

## ColorIR™ Monarch™

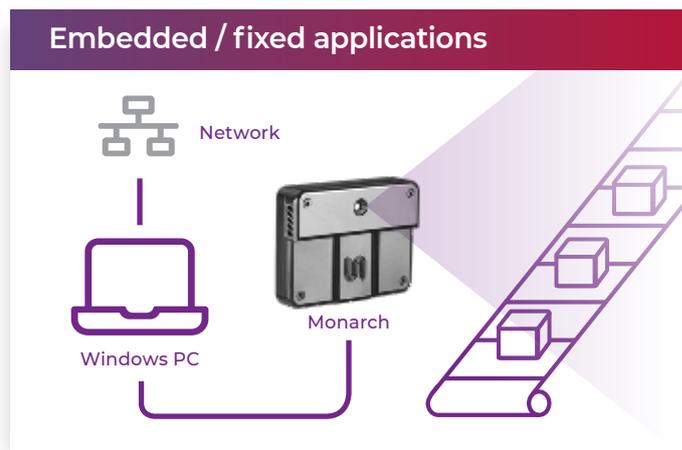
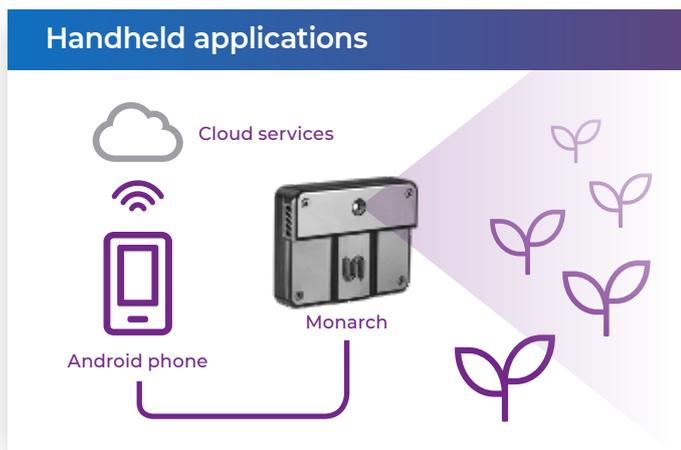
### NIR Portable Camera

Introducing Unispectral's Monarch - the world's first portable tunable spectral IR camera for personal, industrial, scientific, and commercial use.

The Monarch™ is the first device that allows you to capture spectral images easily and inexpensively, anywhere and anytime. No more need for expensive, bulky and sensitive equipment, or handheld point spectrometers that require a trained operator and can't capture scene context. Monarch opens a wide array of new applications for any market segment.

Unispectral's tuneable NIR solutions provide an additional layer of actionable information by capturing multiple spectral images in near-IR bands for immediate inspection, detection and classification applications. The new Monarch small and light camera captures and immediately outputs multiple single-band spectral-cube high-resolution images within 700nm-950nm spectral range. Its affordability and simplicity remove the barrier to wide adoption in many applications and mass-market platforms.

Monarch is the second generation of the ColorIR™ NIR camera. It consists of the Unispectral tunable Fabry-Pérot filter ( $\mu$ FPF), integrated with a miniature IR camera module - optics, image sensors and controllers - all integrated on a 60x40x14.5mm, 30gr PCB. Monarch is designed for two types of applications:



Whether in field, on the road or in lab, Monarch is ready for use through a USB-C connection to an Android mobile device. All the camera controls, settings and output display are provided through an android application. It is always available and can provide immediate diagnostics of produce, merchandise, humans, medical processes etc.

Monarch can be embedded in robotics, machine vision platforms, manufacturing lines, QA systems and biometric authentication terminals. It can also connect to real-time analysis, inspection and control systems through a PC interface. The camera controls, settings and output display are provided through a Windows application.

## Applications

### Agriculture Inspection

- Pre/post harvesting nutrients analysis
- Processing line and sorting
- Hydration stress
- Pest/disease infestation
- Grain grading
- Brix, NPK, firmness, rotten, defects

### Automotive

- DMS-Driver monitoring system

### Industrial Automation

- Production lines classifications
- Robotics, automatic inspection
- Computer vision and sensing

### Facial authentication

- Domestic/Commercial access control
- Payment Terminals
- Device unlock

### Medical

- Contactless inspection
- Remote healthcare
- Cosmetics and skin analysis

### Mobile phone/tablet

- Facial authentication
- Image enhancement

## Specifications

Optics		Operation	
F#	4.7	Input Voltage	5 Vdc
EFL	4.98 mm	Power Consumption	preview mode <0.5W max < 0.85W
H-FOV	31.5°	Operating Temperature	0-70C
V-FOV	25.5°	Optional add-ons and accessories	Cable mount, Tripod, Mobile Magnet
D-FOV	39.8°	Interface	USB- C
Sensor Resolution	1280 x 1024	Working modes	Single frame / Spectral cube
Spectral Bands per Second	30 BPS	Size	60x40x14.5mm
Preview Mode	60 FPS	Weight	30gr
Gain	X1 ÷ x10	Software	
Exposure Time	1 ÷ 500 ms	Android device	Complete with camera controls, image display, captured cube display
ColorIR Filter		Windows PC	Provided DLL and API for embedded applications
FWHM	40 ± 10 nm		
Spectral Response	688-938nm T>50%		
Spectral Band Range	705-920nm ± 5nm		
Angular dependency [nm/deg]	-1.1nm/deg Averagev		