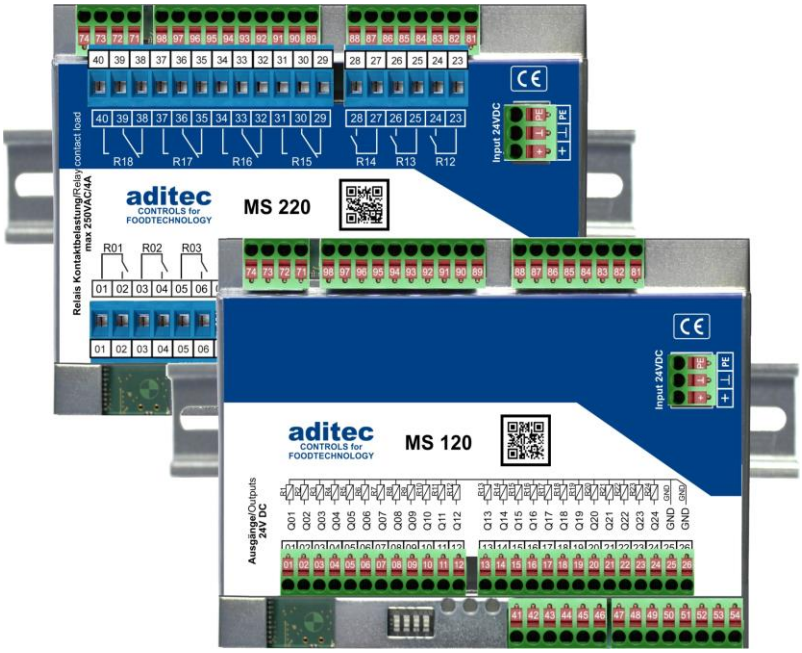
Freely programmable controller MS 120 / MS 220

» for cooking, smoking, climatic, maturing + intensive cooling chambers

aditec CONTROLS for FOODTECHNOLOGY

» OVERVIEW



The controllers **MS 120 / MS 220** can be used in **cooking, smoking, climatic, maturing chambers and intensive cooling systems.** They can also be used to **control defrosting or freezing processes**. The controllers are designed for installation in **switching cabinets on a rail**.

The controllers MS 120 / MS 220 are used in combination with the aditec Touch panels TP 720 or TP 1020!

The controllers have **4x Pt100 temperature inputs** and **2x transposable inputs** (Pt100, power 0-20mA, voltage 0-10V or thermocouples). **Pt100 can be connected as two-wire circuit or as tree-wire circuit. In three-wire connection a lead compensation is not necessary** because it takes place automatically**. At 2-wire connection a digital lead compensation can be done**.

The standard model of the controller **MS 120 has 24x 24V DC transistor outputs** for relay-control and the standard model of the controller MS 220 has **18x potential free relay outputs** (14 closer / 4 change-over). Both controllers have **2x analogue outputs** (transposable between 0..20mA and 0..10V) and **12x digital inputs**.

For communication there are the following serial interfaces: **LAN/Ethernet** and **USB Serial Port**. **Via the USB Serial Port you can make a firmware update at any time.** Up to **120 transistor outputs for MS 120, 72 relay outputs for MS 220,** 48 digital inputs, several analogue in- and outputs with additional modules can be allocated as an option.

To be ideally suited to the required task, **each control loop can be pre-programmed to be a two-point controller, a XP-controller or PID.** Free assignment of the output relays. All relays can be assigned to the 48 processes, each with different timing. 48 processes are freely programmable.

With the Codesys option, configuration options can be extended with a PLC level.

The visualization programme **aditec "VisuNet"** offers the possibility of linking the controller to a super-ordinate programme-surveillance and of logging temperature and humidity trend, processes etc. It thereby ensures a comprehensive quality control of the products treated in the units in accordance with HACCP and IFS (ISO 9000).

Use the **remote maintenance- /telecontrol system aditec-control** to not only run and monitor the VisuNet programme but to make changes to the system from anywhere you happen to be (Internet).

CE

» FEATURES

- **Robust stainless steel housing** (1.4016)
- Easy and systematic adjustment of configuration data
- Programming, configuring, Firmware updates via **mini-USB**
- **Ethernet LAN** for connection of aditec Touch panels (TP 720 / TP 1020) or a PC
- **CAN-Bus** connection for expansion modules
- **Micro SD card** up to 32 GB
- **3x tricolour LEDs** (red, yellow, green) for status display
- **1-250 programs, at 1-200 steps each. Altogether max. 5000 steps** selectable (number of programs and steps can be adjusted individually)
- **MS 120: 24 freely programmable and galvanically insulated transistor outputs** (expandable, see below) can be combined with different logical links (timer, time and control behaviors)
- **MS 220: 18x freely programmable and galvanically insulated relay outputs** (expandable, see below), can be combined with different logical links (timer, time and control behaviors)
- **4x galvanically insulated analogue inputs** (Pt100), two- or three-wire. Three-wire with automatic line compensation
- **2x galvanically insulated analogue inputs** (expandable, see below) programmable as: Pt100 or all thermocouples according to standard DIN EN 60584 (like type K: NiCr-Ni, voltage 0-10V or power 0(4)-20mA). Pt100 at three-wire connection with automatic line compensation.
- **12x galvanically insulated digital inputs** (expandable, see below) also usable as counter inputs
- **2x galvanically insulated analogue outputs** (expandable, see below) transposable between 0(4)-20mA and 0(2)-10V
- **48 programmable processes**
- Programmable nominal value limits
- Circuits can be set to **2-Pt. behaviour, XP behaviour or PID**
- Process runtime from 00h : 01min up to 99h : 59min or continuous operation
- Preselecting time (starting time) adjustable via **real-time clock**
- Detection of sensor defects (break or short circuit)
- **60 limit value alarms**
- **99 logical links**
- **20 timer**
- Program memory will be retained during a power cut
- **Programs that were interrupted through a power cut are resumed** at the point where they stopped when power is restored.
- **Networking for visualization and control according to HACCP with aditec-VisuNet is possible.**

» OPTIONS

- **MS 120:** Expandable **up to 120 transistor outputs** via **additional module MT 16** (16 outputs per module) additional 120 virtual relays
- **MS 220:** Expandable **up to 72 relay outputs** via **additional module MR 6** (6 outputs per module) additional 168 virtual relays
- Expandable **up to 48 digital inputs** via **additional module MD 12** (12 inputs per module)
- Expandable **up to 14 analogue inputs** via **additional module MAE 24** (4 inputs per module)
- Expandable **up to 6 analogue outputs** via **additional module MAE 24** (2 outputs per module)
- **8 analogue inputs for Wheatstone bridges** via **additional module MW 4** (4 inputs per module)
- **2 vacuum inputs** via **additional module MV 2** (2 inputs per module)

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» TECHNICAL DATA

General data		
Dimensions	(HxWxD) 104mm x 136mm x 110mm	Depth with terminals 111,4 mm
Material	Robust stainless steel housing (1.4016)	Ideal for use in the food industry
Display	3x LEDs, three-coloured (red, yellow, green)	For status display
Own weight	MS 120: 1000g	MS 220: 1150g
Operating temperature	-20 to +65°C	
Storage temperature	-50 to +75°C	
Protection class	IP20 according to EN 60529	
Electrical data		
Power supply Residual ripple	24VDC +25% -20% 5%	
Current consumption	Min. 200 mA at 24V AC Max. 500 mA at 23V AC	Attention! Please note the connection of additional modules. Attention! Please also note the current from transistor outputs.
Power consumption	Max. 12 W	24 transistor outputs (MS 120) or 18 relay outputs (MS 220) are controlled
Contact load of the relay (MS 220)	Max. 250V AC, 4A	
Electrical safety	According to DIN EN 61010-1 Overvoltage category III	
Electromagnetic compatibility	According to DIN EN 61326-1 emitted interference	Class A for industrial use
	Interference immunity	For industrial requirements
Battery lifetime (for real-time clock)	8-10 years	
Connections	Removable terminals in Push-in-technology (spring terminals)	Min. 0,14mm² up to max. 1,5mm² wire cross-section with 10mm wire end ferrules
Connections for relay outputs (MS 220)	Removable cable cage with screw	Wire min. 0,5mm² up to max. 2,5mm²

6x analogue inputs (+ 8x optionally via additional modules MAE 24)

Sensor		Type	Measuring range	Accuracy	Ambient temperature effect	
E1-E4		Pt100	-100… 500°C (-148… 932°F)	≤0,1%	≤100ppm/°C	**Expandable up to a total of 14** via additional modules MAE 24 (4 inputs per module)
		TFG80H	0…100 % relative humidity	≤0,6%	≤100ppm/°C	
		P1000A	Potentiometer:1000Ω	≤0,12%	≤100ppm/°C	
⊖	E5-E6	Typ K: NiCr-Ni	-200…1372°C (-328…2501°F)	≤0,4%	≤100ppm/°C	
		Typ T: Cu-CuNi	-200… 400°C (-328… 752°F)	≤0,5%	≤100ppm/°C	
		Typ B: Pt30Rh-Pt6Rh	250…1820°C (482…3308°F)	≤0,4%	≤100ppm/°C	
		Typ E: NiCr-CuNi	-200…1000°C (-328…1832°F)	≤0,4%	≤100ppm/°C	
		Typ J: Fe-CuNi	-210…1200°C (-346…2192°F)	≤0,4%	≤100ppm/°C	
		Typ N: NiCrSi-NiSi	-200…1300°C (-328…2372°F)	≤0,4%	≤100ppm/°C	
		Typ R: Pt13Rh-Pt	-50…1768°C (-58…3214°F)	≤0,4%	≤100ppm/°C	
		Typ S: Pt10Rh-Pt	-50…1768°C (-58…3214°F)	≤0,4%	≤100ppm/°C	
		0(4)...20mA	0..20 mA with R_{In} = 200Ω	≤0,33%	≤100ppm/°C	
		0(2)...10V 0...1V	0-10V with R_{In} = 100kΩ 0-1V with R_{In} = 100kΩ	≤0,13% ≤0,1%	≤100ppm/°C ≤100ppm/°C	
		Sensor HC2	Depending on sensor type	≤0,1%	≤100ppm/°C	

2x analogue outputs (+ 4x optionally via additional modules MAE 24)		
A1 and A2	0(2)-10V with $R_{Last} \geq 1000\ \Omega$ or 0(4)-20mA with $R_{Last} \leq 500\ \Omega$	**Expandable up to a total of 6** via additional modules MAE 24 (2 outputs per module)
12x digital inputs (+ 36x optionally via additional modules MD 12)		
D1…D12	Potential free, usable as counter inputs up to 1kHz, with pulse duration min. 0.5ms and pause duration min. 0.5ms	**Expandable up to a total of 48** via additional modules MD 12 (12 inputs per module)
MS 120: 24x digital transistor outputs (+ 48x optionally via additional modules MT 16)		
Q01…Q24	24V DC, max. 50mA per output	**Expandable up to a total of 120** via additional modules MT 16 (16 outputs per module)
MS 220: 18x digital relay outputs (+ 54x optionally via additional modules MR 6)		
R01…R18	Potential free, contact load max. 250V AC/4A R01-R14 closer / R15-R18 change-over	**Expandable up to a total of 72** via additional modules MR 6 (6 outputs per module)

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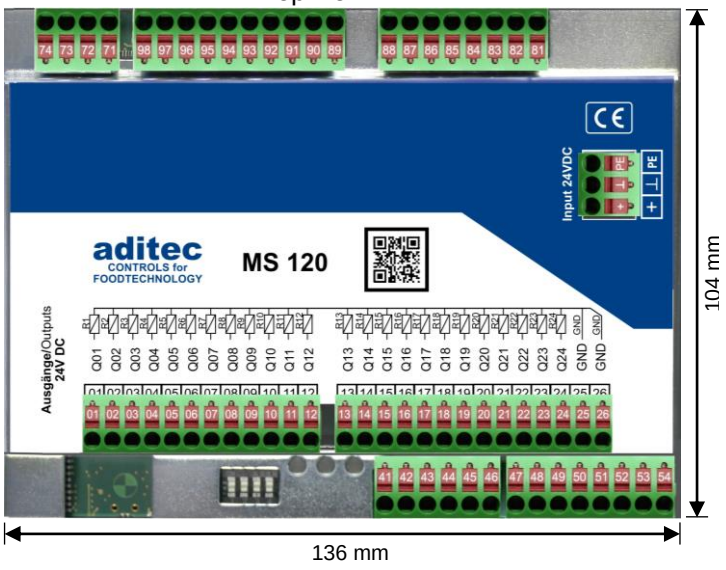
» TECHNICAL DATA

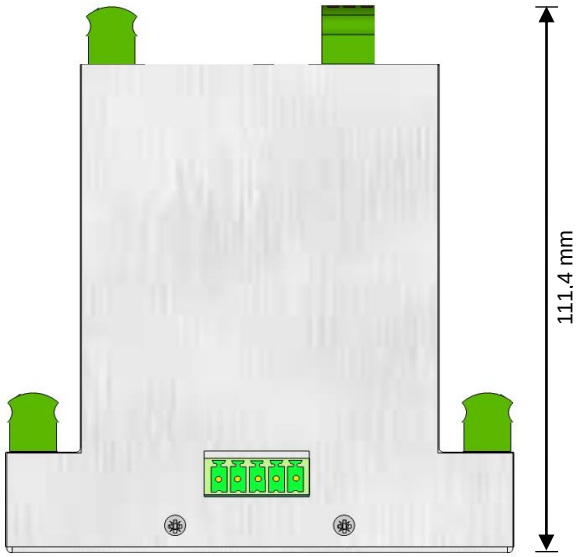
3x serial interfaces		
1	LAN	
1	USB-Host	
1	Can Bus (system bus)	
1 memory	Micro SD card slot	For micro SD cards up to 32GB.
Galvanic isolation		
Mains inputs 24 VDC	2,5 kV	
Transistor outputs (MS 120)	3,75 kV	
Relay outputs (MS 220)	3,75 kV	
Sensor outputs (analogue inputs)	2 kV	
Digital inputs	3,75 kV	
Analogue outputs	4 kV	
Serial interfaces: - LAN - USB - CAN	 1,5 kV ---- 1 kV	

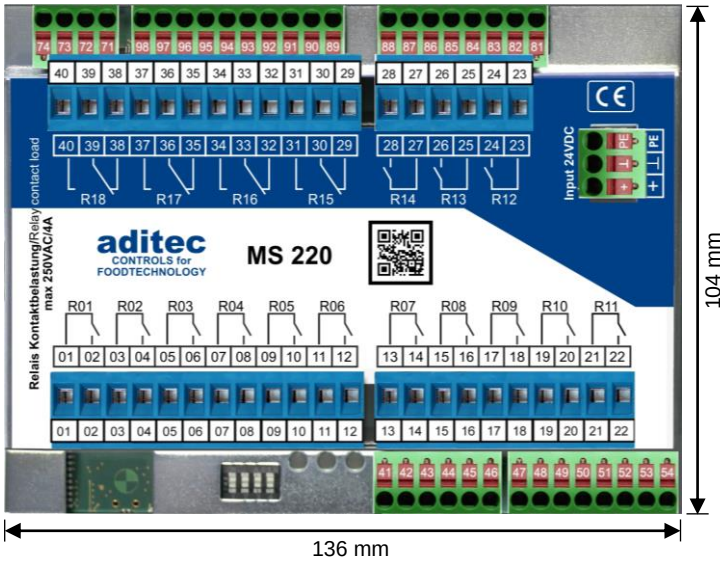
» DIMENSIONS

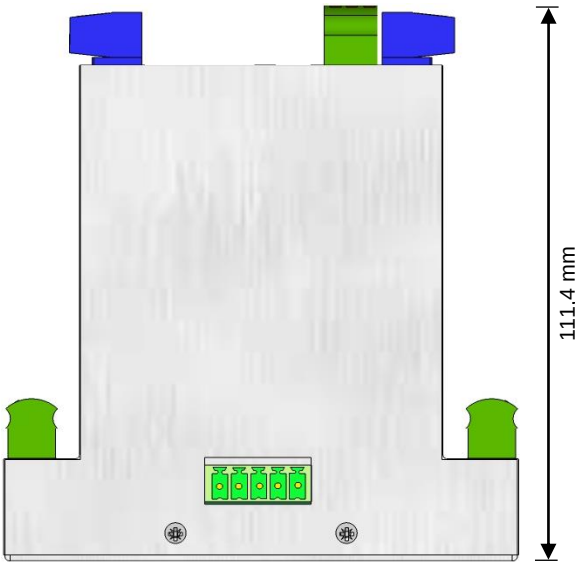
Top view



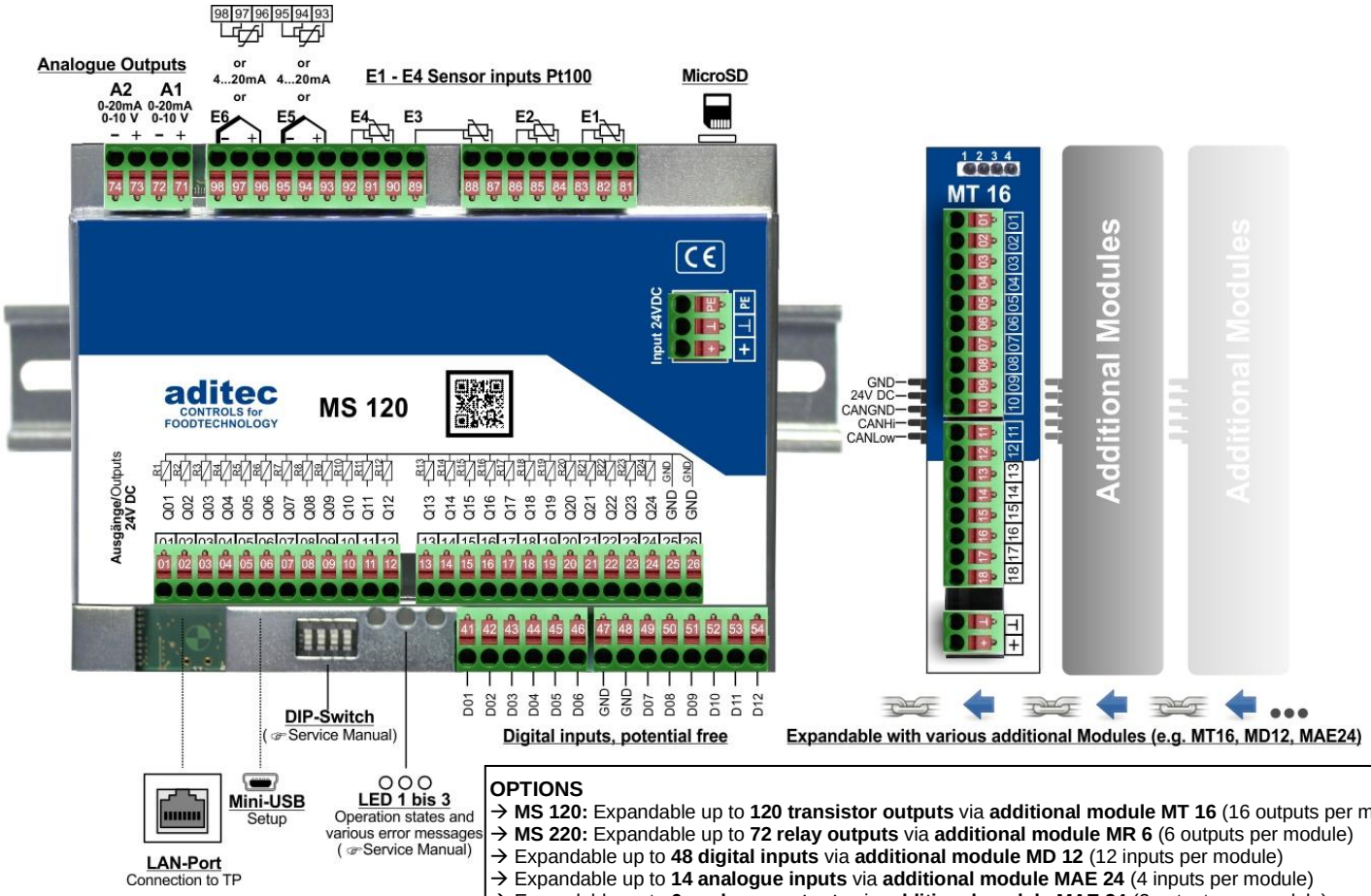
Side view







» CONNECTION DIAGRAMM



OPTIONS
→ **MS 120:** Expandable up to **120 transistor outputs** via **additional module MT 16** (16 outputs per module)
→ **MS 220:** Expandable up to **72 relay outputs** via **additional module MR 6** (6 outputs per module)
→ Expandable up to **48 digital inputs** via **additional module MD 12** (12 inputs per module)
→ Expandable up to **14 analogue inputs** via **additional module MAE 24** (4 inputs per module)
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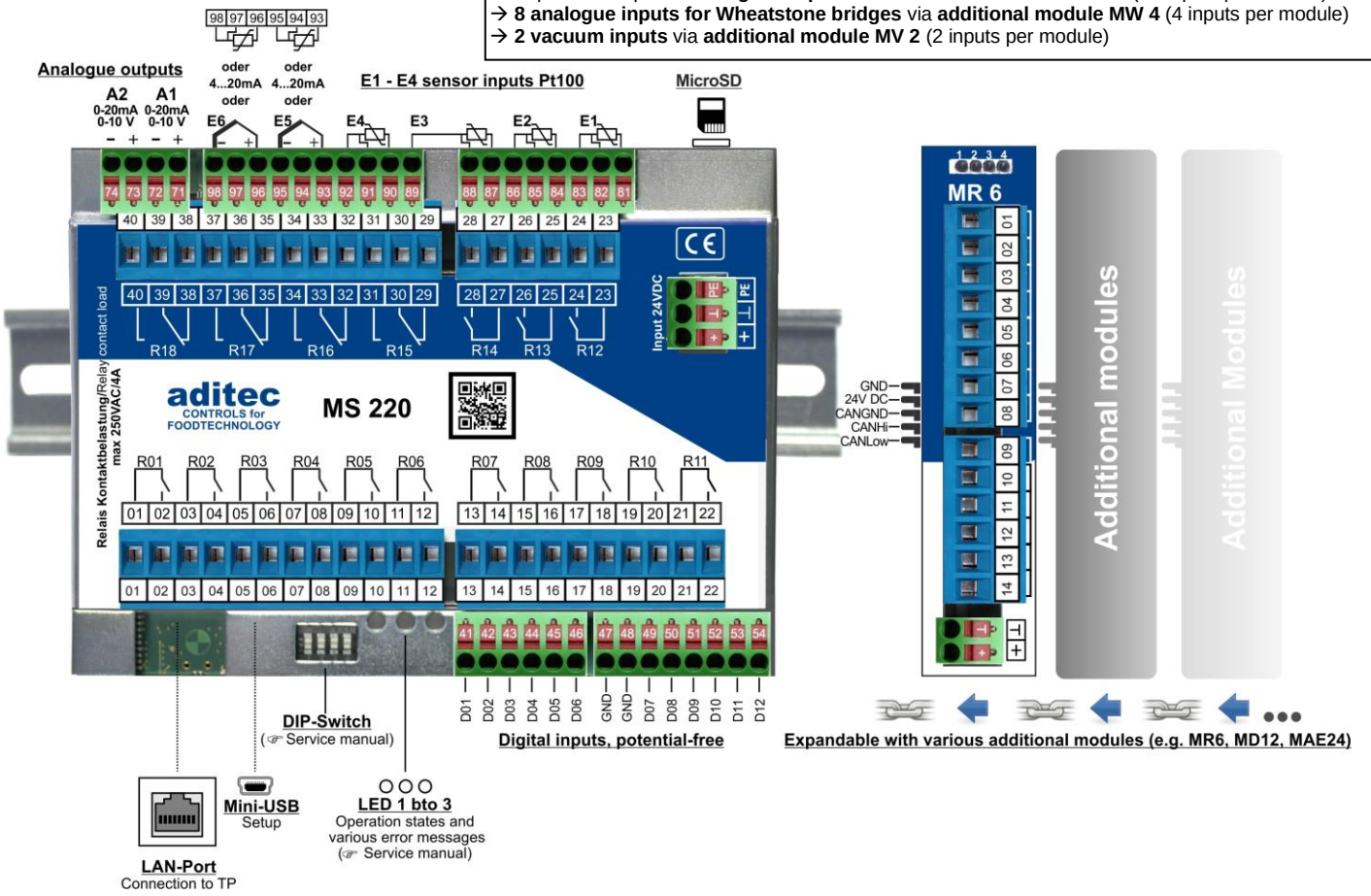

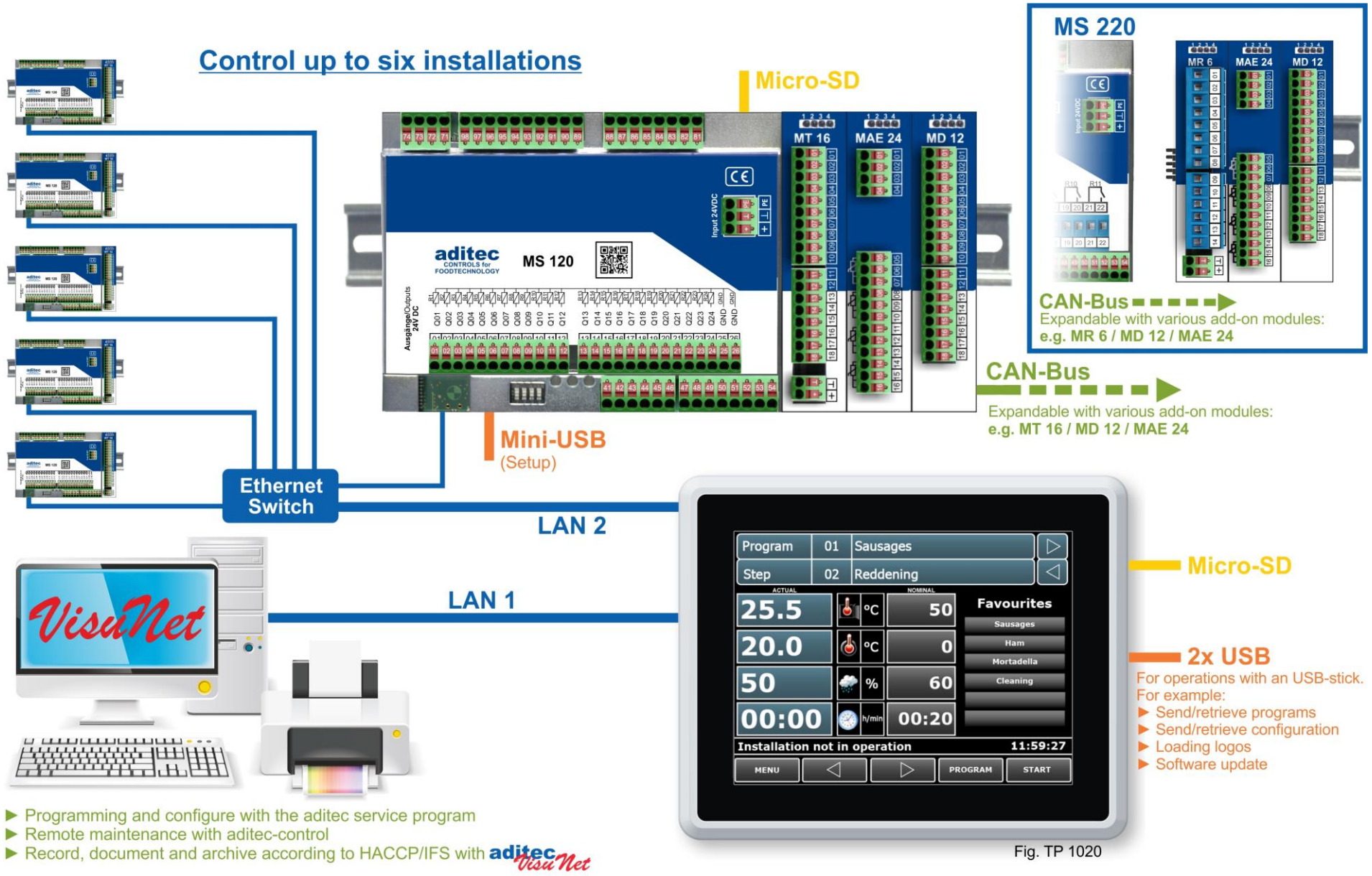

Fig. TP 1020

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