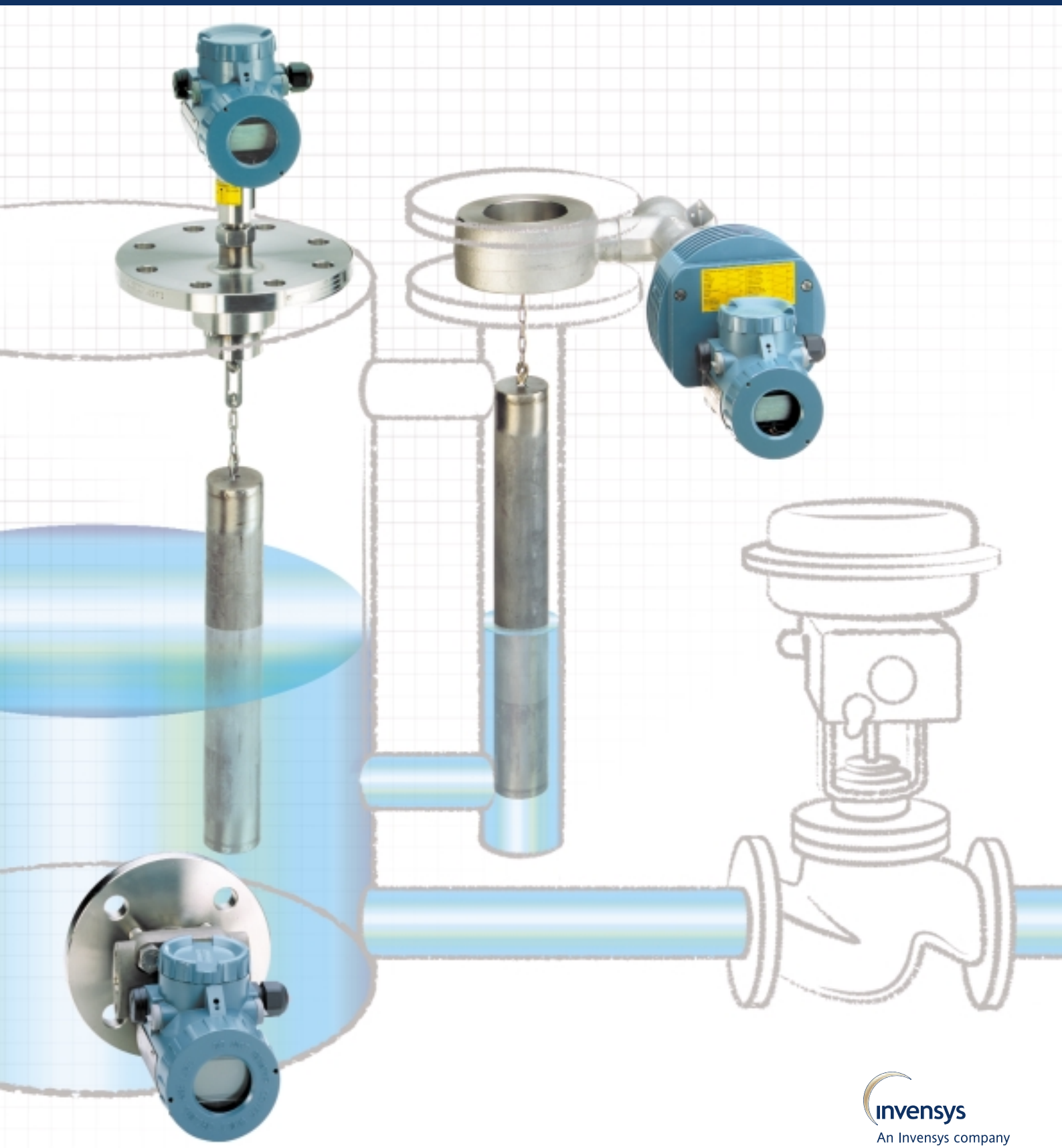
Transmitter for Liquid Level, Interface and Density

FOXBORO ECKARDT



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Foxboro Eckardt – Your Partner in Level

The continuous measurement of liquid level for exact indication and control of process sequences is among the most important measuring tasks in the chemical and petrochemical process industry.

The intelligent transmitter program from Foxboro Eckardt always has the right solution available for your liquid level applications.

Each liquid level measurement makes special demands on the sensor technology employed and the transmitters used.

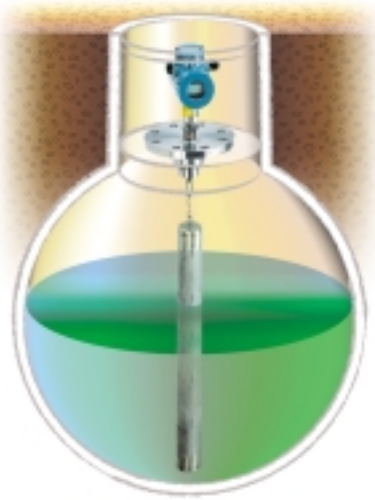
Along with diverse measuring tasks such as liquid level, density or interface which need to be given special attention, are also application specific process conditions which are critical to the selection of the transmitter. We offer to you solutions made to measure your process conditions. The careful selection of process procedures, transmitters and spare parts, lays the foundation for successful measuring and optimal results.

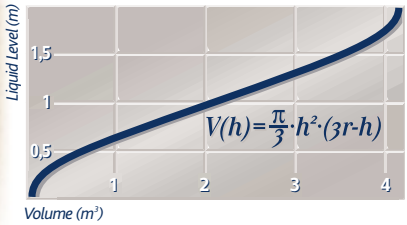
Measuring Process / Process Condition	Hydrostatic with p-Transmitter	Hydrostatic with d/p-Transmitter	Displacer-Transmitter
High Temperature	■●	■●	■
High Pressure	—	■	■
Low Temperature	□	□	■
Vacuum	—	■	■
Vapours	□	■	■
Foam Formation	■	■	■
Tank Installations	■	■	■▶
Corrosive Media	■●	■●	■
Highly Viscose Media	■	■	■
Varying Electrical Properties	■	■	■
Measuring Task			
Continuous Filling Level (liquid)	■	■	■
Density (liquid)	□	■	■
Liquid Interface (liquid/liquid)	□	■	■
Compound	■	■	■
Volume	■	■	■

■ Suitable □ Limited suitable — Not suitable ● With Diaphragm Seal ▶ In displacer chamber or protective tube

The Descendants of Archimedes

The continuous measuring of liquid level, interface and density is based on Archimedes buoyancy principle. An element submerged in liquid (process wetted, cylindrical measuring element) is subjected to a buoyancy force, proportionate to the weight force of the fluid volume displaced.





During the process the buoyancy element has such dimensions that it will submerge despite greatest possible buoyancy force.

At constant fluid density, the measuring element records the process level, independent of physical influence factors (disturbance variables) which offers considerable advantages over other, i.e. non-touching measuring principles. The electrical conductivity (di-electricity figure) of the medium, temperature, pressure, foam formation, etc., will have negligible or no influence on the actual process variable.

The measuring device is suitable at extremely high process conditions, such as low/high temperatures (-196°C to +400°C) and high pressures (up to PN500), depending on the transmitter type. The intelligent transmitters are certified in Ex-Ranges up to Zone O and also as overfill protection (WHG, VbF). The main range of application is in the determination of liquid filling levels at a height change from appr. 0.35 to 3 m. We further offer specific solutions for applications with larger and smaller measuring ranges.

Tradition meets Progress

The modular design of the liquid level transmitters from Foxboro Eckardt enables an economic modernization of installed instruments, through uncomplicated exchange of sensor technology, resp. electronic modules. Whether pneumatic or digital – we will take care of your Level needs!

We do not want to state presumptuously that the employees of the Liquid Level Measuring Technique Team at Foxboro Eckardt are the descendants of Archimedes – only that they certainly are driven by the spirit that is behind it.

Hydrostatic of the Best

Hydrostatic level measurement is the most commonly used method for measuring liquid levels in open or closed vessels. The underlying physics principle is that the height of the liquid multiplied by the specific gravity of the liquid is proportionate to the vessel fluid level.

Foxboro Eckardt offers one of the best Product Programs for recording and monitoring of hydrostatic filling levels.

The exact measurement of liquid level ensures a dependable and safe course of operation. For instance, to avoid overfilling of vessels and to serve as a production review of manufacturing.

Independent of the form / geometric configuration of the tank, changing electrical characteristics, foam or deposit formation, the hydrostatic measuring method guarantees optimal results. Whether placed frontally or direct mounted, under extreme process conditions with diaphragm seal or capillary system, the scope of applications is almost limitless.

In applications within hygienically sensitive plants, it should be understood that at the frontally placed measuring diaphragm there are neither corners nor edges nor dead spaces.

A wide spectrum of application possibilities thus becomes available for the pressure transmitter in the Food and Pharmaceutical Industry, the Beverage and Brewery Industry, and in other fields of the Process Industry.

Also, in rough process environments, such as in the Chemical and Petrochemical Industry, a variety of process connection flanges, diaphragm seals and accessories, allows operation in diverse applications. At high process temperatures, resp. extremely aggressive product media, i.e. in columns and reactors, the installation of differential pressure transmitters with corresponding laid out diaphragm seals systems is recommended.

Quality, dependable design and high accuracy during performance, are not only a matter of fact, but also company tradition and philosophy of our employees.

Complete Range of Accessories

...from outlet flange to additional field indicator, Foxboro Eckardt can supply everything that provides successful measuring. Exactly fine tuned interdependent components guarantee best performance and long life duration of measuring units.

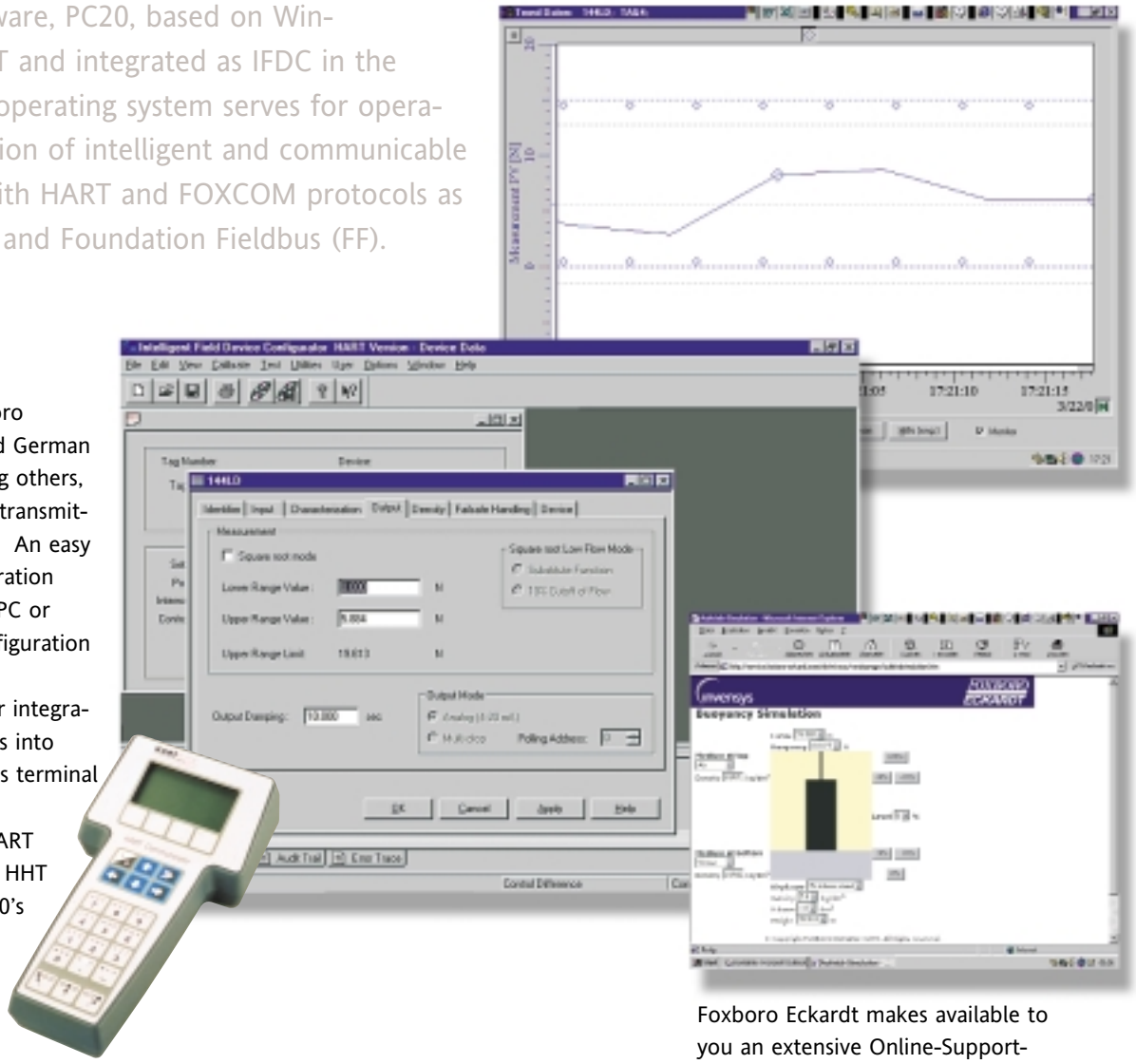
The separate amplifier installation, as an example, can be used with all instruments of the I/A 140 series transmitter family and permits a universal usage of this unique installation possibility of sensor and amplifier. The connection between amplifier electronics and measuring cell is strictly electrical – permitting separate amplifier installation with no diaphragm system which provides considerable advantages. The separate amplifier installation can be an attractive alternative to a separate field indicator (AE 214) and is available also in ignition type protection EEx ia IIC T4.
A wide range of installation accessories for all pressure and differential pressure transmitters as well as a broad selection of adapters, screw joints and process connection flanges supplements the usefulness of the transmitter family. Transmitters with displacers for measuring liquid level, interface and density, can be operated in open or closed vessels. Installation can be done directly from above, on the top of the vessel, or else, if this is not possible due to built in elements, can be done with a displacer chamber installed on the side. Depending on the type of vessel and the transmitter, different accessories might be required.

Multiple installation modes, measurements, materials as well as adherence to national and international standards (DIN, ANSI, etc.) guarantee the technically safe conversion to accomplish your requirements (TÜV-Certification, Material Certificates, Welding Test Certificates, etc.)

For process security it is especially true that: **Competent Partners Guarantee Safety.**

Intelligent, PC-supported Operation and Configuration

The operating software, PC20, based on Windows '95/98 and NT and integrated as IFDC in the Foxboro I/A series operating system serves for operation and configuration of intelligent and communicable field instruments with HART and FOXCOM protocols as well as Profibus PA and Foundation Fieldbus (FF).



PC20 / IFDC – Configuration Software

This software from Foxboro Eckardt in the English and German language supports, among others, all intelligent liquid level transmitters of the I/A 140 series. An easy and clearly arranged operation and/or configuration via PC or Laptop is possible. A configuration is available as well via:

- AMS software driver for integration of field instruments into already installed process terminal systems
- Hand Held Terminal (HART and FOXCOM) FoxCom HHT not compatible with 140's
- ABO991.

Displayed Instrument Characteristics and Measuring Values

PC20/IFDC offers the possibility to continuosly display instrument characteristics and measuring values as well as providing the ability carry out configuration in a very user friendly and timely manner.

- Displayed instrument characteristics
  - Instrument variant
  - Instrument location / instrument type
  - Measuring Point Number / Name
  - etc.
- Configurable Instrument Functions
  - Inlet / Outlet (measuring range, physics unit, etc.)
  - Characteristic curve, (linear, square root, customised with max. 32 set points)
  - Output signal damping
  - Safety regulations
  - Local display / local key

Foxboro Eckardt makes available to you an extensive Online-Support-Service via World Wide Web – wherever you are – 24 hours a day, 365 days per year.

Available online is general technical information on measuring technique and detailed information about the intelligent displacer transmitters. If you want to freshen up your knowledge about the measuring principles, simulate buoyancy forces, make technical drawings of your measuring arrangement or simply want to solve interesting perplexities, we offer the correspondence service to you.

Power Supply Units and Separators

Foxboro Eckardt offers total solutions with our process products. Included are, of course, power supply units and Ex-Separators.

For intrinsically safe applications, installation of a corresponding supply unit is generally recommended. A matter of importance in this case is: Exactly interactive components guarantee best performance and a reliable operation of your unit.

Consider as an example the Universal Ex-Separator MT228:

- Design in rail mounted installation or 19”
- Bi-directional communication with intelligent transmitter
- Support by FOXCOM protocol (analog/digital)
- 1 or 2 channel version at 19“
- Low power consumption
- Bushing for hand terminal or PC / Laptop at the front of the instrument

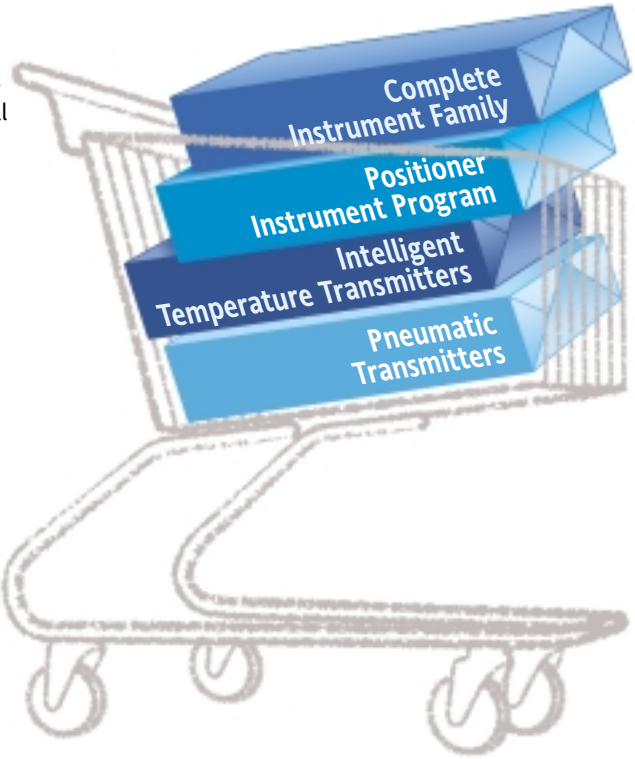
Supply units for various operations (direct / via power supply units, HART / FOXCOM / without communication, intrinsically safe / not intrinsically safe):

Application \ Supply	Direct	MT228	MUS925	MUS80	MUS924	I/A Series Operating System
Without Communication	□	■	□	□	□	□
HART	□	■	■	—	—	—
FOXCOM analog	□	■	□	—	—	□
FOXCOM digital	□	■	—	—	—	■

■ Recommended □ Possible — Not possible

To round out the field instrument program, Foxboro Eckardt offers you additionally intelligent solutions for all of your measuring tasks:

- A **complete instrument family** which can solve all of your pressure measuring tasks – independent of whether you require absolute, relative or differential pressure.
- The **positioner system program** with functions for status and diagnosis recordings and automatic valve adaptation. A modular design of the instrument family facilitates an easy electronic updating (i.e. to fieldbus protocols) and different attachment sets guarantee an uncomplicated and fast installation to all current linear and rotary actuators as well as all valve versions.
- For **intelligent temperature transmitters**, Foxboro Eckardt offers a broad spectrum of sensors and temperature detectors, with a very impressive accuracy. Various installation possibilities and an easy, user friendly configuration can readily be observed.
- Included in our program are intelligent field instruments for flow and analytical tasks as well as **pneumatic transmitters, controllers, indicators and recorders.**



The Foxboro Eckardt Internet offers a constantly up-dated service. In addition to documentation covering all of our devices you will find information regarding new products in ”news“. We gladly will answer any questions you may have.

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