

# VT Series

High Sensitivity & High Speed TDI Line Scan Cameras



## VTDI

- Next generation hybrid TDI line scan technology
- Up to 250 kHz at 9k resolution and 100 kHz at 23k resolution
- Greater sensitivity at faster speed with very low noise



**VIEWWORKS**

[www.viewworks.com](http://www.viewworks.com)

# VT Series – High Sensitivity TDI Line Scan Cameras

## Overview

VT series, Vieworks' Time Delayed Integration line scan cameras, is designed for applications where faster line rates and higher sensitivity are crucial.

Vieworks' advanced TDI line scan technology based on the outstanding hybrid imaging sensors allows image captures as fast as 250 kHz line rates with up to 128× higher sensitivity using the M72 mount based VT-9K7X camera.

Even superior resolution and sensitivity, up to 23360 pixel resolution at 100 kHz line rate and 256× greater sensitivity can be achieved using the M95 mount based VT-23K3.5X camera.

A diverse lineup of VT TDI line scan cameras is now available at reasonable prices to meet various system design requirements including resolution, line rate, sensitivity and lens mount (M42/M72/M95) specifications.

VT series is available with Camera Link or the latest CoaXPress interface standard to meet application-specific requirements.

Featured with high speed and high sensitivity, this brand new technology is ideal for demanding applications such as flat panel display inspection, wafer inspection, printed circuit board inspection, and high-performance document scanning.

## Main Features

- 3k / 4k / 6k / 9k / 12k / 16k / 18k / 23k TDI Line Scan Cameras
- Bidirectional Operations with up to 256 TDI stages
- CoaXPress or Camera Link Interface
- Anti-blooming
- Exposure Control
- Advanced PRNU and DSNU Correction
- Area Scan Mode for Camera Alignment

## Applications

- Flat Panel Display Inspection
- Printed Circuit Board Inspection
- Wafer Inspection
- High Performance Document Scanning



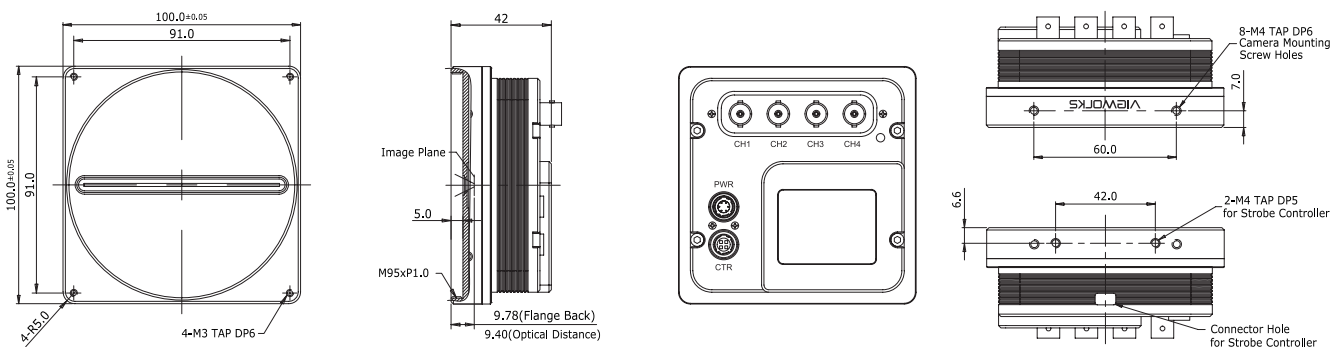
# VT Series – High Sensitivity TDI Line Scan Cameras

M95 Mount based VT Series Specifications



Model	VT-16K5X-H140	VT-23K3.5X-H100
Resolution (H × V)	16384 × 256	23360 × 256
Pixel Size	5.0 μm × 5.0 μm	3.5 μm × 3.5 μm
Interface	CoaXPress	
Max. Line Rate	140 kHz	100 kHz
Max. Line Rate (2 × 2 Binning)	120 kHz	100 kHz
Min. Line Rate	1 kHz	
Pixel Data Format	8 / 10 / 12 bit	
TDI Stage	64 / 128 / 192 / 256	64 / 128 / 192 / 256
Trigger Mode	Free-Run, Timed, Trigger Width	
Throughput	2.29 Gpix/s	2.34 Gpix/s
Gamma Correction	User Defined Lookup Table (LUT)	
Black Level	Adjustable (-255 ~ 255 at 8 bit)	
Gain Control	Analog Gain: ×1, ×2, ×3, ×4 / Digital Gain: ×1.0 ~ ×8.0	
Lens Mount	M95 × 1	
Dimension / Weight	100 mm × 100 mm × 42 mm / 608 g	
Temperature	Ambient Operating: 0°C ~ 50°C (Housing: 10°C ~ 50°C), Storage: -40°C ~ 70°C	
Power	10 ~ 30 V DC	
Power Dissipation	Typ. 12 W	Typ. 15 W
API SDK	Vieworks Imaging Solution 7.X	

## Mechanical Dimension in mm



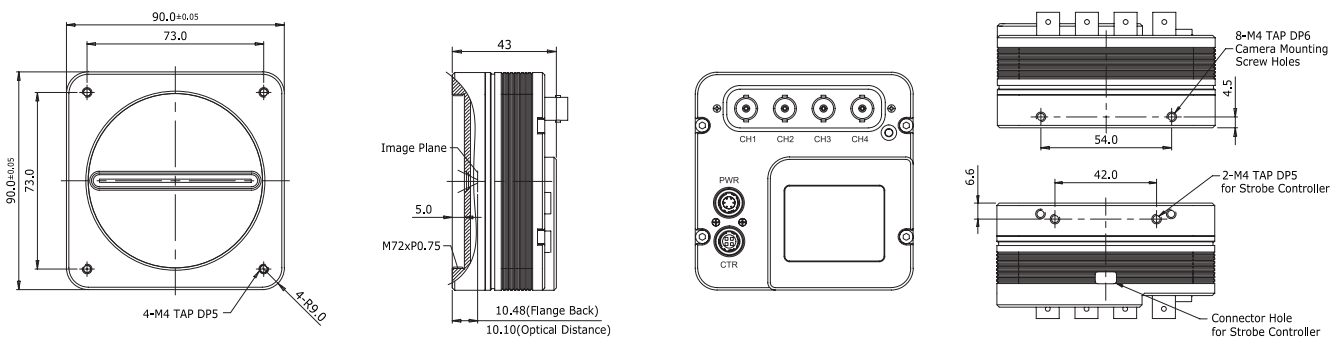
# VT Series – High Sensitivity TDI Line Scan Cameras

M72 Mount based VT Series Specifications



Model	VT-18K3.5X-H140	VT-12K5X-H200	VT-9K7X-H250	VT-6K10X-H170
Resolution (H × V)	17824 × 256	12480 × 256	8912 × 128	6240 × 128
Pixel Size	3.5 μm × 3.5 μm	5.0 μm × 5.0 μm	7.0 μm × 7.0 μm	10.0 μm × 10.0 μm
Interface	CoaXPRESS			
Max. Line Rate	136 kHz (@ROI 17824) 142 kHz (@ROI 17120)	192 kHz (@ROI 12480) 200 kHz (@ROI 12000)	250 kHz (@ROI 8912)	172 kHz (@ROI 6240)
Max. Line Rate (2 × 2 Binning)	142 kHz	172 kHz	208 kHz	–
Min. Line Rate	1 kHz			
Pixel Data Format	8 / 10 / 12 bit			
TDI Stage	64 / 128 / 192 / 256		32 / 64 / 96 / 128	
Trigger Mode	Free-Run, Timed, Trigger Width			
Throughput	2.42 Gpix/s	2.40 Gpix/s	2.23 Gpix/s	1.07 Gpix/s
Gamma Correction	User Defined Lookup Table (LUT)			
Black Level	Adjustable (–255 ~ 255 at 8 bit)			
Gain Control	Analog Gain: ×1, ×2, ×3, ×4 / Digital Gain: ×1.0 ~ ×8.0			
Lens Mount	M72 × 0.75			
Dimension / Weight	90 mm × 90 mm × 43 mm / 500 g			
Temperature	Ambient Operating: 0°C ~ 40°C (Housing: 10°C ~ 50°C), Storage: –40°C ~ 70°C			
Power	10 ~ 30 V DC			
Power Dissipation	Typ. 12 W	Typ. 10 W	Typ. 10 W	Typ. 10 W
API SDK	Vieworks Imaging Solution 7.X			

## Mechanical Dimension in mm



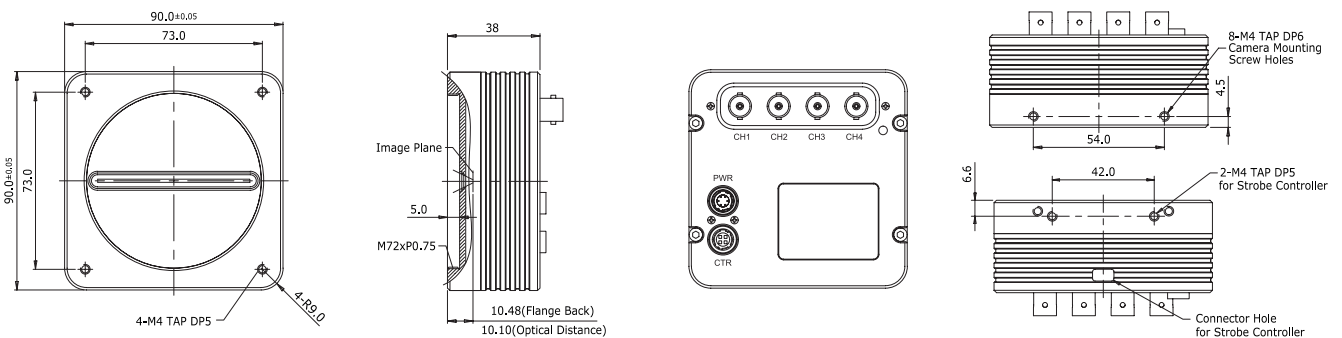
# VT Series – High Sensitivity TDI Line Scan Cameras

M72 Mount based VT Series Specifications



Model	VT-18K3.5X-H80	VT-12K5X-H100	VT-9K7X-H120
Resolution (H × V)	17824 × 256	12480 × 256	8912 × 128
Pixel Size	3.5 μm × 3.5 μm	5.0 μm × 5.0 μm	7.0 μm × 7.0 μm
Interface	CoaXPRESS		
Max. Line Rate	80 kHz (@ROI 17824)	100 kHz (@ROI 12480)	125 kHz (@ROI 8912)
Max. Line Rate (2 × 2 Binning)	80 kHz	100 kHz	125 kHz
Min. Line Rate	1 kHz		
Pixel Data Format	8 / 10 / 12 bit		
TDI Stage	64 / 128 / 192 / 256		32 / 64 / 96 / 128
Trigger Mode	Free-Run, Timed, Trigger Width		
Throughput	1.43 Gpix/s	1.25 Gpix/s	1.11 Gpix/s
Gamma Correction	User Defined Lookup Table (LUT)		
Black Level	Adjustable (-255 ~ 255 at 8 bit)		
Gain Control	Analog Gain: ×1, ×2, ×3, ×4 / Digital Gain: ×1.0 ~ ×8.0		
Lens Mount	M72 × 0.75		
Dimension / Weight	90 mm × 90 mm × 38 mm / 500 g		
Temperature	Ambient Operating: 0°C ~ 40°C (Housing: 10°C ~ 50°C), Storage: -40°C ~ 70°C		
Power	10 ~ 30 V DC		
Power Dissipation	Typ. 12 W	Typ. 10 W	Typ. 10 W
API SDK	Vieworks Imaging Solution 7.X		

## Mechanical Dimension in mm



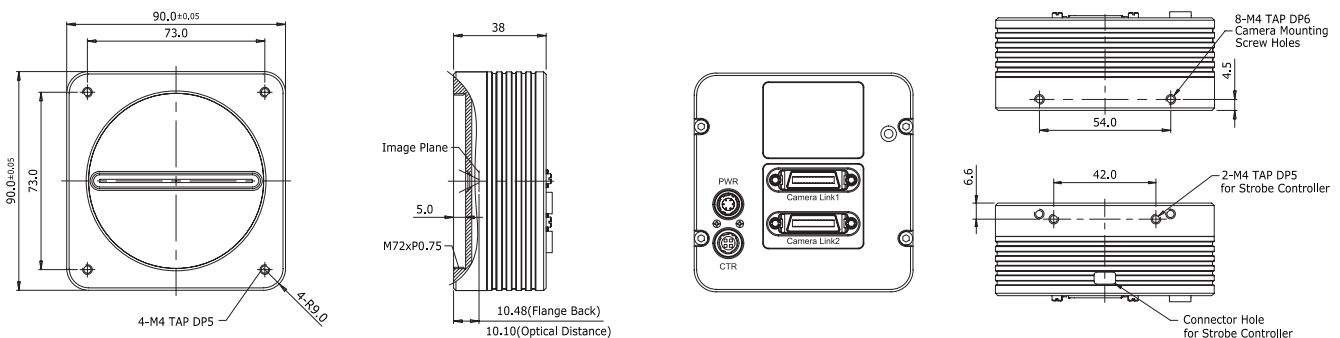
# VT Series – High Sensitivity TDI Line Scan Cameras

M72 Mount based VT Series Specifications



Model	VT-18K3.5C-H40	VT-12K5C-H60	VT-9K7C-H80	VT-4K14C-H120	VT-4K7C-H120
Resolution (H × V)	17824 × 256	12480 × 256	8912 × 128	4096 × 64	4096 × 128
Pixel Size	3.5 μm × 3.5 μm	5.0 μm × 5.0 μm	7.0 μm × 7.0 μm	14.0 μm × 14.0 μm	7.0 μm × 7.0 μm
Interface	Camera Link				
Max. Line Rate	47kHz(@ROI 17824)	67kHz(@ROI 12480)	94kHz(@ROI 8912)	125kHz(@ROI 4096)	125kHz(@ROI 4096)
Max. Line Rate (2 × 2 Binning)	80 kHz	100 kHz	120 kHz	–	120 kHz
Min. Line Rate	1 kHz				
Pixel Data Format	8 bit (2/4/8/10 Tap) / 10 bit (2/4 Tap) / 12 bit (2/4 Tap)				
TDI Stage	64 / 128 / 192 / 256		32 / 64 / 96 / 128	16 / 32 / 48 / 64	32 / 64 / 96 / 128
Trigger Mode	Free-Run, Timed, Trigger Width				
Throughput	0.83 Gpix/s	0.83 Gpix/s	0.83 Gpix/s	0.51 Gpix/s	0.51 Gpix/s
Gamma Correction	User Defined Lookup Table (LUT)				
Black Level	Adjustable (–255 ~ 255 at 8 bit)				
Gain Control	Analog Gain: ×1, ×2, ×3, ×4 / Digital Gain: ×1.0 ~ ×8.0				
Lens Mount	M72 × 0.75				
Dimension / Weight	90 mm × 90 mm × 38 mm / 500 g				
Temperature	Ambient Operating: 0°C ~ 40°C (Housing: 10°C ~ 50°C), Storage: –40°C ~ 70°C				
Power	10 ~ 30 V DC				
Power Dissipation	Typ. 12 W				
Configuration Software	Configurator				

## Mechanical Dimension in mm



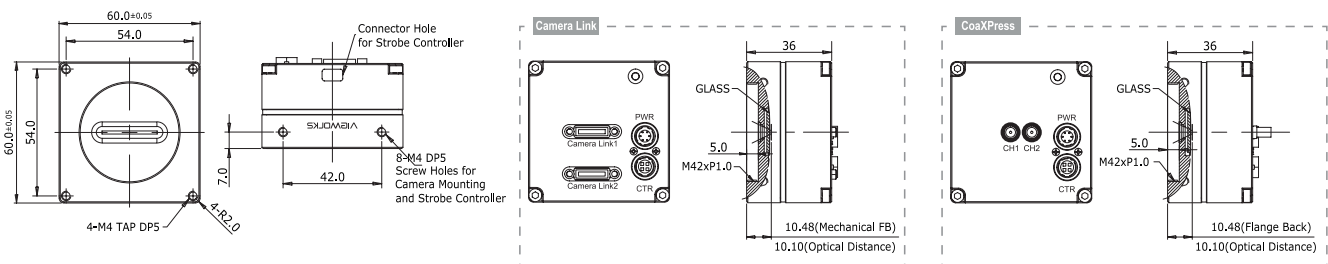
# VT Series – High Sensitivity TDI Line Scan Cameras

M42 Mount based VT Series Specifications



Camera Link	VT-3K7C-E100	VT-3K7C-H100	VT-4K5C-E100	VT-4K5C-H100	VT-6K3.5C-E100	VT-6K3.5C-H100
CoaXPRESS	VT-3K7X-E250	VT-3K7X-H250	VT-4K5X-E200	VT-4K5X-H200	VT-6K3.5X-E160	VT-6K3.5X-H160
Resolution (H × V)	3200 × 32	3200 × 128	4640 × 64	4640 × 256	6560 × 64	6560 × 256
Pixel Size	7.0 μm × 7.0 μm		5.0 μm × 5.0 μm		3.5 μm × 3.5 μm	
Interface	Camera Link / CoaXPRESS 2CH					
Max. Line Rate	100 kHz (Camera Link) 250 kHz (CXP 2 CH)		100 kHz (Camera Link) 200 kHz (CXP 2 CH)		100 kHz (Camera Link) 160 kHz (CXP 2 CH)	
Max. Line Rate (2 × 2 Binning)	100 kHz 208 kHz		100 kHz 176 kHz		100 kHz 140 kHz	
Min. Line Rate	1 kHz					
Camera Link Pixel Clock	40 MHz / 60 MHz / 80 MHz / 85 MHz					
Pixel Data Format	Camera Link: 8 bit (2/4/8/10 Tap) / 10 bit (2/4 Tap) / 12 bit (2/4 Tap) CoaXPRESS: 8 / 10 / 12 bit					
TDI Stage	32	32/64/96/128	64	64/128/192/256	64	64/128/192/256
Trigger Mode	Free-Run, Timed, Trigger Width					
Throughput	0.32 Gpix/s (Camera Link) 0.80 Gpix/s (CXP 2 CH)		0.46 Gpix/s (Camera Link) 0.93 Gpix/s (CXP 2 CH)		0.66 Gpix/s (Camera Link) 1.05 Gpix/s (CXP 2 CH)	
Gamma Correction	User Defined Lookup Table (LUT)					
Black Level	Adjustable (-255 - 255 LSB at 8 bit)					
Gain Control	Analog Gain: ×1, ×2, ×3, ×4 / Digital Gain: ×1.0 ~ ×8.0					
Lens Mount	M42 × 1 (C or F-mount is available upon request)					
Dimension/Weight	60 mm × 60 mm × 36 mm / 223 g					
Temperature	Ambient Operating: 0°C ~ 40°C (Housing: 10°C ~ 50°C), Storage: -40°C ~ 70°C					
Power	10 - 30 V DC					
Power Dissipation	Typ. 3.5 W		Typ. 4 W		Typ. 4.5 W	
API SDK for CXP	Vieworks Imaging Solution 7.X					
Config. SW for CL	Configurator					

Mechanical Dimension in mm



# VT Series – High Sensitivity TDI Line Scan Cameras

## Specifications

### Connector Specification

#### Power



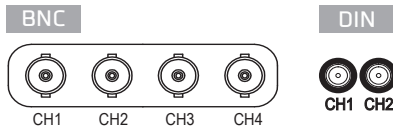
1 2 3: +12V DC, 4 5 6: GND  
(HR10A-7R-6PB)

#### Control



1: Trigger IN, 2: Direction IN  
3: DC Ground, 4: Strobe OUT+  
(HR10A-7R-4S)

#### Data Transfer/Communications



CH1: Master Connection (75 Ω)

Connectors on camera body



### Ordering Scheme

