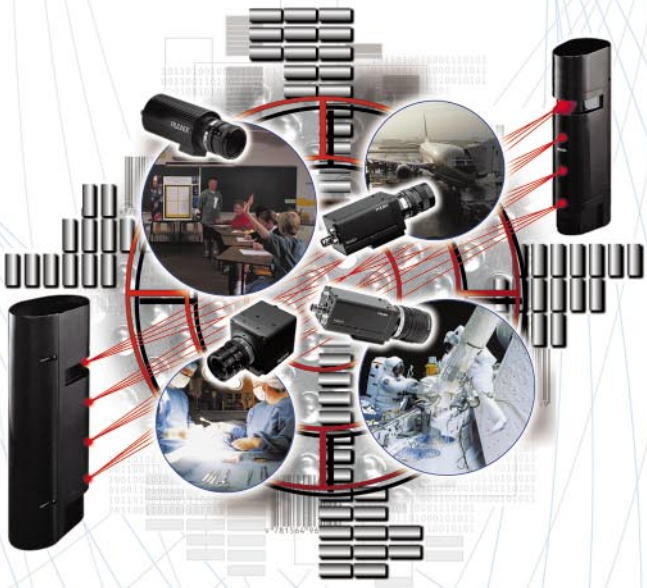
PE300/PE800/PE1300
High Resolution CCD Progressive Scan Cameras

PE300 [659 (H) x 494 (V) pixels]
PE800 [1034 (H) x 779 (V) pixels]
PE1300 [1300 (H) x 1030 (V) pixels]



The PULNiX PE300 series cameras are compact, high resolution, monochrome progressive scan video cameras. Waveform correction of video signals is controllable remotely through RS-232, making it possible to use the cameras under optimum conditions as required by each application.
Employing progressive scan CCD imagers that perform interline transfer, these cameras are suitable as sensors for high resolution measurements, pattern inspection, and character reading.

Features

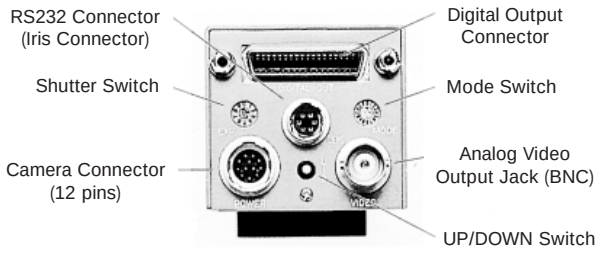
- Individual readout of every pixel by progressive scanning prevents deterioration of vertical resolution even when the electronic shutter operates.
- Output 10-bit digital video signals through RS-422. It is also possible to output through the optional RS-644 interface.
- Scanning of all pixels can be performed at rates of 12 to 30 frames per second (depending on model).
- Full frame shutter, 1/12 to 1/10,000 sec.
- Asynchronous reset with external shutter control (strobe trigger output).
- The backup memory (EEPROM) can hold 6 different operating parameters.

Applications

- Input device for high resolution image processing units with electronic shutter.
- Reading of high density bar code data.
- Reading of automobile number plates.
- Defect detection for shadow masks of LCD or CRT.
- Microscopy applications.
- Metrology applications.
- General image processing operations.

Backpanel Description

Backpanel has controls for changing the gain and modes or speeds of the electronic shutter. There are also connectors for digital, analogue and RS-232 signals.



Setting Shutter Speeds

Changeover between the high speed mode and the low speed mode, or between the continuous shutter mode and the asynchronous reset mode is done by the mode switch and the UP/DOWN switch.

Setting Operational Models

Operational modes can be set using the mode switch on the backpanel.

Progressive Scanning

By means of individual readout of every pixel, signals of all pixels are output individually and sequentially.

This method is called “Progressive Scanning”. It prevents deterioration of vertical resolution to provide high resolution images even when the electronic shutter operates.

Connection

- **RS-232 Connector**

The table below shows the RS-232 pins (6 pins) and their signals.
This connector is also used as the connector for the auto iris lens.

Pin number	Signal name
1	D2 / RXD
2	GND
3	VIDEO OUTPUT
4	+12V
5	D0 / RTS
6	D1 / TXD

- As a dedicated RS-232 cable, RS23-** is available (option)

**Any number that shows the length in metres such as 01 or 02 is placed here.
Example: RS23-01 (one metre cable)

- **RS-232 Control**

- Communication Condition

Factory set RS-232 Communication settings

Baud rate:	9600bps
Data:	8 bits / character
Stop bit:	2 stop bits
Parity:	None
Xon / xoff	No control

- **Camera Connector (HRS HR 10A-10R-12PB)**

The table below shows the relationship between the pins of the camera connector and signals.
If you are going to use an optional camera cable, please see the wire colour in the table.
The length of the camera cable should be less than 15 metres.

Pin number	Signal name	Wire Colour
1	GND (0V)	Grey
2	+12V	Yellow
3	GND (0V)	Coaxial wire (red), net wire
4	Video Output	Coaxial wire (red), core wire (white)
5	GND (0V)	Shielding wire (orange), net wire
6	Ext. trigger signal	Shielding wire (orange), core wire (yellow)
7	VD IN	Shielding wire (white), core wire (yellow)
8	GND (0V)	Coaxial wire (black), net wire
9	HD IN	Coaxial wire (black), core wire (white)
10	GND (0V)	Poly wire (brown)
11	Strobe output	Poly wire (yellow)
12	GND (0V)	Shielding wire (white), net wire

- Both the external trigger input and the strobe output are TTL level.
- Hirose Electrics, HR10A-10P-12S plug fits this product.

• Digital Output Connector (HRS DX 10A-36S)

The table below shows the relationship between pin numbers and signals.

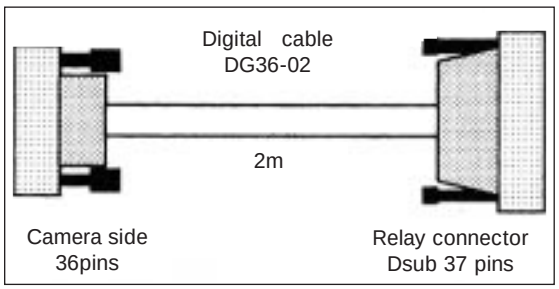
Relay connector

(Viewed from the camera)

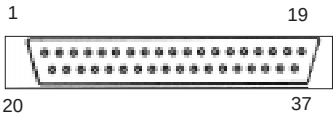
Pin number	Signal name	I/O	Pin number	Signal name	I/O
1	CLK+	Out	2	CLK-	Out
3	LDV+	Out	4	LDV-	Out
5	FDV+	Out	6	FDV-	Out
7	GND		8	GND	
9	EXT.HD	In	10	EXT.VD	In
11	NC	In	12	BUSY	Out
13	WEN	Out	14	Vinit	In
15	DO0+	Out	16	DO0-	Out
17	DO1+	Out	18	DO1-	Out
19	DO2+	Out	20	DO2-	Out
21	DO3+	Out	22	DO3-	Out
23	DO4+	Out	24	DO4-	Out
25	DO5+	Out	26	DO5-	Out
27	DO6+	Out	28	DO6-	Out
29	DO7+	Out	30	DO7-	Out
31	DO8+	Out	32	DO8-	Out
33	DO9+	Out	34	DO9-	Out
35	GND		36	GND	

CLK ... Pixel clock
LDV ... Line data valid
FDV ... Frame data valid
DO0 - DO9 ... (10-bit) Digital video output
Vinit ... External trigger (TTL)
BUSY ... Busy signal (TTL)
WEN ... Write enable signal (TTL)
HD/VD ... External synchronisation signal (TTL)

• Digital Cable (optional)



37 Pin Relay Connector



(Viewed from the connector)

Pin number	Signal name	Pin number	Signal name
1	CLK+	20	CLK-
2	LDV+	21	LDV-
3	FDV+	22	FDV-
4	NC	23	GND
5	NC	24	NC
6	DO0+	25	DO0-
7	DO1+	26	DO1-
8	DO2+	27	DO2-
9	DO3+	28	DO3-
10	DO4+	29	DO4-
11	DO5+	30	DO5-
12	DO6+	31	DO6-
13	DO7+	32	DO7-
14	DO8+	33	DO8-
15	DO9+	34	DO9-
16	GND	35	GND
17	Vinit	36	NC
18	NC	37	NC
19	NC		

• Image outputs from the camera

(1) **Progressive scanning analogue signals**
CCD output signals are amplified by the CDS/video amplifier, and can be taken directly from the video output terminal (BNC). (1.0Vp-p at 75Ω).

(2) **Progressive scanning digital video signals**
The analogue signals amplified in the CDS/video amplifier are converted to 10-bit digital signals (DO0-DO9) through the digital signal output driver, and are output from the digital output connector (36 pins) on the backpanel of the camera in the RS-422 format.

• Digital Output Signals

(1) Digital Video Outputs (DO0+ ~ DO9+, DO0- ~ DO9-)
RS-422-compliant 10-bit differential digital output signals
(Receiving end impedance : 100 - 220Ω each)

(2) Line Data Valid (LDV+, LDV-)
RS-422-compliant differential digital output signals

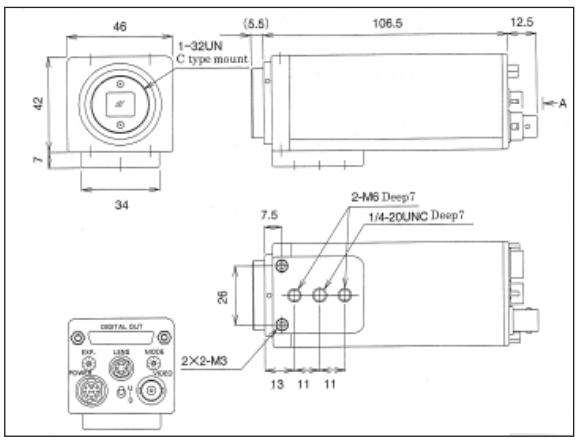
(3) Frame Data Valid (FDV+, FDV-)
RS-422-compliant differential digital output signals

Specifications

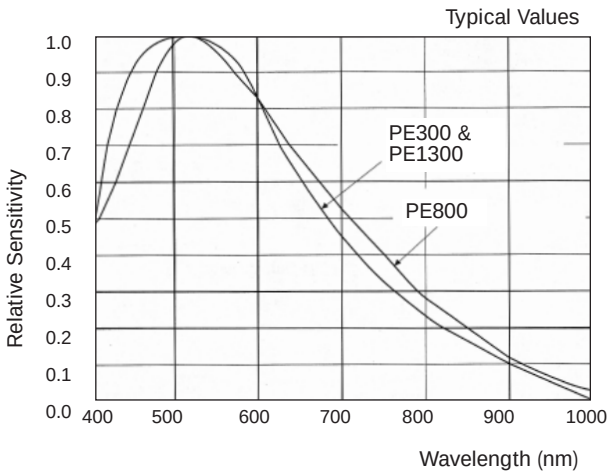
Model	High Resolution Progressive Scan Camera		
Model Number	PE300	PE800	PE1300
Imager	Progressive Scanning Interline Transfer CCD		
Format	1/3"	1/2"	2/3"
Pixel	659 (H) x 494 (V) 330k pixels	1034 (H) x 779 (V) 800k pixels	1300 (H) x 1030 (V) 1300k pixels
Cell Size	7.4µm (H) x 7.4µm (V)	6.25µm (H) x 6.25µm (V)	6.7µm (H) x 6.7µm (V)
Resolution	Digital: 450 TVL(H)	Digital: 1020TVL(H)	Digital: 1280TVL(H)
Scanning	(fH) 15.73kHz (fV) 30Hz (FCLK) 12.27MHz	12.0kHz 15Hz 14.318MHz	12.4kHz 12Hz 20.034MHz
Sync.	Internal/external auto switch HD = 15.73kHz VD = 30Hz	Internal/external auto switch HD = 12.0kHz VD = 15Hz	Internal/external auto switch HD = 12.4kHz VD = 12Hz
S / N Ratio	50dB min. (AGC=OFF)		
Min. Illum.	0.3 lux at f=1.4 (without IR cut filter)	1.0 lux at f=1.4 (without IR cut filter)	1.0 lux at f=1.4 (without IR cut filter)
Output	Non-interlaced: 30 frame/sec.	Non-interlaced: 15 frame/sec.	Non-interlaced: 12 frames/sec.
	Digital: 10-bit RS-422 differential output, 100Ω load Analogue: 1.0 Vp-p composite video at 75Ω		
AGC	AGC/MGC selectable by mode switch and up & down switch on rear panel		
Gamma	0.45 or 1.0 switchable (factory set: 1.0)		
Lens Mount	C Mount		
Shutter	1/10,000 to 1/30 sec. (time-exposure shutter)	1/10,000 to 1/15 sec. (time-exposure shutter)	1/10,000 to 1/12 sec. (time-exposure shutter)
Power Req.	12V DC ± 10%		
	300mA (analogue output) 550mA (analogue & digital output)	300mA (analogue output) 450mA (analogue & digital output)	350mA (analogue output) 450mA (analogue & digital output)
Operating Temp.	+0°C to + 40°C		
Vibration & Shock	Vibration: 7**g**(11 ~ 200Hz); Shock: 70**g**		
Size (W x H x L)	46mm x 49mm x 120mm		
Weight	300g		

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

Physical Dimensions (mm/inch)



Spectral Response



UK INDUSTRIAL VISION ASSOCIATION

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