

### Features

- Turnkey gas analyzer
- Absolute gas quantification
- Calibration-free gas analysis
- PPB-level sensitivity without cross-talks
- Digital and analog data interfaces
- IP68 grade mechanics
- Supply voltage: 15-32 VDC polarity protected



### Description

The BM-H-3 BeamStack is a high-performance turnkey solution based on tunable diode laser absorption spectroscopy (TDLAS) for gas analysis.

The analyzer is designed with user- and integration-friendliness in mind, suitable for both industrial settings with PLC systems and research laboratories, where raw and/or processed data can easily be exported and visualized for post-processing in third-party tools.

The robust and established TDLAS technology provides fast (100  $\mu$ s) and highly sensitive (PPB-level) gas analysis.

The TDLAS technology is also inherently self-referencing and calibration-free, requiring little to no maintenance.

The analyzer can measure many common gases found in the industry and laboratories, including greenhouse gases such as methane (CH<sub>4</sub>). Other commonly analysed gases include O<sub>2</sub>, CO<sub>2</sub>, CO, N<sub>2</sub>O, NH<sub>3</sub>, NO<sub>x</sub>, HF, H<sub>2</sub>S and HCl, as well as hydrocarbons.

The highly energy-efficient design allows the BM-H-3 BeamStack to run for hours on batteries, making it well-suited for mobile analyzer solutions at locations where there is no access to external power.

The calibration-free gas analyzer system is highly durable for use in heavy industries and extremely robust in harsh environments.

### Examples of gases

Gas	Analysis precision (ppm) <sup>a)</sup>
O <sub>2</sub>	6
HF	0.01
CO	0.2
CO <sub>2</sub>	0.5
CH <sub>4</sub>	0.2
H <sub>2</sub> S	0.3
NO	0.3
NH <sub>3</sub>	0.2
N <sub>2</sub> O	2
H <sub>2</sub> O	0.2

*a) Under standard test conditions: L = 1 m, t = 1 s, P = 1 atm, T = 300 K, largest of 1% relative and specified precision*



## Spectroscopy Characteristics

Parameter	Symbol	Min	Typical	Max
Data rate	$f_R$		1 Hz	10 kHz
Data sampling noise			0.1 $\mu$ Vrms*	
Low-light limit (10 s)	$I_{LL}$		1 nW	

\*1 s sampling time

## Interfaces

Interface	Model	Mounted	Quantity
USB	53398-0471 Communication, Data	Yes	2
USB	Mini USB, Firmware upgrade	Yes	2
RS-485	4 wire Full Duplex - protected	Yes	1
RS-485	4 wire Full Duplex - service data	Yes	1
RS-485	Half Duplex	Yes	1
Trig In	4-30 V	Yes	2
IO	0-12 V	Yes	2
IO Supply	12 V	Yes	1
Relay Output	G6K-2F-5DC, NC/NO	Yes	2
4-20 mA	Passive / Active	Expansion	2
Expansion connector	I <sup>2</sup> C, SPI, GPIO, ADC, Loop Relay, Sync, GND, PWM, UART, Relay, IO, 5 V, 2.5 V, 12 V, PWR_IN, 4-20 mA, 0-10 V	Yes	3
Sync signals	Daisy chain configuration	Yes	2
Master clk in / out	73412-0110	Yes	2

## Electrical Characteristics

Parameter	Symbol	Min	Typical	Max
Supply voltage	$V_{in}$	15 VDC*	24 VDC	32 VDC
Power consumption			5 W**	
TEC driver power		0 W		3.56 W
Comm. link length				30 m
Comm. link speed				3 Mbit/s
Startup-time (ambient)	$t_{su}$		5 s	

\*Degraded noise performance if  $V_{in} < 15$  V | \*\* 50 mA laser diode

## Other

Parameter	Symbol	Min	Typical	Max
Operating temperature	$T_{op}$	-10 °C		50 °C
Humidity (non-condensing)		40% @ 50 °C / 80% @ 30 °C		
IP classification		IP67		
Infrared laser		Laser Class I		
CE-marked EU directives		2014/35/EU, 2012/19/EU, 2011/65/EU, EN61000-6-2:2005, EN61000-6-2:2019, EN61000-6-4:2007, EN61000-6-4:2019		

