



ColorIR™ Monarch™

NIR Portable Camera for Agriculture Applications

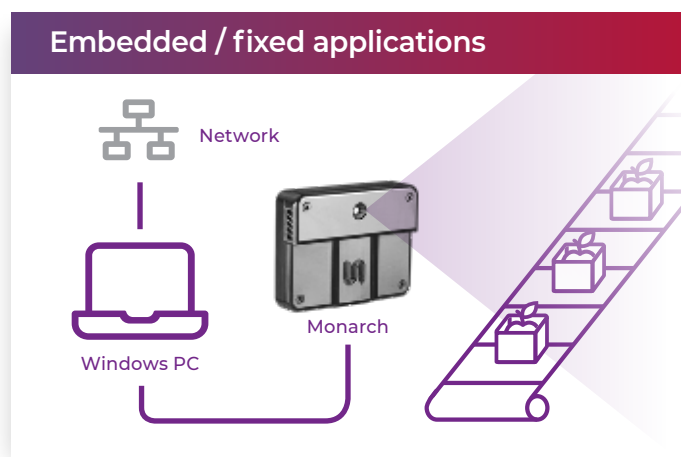
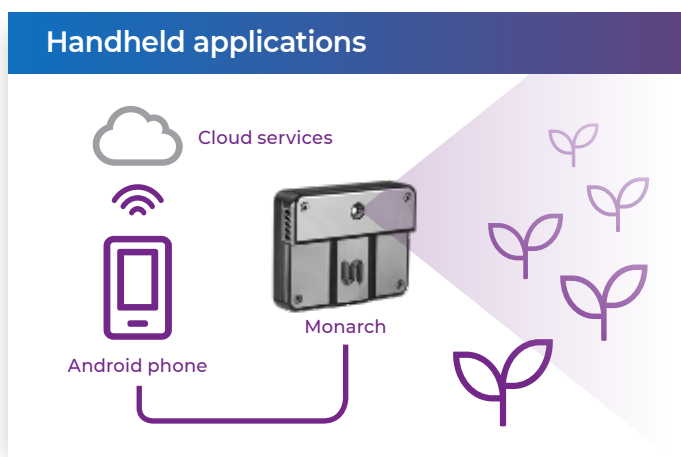
Monarch™ is the world's first portable spectral NIR Camera with advanced Agritech applications, designed for growers, agronomists and supply-chain partners. Bringing the lab to the field, enables plant health monitoring, nutrients monitoring, pest detection, pesticide residues detection and many more high-end diagnostic functions. Monarch camera is suitable for both hand-held inspection and installations in greenhouses, vertical growing facilities, robotics and machine vision platforms.

No more need for expensive, bulky, sensitive equipment or limited handheld spectrometers. As a spectral NIR camera, Monarch can measure large samples and unlike point devices, enables context understanding.

Monarch opens a new array of applications for agriculture individuals and cooperatives. For example, it enables easy and inexpensive advanced field tests, allowing on-spot decision-making, offers quality grading for supply-chain partners with quantified values that are acceptable to all parties and much more.

By using spectral IR imaging, Monarch provides a new layer of information. The NIR light reflections of plants, chemicals and minerals contain information that is invisible to the human eye. Monarch small and light camera captures detailed frames in 700nm-950nm NIR spectral range that unveil actionable information. Its affordable cost and simplicity remove the entry barrier to wide adoption in agriculture diagnostics that any grower and producer need, creating numerous new possibilities and opportunities.

The Monarch measures only 60x40x14.5mm and weights 40 gr. It is delivered for two types of use cases:



Whether in the field, greenhouse or lab, Monarch is ready for use through a USB-C connection to any Android device. The camera's controls, settings and output display are provided through an Android application. It is always available and can provide immediate diagnostics of plants and produce.

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.



Monarch helps improving yield, preventing plant disease propagation, automate processing and much more.

- **Field applications** Monarch is always available and can provide immediate diagnostics of soil, individual plant or the condition of an entire field. You can test water content, NPK, magnesium, iron, calcium, sugar, PH, starch, acid, protein, amylose and amylopectin for health, maturity and other values in various produce such as tomatoes, apples, bananas, grains and more
- **Processing line applications** Real-time NIR capture and processing is used for measuring, detecting, analyzing, quality control, sorting, in any harvesting, processing, or packing systems. Monarch can indicate firmness, rottenness and other defects, and pesticide presence..
- **Livestock and fish analysis** Diagnose health indicators, stress, protein, fat and other animal husbandry indicators.

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