



**V-ELIN d.o.o.**



ISO 9001:2008  
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# BUSINESS PORTFOLIO

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## **ABOUT US**

### **❖ How we started**

Company V-ELIN d.o.o. Electronics and Informatics Ltd. started its work in 1992.

In 2001 the company moved to a new location in Preloška 25 in Čakovec.

From the beginning, the main activities are focused on its own development and design of industrial electronics products with a focus on systems of measurement, control, management and remote control.

In 2001. The company intends to move to their own business premises at Preloška 25 in Čakovec.

Quality standards ISO 9001 applies since 2004.

Today, the company has successfully produced a number of products industrial electronics based on its own development and design. We pay special attention to innovation and following the latest technologies in the world of electronics.

### **❖ What we strive for**

In the next period, our main goal is further growth of production and services in accordance with customers' needs and market requirements, employment of young, highly educated people, and development of our own products.

### **❖ Development as a constant**

V-ELIN d.o.o. has been successfully operating in domestic and foreign markets for twenty years with a wide range of products and services. We are constantly evolving, and gradually expanding our activities.

Product and service quality is ensured by the installation of excellent and controlled components and spare parts, as well as years of experience and our knowledge.

The company is active in various industrial sectors; electrical and metal industry, food industry and others.

Employees of companies actively involved in the work of professional associations such as CIGRE - International Council on Large Electric Systems, Electrotechnical Society Zagreb, Varazdin Company energy experts and others. Many meetings were published works of our experts, and since 2013 we have become an honorary member of the Electrotechnical Society Zagreb.

## **PRODUCTS**

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More info: [www.v-elin.hr](http://www.v-elin.hr)



## ❖ LEVEL MEASURING PROBE

- Piezosensitive measuring element
- Outbound communication RS-485, Modbus RTU protocol, 9600 bps
- Maximum length from waters 1200 m
- Measurement accuracy  $\leq 0.1\%$
- Measuring range: 0...1 m, 0...5 m, 0...10 m, 0...20 m or by request
- Measuring liquids temperature
- Standard measured value change damping is 250 ms or by request
- Power supply 9-24V / 30mA
- Protection against reversal of polarity
- Output cable with integrated capillaries for pressure equalization
- Standard cable length: measuring range + 2m
- Built-in surge protection
- Permitted pH value of measured liquid- pH5...pH9
- Inox enclosure IP68
- Compactness and robustness

### ADDITIONAL ELEMENTS:

- Galvanic coupling
- Vermogs
- Wireless or optical modems - for direct connection of probes to the modem without additional hardware
- COMPUTATIONAL UNIT (communication with max. 30 probes on the same bus, inspection and measurement system configuration, process control, RS-232 communication with external process or computer, analog outputs of measuring values...)



*Probe*



## ❖ GALVANIC COUPLING

- overvoltage protection communication and power supply
- for RS485 half duplex
- Power supply 24V / 30mA
- voltage on the secondary side 12 V / 2 W



*Galvanic coupling*



## ❖ VEMOGS

VEMOGS – COMPUTATIONAL UNIT is designed for connection to digital (RS485 – Modbus) measuring probes. The computational unit is used for processing and displaying of measured values, signaling, control and transfer of measurement values to other devices in the process.

The calculating unit consists of:

- central computational unit (a system for measuring, collecting, processing, and displaying of the measured values, 2 analog outputs and RS485 communication channel),
- relay outputs unit (BCD output for measured values and signaling of limit values), optional,
- analog outputs unit (used for analog outputs, 4-20mA, more measured values), optional.



*Housing for rack 19"*

Vemogs – calculating unit is made in SMD technology, designed for an industrial applications. Data collection is done via a standard RS485 Modbus communication channel. Single input can communicate with a maximum of 32 probes.

The calculating unit is equipped with a graphic display, which shows the measured values. The keypad is used to scroll through the measurement values and to adjust the offset of measured values.

Programming (parameterization) of the computational unit is done through the USB port using a Windows based software package that comes with the device.

The calculator has two galvanically isolated 4-20mA analog outputs and two galvanically isolated RS485 communication channels that are used for the measuring probes connection and additional peripherals units or higher-level control system.

## Technical specifications

- power supply 18 – 36V,
- max. system consumption 5W,

- language Croatian (English, German),
- keyboard with 4 keys
- 2 analog outputs
- 2 communication channels RS232 and RS485
- memory 512 measurement data with the possibility of extension

**VEMOGS PROCESS SYSTEM** provides a wide range of applications in industry, such as management of complex technological processes, measuring the level of groundwater and surface water over a wide area, control over public infrastructure without further digging in the streets, monitoring weather conditions and many other forms of application.

**VEMOGS** computational unit is accompanied by our own software solution.





## ❖ VEMLOG

- pH meter for detection of acid and alkaline substances in sewage and wastewater

VEMLOG SYSTEM is a measuring device for measurement, analysis and data logging.

VEMLOG is equipped with a touch screen display that allows easy and simple control. The device connects to a PC that gives options for setting parameters and data display.



One of VEMLOG SYSTEM's interesting implementations is to protect the sewage system from irresponsible users.

VEMLOG is embedded in the waterproof case, and is equipped with a GSM mobile communication. The device is placed in a sewer manhole at the site of potential irresponsible polluters. When pH value exceeds a certain limit, the system independently informs staff on duty and inspection services by sending SMS text messages or alerting them through the Web App, as well as records the measured values to the device memory, thus enabling a subsequent analysis to determine the exact time and amount of pollution.

VEMLOG

## ❖ LOGIC CONTROLLER

**Logic controller** is a measuring device intended for measurement and regulation process in the industrial environment.

In more reference applications in food, textile, graphic and industrial waste water scavenge these modular controllers reliably perform oversight, regulation and alarm functions. The new processor technology based on microcontrollers one of the world's most famous producers and intelligent software and hardware solutions allow safe conduct and supervision of a very wide range of industrial processes in real time. Implementation industry-standard communications network-MODBUS protocol (RS232C/RS485) makes this modular controllers program compatible with almost all known SCADA tools. A high degree of protection IP40 DIN and flexible assembly with the escort of DIN-EN-50022-35mm carrier and use COMBICON connectors, make it easier maintenance and servicing.

Logic controller designed for solving the supervisory and alarms problems in measurement, process control and industrial applications. Carrying out the application and the actual printout and inspection program parameters enabled by 2x16-character LCD with a back-LED ambient lighting. Placing an program parameters is carried out through a small keyboard with a basic four keys. The device is configured as necessary calibration entrances / exits control, depending on the criteria set by applications. The offer two versions of devices for 18-65VDC power supply (24VDC applications) and 230VAC power supply.



LOGIC CONTROLLER

### TECHNICAL FEATURES:

- Power supply 18-65 VDC /100mA
- Communication port 1 x RS232 or 1 x RS485
- Analog input current (4...20 mA) or voltage (0..10 V)
- Relay output 2 x

## ❖ TEMPERATURE REGULATOR

### - for Infrared heaters – IGU

IGU is a programmable temperature regulator designed for controlling of “ambient” temperature in an industrial environment using infrared heaters. Overview of measurement data and program parameters is provided on the display, and the assignment of program parameters is provided over a small keyboard. IGU measures ambient temperature via its own temperature sensor.

#### It comes in four variants:

##### - IG-U

The simplest controller for a single heater

##### - IG-U1-T

Controller for a single heater with weekly programming clock

##### - IG-U1-S

Controller for a single heater for operation in a network (slave) without programming clock

##### - IG-U1-MT

Controller for a single heater for operation in a network (master) with the programming clock



IGU

#### Technical specifications

- power supply 230 V (+/- 10%) 50 Hz / 10 mA
- temperature range min. -20°C to max.80°C / +/-1°C
- allowed relative humidity 0% to 90%
- thermal sensor semiconducting – internal
- relay output for burner/heater operation 250 VAC/3 A max.
- display of program parameters LCD – 2×16 characters
- input of program parameters 4 buttons + reset



## ❖ ELECTRICAL SHEPHERD

Electric Shepherd is the power source for the electric fence keeping livestock size goats to cattle and safe to property protected from predators.

**ELECTRICAL SHEPHERD EP1** is powered by standard voltage 220V, 50Hz. Voltage on the fence is 10kV, pulse frequency is 1Hz, dimensions are 160x120x80mm, mass of 1.6 kg.

**ELECTRICAL SHEPHERD EP2** is powered by a single polarity 12V (battery voltage). Device has a built-in power control. Voltage on the fence is 10kV, pulse frequency is 1Hz, dimensions are 190x145x70mm.



**ELECTRICAL SHEPHERD EP2.2** is powered by a single polarity 12V (+ battery voltage power from solar photovoltaic modules). Device has a built-in charging regulator for solar systems and power control. Voltage on the fence is 10kV, pulse frequency is 1Hz, dimensions are 190x145x70mm.



## ***SELECTED FINISHED PROJECTS***

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## ❖ SEWAGE PUMPING STATION

Croatia Pumpe Nova, Karlovac

As a partner for the electrical part of the project, in cooperation with the Croatia pumpe nova d.o.o. from Karlovac, we have developed a complete monitoring, control and remote control center for the sewage pumping station.

Sewage pumping station is used in waste water systems and serves to raise the water level in the drainage system. The pumping station is detached and adapted for installation below ground level.



The station features two pump generator units with mutually independent ascent pipelines which are connected to a common outlet pipeline. The pumps operate independently and individually (1+1) and in the peak loads both pumps can operate parallel.

Electrical equipment consists of a control cabinet with the power section of the equipment, and computational unit with logic control and remote communication unit. An ultrasonic probe is integrated in the pumping station for level measuring, two floats for detecting the level in the station and two pressure probes on ascent pipelines.

### *Computational unit*

Electrical equipment consists of the power section, computational unit with logic control and remote communication unit. Power section consists of power input terminal from the public electricity network and power input terminal from the auxiliary electric power generators.

The pumps are switched on via soft-start device.

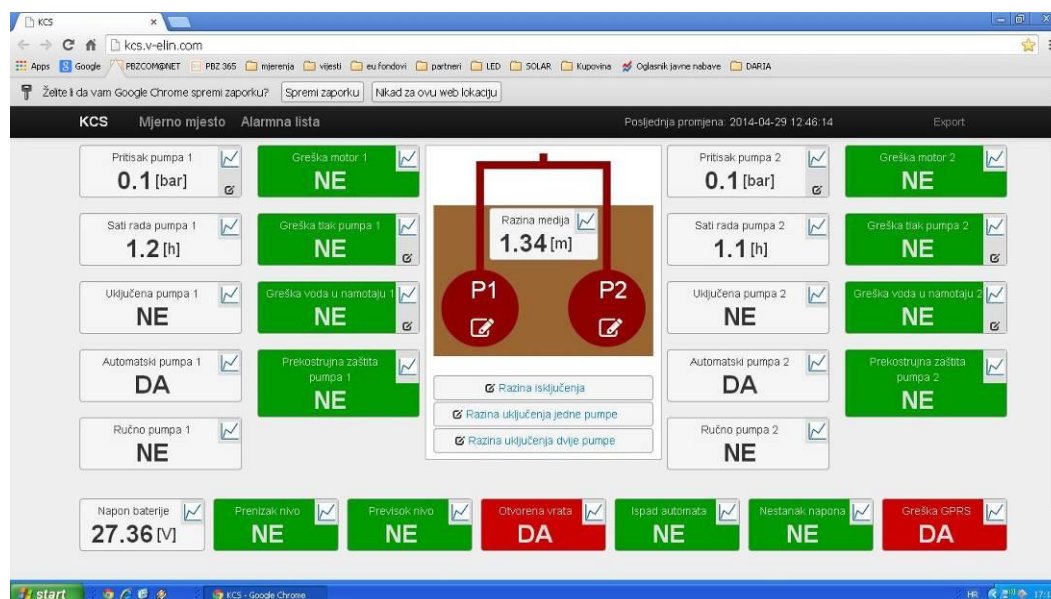
The control panel includes ON/OFF signalization for the pumps, signal for overcurrent protection on the soft-start device and signal for water presence in the motor winding. In addition, instruments for voltage and current measuring of the pump motor are on the panel.



Each pump has a switch to select the mode of operation.

Operation can be MANUAL – 0 – AUTOMATIC.

At automatic operation mode the computational unit manages the pump. The display on the computational unit shows work hours of each pump.



### *Web application and data transfer*

The computational unit also holds a communication unit via GSM/GPRS communication interface. The user is required to provide a SIM card for data transfer and place on the server. All the relevant information about the work of pumping stations is transmitted in real time to a server and can be presented on any computer or smart phone that has been granted access via an access password.

Manual management of the pumps is possible via access approved computer which limitations depend on the actual level in the pumping station.

The capacity and number of pumps and size of the shaft is variable, as required by the user.

## ❖ SISTEM FOR REMOTE WATER LEVEL MEASUREMENT



*Measurement station*

### HYDROELECTRIC POWER PLANT GOJAK, Croatia

Measurement of the water levels consists of many measuring points in Gorski Kotar.

Measurement is carried out with hydrostatic probes and a remote unit of our in-house production. The system is powered by PV modules and the data transfer is conducted via GSM/GPRS mobile network. The measuring system is combined of many remote units.

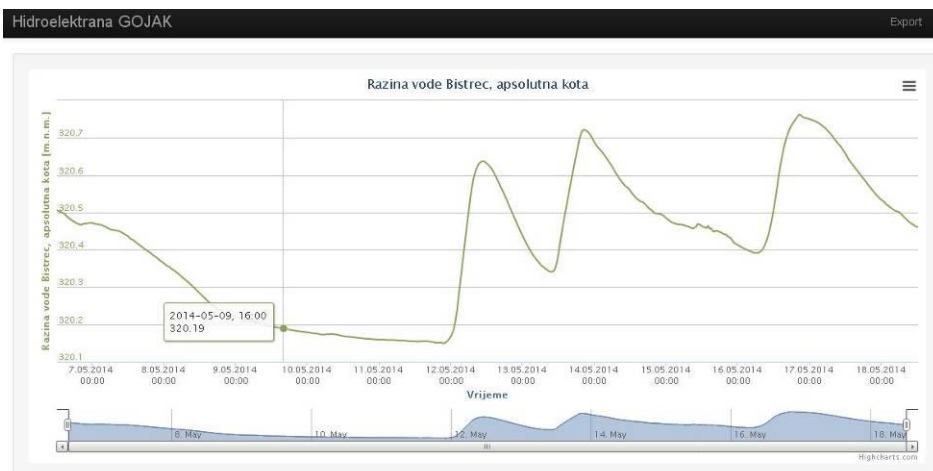
Functioning of the entire system is defined by system parameters. Parameters are adjustable.

The remote computational unit has a primary function of collecting and transmitting data from the probe through GSM/GPRS communication. The unit has an integrated battery charging regulator through the PV module and an alarm that indicates when the unit's metal cabinet door is open.

Hidroelektrana GOJAK				Export
Alarm Pečina				Zatvoreno
Razina vode Pečina, apsolutna kota	Razina vode Pečina, relativna kota	Temperatura vode Pečina	Napon baterije Pečina	
<b>326.01</b> [m.n.m.]	<b>0</b> [cm]	<b>10.1</b> [°C]	<b>13</b> [V]	
Alarm Bliznec				Zatvoreno
Razina vode Bliznec, apsolutna kota	Razina vode Bliznec, relativna kota	Temperatura vode Bliznec	Napon baterije Bliznec	
<b>320.46</b> [m.n.m.]	<b>109</b> [cm]	<b>9.1</b> [°C]	<b>13</b> [V]	

### *Quick view app*

Along with the data on water level and temperature, the remote computational unit collects and transmits the data on battery voltage and alarm when the unit's metal cabinet door is open.



*Graphic chart displaying continuing measurment*

#### Mjerenje vodostaja HE Gojak

Rd.br.	Naziv signala	Datum i vrijeme	Vrijednost
1.	Razina vode Pečina, apsolutna kota	2014-05-18 12:06:08	326,01 [m.n.m.]
2.	Temperatura vode Pečina	2014-05-18 12:06:08	10,12 [°C]
3.	Napon baterije Pečina	2014-05-18 12:06:08	13,00 [V]
4.	Alarm Pečina	2014-05-18 12:06:08	0,00 [ ]
5.	Razina vode Pečina, relativna kota	2014-05-18 12:06:08	0,00 [cm]
6.	Razina vode Bistrec, apsolutna kota	2014-05-18 12:07:14	320,46 [m.n.m.]
7.	Temperatura vode Bistrec	2014-05-18 12:07:14	9,07 [°C]
8.	Napon baterije Bistrec	2014-05-18 12:07:14	13,00 [V]
9.	Alarm Bistrec	2014-05-18 12:07:14	0,00 [ ]
10.	Razina vode Bistrec, relativna kota	2014-05-18 12:07:14	109,10 [cm]

The remote computational unit is built in a way that energy consumption is minimal for the continuous transmission of data to the server.

Quick view of current data is adapted for smartphone display.

#### *Extended Quick view app*



## ❖ DRILLING SET MONITORING USING PETROL GEOTERM d.o.o., Slovenia

One of the key demands of today's industry is the monitoring of a process, in particular of its parameters. Measurement of various process parameters is commonly used for automatic control and is often used for making various reports during or after completion of process cycles. In addition to local monitoring of various process parameters, there is a prevalent need for data to be available online, independent of the place of collection. Online availability becomes an additional problem for remote measurement sites and at industrial installations that are not stationary.



*Remote unit*

One example of such a plant is a drilling station, where the plant is in one location but the people who operate the drilling are often in an office at a completely different location. Furthermore, drilling sites are usually situated outside of populated areas, where only wireless communication is possible. For these reasons the system

for remote monitoring and management was implemented on one of the drilling sets of Petrol Geoterm in Slovenia.

System is designed to measure, display, store and to transmit measured data to the server that is on another location. Data transfer can be achieved through public GSM / GPRS network or over Wi-Fi or WLAN communication for the local connection to a computer.

Metering system includes parameters which are grouped into so-called Master Log:

- time & date
- depth [m]
- the progress of the drilling [m/min]
- load on the hook [t]
- load on the chisel [t]
- pressure mud pumps [bar]
- capacity mud pump 1 [l/min]
- capacity mud pump 2 [l/min]
- Speed desk [rev/min]
- torsion [%]



*Master Log display*

The system of measurement, processing, storing and transmitting is controlled by hardware circuitry that enables all actions to be executed simultaneously. The transfer to the local portable computer and a remote computer takes place independently of each other, thus avoiding data in the transmission process due to a power failure or some other problem in the system.

Remote monitoring system of drill sets is applied at Nafta Geoterm Company in Slovenia, where it is used to measure the depth of drilling, drilling progress, the load on the chisel, desk speed, pump capacity, pump pressure and torsion.

**Necessary for the remote monitoring system:**

- Remote station with equipment for measuring, collecting and transmitting data through communication equipment for GSM / GPRS, Wi-Fi and LAN communication,
- Pressure probe for measuring load, pressure probe for measuring torsion and pressure probe for measuring mud pumps pressure,
- Modules for powering the remote station and industrial panels
- Industrial panel (displays all measurement signals in the operational cabin, alarm alert at situations beyond the limits),
- Base station with a GSM modem, server unit, a computer software for remote system monitoring and managing,
- Portable computer with program for displaying and storing measurement signals and for setting parameters (sets default depth, maximum load, the diameter of hammering on mud pumps).

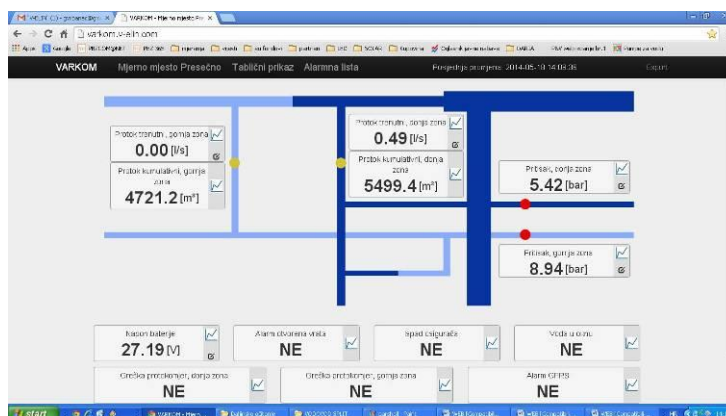


A photograph of a solar panel mounted on a metal stand in an outdoor enclosure. The panel is tilted upwards and is surrounded by a blue chain-link fence. The ground is dirt, and there are trees in the background.

The system is powered by an independent PV system and battery designed for stationary systems. Functioning of the entire system is defined by system parameters, which can be changed if necessary to enable better system functioning.

*Independent PV module*

VEMS GSM-RS remote station has the primary function of collecting, processing and transmitting data via GSM / GPRS communication. Along with the information on flow and pressure, remote computational unit also collects and transmits information on the battery voltage.



### Web application

Remote station is designed to have minimal power consumption while transmitting the data to a web server.

VEMS DI8 digital input unit has the function of collecting digital signals and data processing.

VEMS AI8 analog input unit has the function of collecting analog signals and data processing.

All data is available online via computer or smart phone. A login password is provided to access the data.

## ❖ DC POWERE SYSTEM

INA d.d. - Molve, Croatia

Battery charger and distribution system is designed for uninterruptible power supply coverage in industrial plants. The system is designed to work in very difficult industrial conditions.

The power supply is 230 V, 50 Hz and the output voltage is 24 VDC +10%.



The system is designed to have two groups of batteries and each group can operate independently of the other group.

### System of battery charger and distribution of 24 VDC consists of:

- power supply unit 230 VAC
- control unit for battery charging
- under voltage relay
- rectifier diodes
- circuit breaker
- signaling
- instruments for measuring current and voltage

*Power charger rack*

VE-PSU 400-24 is a high quality high-performance industrial power supply. The power supply is designed to work reliably in very difficult industrial conditions. It is designed as a DC voltage source for industrial devices. In combination with the battery charging control unit VE-REG, it is not necessary to regulate the output voltage since it adjusts on the VE-REG unit.

## **REFERENCES**

### **CENTROMETAL d.o.o. Macinec, Croatia**

- design and development of the control electronics for electric water heater

### **HPP FUŽINE, Croatia**

- ultrasonic water level measurement
- installation of 2 ultrasonic probes with analog outputs

### **HPP Banea, Guinee**

- repairing turbine regulator

### **CROATIA PUMPE NOVA d.o.o.**

- sewage pumping station
- Web application form monitoring

### **DUKAT d.d. Zagreb, Croatia**

- wastewater measuring system using a probe in a Parshall flume

### **HPP Varaždin, Croatia**

- instalation of measuring water levels
- reconstruction of DC power distribution
- reconstruction of engineroom drainage control at dam
- synchronizer replacement
- reconstruction of PROCIS

### **HOPS, Croatia**

- DC power suply

### **HPP Čakovec, Croatia**

- system management and remote signaling the pumping station
- reconstruction of temperature measurement and thermal image of generators and transformers
- reconstruction of PROCIS

### **HPP Dubrava, Croatia**

- system management and remote signaling the pumping station
- reconstruction of temperature measurement and thermal image of generators and transformers
- synchronizer replacement
- reconstruction of PROCIS

### **HPP GOJAK, Croatia**

- system for remote water level measurment
- installation fish barrier

- configuration of SCADA system for measuring the level

**HPP OZALJ, Croatia**

- system for remote water level measurement
- turbine regulation revision

**INA d.d., Molve, Croatia**

- DC power system

**KNAUF INSULATION d.o.o. Novi Marof, Croatia**

- wastewater measuring system using a probe in a Parshall flume

**KONČAR d.d. Zagreb, Croatia**

- reconstruction of PROCIS at dam of HPP Varaždin
- reconstruction of ABM control at HPP Čakovec
- projects for the replacement of counters for electricity registration
- replacement of the excitation system at HPP Varaždin

**MEĐIMURSKE VODE d.o.o. Čakovec, Croatia**

- remote monitoring system for measuring, monitoring and managing of the water supply system

**MEGGLE Hrvatska d.o.o., Osijek, Croatia**

- wastewater measuring system using a probe in a Parshall flume

**VODOVOD I KANALIZACIJA, Split, Croatia**

- remote monitoring system for measuring, monitoring and managing of the water supply system
- Web application

**AAT Geotherme Draškovec, Croatia**

- Control cabinet debit test gas power plant

**HRVATSKE VODE, Zagreb, Croatia**

- remote monitoring system for measuring the amount of free oxygen in the river Drava

**PETROL GEOTERM d.o.o., Slovenia**

- system for remote monitoring and management of a drilling station

**SENG – SOŠKE ELEKTRARNE Nova Gorica, Slovenia**

- HPP Doblar - remote water level measuring system

**SIEMENS WIEN, Austria**

- production of documentation, connecting, testing and commissioning of LSA station at HPP Čakovec

**VARKOM d.d.**

- remote monitoring system for measuring, monitoring and managing of the water supply system



## **V-ELIN d.o.o.**

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for successful partnership!***