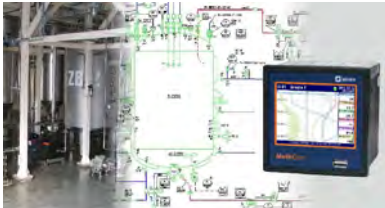
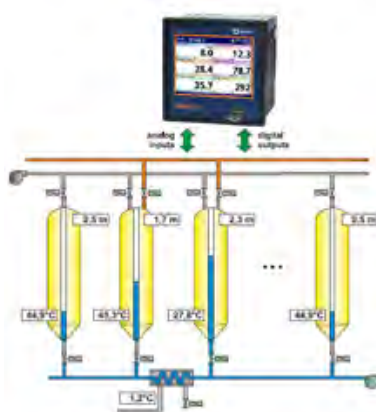




Click an image below to jump to a selected application note



PID loop systems



Automatic fruit juice mixing



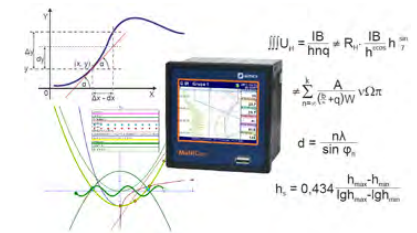
Pulse, flow and tacho inputs



Portable datalogger



Pharmaceutical precision



Mathematical functions



Optoisolated counter

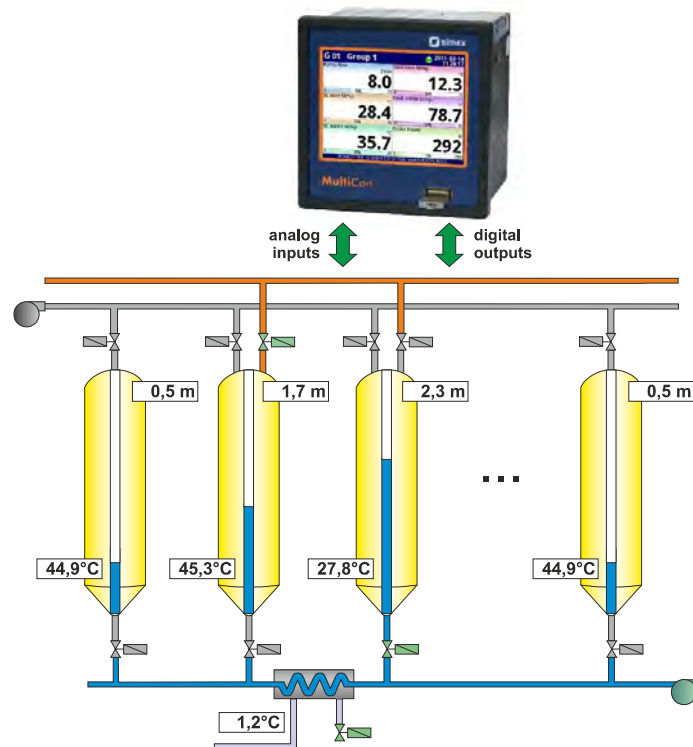


60 channels

Just a selection of the 43 application note bulletins currently listed below

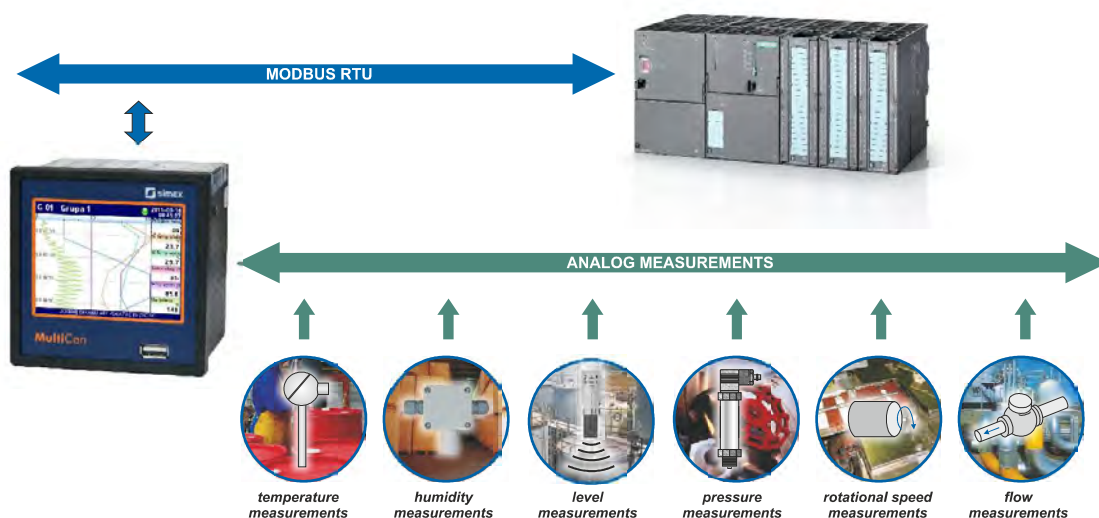
Application 1: Automatic fruit juice mixing system.

Logical functions implemented in MultiCon CMC make complex control procedures simply available. Depending on tank levels the Multicon CMC switches batch valves. After finishing this sequence it can turn the pump on. Levels can be displayed on the Multicon CMC screen. Alarm signalling can be implemented using the device's integral relay or digital outputs. The Multicon CMC provides an integrated controller and HMI unit in one single device with onboard programming and stored control sequences.



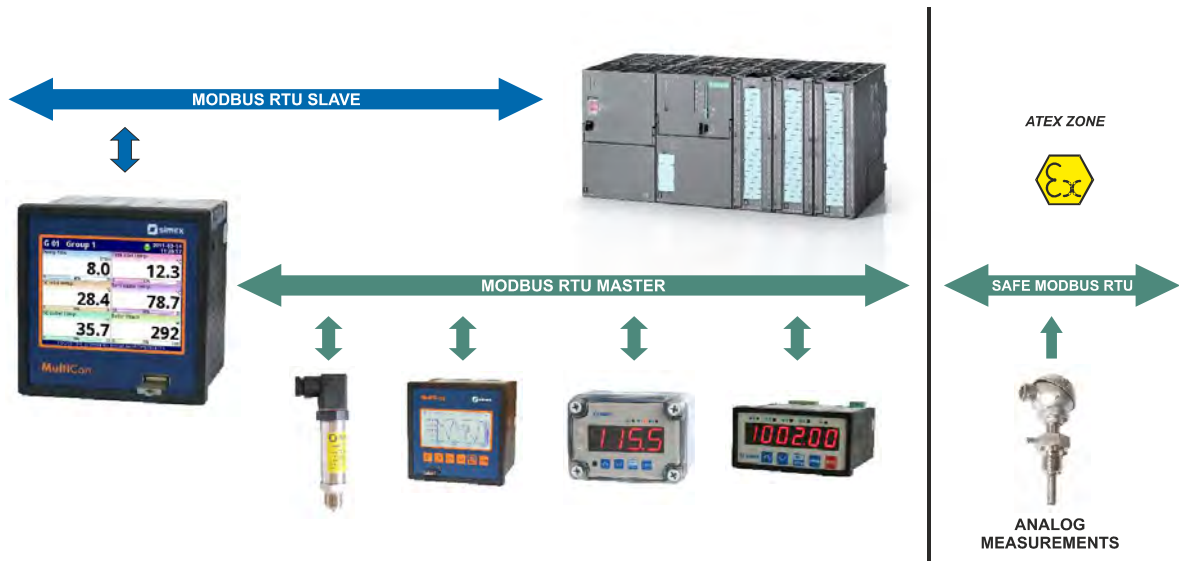
Application 2: Hub for communicating multiple analogue transducers to a PLC using Modbus RTU

In this kind of industry application CMC-99 collects analogue measurements and sends them via Modbus RTU to a central controlling PLC. The distance between CMC-99 and a PLC installation can be up to 1000 m. All measurements are sent using one cable, this is a very cost effective method. Modbus RTU is very popular and reliable communication protocol. There is a possibility to divide the Modbus network into several subnets. CMC-99 can work as a Master in one subnet and as a Slave in another.



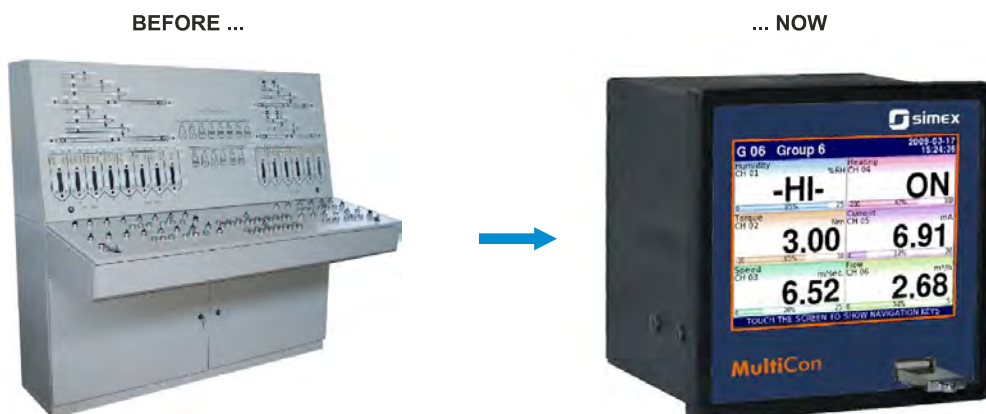
Application 3: ATEX controlled zones reached using Modbus RTU

With the MultiCon CMC collecting analogue measurements using Modbus RTU protocol as a Master mode, all data is sent to another device (e.g. PLC) using one single cable. Today it is the most advisable communication method. Modbus RTU protocol can be used in explosive ATEX zone as well. There is no need to extend system. All analog measurements are collected together and seen on CMC screen. Our controller can be extended to manage up to three Modbus RTU subnets.



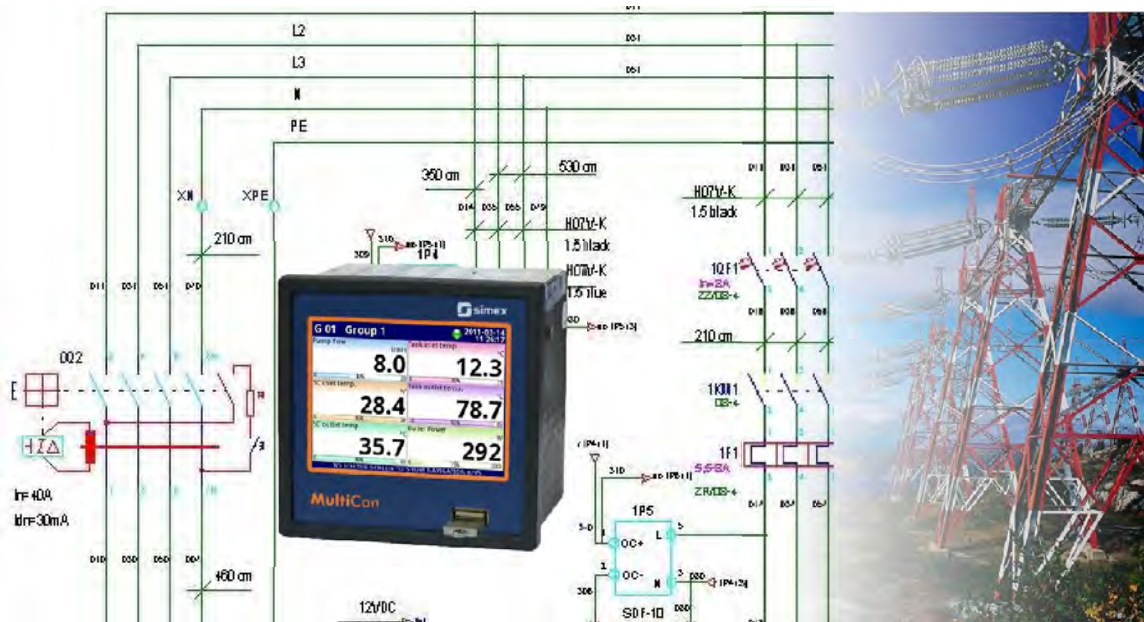
Application 4: Industrial automation trends - rationalising and adding flexibility

Industrial automation trends are towards rationalising, miniaturising and employing controls that are flexible to allow easier reprogramming. Outdated and unreliable old control desks can be now replaced with multi-purpose programmable devices. Today meters/controllers must be able to meet many customers specific needs. MultiCon CMC is an ideal solution for applications where simultaneous measurement and regulation of numerous channels is required. All control functions are collected in one single device. CMC is equipped with colour TFT touchscreen that makes HMI simple applications possible and saving time. A variety of different screen layouts are available to visualize different measurements very clearly. Even complicated automation process can be implemented in MultiCon easily. Different types of inputs are combined using calculated, virtual channels. Using those channels and built in control methods MultiCon CMC covers almost every industrial automation process.



Application 5: Replacing the PLC - expanded mathematical functions

MultiCon CMC controller allows to operate logical channels with mathematical functions. The user can adjust each channel value using arithmetic operators. This feature is useful when CMC works as a signal circuit analyser for monitoring power, power factors and electric energy. Despite only having voltage and current as input channels, all these power components can be calculated using just the built-in mathematical functions of the MultiCon CMC. The result of such an arithmetic operation is a virtual input channel and it can be displayed on the CMC-99 screen or be output to another device through a connection to a CMC-99 output. Using binary logic as an arithmetic component MultiCon CMC gives you a great possibility to implement simple PLC industrial application control systems.



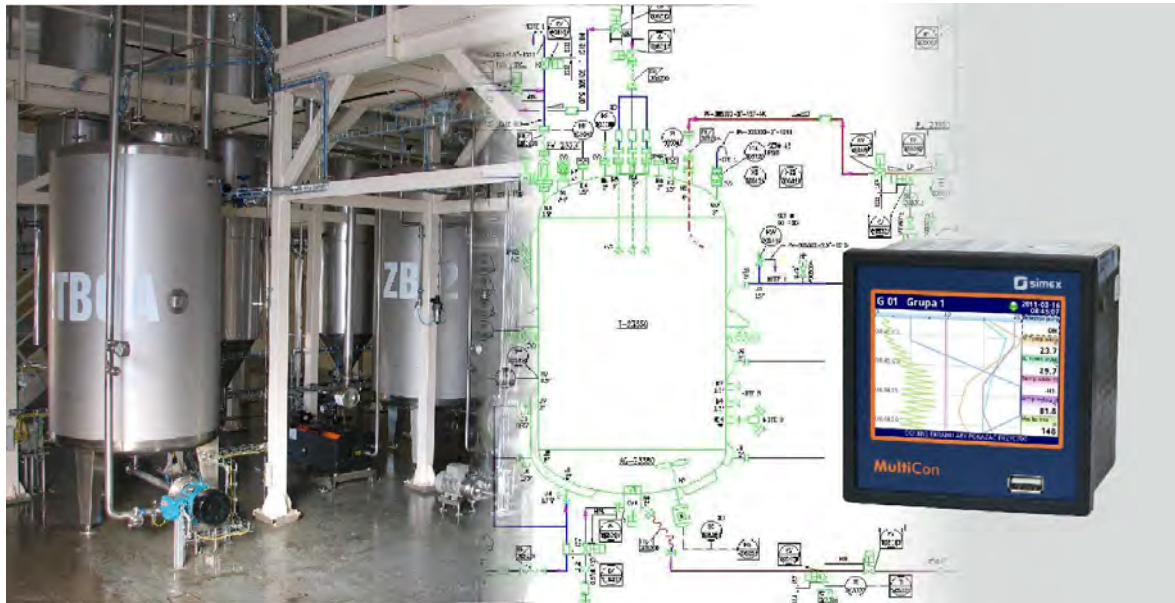
Application 6: Faster configuration through USB connections

The MultiCon CMC controller is powerful and has many parameters and function options. They make this device more versatile and they can cover all of our customers' individual needs. Setting these MultiCon CMC extended options would be time-consuming except two USB Host ports are available for PC mouse and keyboard connection and use. Multiple MultiCon CMC units can be quickly configured this way.



Application 7: PID loop systems

MultiCon CMC supports up to 5 internal PID controller channels. This makes enhanced industrial control feasible without an array of separate controllers. PID loop control provides cost and energy efficient control systems.



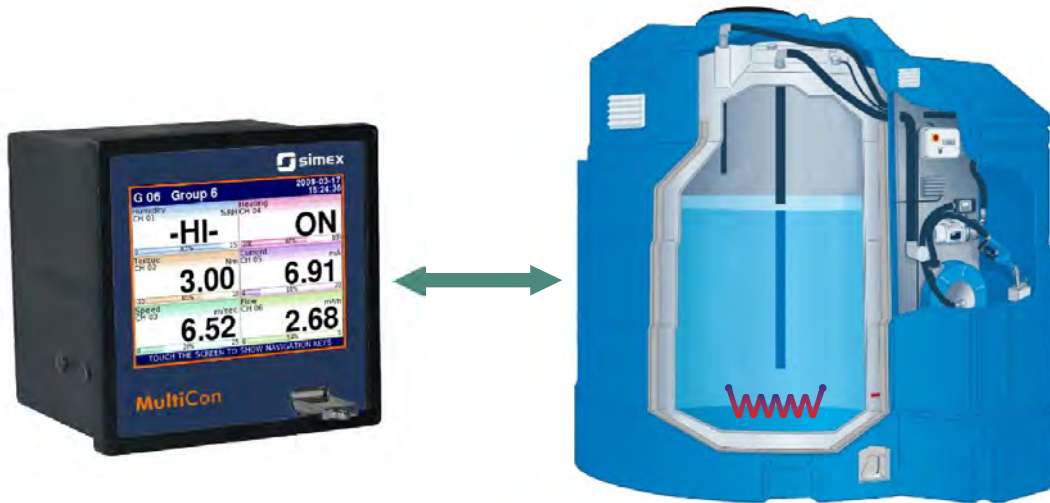
Application 8: MultiCon CMC as a temperature meter

MultiCon CMC-99 collects measurements from 12 temperature points (CMC-141 from 18 temperature points) and sends them to the SimCorder software which logs them in a file. The customer uses one CMC only to view all the measurements at one place. Great facilitation is that our device has dedicated input slots for temperature sensors either resistance or thermocouple. There is no need to use additional devices like eg. external transmitters.



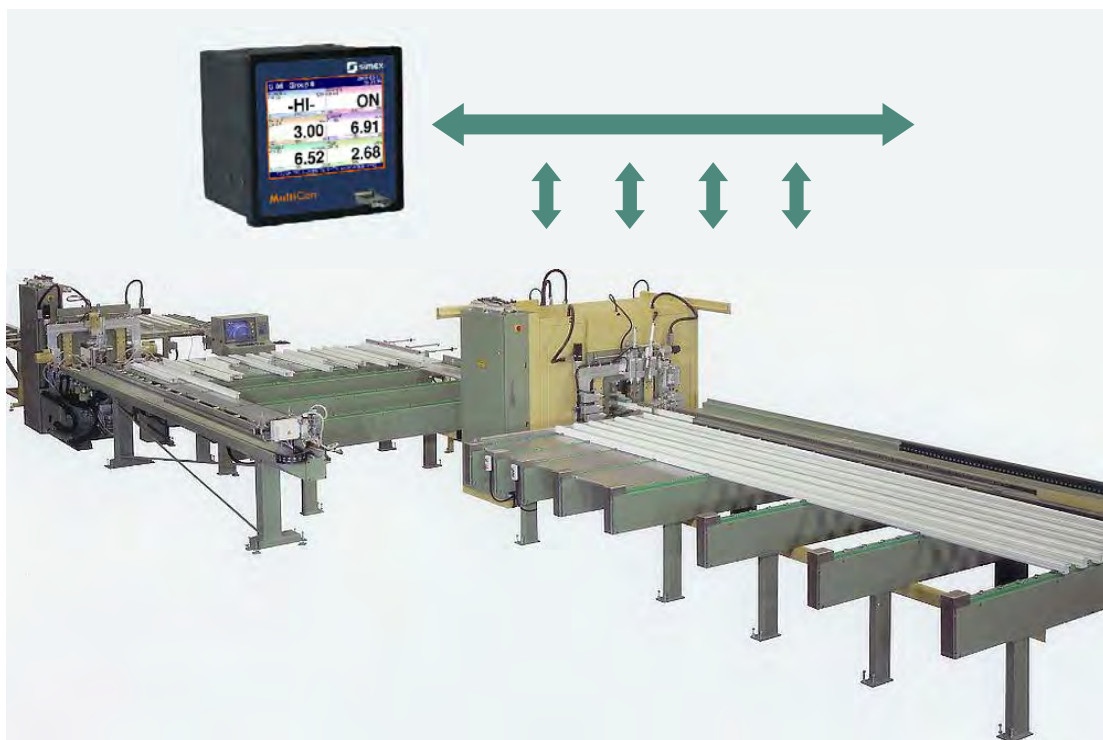
Application 9: Elimination of cabinet components with integral high current relay outputs

A great amount of available controllers have built in relay outputs, but MultiCon CMC has high current relay output slots as an option. The CMC can be equipped with 4 Relays 5A or 6 Relays 5A current load modules. For example CMC having this relay output module in, can control heaters with 1200W load. Furthermore CMC users don't have to install contactors or indirect relays in their applications, which significantly can save space in electric cabinets. When contactors or indirect relays are necessary in any way, MultiCon CMC has 24V DC power supply excitation, in order to drive their coils.



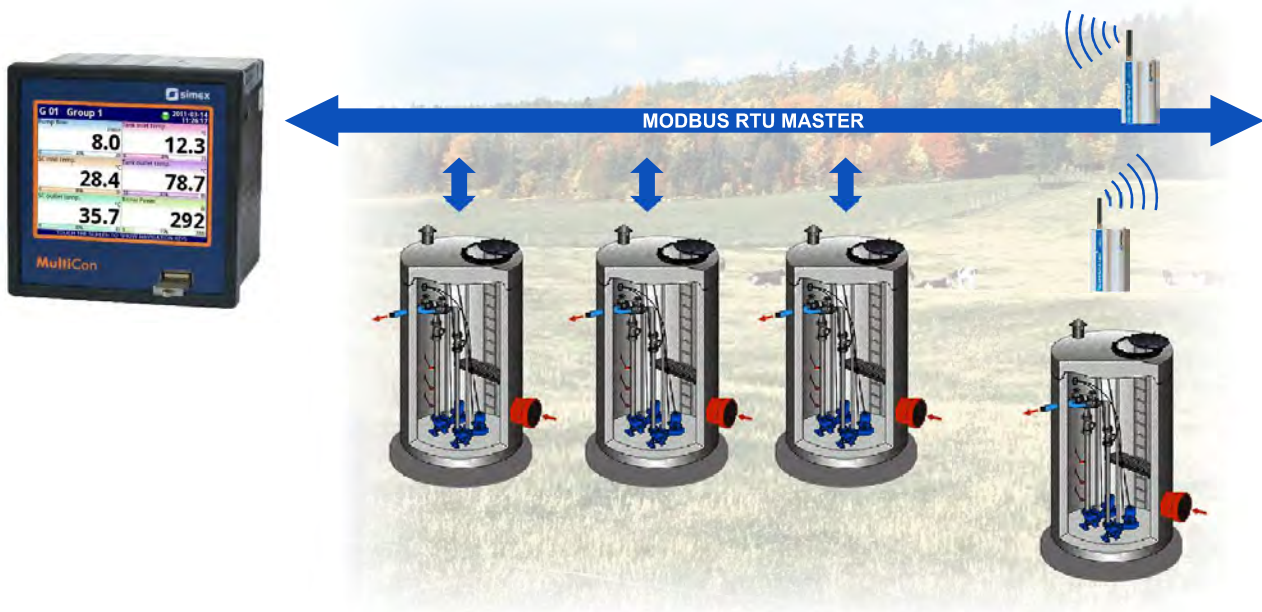
Application 10: Fast SSR outputs control production lines at 0.1 seconds

A great deal of industrial automation solutions needs fast durable outputs. MultiCon CMC is now ready to meet the requirement due to the SSR output available as another PCB module. Fast SSR output can be driven down to 0.1 sec time period. As an example, typical production lines require fast working controllers. Simex MultiCon CMC, with its colour display and visualisation possibilities covers our customers needs perfectly.



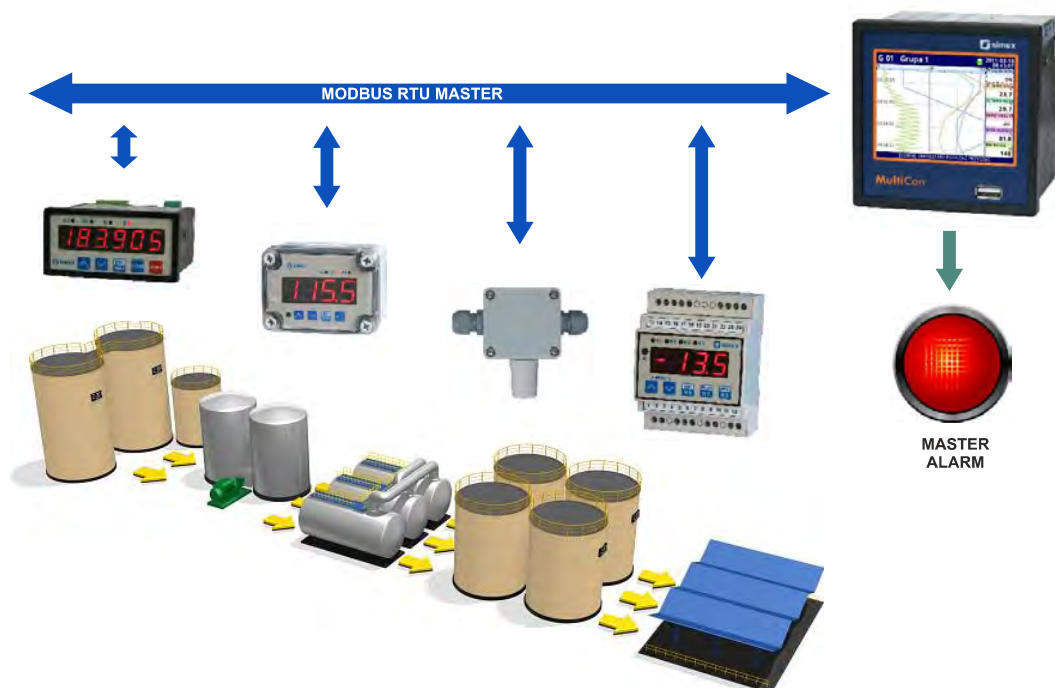
Application 11: Pumping stations - CMC in distributed applications

Thanks to Advanced Communication Module (ACM) available as another slot in CMC, there is a great possibility to implement distributed applications using all Simex and other devices equipped with RS-485 port. MultiCon's Modbus RTU Master has many settings that make demanding and complicate applications possible. Intermediate pumping stations distributed in wide distance is a good example of CMC universality. Options like Modbus Time-out are very useful for GPRS communication.



Application 12: Quicker setup with auto configuration using Modbus RTU interface

Multicon CMC Modbus Master communication options may not be obvious for non experienced maintenance engineers. We have made preconfigured settings for all Multicon CMC devices equipped with RS-485. To set it up one just has to choose a device from the list in the CMC menu. There is no need to change any Modbus options. Communication will start and function automatically.



Application 13: Crop dosing time controller

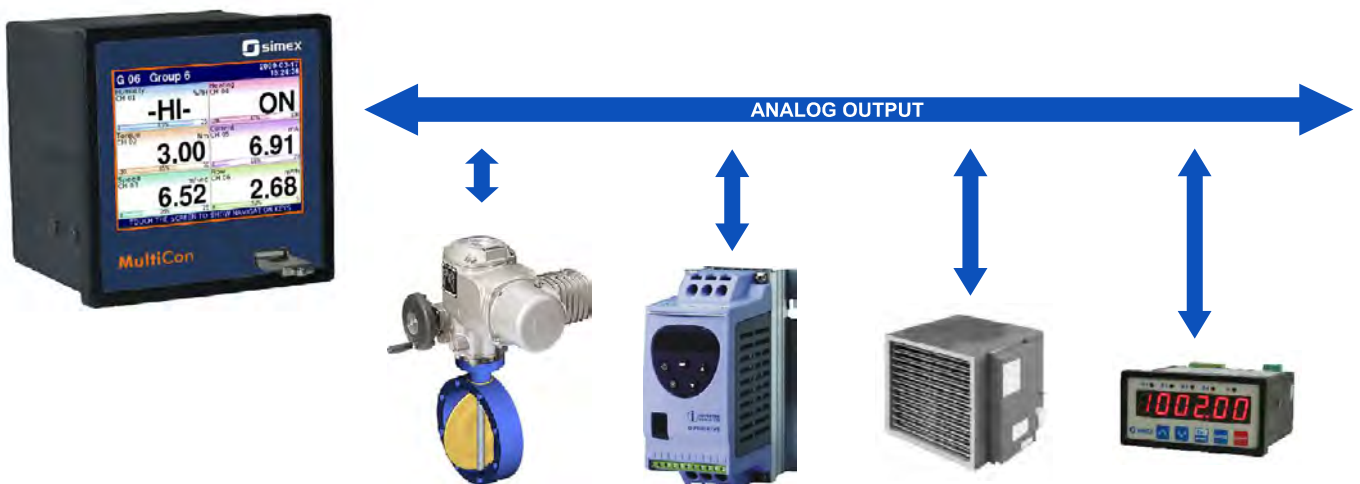
Many typical automation applications are time period. It is very unprofitable to make an investment with expensive PLC if control applications are relatively simple. The MultiCon CMC, thanks to implemented timer system, has a great possibility to control those systems alone. Using different input and output slots one can design as complicated automation systems as PLC, but inexpensively.

As an example, gardening industry needs controllers with date and time functions.



Application 14: Pharmaceutical recipes controlled to 4096 step precision

Thanks to its Analogue output module, the Multicon CMC can control industrial applications using continuous analogue signals (4096 graduations). Using the Profiles function, very complicated control schedules can be programmed. Chemical and pharmaceutical applications that need complicated recipe systems are easy to implement with Multicon CMC.



Application 15: Petroleum refineries where distances are large.

Taking into consideration actual industrial trends, we are pleased to introduce the MultiCon CMC as a distributed controller. There is a family of digital I/O, counter and analog input external modules, implemented in a small housing, that are easy to build inside control boxes. A single cable connection with RS-485 as a Modbus RTU makes applications economical and noise robust. The CMC can be used as the net Master that calculates outputs using information collected from different inputs. Distributed solutions are very common on expansive industrial sites such as petroleum refineries.



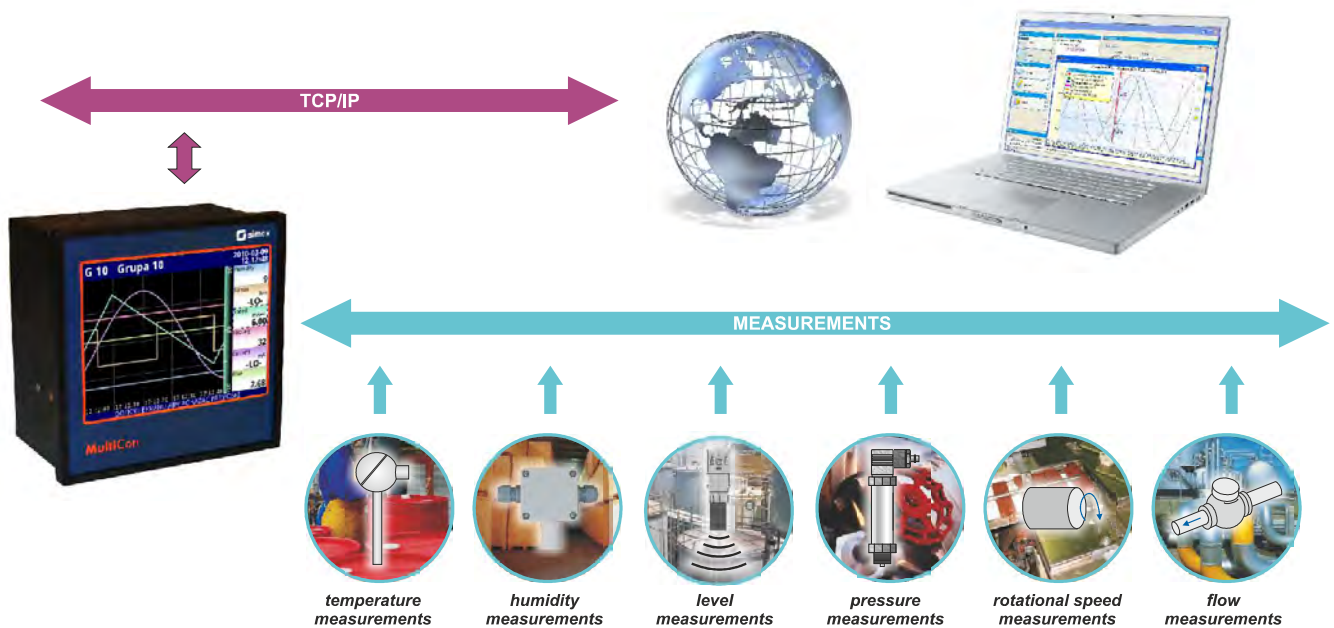
Application 16: TS-35 DIN rail holders

Sometimes there is a necessity to build MultiCon CMC inside a control box. Using a common TS-35 DIN rail and new, optional MultiCon CMC DIN rail holders, the controller is easy to assemble in such applications. This way of installation is very helpful if access to this device has to be protected against unauthorized personnel or high IP protection is required inside a cabinet.



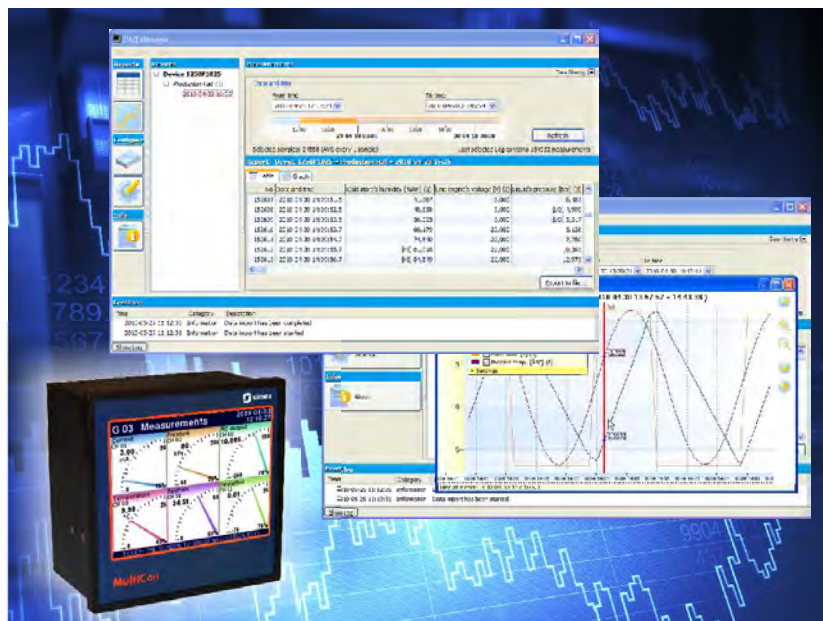
Application 17: Web browser view and control over your Ethernet network

MultiCon CMC is well known as a universal meter and data logger. The unit is capable to collect different type of measurements coming to the input modules or transmitted via Modbus RTU port. Now, thanks to the Ethernet port built-in optionally, CMC gets a new functionality - display channels can be selected and viewed using typical web browser. The device can have a static or dynamic IP address (DHCP mode) which enables you to introduce CMC to a corporate network.



Application 18: Datalogging to USB joins system control in a single device

Where there is a requirement to control actuators and log data using a one single device. In this case CMC is the right choice. Using the software licence key a customer can activate data logging functions. Recorded data can be moved to the DAQ Manager PC software with a USB flashdrive. The DAQ Manager allows to analyse recorded measurements using tables or graphs. Data can even be exported as a file for use in other customer programs for further analysis.



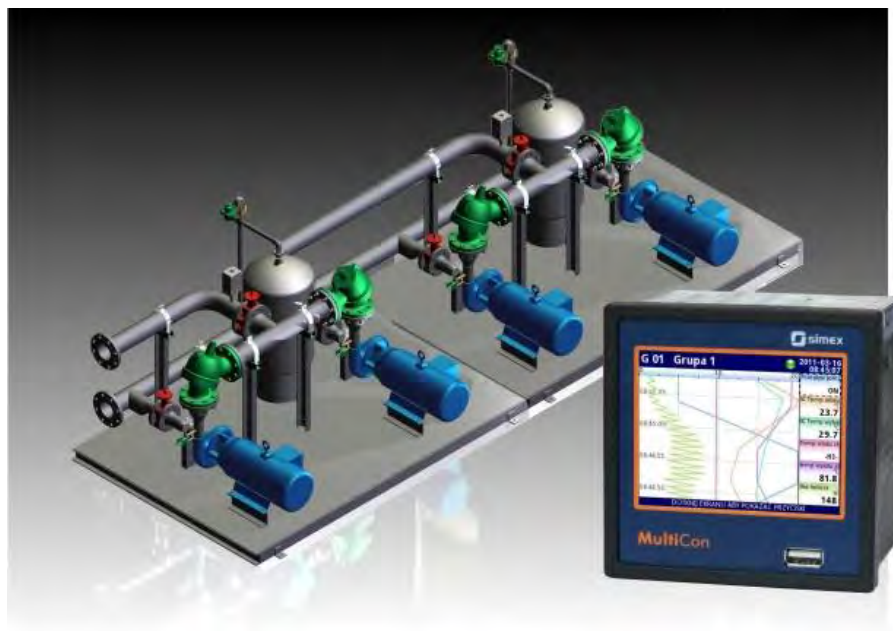
Application 19: Heating control characteristics adjustable with minimal keypresses

It is very convenient, for users, to change "Setpoint" values in each controller simply. In the MultiCon CMC, the user has just to touch a chosen logic channel on the unit screen and hold for at least one second. There is no need to struggle with settings in a Menu mode. Setpoint value can be a mathematical function or selectable profile as well - useful in a heating characteristic procedure.



Application 20: Time profiles in livestock production

There are many industrial objects that are time period determined. Everyday controlling cycle depends on day time. Good examples for those applications are typical pumping stations or chicken farms. The MultiCon CMC has built in, time control functions that are suitable for common time cycle applications. Using other CMC functions, the user can build quite sophisticated controlling procedures.



Application 21: New pulse, flow and tacho inputs

Many industrial control applications are built using proximity switches - mostly driven with fast digital inputs and often from pulse counters. These signals give data about position, speed, flow, etc.
The MultiCon CMC Input/Output modules list has now been extended with the following new options:

CP4 - 4 universal pulse counters

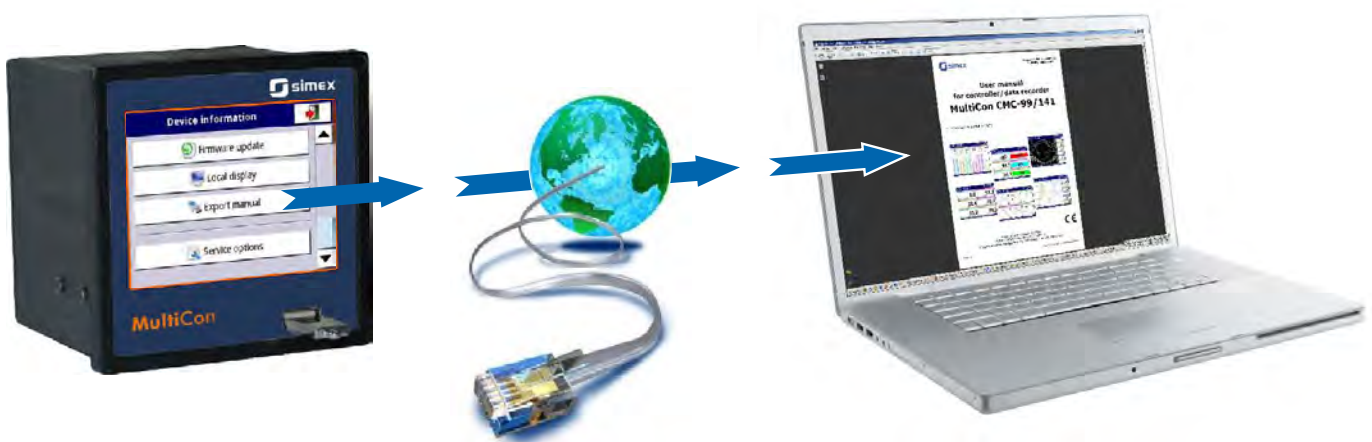
FT4 - 4 tachometer/flow inputs with totalizer counters and 4 additional analogue current inputs

FI4 - 4 flow inputs as analogue current inputs with totalizer counters and 4 additional analogue current inputs .



Application 22: Technical manual stored inside every MultiCon memory

In order to make the configuration easier, there is a copy of the MultiCon CMC operating manual inside each device. You manual can be extracted onto a USB memory stick as required. This functionality helps to keep all required documentation close to device.



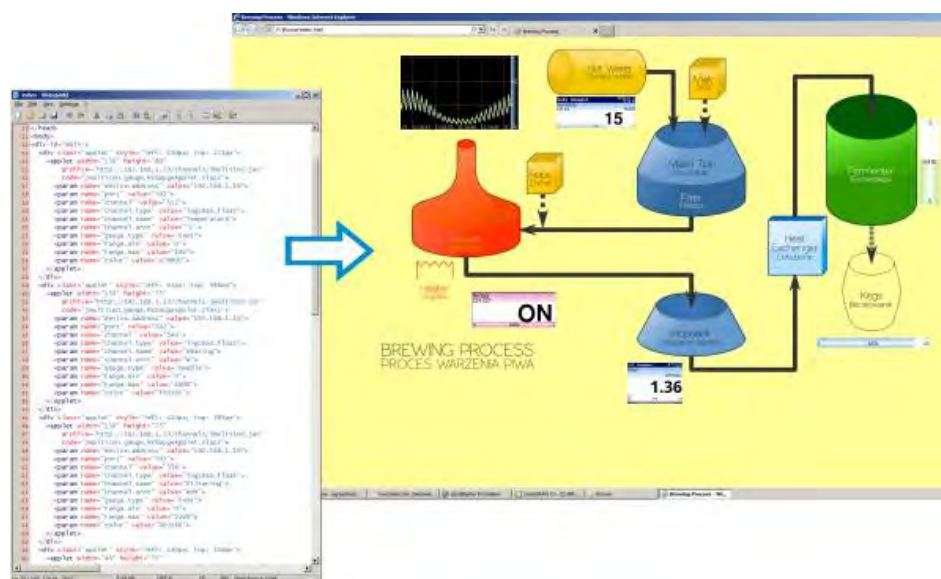
Application 23: Modbus TCP server for industrial monitoring and control

The MultiCon has implemented Modbus TCP server version. Up to 3 clients can communicate with our device at the same time. It can be the CMC's web page, the DAQ Manager PC software or a dedicated SCADA software. Nowadays ethernet/internet is the most popular communication medium. The MultiCon's functionality with Modbus TCP offers now many new possibilities in the industrial monitoring and control applications.



Application 24: Cost-effective SCADA solution

Sophisticated applications often lend themselves to HMI's (Human Machine Interfaces). A multipurpose SCADA system represents quite an expensive solution. With Multicon CMC you can build your own HTML Web pages to offer SCADA functionality. All measurements are then available through Java script Modbus TCP library. There are plenty of free of charge applications that support html programming. The HTML language allows to design even quite sophisticated and demanding applications.



Application 25: Hourmeter modules control machinery run-time

The **HM2** and **HM4** are the hourmeters modules developed for the **MultiCon CMC** units. Allow to measure period of time between **START** and **STOP** signals, as well as sum of periods. These modules are ideal solution to control working time of a machinery, duration of phenomena or for maintenance purposes. The **HM2** and **HM4** have 2 and 4 independent counters respectively. Each counter is equipped with 2 inputs - **START/STOP** and programmable, which can be set as asynchronous **RESET**, **HOLD** or used as independent digital input.



Application 26: User selectable time format display up to 1/1000th second

Time format is an advanced method of data presentation in format of time. User can easily get a desired format, by entering a "formatting string" composed of letters and colons, for example a string: "w:d:hh:mm" lets user to display data as number of weeks, days, hours and minutes, separated by colons. This mechanism allows also for dividing the result on two independent channels. Input data must be expressed in seconds. The maximum displaying precision is 1/1000 of a second.



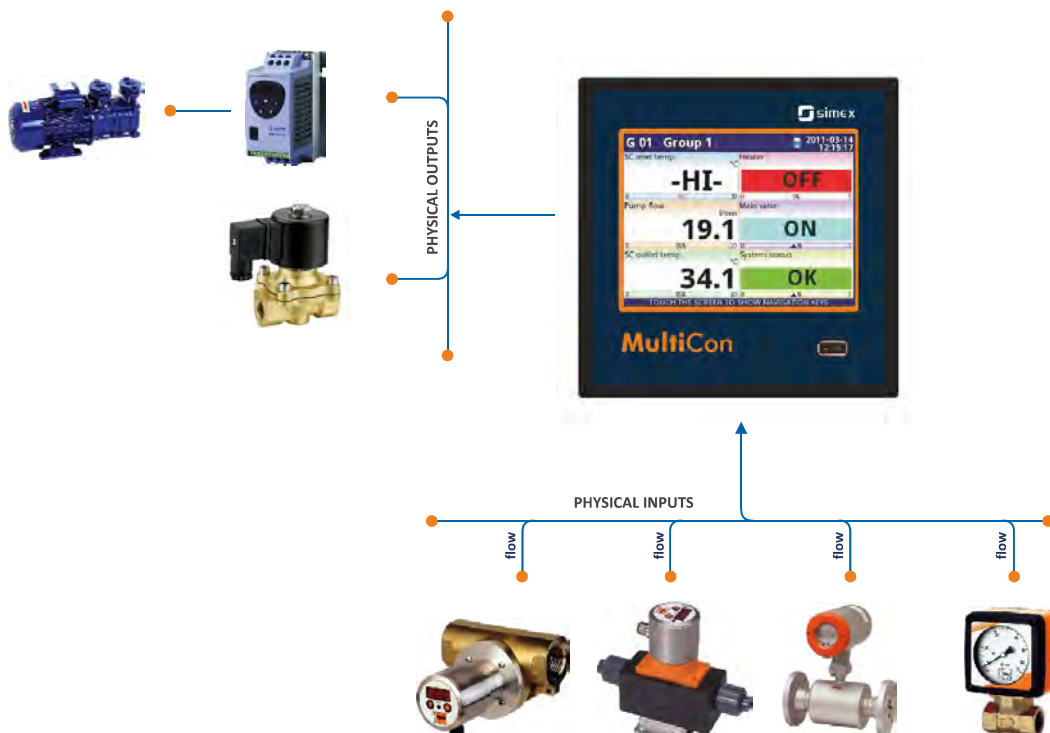
Application 27: Display weather station data as an electronic compass - phasor diagram

MultiCon CMC features 1.5 GB of memory enabling to save up to 125,000,000 samples, and offers the possibility of remote access. Thus, it can be successfully used as an autonomous recorder of climate data. The mode of displaying values as phasor diagrams makes it possible to visualise the data collected from a weather station in the form of a classic compass.



Application 28: Flow measurement in fluid process industries

As a universal controller and recorder, MultiCon CMC can cooperate with impulse flow meters as well as flow meters equipped with a current output. Apart from the instantaneous value, the total flow of liquid, gas or powder is calculated on a separate channel thanks to the totalizer function. The high load relay output modules as well as precise analogue outputs with the resolution of 4096 segments make MultiCon CMC an ideal solution for the demanding processes of flow capacity regulation.



Application 29: MultiLevel User Access secures your data. Auto-logout with USB key.

With an effort to meet the requirements of the most difficult industrial automation applications, we have equipped the multichannel MultiCon CMC controllers with a new feature. The "MultiLevel Access" mode makes the MultiCon CMC even more universal. You can define up to 16 independent users including the administrator who is the only user with a permission to freely configure the device without any limitations. The administrator's role also consists in defining permissions for other users. Only one user can be logged on at a given moment. The user is logged off after the lapse of time from the moment of the last interaction of the user with the device as specified by the administrator or upon express request of the user after clicking the padlock icon on the information bar. The authorisation process is additionally facilitated by the possibility of using USB keys. The hardware key allows the user to log on without the necessity of entering a password while removal of the key is equal to logging off. The key is assigned individually to each user. Such a facilitation will be available only for those users whose devices have Access Dongle licence activated. Otherwise the login and logoff process must be carried out manually. The permission file may be saved using external memory and thus it is portable, which highly decreases the configuration time of subsequent units. The hardware key options are available with a MultiCon CMC device having Access Dongle licence activated only.



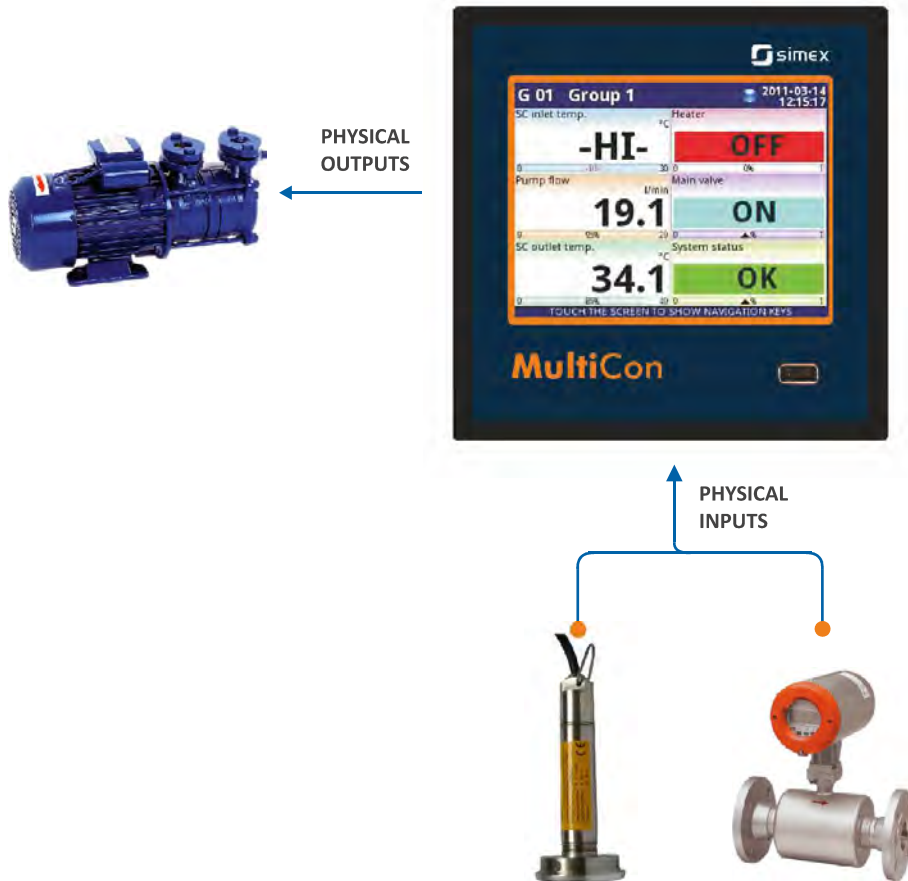
Application 30: Extended operating temperature range between -20°C and +50°C

As an universal controller, the MultiCon CMC may operate in various conditions, such as in a closed control cabinet, at a production hall surrounded by heavy-duty equipment and even in the control units of seagoing vessels. In response to the requirements of the most demanding customers, MultiCon CMC has met another challenge, i.e. low temperatures. We are proud to inform you that the version with an extended operating temperature range between -20°C and +50°C is now available.



Application 31: Dry running protection for small and medium-sized pumping stations

Owing to the broad and varied range of the available input/output modules, the **MultiCon CMC** is an ideal control unit for small and medium-sized pumping stations. On the basis of the signals supplied from the flow meters and the hydrostatic probes, the implemented mathematical functions make it possible to realize complex algorithms of the physical output control. The possibility of securing pumps against dry runs is an additional advantage.



Application 32: Portable applications as a roving datalogger

MultiCon enclosed in a PELI case is dedicated to especially difficult applications in industrial automation where there is no possibility of safe installation of a recorder/controller. The cases are made of highly impact resistant polypropylene copolymer, ABS and stainless steel and meet the most demanding safety standards. The increase of safety does not mean that **MultiCon** is less functional. It is possible to supply as many as 20 multipin connectors for sensors and external interfaces.



Application 33: Browser control of your process from anywhere in the world

Apart from remote data insight via a web browser or the DAQ Manager software, **MultiCon CMC** also enables direct process controlling from almost anywhere in the world. Using the Modbus TCP/IP protocol implemented in **MultiCon CMC** as well as the remote display functionality, the user can easily transfer the display of the device onto their computer screen. Connecting **MultiCon CMC** to a router with properly routed ports enables full control of the application from home, office or even a hotel room.



Application 34: Heating management with thermocouple and RTD compatibility

The availability of multiple I/O modules enables to adapt the **MultiCon** to a variety of applications. It is a perfect solution for any heating processes. MultiCon can cooperate with thermocouples as well as RTDs. The relay outputs, a quick-connect SSR output and analogue outputs enable to realise simple algorithms of threshold control as well as complex PID control algorithms. The highly user friendly and intuitive interface allows to create appropriate heating profiles.



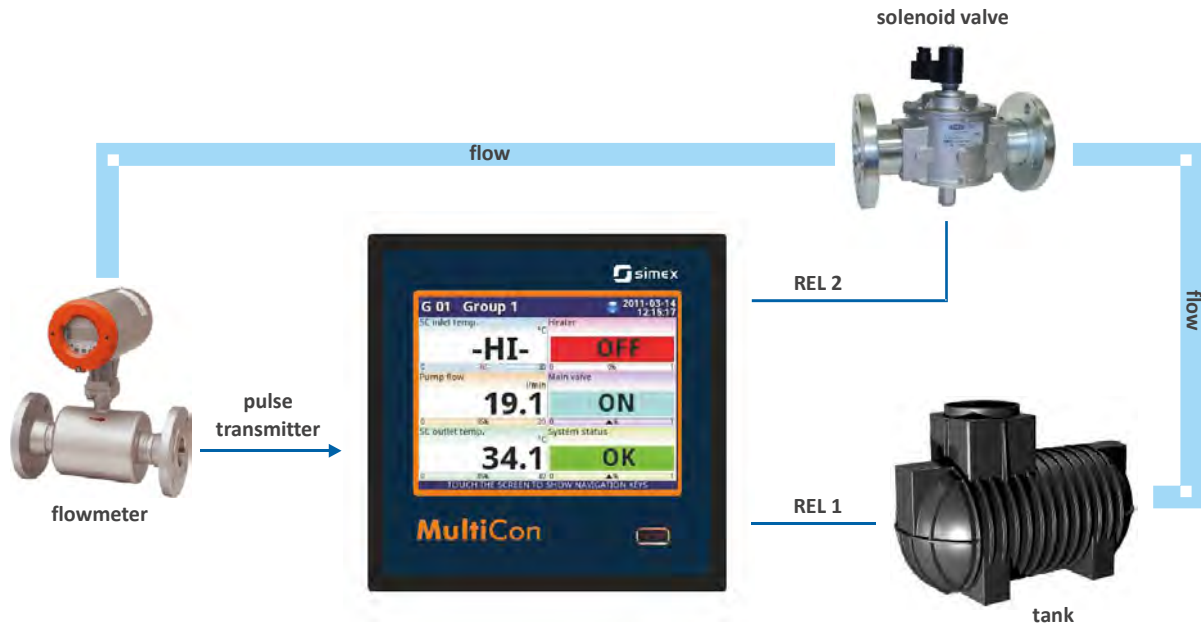
Application 35: Factory dial-in remote support

Using an Ethernet connection and the "Remote Display" feature, nearly any user of the **MultiCon** has the possibility of receiving remote support regardless of their location. All it takes is a connection of the MultiCon to a router with properly routed ports. Our engineers will be happy to assist in configuring the device. Furthermore, every user has the ability to save any configuration which they may send to us for diagnostic and possible correction purposes.



Application 36: Dosing in effluent treatment

MultiCon supports various modules of measuring inputs as well as relay and analogue outputs. Owing to the above, the device has nearly unlimited possibilities. Any types of dosing functions can be a great example of this. **MultiCon** equipped with flow meter inputs as well as relay outputs mentioned above can become a smart dispenser. It measures the existing flow values simply as well as calculating the balance of the medium and distributes it - ideal for effluent treatment roles.



Application 37: MultiCon as an energy meter

MultiCon efficiency has been proven in various industry applications. In some branches, measurement of energy consumption is highly important. There is no need to invest in additional meters - that is where our multichannel controller/recorder comes in handy. Thanks to the transmitters available in our offer, you can easily change the voltage and current into standard automation signals. **MultiCon** can use a number of the built-in mathematical functions to easily calculate the balance and the existing energy consumption.



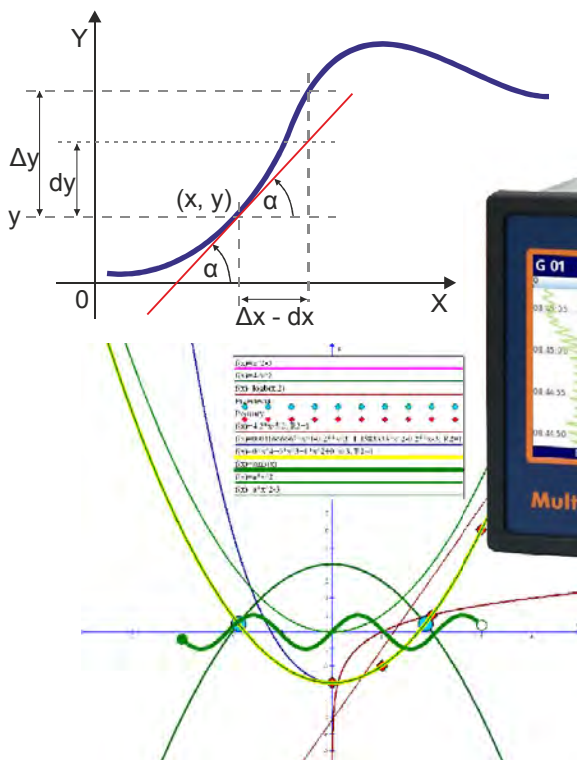
Application 38: Onboard data-analysis using Trend diagrams

MultiCon supports both the dynamic processes as well as the slowly varying processes. Especially in case of the latter, the trend diagram function becomes very useful. The user is granted with the possibility of presenting the process/processes on the screen lasting for a period of up to 1 week.



Application 39: New mathematical functions: derivative, integral, pulse count, flip flop and average

Implementing new mathematical functions such as derivative, integral, pulse count, flip flop and average has extended the already wide scope of possibilities for the MultiCon CMC. This has also significantly decreased the number of the logical channels involved making it possible to optimise complicated applications. Computation of power and acceleration, as well as balancing and averaging of measurement data can be achieved in less time.



$$\iiint U_H = \frac{IB}{hnq} \neq R_H \cdot \frac{IB}{h_{\epsilon \cos}} h \sin_7$$

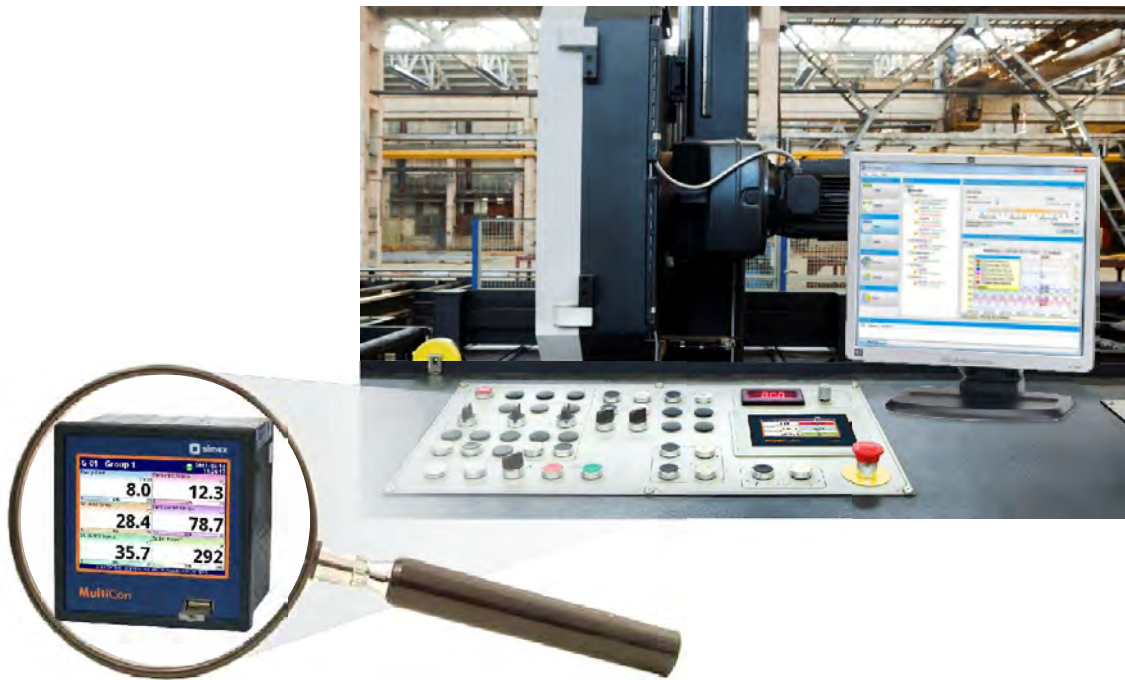
$$\neq \sum_{n=0}^k \frac{A}{(b+q)W} v\Omega\pi$$

$$d = \frac{n\lambda}{\sin \varphi_n}$$

$$h_s = 0,434 \frac{h_{\max} - h_{\min}}{lgh_{\max} - lgh_{\min}}$$

Application 40: Manufacturing processes monitored up to 60 channels at a time

The broad range of I/O modules, expanded regulation features and 1.5 GB memory for simultaneous recording of 60 measuring channels make the **MultiCon** an ideal solution in supporting production processes. Apart from measuring the non-electrical parameters which are key for production, such as temperature, pressure, flow, the MultiCon also calculates details/cycles, records the machine operation time and assigns control signals on the basis of the data collected.



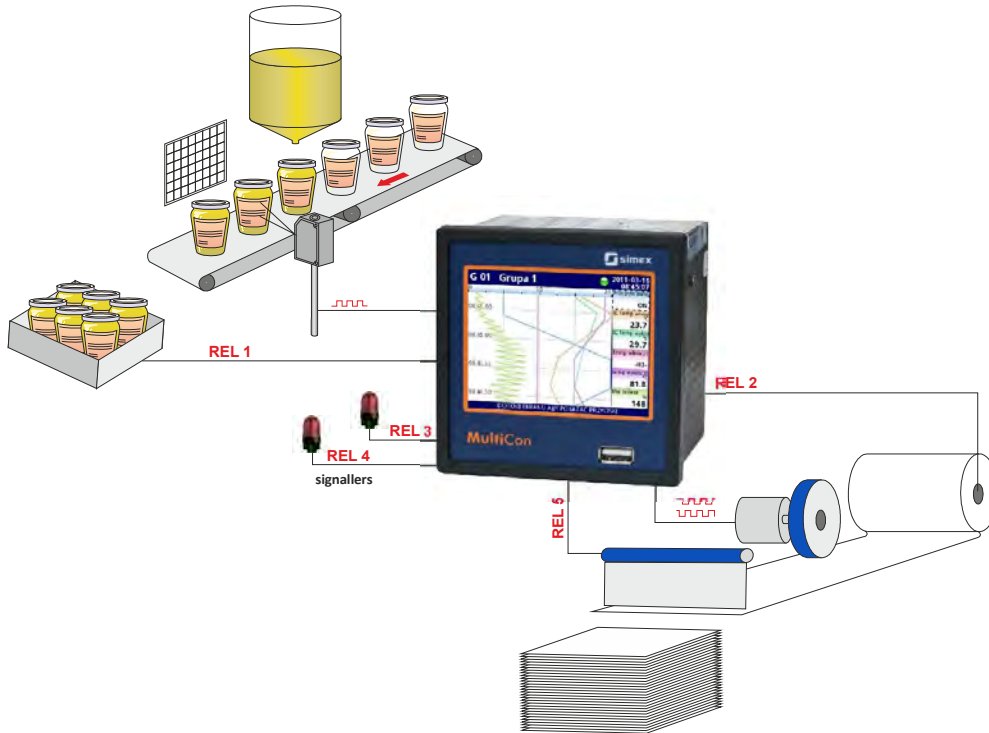
Application 41: Interconnection and communication between multiple Multicon CMC units with ACM

Installing an **ACM** communication module in the **MultiCon** provides a number of possibilities. The three isolated RS-485 interfaces enable easy communication between the devices which also facilitates management of large applications. The fully correlated units may share such activities as: local displaying of the measured values and controlling the physical outputs at the other end of the network. MultiCon which simultaneously carries the Master and Slave functions is an ideal base for creating expansive Modbus networks.



Application 42: Production line cycle time feedback using optoisolated counter input data

MultiCon CMC equipped with a CP2/CP4 module becomes compatible with proximity sensors as well as incremental encoders. With its meter input module and relay inputs, the MultiCon CMC is perfect for such applications as: counting the current quantities of produced components, calculating the production cycles, measuring length or balancing production with control of the production line drive mechanism.



Application 43: Signal conversion permits linking of transducers and controllers

MultiCon as a multifunctional device offers features of a multichannel meter, regulator and recorder. Owing to the implemented RTU Modbus as well as the possibility of equipping this device with three RS-485 interfaces, CMC is ideal as a converter. The device converts Modbus digital signal into analogue signal and vice versa without any problems. A huge competitive advantage of the MultiCon used as a converter is the possibility of displaying all transmitted signals on a large colour display.

