The perfect team: Multiparameter controller Liquiline CM442 and its sensors

Teamed up to make your life easier, the multiparameter controller Liquiline CM442 opens completely new dimensions for your measuring point. Together with sensors for six parameters this team covers all applications. Its ease of use and maintenance guarantees operational safety. All devices speak the same language based on the Memosens protocol. This enables automatic recognition of connected sensors. Our complete concept supports you in achieving your goals of cost optimization and plant security.

Your benefits
- One controller for all parameters: pH, ORP, conductivity, dissolved oxygen, turbidity and nitrate
- Modular concept fits for various applications
- Secures your process thanks to an easy to use menu guidance and common operation concept
- Saves you time by quick sensor exchange with precalibrated Memosens sensors and preconfigured Liquiline
- Reduces your maintenance and stock costs by standardized components

Speaking the same language lets you achieve your goals
The Liquiline platform combined with Memosens offers flexibility and standardization for complete measurement chains.

Flexibility is one key strength of Liquiline CM442 together with Memosens technology: Any combination of different types of digital sensors, cables, holders and assemblies in conjunction with the controller platform results in a measurement chain perfectly composed for your demands and requirements.

All sensors are either Memosens sensors with the fail-safe inductive plug-in head or come with fixed cables as digital sensors based on the Memosens protocol. The controller contains software for all parameters – always. So any sensor with Memosens protocol works with every Liquiline CM442.

Standardization is a second key strength of the Liquiline platform. It is realized by implementing the digital Memosens protocol into the fixed-cable sensors. Hence, all types of sensors use the same standardized protocol. This results in a compatible data and mechanical interface.

The standardization ensures a higher process safety. It also enforces the thinking in complete measurement chains instead of looking on separate components. Finally, it offers optimizations in terms of cost of ownership and stock handling. The concept contributes to the minimization of life cycle costs in a positive way.

Endress+Hauser invented Memosens. Our great success with this digital technology with inductive plug-in heads is obvious by the large installed base of Memosens sensors. Memosens has become a de-facto standard that also convinced further suppliers of liquid analysis. Now we share our knowledge with some of them, and there will be more in future. This means we are offering you a second source – if you want it.

Memosens – the future is digital!
Liquiline CM442 is not only a controller — it is the heart of the new Endress+Hauser liquid analysis platform. Its hardware and software are also integrated in the new stationary sampler Liquistation CSF48 and its portable version Liquiport CSP44. Our clear goal is to facilitate your daily work by maximizing uniformity for highest process safety at low costs.

Easy to use
- Intelligent software recognizes sensors automatically allowing plug & play for all Memosens sensors. This makes commissioning a simple affair.
- One identical human machine interface facilitates the operators’ job. They can configure the device quickly and safely. The same interface is used in the samplers which extends the platform to an even wider range of applications.
- The uniform philosophy brings the platform concept to the management level. Plant managers can use the same procedure for integrating the devices in their process management system.
- Fast connection via cage terminals makes life easy for the electricians.

Simple to maintain
- Thanks to Memosens, all sensors can be precalibrated in the laboratory. When connected to the Liquiline controller, the intelligent software recognizes them automatically and takes over all calibration values. This makes the exchange of sensors really fast and maximizes the uptime of the measuring point.
- The same is true for the exchange of electronic modules. Again, the controller automatically recognizes the new module and reduces the required maintenance time to a minimum.

One for all is the key to highest flexibility and maximum uniformity.

The uniformity of the electronic modules and the cables used for the Memosens sensors simplifies the stock management. You can reduce your investment costs (CapEx) and operational costs (OpEx).

Integration into FieldCare and W@M enables effective asset management. FieldCare the FDT based Plant Asset Management Tool offers you allaround support throughout the plant lifecycle. W@M provides up-to-date and complete information from engineering, procurement, commissioning through operation, maintenance and the replacement of individual components.

Platform concept
One controller for all applications – Easy to use, simple to maintain
Liquiline CM442
Everything under control

The Liquiline platform takes our portfolio for liquid analysis one step further. In addition to the usual reliability and high quality of our products, it excels by unique user friendliness at each stage of its life cycle.

Flexible connection possibilities
- “Multiparameter device” measuring all relevant values of water and wastewater applications
- Plug & play: Memosens protocol for all parameters
- Mix and match as needed: The device recognizes any combination of Memosens sensors and starts operating immediately
- One controller for all parameters: Uniform handling, less maintenance and less stock
- Modular concept: The hardware can be easily adapted to different applications and requirements
- Simple software handling: Via SD card, a setup can be copied to further devices and the software can be updated within a few minutes

High-quality hardware
- Robust technology – even in “difficult” environment with electromagnetic interferences
- Rugged IP 66 and IP 67 rated polycarbonate housing
- Navigator for fast and easy operation
- High-contrast, backlit, graphical display
- Optional pre-installed M12 connectors – the fastest and easiest way to connect the sensor cable to the controller

Perfect user guidance
- Intuitive menu guidance concept proven by our customers
- All menu languages are available in each device guaranteeing safe operation
- Fast navigation through the menu thanks to low menu depth and identical structures for all parameters
- Easy configuration and diagnostics due to plain text display
- Clear instructions in case of an alarm for effective troubleshooting

Which modules are available?
- Basic, double module (BASE)
  - Power unit
  - 2 x Memosens input
  - 2 x current output
  - SD card
  - Alarm relay
  - CDI interface
- Analog output, relay mixed module (AOR)
  - 2 x analog output
  - 2 x relay (e.g. for cleaning and limit values)

Flexibility in use – meeting your application requirements.
Basic device is expandable individually.
Memosens sensors with inductive plug-in head

Communication: Memosens protocol

Profit from the benefits of Memosens technology

The de-facto standard Memosens offers an inductive plug-in head for non-contact data transmission. Rounded up with the standardized digital data protocol for all sensors, you achieve a simplified and faster handling especially for calibration and maintenance purposes.

Resistance to corrosion and salt bridges is another advantage of the non-contacting data and power transfer in the patented coupling. Opening Memosens to a de-facto standard is an inherent consequence of our commitment which creates meaningful value for you.

1 pH/ORP glass electrodes
Glass electrodes for the whole range of applications: Available with ceramic, teflon diaphragm or open aperture and gel or liquid reference. ORP sensitive element is gold or platinum.

2 pH ISFET sensors
Unbreakable glass-free sensors available with ceramic diaphragm or open aperture, gel or liquid reference system, short response time, measurement at high organic load, sterilizable (CPS441D and CPS471D).

3 pH ceramic sensor
First enamel electrode with Memosens worldwide, standard for hygienic applications, combines the advantages of pH measurement with pH-sensitive enamel.

4 + 5 Amperometric dissolved oxygen sensors
Sensors for long-term stable measurement of dissolved oxygen over a very broad measuring range. Use the tried-and-tested amperometric measuring principle.

6 + 7 Conductive conductivity sensors
Conductive sensors available in various designs and materials for perfect adaption to process conditions. High measuring accuracy thanks to individually measured cell constants.

8 Chlorine sensors
Membrane-covered amperometric sensors offering ultimate measuring reliability and minimum maintenance.

Selected channel

Soft keys
Digital fixed-cable sensor family
Communication: Memosens protocol

This sensor family is equipped with fixed cables instead of plug-in heads because it does not require frequent calibration or maintenance. These sensors also offer all advantages of the Memosens protocol.

One cable system allows interconnection and extension between sensors and the new controller platform. The mechanical and electrical connection is done in the same way in all cases. Again a chance for stock reduction of extension cables. Nitrate, turbidity and optical dissolved oxygen sensors have the same outline dimension of 40 mm. The Flexdip CYH112 holder with its CYA112 assembly matches the thread diameters of all digital fixed-cable sensors.

This unique set of sensors combines the complexity and variety of specific sensor technology with the same protocol layer, Memosens.

1 + 2 Toroidal conductivity sensor
Indumax P CLS50D
Robust sensor covering a conductivity range of six decades. PFA version: High chemical resistance and dirt-repellent surface. PEEK version: Suitable for application at high temperatures.

3 Nitrate sensor
Viomax CAS51D
Photometric sensor using the principle of self-absorption and working with the two-beam method, long-term stable, low maintenance thanks to automatic air cleaning, detection of load peaks.

4 Turbidity sensor
Turbimax CUS51D
Optical turbidity sensor using the 4-beam alternating light method with scattered light. This method compensates contamination and ageing of the optics and is insensitive to aeration systems.

5 Optical dissolved oxygen sensor
Oxymax COS61D
Sensors for measurement of dissolved oxygen according to the fluorescence quenching principle. The optical technology offers minimum maintenance and maximum availability.
The perfect match
Team players for your measuring point

Selection and procurement of a measuring point are not only determined by technical specifications but also strongly rely on multipliers such as uniform design and multiple usability.

Your choice begins with sensors for the different parameters, includes the cables, respective holders and controllers and is completed with the measuring stations like samplers.

**Doing the same things the same way is the key to ease of use and maintenance.**

One of the corner stones is the Memosens technology. This sustainable success is based on a big leap in customer benefit with regard to maintenance strategies. Our entire portfolio of digital sensors – regardless if Memosens sensors with inductive coupling or digital fixed-cable sensors with Memosens protocol – can be integrated in your plant architecture in an optimum way. You can use the the same infrastructure, such as holders and cables, for the different sensors.

This standardized concept offers optimization in terms of cost of ownership as well as stock handling and results in a higher process safety. It contributes to the minimization of life cycle costs and supports you in running your plant more cost-efficiently.

The combination of excellent products, high quality and a comprehensive sales and service network offer sustainable value for you.

**Life cycle management**

Realization and maintenance of a measurement chain is inevitably associated with costs – the so called life cycle costs. They start during selection and procurement of the measurement chain and continue over installation and commissioning to maintenance including servicing. The objective is to minimize these overall costs.

Select a Liquiline CM442 measuring point to lay the foundation for cost optimization over the whole life cycle.

Convincing arguments
- Complete product portfolio out of one hand
- Only one controller for all parameters
- Plug & play for sensors and hardware modules
- Easy to use, intuitive menu guidance
- Flexible, modular concept meeting all application requirements right to the point
- Basic device individually expandable
- Mix and match of digital sensors as desired
- Standardization for minimized life cycle costs
- Maximum process safety thanks to identical handling of all parameters
- Uniform skill standard for service and operator staff
- Easy stand-in in times of absence; everybody can be an expert
- Fast and reliable service by Endress+Hauser

Benefits of Memosens technology
- Only system on the market with perfect galvanic isolation
- Resistant to environmental influences such as moisture, corrosion and salt bridges
- No need to connect a grounding pin or potential matching line (PML)
- Even possible to plug in under water
- Patented bayonet lock without twisting cable for easy, fast and safe opening and closing
- Inductive, non-contacting data and power transmission
- Data processing in the sensor plug-in head
- Extremely high availability of the measuring point thanks to sensor calibration in the laboratory
- Sensor operating life up to 40 % longer, minimum calibration cycles
- De-facto standard and available at further manufacturers of liquid analysis systems.

Selection and procurement of a measuring point are not only determined by technical specifications but also strongly rely on multipliers such as uniform design and multiple usability.
Accessories

The Liquiline CM442 does not only come with a complete sensor team but also with a whole range of accessories. They perfectly adapt the measuring point to ambient conditions and existing plant infrastructure.

- Weather protection cover
  For installation in the field, protects the transmitter from direct sunlight and rainfall
- Flexible post fixture
  For round and rectangular posts (Ø 25-61 mm)
- Velcro cable ties
- SD card
  For easy software updates, storage of measured data, transfer of complete configurations to an identical controller

- Field Data Manager
  For archiving and visualization of historical data
- Commubox FXA291
  For connection of Endress+Hauser field devices to the USB interface of a computer via CDI (Common Data Interface). This allows remote operation using e.g. the FieldCare software platform for plant-specific asset management.
- Memocheck Sim CYP03D
  For simulation of measured values of all digital sensors, with programmable simulation sequences

- Flexdip CYH112
  Modular holder system for sensors and assemblies in open basins, channels and tanks. The holder system works for nearly any type of fixing - directly on a rail, on the wall or on the floor. Its handling is extremely easy thanks to quick clamps.