



## PRODUCT DATASHEET

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# MLT 3 and MLT 4

## Multi-Component Gas Analyzer

- Multi-component gas analyzer with up to five components featuring NDIR/UV/VIS photometer, paramagnetic and electrochemical O<sub>2</sub>, and thermal conductivity sensors
- Stand-alone or networked analyzer as central interface for multiple analyzer modules
- Table-top, portable and rack-mountable 19" housings with front panel display and keypad
- The MLT 3 Gas Analyzer can measure up to four gas components with internal power supply and the MLT 4 can measure up to five gas components with external power supply
- The Analyzer Module (AM) is a blind analysis unit that measures concentrations and other relevant parameters and provides data to the analyzer network
- The AM version can be combined with an MLT analyzer or a platform in a system
- FOUNDATION™ fieldbus connectivity and NGA or XTR WinControl data acquisition

## Applications

- Internal combustion engine emissions and engine/catalyst development
- Suitability-tested continuous emission monitoring systems
- Control of denitrification and desulphurization equipment
- Research and development institutes
- Trace monitoring in gas purity

## Worldwide Approvals

CE, CSA-C/US and c-Tick approvals allow global installation of MLT 3 and MLT 4 gas analyzers.



MLT 3 and MLT 4 Multi-Component Gas Analyzer

## Features

- Multi-component analyzer with multi-channel capability
- NDIR: microflow sensor or solid-state detector
- NDUV/VIS: vacuum diode
- O<sub>2</sub>: fast response paramagnetic or long-term stable electrochemical oxygen sensor
- TC: special coated thermal conductivity cell
- Four ranges per channel
- Dynamic autoranging ratio 1 : 10 or more (up to 1 : 250)
- AK protocol for automotive
- Autocalibration via internal or external valve block, controlled I/O, serial interface, network or time-programmed
- Zero and span stability by autozero and automatic gain control without span gas
- Thermostat controlled benches (standard 55 °C, up to 120 °C as option)
- Barometric or process pressure compensation
- Sample flow rate measurement
- Pump, filter and throttle (MLT 3)
- Analog, digital and serial I/Os (SIO/DIO)
- Suppressed ranges for O<sub>2</sub>, H<sub>2</sub>, CO<sub>2</sub> and N<sub>2</sub>O

## Process-approved Sensors

Solvent-resistant, corrosion-resistant and intrinsically safe measuring cells and stainless steel tubing are available.

## Specifications

Please contact your Emerson representative if your requirements are outside the specifications listed below. Improved performance, other products and material offerings may be available depending on the application.

**Table 1 - Gases and Measuring Ranges**

| Gas Components             |                                | Minimum Ranges          | Maximum Ranges         |
|----------------------------|--------------------------------|-------------------------|------------------------|
| Ammonia                    | NH <sub>3</sub>                | 0–100 ppm               | 0–100 %                |
| Carbon dioxide             | CO <sub>2</sub>                | 0–5 ppm <sup>(1)</sup>  | 0–100 %                |
| Carbon monoxide            | CO                             | 0–10 ppm <sup>(1)</sup> | 0–100 %                |
| Hexane                     | C <sub>6</sub> H <sub>14</sub> | 0–100 ppm               | 0–10 %                 |
| Methane                    | CH <sub>4</sub>                | 0–100 ppm               | 0–100 %                |
| Nitric dioxide             | NO <sub>2</sub>                | 0–10 ppm <sup>(1)</sup> | 0–10 %                 |
| Nitric oxide               | NO                             | 0–150 ppm               | 0–100 %                |
| Nitrous oxide              | N <sub>2</sub> O               | 0–100 ppm               | 0–100 %                |
| Oxygen                     | O <sub>2</sub>                 | 0–1 % <sup>(1)</sup>    | 0–100 % <sup>(3)</sup> |
| Sulphur dioxide            | SO <sub>2</sub>                | 0–25 ppm                | 0–100 %                |
| Sulphur hexafluoride       | SF <sub>6</sub>                | 0–5 ppm                 | 0–2 %                  |
| Water vapor <sup>(2)</sup> | H <sub>2</sub> O               | 0–1,000 ppm             | 0–100%                 |

(1) Non-standard specifications

(2) Dew point must not exceed ambient temperature

(3) Non-standard components require special calibration and linearization methods

**Table 2 - MLT 3 Electrical Specifications**

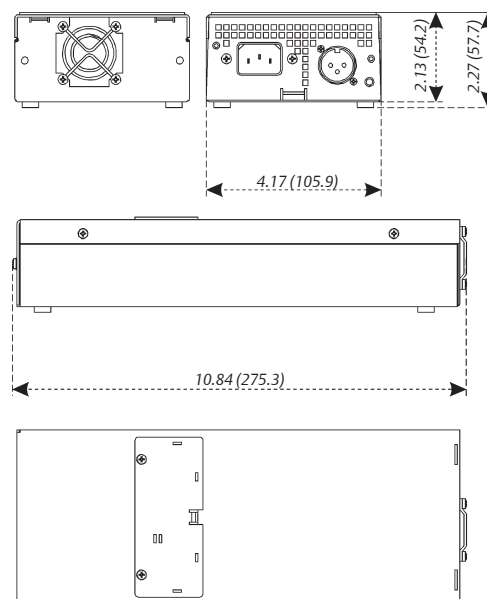
|                                                      |
|------------------------------------------------------|
| Internal power supply. See UPS specifications below. |
|------------------------------------------------------|

### Specifications, UPS/SL 5, SL 10

|                                                       |                                                                                        |
|-------------------------------------------------------|----------------------------------------------------------------------------------------|
| <b>Input</b><br>UPS/SL 5, SL 10                       | IEC appliance inlet/terminals                                                          |
| <b>Nominal voltage</b>                                | 120/230V AC, 50/60 Hz                                                                  |
| <b>Input voltage</b><br>UPS/SL 5, SL 10               | 93–132V AC resp. 196–264V AC, 47– 63 Hz<br>autoranging/manual switch                   |
| <b>Input current</b><br>UPS//SL 5//SL 10              | 2.5/1.5 A//2.6/1.4 A//6.0/2.8 A                                                        |
| <b>Output</b><br>UPS                                  | Three pole XLR flange (female)<br>internal version: dual pole connectors               |
| SL 5, SL 10                                           | Terminals                                                                              |
| <b>Output voltage</b><br>UPS, SL 5/SL 10              | 24V DC<br>Maximum 5.0 A/maximum 10.0 A                                                 |
| <b>Nominal Power</b><br>UPS, SL 5<br>SL 10            | Maximum 120 W<br>Maximum 240 W                                                         |
| <b>Dimensions</b><br>UPS Rack Module<br>SL 5 (SL 10)  | 19", 3 HU, 21 DU<br>125 x 65 (122) x 103 mm (H x W x D)                                |
| <b>Installation</b><br>UPS Rack Module<br>SL 5, SL 10 | Depth min. 400 mm (with plug/cable)<br>Mountable on DIN supporting rails<br>type TS 35 |

**Table 3 - MLT 4 Electrical Specifications**

|                                     |                                                                                                                                         |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Input</b>                        | Three pole XLR flange (male), lockable                                                                                                  |
| <b>Voltage supply</b>               | 24V DC ± 5 %/5 A                                                                                                                        |
| <b>For AV operation (120/230 V)</b> | The DC supply must be provided by including one of the following options:<br>UPS, SL 5/SL 10 (cabinet only) or equivalent power supply. |



All dimensions in inches (mm in parenthesis)

Figure 2 - Mounting dimensions for universal power supply table-top version (without cable)

Table 4 - Performance Specifications

|                                                                                                  | NDIR/UV/VIS                                                                                               | Oxygen Sensor (pO <sub>2</sub> and eO <sub>2</sub> <sup>(8)</sup> ) | Thermal Conductivity (TCD)                                                   |
|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------------------|
| Detection limit                                                                                  | ≤ 1 % <sup>(1) (4)</sup>                                                                                  | < 1 % <sup>(1) (4)</sup>                                            | < 1 % <sup>(1) (4)</sup>                                                     |
| Linearity                                                                                        | ≤ 1 % <sup>(1) (4)</sup>                                                                                  | ≤ 1 % <sup>(1) (4)</sup>                                            | ≤ 1 % <sup>(1) (4)</sup>                                                     |
| Zero-point drift                                                                                 | ≤ 2 % per week <sup>(1) (4)</sup>                                                                         | ≤ 2 % per week <sup>(1) (4)</sup>                                   | ≤ 2 % per week <sup>(1) (4)</sup>                                            |
| Span (sensitivity) drift                                                                         | ≤ 0.5 % per week <sup>(1) (4)</sup>                                                                       | ≤ 1 % per week <sup>(1)</sup>                                       | ≤ 1 % per week <sup>(1) (4)</sup>                                            |
| Repeatability                                                                                    | ≤ 1 % <sup>(1) (4)</sup>                                                                                  | ≤ 1 % <sup>(1) (4)</sup>                                            | ≤ 1 % <sup>(1) (4)</sup>                                                     |
| Response time (t <sub>90</sub> ) <sup>(3)</sup>                                                  | 3 s < t <sub>90</sub> < 7 s <sup>(5)</sup>                                                                | < 5 s <sup>(9)</sup> /Approx. 12 s <sup>(8)</sup>                   | 15 s ≤ t <sub>90</sub> ≤ 30 s                                                |
| Permissible gas flow                                                                             | 0.2–1.5 l/min                                                                                             | 0.2–1.0 l/min/0.2–1.5 l/min.                                        | 0.2–1.5 l/min ± 0.1 l/min                                                    |
| Influence of gas flow                                                                            |                                                                                                           | ≤ 2 % <sup>(1) (4)</sup>                                            | ≤ 1 % <sup>(1) (4)</sup>                                                     |
| Maximum gas pressure                                                                             | ≤ 1,500 hPa abs. (≤ 7 psig)                                                                               | Atm. pressure/≤ 1,500 hPa abs. (≤ 7 psig)                           | ≤ 1,500 hPa abs. (< 7 psig)                                                  |
| Influence of pressure<br>- At constant temperature<br>- With pressure compensation               | ≤ 0.1 % per hPa <sup>(2)</sup><br>≤ 0.01 % per hPa <sup>(2)</sup>                                         | ≤ 0.1 % per hPa <sup>(2)</sup><br>≤ 0.01 % per hPa <sup>(2)</sup>   | ≤ 0.1 % per hPa <sup>(2)</sup><br>≤ 0.01 % per hPa <sup>(2)</sup>            |
| Permissible ambient temperature                                                                  | +5 °C to +40 °C <sup>(7)</sup>                                                                            | +5 °C to +40 °C <sup>(7)</sup>                                      | +5 °C to +40 °C                                                              |
| Influence of temperature<br>(at constant pressure)<br>- On zero point<br>- On span (sensitivity) | ≤ 1 % per 10 K <sup>(1)</sup><br>≤ 1 % per 10 K <sup>(1)</sup><br>≤ 5 % (+5 to +40 °C) <sup>(1) (6)</sup> | ≤ 1 % per 10 K <sup>(1)</sup><br>≤ 1 % per 10 K <sup>(1)</sup>      | ≤ 1 % per 10 K in 1 h <sup>(1)</sup><br>≤ 1 % per 10 K in 1 h <sup>(1)</sup> |
| Thermostat control                                                                               | None                                                                                                      | Approx. 55 °C <sup>(9)</sup> /None                                  | Approx. 75 °C <sup>(9)</sup>                                                 |
| Warm-up time                                                                                     | Approx. 15 to 50 minutes <sup>(5)</sup>                                                                   | Approx. 50 minutes <sup>(5)</sup>                                   | Approx. 15 minutes                                                           |

(1) Related to full scale

(2) Related to measuring value

(3) From gas analyzer inlet at gas flow of 1.0 l/min (electr. = 2 s)

(4) Constant pressure and temperature

(5) Dependent on integrated photometer bench/sensor

(6) Starting from 20 °C (to +5 °C or to +40 °C)

(7) Higher ambient temperatures (45 °C) on request

(8) eO<sub>2</sub>: Not for use with sample gas containing FCHC(9) Paramagnetic sensor (pO<sub>2</sub>) only

## Performance Specifications

|                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Compliances</b><br><br><b>Suitability tests</b><br> | EN 61326, EN 61010-1, NAMUR, PAC, C-Tick<br>GOST: VNIIMS, Pattern (Belarussia)<br><br>TÜV Rheinland:<br>CO / SO <sub>2</sub> / NO / NO <sub>2</sub> / O <sub>2</sub> measurement acc. to<br>TI Air (Technical Instruction on Air Quality Control),<br>13 <sup>th</sup> BlmScV (Large Furnace order)<br>and 17 <sup>th</sup> BlmSchV (Order on Incineration Plants<br>for Waste and Similar Combustible Materials)<br>TÜV Nord:<br>FDA test: 0–10 ppm CO and 0–5 ppm CO <sub>2</sub><br><br><b>Measuring components</b><br>Approx. 60 gases are detectable, e.g.:<br>NO, NO <sub>2</sub> , SO <sub>2</sub> , CO, CO <sub>2</sub> , CH <sub>4</sub> , C <sub>6</sub> H <sub>14</sub> , SF <sub>6</sub> , Cl <sub>2</sub> , H <sub>2</sub> O,<br>N <sub>2</sub> O, O <sub>2</sub> , NH <sub>3</sub> , R13a, H <sub>2</sub> etc.<br><br><b>Gas connections for<br/>sample, reference or<br/>purge gas</b><br>MLT 3: 6 fittings, 6/4 mm PVDF<br>MLT 4: 10 fittings, 6/4 mm PVDF<br>Option: 6/4 mm ss, 1/4" ss; for more options c.f<br><br><b>Protection class of<br/>enclosure</b><br>IP 20 according to IEC 60529:<br>General purpose for installation in weather protected area<br><br><b>Permissible humidity<br/>(non-condensing)</b><br>< 90 % rel. humidity at 20 °C (68 °F)<br>< 70 % rel. humidity at 40 °C (104 °F)<br><br><b>Weight</b><br>Approx. 8–13 kg, depending on configuration<br><br><b>Options</b><br>Integrated flow sensor and pressure sensors, thermostated<br>box for physical components (standard 55 °C, optional up to<br>120 °C), solenoid valve block, sample handling (MLT 3 only):<br>pump, fine dust filter and throttle. |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Signal Outputs, Interface

### SIO and DIO (Options)

#### 2–8 analog signal outputs

(SIO, optically isolated, sub-modular structure):

▪ 0–10 V and 0–20 mA

(R<sub>b</sub> ≤ 500 Ω)

▪ 2–10 V and 4–20 mA

(R<sub>b</sub> ≤ 500 Ω)

#### 3 relay contacts (SIO, NAMUR):

▪ Contact rating: 1 A, 30 V

#### Serial interfaces (SIO, option):

▪ RS 232 C or RS 485

**Digital I/Os** (DIO, optically isolated, freely  
programmable from a list of commands):

▪ 8 digital inputs, 0–30V DC/

2.2 mA (for remote functions)

▪ 24 digital outputs, 5–30V DC/500 mA

#### Network

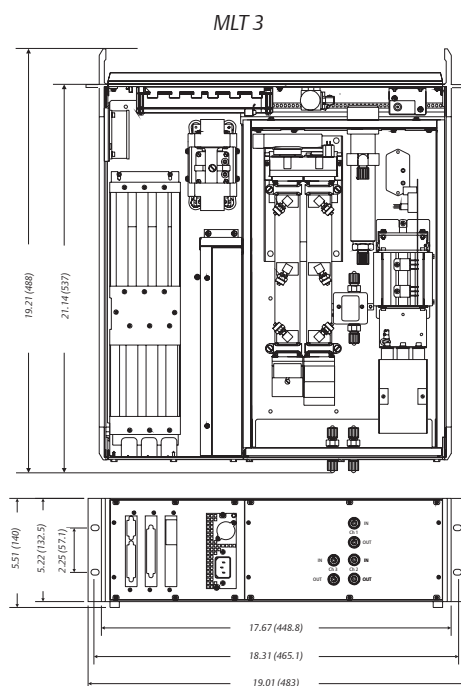
▪ FOUNDATION™ fieldbus

▪ LON (analyzer network)

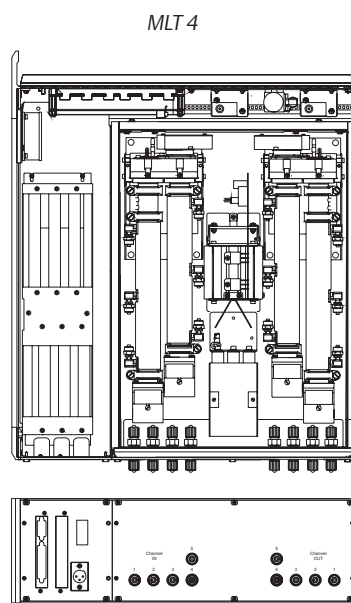
## Dimensions

The drawings below represent the minimum recommended installation guidelines for the MLT 3 and MLT 4 Multi-Component Gas Analyzer. Please contact your Emerson representative for detailed installation recommendation of your application.

### MLT 3 and MLT 4 - Rack-Mounting/Table-Top Housing



Inside view (including options)



Inside view

All dimensions in inches  
(mm in parentheses)

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