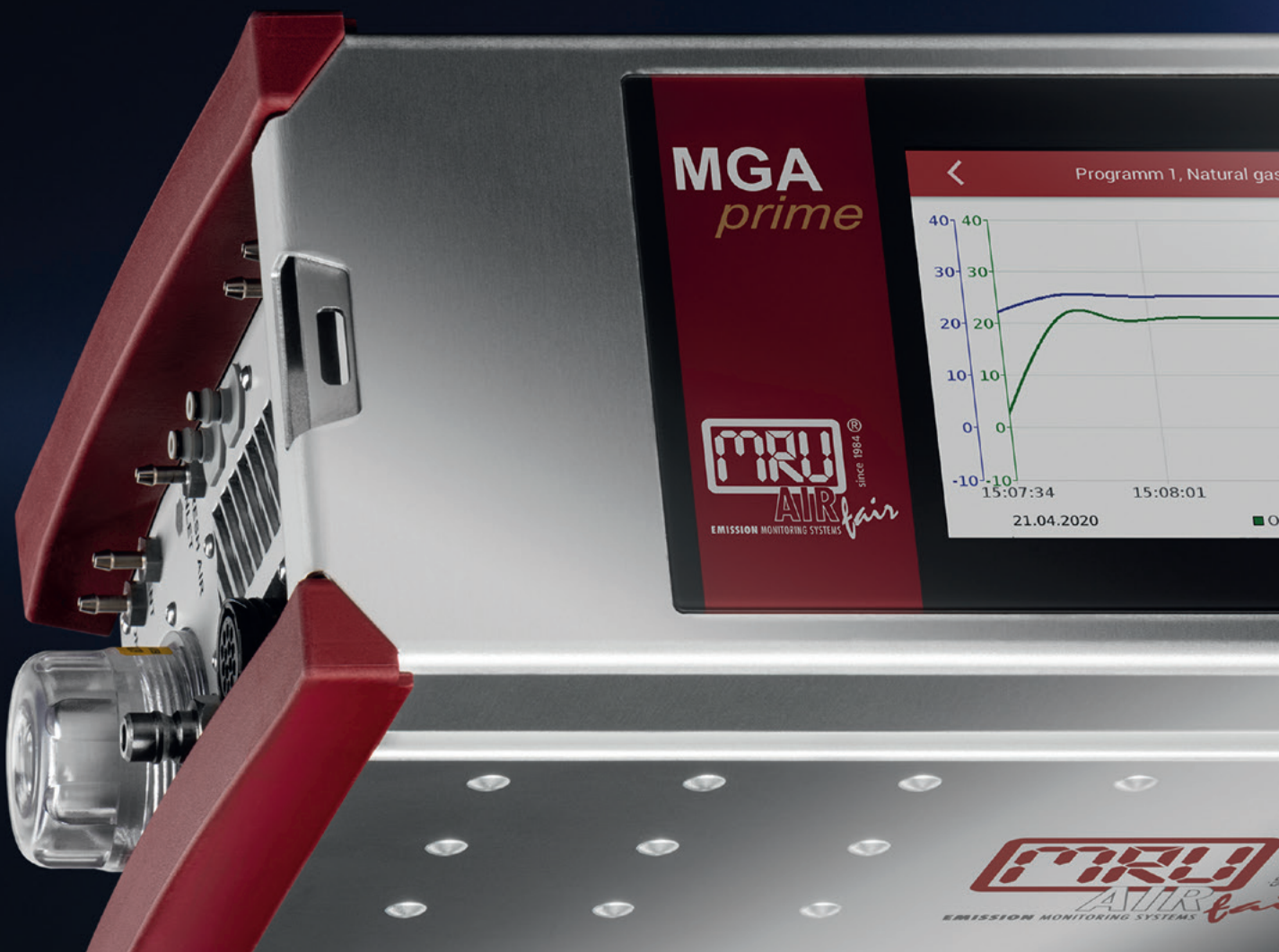




NO<sub>x</sub> | NO | NO<sub>2</sub> | CO | CO<sub>2</sub> | SO<sub>2</sub> | N<sub>2</sub>O | CH<sub>4</sub> | HC as C<sub>3</sub>H<sub>8</sub> | O<sub>2</sub>

## MGAprime

Portable flue gas and emission analyser.





# MGAprime

## Highly precise NDIR measuring technique

If highly precise NDIR analysis is required for industrial applications, MGAprime fulfills exactly these requirements.

With **MGAprime**, simultaneous analysis of up to 8 NDIR gas components is possible:

Gas measurement (NDIR)	Measuring range min./max.	Resolution	Repeatability
Nitric monoxide (NO)	0 ... 400/4,000 ppm	0.1 ppm	2 ppm or 1 % reading
Nitric dioxide (NO <sub>2</sub> )	0 ... 300/500 ppm	0.1 ppm	1 ppm or 1 % reading
Sulphur dioxide (SO <sub>2</sub> )	0 ... 300/4,000 ppm	0.1 ppm	2 ppm or 1 % reading
Carbon dioxide (CO <sub>2</sub> )	0 ... 40 %	0.01 Vol%	0.2 % or 1 % reading
Carbon monoxide (CO)	0 ... 300/10,000 ppm	0.1 ppm	2 ppm or 1 % reading
Nitrous oxide (N <sub>2</sub> O)	0 ... 300/1,000 ppm	0.1 ppm	2 ppm or 1 % reading
Methane (CH <sub>4</sub> )	0 ... 500/10,000 ppm	0.1 ppm	10 ppm or 1 % reading
Propane (C <sub>3</sub> H <sub>8</sub> )	0 ... 200/5,000 ppm	0.1 ppm	2 ppm or 1 % reading

### We offer you these special advantages:

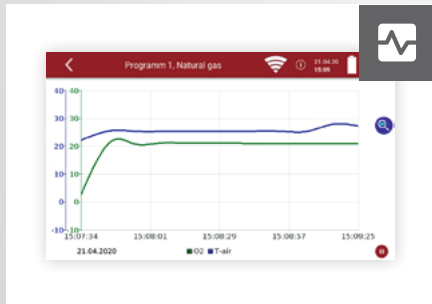
- Duration of measurement, interval and averaging can be set by the user, measured value display also possible as a curve chart
- Automatic zero point calibration for long-term measurements
- Lithium-ion battery operation, including gas cooler and measurement, but without heating hose
- Data transmission LAN, WiFi, USB, RS 485, analog as well 400 MB internal data storage





# The device in detail

## An overview of the special features



### Practical touch display

High resolution 7" color display with graphical output of the measured values



### Optimal protection

All-metal housing with soft bumper corners for the harsh industrial everyday use



### Comfortable size

Very compact dimensions (W x H x D: 430 x 290 x 150 mm) and light weight (10 kg) including nylon pouch, IP 42



### On the go

Aluminum transport case with wheels or nylon carrying/protective bags



# Operation and interfaces

## Simple and clear

### Operating options



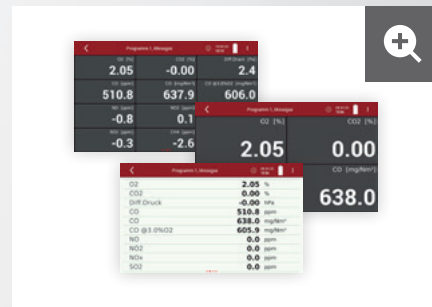
#### Touchscreen

Device operation via the 7" touch/swipe display, resolution 800 x 480 px, 750 cd/m<sup>2</sup>



#### Contactless

Operation via smartphone or PC via VNC connection, mirrored device display on smartphone



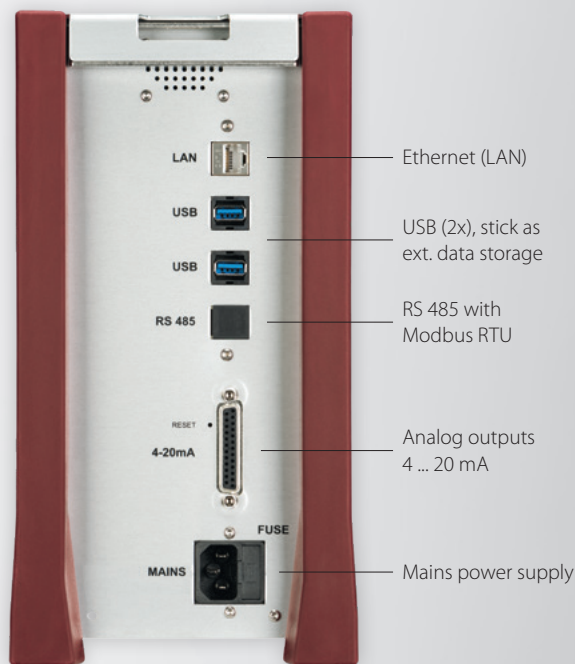
#### Zoom function

Variable display modes for the display

### Connections and interfaces

#### Measuring technology

#### Data communication



# The gas conditioning

## An overview

### Gas sampling probe

- Robust industrial probe with heated hose
- probe tubes of different lengths attachable
- Also possible for flue gas temperatures up to 1,100 °C
- Heated gas sampling line (3 m, 5 m or up to 50 m)
- Easy to change filter in the probe head
- Filters can be filled with different material, depending on the amount of dirt



Effective filter system, quickly exchangeable by the user



### Double stage gas cooler

- Cools hot sample gas in 2 stages and keeps it at a constant dew point of 4 °C
- Constant dew point compensates the cross sensitivity of water on the measured gas components
- Automatic condensate pumps for drainage



### Gas pump

- Powerful pump for use with high negative pressure
- Regulation on low, constant flow volume of 1 l/min. to increase in filter life
- High contamination alarm of the filter
- Easily accessible main filter



### Phosphoric acid dosage

- Controlled injection of 10% phosphoric acid for reliable, precise measurement of SO<sub>2</sub> and NO<sub>2</sub>
- Required device APE, incl. acid storage container delivered ready for connection

# Data transmission and measurement

## The technology behind

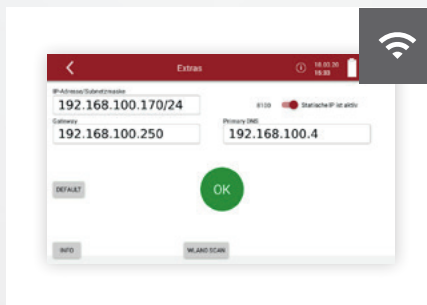
### Data transmission

#### Fully equipped standard device:

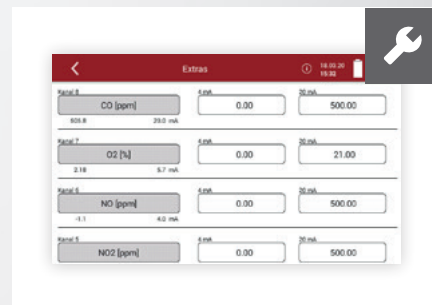
- Ethernet (LAN) TCP/IP
- WiFi
- 8 analog outputs 4 ... 20 mA
- 4 analog inputs
- USB (2x)
- RS 485

#### Internal data storage:

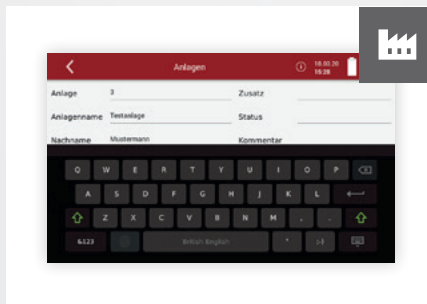
The huge memory with 400 MB offers space for thousands of facilities and data sets.



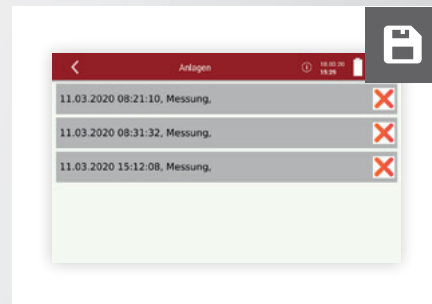
Set LAN



Set analog outputs



Manage facilities

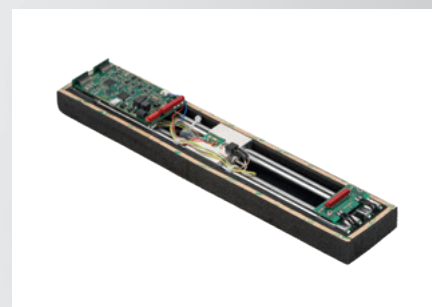


Save measurements by facility

### High quality measurement technology

**The advanced and optimized infrared measurement technology of the MGAprime guarantees a high measuring accuracy without zero drift.**

- Optimal sensors, electrochemical for H<sub>2</sub> and H<sub>2</sub>S analysis
- Paramagnetic or electrochemical sensor for O<sub>2</sub>
- Differential pressure measurement
- Temperature measurement of flue gas and combustion air
- Flow rate measurement and volume flow calculation



### Equipment variants

#### 8 channel NDIR module

NO, NO<sub>2</sub>, CO, CO<sub>2</sub>, SO<sub>2</sub>,  
N<sub>2</sub>O, CH<sub>4</sub>, HC as C<sub>3</sub>H<sub>8</sub>

#### 6 channel NDIR module

NO, NO<sub>2</sub>, CO, CO<sub>2</sub>, SO<sub>2</sub>, HC as CH<sub>4</sub>  
Optional sensors for  
H<sub>2</sub> and H<sub>2</sub>S analysis available

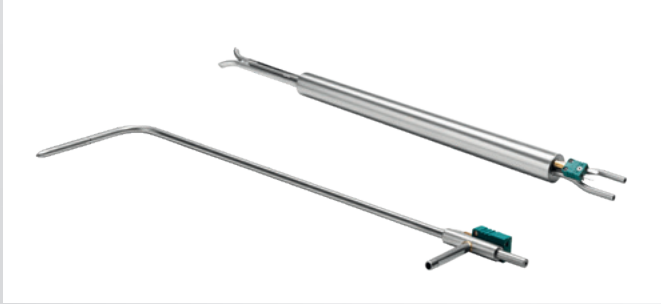
#### 6 channel NDIR module

NO, NO<sub>2</sub>, CO, CO<sub>2</sub>, SO<sub>2</sub>, HC as C<sub>3</sub>H<sub>8</sub>  
Optional sensors for  
H<sub>2</sub> and H<sub>2</sub>S analysis available



# Practical accessories

## For more flexibility



### Pitot tubes for flow velocity measurement

- L-type or S-type with temperature measurement (up to 1,000 °C), length: 300 ... 1,500 mm
- Measuring ranges from 3 to 100 m/s at a resolution of 0.1 m/s
- Additional calculation of the volume flow (m<sup>3</sup>/s)



### Dosage unit for phosphoric acid

- Incl. 2 l storage container
- Acid injection ensures precise measuring results especially at small measuring ranges of SO<sub>2</sub>
- Prevents the gas cooler from drying out



### NiMH battery

- Practical battery for safe flight transportation, instead of a lithium-ion battery



### WiFi printer

- With lithium-ion battery and USB socket
- Suitable for 80 mm paper width



### PC software "MRU4Win"

- Software for Windows to visualize measure data, manage, export and print
- Connect multiple devices at the same time and read out live values
- Logging and saving live values
- Database with customer contacts, attachments and manage users
- Export measurement reports as PDF
- Documents with customized logo and print out the address
- Read out data storage, save measurements, print and save as PDF

# MGAprime

## Technical data

Gas measurement (NDIR)	Measuring range min./max.	Resolution	Repeatability*	8h-Drift*	Linearity
Nitric monoxide (NO)	0 ... 400/4,000 ppm	0.1 ppm	2 ppm or 1% reading	2 ppm or 1% reading	1% m. r.
Nitric dioxide (NO <sub>2</sub> )	0 ... 300/500 ppm	0.1 ppm	1 ppm or 1% reading	2 ppm or 1% reading	1% m. r.
Sulphur dioxide (SO <sub>2</sub> )	0 ... 300/4,000 ppm	0.1 ppm	2 ppm or 1% reading	2 ppm or 1% reading	1% m. r.
Carbon dioxide (CO <sub>2</sub> )	0 ... 40%	0.01 Vol%	0.2% or 1% reading	0.2% or 1% reading	1% m. r.
Carbon monoxide (CO)	0 ... 300/10,000 ppm	0.1 ppm	2 ppm or 1% reading	2 ppm or 1% reading	1% m. r.
Nitrous oxide (N <sub>2</sub> O)	0 ... 300/1,000 ppm	0.1 ppm	2 ppm or 1% reading	2 ppm or 1% reading	1% m. r.
Methane (CH <sub>4</sub> )	0 ... 500/10,000 ppm	0.1 ppm	10 ppm or 1% reading	2 ppm or 1% reading	1% m. r.
Propane (C <sub>3</sub> H <sub>8</sub> )	0 ... 200/5,000 ppm	0.1 ppm	2 ppm or 1% reading	2 ppm or 1% reading	1% m. r.

Gas measurement (EC/PM)	Method <sup>1</sup>	Measuring range	Resolution	Accuracy
Oxygen (O <sub>2</sub> ) (long life)	EC	0 ... 25%	0,01 %	0,2 %
Oxygen (O <sub>2</sub> )	PM	0 ... 25%	0,01 %	0,1 %

Other measurements	Method	Measuring range	Resolution	Accuracy*
Stack gas temperature (T <sub>gas</sub> )	NiCrNi	0 ... 1,100 °C	1 °C	± 1 °C or 2% reading
Combustion air temperature (T <sub>air</sub> )	NiCrNi	0 ... 100 °C	1 °C	± 1 °C or 1% reading
Ambient air temperature (T <sub>amb</sub> )	NiCrNi	0 ... 100 °C	1 °C	± 1 °C or 2% reading
Differential pressure (P-Druck)	Piezoresistive	-120 ... +120 hPa	0.1 Pa	± 2 Pa or 1% reading
Flow velocity measurement (v)	Pitot	3 ... 100 m/s	1 m/s	± 1 m/s or 1% reading
Standardized ext. signal (AUX connection)	software	for K-thermocouple, 0 ... 10 Vdc, 4 ... 20 mA, RS 485		
Combustion calculations (fuel type depend.)	software	Losses, ExcAir, Air Ratio, dew point, CO <sub>2</sub>		
Emission calculations	software	mg/Nm <sup>3</sup> , reference to O <sub>2</sub> , g/s, kg/h		

General technical data	
Operating system	LINUX
Display, operation	7" TFT (800 x 480 px) colour display, backlit, with touch pad
Data storage type	dynamic, internally 10,000 data sets, external USB stick
Interface to PC/notebook	Ethernet, WiFi, RS 485
Cable/wireless communication interface	RS 485, RJ45 (Ethernet), WiFi
Printer	external USB/WiFi printer
Analog output/input 4 ... 20 mA	8 channel out, 4 channel in, user configurable
Universal analog input (AUX)	0 ... 10 Vdc, 4 ... 20 mA, NiCrNi-thermocouple, RS 485
System warm up time	30 minutes, typical
Mains free operation time	Li-Ion, 96 Wh, for standby 1 hour
Operating conditions	+5 ... +45 °C; RH up to 95% non condensing
Storage temperature	-20 ... +50 °C
Power supply	86 ... 265 Vac, 47 ... 63 Hz, 105 W (up to 600 W with heated gas sample line)
Protection class	IP20 (or IP42 inside transport case)
Dimensions (W x H x D)	430 x 290 x 150 mm
Weight	approx. 10 kg device only, approx. 10 kg per bag (1x device and 1x accessories)

**MRU – Competence in gas analysis. For over 35 years.**

### MRU · Messgeraete fuer Rauchgase und Umweltschutz GmbH

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