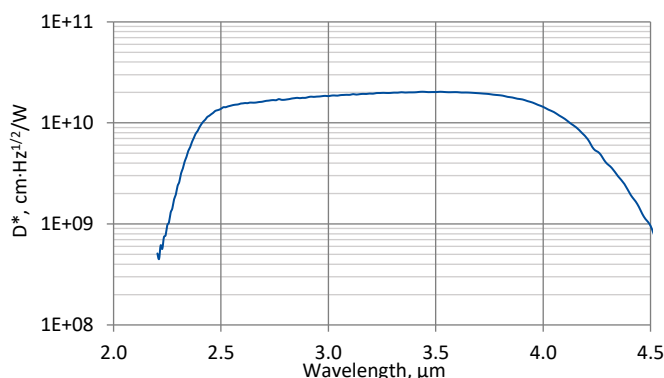


## LabM-I-4

### 2.4 – 4.3 $\mu\text{m}$ 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 ( $T_a = 20^\circ\text{C}$ , default module settings)

Parameter	Typical value
<b>Optical parameters</b>	
Cut-on wavelength $\lambda_{\text{cut-on}}$ (10%), $\mu\text{m}$	2.4±0.5
Peak wavelength $\lambda_{\text{peak}}$ , $\mu\text{m}$	3.5±0.5
Optimum wavelength $\lambda_{\text{opt}}$ , $\mu\text{m}$	4.0
Cut-off wavelength $\lambda_{\text{cut-off}}$ (10%), $\mu\text{m}$	4.3±0.3
Detectivity $D^*$ ( $\lambda_{\text{peak}}$ , 25 kV/A), $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 2.0 \times 10^{10}$
Detectivity $D^*$ ( $\lambda_{\text{opt}}$ , 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), $\text{nV}/\text{Hz}^{1/2}$	$\leq 300$
<b>Electrical parameters</b>	
Voltage responsivity $R_v$ ( $\lambda_{\text{peak}}$ , 25 kV/A), V/W	$\geq 3.5 \times 10^4$
Voltage responsivity $R_v$ ( $\lambda_{\text{opt}}$ , 25 kV/A), V/W	$\geq 2.3 \times 10^4$
Low cut-off frequency $f_{\text{lo}}$ , Hz	DC/10 (adjustable)
High cut-off frequency $f_{\text{hi}}$ , Hz	$\geq 5\text{M}$ (adjustable)
Output impedance $R_{\text{out}}$ , $\Omega$	50
Output voltage swing $V_{\text{out}}$ , V	1 ( $R_L = 50 \Omega^*)$
Output voltage offset $V_{\text{off}}$ , mV	max ±20
<b>Other information</b>	
Active element material	epitaxial HgCdTe heterostructure
Optical area $A_o$ , mm×mm	1×1
Window	wAl <sub>2</sub> O <sub>3</sub>
Acceptance angle $\Phi$	~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

<sup>\*)</sup>  $R_L$  – load resistance

#### Features

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

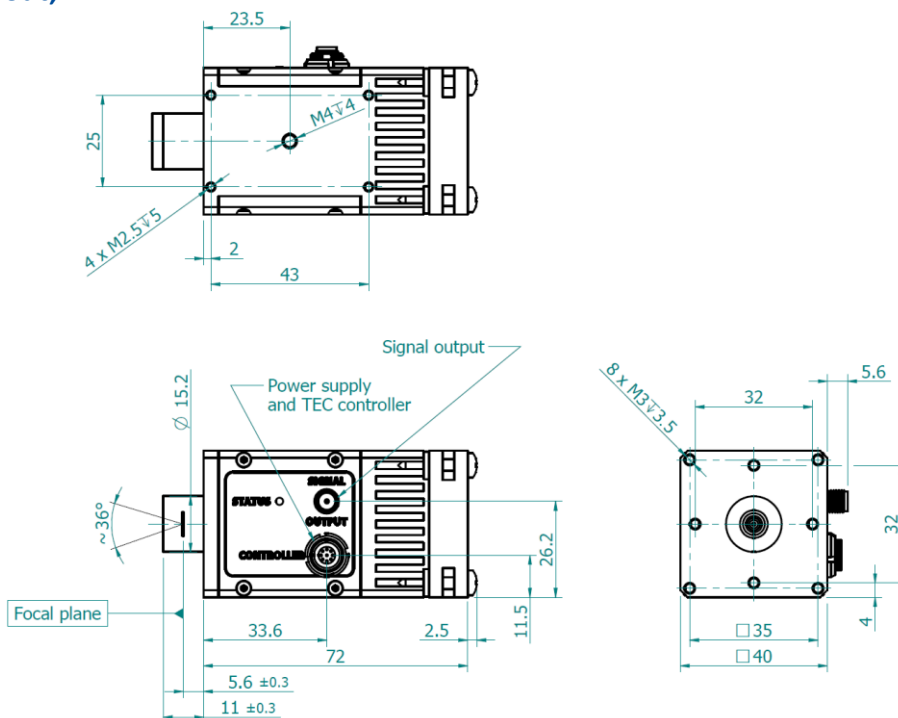
#### Parameters configurable by the user

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

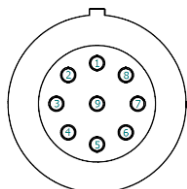
#### Applications

- Gas detection, monitoring and analysis (CH<sub>4</sub>, C<sub>2</sub>H<sub>2</sub>, CH<sub>2</sub>O, HCl, NH<sub>3</sub>, SO<sub>2</sub>, C<sub>2</sub>H<sub>6</sub>)
- Breath analysis
- Explosion prevention
- Flue gas denitrification
- Emission control (exhaust fumes, greenhouse gases)

### Mechanical layout, mm

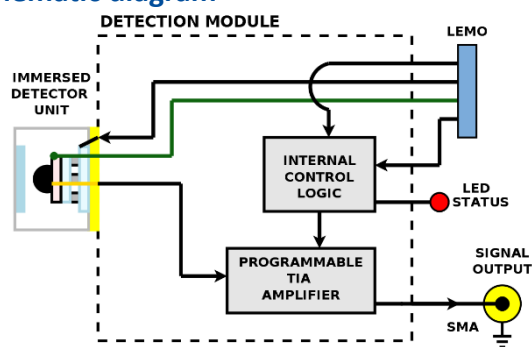


### Power supply and TEC control socket LEMO (female) ECG.0B.309.CLN



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 <sub>sup</sub>	4
Ground	GND	5
Power supply input (+)	+V <sub>sup</sub>	6
TEC supply input (+)	TEC+	7
Thermistor output (1)	TH1	8
Bidirectional 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