Interfacing an Analog Camera
with a DOMINO Board

JAI CV-M10BXE

EURESYS™
E x c e l l e n c e   i n   v i s i o n

Main characteristics

Sensor	Area-scan, monochrome
Image size	646 (H) x 492 (V) Pixel
Line rate	1000 Line per second
Frame rate	30 frame per second
Last update	31 Aug 2010

Configurations

Configuration	CAM file	Description
P30RD	CV-M10E_P30RD.cam	Asynchronous reset, Camera controls exposure, Digital Synchronization.
P30SA	CV-M10E_P30SA.cam	Progressive Free-Run Scanning, Analog synchronization.

Compatible Cables

Configuration	Cable name	Designator	Usage
P30SA P60SA	Dual Channel	A15-C03-xx	Synchronous mode Single HR12M connector
P30SA P30RA P60SA P60RA P30RA_G P60RA_G	Dual Channel RG/2	A15-C07-xx	Asynchronous reset HR12M and HR6M connectors
P30RD	Single Channel RGC/2	A15-C06-xx	Asynchronous reset Pixel clock HR12M and HR6M connectors

Refer to the MultiCam release notes for supported camera configurations.

Locating Items
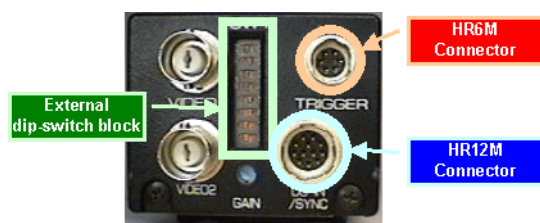
Camera rear view
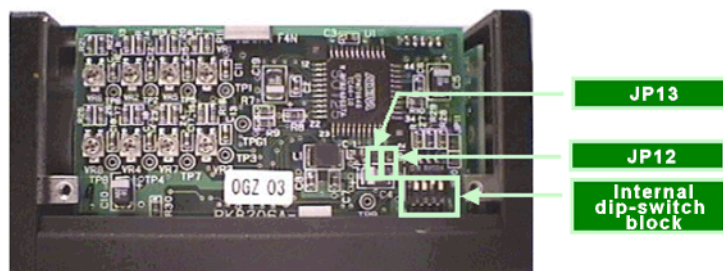
Camera internal view
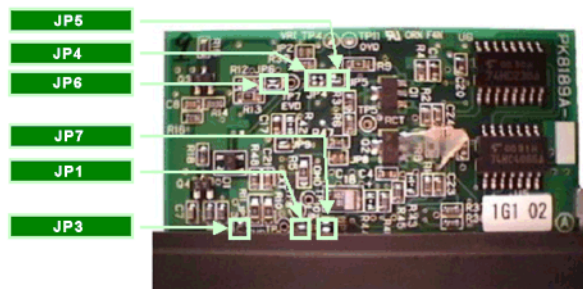
Camera internal view

Camera internal view

Connection Information

HR12M Pin-out

Valid for configurations P30SA, P30RA, P30RA_G, P60SA, P60RA, P60RA_G

Valid for configuration P30RD

HR6M Pin-out

Valid for configurations P30SA, P30RA, P30RA_G, P60SA, P60RA, P60RA_G. TXD and RXD apply to CV-M10RSE only.
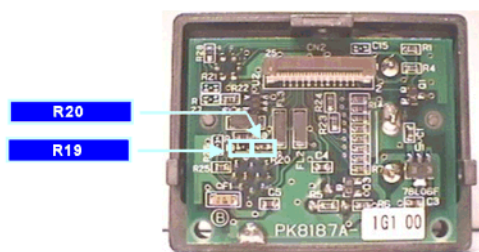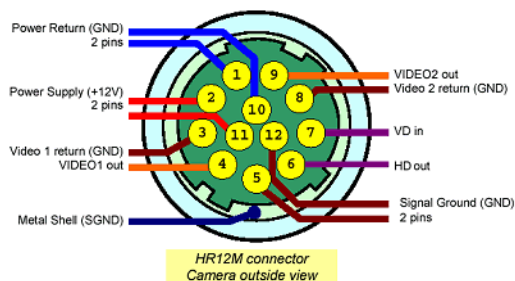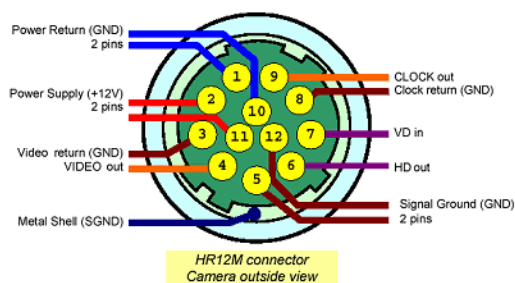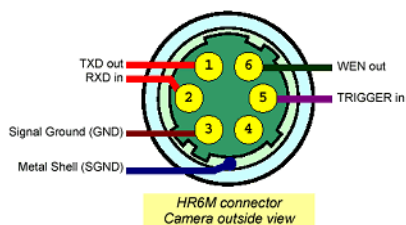
Signal Mapping

Cable "Dual Channel" and "Dual Channel RG/2"

Signal @ Camera	Signal @ Board	Configuration		Usage
		P30SA	**P60SA**	
VIDEO1 out	**V1+**	✓	✓	Analog channel 1
VIDEO1 return GND	**V1-**	✓	✓	
VIDEO2 out	**V2+**	-	✓	Analog channel 2
VIDEO2 return GND	**V2-**	-	✓	
+12 V	**+12 V**	✓	✓	Power supply
Power Return GND	**PGND**	✓	✓	
Signal Return GND	**GND**	✓	✓	Signal return
Metal Shell SGND	**Metal Shell SGND**	✓	✓	EMC shield
HD in	**HIO**	-	-	-
VD in	**VIO**	-	-	-

Refer to the camera cable A15-C03-xx and A15-C07-xx for additional useful manufacturing information.

Cable "Dual Channel RG/2"

Signal @ Camera	Signal @ Board	Configuration		Usage
		P30RA	**P60RA**	
VIDEO1 out	**V1+**	✓	✓	Analog channel 1
VIDEO1 return GND	**V1-**	✓	✓	
VIDEO2 out	**V2+**	-	✓	Analog channel 2
VIDEO2 return GND	**V2-**	-	✓	
TRIGGER	**RST**	✓	✓	Asynchronous reset
WEN	**GATE**	✓	✓	Vertical synchronization
+12 V	**+12 V**	✓	✓	Power supply
Power Return GND	**PGND**	✓	✓	
Signal Return GND	**GND**	✓	✓	Signal return
Metal Shell SGND	**Metal Shell SGND**	✓	✓	EMC shield
HD in	**HIO**	-	-	-
VD in	**VIO**	-	-	-
TXD	**No connect**	-	-	-
RXD	**No connect**	-	-	-

Refer to the camera cable A15-C07-xx for additional useful manufacturing information.

Cable "Dual Channel RG/2"

Signal @ Camera	Signal @ Board	Configuration		Usage
		P30RA_G	P60RA_G	
VIDEO1 out	**V1+**	✓	✓	Analog channel 1
VIDEO1 return GND	**V1-**	✓	✓	
VIDEO2 out	**V2+**	-	✓	Analog channel 2
VIDEO2 return GND	**V2-**	-	✓	
TRIGGER	**RST**	✓	✓	Asynchronous reset
WEN	**GATE**	✓	✓	Vertical synchronization
+12 V	**+12 V**	✓	✓	Power supply
Power Return GND	**PGND**	✓	✓	
Signal Return GND	**GND**	✓	✓	Signal return
Metal Shell SGND	**Metal Shell SGND**	✓	✓	EMC shield
HD in	**HIO**	-	-	-
VD in	**VIO**	-	-	-
TXD	**No connect**	-	-	-
RXD	**No connect**	-	-	-

Refer to the camera cable A15-C07-xx for additional useful manufacturing information.

Cable "Single Channel RGC/2"

Signal @ Camera	Signal @ Board	Configuration	Usage
		P30RD	
VIDEO1 out	**V1+**	✓	Analog channel
VIDEO1 return GND	**V1-**	✓	
CLOCK out	**CK+**	✓	Pixel clock
CLOCK return GND	**CK-**	✓	
TRIGGER	**RST**	✓	Asynchronous reset
WEN	**GATE**	✓	Vertical synchronization
HD in/out	**HIO**	✓	Horizontal synchronization
+12 V	**+12 V**	✓	Power supply
Power Return GND	**PGND**	✓	
Signal Return GND	**GND**	✓	Signal return
Metal Shell SGND	**Metal Shell SGND**	✓	EMC shield
VD in	**VIO**	-	-
TXD	**No connect**	-	-
RXD	**No connect**	-	-

Refer to the camera cable A15-C06-xx for additional useful manufacturing information.

Camera Setup

Internal Jumpers

Valid for configuration P30SA

Jumper	Required	Factory	Meaning
R19	**Open**	Open	No pixel clock
R20	**Short**	Short	
JP3	**Short**	Short	No HD as camera output or input
JP1	**Short**	Short	
JP7	**Open**	Open	
JP6	**Short**	Short	No VD as camera output or input
JP5	**Short**	Short	
JP4	**Open**	Open	
JP12	**Open/Short**	Open	Irrelevant
JP13	**Open/Short**	Open	

There is no alteration from the factory condition.

Valid for configurations P30RA

Jumper	Required	Factory	Meaning
R19	**Open**	Open	No Pixel Clock
R20	**Short**	Short	
JP3	**Short**	Short	No HD as camera output or input
JP1	**Short**	Short	
JP7	**Open**	Open	
JP6	**Short**	Short	No VD as camera output or input
JP5	**Short**	Short	
JP4	**Open**	Open	
JP12	**Short**	Open	H Non Reset mode Pulse Width Control
JP13	**Short**	Open	

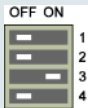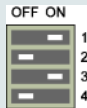JP12 and JP13 have to be altered from the factory condition.

Valid for configuration P30RD

Jumper	Required	Factory	Meaning
R19	**Short**	Open	No Pixel Clock
R20	**Open**	Short	
JP3	**Short**	Short	No HD as camera output or input
JP1	**Open**	Short	
JP7	**Short**	Open	
JP6	**Short**	Short	No VD as camera output or input
JP5	**Short**	Short	
JP4	**Open**	Open	
JP12	**Open**	Open	H Reset mode Single trigger
JP13	**Open**	Open	

R19, R20, JP1 and JP7 have to be altered from the factory condition.
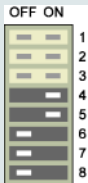
Internal DIP Switch Block

Valid for configurations P30SA and P30RD

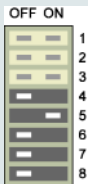| Normal speed shutter	High speed shutter
Exposure ranging from 100 µs to 16 ms	Exposure ranging from 1.25 µs to 50 µs

The CV-M10RSE model should be set in the desired configuration through its RS-232 control line.

External DIP Switch Block

Valid for configuration P30SA

Look	Switch	Setting	Effect
	1	ON/OFF	Select exposure time as indicated below
	2	ON/OFF	
	3	ON/OFF	
	4	ON	Asynchronous reset disabled
	5	ON	Progressive scan enabled
	6	OFF	Gamma correction disabled. ON setting allowed
	7	OFF	Fixed gain control
	8	OFF	
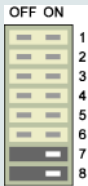
Valid for configuration P30RD

Look	Switch	Setting	Effect
	1	ON/OFF	Select exposure time as indicated below
	2	ON/OFF	
	3	ON/OFF	
	4	OFF	Asynchronous reset enabled
	5	ON	Progressive scan enabled
	6	OFF	Gamma correction disabled. ON setting allowed
	7	OFF	Fixed gain control
	8	OFF	

Valid for configuration P30RA
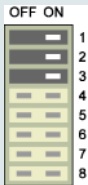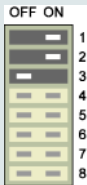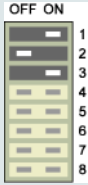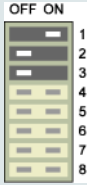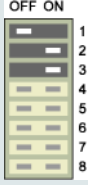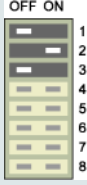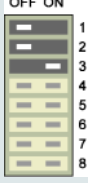
Look	Switch	Setting	Effect
	1	OFF	Select exposure time as indicated below
	2	OFF	
	3	OFF	
	4	OFF	Asynchronous reset enabled
	5	ON	Progressive scan enabled
	6	OFF	Gamma correction disabled. ON setting allowed
	7	OFF	Fixed gain control
	8	OFF	

Setting RS-232 control

Look	Switch	Setting	Effect
	1	ON/OFF	Irrelevant
	2	ON/OFF	
	3	ON/OFF	
	4	ON/OFF	
	5	ON/OFF	
	6	ON/OFF	
	7	ON	RS-232 control is enabled
	8	ON	

This only applies to CV-M10RSE. The configuration settings are reached through the RS-232 control line.

Establishing exposure time

Look	High speed shutter	Normal speed shutter	Look	High speed shutter	Normal speed shutter
	1/800000 s 1.25 µs	1/10000 s 100 µs		1/400000 s 2.5 µs	1/4000 s 250 µs
Look	High speed shutter	Normal speed shutter	Look	High speed shutter	Normal speed shutter
	1/200000 s 54 µs	1/2000 s 500 µs		1/100000 s 10 µs	1/1000 s 1 ms
Look	High speed shutter	Normal speed shutter	Look	High speed shutter	Normal speed shutter
	1/80000 s 12.5 µs	1/500 s 2 ms		1/60000 s 16 µs	1/250 s 4 ms
Look	High speed shutter	Normal speed shutter	Look	High speed shutter	Normal speed shutter
	1/40000 s 25 µs	1/125 s 8 ms		1/20000 s 50 µs	1/60 s 16 ms

Board Jumpers Setup

The Domino Iota and Domino Alpha 2 jumper blocks should be configured as follows.

Valid for configurations P30SA, P30RA, P60SA, P60RA

Settings for the jumper block facing the connector the camera is linked to

Jumper block	MultiCam parameter	Value	Meaning
	JumperV	TTL	The pin 4 (VIO) and pin 5 (EXP) of the connector feeding the channel can be used as input or output in TTL format.
	JumperH	TTL	The pin 14 (HIO) and pin 15 (GATE) of the connector feeding the channel can be used as input or output in TTL format.
	JumperCK	EMPTY	Camera clock: None. Pin 9 and pin 10 of the channel connector are unused.
	JumperL1	DT	The video lane 1 is sensed as a differential 75 W terminated analog signal applied at pin 1 (V1+) and pin 2 (V1-).
	JumperL2	DT	The video lane 2 is sensed as a differential 75 W terminated analog signal applied at pin 11 (V2+) and pin 12 (V2-).

Valid for configuration P30RD

Settings for the jumper block facing the connector the camera is linked to

Jumper block	MultiCam parameter	Value	Meaning
	JumperV	TTL	The pin 4 (VIO) and pin 5 (EXP) of the connector feeding the channel can be used as input or output in TTL format.
	JumperH	TTL	The pin 14 (HIO) and pin 15 (GATE) of the connector feeding the channel can be used as input or output in TTL format.
	JumperCK	CKDPOS	The channel receives a non-inverted differential pixel clock from the camera through pin 9 (CK+) and pin 10 (CK-).
	JumperL1	DT	The video lane 1 is sensed as a differential 75 W terminated analog signal applied at pin 1 (V1+) and pin 2 (V1-).
	JumperL2	DT	The video lane 2 is sensed as a differential 75 W terminated analog signal applied at pin 11 (V2+) and pin 12 (V2-).