X-Rite In-Line Color Measurement System ERX130

x·rite
PANTONE®

Non-contact, spectral color measurement on a production machine with coaxial measurement geometry.

Advantages of In-Line color measurement

✓ Possible corrections before production is out of tolerance result in reduced waste

✓ Continuous process monitoring, therefore early identification of disturbances (material, process, control)

✓ In-Line color measurement is needed for fast manual control and automatic control, resulting in stable production and faster and better color changes

✓ Documentation of the production (ISO 9001)

Special advantages ERX130

✓ With the coaxial geometry even rough surfaces are measured reliably

✓ Large distance to the measured product

✓ Large measurement area for good averages

✓ Excellent results with real spectral resolution of 1 nm

✓ Stable against distance variations

✓ Ambient light, web speed and normal flutter do not influence the accurate measurement results

✓ Compact style based on the well-known, proven model ERX50

✓ Modular setup, thus even easier to service

✓ CAN Bus for faster and more secure data transfer
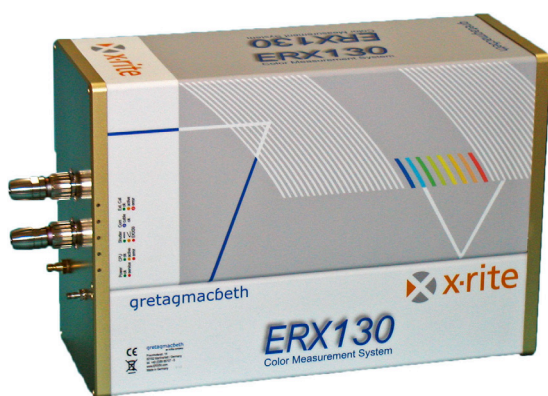
ERX130 Non-Contact Spectrophotometer for reflectance measurements

Learn More
http://www.ERX50.com
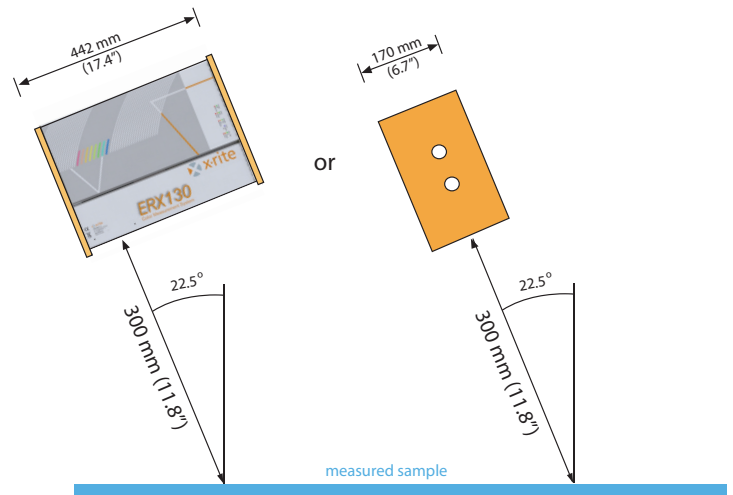
Paints & Coatings

Figure 1. Measurements

Functional description ERX130

The ERX130 is a compact In-Line spectrophotometer with the coaxial geometry, typical: illumination at 22.5°, measurement at 22.5° coaxial. The sample is measured non-contact at a distance of 300 mm (11.8 inch) with a measurement spot of Ø90 mm. (Figure 1).

For a measurement a sample will be illuminated by white light (Xenon flash lamp, daylight) typically at 22.5° for approx. 2 / 1000 sec. In the same direction (under 22.5°) the reflected light will be collected and guided to a high resolution spectrometer (Figure 2).

Simultaneously with the sample measurement a reference measurement of the lamp will be taken with a second high resolution spectrometer (full dual beam design).
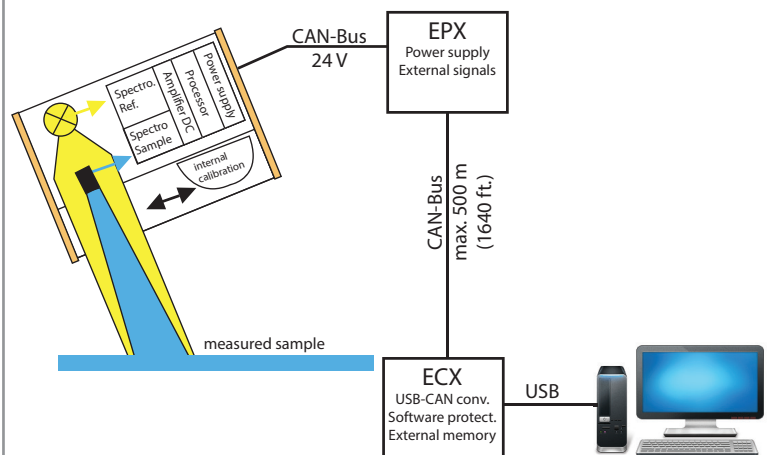

Figure 2. Function blocks in the ERX130

In both spectrometers the optical measurement signals will be separated into 401 different wavelength signals via corrected holographic concave gratings and measured via 401 photoelectrical sensors. The result is a true 1 nm spectral measurement resolution.

The measurement signals will be amplified and digitised with high resolution. A fast processor calculates corrected spectral reflectance data.

These 401 reflectance results (from 330 nm to 730 nm) are the basis for all further colorimetric calculations for any possible illuminant and observer (e.g. CIELab data for illuminant D65:10° observer or illuminant C:2° observer).

The automatic internal calibration of the system also includes automatic wavelength calibration for excellent measurement accuracy and long-term stability. This guarantees high and reproducible measurement accuracy.

Control over the color measurement system ERX130 is done via CAN bus interface. This allows distances between the computer and the measuring system of up to 500 m (1640 ft). The built-in optical isolation guarantees stable operation in a real world production environment.

In the ECX, close to the computer the CAN bus signal is converted to USB interface to allow the usage of a standard computer.

Typical applications

The In-Line spectrophotometer ERX130 is well suited for all applications where the frequent, non-contact color measurement of a product is needed. In most cases it will be a continuous product.

References
The ERX130 In-Line spectrophotometer is successfully working for the In-Line measurement of the following material:

Plastic pellets
Carpets
Woven or knitted textiles
Paints and plaster
Powders (kaolin, cemet, marbel, chalk, detergents, etc)
Pigments

Special advantages of the ERX130
Precise spectral color measurement

- Also critical colors and demanding applications can be measured with high quality based on the excellent spectral resolution of 1 nm.

- The wide spectral range of the ERX130 from 330 nm to 730 nm gives excellent information.

- The illumination and the observation are coaxial. Thus the product is homogeneously illuminated even when the surface is rough. So rough materials can be measured reliably.

- Good correlation to the laboratory measurements.

Automatic measurement and calibration

- Precise color measurement because of automatic internal calibration.

- Absolute automatic wavelength calibration with highest precision (0.07 nm). Therefore very good long-term stability and precision.

Stable, accurate measurements on the production machine

- 24 hours, 365 days per year automatic color measurement on the production machine.

- Despite distance variations of several millimetre stable measurement results.

- The production speed and ambient light have no influence on the accurate measurements.

- The unit is robust, splash water tight (IP 65) and rarely needs service thanks to the compact design.

- The long-life Xenon flash lamp (1 year warranty) is a low-price item.

Frequent or triggered measurement In-Line

- When the product is always available (like plastic pellets on a conveyor belt or textile on a production machine), the measurement frequency is time controlled.

- Triggered measurement through external signals is used when a discrete product is in the right position to measure.

This ER product family has been successfully measuring in hundreds of installations since 1987

- By continued development and improvements our customers have proven systems with the latest technology

- The current model is the fourth generation and has further improved technical data

- Development and production of the ERX50 spectrophotometer family in Switzerland

- Installations worldwide
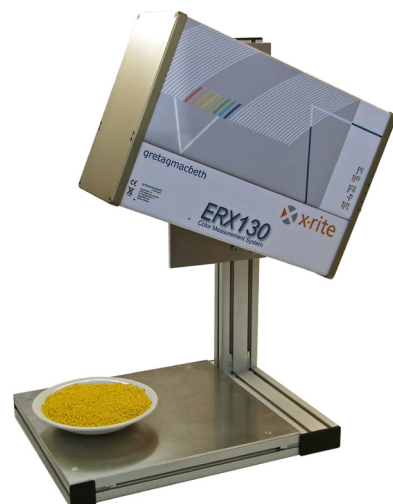
Turnkey In-Line color measurement system

The In-Line spectrophotometer ERX130 is typically sold as turnkey system directly from the manufacturer, including installation frame or linear track, software and computer (Figure 3).

Support and service are available around the world.

At X-Rite you find the experienced experts and proven partners for your color measurement and Closed Loop Color Control

- In-Line spectrophotometer ERX family
- Software
- Quality control
- Automatic Closed Loop Color Control
- Machine interface (machine stop, new batch)
- Alarm signal
- Link to other information systems
- Linear Track (optional)
- Measurement in cross direction
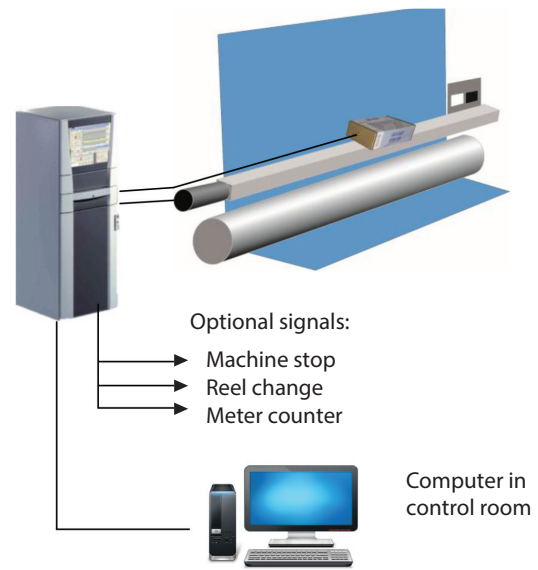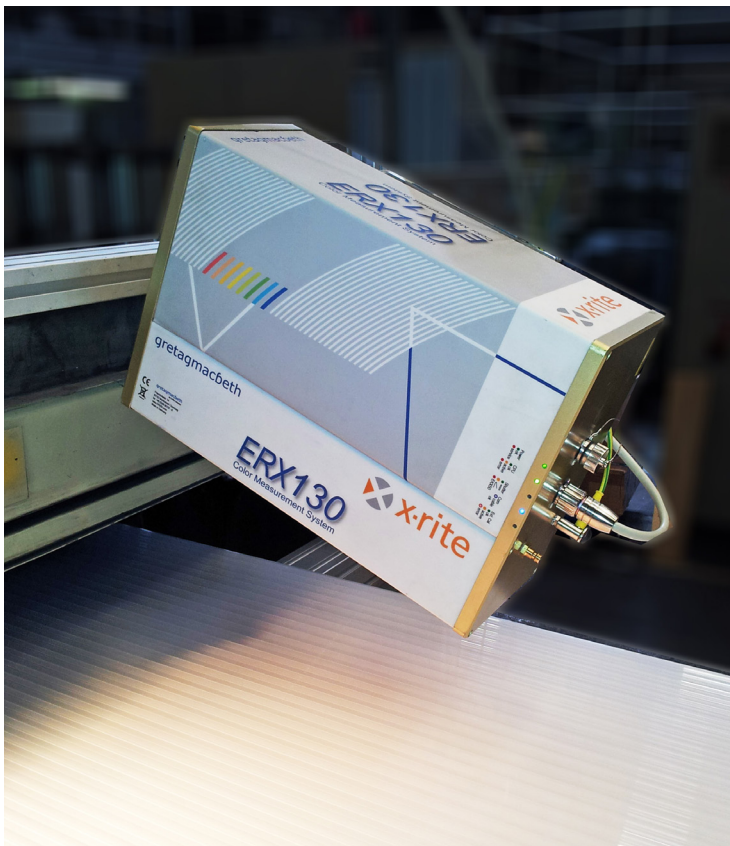- Automatic edge detection

Optional signals:
→ Machine stop
→ Reel change
→ Meter counter

Computer in control room

Figure 3: In-Line color measurement

ERX130 measures the color properties in an continuous production

The X-Rite group supplies:

- Color data products (portable, benchtop, In-Line)
- Software for quality control, color matching and Closed Loop Color Control
- Light booths for visual inspection
- Densitometers, color management systems

Quality Management
We are certified

Voluntary participation in regular monitoring according to ISO 9001:2008

Technical Data ERX130, EPX and ECX

Color sensor ERX130

Given the broad nature of the coatings industry, it is difficult to incorporate universal color standards into coating production and non-contact measurement in the process; not sensitive to ambient light; automatic calibration and measurement; measurement geometry α:α coaxial; robust construction; high accuracy and precision; built-in diagnostics with service memory (remote diagnostics).

Description	Specification
Illumination	direct, typical 22.5°
Measurement	coaxial to the illumination (= 45° to the gloss axes)
Spectral measurement area with UV	330 nm ... 730 nm
Spectral resolution (optical)	1 nm
Absolute wavelength accuracy with internal automatic control	better than 0,1 nm
Dual beam (sample and reference channel)	simultaneous
Measurement time	20 ms
Measurement area	90 mm (3.5") diameter
Measurement distance (illumination head – sample)	300 mm (11.8")
Distance variation with error dE* < 0,2	± 10 mm
Measurement interval	20 sec typ., 5 sec min.
Reproducibility CIELAB (standard deviation for repeated difference measurements of the white standard)	ΔL^*, Δa^*, $\Delta b^* \leq 0.03$
Inter-instrument agreement between ERX50 systems Based on a white tile	ΔL^*, Δa^*, $\Delta b^* \leq 0.1$
Average color difference for measurement of the 12 BCRA standards from production average	$\Delta E^* < 0,3$
Size	170 x 305 x 444 mm³
Weight	14 kg
Protection	IP 65, CE Mark
Calibration (traceable to PTB)	instrument specific white standard
Communication with computer	CAN-Bus, with interface converter on USB
Spectral data directly from the measm. head (330nm - 730nm) More data will be available via the computer (see evaluation programs ESWin)	measured in steps of 1 nm
Ambient temperature:	max. 60°C, with cooling case EGX130PL max. 80°C
Power Interface EPX	
Input Voltage	115V/230V AC, +25% / -15%, 45-440 Hz
Power consumption	max. 50 VA, typ. 25 VA
Measurement head interface	max. 20 m cable
Size approx.	265 x 265 x 155 mm³ (10.4" x 10.4" x 6.1")
Weight approx.	2.3 kg
Protection.	IP 65, CE Mark
Computer Interface ECX	
Input Voltage	115V/230V AC, +25% / -15%, 45-440 Hz
Power consumption	max. 100 VA, typ. 10 VA
Interface to EPX trough CAN-Bus	max. 500 m cable
USB interface to computer	typ. 1.5 m, max. 3 m cable
Size approx	265 x 265 x 135 mm³ (10.4" x 10.4" x 5.3")
Weight approx.	2.4 kg
Protection	IP 65, CE Mark

x·rite

PANTONE®