



➤ Overview

Flat panel sensor Xmaru1215CF-PLUS sensor is fully adaptable for real-time imaging application of digital x-ray imaging systems with high resolution. CMOS active pixel type sensor makes extremely low noise level and high sensitive performance. 14 bits video out ensures the wide dynamic range. The high physical and functional performance of Xmaru1215CF-PLUS gives competitive image quality.

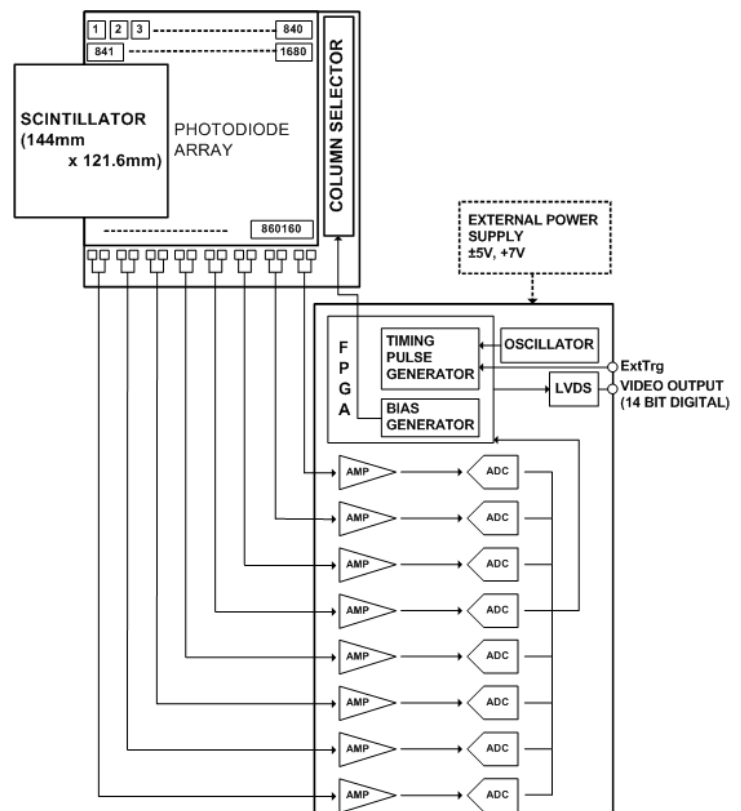
➤ Feature

- **High sensitivity**
- **Extremely low electrical noise**
- **High resolution**
~ 3.5 lp/mm
- **High-speed frame rate**
~ 30 frames/s
- **14-bit digital output**

➤ Applications

- **Digital radiography**
- **Computed tomography**

➤ Block Diagram



The Xmaru1215CF-PLUS employs a CsI:Tl scintillator for x-ray-to-light converter. (Optional GdOS:Tb). Xmaru1215CF-PLUS derives with 16 channels. Analog channel can be MUXed to go to dual ADC. This characteristic gives the lowest channel variation and high readout speed with stable signal. Xmaru1215CF-PLUS make image with internal or external trigger. Readout speed can be controlled by external trigger in external trigger mode.



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➤ General Information

Parameter	Description
Readout	Charge amplifier array
Video output	Camera Link
Output data rate	16 MHz

➤ Power Supply Information

Parameter	Description
Supply Voltage	+5V (±0.2), -5V (±0.2), +7V (±0.2)
Current	3A, 1A, 1A
Input Voltage for Ext. Trg.	0 to 5V

➤ Specification

Parameter	Unit	Specification
Sensor Type	-	CMOS photodiode array
X-ray Convertor	-	CsI:Tl (GdOS:Tb)
Dimension (W x L x T)	mm	212.5 x 150 x 24.7
Pixel Size	mm	0.14
Active Area	mm	143.36 x 117.6
Number of Active Pixels	pixels	1024 x 840
Effective Area* ²	mm	141.96 x 116.2
Number of Effective Pixels	pixels	1014 x 830
Frame Rate Internal	fps	30
Frame Rate External	fps	~ 28
Noise* ³	ADU	< 5
Resolution* ⁴	lp/mm	2.5
Sensitivity* ⁵	ADU/μGy* ⁶	> 1200
A/D	bits	14
Dynamic Range	dB	83
Defect Line	lines	Max. 10
Energy Range* ⁷	kVp	40 ~ 90

*1: Full Resolution mode (non binning)

*2: X-ray sensitive area

*3: RMS of dark current

*4: Spatial resolution @ over MTF 10%

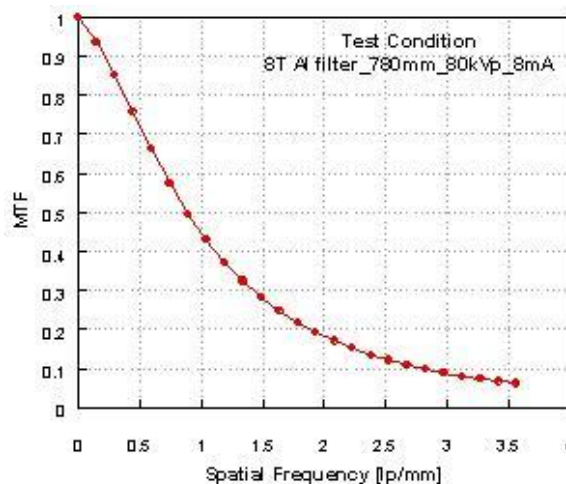
*5: Measured @ 80kVp, 8 mm Al filter

*6: μGy is the unit of X-ray exposure (1mR = 8.69 μGy)

*7: Recommended Range

More than 90kVp available,(Reduced the life time)

➤ Resolution

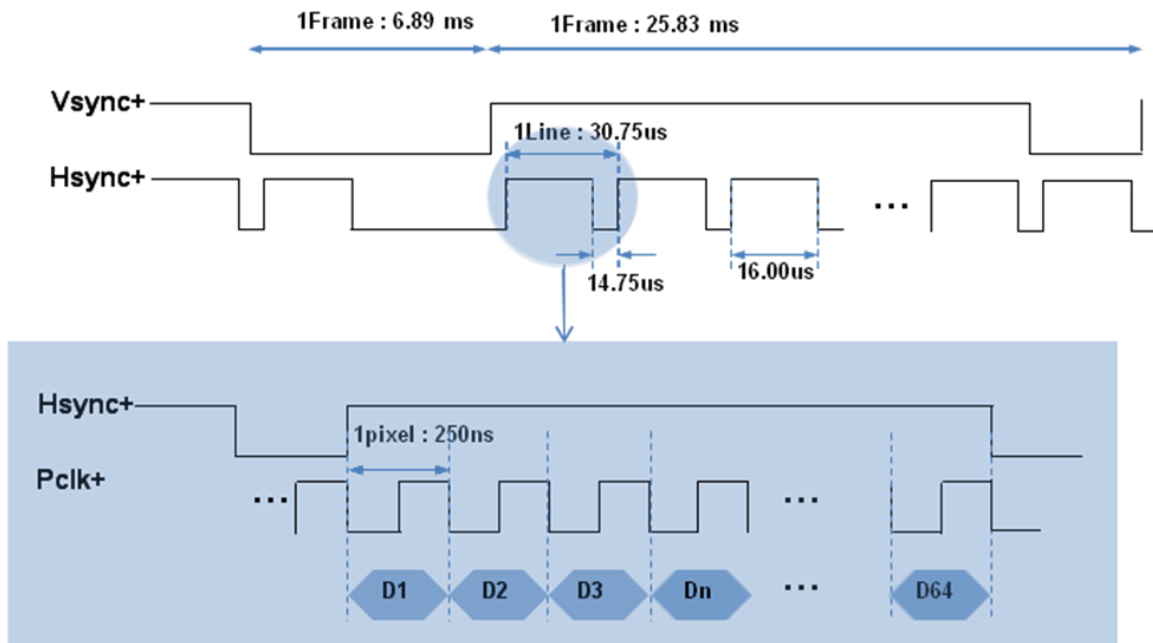


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➤ Timing Chart

Readout timing of Xmaru1215CF-PLUS is followings. To acquire image, frame grabber setting or proper camera file should be needed considering timing information of Xmaru1215CF-PLUS.

⦿ Internal mode

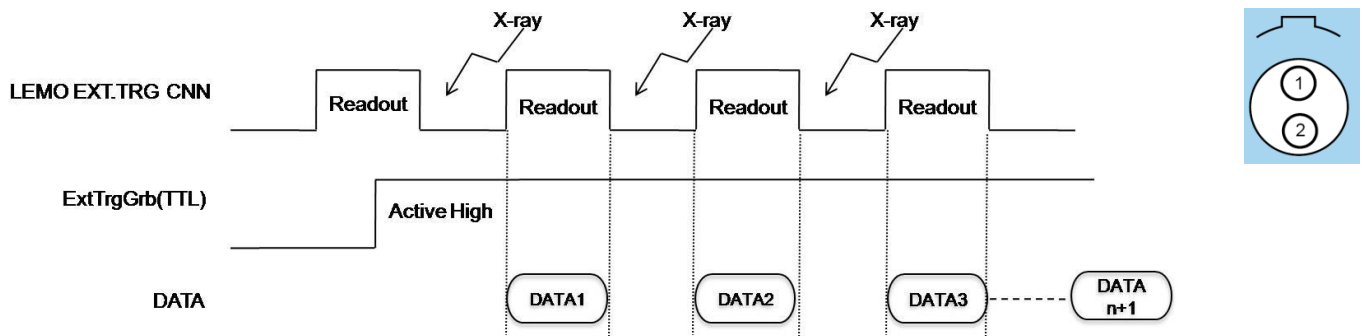


External mode

Xmaru1215CF-PLUS can be controlled frame rate by input external trigger pulse. Readout sequence in external trigger mode is following. External trigger pulse should be inputted with proper input voltage.

[Table 1] External trigger pin map and derive condition

Mode		Frame Grabber Reception (80 pin)		Ext. Trig. Reception (2 pin)	
		Pin # 33 (IN_TRG)	Pin # 73 (EX_TRG)	Pin #1	Pin #2
Internal Trigger Mode		Low	Input signal is ignored	Input signal is ignored	
External Trigger Mode	Use F/G	High	Pulse signal (TTL)	Open	
	Use Ext. LEMO		High or Open	+ 5V	Pulse



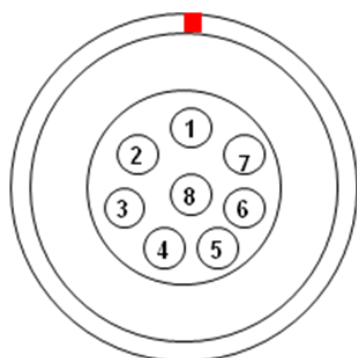
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➤ System Requirements

To operate Xmaru1215CF-PLUS with full performance, proper system is required.

- PC: IBM PC with Windows XP OS or Vista OS.
RAM should be at least 1GB.
PCI-E slot should be at one.
- Frame grabber card
16bits or more data acceptable
Pixel clock should be at least 20.0 MHz
Camera link interface signal
- Power supply: +5V ($\pm 0.2V$), -5V ($\pm 0.2V$), +7V ($\pm 0.2V$)
The input voltage is described in figures of geometric information.
See power supply connector pin map (Table2).
The impedance of power cable should be low enough to avoid voltage drop.
Low noise power source is recommended to avoid additive noise.
Please check the ground terminal.
- External trigger cable
Please use proper Ext. Trg. cable, matched with Ext. Trg. connector on Xmaru1215CF-PLUS
See Ext. Trg. cable pin map (Table1).

[Table 2] Power supply connector pin map on the sensor side



Model	Pin	Description
SPB-1BR1-308S-ELS Company: SAMWOO	1	+5V
	2	+5V
	3	GND
	4	-5V
	5	-5V
	6	GND
	7	+7V
	8	+7V

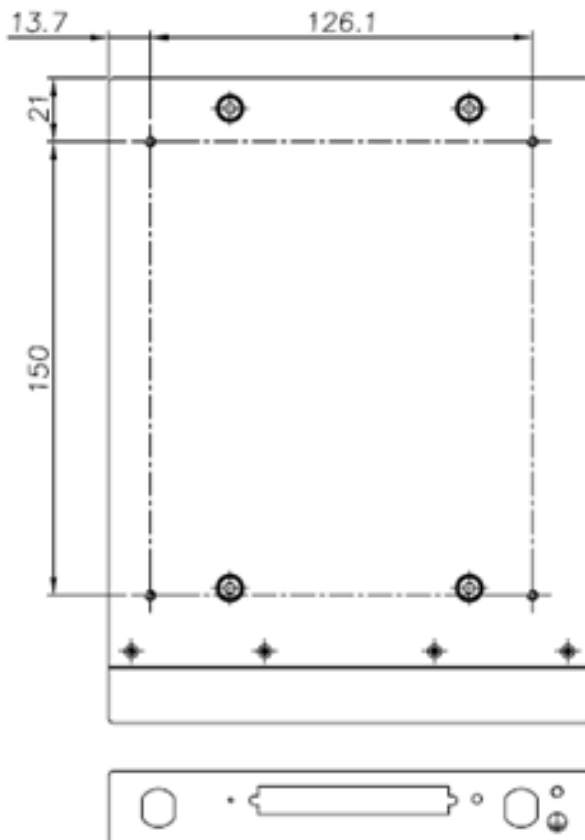
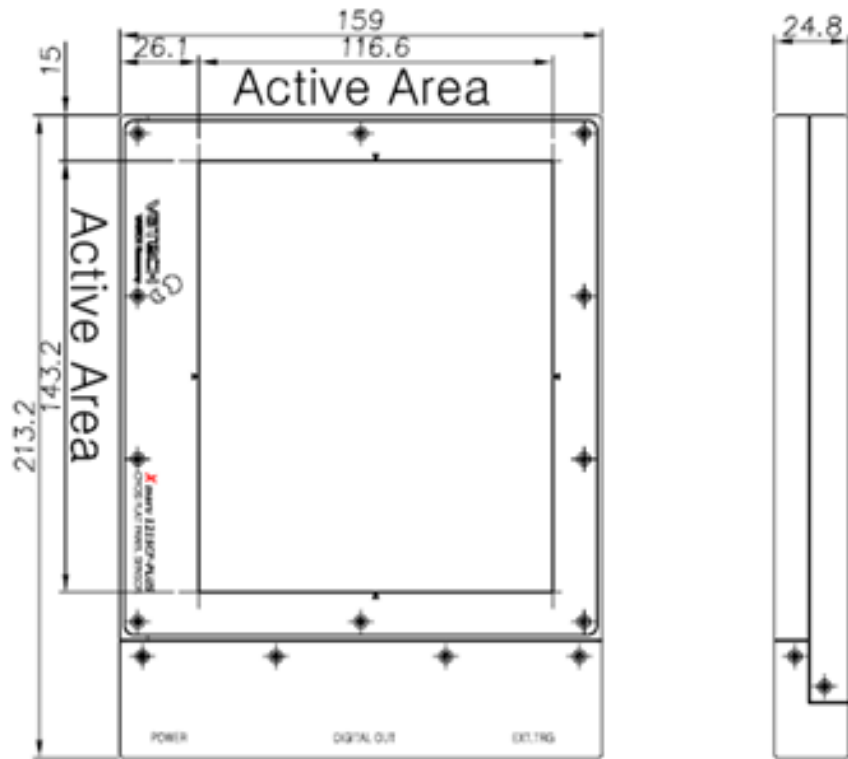


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➤ **Geometric Information**

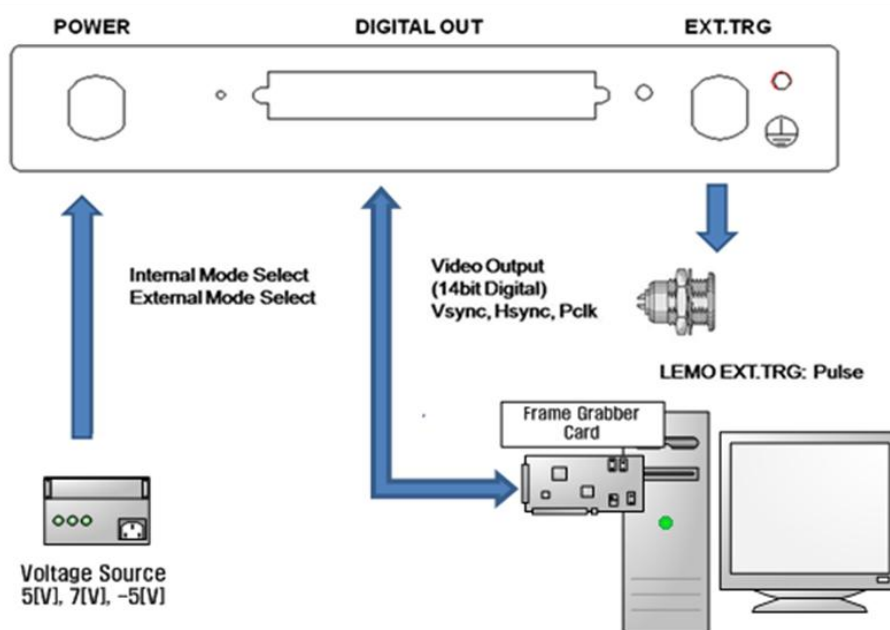


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➤ Sensor Connection



CAUTION

Handle the sensor carefully, it may be damaged, if something is hit, dropped. Please do not place the sensor near vibration or shock. The sensor will be malfunction or permanent damaged.

Xmaru1215CF-PLUS is made for dental application. Please keep in mind the usable x-ray energy range (40~90kV). If Xmaru1215CF-PLUS is exposed over 90kv level of x-ray, we cannot ensure full performance and life-time of sensor. Also the warranty will be expired.

Be sure to connect the cables to the proper connectors. Before using, you should check the information and deriving condition of sensor, such as power source and external trigger and digital out cable.

Don't load object over 20 kg locally on the window surface. Be sure to connect the sensor ground.

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