

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 O₂, 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
- O₂: 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 O₂, H₂, CO₂ and N₂O

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 ₃	0–100 ppm	0–100 %
Carbon dioxide	CO ₂	0–5 ppm ⁽¹⁾	0–100 %
Carbon monoxide	CO	0–10 ppm ⁽¹⁾	0–100 %
Hexane	C ₆ H ₁₄	0–100 ppm	0–10 %
Methane	CH ₄	0–100 ppm	0–100 %
Nitric dioxide	NO ₂	0–10 ppm ⁽¹⁾	0–10 %
Nitric oxide	NO	0–150 ppm	0–100 %
Nitrous oxide	N ₂ O	0–100 ppm	0–100 %
Oxygen	O ₂	0–1 % ⁽¹⁾	0–100 % ⁽³⁾
Sulphur dioxide	SO ₂	0–25 ppm	0–100 %
Sulphur hexafluoride	SF ₆	0–5 ppm	0–2 %
Water vapor ⁽²⁾	H ₂ 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

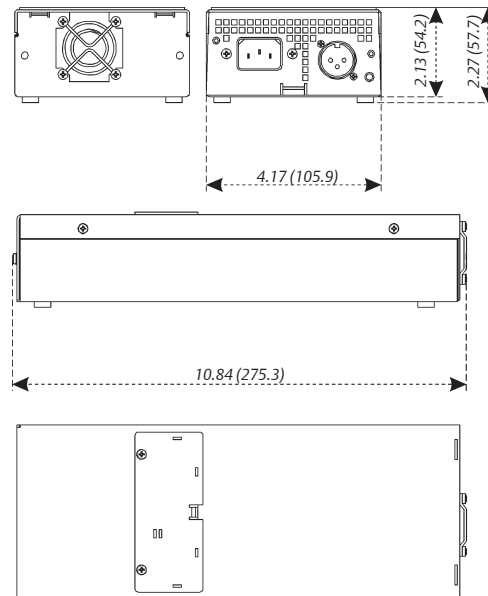
Internal power supply. See UPS specifications below.
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Specifications, UPS/SL 5, SL 10

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

Table 3 - MLT 4 Electrical Specifications

Input	Three pole XLR flange (male), lockable
Voltage supply	24V DC ± 5 %/5 A
For AV operation (120/230 V)	The DC supply must be provided by including one of the following options: 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 ₂ and eO ₂ ⁽⁸⁾)	Thermal Conductivity (TCD)
Detection limit	≤ 1 % ⁽¹⁾⁽⁴⁾	< 1 % ⁽¹⁾⁽⁴⁾	< 1 % ⁽¹⁾⁽⁴⁾
Linearity	≤ 1 % ⁽¹⁾⁽⁴⁾	≤ 1 % ⁽¹⁾⁽⁴⁾	≤ 1 % ⁽¹⁾⁽⁴⁾
Zero-point drift	≤ 2 % per week ⁽¹⁾⁽⁴⁾	≤ 2 % per week ⁽¹⁾⁽⁴⁾	≤ 2 % per week ⁽¹⁾⁽⁴⁾
Span (sensitivity) drift	≤ 0.5 % per week ⁽¹⁾⁽⁴⁾	≤ 1 % per week ⁽¹⁾	≤ 1 % per week ⁽¹⁾⁽⁴⁾
Repeatability	≤ 1 % ⁽¹⁾⁽⁴⁾	≤ 1 % ⁽¹⁾⁽⁴⁾	≤ 1 % ⁽¹⁾⁽⁴⁾
Response time (t₉₀)⁽³⁾	3 s < t ₉₀ < 7 s ⁽⁵⁾	< 5 s ⁽⁹⁾ /Approx. 12 s ⁽⁸⁾	15 s ≤ t ₉₀ ≤ 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 % ⁽¹⁾⁽⁴⁾	≤ 1 % ⁽¹⁾⁽⁴⁾
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 - At constant temperature - With pressure compensation	≤ 0.1 % per hPa ⁽²⁾ ≤ 0.01 % per hPa ⁽²⁾	≤ 0.1 % per hPa ⁽²⁾ ≤ 0.01 % per hPa ⁽²⁾	≤ 0.1 % per hPa ⁽²⁾ ≤ 0.01 % per hPa ⁽²⁾
Permissible ambient temperature	+5 °C to +40 °C ⁽⁷⁾	+5 °C to +40 °C ⁽⁷⁾	+5 °C to +40 °C
Influence of temperature (at constant pressure) - On zero point - On span (sensitivity)	≤ 1 % per 10 K ⁽¹⁾ ≤ 1 % per 10 K ⁽¹⁾ ≤ 5 % (+5 to +40 °C) ⁽¹⁾⁽⁶⁾	≤ 1 % per 10 K ⁽¹⁾ ≤ 1 % per 10 K ⁽¹⁾	≤ 1 % per 10 K in 1 h ⁽¹⁾ ≤ 1 % per 10 K in 1 h ⁽¹⁾
Thermostat control	None	Approx. 55 °C ⁽⁹⁾ /None	Approx. 75 °C ⁽⁹⁾
Warm-up time	Approx. 15 to 50 minutes ⁽⁵⁾	Approx. 50 minutes ⁽⁵⁾	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) eO₂: Not for use with sample gas containing FCHC(9) Paramagnetic sensor (pO₂) only

Performance Specifications

Compliances	EN 61326, EN 61010-1, NAMUR, PAC, C-Tick GOST: VNIIMS, Pattern (Belarussia)
Suitability tests	TÜV Rheinland: CO / SO ₂ / NO / NO ₂ / O ₂ measurement acc. to TI Air (Technical Instruction on Air Quality Control), 13 th BlmScV (Large Furnace order) and 17 th BlmSchV (Order on Incineration Plants for Waste and Similar Combustible Materials) TÜV Nord: FDA test: 0–10 ppm CO and 0–5 ppm CO ₂
Measuring components	Approx. 60 gases are detectable, e.g.: NO, NO ₂ , SO ₂ , CO, CO ₂ , CH ₄ , C ₆ H ₁₄ , SF ₆ , Cl ₂ , H ₂ O, N ₂ O, O ₂ , NH ₃ , R13a, H ₂ etc.
Gas connections for sample, reference or purge gas	MLT 3: 6 fittings, 6/4 mm PVDF MLT 4: 10 fittings, 6/4 mm PVDF Option: 6/4 mm ss, 1/4" ss; for more options c.f
Protection class of enclosure	IP 20 according to IEC 60529: General purpose for installation in weather protected area
Permissible humidity (non-condensing)	< 90 % rel. humidity at 20 °C (68 °F) < 70 % rel. humidity at 40 °C (104 °F)
Weight	Approx. 8–13 kg, depending on configuration
Options	Integrated flow sensor and pressure sensors, thermostated box for physical components (standard 55 °C, optional up to 120 °C), solenoid valve block, sample handling (MLT 3 only): 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_B ≤ 500 Ω)
- 2–10 V and 4–20 mA
(R_B ≤ 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

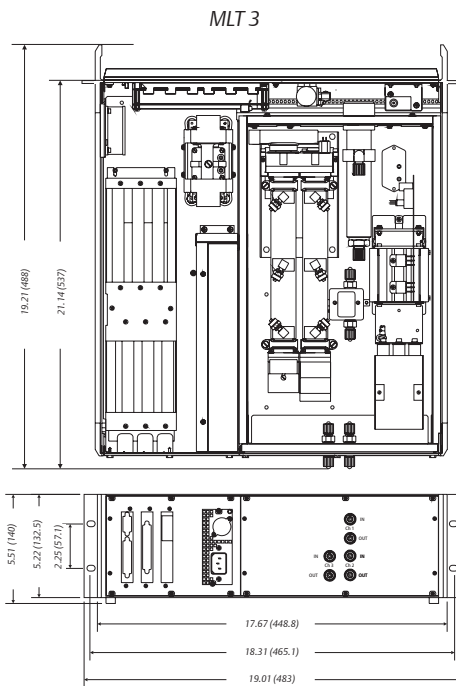
Network

- FOUNDATION™ fieldbus
- LON (analyzer network)

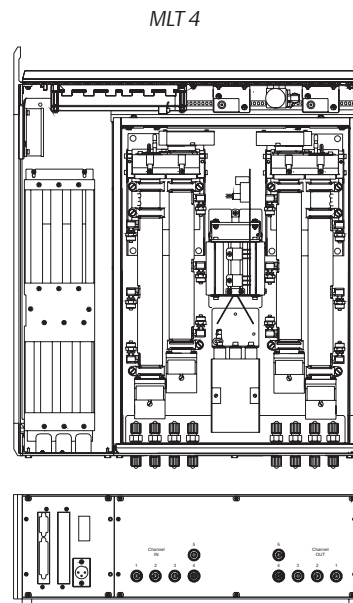
Dimensions

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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