TM-7 and TM-7CN Series Cameras

Features

- High resolution 768 (H) X 494 (V) TM-7 series (EIA) 752 (H) X 582 (V) TM-6 series (CCIR)
- Super mini size
- Shutter from 1/60 to 1/10,000 sec.
- Asynchronous reset
- Ext. sync (TM-7EX), clock and sync out (TM-7CN)
- Connector output, manual gain, AGC and gamma switch (TM-7CN)
- Advanced 1/2" interline transfer CCD
- Custom cable length (TM-7) optional
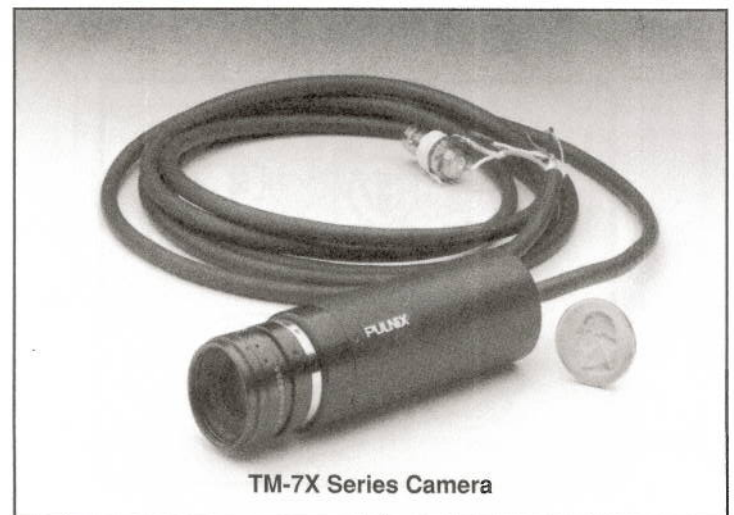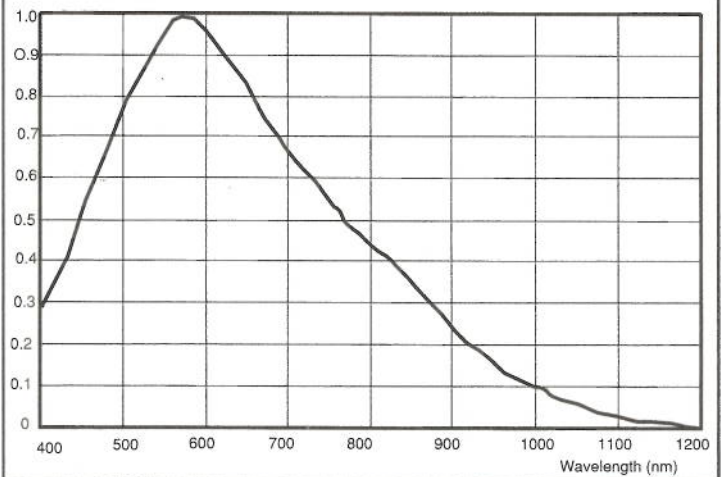- 9-12 DC, 2.5W

General Description

The TM-7 series cameras represent a quantum step in CCD camera development. For the first time, the user has superb resolution with numerous standard and optional features in a very tiny package. These cameras fit easily, both physically .nd functionally, into all types of machine vision, automated processing, and related applications. Other uses include remotely piloted vehicles, miniature inspection devices, surveillance, microscopes and medical equipment. The tiny size eliminates the need for a remoted imager camera in all but the most confined spaces.

The TM-7 series offers the highest resolution interline transfer 1/2" CCD imager available to date. Industrial users can now easily access the most commonly needed adjustments (gain, gamma, and AGC) right on the rear of the "CN" and "EX" versions. The standard TM-7 eliminates all connectors and adjustments in lieu of a single, multi-conductor cable located on the rear of the camera. This is desirable in dirty or dusty locations, or when necessary to deter casual tampering with the camera settings. The tiny cylindrical "X" type cameras offer the smallest package yet for location in small areas. Both the TM-7 and TM-7X feature all input and output functions over a single, flexible cable.

All the cameras in the TM-7 series have shutter capability. The "CN" and "EX" versions allow for the external selection of eight different shutter speeds (1/60 sec. to 1/10,000 sec.) by attaching the SC-745 Shutter Controller to the 6-pin connector located on the rear of the camera. Asynchronous ;huttering is also possible.
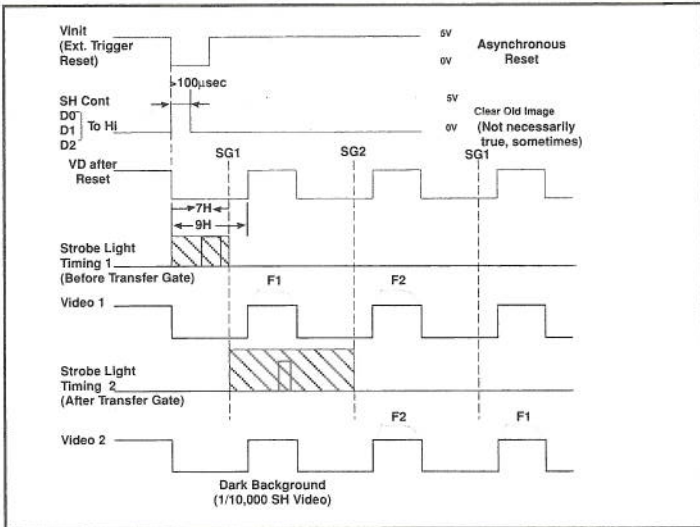
The "EX" version provides for external sync. Also available as an option is the ability to output the clock. All cameras are C-mount; the "CN" and "EX" models include auto iris outputs.

TM-7 Series Spectral Response

TM-7X Series Camera

Asynchronous Reset Timing with Strobe Light or LED Flash
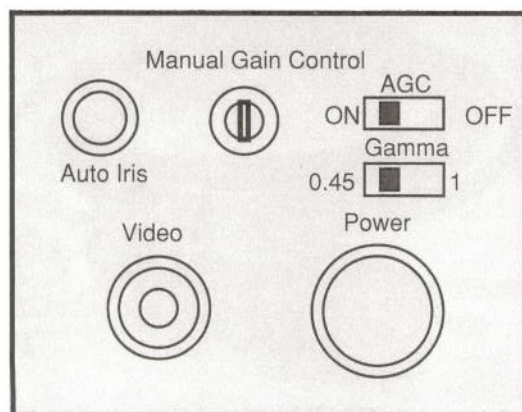

Shutter Speeds

Shutter speeds for the TM-7CN/6CN and TM-7EX/6EX are controlled by attaching the SC-745 Shutter Controller to the 6-pin connector located on the rear of the camera. Below is the control setting information.

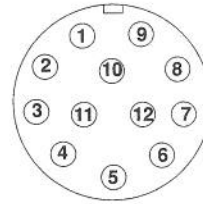| Control Setting	0	1	2	3	4	5	6	7
(sec)	1/60	1/125	1/250	1/500	1/1000	1/2000	1/4000	1/10000
D0	L	H	L	H	L	H	L	H
D1	L	L	H	H	L	L	H	H
D2	L	L	L	L	H	H	H	H

NOTE: If strobe is fired after SG (Transfer Gate), the video output will be delayed one field.

Rear Panel
TM-7CN/TM-6CN and
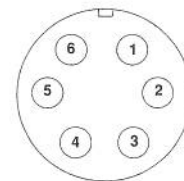### TM-7EX/TM-6EX

12-Pin Connector
TM-7EX/TM-6EX and
TM-7CN/TM-6CN

TM-7EX	Pin No.	TM-7CN
GND	1	GND
+12VDC	2	+12VDC
GND	3	GND
Video	4	Video
N/C	5	GND
Vinit in	6	Sync out
VD in	7	Clock out*1
N/C	8	N/C
HD in	9	Vinit in
N/C	10	N/C
N/C	11	N/C
N/C	12	GND

*1 28.6363 MHz external clock input (RV option)

Cable for TM-7/TM-6 and TM-7X/TM-6X

Pin No.		Cable
1	GND	Gray
2	+12VDC	Yellow
3	GND	Red coax shield
4	Video	Red coax
5	GND	Orange coax shield
6	Sync out	Orange coax
7	Clock out*1	Black coax
8	N/C	White shield (N/C *2)
9	Vinit in	White coax
10	N/C	Brown (5V)
11	N/C	Blue (D2 ... 1/1000 sec)
12	GND	Black coax shield

*1 28.6363 MHz external clock input (RV option)
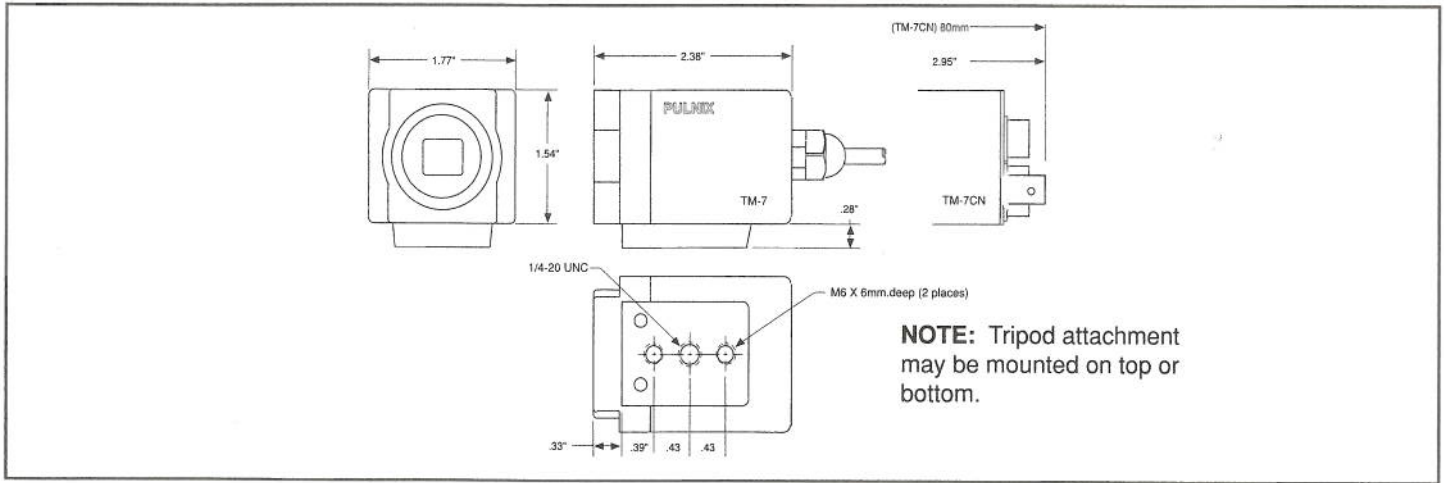*2 Auto iris control output (optional)
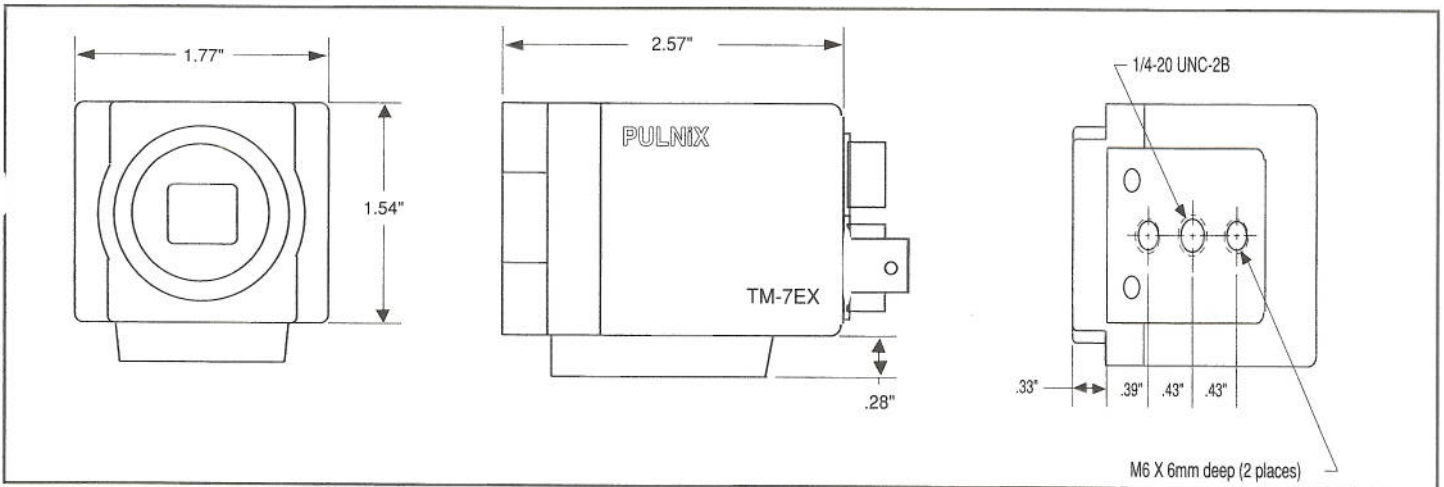

6-Pin Connector
TM-7EX/TM-6EX and
TM-7CN/TM-6CN

Pin No.

1	D2
2	GND
3	Video
4	+12V (or 5V)
5	D0
6	D1

Physical Dimensions

TM-7, TM-6, TM-7CN, TM-6CN

NOTE: Tripod attachment may be mounted on top or bottom.
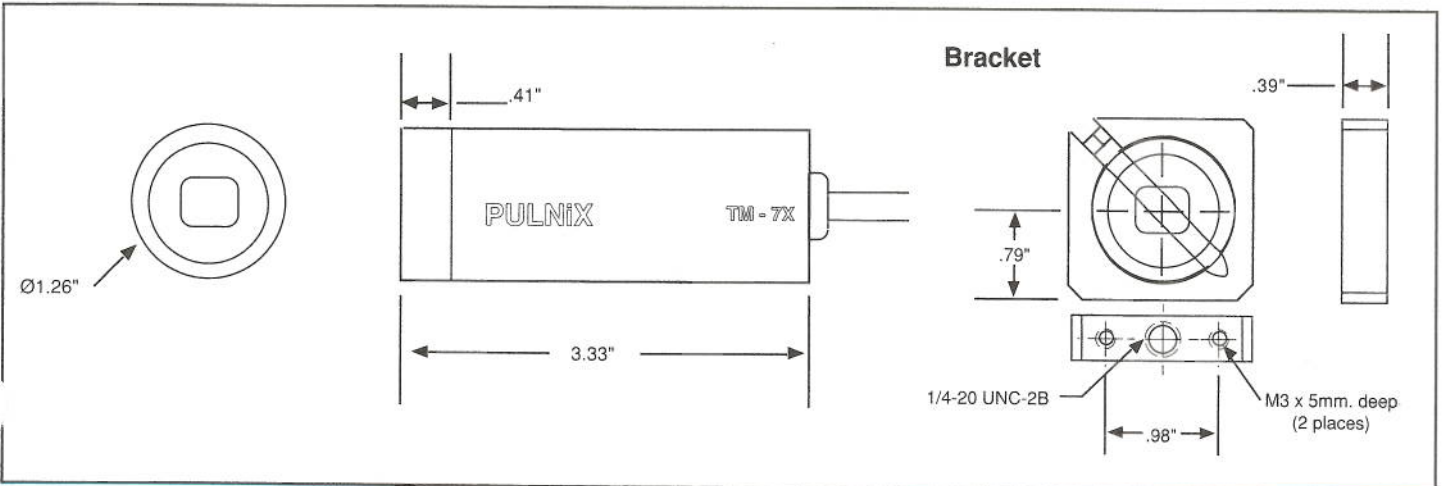
TM-7EX, TM-6EX

TM-7X, TM-6X

Specifications

Model	TM-7EX (EIA)	TM-7CN (EIA)	TM-7 (EIA)	TM-7X (EIA)
Imager	1/2" Interline transfer CCD			
Pixel	768 (H) x 494 (V)			
Cell size	8.4 μm X 9.8 μm			
Scanning	525 lines EIA			
Sync	Internal/external auto switch fH=15.734 KHz ±5% fV=59.94 Hz ±5%	Internal crystal		
TV resolution	570 (H) X 350 (V)			
S/N ratio	50 dB min. AGC off			
Min. illumination	1 lux (F=1.4)			
Video output	1.0 Vp-p composite video, 75Ω			
AGC	ON/OFF back panel switch (16 dB std., 32 dB max.)		ON/OFF (16dB std., 32 dB max.)	
Gamma	1 or 0.45 Back panel switch		1 or 0.45	
Lens mount	C-mount			
Power req.	9-12 V DC, 220 mA			
Operating temp.	-10° C to +50° C			
Vibration & shock	Vibration 7G (11 Hz to 200 Hz) Shock 70G			
Size (W X H X L)	45mm X 39mm X 65mm 1.77" X 1.54" X 2.56"	45mm X 39mm X 60mm 1.77" X 1.54" X 2.36"		32mm (dia.) X 85mm 1.26" X 3.31"
Weight	180 grams			
Power cable	KC-10 or 12P-02		2-meter interface cable attached	
Power supply	K25-12V, DC-12 or PD-12			
Auto iris connector	PC-6P		None	
Functional options	3,7 (refer to video price list)			
Accessories	ENC-20 Video Detail Enhancer		ENC-22 Video Detail Enhancer	

Model	TM-6EX (CCIR)	TM-6CN (CCIR)	TM-6 (CCIR)	TM-6X (CCIR)
Imager	1/2" Interline transfer CCD			
Pixel	752 (H) X 582 (V)			
Cell size	8.4 μ X 8.2 μ			
Scanning	625 lines CCIR			
TV resolution	560 (H) X 420 (V)			
AGC	ON/OFF Back panel switch (16 dB std., 32 dB max.)		ON	
Gamma	1 or 0.45 back panel switch		1	
Power supply	P-15-12			

All other specifications same as EIA models.

Due to ongoing product improvements, specifications may change without notice.

Ordering Considerations

As a reminder, the TM-7/TM-6 and TM-7X/TM-6X come factory set with field mode, gamma 1.0 and AGC ON. Please be sure that these settings are acceptable for your application, as it requires an internal modification to change them later. Optional settings are frame mode, gamma 0.45, and AGC OFF.

PULNiX does not charge for these settings if specified at the time order is originally placed. PULNiX will charge standard option fees if added or changed later.

Also, extra cable length for the TM-7,-7X,-6, -6X is a charge item. Call PULNiX for pricing.