

Precision is our business.



## UniLine-2048 CCD BW Line Scan Camera

### Description



UniLine series cameras are compact, rugged industrial line scanning cameras with exceptional performance features. The camera withstands ambient temperatures of up to 45° C, even at maximum data signalling rates. This allows for use in very hot production environments. A high quality CCD chip with electronic shutter for the reduction of exposure times at the selected scanning rate is at the heart of the camera. The camera's electronics automatically correct temperature related offset-level drift independent of integration time and data signalling rate. Additional offset correction procedures at the PC are thus unnecessary. As a special feature, process trigger signals

such as line start signals generated by an incremental encoder and frame start signals from an initiator can be directly connected to the UniLine-2048. Encoders are provided with the necessary supply power directly from the camera. This significantly simplifies system wiring, because, as a rule, all of the components are directly at the production line anyway. The camera only requires one single-supply 12V power pack, because all of the required operating voltages are generated with appropriate DC-DC transformers inside the camera. Some frame grabbers are equipped with a +12V auxiliary power supply which is taken from the PC and made available at the interface plug connector. In this case, supply power for the camera can be provided via the interface cable. The 4-pin power socket at the back of the camera is used if no auxiliary power is available from the frame grabber.

### Features

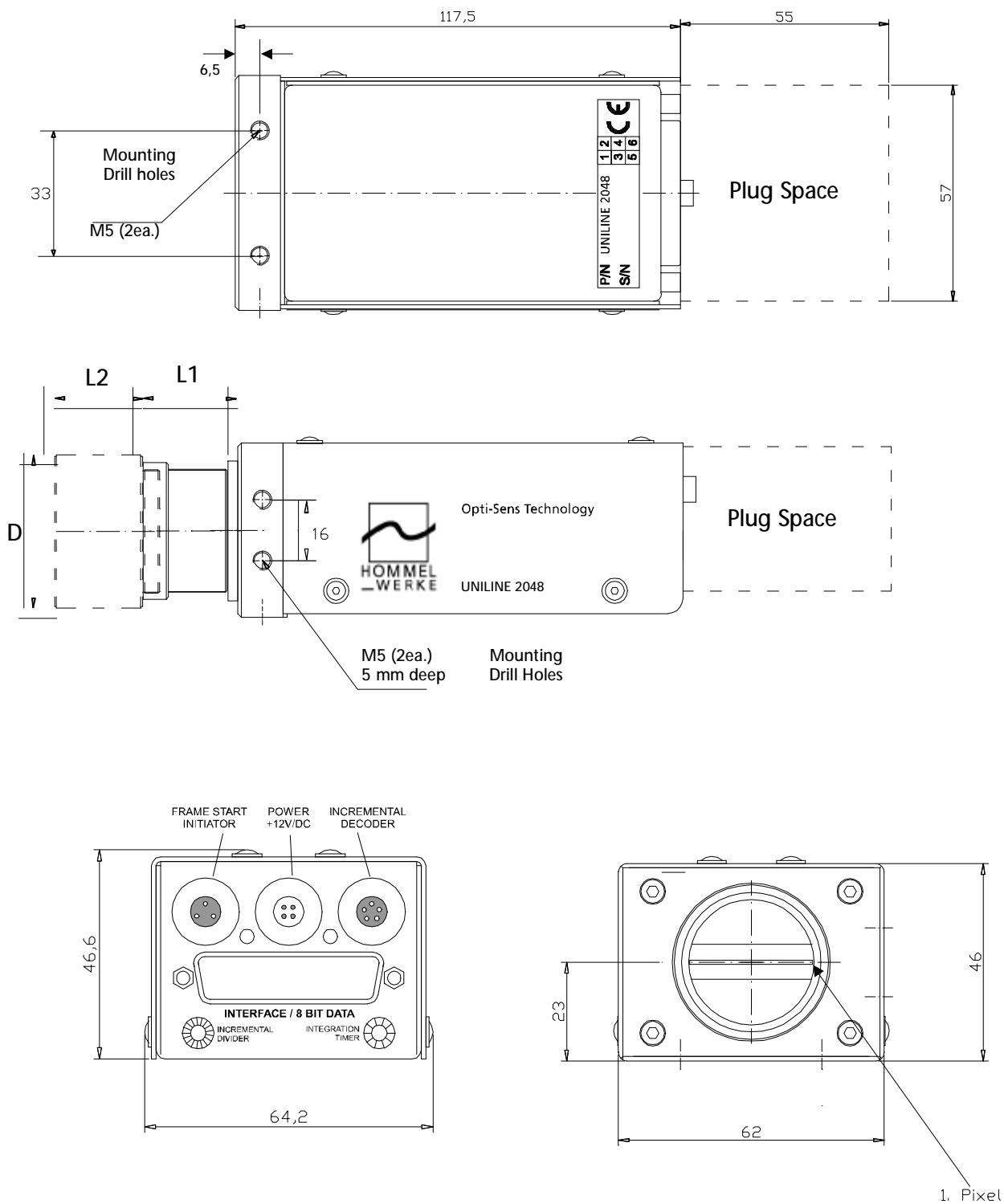
- Watchdog in the camera  
If the production line comes to a standstill, the camera continues to run on its own at 38 Hz. Valid lines as soon as the production line starts back up.
- The trigger sources for the line and the frame start directly connected to the camera and powered from the camera.
- Selectable integration time in the free running or incremental encoder mode.
- Selectable divider for the line scan trigger signal from an incremental encoder.
- Free running camera.
- Single supply +12V DC.
- Internal or external master clock.
- Programmable integration time.
- Ultra sensitivity (40V / x\*s).
- Two control bits for selectable gain.
- All settings and trigger functions can also be controlled over the frame grabber interface.

## Technical Specifications

Sensor		Timing	
Pixel geometry	14 $\mu\text{m}$ x 14 $\mu\text{m}$	Pixel frequency	max. 10 Mhz
Number of pixels	2048	Line frequency, free-running	max. 4.70 KHz
Active length of sensor line	28.67 mm	External start frequency	max. 4.60 KHz
Sensitivity	40V/(lx*s)		
Electronics			
Inputs HD SUB 44	Selection MCLK INT/EXT	RS 644 LVDS	
	Static low corresponds to	Master clock at grabber active	
	Static high corresponds to	Master clock at camera active	
	External master clock (MCLK)	RS 644 LVDS	
	External line start (EXSYNC) inclusive shutter function	RS 644 LVDS	
	Falling edge triggering the Low corresponds to	Line start Integration time	
Optional	Shutter (integration control) High Low	RS 644 LVDS Integration time Pixel reset	
	Gain control	2 TTL control bits	
Inputs 3-pin initiator socket	Frame start PNP or NPN initiators 10V-30V DC models	Low ~ 0.5V – High ~ +12V	
5-pin incremental socket	Line start via incremental encoder + 5V supplied to encoder	RS 644 or RS 422	
4-pin power supply socket	Power supply	+ 12V-DC +/- 10% ~ 300mA	
Outputs HD SUB 44	PIXEL VALID (PVAL)	RS 644 LVDS	
	LINE VALID (LVAL)	RS 644 LVDS	
	VIDEO DATA, 8 BIT	RS 644 LVDS	
	FRAME START	RS 644 LVDS	
Power consumption	Including power supply for incremental encoder and initiator	3.6 W	
Operating temperature		0°C – 45° C	
Max. relative humidity	No condensation allowed	90%	
Camera weight	without lens	420 g	
Lens	Lens mount	M 39x1/26'' or M 32.5 x 0.5	

## Camera dimensions and mounting

When mounting the camera, it must be assured that it is electrically isolated. This means that the camera housing may be electrically connected to the machine. The camera is grounded via the connector cable from the frame grabber (PC) to the camera. This prevents interference caused by ground loops which may significantly impair signal quality.

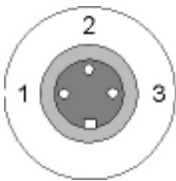

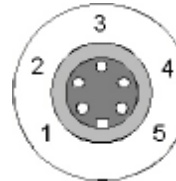


### Pin assignments

Framegrabber interface (Type: High density D-SUB 44 female – signals listed in pairs)

Pin	Signal	Pin	Signal
40	+ D0	20	OVD
39	- D0	36	+ Frame Trigger
12	+ D1	35	- Frame Trigger
11	- D1	34	- MCLK
27	+ D2	33	+ MCLK
26	- D2	4	+ Mode-MCLK Int / Ext
42	+ D3	3	- Mode-MCLK Int / Ext
41	- D3	19	+ EXSYNC & Integration
14	+ D4	18	- EXSYNC & Integration
13	- D4	2	+ Shutter optional
29	+ D5	1	- Shutter optional
28	- D5	21	Bit Gain-0 TTL
44	+ D6	32	Bit-Gain 1 TTL
43	- D6	17	NC
15	+ D7	16	NC
30	- D7	37	NC
10	+ Lval	38	NC
9	- Lval	31	NC
25	+ Pval	8	+ 12V IN POWER
24	- Pval	23	+ 12V IN POWER
6	VD	7	0V IN POWER
5	OVD	22	0V IN POWER

### Trigger inputs and power

Connector socket for frame-start initiator			Connector socket for power supply			Connector socket for incremental encoder		
								
Pin	Signal	IN/OUT	Pin	Signal	IN/OUT	Pin	Signal	IN/OUT
1	0V	O	1	+12V	I	1	+5V	O
2	Initiator signal	I	2	+12V	I	2	-Ua1	I
3	+12V	O	3	0V	I	3	+Ua1	I
			4	0V	I	4	Set_Ink	I
						5	0V	O