



R-MAN^{SL0}TM

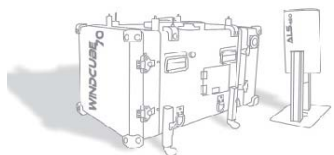
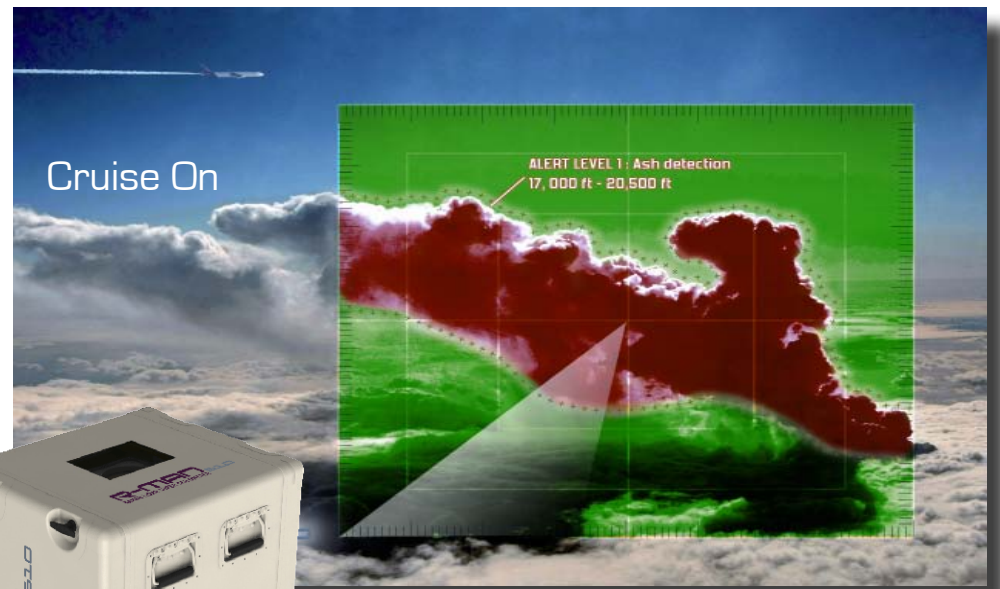
RAMAN LIDAR SUPER CEILOMETER

- Unambiguous ash threat detection
- Decision support at ALL Flight Levels
- Low cost, low maintenance, networkable, full power Raman dual polarization Lidar
- 20 km range, automatic structure detection and characterization (PBL, Aerosol, Cloud layers)

ASH TRACKING

AEROSOL TRANSPORT

PBL TRACKING



Meteorology is modernTM



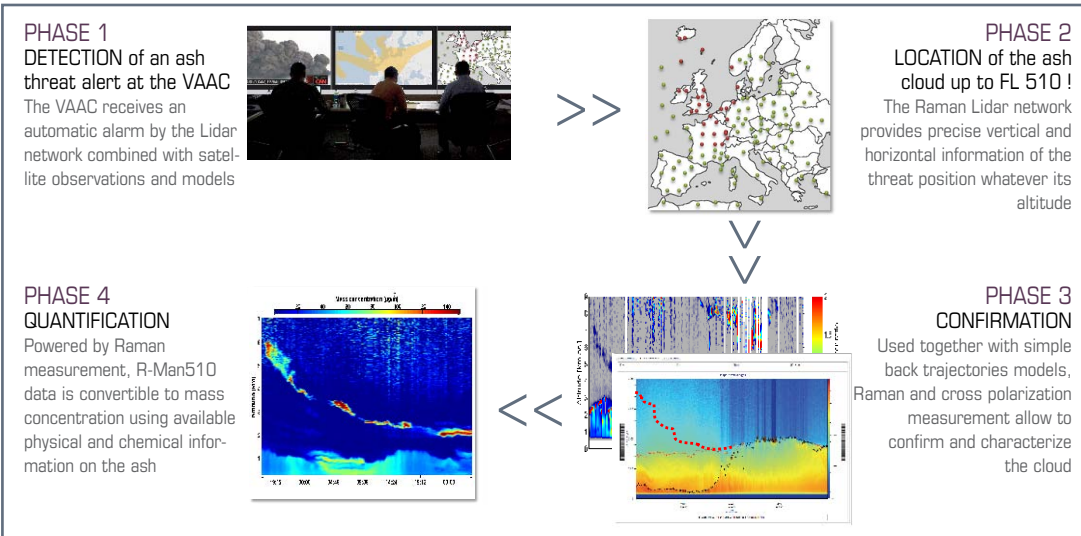
Cruise on

Can we fly ? At which altitude should we fly ? Answering these questions when a volcano spreads its ashes over a continent can help the air traffic industry save billions. By setting up Raman Lidar Super Ceilometer networks, met agencies now have the definitive complement to satellite and chemical transport numeric model to identify, locate, characterize, and quantify the ash threats.

Combining the full performances of the most sophisticated Lidars (nitrogen Raman AND depolarization channels, accurate aerosol measurement not limited to the boundary layer) with the low maintenance requirements and low cost of cloud ceilometers, the R-Man510 is a world-premiere achievement.

R-Man510 also opens a new era of synergies between weather, climate and pollution observation infrastructures. Supplying at an affordable cost automatic tracking of boundary layer heights, cloud height and phase, aerosol layers, along with ash threat alerts, this new technology invites all Lidar network operators to rationalize their network mesh choices and to share data.

From a volcanic eruption to unambiguous decision making



Why is a high power laser required?

This allows measurement at all flight levels, not only in the glide slope or in the planetary boundary layer

Why are Raman and cross polarized channels required?

They allow discrimination of non spherical particles (ash, silicates..) from pollution; allow a self calibration of the Lidar and a 90% accurate extinction information which authorizes estimation of mass concentration.

Specifications

PERFORMANCES	
Measurement range	4.5m – 20,000m / 15ft – 65,000ft
Averaging time (programmable)	Minimum: 1s Standard: 30s to 10min
Vertical range resolution (programmable)	Minimum: 4.5m / 15ft Standard: 15m to 60m / 49ft to 200ft
Cloud layers report	9 layers reported, up to 15,000m / 49,200 ft 3 types (low, middle, high), Ice/water discrimination
Aerosol layers report	2 main gradients detection in the low troposphere (planetary boundary layer) Non-spherical particles detection in the free troposphere (ash, dust)
Relative attenuated backscatter (parallel polarization)	Molecular measurement range (day/Night) : 0 – 13,000m / >15,000m* (10 min averaging time)
Basic particle shape information (Depolarization ratio)	Molecular measurement range (day/Night) : 0 – 6,000m / 9,000m* Aerosol/cloud measurement range (day/night) : 0 – 13,000m* (10 min averaging time)
Nitrogen Raman vertical profile @387 nm	Measurement range (Day / Night) : 0 – 1,000m/3,000m* (10mn accumulation time)
Retrieved atmospheric parameters	Backscatter and extinction coefficients Structure layer reports (clouds, aerosol, PBL) and heights AOD (Aerosol Optical Depth) Depolarization ratio (particle asphericity information) Lidar ratio

*Upper or lower range can be reached according to atmospheric conditions and averaging time

TECHNICAL	
Laser source	Nd: Yag 355nm – diode pumped
Detection channels	- Parallel-polarized channel @ 355 nm - Cross-polarized channel @ 355 nm - Nitrogen Raman channel @ 387 nm
Acquisition type	Analog and photon-counting on each channel
Power supply	100-240V AC / 50-60 Hz
Electrical consumption	300W to 600W (in maximum heating mode)
Dimensions and weight	Dimensions (mm): H1000 X L700 x W600 Weight(kg): 60
Tilt positions	Vertical to 5° tilted

ENVIRONMENTAL	
Vibration	FEDEX 6B
EMC	IEC 61326-1
Electrical safety	IEC 61010-1
Eye-safety	IEC/EN 60825-1 / ANSI-Z136.1-2007 compliant
Housing classification	IP65
Operating conditions	Temperature range : - 20°C to + 45°C / Relative Humidity: 10% to 100 Air conditioning/heating modules

SOFTWARE/DATA	
Data format	ASCII, HDF
Data transfer	Ethernet / LAN
Software features	Full instrument control, Data automatic processing (parallel and perpendicular polarizations, Nitrogen channels), Signal calibration, noise filtering Alarm, system status, Data storage and edition