Polymatech®

INDIA EDITION

Ravaye™ E2 Vein Finder

Near-Infrared Vein Visualisation System
Model PM-VF-100 · Version Poly2025

USER MANUAL

Read this manual before use · Professional use only



Document ref. PM-VF-100-UM-IN · V2 · October 2026

NEAR-INFRARED · 760–940 nm · REAL-TIME PROJECTION

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About this manual. This manual provides operating instructions, safety information, maintenance guidance and regulatory details for the Ravaye™ E2 Vein Finder. Read it carefully before first use, retain it for future reference, and keep it with the device if the device is transferred to another user.

Professional use only. Ravaye™ E2 is intended to assist qualified healthcare professionals in visualising superficial veins. It does not replace clinical judgement, standard venepuncture practice, palpation or confirmation of vessel suitability. It is not a diagnostic device. Successful venous access is not guaranteed; the projected image is an aid only. For professional use only.

1. Introduction

Ravaye™ E2 is a handheld near-infrared (NIR) vein visualisation system designed to assist qualified healthcare professionals in locating superficial veins before venepuncture, IV cannulation, blood draw and related vascular access procedures.

The device illuminates the skin with near-infrared light in the 760–940 nm range, detects the optical contrast associated with superficial vasculature, processes it in real time and projects the vein position directly onto the patient's skin by DLP projection. Operation is non-contact and requires no consumables.

2. Intended use

Ravaye™ E2 is intended for use by qualified healthcare professionals to assist in visualising certain superficial veins on the skin surface, in settings including hospitals, clinics, ambulatory centres and emergency departments.

The device is an aid to visualisation. It does not replace clinical judgement, standard venepuncture practice, palpation or confirmation of vessel suitability.

Not intended for

- Diagnosing vascular disease or any other condition
- Measuring vein depth or blood flow
- Use on or near the eyes
- Use as the sole method of vein location
- Consumer or home use
- Treatment of any kind

3. Safety information

WARNING. Do not direct the projected light into the eyes of the patient or operator, and avoid prolonged viewing of the light source.

WARNING. Do not rely on the projected image alone. Always confirm vein location and suitability by standard clinical methods before inserting a needle or cannula.

CAUTION. Keep the device dry. Do not immerse it or expose it to liquids. Do not use heat or pressure sterilisation (do not autoclave).

CAUTION. Do not open the casing. There are no user-serviceable parts inside; repairs must be carried out by authorised service personnel only.

CAUTION. Use only the supplied charger, cable and approved accessories. Discontinue use if the projection window is scratched or damaged, or if calibration cannot be verified, and arrange authorised service.

4. Device overview and package contents

Ravaye™ E2 is a compact, battery-powered handheld unit designed for single-hand operation. Settings are selected from an LCD menu using the power, sleep, OK and four-way navigation keys. A status indicator shows operating and charging state.

Control / element	Function
Power key	Switches the device on and off
Sleep key	Enters and exits sleep mode
OK key	Confirms a menu selection
Four-way navigation keys	Move through menus and adjust settings
LCD menu display	Shows current settings, battery level and low-battery prompt
Projection window	Emits NIR illumination and projects the vein image; keep clean and unscratched
Status indicator	Blue — operating normally · Green — fully charged · Red — charging
USB Type-C port	Charging input



Package contents

- Ravaye™ E2 Vein Finder main unit
- USB Type-C charging cable and charging adapter (100–240 V input)
- Aluminium carrying case
- Calibration card
- User manual, product certificate and warranty card

Optional accessories, available separately: table stand with mobile base; mobile stand with articulated arm.

> **On receipt.** Check that all items are present and undamaged. Record the serial number from the product label on the warranty card. Charge the battery fully before first use.

5. Operation

5.1 Preparing for use

1. Confirm the battery is charged (LCD battery level, status indicator blue when on).
2. Verify calibration against the supplied calibration card if required by your facility procedure (Section 6).
3. Prepare the patient and site according to standard practice. Reduce strong direct ambient light where possible.

5.2 Using the device

1. Press the power key. The LCD menu and the projected image appear.
2. Hold the device 20–26 cm above the skin, directly overhead and perpendicular to the skin surface.
3. Use the centre line of the projected image as the positioning reference. Tilting or moving the device sideways can offset the projected vein position.
4. Adjust colour, size, brightness, inverse or display mode with the navigation and OK keys until the vein image is clear for the skin tone and lighting.
5. Confirm the selected vein by palpation and standard clinical assessment, then proceed with the procedure according to institutional practice.
6. Press the sleep key between patients, or the power key to switch off after use.

5.3 Display and operating functions

Function	Options
Projection colour	12 selectable colours
Projection size	Large, medium, small
Brightness	6 levels
Inverse mode	On / off
Display mode	9 modes — default, enhance, hair-removal, guide-line and 5 colour-mix modes
Automatic sleep	After 10 minutes idle by default; interval adjustable
Automatic shutdown	After 35 minutes idle

6. Calibration and verification

A calibration card is supplied with the device. Verify calibration before first use and periodically in line with facility procedure.

1. Place the calibration card on a flat surface under even lighting.
2. Hold the device directly over the card at the optimal working distance (20–26 cm).
3. Check that the projected grid lines and concentric circles align with the pattern printed on the card.

If the projected pattern does not align with the card, do not use the device. Discontinue use and contact service to restore calibration.

7. Clinical limitations

The device displays only superficial vasculature within a detection depth of 0–10 mm. Some veins may display poorly or not at all, and the projected vein width may differ from the actual vein width. Image quality and visible depth vary with:

- Patient anatomy — skin thickness, pigmentation and adipose tissue
- Vein depth and size
- Skin conditions, tattoos, hair, scars and highly contoured surfaces
- Ambient lighting
- Device position and angle
- Selected settings — brightness, mode and colour

> **Remember.** The absence of a projected vein does not mean a vein is absent, and a projected vein is not confirmation that it is suitable for access.

8. Care, cleaning and battery

8.1 Cleaning

1. Switch the device off and disconnect the charging cable.
2. Wipe the exterior with a lint-free cloth lightly dampened with 70% isopropyl alcohol. Do not spray liquid directly onto the device.
3. Wipe the projection window gently with a clean, dry lint-free cloth; do not use abrasives.
4. Allow the device to air-dry fully before use.

> **CAUTION.** Do not immerse. Do not autoclave or use any heat or pressure sterilisation. Do not open the casing or attempt to clean the interior.

8.2 Storage and handling

- Keep the device dry and store it in the aluminium carrying case when not in use.
- Avoid extreme temperatures, prolonged direct sunlight, dropping and impact.

8.3 Battery and charging

- Rechargeable lithium-ion battery, 4,900 mAh; approximately 3.5 hours of operation per charge.
- Charge with the supplied adapter and USB Type-C cable only (output 5 V ⎓ 4.5 A; input 100–240 V AC, 50/60 Hz).
- The indicator is red while charging and green when fully charged. Recharge when the low-battery prompt appears.
- Do not attempt to replace the battery. Battery service is carried out by authorised personnel only.

9. Troubleshooting

Observation	Action
Device does not switch on	Charge the battery with the supplied adapter; confirm the indicator turns red. If it still does not start, contact service.
Device switched itself off	Automatic shutdown after 35 minutes idle, or battery exhausted. Press power; recharge if required.
Image faint or unclear	Check working distance (20–26 cm); reduce direct ambient light; increase brightness; try enhance, inverse or another colour or display mode.
Projected veins appear offset	Hold the device perpendicular to the skin and use the centre line; verify calibration with the card (Section 6).
Projection window scratched or damaged	Stop using the device and contact service.

10. Technical specifications

Parameter	Specification
Detection method	Near-infrared illumination
Wavelength range	760–940 nm
Detection depth	0–10 mm (superficial vasculature)
Optimal working distance	20–26 cm
Vessel position and resolution accuracy	±0.3 mm
Patient interface	Non-contact, no consumables
Projection technology	DLP projection onto skin
Projection colours	12 selectable
Projection sizes	3 — large, medium, small
Brightness and inverse mode	6 levels; inverse selectable
Display modes	9 — default, enhance, hair-removal, guide-line and 5 colour-mix modes
User interface	LCD menu; power, sleep, OK and 4-way navigation keys
Battery	Rechargeable lithium-ion, 4,900 mAh
Operating duration	Approx. 3.5 hours
Charging	USB Type-C, 5 V ⎓ 4.5 A; adapter 100–240 V AC, 50/60 Hz
Status indicators	Blue — normal · Green — charged · Red — charging
Auto sleep and shutdown	10 min sleep / 35 min shutdown when idle (sleep interval adjustable)
Weight	450 g
Dimensions (L × W × H)	24 × 6 × 6.5 cm
Working noise	≤ 35 dB
Form factor and mounting	Handheld, single-hand operation; optional stand
Model / version	PM-VF-100 · Version Poly2025 (Edition 2)

Specifications are subject to change without notice in the interest of product improvement.

11. Regulatory and manufacturer information

Jurisdiction / scope	Status
India	CDSCO Class A Medical Device
Quality systems	ISO 13485:2016 · ISO 9001:2015 · ISO 14001:2015
Europe	CE under Low Voltage Directive 2014/35/EU

MANUFACTURER

Polymatech Electronics Limited
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Users are responsible for compliance with applicable Indian regulations and with institutional policies on medical device use.

12. Warranty, service and contacts

Warranty terms are as stated on the warranty card supplied with each unit. For demonstrations, orders, warranty service, returns and technical support, contact your authorised Polymatech dealer or Polymatech directly. Authorised dealers are listed at www.polymatechworld.com/where-to-buy.html.

The warranty does not cover damage from misuse, liquid ingress, dropping, unauthorised opening or repair, or use with unapproved accessories.

SALES AND ENQUIRIES

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WARRANTY AND SERVICE

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