

## Apris Online Measurement System (OMS)

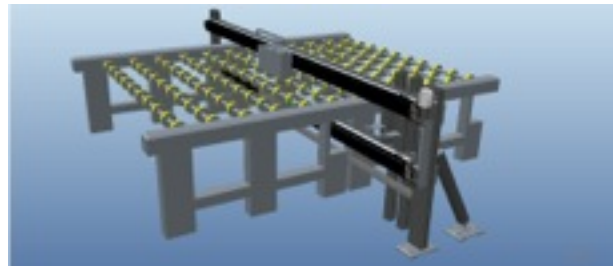
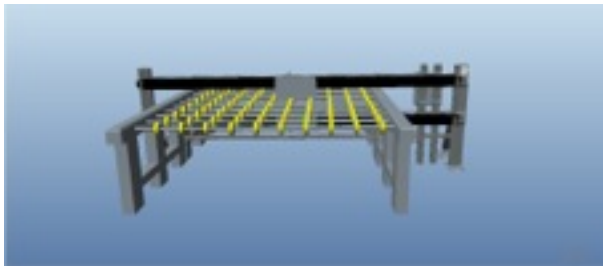
Online Quality Control and Process Monitoring of Coated Glass Using Reflectance, Transmission and Color

### *Key uses and applications*

- Color and spectral monitoring for quality control of coated glass products
- Coating process monitoring
- Optimize coating process and improve yield to decrease waste
- For product and process development
- Coater equipment diagnostics, preventive maintenance
- Quick startup from initial coater installation, from a maintenance condition or when changing between different glass products

### *Advantages*

- long life lamp - 10,000 hrs
- low cost of ownership
- quick ROI at high performance to cost ratio



Factory installations (quality control for low-E glass production):



**Left:** 3 channel configuration (8 degree film- and glass-side reflectance, transmission) measurement system  
**Right:** Oblique angle (60 degrees) glass-side reflectance measurement system

## Specifications

Measurement mode		Reflection, transmission
Incident angle	Reflection	8 degrees or 60 degrees
	Transmission	8 degrees
Wavelength Range		380-825 nm
Optical Resolution		< 1.6 nm
Spot Size		approx. 10 mm
Lamp		10,000 hrs. MTBF
Spectrometer ADC resolution		16 bit
Color repeatability		0.15 dE CIE color (on reference)

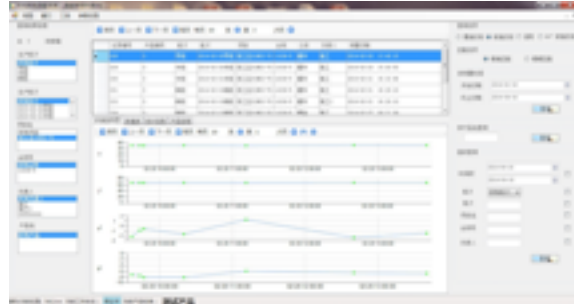
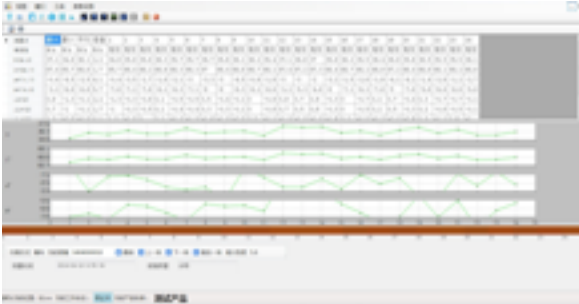
## System

Traverse Length		3.3 m standard
Scan speed		0.125 m / sec. typical
Configurations	1 to 4 measurement modules	Combination of film-side, glass-side reflectance, transmission, oblique reflectance (60 deg)
Measurement modes	Automatic	On glass arrival / presence sensors or factory signal
	Manual	Control from software
Distance to control computer		Up to 100 m with ethernet

# On-line Measurement Software

## On-Line Measurement Software for Spectrum and Color Monitoring

- Automatic measurement scan on glass arrival using glass presence sensor or signal from factory interface
- Dataview options: table, spectrum, trend graphs
- Measurement result comparison to product-specific color or spectrum targets
- Database server (MySQL) for product information and measurement results, data review, statistics and archiving
- System-to-system transfer of product specifications, color and spectrum targets

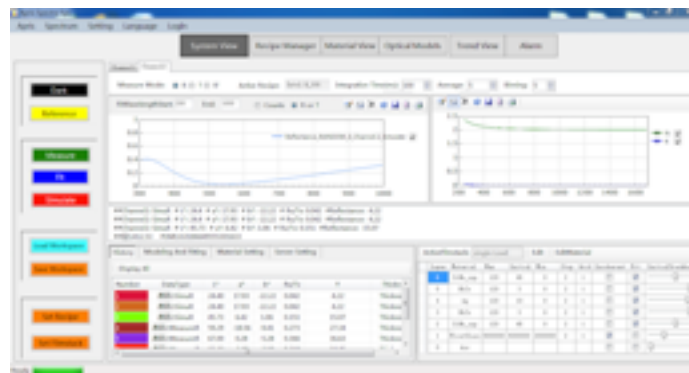


Screenshots of Apris OMS software Live Scanning Measurement Mode (left) and Data Review (right)

# Apris SpectraSys - Thin Film Simulation and Measurement

## Software for Thin Film Measurements and Simulation

- Simulation of reflectance and transmission spectra of thin film stacks, including at different oblique incident angles (useful for architectural glass low-E product thin film design)
- Measurement of thickness and optical properties of multi-stack thin films on various substrates (silicon, metal, glass, PET) by fitting of simulated spectra to measured spectra
- Modeling of sample conditions - roughness, back side correction for transparent substrates
- Material optical properties using table values, parametric models (functions and physical models)
- Recipe and material management using a lightweight database
- Data management and review



Screenshot of thin film simulation software **System View** with low-E glass simulation