



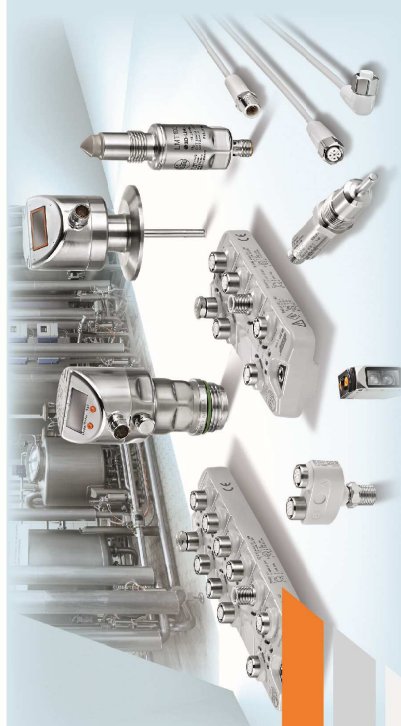
ifm's CIP Process Innovation for Food & Beverage online Webinar

Wednesday

09 December

14H00 PM

CIP Process Innovation for Food & Beverage



Food Specialist

Raegan Ramsunder

Presenter



New Business Development Manager

Johan van Niekerk

Host





Raegan Ramsunder

Sales Engineer – Food and
Beverage

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CIP Process Innovation for the F&B

Overview

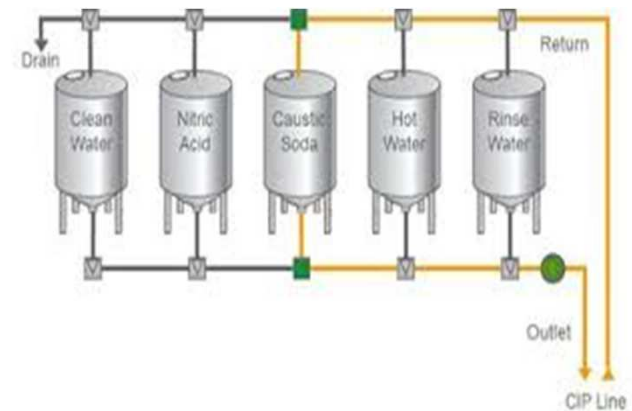
1. Introduction
2. MVQ smart valve sensor
3. LDL Conductivity sensors
4. TCC temperature sensors
4. PM pressure sensors
5. IO link masters
6. Connection technology
7. Q&A Session





Introduction

CIP, or Cleaning-in-Place is a critical hygiene process that helps to ensure the health and safety of the consumer. CIP refers to the use of a mix of chemicals, heat and water to clean equipment. The best results are obtained by ensuring a suitable combination of temperature, time, physical action and chemical concentration





Overall Equipment Effectiveness

A AVAILABILITY

... takes into account Unplanned and Planned Stops. An Availability score of 100% means the process is always running during Planned Production Time.

P PERFORMANCE

... takes into account Slow Cycles and Small Stops. A Performance score of 100% means when the process is running, it is running as fast as possible.

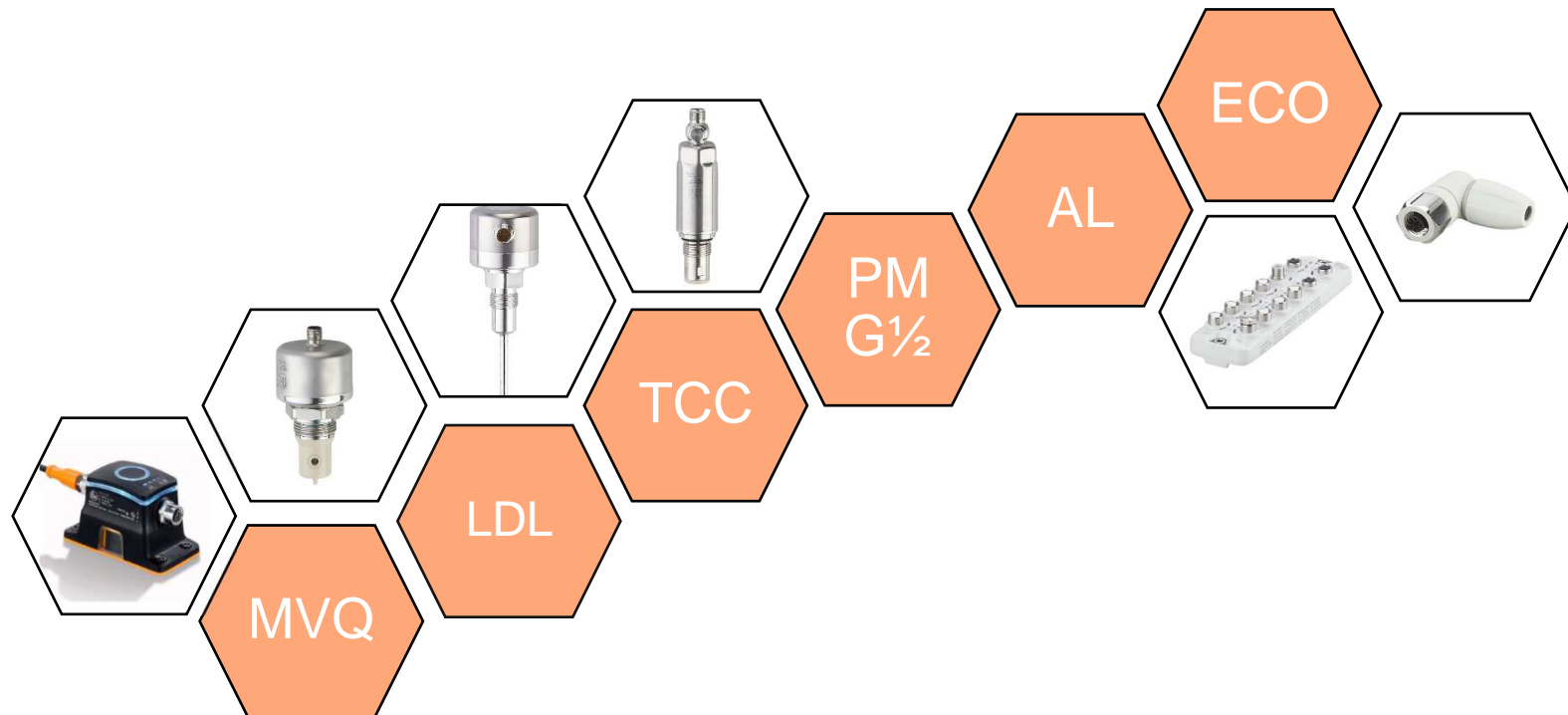
Q QUALITY

... takes into account Defects (including parts that need Rework). A Quality score of 100% means there are no Defects (only Good Parts are being produced).


$$OEE = A \times P \times E$$

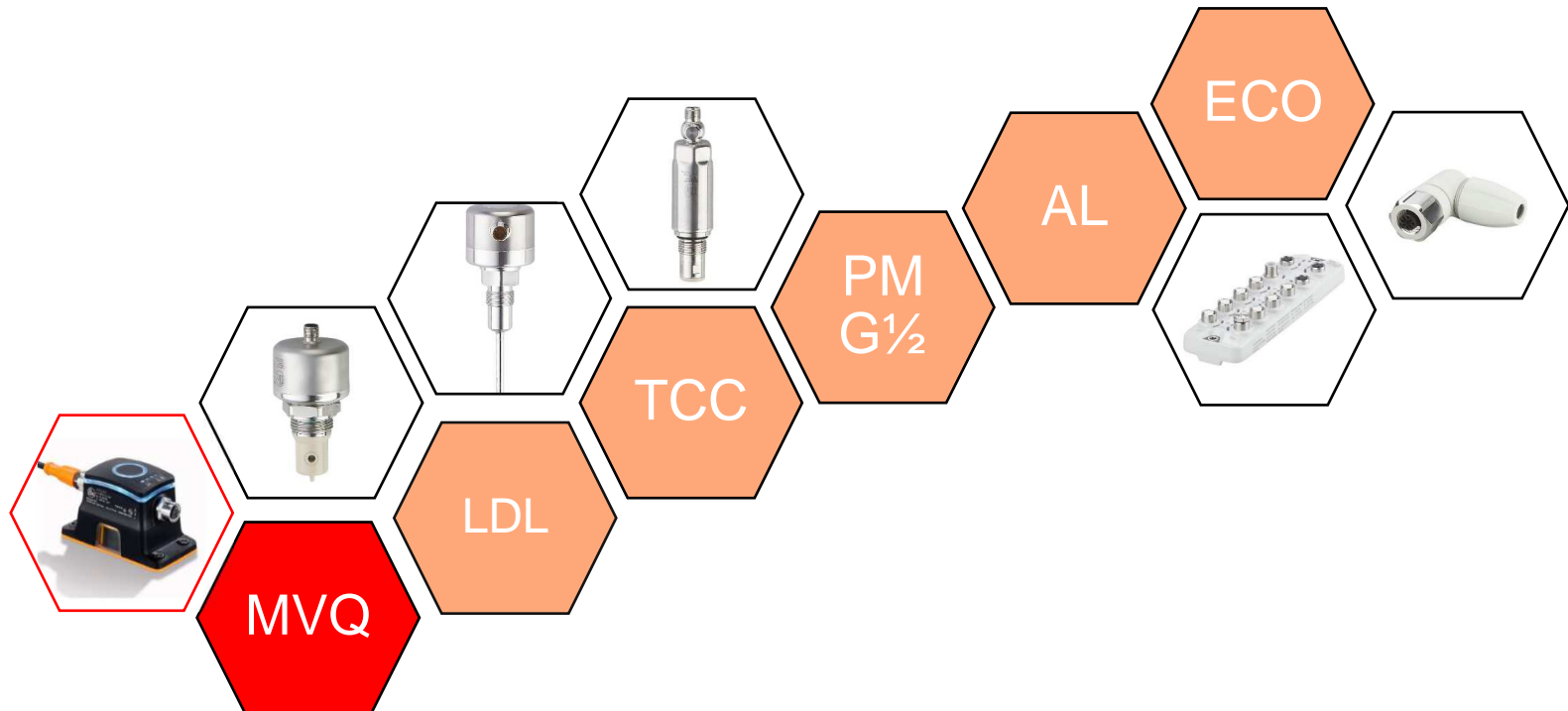


CIP Process System Solution





MVQ – Precise Valve Monitoring and Controlling





MVQ: Smart Valve Sensor

Features on IO link :



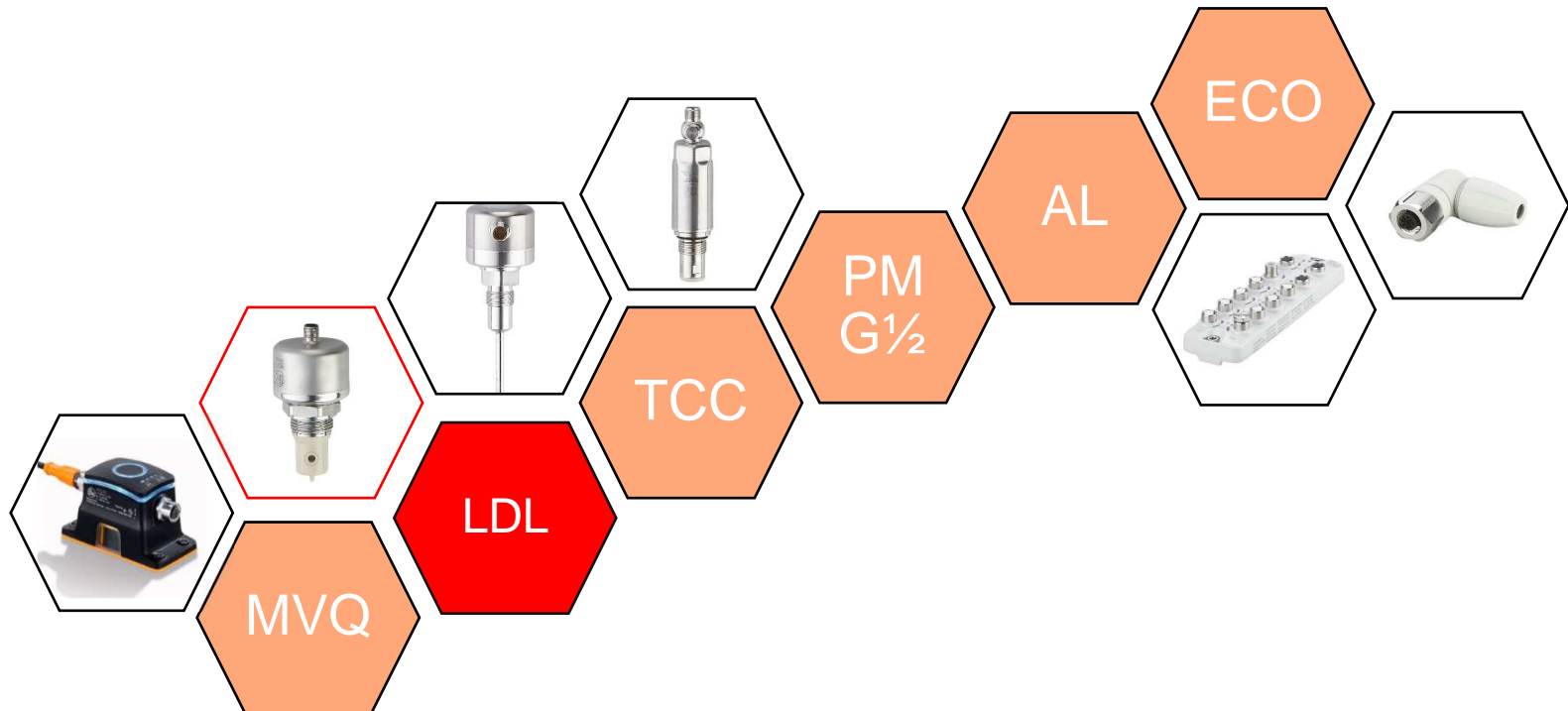
1. Reducing of cabling (single M12 connector for the solenoid & Feedback)
2. Automatic teach of the end positions of the valve by directly controlling the solenoid valve via the MVQ
3. LED ring light for easy detection in the plant
4. Prevention of defects by early detecting of wear or adhesion
5. Cycle counter for monitoring
6. Cost and time savings due to more precise planning of maintenance

***Webinar available on ifm webpage



LDL – Conductivity Measurement in Food & Beverage

- Classic Example: CIP Process

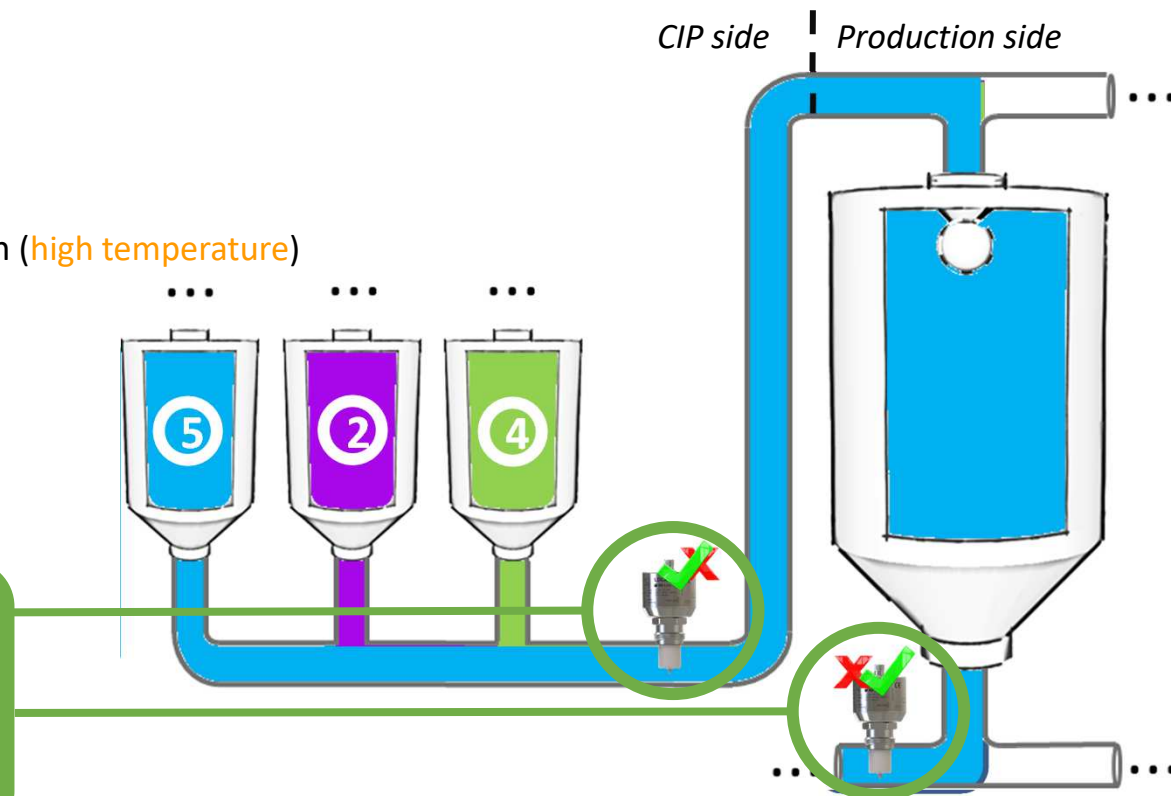




CIP Process

- ① Rinse with process water
- ② Cleaning with alkaline solution (*high temperature*)
- ③ Flush with process water
- ④ Clean with acid
- ⑤ Flush with process water

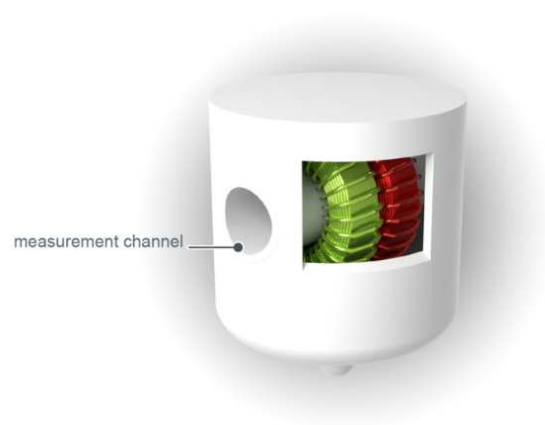
The use of conductivity sensors can reduce the consumption of water and chemicals



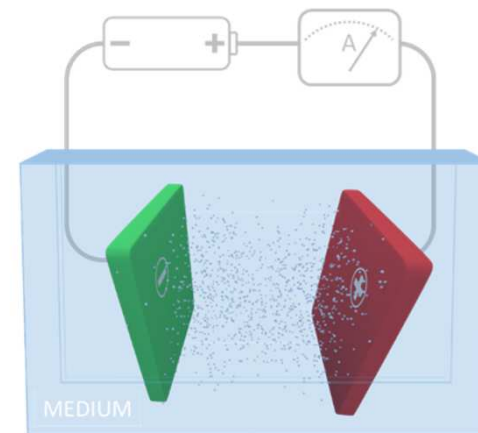


ifm Conductivity Sensors

Inductive
(Toroidal)



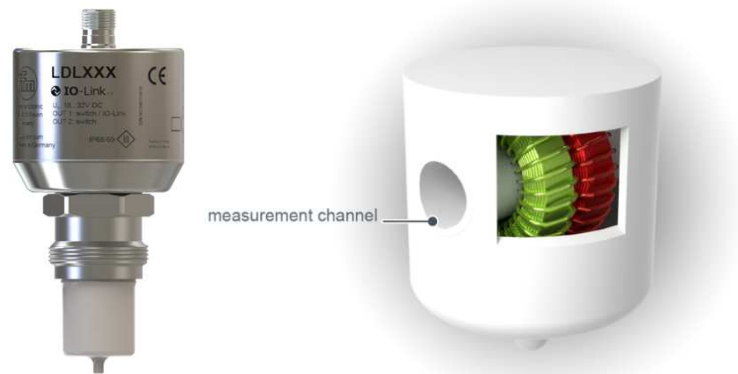
Conductive
(Contacting)





ifm Conductivity Sensors

Inductive
(Toroidal)



Conductive
(Contacting)





ifm Conductivity Sensors

- **Measuring Principles for Sanitary Applications : LDL100**

Conductive
(Contacting)



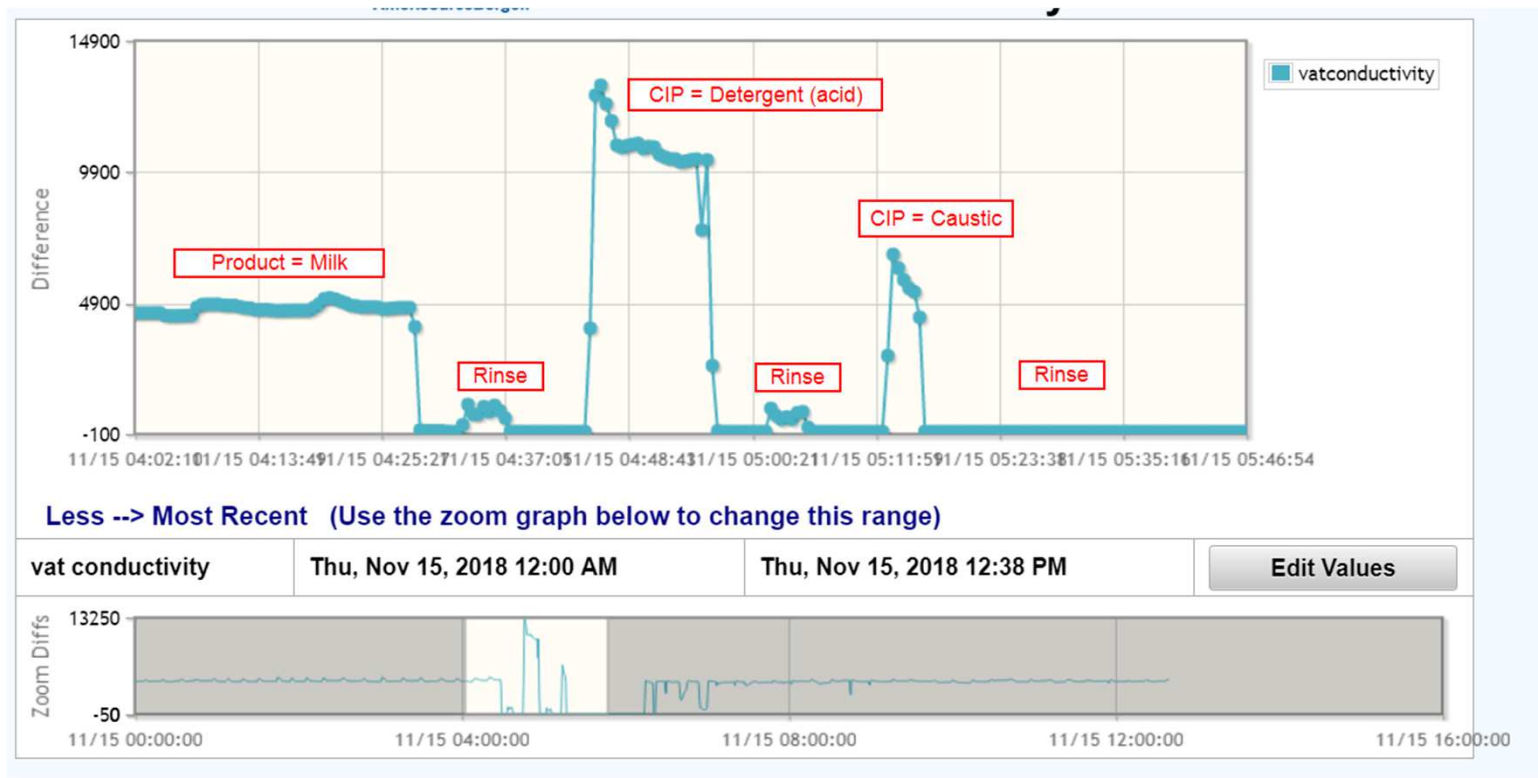
Simple solution for interphase detection and monitoring of products/CIP

- All-in-one transmitter
- Fast response to temperature
- Measuring range: **100...15000 $\mu\text{S/cm}$**
- Sanitary design with 3A approval
- Can be installed in pipes down to 1" (DN25)

*Measurement environment varies
with installation conditions



TREND OF PROCESS VALUES

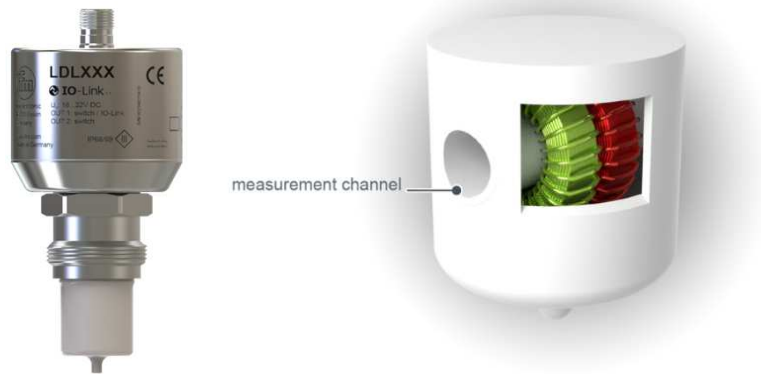




ifm Conductivity Sensors

- **Measuring Principles for Sanitary Applications: LDL200**

Inductive
(Toroidal)



*Measurement channel is a
fixed environment

Solution for chemical concentration and measurement of complete CIP cycle.

- All-in-one transmitter
- Machined PEEK probe
- Sanitary design with 3A approval
- Probe length up to 33.5 mm
- Measuring range 100 $\mu\text{S}/\text{cm}$ to 1000 mS/cm



Digital vs Analog Resolution

Measuring range ($\mu\text{S/cm}$)	PLC analog input card (12 bit)	IO-Link *
0...500	1 $\mu\text{S/cm}$	1 $\mu\text{S/cm}$
0...5,000	2 $\mu\text{S/cm}$	
0...15,000	4 $\mu\text{S/cm}$	
0...100,000	25 $\mu\text{S/cm}$	
0...500,000	122 $\mu\text{S/cm}$	
0...1,000,000	244 $\mu\text{S/cm}$	

* LDL100 measuring range is limited to 15,000 $\mu\text{S/cm}$

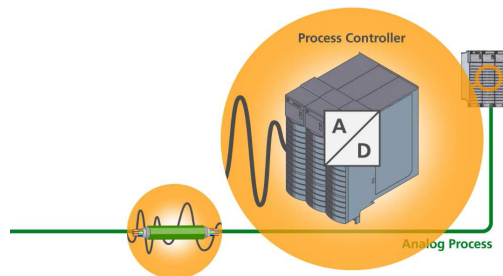
Example:

12 bit Analogue system (sensor output + analog input card)

- 12 bits (4096 steps) available
- Assuming 500mS/cm scaling

$500,000 / 4096 = 122 \mu\text{S/cm}$ per step

>25% ERROR (water)



IO link Resolution = $1 \mu\text{S/cm}$



ifm LR Device Software

All

Identification

Parameter

Output configuration

Analog Output 2

Temperature

Conductivity

Memory

Temperature

Conductivity

Fault Configuration Output 2

Calibration

Damping

Setting of the sensor display

Simulation


Temperature

Conductivity

Setup

Temperature

Diagnosis



Product ID: LDL100

Vendor: ifm electronic gmbh

Device ID: 921 d (310 d)

Serial number:

Revision:

Device type: Conductivity sensor, 0...15.000 µS/cm

Device state:

Parameter	Value	Unit	Min	Max	Description
Application Specific Tag	***		0	32	Application Specific Tag
Function Tag	***		0	32	Plant designation, describes the device functionality
Location Tag	***		0	32	Location designation, identifies the device location
ou2	I / Analog signal 4...20 mA				Output configuration [OUT 2]
SEL2	COND				Selection of the measurand for the evaluation via [OUT 2]
ASP2 - TEMP	0.0	°C	-25.0 °C	115.0 °C	Analogue start point 2 / Temperature. [ASP2] must be smaller than [AEP2]. Min Temperature distance [AEP2]-[ASP2] = 35.0 °C. ! Rounded on stepwidth !
AEP2 - TEMP	150.0	°C	10.0 °C	150.0 °C	Analogue end point 2 / Temperature. [AEP2] must be greater than [ASP2]. Min Temperature distance [AEP2]-[ASP2] = see [ASP2]. ! Rounded on stepwidth !
ASP2 - COND	0	µS/cm	0 µS/cm	7500 µS/cm	Analogue start point 2 / Conductivity. [ASP2] must be smaller than [AEP2]. Min Conductivity distance [AEP2]-[ASP2] = 100 µS/cm. ! Rounded on stepwidth !
AEP2 - COND	15000	µS/cm	100 µS/cm	15000 µS/cm	Analogue end point 2 / Conductivity. [AEP2] must be greater than [ASP2]. Min Conductivity distance [AEP2]-[ASP2] = see [ASP2]. ! Rounded on stepwidth !
Lo.T	0.0	°C	-35.0 °C	160.0 °C	Minimum memory value for temperature
Hi.T	0.0	°C	-35.0 °C	160.0 °C	Maximum memory value for temperature
Standard Command	Reset [Hi.T] and [Lo.T] memory				
Lo.C	0	µS/cm	0 µS/cm	15750 µS/cm	Minimum memory value for conductivity
Hi.C	0	µS/cm	0 µS/cm	15750 µS/cm	Maximum memory value for conductivity





TOP
PRODUCT

Conductivity sensor for clamp and hygienic pipe fittings

Analytical sensors



UPDATE
Product launch LDL201

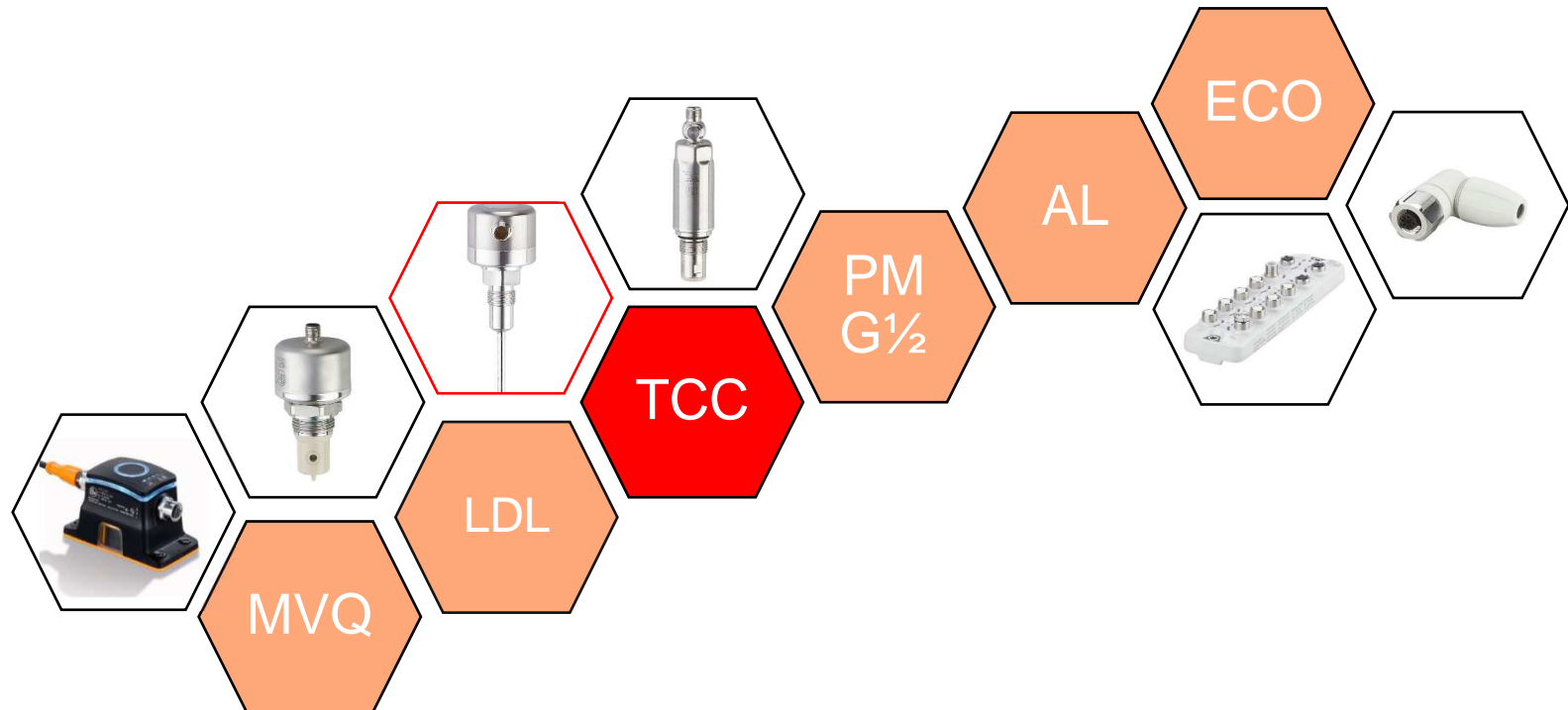
- ✓ Solid tip prevents breakage
- ✓ Reduce inaccuracies associated with a time-based cleaning process
- ✓ Flexible process adjustments increase system efficiency
- ✓ Easily adapted to new recipes and media
- ✓ Loss-free digital transmission of measured values

Process adapters clamp and hygienic pipe fittings

	Clamp – G 1 Aseptoflex Vario DN50 with leakage port	E33309
	Tri-clamp – G 1 Aseptoflex Vario 2" with leakage port	E33209
	Tri-clamp – G 1 Aseptoflex Vario 2"	E33202
	Tri-clamp – G 1 Aseptoflex Vario 1.5" with leakage port	E33208
	Tri-clamp – G 1 Aseptoflex Vario 1 – 1.5" with leakage port	E33201
	Hygienic pipe fitting – G 1 Aseptoflex Vario 1.5"	E33212
	Hygienic pipe fitting – G 1 Aseptoflex Vario 2"	E33213
	Hygienic pipe fitting – G 1 Aseptoflex Vario 1.25"	E33211
	Pipe fitting – G 1 Aseptoflex Vario DN33,7 Series B with leakage port	E33304
	Pipe fitting – G 1 Aseptoflex Vario DN40 with leakage port	E33302
	Clamp connection with notch – G 1 Aseptoflex Vario DN40 with leakage port	E33308



TCC – Reliable Temperature Measurement in Food & Beverage





Importance of Temperature Measurement

Wrong temperature readings have a major impact on product quality and safety for the consumer – Critical processes eg: CIP, Sterilization, Pasteurization

There are two types of internal factors to secure procedures

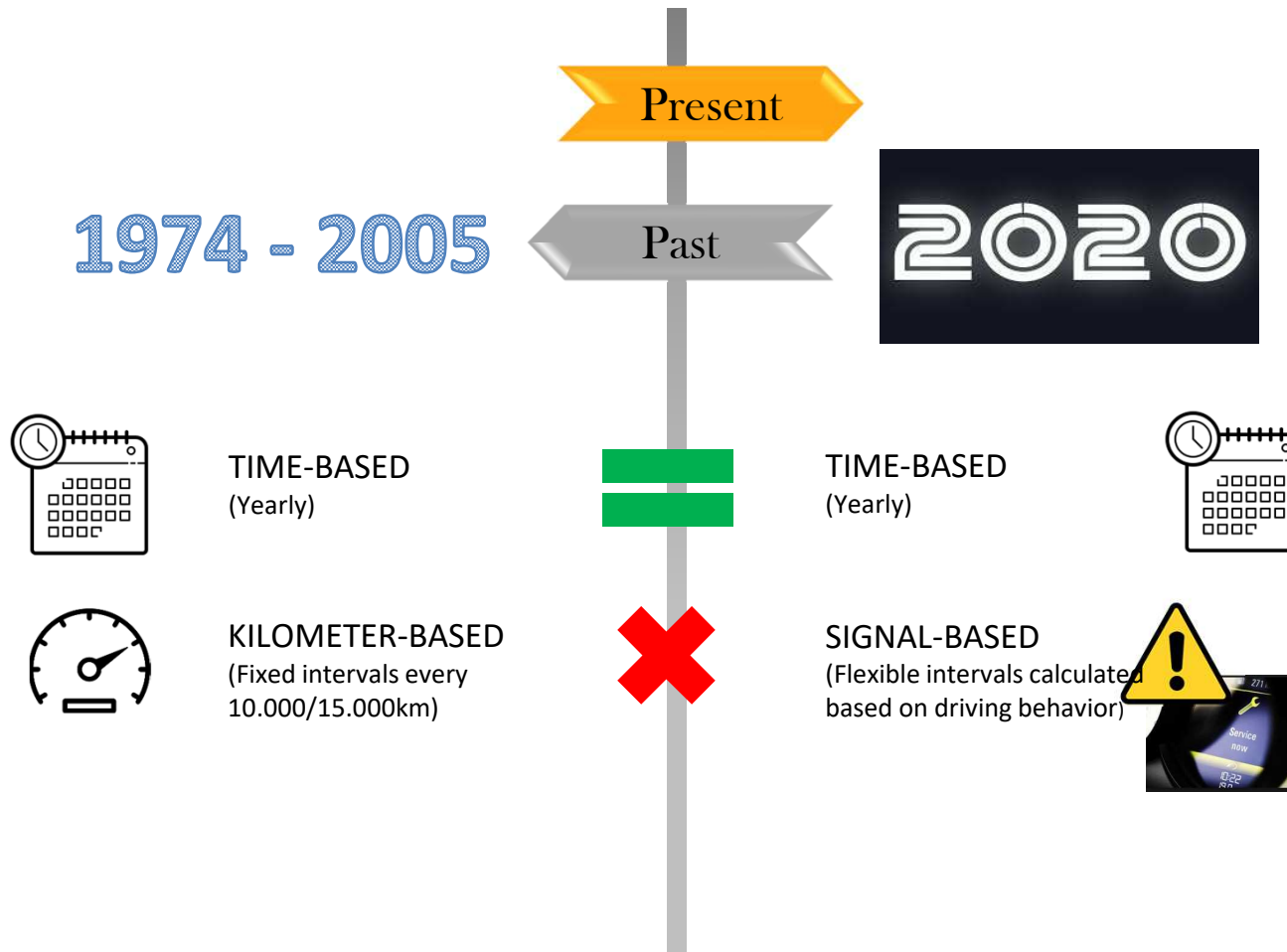
- 1) Redundancy of measurement
- 2) Calibration of the sensors

****Both can contain a false sense of safety**





Car Service

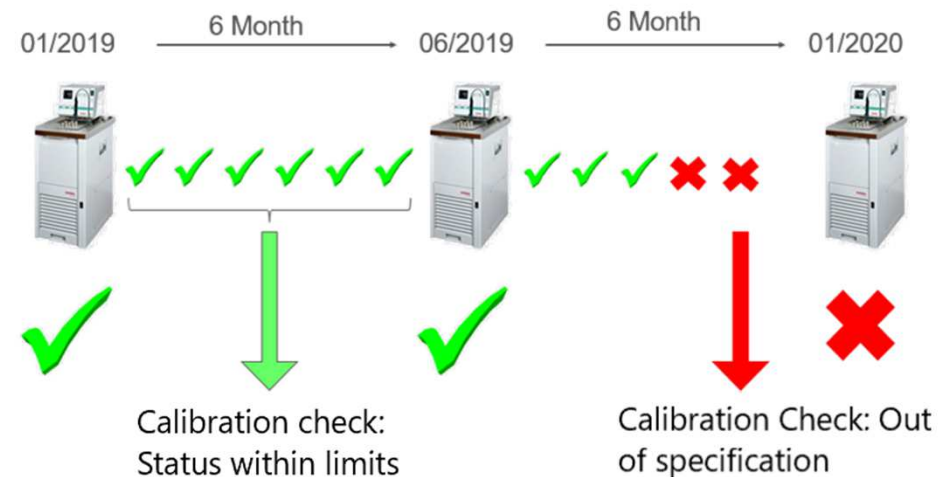




Calibration of Temperature Sensors

With calibration it is only possible to determine a drift when it has already happened.

How much of product is out in the market??





Thermal Shock Impact on Drift and Sensor Life

CIP processes are extremely harsh to instruments that are exposed. The constant cycling between hot and cold temperatures can quickly cause fatigue of the electronic components and therefore, lead to drift and failure.

ifm Solution: TCC



*3-Point calibration certificate included

Temperature Sensor with drift monitor detection:

Key Features:

Range: -25...160°C

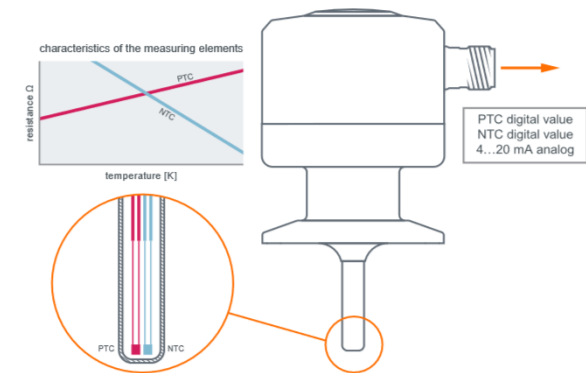
Output: 4...20mA / IO-Link

T05 / T09: 1,5sec / 4sec

Accuracy: 0,2K (-10...130°C)



‘Calibration Check’ technology provides real-time continuous monitoring of instrument accuracy and measurement uncertainty. A large, bright LED dome provides an immediate signal of any deviation from the specified tolerance



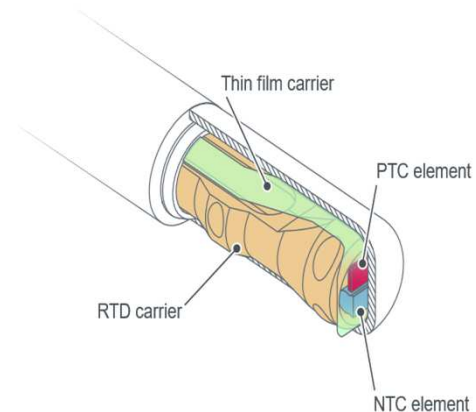
TCC health status
“healthy”



TCC health status
“warning”

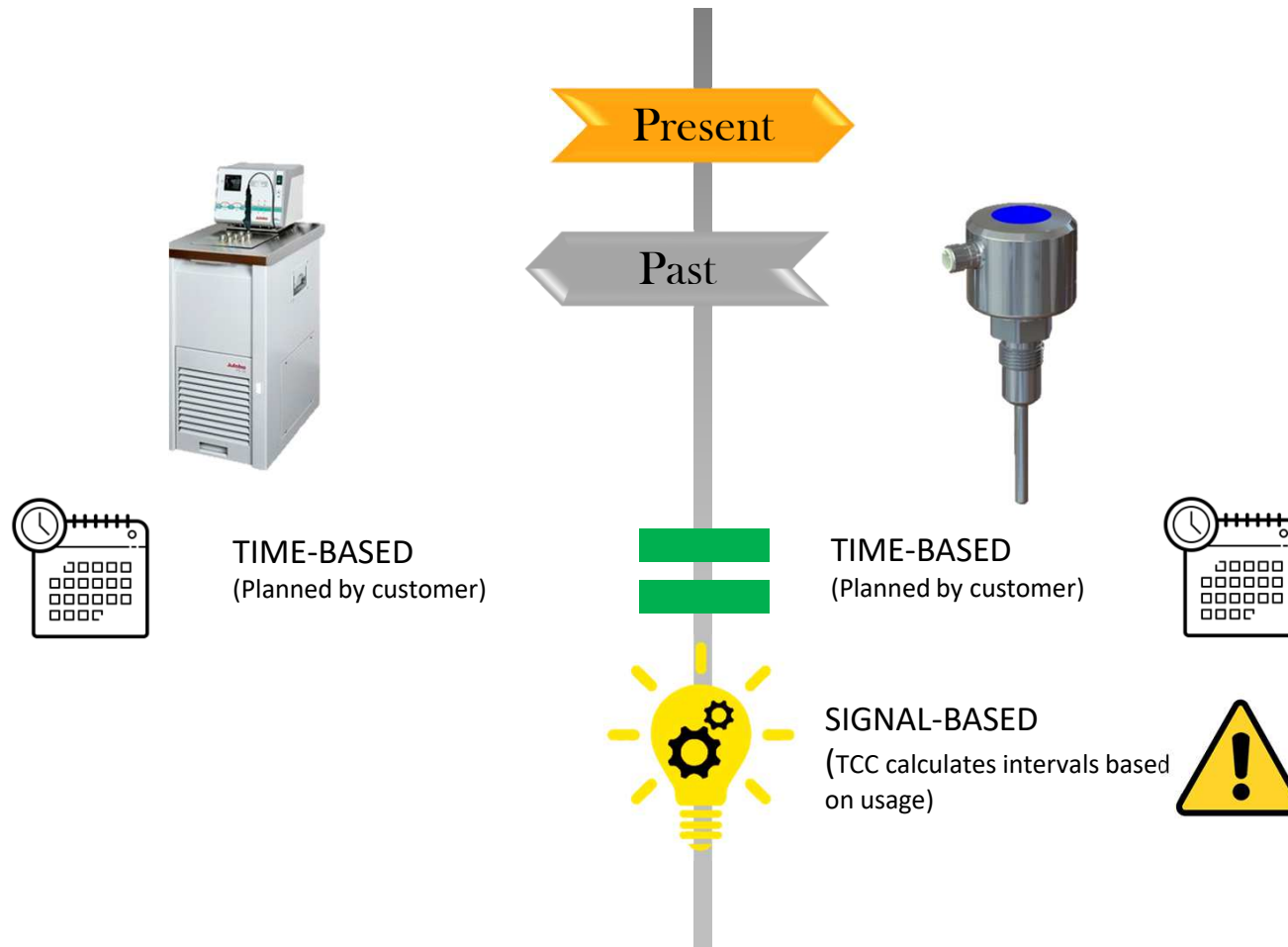


TCC health status
“error”





Smart Sensor Calibration



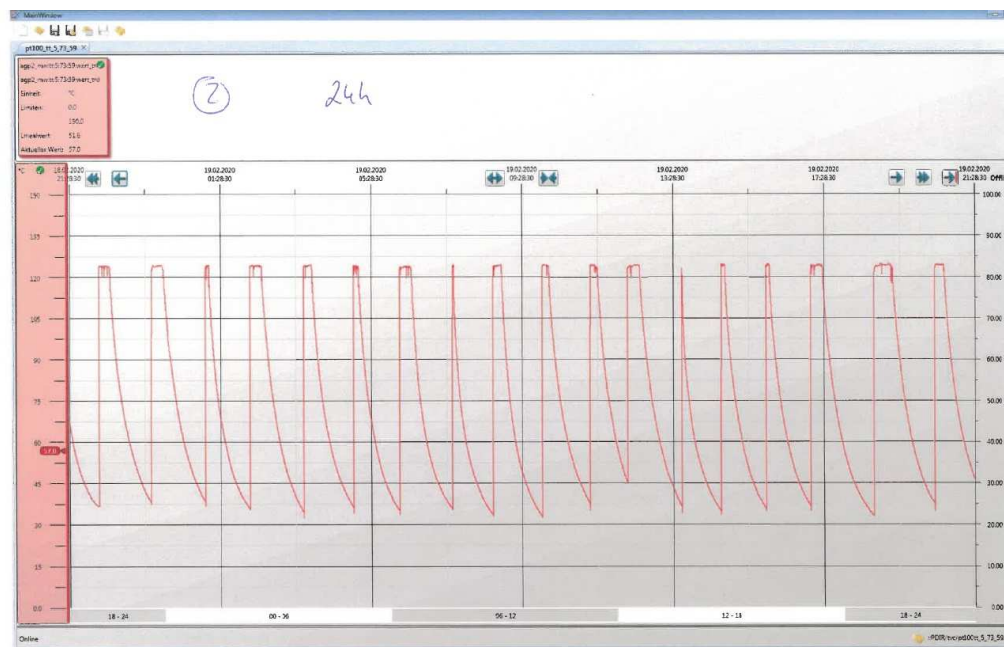


26

Relax: Lean back while the TCC monitors itself



CIP Process : Energy Saving



... Process

Process optimization:

to heat 1m³ of water by only 1 Kelvin the required energy is 1.16kw/h

overheated by 1 kelvin
x18 times per day

365 days a year = 7000Kw energy saving

Fast response saves energy!

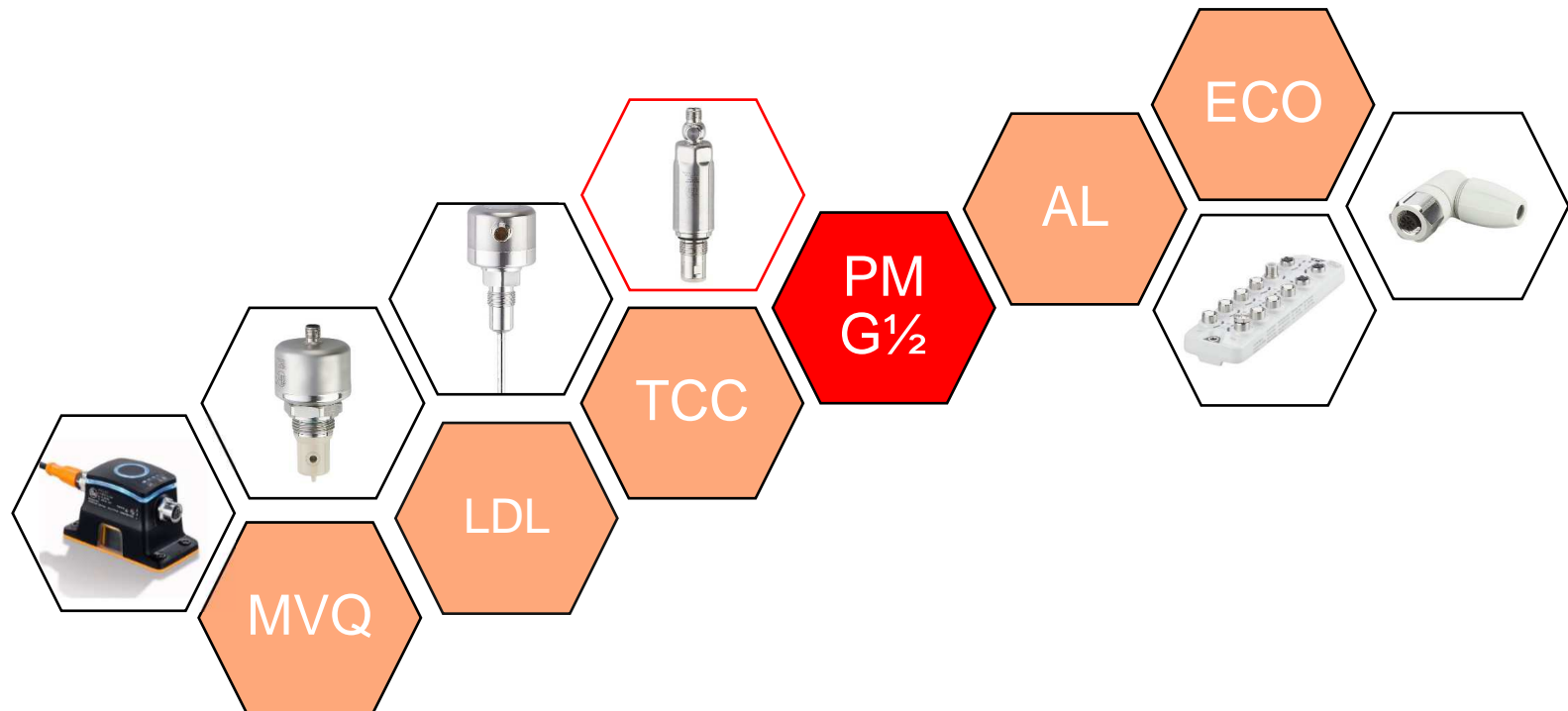


... Process

return



PM G1/2" – Precise Pressure Measurement in Food & Beverage





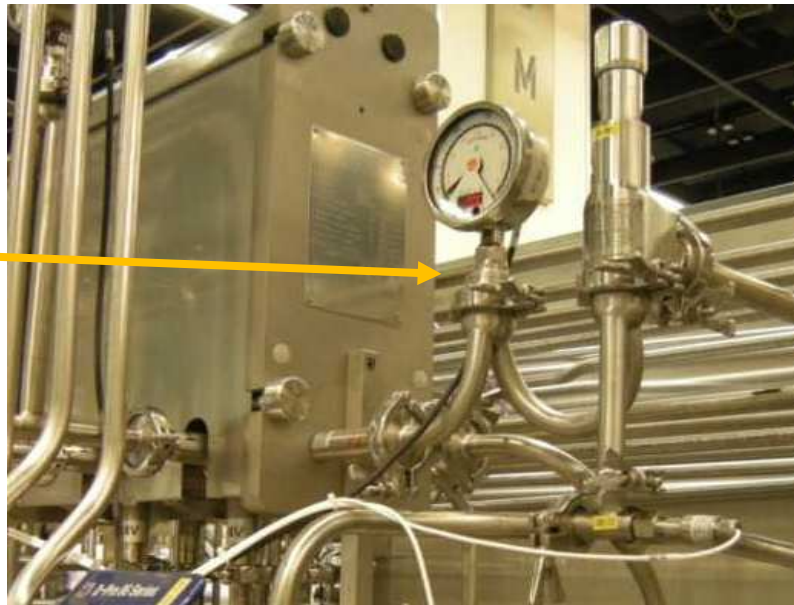
G1/2 Flush

For Hygienic Applications



Challenges For Small Pipes

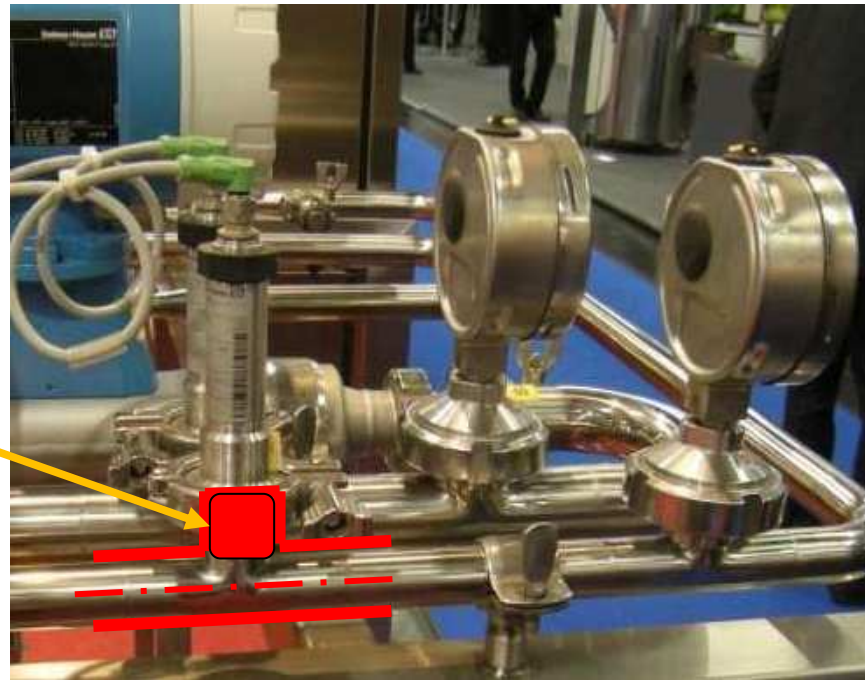
**Expensive and
complex adapters
for pressure sensors
in pipes**





Challenges For Small Pipes

Difficult to clean:
Dead space





Solution : PM15**

- Better cleaning: Less dead space
- Direct weld on adaptation
- Medium temperature measurement integrated





Product Benefits

Cost savings

The G1/2" adaptation leads to considerable cost savings for Pipe Installation



Increased process reliability

Improved cleanability: The small measuring cell means improved flush mounting of sensors

Approvals

Approvals for food sector (EHEDG, 3A, FDA, EG1935)

Added-value with IO-Link

Temperature transferred using IO-Link

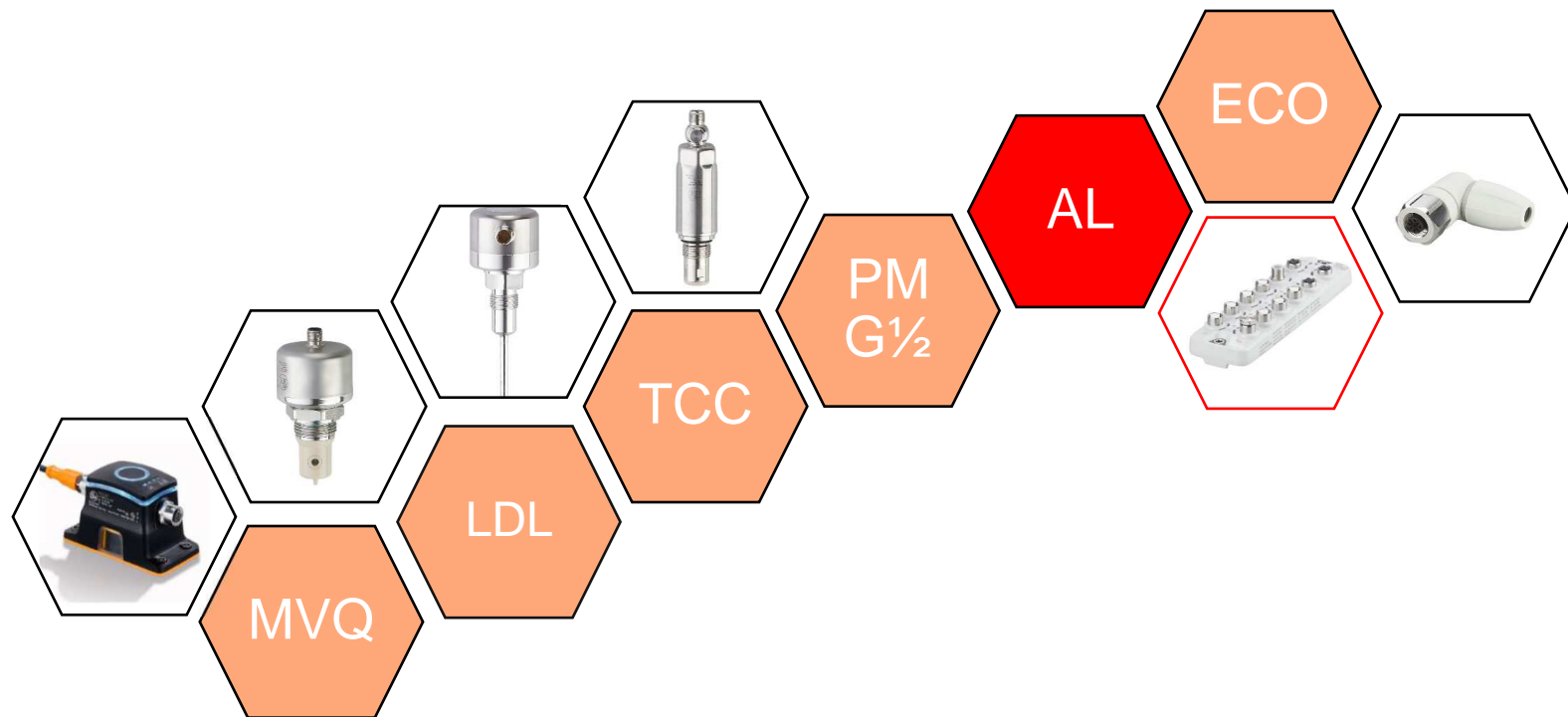
*****Degrees C & Pressure Bar**

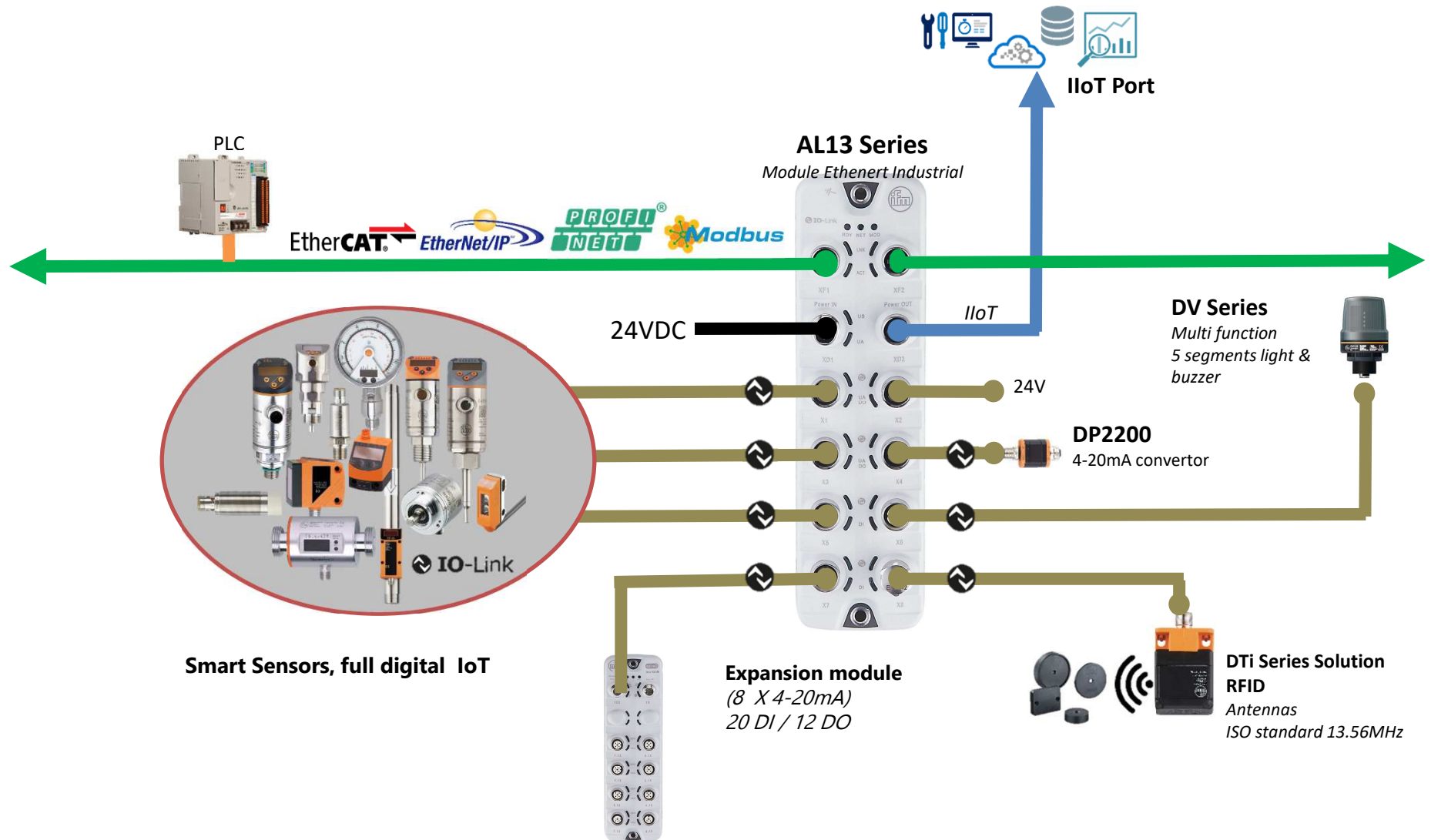
Quality assurance

5 year warranty



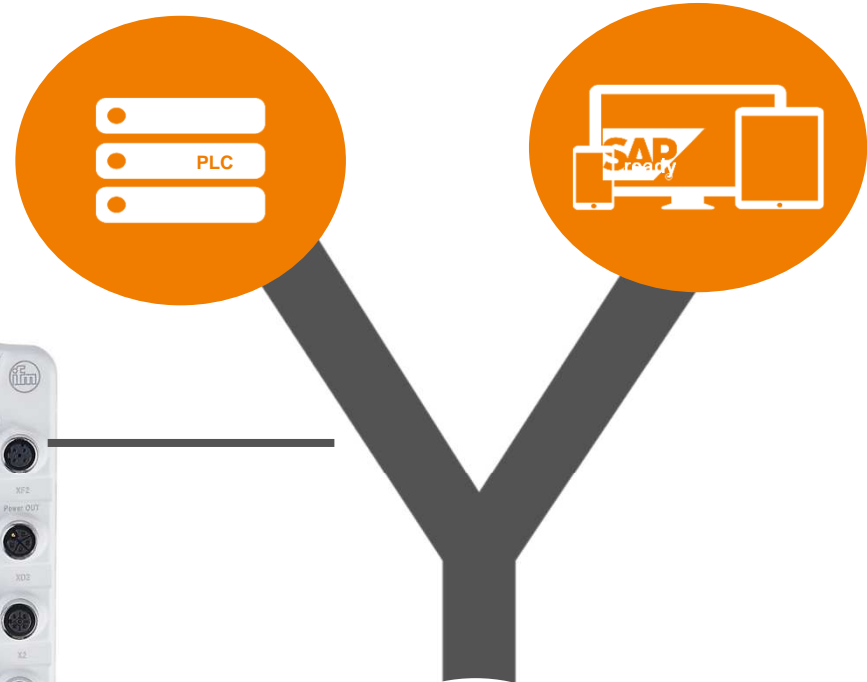
Integration – Next Steps







Y-path with Smart Devices



IO-Link



Smart Sensors & Actuators



ECO-Link – Optimum Sealing





EVF: Hygienic Cables

Connection technology

ecolink M12 with reduced length

Use in wet areas and in the food and beverage industry

ecolink M12 T split for difficult applications

Use in wet areas and in the food and beverage industry

ecolink M12 D-Cod for difficult applications and vibration

Use in wet areas and in the food and beverage industry

ecolink M12/RJ45: the new connection for special applications

Use in wet areas and in the food and beverage industry

Halogen-free and silicone-free
 Contoured nut with enhanced grip makes for optimum sealing even when hand tightened
 Permanent vibration protection with saw tooth contour
 High material resistance to common cleaning agents used in the food industry

Vibration and shock resistant
 Operating temperature up to 100°C

Vibration and shock resistant
 High-grade stainless steel

Vibration and shock resistant
 IP 67
 IP 68
 IP 69 K

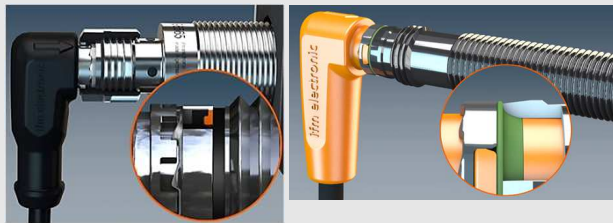
ecolink M12 for hygienic and wet areas in the food industry
 Most applications require special solutions. Only high-quality materials, safe production processes and faultless mounting lead to success in the long run.
 The asymmetrically acting vibration protection holds the nut tight in its position, guaranteeing an optimum and permanent seal.
 No tools are needed for installation and removal which can be done manually without any problem.
 High-quality materials especially adapted to the application and intensive monitoring during and after production guarantee maximum quality standards.



What Does Ecolink Mean?



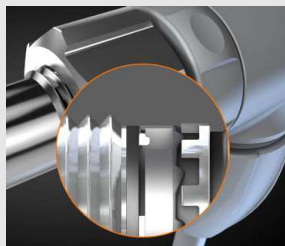
Innovative sealing concept



Innovative strain relief concept



Concept for vibrating protection and tool-free mounting



Special connector material for LED versions





www.ifm.com/za

Process topics in focus



Conductivity – a new approach



Are you confident in your temperature sensors?



Compressed air and specialty gases are not free



Ceramic measuring cell eliminates metal diaphragm



→ Learn more



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[Products](#) [Applications](#) [Industry 4.0](#) [Resources](#) [my ifm](#)

Enter search term (e.g. IFS215, IO-Link, pressure sensor, machine tool, etc.)

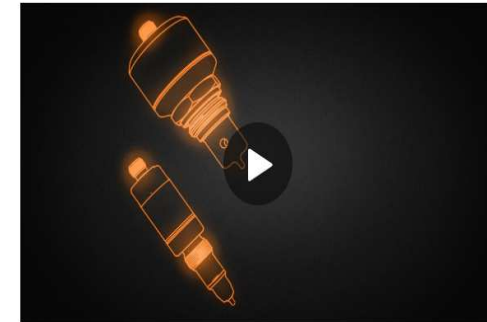
Homepage » Conductivity – a new approach

Conductivity – a new approach

[Applications](#)
[Technology](#)
[IO-Link benefits](#)
[Select products](#)
[Installation guidelines](#)
[Use cases](#)
[FAQs](#)

Conductivity – a new approach

Introducing the LDL family of conductivity sensors from ifm



Improve process quality with clear indication of the measured media concentration value.

Measurement at each piece of equipment or process segment verifies the product and confirms cleaning or rinsing has been properly completed. Eliminating a time-based process control ensures that you run the cleaning and rinsing cycles only as long as needed.





www.ifm.com/za

Factory Calibration

During the production process the measurement signal and the evaluation electronics are paired and verified to provide calibrated digital and analog outputs directly from the sensor.

- Out of the box performance
- No pairing to separate transmitters is required
- Verification of analog and digital accuracy
- Free downloadable Factory Certificate

Factory Certificate
Werkszertifikat

Article no.: LDL200

Artikelnummer:

Serial no.: 000004679538

Seriennummer:

Factory setting: 1000 mS/cm

Messbereich:

Output signal: 4 - 20 mA

Ausgangssignal:

Accuracy conductivity: $\pm (2\% \text{ MV} \pm 25 \mu\text{S} / \text{cm})$

Genauigkeit Leitfähigkeit:

Accuracy temperature: 0,2 K

Genauigkeit Temperatur:

Nominal position: vertical

Nennlage:

Order no.: 4500728218

Auftragsnummer:

Test medium: Kcl Medium

Prüfmedium:

Test equipment: Keysight 34410A

Prüfanlage: SN: MY53014457

Test equipment: WTW TetraCon925

Prüfanlage: SN: 18341347

Test equipment: MSR 145

Prüfanlage: SN: 325857

Test equipment: Yokogawa 7561

Prüfanlage: SN: 46CC0088

Test equipment: Burster R1427

Prüfanlage: SN: 465491

Environmental conditions / Umgebungsbedingungen:

Temperature / Temperatur: 22,2 °C

Rel. humidity / rel. Luftfeuchte: 42,8 %

Barometric Pressure / Luftdruck: 986,6 hPa

Comparison measurement in a potassium chloride solution.
Vergleichsmessung in Kaliumchloridlösung

	Reference value [mS/cm] Prüfnormal	Measured value [mS/cm] Digitaler Istwert	Digital value Analog output [mA] Digitaler Stellwert	Analog value measured [mA] Prüfnormal	Deviation [%] Abweichung
Conductivity Leitfähigkeit	60,400	60,385			-0,025
Analog output Analogausgang			12,000	12,002	-0,017
Total Conductivity = Analog Gesamt Leitfähigkeit = Analog (calculated / berechnet)					-0,042

Comparison measurement in a circulated water bath.
Vergleichsmessung im zirkulierenden Wasserbad

Reference value [°C] Prüfnormal	Measured value [°C] Digitalwert Istwert	Deviation [K] Abweichung
34,970	35,0	0,030

Deviations [%]

Deviations [K]

MV = Measured value

ifm electronic gmbh confirms that the above-mentioned measuring system, following a QM system certified to DIN EN ISO 9001:2015, is duly calibrated and can be traced back to national standards. ifm electronic gmbh bestätigt, dass das oben genannte Messsystem, unter Beachtung eines nach DIN EN ISO 9001:2015 zertifizierten QM-Systems, gültig kalibriert und auf nationale Standards rückführbar ist.

Remark: This certificate was made automatically and is valid without signature.
Hinweis: Dieses Zertifikat wurde automatisch erstellt und ist ohne Unterschrift gültig.

Date of inspection / Prüfdatum: 17.06.2019 06:25:20

ifm electronic gmbh, Friedrichstraße 1, 45128 Essen, www.ifm.com

ifm South Africa

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Thank you for participating

Please contact us:



Johan v Niekerk

**New Business Development
Manager:**

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