



Smart Transmitter Series **MTP 200-SIL2/AK4**
Smart 2-Wire-Supply unit Series **MSK 200- SIL2/AK4**
High Availability **DuoTec®**-Failsafe Technology
TÜV certificate for DIN 19250 Class AK4
and certified for **IEC61508 SIL 2**



Safety Integrity Level - SIL2



DuoTec®-Failsafe Technology increases safety and accuracy thus lowering total costs

Introduction

To achieve a maximum safety in production processes, new innovative technologies have to guarantee safety of these processes, in order to note and indicate any disruptions from optimal conditions as soon as possible. With the DuoTec-Failsafe technology developed by Mütéc Instruments, these criteria are met by means of self-monitoring security. Additionally measuring accuracy and reliability is increased and lifetime cost of instruments reduced. DuoTec-Failsafe is the only Interface worldwide with self-monitoring and has achieved DIN 19250 TÜV-certification according to AK4 and it is conform to IEC 61508 SIL2.

With the experience of more than many 1000 installed systems worldwide during a period of approx 38 years, we venture to express:

“With DuoTec your system is in safe hands”

Application

DuoTec-systems consist of the transmitter (MTP200) and the 2-wire-supply unit (MSK200). They are the Interface between the system (sensors in the field) and the PCS or PLC. The system accepts practically all electrical standard signals (mA, mV, V) and temperature sensors (Pt100, TC). Hazardous area protection to **EExia** (area 0) is available. Two-wire transmitter are supplied directly by the supply unit to **EExib** (area 1) or **EExia** (area 0). The systems itself are not installed in an ex-area. Output signals such as 4-20mA or 0-10VDC, 4 limit values and a maintenance accessory relay are available. All information's are available by serial Interface (RS 232/RS 485).

The measuring transmitter and the measuring transmitter power supply system include limit switches, thus an separate limit switch card is not necessary.

Safety due to request of IEC 61508 SIL2

In addition to standard applications the devices are suitable for fail-safe installations. Fail-safe installations are designed to minimize risk of damage and harm to equipment and personnel by maintaining a safely operation in case of emergency or even controlled shut-down of production line.

World-wide applicable safety standard IEC 61508 and IEC 61511, Functional safety of electrical/electronic/programmable electronic safety-related systems, require detailed documentation about remaining risk in emergency situations. Remaining risk of a fail-safe function is calculated from failure probability of all connected/ effected components within the electrical loop.

Four (4) Safety Integrity Levels (SIL 1 to SIL 4) define the level of security measure for each plant component. Selecting one of the Safety Integrity Levels also determines limiting value of remaining risk. Most common selection for circuit calculation is SIL 2, rarely is SIL 3 used.

Mütéc Instruments GmbH was the first company seeking certification for its transmitters and transmitter power supplies. Initial certification was established in 1999 by TÜV Nord according to DIN19250 for class SIL 4. Starting in August of 2004, all devices are now IEC/EN 61508 SIL2 certified.

The enhanced certification along with our vast experience from long term installations in a wide array of diverse applications guarantee highest safety and reliable operation.

Continuous self monitoring

Our principle design in our DuoTec systems consist of two (2) independent microprocessors. These microprocessors consistantly monitor themselves and all involved functions while processing measurements. These functions include the measurement circuit, output circuit, power supply circuit, relais contacts, microprocessor hardware, and software. Within 100ms a total of 10 single diagnostic functions are initiated. If any of the diagnostic functions don't pass a plausibility algorithm a service alarm is generated. In any event, a open contact (closed-circuit current) is available for either a safety loop or group alarm. A front-sided red LED visually indicates an alarm directly at the transmitter and is displayed on a connected monitor via our WINSMART software. In case of an intermittant alarm, for instance a loose cable connection, this error is protocolled in the error register and visually indicated by a blinking LED at the transmitter.

Since the DuoTec system independently monitors itself routine maintenance is not required. A detailed error description allows for fast and efficient error analysis. In case of an error an automatic procedure to safely shut-down a production line can be initiated.

Main benefits

- **IEC 61508 SIL2 and TÜV-Certificate according to DIN 19250 AK4**
- **Self monitoring by 2 micro processors with diagnosis manager with error memory**
- **4 limit alarms, 1 service alarm**
- **Configuration software WINSMART**
- **Bus-connection (RS 232 and RS 485)**
- **DIN-rail or 19"-form of construction**
- **Input: multi-functional**

Further benefits

- Optional for hazardous area protection to **EExia** (area 0) or **EExib** (area b) according to ATEX.
- Diagnosismanager with analyse of the error and error memory (e.g. for the early recognise of loose connection). That means a routine maintenance or a cost intensive error fault detection is not necessary and ensures a high available plant.
- 1 error-relays as collection alarm.
- All devices with 2 free configurable relais and two transistor equipped and for limit monitoring and/or error monitoring applicable. Therefore all DuoTec-devices has the function of limit monitoring.
- Only 2 typs of devices: Universal transmitter MTP for e.g. Pt100, Thermocouple, current, voltage, potentiometer etc. and the power supply MSK for giving supply to 2-wire-sensors as well as current and voltage input. By means of this multifunctional the DuoTec-Series a stocking up of many transmitters with different inputs and functionalities is not necessary. That means optimal resp. cost effective storage and a maximum amount of flexibility.
- Front sockets for HART-signal lead through by MSK 200 (optional via analog output).
- Galvanically separation between input, output and supply and interface as well as 5 galvanically separated alarm outputs (3 * relais, 2 * transistor).
- All devices for DIN-rail or 19"-mounting with identical functions and a uniform software, so that with the same technology/ function (and software) are different mountings could be used.
- At the DIN-rail mounting the supply can be carried out via a adapter in between a conventional DIN-rail or alternative via a clamp. Via the adapter a bus connection (RS485-interface can be used as well.

Technical data SMART-transmitter power supply MSK 200 SIL2/AK4

MSK 200 2-wire-supply system in **DuoTec- Technology** with self monitoring
Output: 0/4-20 mA, 1-5/0-10 VDC (actual value)
Galvanic separation between auxiliary energy, input and output
4 individually adjustable limit values
2 relay contact outputs, 2 transistor outputs, 1 collective alarm relay contact AK4
Configuration ON-LINE by means of **WINDOWS-WINSMART**-Software
RS 232-interface on the front panel, RS 485-interface from the multi-pin plug
Auxiliary power supply 24 VDC/AC
Form of construction: 19", 4TE, 3HE

MSK 200-T as above, but form of construction: mounting rail, DIN EN 50022

Option: „iExa“ Input EExia IIC (zone 0) (by form 19": Option „iEx": EExib IIC (Zone 1)

Option: „SIL2/AK4“ Certification according DIN 19250 AK4 and IEC 61508 SIL2

Technical data SMART-universal measuring transmitter MTP 200 SIL2/AK4

MTP 200 Universal measuring transmitter in **DuoTec-Technology** with self monitoring
Input: Resistor and Pt100 in 2-, 3- and 4-wire-configuration,
all sorts of thermo couples, mA, mV, V
Output: 0/4-20 mA, 1-5/0-10 VDC
Galvanic separation between auxiliary energy, input and output
4 individually adjustable limit values
2 relay contact outputs, 2 transistor outputs, 1 collective alarm relay contact
Configuration ON-LINE by means **WINDOWS -WINSMART**-Software
RS 232-interface on the front-panel, RS 485 interface from the multi-pin plug
Auxiliary power supply: 24VAC/DC
Form of construction: 19", 4TE, 3HE

MTP 200-T as above, but form of construction: mounting rail, DIN EN 50022

Option: „iExa“ Input EExia IIC (zone 0)

Option: „SIL2/AK4“ Certification according DIN 19250 AK4 and IEC 61508 SIL2

Technical data measuring data collector / Gateway coupler

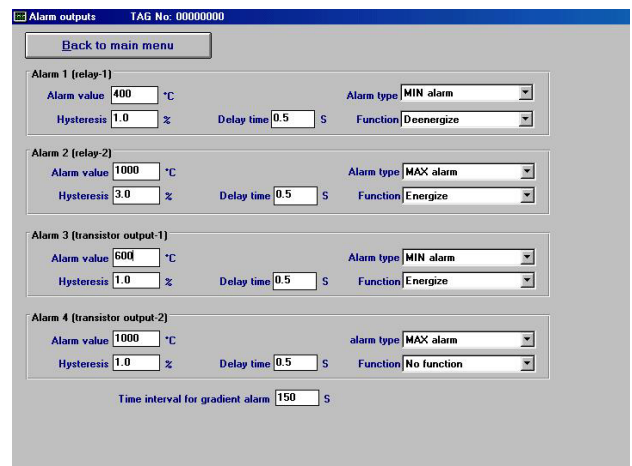
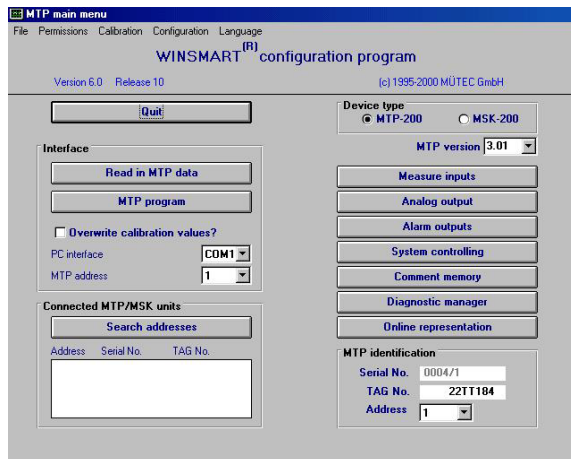
MDS 248 Measuring data collector for interconnection of interfaces of max. 31 MTP / MSK 200-systems
Transfer protocol: RTU-MODBUS
Baud-rate to MTP- / MSK 200 and PC: 9600 bps
Auxiliary power supply 24 VDC/AC, form of construction: 19", 4TE, 3HE

MDS 200 Measuring data collector for linking up to 20 measuring transmitter of a 19"-Racks (20x 4TE) and the GWK 200.
Transfer protocol: RTU-MODBUS
Baud-rate to MTP-/MSK 200 systems: 9600 bps
Baud-rate to GWK 200: 19200 bps
Auxiliary power supply 24 VDC/AC, form of construction: 19", 4TE, 3HE

GWK 200 Gateway-coupler for link between MDS 200, measuring transmitter and the PC as well as PCS.
Transfer protocol: RTU-MODBUS; Baud-rate: 19200 bps
With 99 MDS 200 and 20 MTP-/MSK 200 per MDS 200 up to 1980 systems can be wired.
Auxiliary power supply 24 VDC/AC, form of construction: 19", 4TE, 3HE

Comfortable configuration with WINDOWS-Software WINSMART

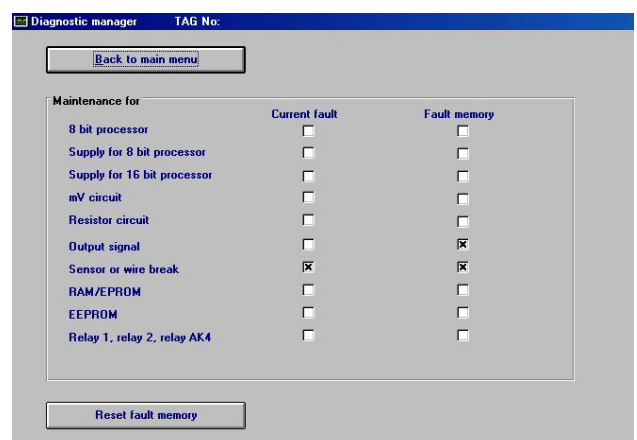
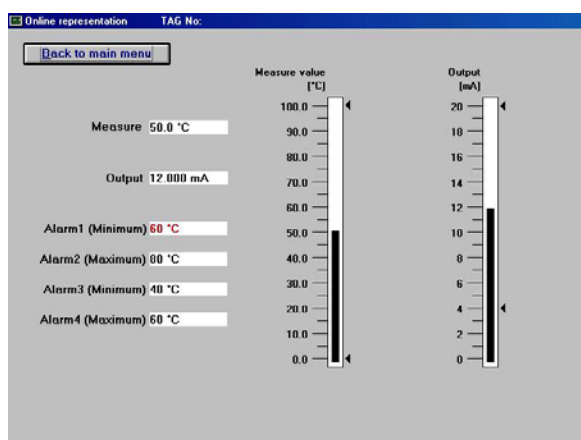
Systems can be configured and parameters modified from the measure monitoring by means of a Notebook with the RS232-Interface on the front panel or by the RS485-Bus. The Software **WINSMART** which is WINDOWS based is very clear and easy to operate. All input data like: choice of thermo couples, Pt100, mA-, mV-signal, all output data, limit values, tolerance ranges, measuring accuracy, filter (also on the output) etc. can easily be adjusted by a Mouse click. Even a survey of MIN- and MAX-gradient is integrated in the mask for limit value adjustment. Input or change of data is protected against manipulations by means of an access code.



Finding and elimination of errors by means of the diagnosis manager

WINDOWS-WINSMART displays the measuring value in analogue and digital forms in an online-mask. If the limit value is exceeded, this is indicated at the system itself and in the software. A permanent monitoring of limit values thus also is guaranteed over great distances.

The diagnosis manager integrated in **WINDOWS-WINSMART** displays „current fault“ and „fault memory“. Thus it is guaranteed that even short-term errors like intermittent contacts can be localized. Only by „Reset fault memory“ in the diagnosis manager can the error-memory be deleted. A text-memory freely available for user enables a documentation of history of the measuring transmitter and supply system.

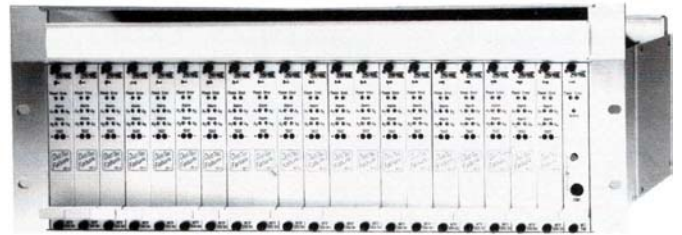


DuoCompact and racks for 19"-mounting

DuoCOMPACT is a housing for 4 resp. 8 DuoTec-FAILSAFE units. The use of 19"- and DIN-rail technology is the easiest way to combine multiples of the system. The housing is mounted on a DIN-rail and can be wired firmly. Additionally, the cards can be changed even while the process is running. This means even hard-wired systems can be exchanged easily. Thus **DuoCOMPACT** offers, compared to the mounting area needed, the best possible density of function like multi-inputs, analog- and Bus-communication, 4 limit values and diagnosis/indication of error. Due to the modular construction design, extension or modification, and exchange etc. can be undertaken without problems. Additionally, Series **DuoCOMPACT 208** has a redundant voltage supply with integrated diode decoupling. And DuoTec-systems also are available in racks (19"-Racks) and switchboards according to clients requirements.



Cabinets



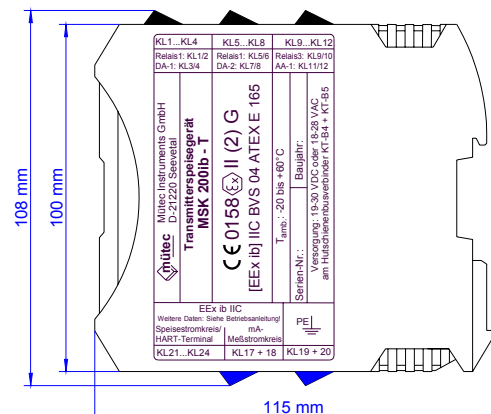
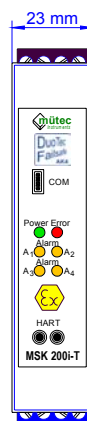
Racks



DuoCompact

DIN-Rail devices

The devices MTP200-T and MSK200-T are designed for picking up directly on a DIN rail. Despite the high function density of devices the small form of construction is only 22.5 cm broad. Deductible clamps make a comfortable wiring.



Test adapter



For fast and secure configuration, calibration and for testing a test adapter is available. The system is easy to use and fits all system types of series MSK 200 and MTP 200.

Certificates



Service

◆ Special models, advice, putting into work, racks to customer wishes etc. ◆

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