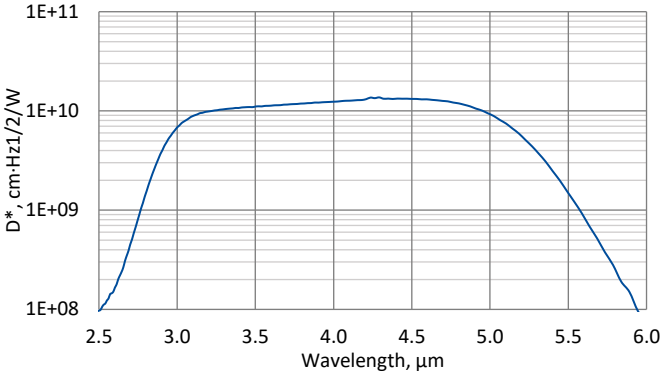
LabM-I-5

2.9 – 5.5 µm and over 15 MHz HgCdTe programmable, laboratory IR detection module with optically immersed photovoltaic detector

LabM-I-5 is a laboratory IR detection module with optically immersed photovoltaic detector based on HgCdTe heterostructure, integrated with transimpedance, programmable preamplifier. 3° wedged sapphire window prevents unwanted interference effects. For proper operation programmable „smart" VIGO thermoelctric cooler controller PTCC-01 (sold separately) and Smart Manager Software (freeware) are required. LabM-I-5 module comes complete with PTCC-01 and Smart Manager is the best solution for prototyping and R&D stage in a variety of MWIR applications. This set provides flexible approach to different needs of system designers.

Spectral response (T_a = 20°C)



Exemplary spectral detectivity, the spectral response of delivered devices may differ.

Specification (T_a = 20°C, default module settings)

Parameter	Typical value
Optical parameters	
Cut-on wavelength $\lambda_{cut\text{-}on}$ (10%), µm	2.9±1.0
Peak wavelength λ_{peak}, µm	4.2±0.5
Optimum wavelength λ_{opt}, µm	5.0
Cut-off wavelength $\lambda_{cut\text{-}off}$ (10%), µm	5.5±0.3
Detectivity D* (λ_{peak}, 25 kV/A), cm·Hz$^{1/2}$/W	≥1.4×10^{10}
Detectivity D* (λ_{opt}, 25 kV/A), cm·Hz$^{1/2}$/W	≥1.0×10^{10}
Output noise density v_n (10 MHz), nV/Hz$^{1/2}$	≤500
Electrical parameters	
Voltage responsivity R_v (λ_{peak}, 25 kV/A), V/W	≥4.8×10^4
Voltage responsivity R_v (λ_{opt}, 25 kV/A), V/W	≥3.2×10^4
Low cut-off frequency f_{lo}, Hz	DC/10 (adjustable)
High cut-off frequency f_{hi}, Hz	≥15M (adjustable)
Output impedance R_{out}, Ω	50
Output voltage swing V_{out}, V	1 (R_L = 50 Ω*))
Output voltage offset V_{off}, mV	max ±20
Other information	
Active element material	epitaxial HgCdTe heterostructure
Optical area A_O, mm×mm	1×1
Window	wAl_2O_3
Acceptance angle Φ	~36°
Ambient operating temperature T_a, °C	10 to 30
Signal output socket	SMA
Power supply and TEC control socket	LEMO (female) ECG.0B.309.CLN
Mounting hole	M4
Fan	yes

*) R_L – load resistance

Features

- High performance and reliability
- DC offset compensation
- Compatible with optical accessories
- Versatility and flexibility
- Quantity discounted price
- Fast delivery

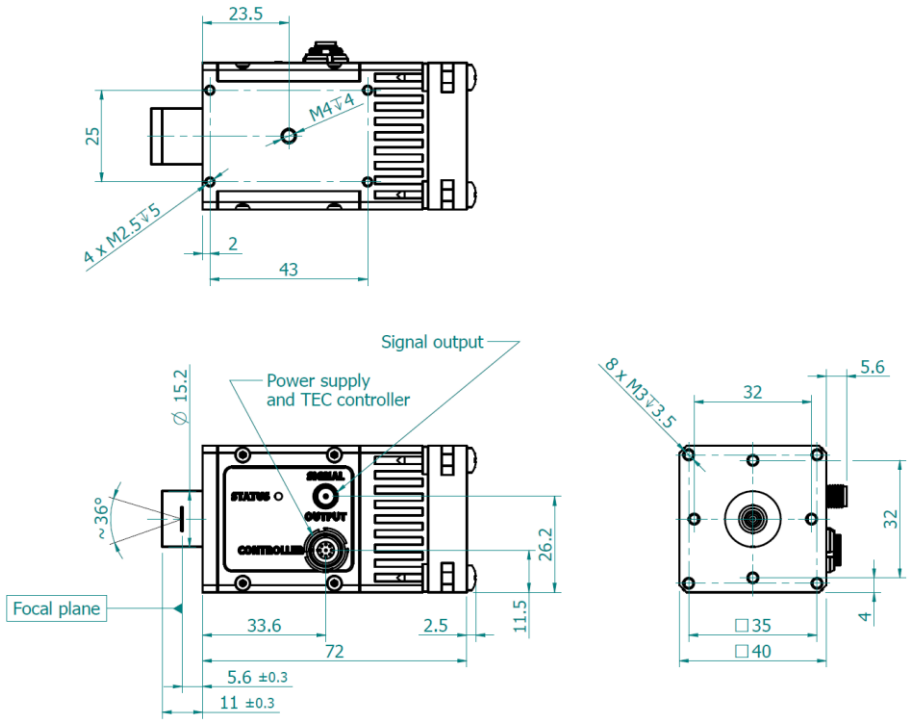
Parameters configurable by the user

- Output voltage offset
- Gain (in 40 dB range)
- Bandwidth (1.5 MHz / 15 MHz)
- Coupling AC/DC
- Detector's parameters (temperature, reverse bias etc.)

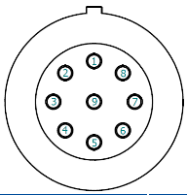
Applications

- Contactless temperature measurements (railway transport, industrial and laboratory processes monitoring)
- Flame and explosion detection
- Threat warning systems
- Gas detection, monitoring and analysis (CO, CO_2, NO_x)
- In-vivo alcohol detection
- Breath analysis
- Solids analysis
- Leakage control in gas pipelines
- Combustion process control

Mechanical layout, mm

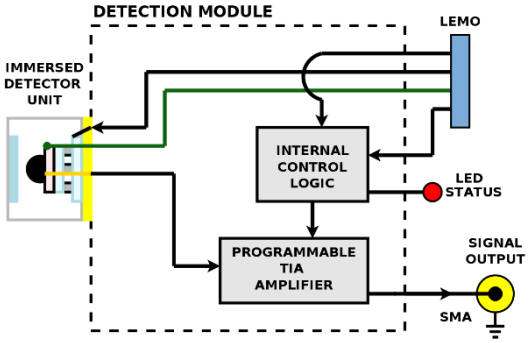


Power supply and TEC control socket
LEMO (female) ECG.0B.309.CLN



Function	Symbol	Pin number
Fan and programmable preamp internal logic auxiliary supply	FAN+	1
Thermistor output (2)	TH2	2
TEC supply input (–)	TEC–	3
Power supply input (–)	$-V_{sup}$	4
Ground	GND	5
Power supply input (+)	$+V_{sup}$	6
TEC supply input (+)	TEC+	7
Thermistor output (1)	TH1	8
Biderictional data pin	DATA	9

Schematic diagram



Included accessories

- **SMA-BNC**, **LEMO-DB9** cables

Dedicated accessories

- **PTCC-01-BAS** TEC controller + **USB: TypeA-MicroB** cable + **AC adaptor**
- **PTCC-01-ADV** TEC controller + **USB: TypeA-MicroB** cable + **AC adaptor**
- **PTCC-01-OEM** TEC controller + **USB: TypeA-MicroB**, **KK2-POWER** cables
- **OTA** optical threaded adapter
- **DRB-2** base mounting system