

Complete evaluation kit designed for Hamamatsu Image Sensors
(CCD, InGaAs and NMOS)

Newly Updated
software drivers
and power supply!

FEATURES

- LabVIEW drivers
- Wavelength calibration
- Automated measurement functions
- UV – NIR spectral coverage
- Cooled camera head

APPLICATION

- UV imaging
- ICP
- DWDM Channel monitor
- NIR spectrometer
- Scientific measuring instrument
- Optical and Spectrophotometric Analyzer

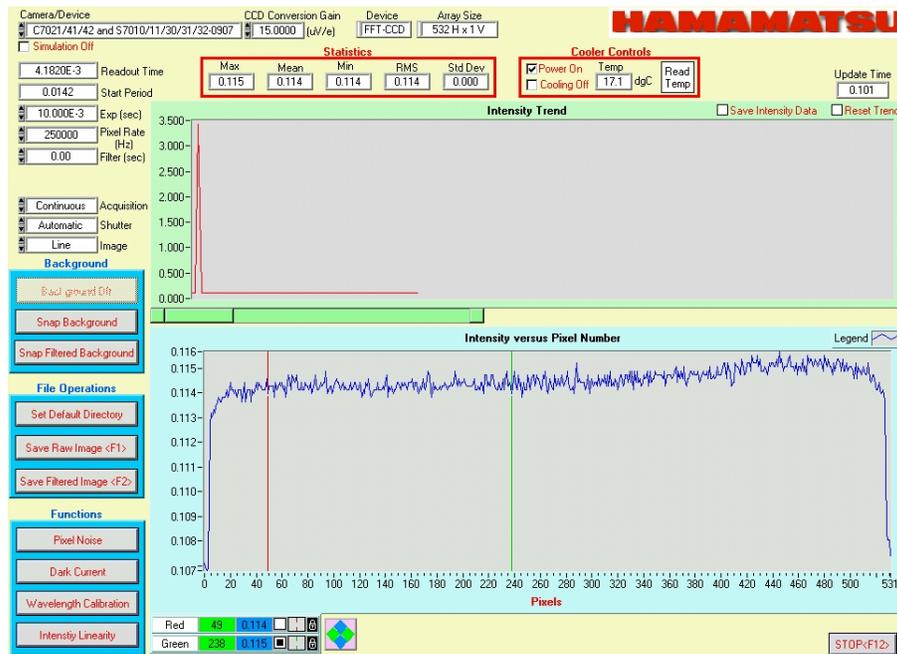


A/D Card

Camera Head

Power Supply /
Interface Box

The HC230 series is designed as an OEM evaluation tool. It allows the user to acquire data using a



personal computer. The easy of use will enable the end user to focus on the specific application, not computer interface. The new HC230 series includes a cooled camera head, power supply/interface box, LabVIEW drivers and cable assemble. Shown on the right is the main screen of the software. Users can adjust the exposure time, readout frequency, gain and shutter operation. Built

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in automated test functions such as pixel noise, dark current, wavelength calibration and linearity measurements greatly simplify operation. All of the data can be saved as a text file for data analysis using EXCEL spreadsheet.

The HC230, HC231 and HC236 series are based on a back thinned (BT) full frame transfer CCD having 90% quantum efficiency (QE) at 600nm. Each sensor has a 24um square pixel. The pixel format ranges from 532x64, upto a 1044x256 matrix. These scientific grade imagers operate in the MPP mode greatly reducing dark current generation, additional reduction is achieved using a built in thermo-electric cooler. Customized LabVIEW drivers control the readout in either area scanning mode (2D) or full line binning mode (1D).

A front illuminated (FI) version having extremely low dark current ($15 \text{ e}^-/\text{pixel}/\text{second}$ @ -10°C) is the HC232 series. Matching the pixel size and format with the BT-CCD family. The HC232 series is well suited for visible to near infrared spectrometry application.

For higher light levels users prefer the HC233 series. These self scanning photodiode arrays have a 50pC saturation charge making it ideal for absorption measurements. The pixel height is 2500um while the pitch ranging from 25um too 50um.

Telecommunications monitoring DWDM signals will benefit from the HC234 series. The pixel pitch is 25um or 50um, peak response is centered at 1550nm. Pixel counts from 256/50um upto a 512/25um.

Part Number	Sensor Type	Wavelength Coverage	Operating Temperature	Dynamic Range (*1)
HC230 series	BT-CCD (Low noise)	200-1100nm	-10°C	30,000
HC231 Series	BT-CCD (Large full well)	200-1100nm	-10°C	45,000
HC232 Series	FI-CCD	400-1100nm	-10°C	30,000
HC233 Series	NMOS	200-1100nm	0°C	85,000
HC234 Series	InGaAs	900-1700nm	-10°C	10,000
HC235 Series	InGaAs (Extended cutoff)	1200-2600nm	-25°C	8,000
HC236 Series	BT-CCD	200-1100nm	-20°C	30,000

(*1) Dynamic range (DR) is the saturation level or full well (FW), divided by the readout noise (N_R).

$$DR \equiv \frac{FW}{N_R}$$

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Specification Summary Table

Part Number		Pixel Format Size (24um x 24um)	Dark Signal		QE (@ λ_p)	Full Well (electrons)	Typical N_R (electrons)
			Typ.	Max.			
HC230	-0906	532 x 64	50 (e ⁻ /p/s) {-10°C}	300 (e ⁻ /p/s) {-10°C}	90% @ 650nm	600K e ⁻	20 e ⁻
	-0907	532 x 128					
	-0908	532 x 256					
	-1006	1044 x 64					
	-1007	1044 x 128					
	-1008	1044 x 256					
HC231	-0907	532 x 128	50 (e ⁻ /p/s)	300 (e ⁻ /p/s)	90% @ 650nm	2700K e ⁻	60 e ⁻
	-1007	1044 x 128	{-10°C}	{-10°C}			
HC236	-0906	532 x 64	14 (e ⁻ /p/s)	80 (e ⁻ /p/s)	90% @ 650nm	600K e ⁻	20 e ⁻
	-0907	532 x 128					
	-0908	532 x 256					
	-1006	1044 x 64					
	-1007	1044 x 128					
	-1008	1044 x 256					
HC232	-0906	532 x 64	15 (e ⁻ /p/s)	45 (e ⁻ /p/s)	40% @ 650nm	600K e ⁻	20 e ⁻
	-0907	532 x 128					
	-0908	532 x 256					
	-1006	1044 x 64					
	-1007	1044 x 128					
	-1008	1044 x 256					
Part Number	Pixel Count Size	Dark Current (pA)		QE (@ λ_p)	Saturation Charge (pC)	Typical N_R (uVrms)	
HC234	-256 (50um x 500um)	4 *	40 *	75% @1500nm	30	150	
	-512 (25um x 500um)	6 *	60 *	75% @1500nm	30	150	
HC235-256	256 (50um x 250um)	1000	4000	70% @2300nm	30	180	
HC233	-0900 (50um x 2500um)	0.009	0.03	50% @600nm	50	300	
	-1010 (25um x 2500um)	0.004	0.01	50% @600nm	25	300	

(*) At 25°C