SWIR for Security Applications

“See more!”

NEAR INFRA RED (0.9 – 1.6 um)

BOATS VISIBLE

VISIBLE SPECTRUM (normal camera)

BOATS INVISIBLE

龜山島 Jan 2013
SWIR Applications

- Mounted on a vehicle (360 degree vision possible)
- Mounted on a boat (with telescope)
- Mounted on coast or mountain (with telescope)
SWIR (InGaAs) Imaging

- NEAR Infrared Imaging (900 nm – 1600 nm)
- DIFFERENT to Thermal IR Imaging (8000 – 14000 nm)
- SWIR images light REFLECTED from surfaces
- Can “see-through” haze and some fog
SWIR Camera

- High QE InGaAs from 900nm-1.7 μm

- VGA Resolution, 640 x 512 effective pixels, 15 μm square pixels, 12.3mm diagonal

- High Dynamic Range thanks to its patented Solar Cell pixel structure: 140 dB
  — no illumination saturation

- Native WDR™: Intrinsic wide dynamic range - no knee points to setup
  — no multiple exposures
  — 140 dB in a single shot

- Single USB 2.0 output - compatible with Windows OS (driver Vista, 7.0, 8.0)
Valuable Tool for Long Range Surveillance

- SWIR allows you to see through haze, smoke and dust:
  - Over 3 KM (Night Vision Possible)
  - Over 10 KM (Low Light Possible)
  - Over 35 KM!!! (Daylight)
3.6 KM Distance (龍潭)
10 KM Distance (烘爐地)

Camera GPS: 24.971198, 121.498833
Mountain GPS: 25.106974, 121.423473
10 KM Distance (台中)

Camera GPS: 24.140644,120.684115
Pylon GPS: 24.112287,120.761325 (approx)
35 KM Distance (宜蘭)

Camera GPS: 24.865412, 121.773920
Boat GPS: 24.588924, 121.895328
Good for Large Areas (宜蘭)

Camera GPS: 24.865412, 121.773920
Anti-Ariel Counter Surveillance (印度)
Night Vision (龍潭)
Night Vision (英国乡下) (No Laser)
## Very Dark Night Vision

<table>
<thead>
<tr>
<th>Lights ON - Daytime</th>
<th>Lights OFF - Night</th>
<th>Lights OFF – Night HIGH SENSITIVITY</th>
<th>Lights OFF – Night 1550 nm LASER</th>
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*(With Laser)*
Invisible (1550 nm) Laser Assisted Night Vision
Other Applications:

• Bank notes (Anti Counterfeit)

VISIBLE
(4 children)

SWIR
(2 children)
Allied Scientific Pro

- Canada / Taiwan
- Suppliers of Optical and Photonic Products:
  - Imaging (Cameras – VIS, SWIR, MWIR, LWIR)
  - Lasers (Low & High Power – UV -> LWIR)
  - MWIR QCL & Spectrometer for Ranged Explosives and Chemical Gas Detection

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