

## ❖ **TM-1402 CL / TMC-1402 CL** Progressive Scan CCD



- *1/2" progressive scan IT CCD imager (ICX205AL/ICX205AK)*
- *1392(H) x 1040(V) @ 30 fps*
- *4.65  $\mu$ m square pixels*
- *Compact 44 x 44 x 63 mm housing with high-rel connector*
- *LVDS versions: order TM-1402 and TMC-1402*
- *Camera Link output and analog output*
- *30/15 frames per second selectable*
- *Maximum dynamic range control with built-in look-up table*
- *Image center partial scan (500, 250 lines)*
- *Full-frame shutter to 1/16,000 sec.*
- *Asynchronous reset, no-delay shutter with pulse-width exposure control*
- *RS-232 external control*
- *Adjustable back-focus*
- *Monochrome or color*



# Specifications for TM-1402CL/TMC-1402CL†

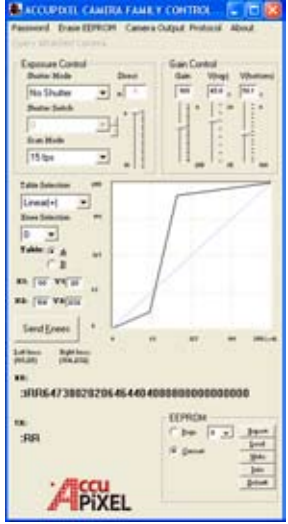
Specifications		TM-1402CL/TMC-1402CL
Sensor		1/2" progressive scan interline transfer CCD
Active area		6.47mm x 4.84mm
Active pixels		1392 (H) x 1040 (V)
Cell size		4.65 μm x 4.65 μm
Readout modes		1392 (H) x 1040 (V) @ 30/15 Hz (selectable) 1392 (H) x 500 (V) @ 56 Hz (partial scan) 1392 (H) x 250 (V) @ 98 Hz (partial scan)
Synchronization*		Internal/External auto switch HD/VD, 4.0 Vp-p impedance 4.7K Ω VD = 15/30 Hz ± 2%, non-interlace HD = 15/55/31.09 kHz ± 2%
Pixel clock		50.00/25.00 MHz
S/N ratio**		>52 dB
Sensitivity	Mono Color	0.9 lux f=1.4 (no shutter) @ 30 fps, 7.6 lux f=1.4 (no shutter) @ 30 fps,
Video output	Analog Digital	714 mV, 75 Ω (900 mV white clip) 8-bit Base Camera Link 10-bit Base Camera Link (OP93-1)
Color (RMC/TMC-1402 only)		Raw Bayer output for host-based interpolation
Gamma		Programmable LUT (1.0 std)
Lens mount		C-mount (use 1/3" format lenses)
Power		12V DC ± 10%, 350 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)		44.5 mm x 44.5 mm x 63 mm
Weight		139.8 g (without tripod)

† For LVDS version specifications refer to product manual  
\* External sync only at 30 fps  
\*\* Image quality will degrade with increasing temperature

### GUI Interface

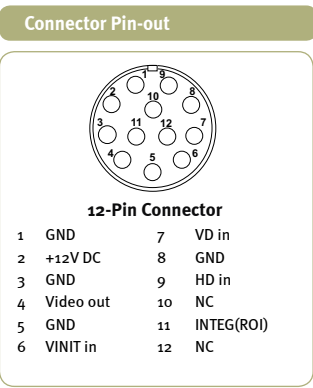
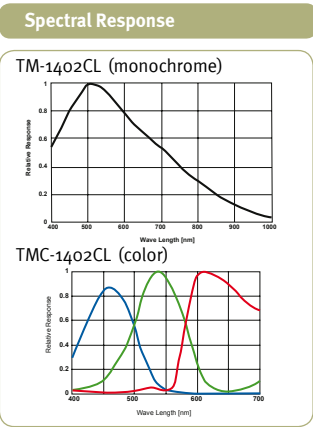
A user-friendly GUI (graphical user interface) is provided. This interface allows users to control the following functions of the TM-1402CL camera:

- 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)



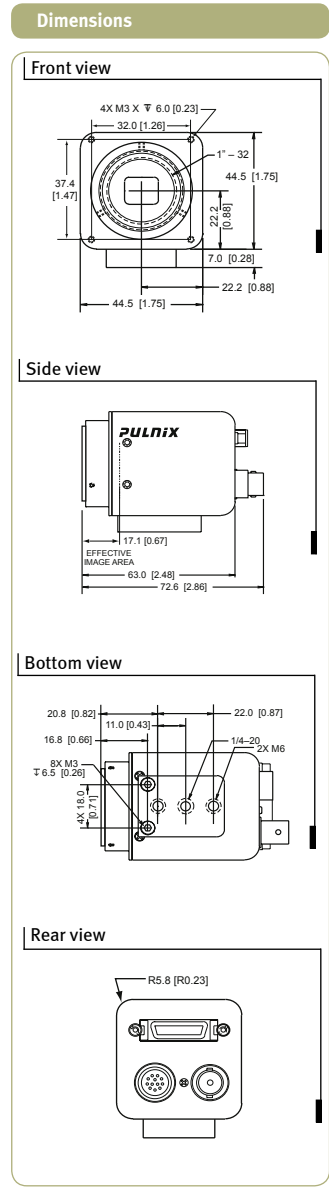
### Shutter Speed

Manual	Async
0 no shutter (1/30)	no shutter (1/30)
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

(For 15 fps mode, the shutter speed is halved)

### Ordering Information

Camera	
Lead Processing	TM-1402CL (mono), TMC-1402CL (color)
RoHS Compliant	RM-1402CL (mono), RMC-1402CL (color)
Optional Functions	
Internal IR Cut Filter Added	OP3-1
Optical Filter Removal	OP3-2 (color only)
Ultraviolet Imager	OP21-1UV (monochrome only)
Strobe Output	OP8o
10-Bit Output	OP93-1
Optional Accessories (must be ordered separately)	
I/O	26CL-02-26
Power Cable	12P-02S power cable with open leads
Power Supply	PD-12UUP (includes power connector)



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