

# ONLINE SUCRO CRYSTAL IMAGING SYSTEM



**Online sucro crystal imaging system** performs the automated measurement of crystal size distribution parameters in the massecuite using classical image analysis techniques. The measurement of the crystal size distribution is a key requirement in optimizing the growth of sugar crystal in crystallization pans or for the quality control of the final product.

Images are captured at different phases of the process using an automated sample collecting device which includes the Smart camera. A powerful, adaptive and automatically controlled LED light source backlights the crystals on a glass surface in front of a high-resolution digital camera with optical magnification.



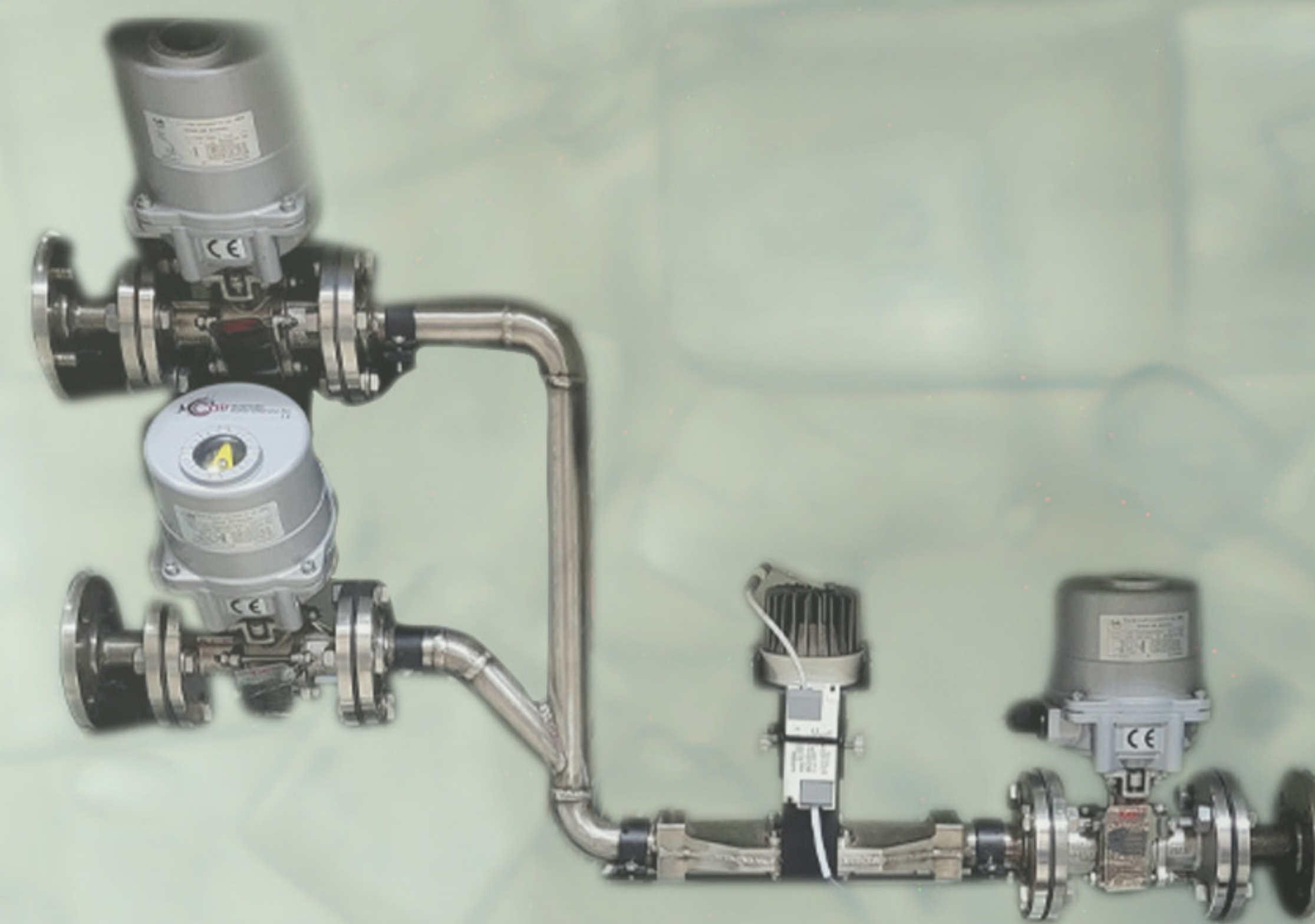
प्रगत संगणन विकास केंद्र  
CENTRE FOR DEVELOPMENT OF ADVANCED COMPUTING



Ministry of Electronics and Information Technology  
Government of India

## Advantages

- Direct mounting on the pan wall
- Simple design and rugged construction, suitable for the pan floor environment
- Crystals observed from 5-micron size and throughout the strike
- Processed Crystal Image showing on a TFT display
- Provides real time information essential to prevent the formation of agglomerates and false grains
- Local controlled automatic flushing valve for cleaning of viewing glass field



## Product Specifications

Model/Series	OSIS01
<b>Displayed parameters</b>	
Crystal Image	Picture
Average Crystal Size	Numerical display in microns
Crystal Size distribution	Chart
Operation status	Labelled LED
<b>Functions</b>	
Operation mode	Auto Switch
Crystal Analysis	Computer Vision and Machine learning algorithm
Operating on UI	Touch panel
<b>Smart Camera</b>	
iVIS Smart	C-DAC
Sensor type	CMOS
<b>Lens Module</b>	
Lens mount	C-Mount
Pixel Size	0.5 $\mu$ m
Type of lens	50mm F2.8 Manual Iris C-Mount Lens
<b>Imaging</b>	
Sampling Rate	5 FPS
Resolution	1920*1080
Focal Length	90 mm
Tool Suite	IVDT (for programming only)
<b>Control Valves</b>	
Electrical Actuator Operated 2 Way Ball Valve	
IVIS IO expander module	C-DAC
<b>External interface</b>	
Ethernet	TCP/UDP
IO Channels	2 Nos., Analog Output (4 – 20mA)
Display	TFT touch display, Analog indicator
<b>External Features</b>	
Unit Size (L x W x H)	42 x 88 x 100cm
Net Weight (kgs)	80
Degree of protection	IP-55
Case material	SS
Power supply voltage	230V AC
Current consumption	5A
Indicator lamps	Yes

### Operating conditions

Temperature range	0 to 65°C
Pressure range	-1 to 1 bar
Humidity range	40 – 70% RH

## Standard Design

- Body and mounting flange in stainless steel
- Smart camera with microscope optics
- Automatic steam valve for flushing of pipelines and sight glasses
- Welding flange for OSIS mounting on pan wall.

## Benefit

- Side mounts onto the crystallizer vessel to provide realtime images of the sugar crystals during the process.
- Labelled processed crystal images
- Crystal growth rate chart
- Calculates MA, CV and percent of fines using continuous image processing techniques.
- Average Crystal size
- Measures crystal sizes from 5  $\mu$ m, monitor the seeding phase and detect false grain
- Masecuite drop time indicator at tightening stage



### Control and Instrumentation Group

Centre for Development of Advanced Computing  
 R&D Organization of the Ministry of Electronics & Information Technology  
 Government of India, Vellayambalam, Thiruvananthapuram – 695033, Kerala  
 Tel: +91 471 2723333 Extn: 385/226, Fax: +91471 2723456,  
 Website: www.cdac.in