



# Integrated Sky Monitor

The Integrated Sky Monitor is the **only instrument** providing **complete characterization of optical atmospheric conditions** including:

- Cloud cover,
- Turbulence, night & day,
- Absorption.

In compliance with the specifications from the CCSDS for **Free Space Optical Communications**, enabling:

- Site survey,
- Optical terminal design & operations,
- Ground segment optimization.

The Integrated Sky Monitor includes a **complete array of passive sensors** in a compact, rugged, carrier grade package which is quickly deployed on site and provides **local, real time and continuous measurements**:

- C-DIMM, turbulence and optical transmission,
- Day seeing monitor turbulence,
- Visible all sky camera, 350-1000nm,
- Thermal all sky camera 8-14μm, radiometrically calibrated,



Data	Unit	Range	Resolution / Precision	Accuracy	Periodicity	Quantity
Allsky visible	ADU	0 – 4 096	12 bits	NA	1ms to 10s	Clouds
Allsky LWIR	°C	-40 to +120	< 60 mK	±2K or ±2.0%	60s	
Seeing night	ArcSec	0.01 to >20"	>0.1"	0,2"	60s	Turbulence
Isoplanatic angle night	ArcSec	0.06" to >10"	0.1"	0.3"	60s	
Fried parameter r0 night	cm	0.5 to 100	0.1	±0.5	60s	
Scintillation night	ADU	0 – 65 536	16 bits	>99%	60s	
Transparency night	ADU	0 – 65 536	16 Bits	>99%	60s	
Seeing day	ArcSec	0,1 – 20"	>0.1"	0,2" (up to 500m)	≥ 0.5s	
Fried parameter r0 day	cm	0.5 to 100	0.1	± 0.5 (up to 500m)	≥ 0.5s	
Pyrgeometer	Wm <sup>-2</sup>	20 - 600	17 bits	>95%	10s	Aerosols
Sky Temp	°C	-60 - 40	17 bits	±0.5C°	10s	
Total Water Column	Cm	0 - 15	17 bits	±20% RMS	10s	
Irradiance	Mag / ArcSec <sup>2</sup>	6 - 22	21 bits	TBD	10s	
Ext Temp	°C	-40 to 85	0.1°	±0.3°	10s	Meteorological
Pressure	hPa	10 to 1100	0.1	±0.5	10s	
Humidity	%	0 to 100	0.05%	±3%	60s	
Wind	Speed, km/h direction	0 to 216 0-360°	0.2 0.1°	±1.1 ±3 %	10s	
Rain/Rain rate	mm mm/h	0 to 500 0 to 400	0.01	±4%	20s	

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## Size, Weight & Power:

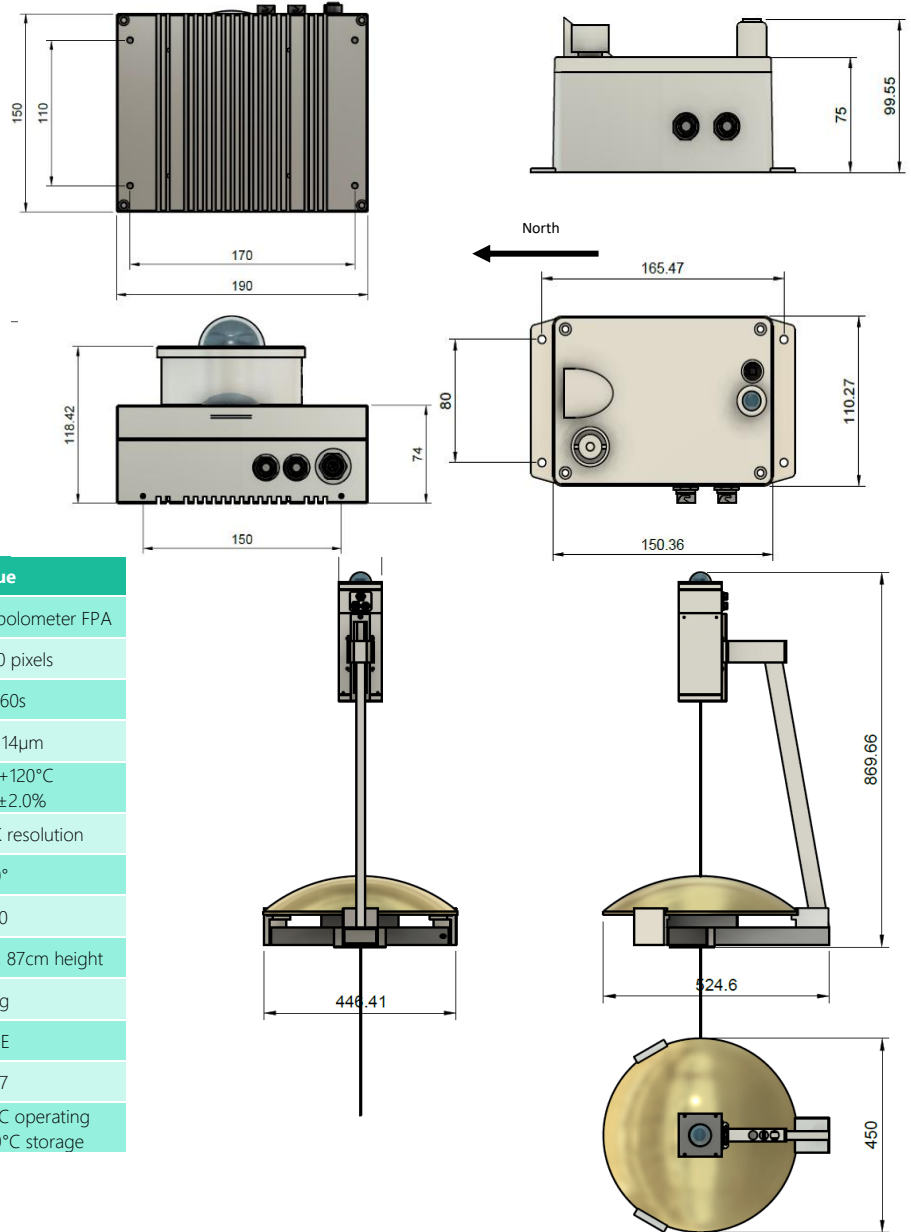
ISM main unit  
150x190x170mm, 2.8kg

C-DIMM  
440x300x260mm, 5.4kg

Sensor cluster  
150x110x100mm, 0.4kg

Weather station  
16x16x263mm, 2.1kg

Total power requirement <40w



## Thermal All Sky camera: (Optional)

Parameter	Value
Detector	Uncooled microbolometer FPA
Resolution	640 x 480 pixels
Acquisition period	10 to 60s
Spectral range	8µm to 14µm
Temperature range radiometrically calibrated	-40°C to +120°C ±2K or ±2.0%
Digitization	16bit, <60mK resolution
Field of view	180°
Aperture	f/1.0
Dimensions	45cm diameter, 87cm height
Weight	10kg
Interface	GigE
Protection class	IP67
Environmental conditions	-25°C to +50°C operating -40°C to +70°C storage

## Order information:

Part #	Description
ISM1	Allsky visible camera, C-DIMM: seeing, r0, Isoplanatic angle, Scintillation (Night & Northern Hemisphere only), Transparency, Seeing, r0, (Day) Pyrgeometer, Sky Temp, Total Water Column, Irradiance, Ext Temp, Pressure, Humidity, Wind, Rain/Rain rate
LWIR640	All Sky LWIR camera 640x480, 360° with radiometric calibration
INSTAKIT	Installation and maintenance kit including windows laptop preconfigured with necessary software, Allen keys, optics cleaning kit, C-DIMM alignment set with laser pointer
ALTAZ	Alt/Az tracking mount for the C-DIMM with absolute encoder, IP 67
INST	On site installation per unit, up to two days and two nights
WARR	Additional warranty per year up to 5 years total

To be specified at the order:

- ▶ Installation location, northern hemisphere, southern hemisphere, equatorial,
- ▶ Distance from C-DIMM to switch, distance from weather station to ISM,
- ▶ Dashboard access, <https://dashboard.miratlas.com/>