

## ❖ TM-4200 CL / TMC-4200 CL

Progressive Scan CCD



- 1.2" progressive scan IT CCD (Kodak KAI-4021)
- 2048 x 2048 resolution @ 15 fps dual-tap
- 7.4  $\mu\text{m}$  square pixels
- Software-selectable single-tap mode available @ 8 fps
- 12-bit A/D (linear) or 8-bit/10-bit with look-up table (LUT)
- Digital Camera Link output and analog output
- Image center partial scan (1000, 500, 250 lines)
- 2X2 binning and user-programmable variable partial scan
- Full-frame shutter to 1/16,000 sec.
- Asynchronous reset, no-delay, pulse width control shutter
- Defective pixel compensation
- PIV (particle imaging velocimetry) mode
- Automatic channel balancing
- Monochrome or color





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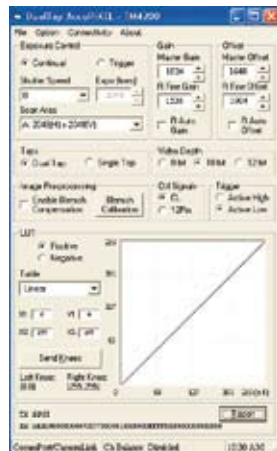
# Specifications for TM-4200CL/TMC-4200CL

Specifications	TM-4200CL/TMC-4200CL
Sensor	1.2" progressive scan interline transfer CCD
Active area	15.15mm x 15.15mm
Active pixels	2048 (H) x 2048 (V)
Cell size	7.4 μm x 7.4 μm
Readout modes	A 2048 (H) x 2048 (V) @ 15 Hz B 2048 (H) x 1000 (V) @ 28 Hz (partial scan) C 2048 (H) x 500 (V) @ 50 Hz (partial scan) D 2048 (H) x 250 (V) @ 80 Hz (partial scan) U User-definable partial scan
Synchronization	Internal/External auto switch HD/VD, 4.0 Vp-p impedance 4.7K Ω VD=14.79 Hz ± 2%, non-interlace HD=30.78 kHz ± 2%
Pixel clock	40.00 MHz
S/N ratio	> 58 dB
Sensitivity	Mono 0.12 lux f=1.4 (no shutter) @ 15 fps, Color 0.8 lux f=1.4 (no shutter) @ 15 fps, Pixel sensitivity: 31 μV/e-
Video output	Analog 1.0 Vp-p, 75 Ω Digital 8-bit x 2-tap Base Camera Link 10-bit x 2-tap Base Camera Link 12-bit x 2-tap Base Camera Link
Color (RMC/TMC-4200 only)	Raw Bayer output for host-based interpolation
Gamma	Programmable LUT (Gamma 1.0 std)
Shutter speed (programmable)	1/15 to 1/16,000 in increments of 32.5 μs
Lens mount	C, F, M42 mount (use "1" format lenses)
Power	12V DC ± 10%, 520 mA (typical at 25° C)
Operating temperature	-10° C to 50° C
Vibration	7 Grms (10 Hz to 2000 Hz) Random
Shock	70 G, 11 ms, half-sine
Dimensions (H x W x L)	51 mm x 51 mm x 74 mm
Weight	191 g (without tripod)

## GUI Interface

A user-friendly GUI (graphical user interface) is provided. This interface allows users to control the following functions of the TM-4200CL camera:

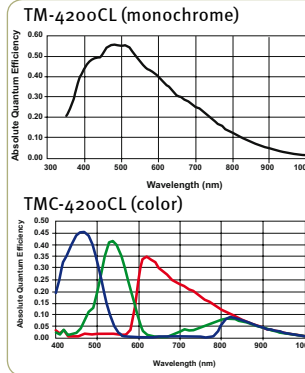
- Shutter control for manual async. and pulse-width control
- Gain control
- Offset control
- Save settings
- Load settings
- Report settings
- LUT setting and graphic display
- Scanning mode selection and option selections
- Channel auto balancing



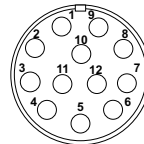
Camera parameters can be uploaded from the PC to the camera. Once these parameters are stored in EEPROMs, an instantaneous change from one setting to another can be done with a delay of few frames in between.

Software available for download at [www.jai.com](http://www.jai.com)

## Spectral Response



## Connector Pin-out



### 12-Pin Connector

- |                 |              |
|-----------------|--------------|
| 1 GND (power)   | 7 VD in      |
| 2 +12V          | 8 Strobe out |
| 3 GND (analog)  | 9 HD in      |
| 4 Video out     | 10 NC        |
| 5 GND (digital) | 11 Reserved  |
| 6 VINIT in      | 12 NC        |

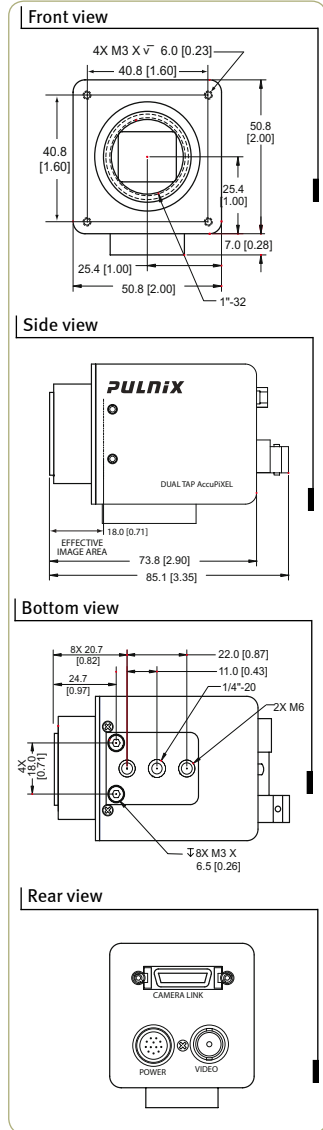
## Shutter Speed

	Manual	Async
0	no shutter	no shutter
1	1/60	1/16,000
2	1/125	1/8,000
3	1/250	1/4,000
4	1/500	1/2,000
5	1/1,000	1/1,000
6	1/2,000	1/500
7	1/4,000	1/250
8	1/8,000	1/125
9	1/16,000	Ext. pulse width control

## Ordering Information

Camera	
Lead Processing	TM-4200CL (mono), TMC-4200CL (color)
RoHS Compliant	RM-4200CL (mono), RMC-4200CL (color)
Optional Functions	
Internal IR Filter Added	OP3-1
Optical Filter Removal	OP3-2 (color only)
Glassless CCD Imager	OP21
Ultraviolet Imager	OP21-UV (monochrome only)
F mount	OP65-6
M42 mount	OP65-7
M42 mount, 10mm back focus	OP65-8
Optional Accessories (MUST BE ORDERED SEPARATELY)	
I/O	26CL-02-26 (2m)
Power Supply	PD-12UUP (includes power connector)
Power Supply/2m cable	PD-12UU/12P-02S

## Dimensions



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