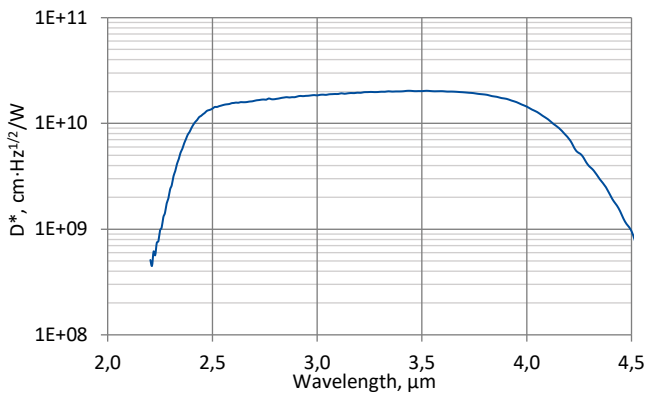


1.6 LabM-I-4

1.6.1 2.4 – 4.3 μm and over 5 MHz HgCdTe programmable, laboratory IR detection module with optically immersed photovoltaic detector

LabM-I-4 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 thermoelectric cooler controller PTCC-01 (sold separately) and Smart Manager Software (freeware) are required. LabM-I-4 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 ($T_a = 20^{\circ}\text{C}$)



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 $\lambda_{\text{cut-on}}$ (10%), μm	2.4±0.5
Peak wavelength λ_{peak} , μm	3.5±0.5
Optimum wavelength λ_{opt} , μm	4.0
Cut-off wavelength $\lambda_{\text{cut-off}}$ (10%), μm	4.3±0.3
Detectivity D* (λ_{peak} , 25 kV/A), $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 2.0 \times 10^{10}$
Detectivity D* (λ_{opt} , 25 kV/A), $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 1.2 \times 10^{10}$
Output noise density v_n (10 MHz), $\text{nV}/\text{Hz}^{1/2}$	≤ 300
Electrical parameters	
Voltage responsivity R_v (λ_{peak} , 25 kV/A), V/W	$\geq 3.5 \times 10^4$
Voltage responsivity R_v (λ_{opt} , 25 kV/A), V/W	$\geq 2.3 \times 10^4$
Low cut-off frequency f_{lo} , Hz	DC/10 (adjustable)
High cut-off frequency f_{hi} , Hz	$\geq 5\text{M}$ (adjustable)
Output impedance R_{out} , Ω	50
Output voltage swing V_{out} , V	1 ($R_{\text{load}} = 50 \Omega$)
Output voltage offset V_{off} , mV	max ±20
Other information	
Active element material	epitaxial HgCdTe heterostructure
Optical area A_{opt} , mm×mm	1×1
Window	wAl ₂ O 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

Features

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

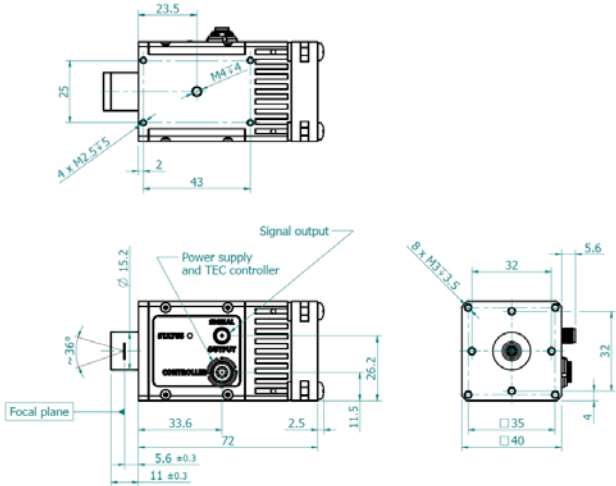
Parameters configurable by the user

- Output voltage offset
- Gain (in 40 dB range)
- Bandwidth (1.5 MHz / 5 MHz)
- Coupling AC/DC
- Detector's parameters (temperature, reverse bias etc.)

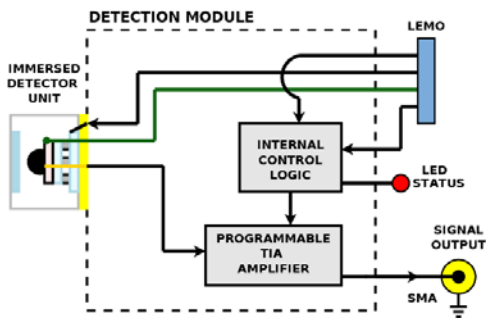
Applications

- Gas detection, monitoring and analysis (CH₄, C₂H₂, CH₂O, HCl, NH₃, SO₂, C₂H₆)
- Breath analysis
- Explosion prevention
- Flue gas denitrification
- Emission control (exhaust fumes, greenhouse gases)

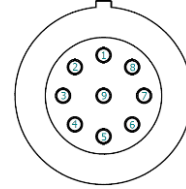
Mechanical layout, mm



Schematic diagram



**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
Bidirectional data pin	DATA	9

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