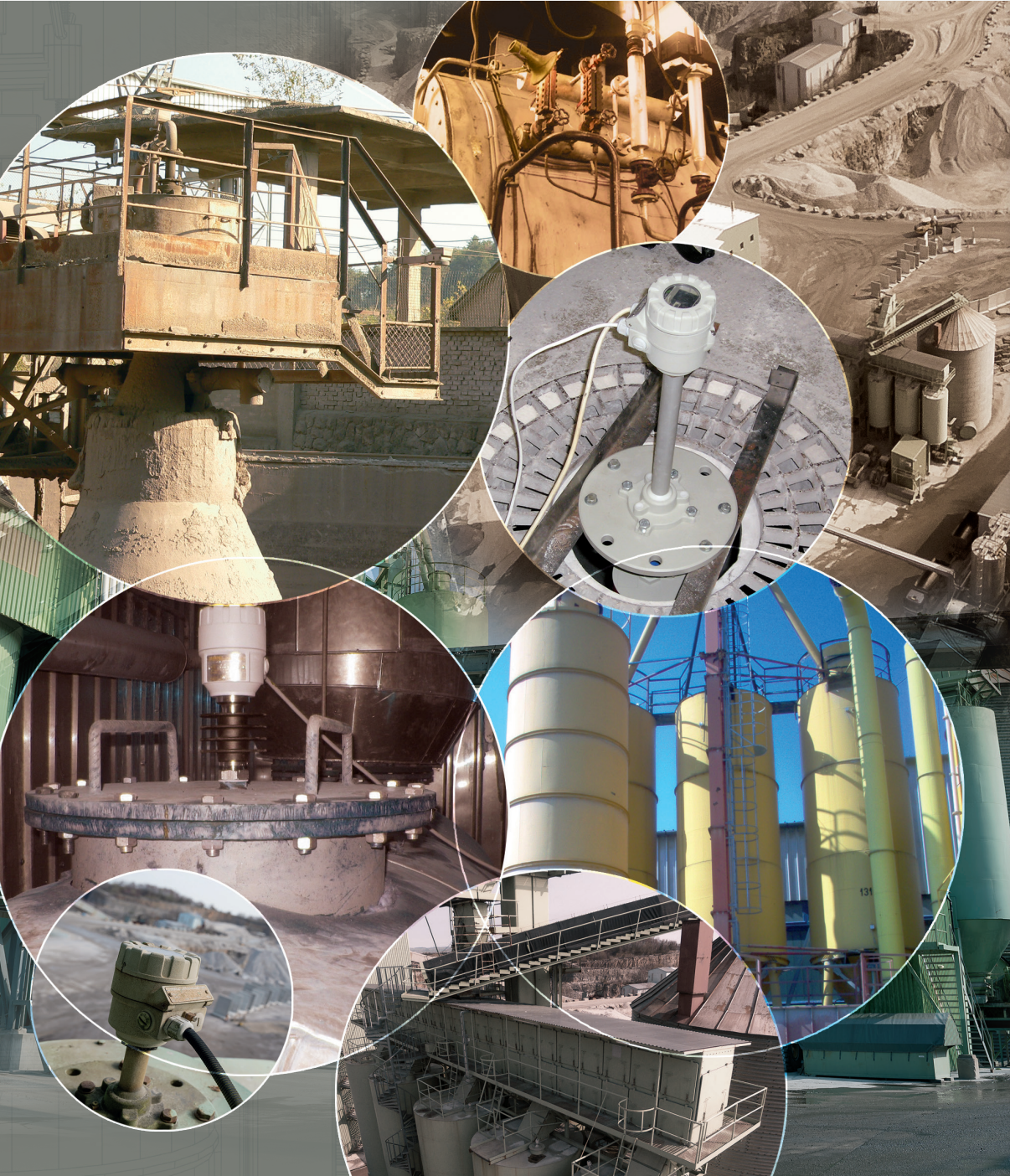


5 YEARS WARRANTY

Construction materials and instrumentation

APPLICATIONS FROM QUARRY TO CEMENT FACTORY



PIVELECO

CONSTRUCTION MATERIALS

FROM SAND ... TO INSULATION MATERIAL

In the construction material industry NIVELCO has more than 30 years of measuring experience, mostly in level switching and level measurement of problematic solid materials.

From the wide selection of NIVELCO made level, pressure & temperature measurement devices suitable solutions can be offered to all applications, including sand mines and quarries through cement and brickmaking to the production of bitumen based insulation materials, and either for level, pressure or temperature measurement and controlling tasks. Long years of operating experience and numerous application examples prove that NIVELCO instruments operate durably and reliably in industrial environments to automate a variety of technological processes in even the toughest conditions.

PiloTREK – non-contact microwave

MicroTREK – guided microwave

EasyTREK – ultrasonic integrated

EchoTREK – ultrasonic compact

NIVOCAP – capacitance

NIVOCONT R – vibrating rod

NIVOSWITCH – vibrating fork

NIVOROTA – rotary paddle

NIVOCAP CK – RF-capacitance

NIVOMAG – magnetic coupling

LEVEL TRANSMITTERS

LEVEL SWITCHES



PRESSURE MEASUREMENT

NIVOPRESS D – hydrostatic

NIPRESS D – pressure transmitter

SIGNAL PROCESSING

MultiCONT – universal controller

UNICONT PM – process controller

TEMPERATURE MEASUREMENT

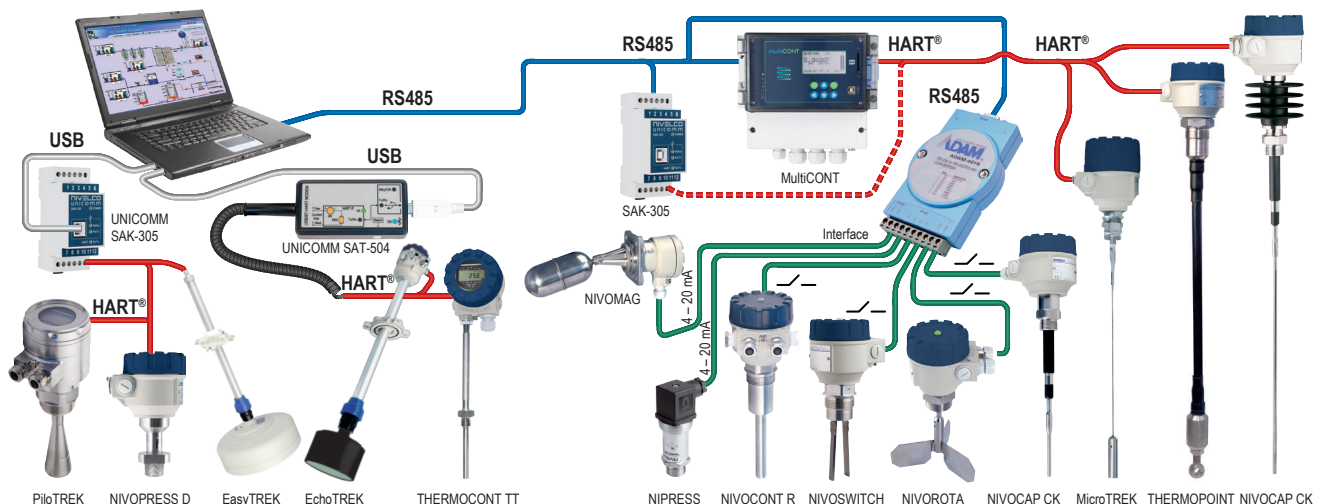
THERMOPONT – multipoint transmitter

THERMOCONT TT – transmitter

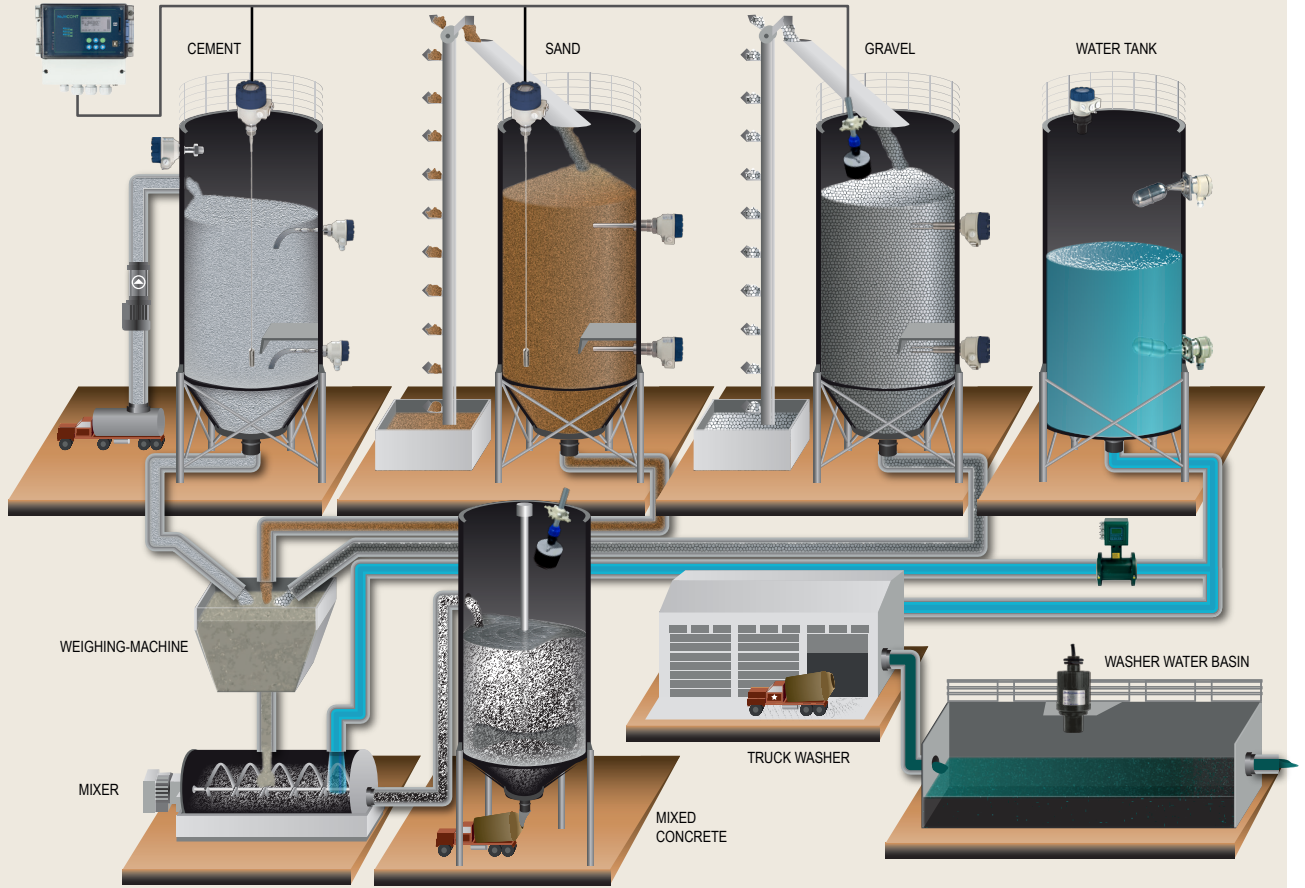
THERMOCONT T – sensor

FIELD INSTRUMENTS IN MEASUREMENT SYSTEMS

All NIVELCO transmitters can be connected to the MultiCONT process controller, or with the help of suitable interfaces or modems, NIVELCO field instruments can provide measurement results and control signals directly to the process control systems. NIVISION software provides a perfect choice for process visualization, data collection, measurement-database management and process control tasks.



CONCRETE PRODUCTION PLANT



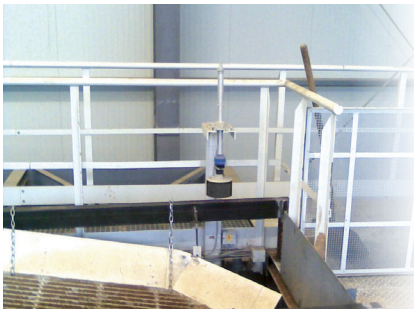
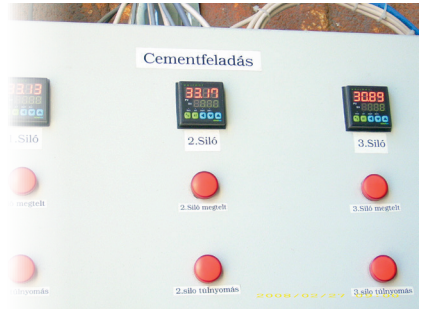
CONCRETE PRODUCTION PLANT

The demand for high quality concrete is growing rapidly, due to the changing requirements of the construction industry. To satisfy the demand, production of high quality concrete requires state of the art instrumentation and computerized control. The main production units of the plant are: cement storage silos, sand, gravel storage silos, auxiliary storage tanks, water tanks, weighing system, mixer, mixed concrete storage tank, truck washer system.



CEMENT STORAGE SILOS

In cement storage silos it is important to continuously monitor the level of the cement, the air pressure above the cement level and provide indications of high and low fail safe levels. **MicroTREK HTN-400** guided microwave level transmitters are recommended for level measurement, **NIVOROTA EKH-700** rotary paddle level switches for low/high fail safe switching and **NIPRESS DRE-400** pressure transmitters are recommended for pressure measurement, with the **UNICONT PMG-411** type display and controller.



INSTRUMENTATION OF SAND, GRAVEL STORAGE SILOS, AND WATER STORAGE TANKS

The continuous level measurement in sand or gravel storage silos can be done by **EasyTREK SCD-300** type ultrasonic level transmitters. For low/high level switching **NIVOCONT R** vibrating rod or **NIVOSWITCH** vibrating fork level switches are recommended. The low-level switches always have to be mechanically protected from damage by a plate mounted above them. For level measurement in water storage tanks, ultrasonic level transmitters are recommended (**EchoTREK** or **EasyTREK**).



NIVISION APPLICATIONS



INSTRUMENTATION AT THE PLASTER FACTORY

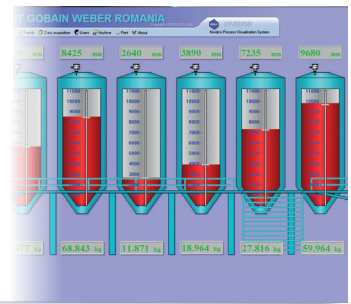
The task was to measure the level of 57 m³ silos of storage of raw material and to display the measured values in the control room. Transmission, display and data logging are carried out by NIVISION software program running on a PC. Taking into consideration the characteristics of cement, sand and dross granulate used in the technology we have chosen the MicroTREK HTN-408-4 microwave level transmitter.



We connected the output signals of the transmitters to UNICONT PMM-324-1 universal control panels. We connected the RS485 output of UNICONT controllers via ADAM 4520 serial industrial communicator to the computer. The NIVISION program was used for visualizing the level changes in the silos, the actual level value and mass of the materials stored in the silos.



The specialty of mass calculation in this case is that the lower part of the silos are cone shaped and contain the 1/4th part of the stored material therefore the actual mass should be registered together with the level changes. We have solved this problem with the help of a mathematical function that performs the needed calculation from the measured level value. Also, part of our task was the setup of data logging. The current measured level and calculated mass values of raw materials have to be stored every 15 minutes.



INSTRUMENTATION SYSTEM OF A COMPLETE BITUMEN TANK FARM

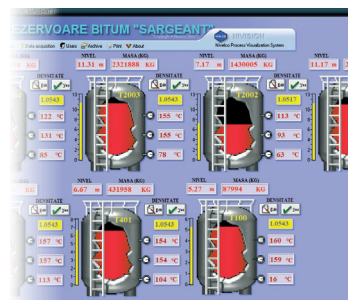
The measurement tasks were the continuous measurement of the stored volume in seven tanks, temperature measurement in 3 points inside the tank, providing high fail-safe alarm with sound and visual indication, local displaying of the measurement data, collecting and logging the data in a central computer and volume correction based on the measured temperature. For the temperature measurement THERMOCONT TBC-526 temperature sensors were used at 3 different levels.



The high temperature type NIVOCAP CMV-115 capacitance level switches are mounted so that the probes sense when the tanks are filled up to 80% and the high temperature type PilotREK WJS-182 radars are continuously measuring the level of the hot bitumen. Upon reaching the high level during filling of the tank the NIVOCAP CK level switches send switching signals to the sound and visual alarm devices to warn the personnel to stop the filling.



The measured level values are transferred by MultiCONT PRD-210 process controller units on RS485 line to the process control PC, where the data can be processed, stored, and displayed with NIVISION process visualization software. NIVISION process visualization software. The software calculates precise volume from the measured level values based on the tank dimensions. The compensation of the thermal expansion is calculated with the help of the measured average temperature. The stored amount in the tank is displayed in kilograms which are calculated based on the average density.



INSTRUMENT SELECTION



PiloTREK – non-contact microwave level transmitter

- Continuous non-contact level measurement of liquids, slurries, emulsions
- Plastic, aluminium or stainless steel housing
- For high pressure, high medium temperature
- For high precision level measurement tasks



MicroTREK – guided microwave level transmitter

- Distance, level and volume measurement
- Liquids, powders and granular mediums with $\epsilon_r \geq 1.4$
- Stainless steel, FEP, PFA or PP coated probes
- Medium with turbulent surface, dense dust, vapour or pressurized gas layers above the product surface
- For all tank shapes, for narrow vessels



EasyTREK / EchoTREK – ultrasonic level transmitter for solids

- Non-contact level measurement of solids
- For normal or medium with combustible dust
- Level, volume or weight calculation
- Wide application range: light powders to coarse bulk solid materials
- Reliable measurement in challenging applications such as dusting during filling



NIVOPRESS D – level and pressure transmitter

- Hydrostatic level measurement of liquids, vapors, and masses in tanks and vessels
- For foaming liquids
- Piezoresistive sensor with stainless steel flush diaphragm
- Wide variety of process connections



NIVOMAG – magnetic coupling level switch

- For liquids with min. 0.7 kg/dm^3 density
- Controlling filling/emptying
- Supplementary fail safe switch if combined with other devices
- Overflow protection



NIVOROTA – rotary paddle level switch

- Wide application range for solids
- Level switching of granular materials and powder
- For free flowing solids with min. 0.1 kg/dm^3 density
- Single or 3-vane paddles according to the density of the measured material
- Low/high fail safe limit switch





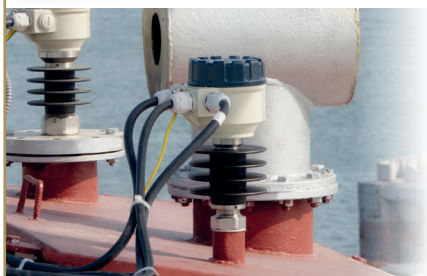
NIVOSWITCH – vibrating fork level switch

- Level switch of liquids, powders, granules
- For low/high fail safe limit switch
- Relay or electronic output



NIVOCONT R – vibrating rod level switch

- Almost any granular material and powder with min. 0.05 kg/dm³ bulk density
- Solid rod or flexible cable extension up to 20 m
- Stainless steel vibrating section
- Adjustable sensitivity



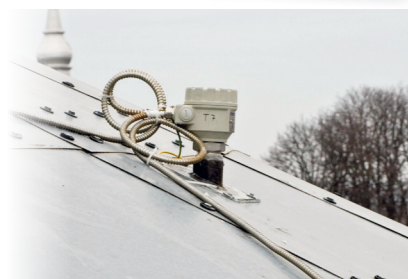
NIVOCAP CK – RF-capacitance level switch

- Intelligent electronic level switch
- For solids and liquids with $\epsilon_r \geq 1.5$
- Easy calibration, selectable sensitivity
- For adhering, sticky materials
- Calibration with external magnet in hazardous (Dust Ex) environment



THERMOPOINT – multipoint temperature transmitter

- Multipoint temperature measurement of powdered, granular or free flowing solids
- Average temperature measurement
- Temperature trend monitoring
- Temperature data can be transferred to longer distances through HART® protocol
- Storage silos



THERMOCONT TT – temperature transmitter

- For normal or explosive materials
- For temperature metering of liquids, vapours, gases and free flowing or powdered solids, providing local indication
- Transmission to long distances (4 – 20 mA, HART®)
- Tanks, vessels, pipelines



UNICONT PM – universal indicator

- Temperature display
- Cooling/heating control
- Switching, control or transmitting tasks
- Sequence control
- Alarm indication



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