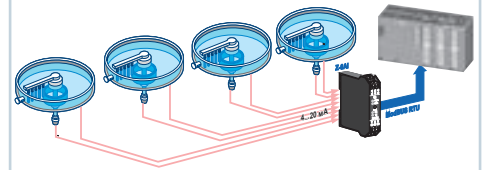
- Distributed I/O System
- I/O modules from 2 to 24 channels
- 3-way galvanic isolation
- Industrial Protocols ModBUS RTU, ModBUS TCP-IP, CANopen
- Energy Management protocols
- Self-diagnostic and safe state
- Hot swapping

For integrated water cycle management SENECA proposes modular hardware platforms (remote I/O systems with ModBUS RTU and TCP-IP protocols) or built-in I/O for Controllers, Dataloggers and RTUs supported by a user-friendly software for data logging. Typical applications are digital alarms management and pulses counting from energy meters, liter counters, volumetric flow systems, oxygen etc. The I/O modules for data acquisition can also be used as contacts for thresholds, thermal, drives and as open-collector outputs for pumps and motors signalling and actuation.

### APPLICATION NOTES



I/O acquisition from the field and retransmission via ModBUS RTU to the supervisory and control system



For more information see the General Catalogue corresponding section or read the QR code.

## PUMPS CONTROL



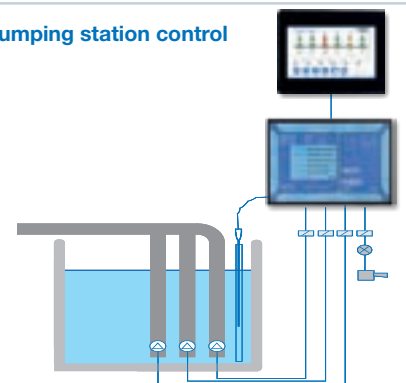
- Sending commands via SMS
- Flow calculation
- Configuration via HMI touch screen 7"
- Pumps regulation, starting, stopping and acceleration
- Suppression of water hammer
- Extending pumps lifetime
- Pressures, levels, flow rates adjustment

SENECA solutions for the automation of water treatment systems are based on recognized standards (eg. IEC 61131), software libraries and technological innovations. They are able to increase energy efficiency, productivity and reliability of all sizes equipment. In particular S6001 Pump Controller is a controller for pumping and pressurization systems. It is designed to handle up to 6 pumps, with constant adjustment of flow, level and pressure, controlling one drive continuously.

### APPLICATION NOTES



Pumping station control



For more information see the General Catalogue corresponding section or read the QR code.



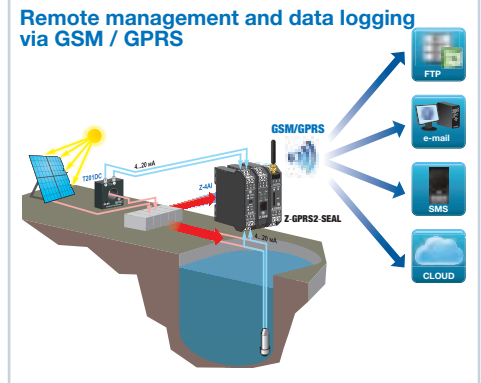
## DATALOGGING AND ALARM MANAGEMENT



- Warning in case of power supply failure
- Event-based actions towards external actuators
- Alarm transmission to maintenance personnel sent via SMS
- Sending & Receiving commands via SMS email or mobile app
- Control and visualization of alarms, events and plants status

GSM/GPRS datalogger belonging to MYALARM2, Z-GPRS2-SEAL, Z-GPRS3 families manage alerts, warnings and alarms through voice control, SMS Message, email, web and cloud apps. Signals generating alarms and events come from external control devices both local and remote, in order to keep plants and equipments under control at any time. The devices are also data storage systems due to an internal flash memory and a micro SD card slot set up for up to 32 GB. These devices allow, among many applications, consumption monitoring and water losses associated to alarms exceeding a predetermined threshold.

### APPLICATION NOTES



For more information see the General Catalogue corresponding section or read the QR code.

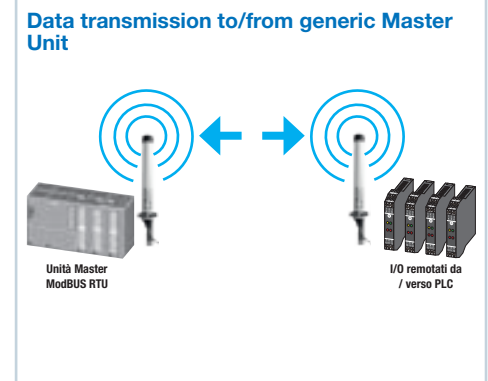
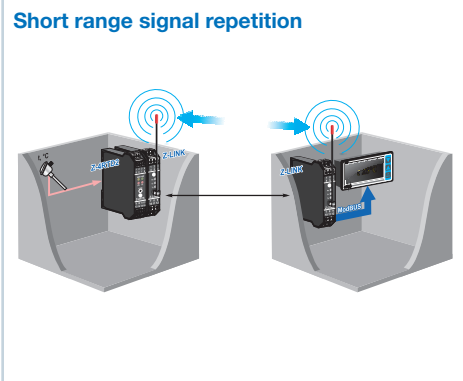
## WIRELESS COMMUNICATION



- Monitoring of remote stations
- Cable replacement, cabling costs saving
- Signals centralization from different points and distances
- Access to difficult to reach areas
- Outdoors data transmission in severe climatic conditions

Our experience in interface technology, radio modules and radio modems is one of the key elements of automation and communication systems, especially in signal transmission from a few meters to several tens of kilometers. UHF / VHF equipment and industrial modem / router 3G+ allow you to reach wide distances with maximum reliability. They also grant you to perform remote control and field devices diagnostics via point-to-point, multipoint, broadcasting, mesh, signal repetition mode.

### APPLICATION NOTES



For more information see the General Catalogue corresponding section or read the QR code.

# TELECONTROL AND SMART GRIDS

SENECA has developed an excellent solution dedicated to the remote control applications, becoming one of the best known manufacturers.

Using consolidated Technological Standard and innovative models (cloud, VPN, IoT, M2M) SENECA systems allow users and organizations to achieve key objectives such as resource efficiency, energy saving, alerts, emergencies and maintenance monitoring, supervision and enhanced support to the plant controls.



## RTU, REMOTE TERMINAL UNITS



### Z-TWS4

Advanced control unit for Energy Management applications (IEC 60870- 101/104, IEC 61850) and plant automation (Straton IEC 61131). It supports ModBUS RTU and ModBUS TCP-IP protocols.



### Z-TWS11

Straton controller with 2 analog inputs, support for industrial protocols (ModBUS RTU and TCP-IP) and network (PPP, HTTP, FTP, SMTP), web server and integrated data logger.



### Z-TWS5

Advanced multifunction controller with IEC 61131. It has 2 Fast Ethernet ports programming system, 4 serial ports, 2 USB ports and Micro SD card slot for cards up to 32 GB.



### Z-MINI-RTU

Remote control unit with nr. 8 built-in I/Os, Ethernet and serial ports, modem GSM / GPRS quadband and programming system IEC 61131 Straton.



### S6001-RTU

Compact remote control unit all-in-one with 31 built-in I/Os, supporting ModBUS RTU / TCP-IP protocols, Energy Management protocols and equipped with Fast Ethernet and 3G + modem. Programmable with Straton.



### Z-PASS2-S

High-performance multi-function controller, support VPN gateways, web servers, 3G+ / integrated Ethernet routers, Straton programming system.



### MYALARM2

Family of GSM / GPRS devices with built-in I/Os designed for remote control and alarm management of buildings, plants, machinery through simple commands sent via SMS.



### Z-GPRS2-SEAL

### Z-GPRS3

GSM / GPRS data logger with built-in I/Os, remote control functions and voice control (Z-GPRS3). It is configured as ModBUS Master RS485.



2.1  
2.2



For more information see the General Catalogue corresponding section or read the QR code.



# TELECONTROL ARCHITECTURES

## TECHNOLOGICAL STANDARDS

### COMMUNICATION PROTOCOLS

**INDUSTRIAL PROTOCOLS**  
ModBUS RTU  
ModBUS TCP-IP

**ICT NETWORK PROTOCOLS**  
HTTP, FTP, SMTP, TCP-IP

**ENERGY PROTOCOLS**  
IEC 61850,  
IEC 60870-101 / 104

### NETWORK TECHNOLOGIES

GSM / GPRS

3G+

VPN / APN

### INFORMATION TECHNOLOGY

OPC

SCADA

IEC 61131

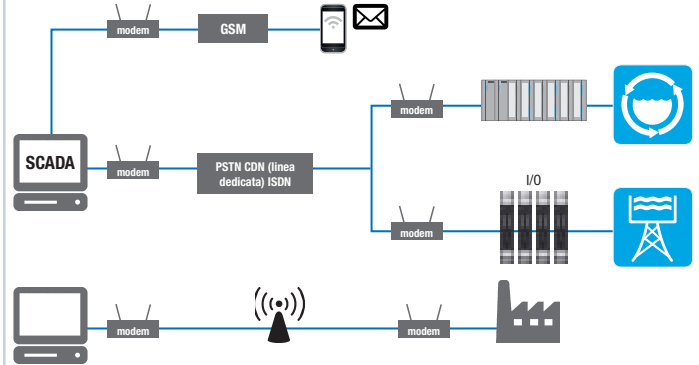
### WEB TECHNOLOGIES

Web Server

App / Cloud

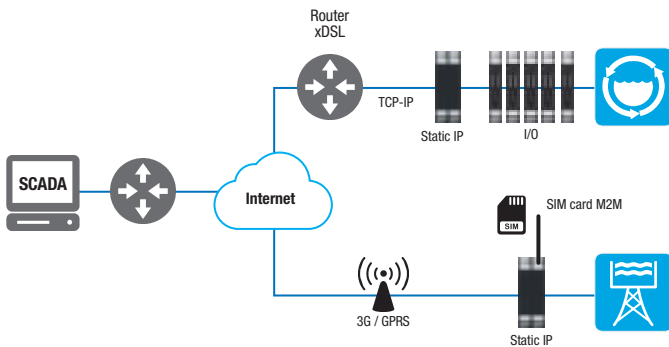
IoT / Big Data

## TELECONTROL VIA PHONE WIRELESS NETWORK



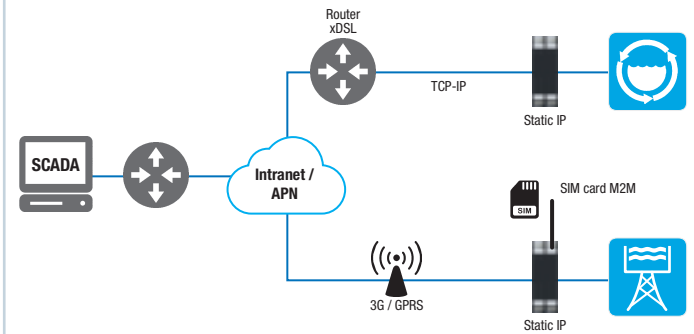
Remote control systems with standard telephone network provide for SCADA unit or Server network to handle the direct connection towards the field through peripheral units.

## TELECONTROL VIA WEB



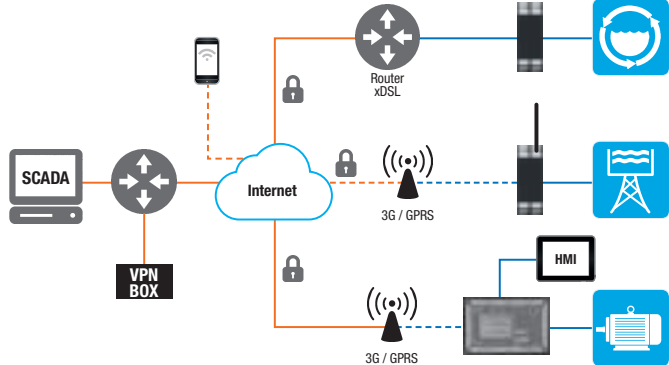
Remote control via Internet offers remote visualization services, alarm reporting, remote management plants, supervision, data collection and analysis, exploiting Internet, 3G / GPRS standard and DDNS technology.

## TELECONTROL VIA INTRANET / PRIVATE APN



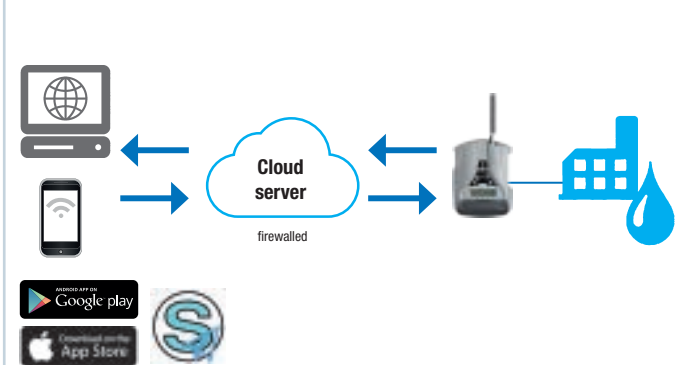
The remote control systems via intranet / APN are based on an intranet with private APN (Access Point Name) systems (static IP addresses on devices SIM).

## TELECONTROL VIA VPN



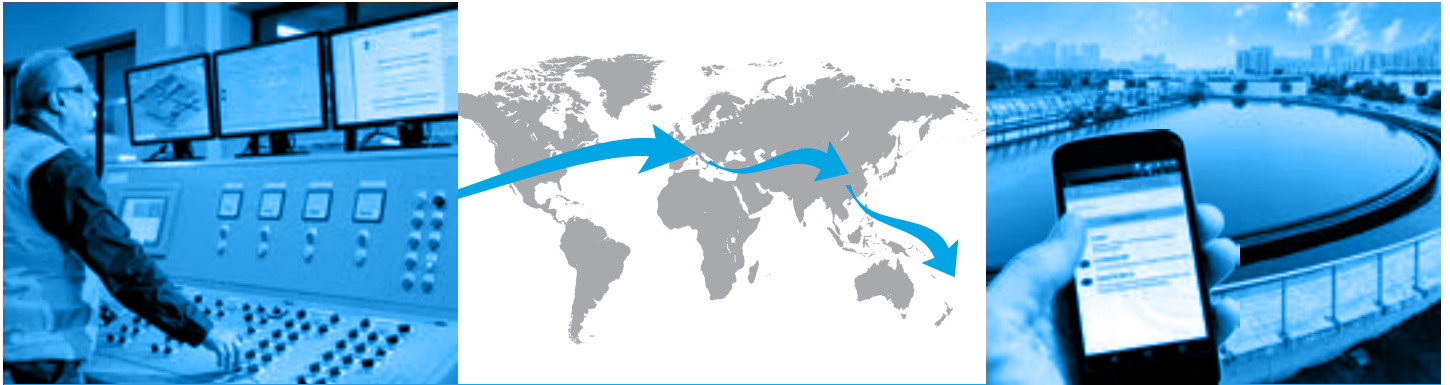
VPN remote control architecture directly manages the VPN tunnel devices and 2G / 3G+ static and dynamic IP. VPN technology is integrated in both the communication modules and in server connectivity module VPN BOX (this is also available in Virtual Machine version).

## TELECONTROL VIA CLOUD / NRT



The remote control Cloud based provides a NRT (Near Real Time) platform in which commands and reports are managed on event in "near real-time" mode.

# REMOTE MAINTENANCE



- **PREDICTIVE MAINTENANCE AND DIAGNOSTIC**
- **REMOTE ASSISTANCE**
- **REMOTE SOFTWARE UPDATE**
- **DATA AND PLANTS ACCESS IN "SINGLE LAN" AND "POINT-TO-POINT" MODE**



**Maintenance  
always on**



**Data always  
available**



**Technician on the site  
doesn't request**



**Reliability**



**Savings**

SENECA devices for networking enable diagnostics and remote maintenance operations on the plants very easy and quick. The multi-function VPN routers manage up to a maximum of 32 client connections "Single LAN" and "Point-To-Point" mode with Server module "VPN Box" and without expensive SIM equipped with static IP. The Z-PASS2 model also supports VPN / Tunnel, 3G + / Ethernet router communication functions and redundant communication system, as well as IEC 61131 embedded control logic in Straton version unit Z-PASS2-S. There are two basic methods of remote access for maintenance and diagnostic activities:

## REMOTE ACCESS "SINGLE LAN"

- Remote access networks / systems for Monitoring / Maintenance
- Trends, reporting, alarms / debug management and PLC, HMI programming
- Simultaneous and always active connection on all remote sites
- Communication between subnets belonging to the same VPN
- Different network configurations for different sites

## REMOTE ACCESS "POINT-TO-POINT"

- Remote access machines and manufacturing lines for maintenance / commissioning
- Real-time Customer Care
- Connection on demand and not simultaneously in different sites
- Multi-User Management
- Ability to use the same network configuration in different sites

## APPARATUS FOR REMOTE ACCESS TO DATA AND INSTALLATIONS



### Z-KEY

Industrial Bridge / Gateway  
- Serial Device Server



### Z-PASS1

Industrial Bridge / Gateway  
- Serial Device Server with  
VPN support



### Z-PASS2

Industrial Bridge / Gateway  
- Serial Device Server with  
VPN support, and 3G+  
modem/ router +



2.3



For more information see the  
General Catalogue corresponding  
section or read the QR code.

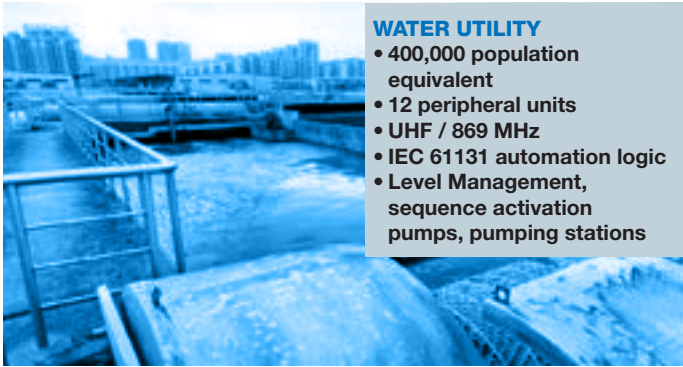


# APPLICATION NOTES

Since many years SENECA solutions are chosen by a growing number of utilities, and public companies for water and sewage networks remote monitoring. SENECA proposal ensures openness, scalability and wide connectivity in data transmission to and from control centers, reducing maintenance costs and offering higher quality of service.

## WASTEWATER TREATMENT

### SEWAGE NETWORK REMOTE CONTROL



- WATER UTILITY**
- 400,000 population equivalent
  - 12 peripheral units
  - UHF / 869 MHz
  - IEC 61131 automation logic
  - Level Management, sequence activation pumps, pumping stations

## WASTEWATER TREATMENT

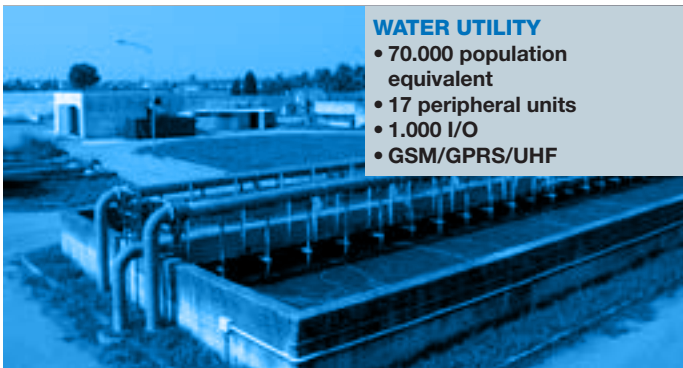
### SEWAGE LIFT STATION CONTROL SYSTEM



- MULTIUTILITY**
- 500 peripheral units
  - 5.000 I/O
  - GPRS / Private APN
  - Public IP SIM management
  - ModBUS TCP-IP real time
  - Datalogging, pumps control, electric parameters monitoring

## WATER / WASTEWATER TREATMENT

### WATER CYCLE MANAGEMENT



- WATER UTILITY**
- 70.000 population equivalent
  - 17 peripheral units
  - 1.000 I/O
  - GSM/GPRS/UHF

## WATER TREATMENT

### RADIO CONTROL SYSTEM FOR FILTERS WASHING



- MULTIUTILITY**
- 250.000 population equivalent
  - 250 I/O
  - UHF/Wi-Fi
  - Energy Management protocols (IEC 60870-5-101, IEC 60870-5-104, IEC 61850)

## WATER DISTRIBUTION NETWORK

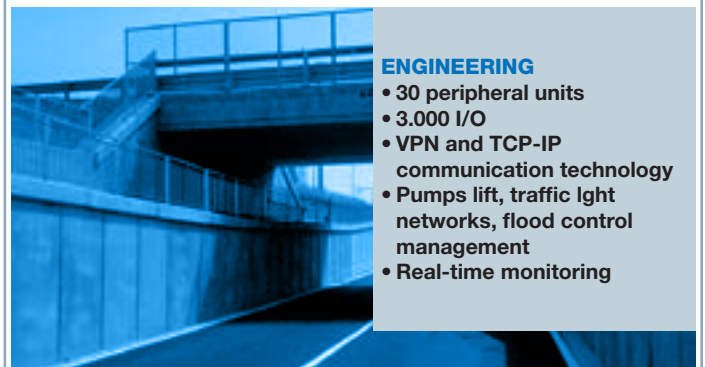
### REMOTE CONTROL IN SURFACE IRRIGATION SYSTEM



- ENGINEERING**
- GSM / GPRS UHF / 869MHz
  - Data Acquisition
  - Pumps control
  - SMS / email alarm management

## ENVIRONMENT / INFRASTRUCTURES

### TUNNEL AND ROAD WAY REMOTE CONTROL SYSTEM



- ENGINEERING**
- 30 peripheral units
  - 3.000 I/O
  - VPN and TCP-IP communication technology
  - Pumps lift, traffic light networks, flood control management
  - Real-time monitoring



For more case histories and details please read the QR code.

## CONTACTS AND INFORMATION

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