

## ❖ **TM-2040GE/TMC-2040GE** Progressive Scan CCD



- 1" progressive scan IT CCD (Kodak KAI-2020)
- 1600 x 1200 pixels @ 34 fps dual-tap mode
- 7.4  $\mu\text{m}$  square pixels
- SW selectable single-tap mode @ 17 fps
- 12-bit A/D (linear) or 8-bit/10-bit with look-up table (LUT)
- GigE Vision Ethernet output and analog output
- 100 m with standard CAT 5E or CAT 6 cable
- Image center partial scan (600, 300, 150 lines)
- User-programmable variable partial scan
- 2X binning (H & V independently selectable)
- Full-frame shutter to 1/32,000 sec.
- Asynchronous reset, no-delay, pulse width control shutter
- Defective pixel compensation
- PIV (particle imaging velocimetry) mode
- Extensive software developer's kit (SDK)
- Monochrome or color

**GigE**<sup>TM</sup>  
VISION



# Specifications for TM-2040GE/TMC-2040GE

| Specifications               |                       | TM-2040GE/TMC-2040GE  |
|------------------------------|-----------------------|---|
| Sensor                       |                       | 1" progressive scan interline transfer CCD  |
| Active area                  |                       | 11.8mm x 8.8mm  |
| Active pixels                |                       | 1600 (H) x 1200 (V)   |
| Cell size                    |                       | 7.4 μm x 7.4 μm   |
| Readout modes                | A<br>B<br>C<br>D<br>U | 1600 (H) x 1200 (V) @ 34 Hz<br>1600 (H) x 600 (V) @ 58 Hz (partial scan)<br>1600 (H) x 300 (V) @ 90 Hz (partial scan)<br>1600 (H) x 150 (V) @ 122 Hz (partial scan)<br>user-programmable partial scan |
| Synchronization              |                       | Internal/External auto switch<br>HD/VD, 4.0 Vp-p impedance 4.7K Ω<br>VD= 34 Hz ± 2%, non-interlace<br>HD= 41.7 kHz ± 2%   |
| Pixel clock                  |                       | 40.00 MHz   |
| S/N ratio                    |                       | >58 dB  |
| Sensitivity                  | Mono<br>Color         | 0.4 lux f=1.4 (no shutter) @ 34 fps,<br>2.4 lux f=1.4 (no shutter) @ 34 fps,<br>Pixel sensitivity: 30 μV/e-   |
| Video output                 | Analog<br>Digital     | 1.0 Vp-p, 75 Ω<br>Gigabit Ethernet (8-bit/10-bit/12-bit)  |
| Color (RMC/TMC-2040 only)    |                       | Raw Bayer output for host-based interpolation   |
| Gamma                        |                       | Programmable LUT (Gamma 1.0 std)  |
| Shutter speed (programmable) |                       | 1/34 to 1/32,000 sec in increments of 24 μs   |
| Lens mount                   |                       | C, F, M42 mount (use 1" format lenses)  |
| Power                        |                       | 12V DC ± 10%, 800 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 85 mm   |
| Weight                       |                       | 216 g (without tripod)  |

## GUI Interface

A user-friendly graphical user interface (GUI), provided as part of the camera's extensive software development kit (SDK), allows users to control various camera functions, including:

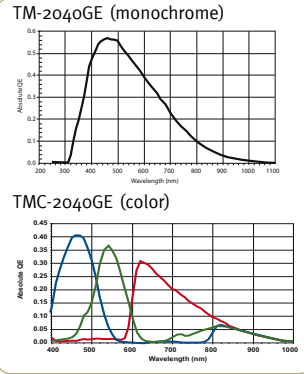
- Shutter control for manual async. and pulse width control
- Gain control
- A/D reference voltage control
- Save settings
- Load settings
- Report settings
- LUT setting and graphic display
- Scanning mode selection and Option selections



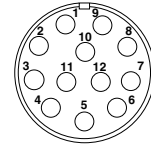
The SDK also provides functions for controlling the grabbing of images, and configuring local I/Os, by means of an integrated API and a set of powerful C++ classes. Changes in the camera's acquisition modes automatically update the API for easy image acquisition. CPU usage is only a few percent, thanks to the TCP/IP offload engine.

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

## Spectral Response



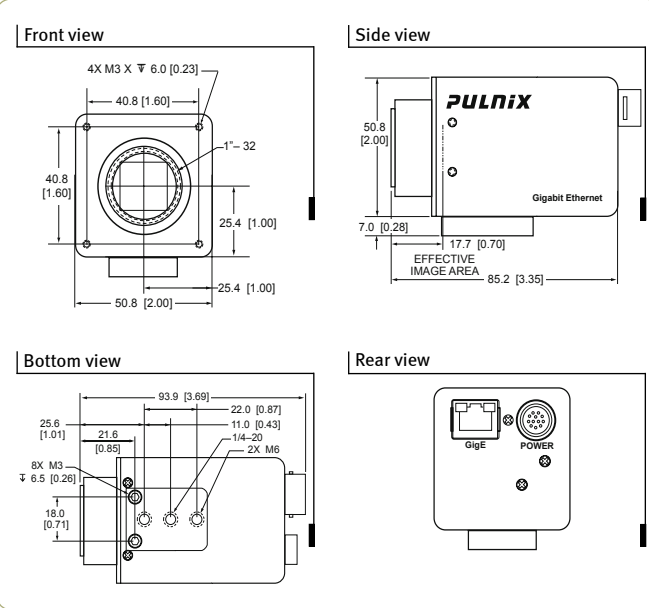
## Connector Pin-out



### 12-Pin Connector

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

## Dimensions



## Ordering Information

| Camera  |  |
|---|--|
| Lead Processing                                   | TM-2040GE (mono), TMC-2040GE (color)       |
| RoHS Compliant                                    | RM-2040GE (mono), RMC-2040GE (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) |  |
| Power Supply/2m cable                             | PD-12UUP/12P-02S                           |
| Power Supply                                      | PD-12UUP series (includes power connector) |

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