

# CCD-16000 / C

16 MPixel Ultra-High Resolution Progressive-Scan  
CCD Camera with 12-bit Digital-Output



## Features

- 4896 (H) x 3264 (V) square pixels
- 2 frames/sec.
- Progressive scan
- Interline-transfer sensor (36 x 24 mm)
- Asynchronous shutter up to 1/7000 sec. (image on demand)
- Effective camera dynamics:  $\geq 1:1000$  ( $\geq 60$  dB)
- Digital RS-644 output with 12-bit (LVDS)
- Very compact design
- Optional: color sensor (Bayer filter)

With a resolution of 4896 x 3264 effective pixels, the **CCD-16000** is a further member of the VDS highest resolution CCD camera family.

The **CCD-16000** supplies 2 frames/sec. at the full resolution. Even 4 frames/sec. can be achieved in the binning mode 4896 (H) x 1632 (V).

By means of the very big sensor in 35 mm format (36 x 24 mm) many applications can be much better realized than with smaller sensors. In addition to the 35 mm format various F-mount lenses are available without the necessity of any changes within the illustration scale.

Owing to the progressive interline transfer sensor very short exposure times up to 1/7000 sec. can be achieved at a full resolution. The exposure time can be regulated in steps of approx. 144 µs. Due to the asynchronous operation (image on demand) the exposure starts 15 µs after an external trigger pulse. Therefore the camera is especially useful for recording moving objects.

The effective dynamics of the complete camera

$$D = \frac{Sat_{(count)} - Dark_{(count)}}{RMSNoise_{(count)}}$$

is more than 1000 and therefore offers reserves even at difficult lighting conditions or very short exposure times. The RS-644 digital output supplies image data with 12-bit precision. The **CCD-16000** is in the main identical regarding the mechanics and pin-compatible to the CCD-1300 camera line.

### Technical Data

- Resolution: 4896 (H) x 3264 (V) pixels
- Progressive scan
- Image rate: up to 2 frames/sec. (4896 x 3264) or up to 4 frames/sec. (4896 x 1632)
- Pixel size: 7.4 µm x 7.4 µm
- Active sensor size: 36.26 (H) mm x 24.15 (V) mm
- Interline transfer sensor (no mech. shutter required)
- Electronic shutter up to 1/7000 sec.; adjustable in 144 µs steps
- Image on demand
- Effective dynamics: ≥ 1:1000 (≥ 60 dB)
- Sensor saturation: ≥ 30,000 e
- Anti-blooming circuit
- Exposure time up to approx. 1 sec.
- Digital output: 12-bit, RS-644 (LVDS)
- Frame system: 3328 lines
- Pixel clock: 40 MHz
- Video gain: 1 or 2 (+ 6 dB)
- Power supply: + 12 V (SELV), approx. 0.6 A
- Ambient air temperature: 0° to 40° C
- Lens mount: F-mount
- Option: color version (with Bayer filter)
- CE standard
- Made in Germany

RS-644 Digital Output (37-pin D-SUB Jack)			
Pin	Function	Pin	Function
1	PCLK	20	/PCLK
2	LEN	21	/LEN
3	FEN	22	/FEN
4	D0	23	/D0
5	D1	24	/D1
6	D2	25	/D2
7	D3	26	/D3
8	D4	27	/D4
9	D5	28	/D5
10	D6	29	/D6
11	D7	30	/D7
12	D8	31	/D8
13	D9	32	/D9
14	D10	33	/D10
15	D11	34	/D11
16	GND	35	GND
17	/TRES	36	TRES
18	/SV2	37	Mode
19	/BIN		

Power and Control Input (15-pin D-SUB Jack)	
Pin	Function
1	
2	+12V DC
3	
4	GND
5	
6	
7	
8	
9	Mode: (Open) → Continuous (GND) → IOD
10	- Trigger Input (Opto Coupler)
11	+ Trigger Input (Opto Coupler)
12	- Exposure Output (Opto Coupler)
13	+ Exposure Output (Opto Coupler)
14	Line Sync Output
15	Frame Sync Output

