INSPECTA

The realtime frame grabber for the PCI-Bus

Hardware Reference Rev. 1.86

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1 General

1.1 Scope of this manual

This manual describes the boards:

M405 Rev 2 and beyond	starting Dez. 96	; INSPECTA-2 PCI Slot board
M422 Rev 1 and beyond	starting Nov. 96	; Digital camera interface
M446 Rev 1 and beyond	starting Mar. 98	; High Speed A/D interface
M482 Rev 3 and beyond	starting Mar. 00	; INSPECTA-3 PCI Slot board
M506 Rev 2 and beyond	starting Aug. 00	; INSPECTA-4A PCI Slot board
M528 Rev 2 and beyond	starting Mar. 01	; INSPECTA-4C PCI Slot board
M531 Rev 2 and beyond	starting Mar. 01	; INSPECTA-4D PCI Slot board

and the software:

ICAM.EXE	starting Ver. 1.45
VCAM95.EXE	

Information presented in this publication has been carefully checked for reliability; however, no responsability is assumed for inaccuracies. The information contained in this document is subject to change without notice.

1.1.1 Inspecta 2-4 differences

Inspecta 2/3 are long PCI Frame Grabbers. They differ by their A/D converter. Inspecta-3 uses a 3-channel high-speed A/D converter with 60/100Mhz sample rate. Inspecta-3 does not support the analog 5:6:5 R:G:B cameramodes of Inspecta-2. Besides that Inspecta-3 behaves togethter with driver software Version 2.35 and greater, identical. to Inspecta-2.

Inspecta-4 is a short PCI Frame Grabber available for analog cameras as Inspecta-4A, for digital cameras as Inspecta-4D and for Camera-Link cameras as Inspecta-4C. Inspecta-4 has no extensions for a fourth video channel and does not support the multiplane modes as Inspecta-2/3 does.
Besides that Inspecta-4 behaves togethter with driver software Version 2.35 and greater, identical to Inspecta-2/3.

1.2 Trademarks

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Intel, the Intel Inside logo, Pentium® are trademarks or registered trademarks of Intel Corporation int the U.S. and other countries, an are used under license.

1.3 EC Declaration of conformity Nr. EGK 9706/001.1

Manufacturer:	Mikrotron GmbH
Address:	Freisingerstr. 3 D-85386 Eching Bundesrepublik Deutschland
Product:	Video Frame-grabber INSPECTA

The above product conforms to the following EC regulations:

89/336/EWG	*Richtlinie des Rates zur Rechtsangleichung der Rechtsvorschriften der Mitgliedsstaaten über die elektromagnetische Verträglichkeit Nr. 89/336/EWG.*
Referencenumber	Date
EN55022 Class A	*1987*
prEN 50082-2	*1994*

Mikrotron GmbH
Eching, June 5th 1997

Signed: Bernhard Mindermann, Dipl. Ing, CEO

2 Hardware

2.1 INSPECTA features

INSPECTA is a long PCI-board with connectors to plug on the camera-adpater. There are two versions: the **one**-channel INSPECTA-S ot the **four**-channel INSPECTA-M.

Image memory is the Pcs main memory. A PCI bus-master-controller can burst-write data with up to 512 DWORDS per burst into main memory with one PCI-clock per DWORD. (>100Mbyte/sec maximum data-rate). The bus-master-controller is 2-dimensional and can adress up to 4Gbyte without CPU intervention.

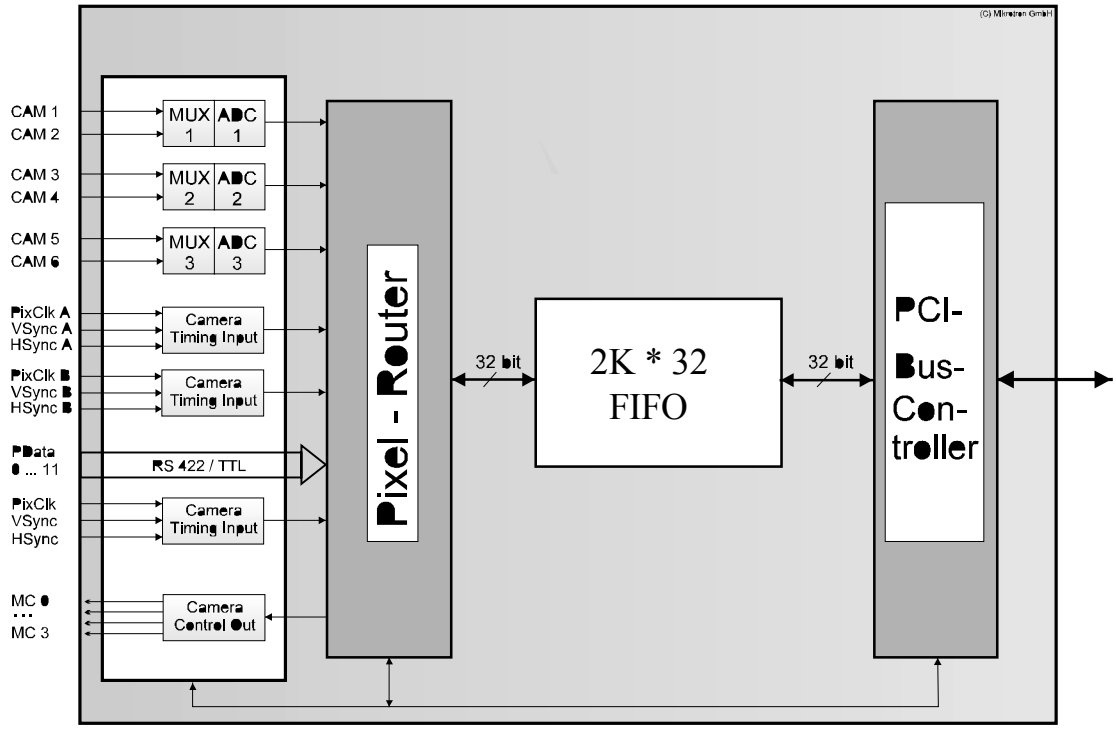
Recording of video-data is - independant for each channel - line oriented. Every HSYNC increments the approprate line counter. This line counter addresses a static RAM, which contains the starting address of this line in frame-memory. This RAM (line-address-table) can be written at any time by the driver software. This writing can also be done partially, the starting line number can be arbitrary selected.

The line-address-table defines the order of video lines in frame-memory. De-interlacing (combinig two fields to one frame) and reversing the frame (bootom up), for imagers who scan the last line first, can be accomplished by writing the line-address-table accordingly.

With four channels, each channel can directly address up to 4096 lines in frame-memory. With one channel, 16380 lines can be addressed. The contents all addresses for one or four channels is called context. There are two contexts available, one of them can be selected by software at any time. Thus 32768 lines can be managed in total without rewriting the line-address-table.

INSPECTAM can also accomodate linescan cameras. It can generate an start of scan signal. A clock counter counts pixelclocks up to 8192 with an additional prescaler of 16. The clock counter is programmable in steps of 32 clocks.The SOS signal is available at the analog or digital camera connector. The length of SOS is 16 pixel clocks.

The following blockdiagramm shows INSPECTA



2.1.1 Analog Video

Six analog video sources together with their sync- and clock signals can be connected to two 15-pin D-connectors. A 2:1 selector routes these signals to three video A/D converter and the logic for processing of the sync- and clock signals.

Three video sources can be recorded at the same time, as long as they are synchronous to eachother.

Cameras can be connected in master- or slave mode. When connected as master, the sync signals are recovered from the analog video or fed in as separate TTL signals. When in slave-mode, the sync-signals are provides by the camera-interface of INSPECTA. The sync-signals conform to either the RS-170 (525 lines) or CCIR (625 lines) standard.

Either in master as in slave mode the pixel clock can be driven from one camera (one input per connector) or from the INSPECTA. The INSPECTA provides up to five discrete clock frequencies: 12.5Mhz, 25Mhz, 14.1875Mhz, 28.37Mhz oder 20Mhz. One quartz-oszillator is socketed, so that oszillators with other frequencies can be plugged in.

If, with master-mode, no clock is available, one of the five internal oszillators can be synchronized to the falling edge of the recovered horizontal sync signal. Per connector one of three video signals or one additional composite sync pin can be selected as sync source.

The phase-jitter of the synchronized clock with respect to the horizontal sync is ¼ clock max. Synchronization is repeated every video-line. Within the line, the clock jitter is negligible.

Additional functions of the camera (e.g.: shutter, integration)are controlled by four independant TTL- signals. Each connecter P1 and P2 has ist own LS-TTL compatible buffer for these signals.

2.1.2 Digital Video

Digital video-signals are fed in via the 64-pin connector X3. Total 32 databits, two frame-data-valid and two line-data-valid signals and two pixel clocks (max. 40Mhz.) can be supplied by the connected cameras. Four single-ended TTL-signals control the camera. These are the same sgnals as are connected to the analog connectors.

The (optional) RS-422 (Type Nr. M422) line-receiver board converts the differential lines to single ended TTL signals. Fast (80Mhz), low threshhold line-receivers are used. A flat-ribbon cable connects the M422 with the INSPECTA.

2.1.3 Camera-simulator

For testing purpose a camera simulator is provided. The simulator generates a greyscale with RS-170 or CCIR timing. Video data is derived from the horizontal counter.

2.1.4 Opto-coupled I/O

External signals are connected via four opto-coupled inputs and four opto-coupled outputs.

2.2 Pin-description

2.2.1 Analogcamera

The connectors P1 und P2 have the same pinning.
Connector: P1, P2, 15 pins D-Type, female

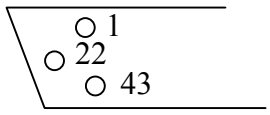
Pin	Name	Typ	Level	comment
1	+12CAM	Power	12V, 1A max.	Camerapower, 3A automatic fuse
2	HSYNC	In	TTL, 330 Ohm	Hor. sync, WEN
		Out	TTL	Hor. Drive
3	SC0	Out	TTL	shutter control 0, +clkout for linescan
4	SC1	Out	TTL	shutter control 1, +SOS for linescan
5	VIDEO0	In	RS-170, 75 Ohm	video signal green
6	VIDEO2	In	RS-170, 75 Ohm	video signal blue
7, 8, 9, 12	GND		GND	Common GND
10	VSYNC	In	RS-170, 330 Ohm	Seperate composite sync
		Out	TTL	vertical drive
11	SC2	Out	TTL	shutter control2, -SOS for linescan
13	SC3	Out	TTL	shutter control3, -clkout for linescan
14	VIDEO1	In	RS-170, 75 Ohm	signal red
15	PCLK	In	1V @ 75 OHM, AC coupled	pixelclock

Connector case is not connected to signal GND.

2.2.2 Digitalvideo

Digitalvideo is connected by the 62-pin high densitiy D-type connector of the RS-422 camerainterface M422.

View on connector pins:



pin Nr.	name	comment	type		pin Nr.	name	comment	type
22	GND	Digital GND						
23	PCLKA	Pixel Clock A	In		2	PCLKB	Pixel Clock B	In
24	LDVA	Line Data Valid A	In		3	LDVB	Line Data Valid B	In
25	FDVA	Frame Data Valid A	In		4	FDVB	Frame Data Valid B	In
30	D0A	Digital Video 0 A	In		9	D0B	Digital Video 0 B	In
31	D1A	Digital Video 1 A	In		10	D1B	Digital Video 1 B	In
32	D2A	Digital Video 2 A	In		11	D2B	Digital Video 2 B	In
33	D3A	Digital Video 3 A	In		12	D3B	Digital Video 3 B	In
34	D4A	Digital Video 4 A	In		13	D4B	Digital Video 4 B	In
35	D5A	Digital Video 5 A	In		14	D5B	Digital Video 5 B	In
36	D6A	Digital Video 6 A	In		15	D6B	Digital Video 6 B	In
37	D7A	Digital Video 7 A	In		16	D7B	Digital Video 7 B	In
26	D8A	Digital Video 8 A	In		5	D8B	Digital Video 8 B	In
27	D9A	Digital Video 9 A	In		6	D9B	Digital Video 9 B	In
28	D10A	Digital Video 10 A	In		7	D10B	Digital Video 10 B	In
29	D11A	Digital Video 11 A	In		8	D11B	Digital Video 11 B	In
1	GND	Digital GND						
21	GND	Digital GND						
38	MC3 *	Mode Control 3 (1)	Out					
17	MC0 *	Mode Control 0 (1)	Out					
18	MC2 *	Mode Control 2 (1)	Out					
43	D12A	Digital Video 12A	In		44	D12B	Digital Video 12B	In
45	D13A	Digital Video 13A	In		46	D13B	Digital Video 13B	In
47	D14A	Digital Video 14A	In		48	D14B	Digital Video 14B	In
49	D15A	Digital Video 15A	In		50	D15B	Digital Video 15B	In
51	D16A	Digital Video 16A	In		52	D16B	Digital Video 16B	In
53	D17A	Digital Video 17A	In		54	D17B	Digital Video 17B	In
55	D18A	Digital Video 18A	In		56	D18B	Digital Video 18B	In
57	D19A	Digital Video 19A	In		58	D19B	Digital Video 19B	In
59	D20A	Digital Video 20A	In		60	D20B	Digital Video 20B	In
61	D21A	Digital Video 21A	In		62	D21B	Digital Video 21B	In
40	D22A	Digital Video 22A	In		19	D22B	Digital Video 22B	In
41	D23A	Digital Video 23A	In		20	D23B	Digital Video 23B	In
42	GND	Digital GND						
39	MC1 *	Mode Control 1 (1)	Out					

The * marked signals are single ended RS-422 signals. The other signals marked with suffix A or B are the positive or negative halves of a RS-422 signalpair. The linedrivers are 26LS31 type, the linereceivers are high-speed low threshhold IDS90C032 type. All I/O are terminated by 100 Ohm.

For digital cameras with 12 Bits max. a connector-adapter for 37-pin D-Sub connectors is available

pin D37P	name	type	comment	pin D62P		pin D37P	name	type	comment	pin D62P
1	PCLKA	In	PCLK A	23		20	PCLKB	In	PCLK B	2
2	LDVA	In	LDV A	24		21	LDVB	In	LDV B	3
3	FDVA	In	FDV A	25		22	FDVB	In	FDV B	4
4	D8A	In	D8 A	26		23	D8B	In	D8 B	5
5	D9A	In	D9 A	27		24	D9B	In	D9 B	6
6	D10A	In	D10 A	28		25	D10B	In	D10 B	7
7	D11A	In	D11 A	29		26	D11B	In	D11 B	8
8	D0A	In	D0 A	30		27	D0B	In	D0 B	9
9	D1A	In	D1 A	31		28	D1B	In	D1 B	10
10	D2A	In	D2 A	32		29	D2B	In	D2 B	11
11	D3A	In	D3 A	33		30	D3B	In	D3 B	12
12	D4A	In	D4 A	34		31	D4B	In	D4 B	13
13	D5A	In	D5 A	35		32	D5B	In	D5 B	14
14	D6A	In	D6 A	36		33	D6B	In	D6 B	15
15	D7A	In	D7 A	37		34	D7B	In	D7 B	16
16	DGND		GND	1,22		35	DGND		GND	21,42
17	MC3	Out	MC3	38		36	NC		NC	
18	MC0	Out	MC0	17		37	MC1	Out	MC1	39
19	MC2	Out	MC2	18						

Remark (1): use of MC(0..3)

camera	MC(0)	MC(1)	MC(2)	MC(3)
Kodak Megaplus	MC0	MC1	MC2	MC3
CV-M10	-	-	-	trigger input
PULNIX TM7605	-	multi shutter	VINIT	ROI
other PULNIX	-	-	VINIT	integration
Opti-Sens OZF-17	-	-	EXSYNC	MODE
T.V.I.	-	New-Frame-	New-Frame+	-
SONY XC-7500	-	-	trigger input	-
Kodak ES 1.0	-	-	EXPOSE+	-

There is a Mini-DIN Socket (X2) at INSPECTA-4C and –4D, making Synchronisation-Signals HDOUT and VDOUT and external Supply (12V, 1A max) accessible for the camera.

2.2.3 Power connector (X2) on INSPECTA-4D and –4C

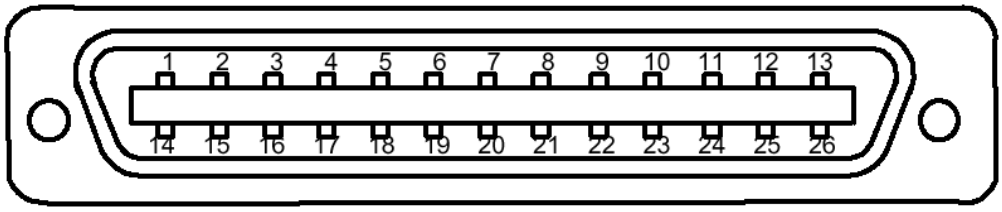
Mini-DIN Pin	Name	Type	Comment
1,2	Xsupply	Power	12V 1A max
3, 4	GND		
5	HD	TTL out	Horizontal Drive out
6	nc		
7	SC2/ CC1	TTL out	Shutter control out

View on solder-pins of cable plug

2.2.4 Camera-Link (INSPECTA-4C)

The Digital Camera with Camera-Link-Interface is connected to the Mini-Delta-Ribbon-Plug X1 of INSPECTA-4:

Pin Nr.	Name	Pin Nr.	Name	Type	Comment
2	CC4-	15	CC4+	LVDS out	MC3
3	CC3-	16	CC3+	LVDS out	MC2
4	CC2-	17	CC2+	LVDS out	MC1
5	CC1-	18	CC1+	LVDS out	MC0
19	SERTFG-	6	SERTFG+	LVDS in	RxD
7	SERTC-	20	SERTC+	LVDS out	TxD
22	RXCLKI-	9	RXCLKI+	CameraLink in	Clock (LVDS)
21	RXI3-	8	RXI3+	CameraLink in	(LVDS)
23	RXI2-	10	RXI2+	CameraLink in	(LVDS)
24	RXI1-	11	RXI1+	CameraLink in	(LVDS)
25	RXI0-	12	RXI0+	CameraLink in	(LVDS)
1	Shield	13	Shield		Schirm
14	Shield	26	Shield		Schirm



External view of INSPECTA-4C plug

2.2.5 Parallel I/O

The parallel I/O signals are accessible through a 16 pin header and a 15 pin flat cable and a 15 pin female D-connector on the rear side. (optional)

connector				**Typical use**	**15 pol. D-connector female on rear side of PC**
pin	**name**	**typ**	**comment**		**pin**
1	Out1	OC	Output 1		1
2	VCC	Power	+5V Supply		9
3	Out2	OC	Output 2		2
4	Rx	common pin of res. networks	+24V		10
5	Out3	OC	Output 3		3
6	K0	In	Kathode Bit 0 (*)	Input of external trigger signal	11
7	Out4	OC	Output 4		4
8	K1	In	Kathode Bit 1 (*)	Linescan cameras: input of channel B of external encoder	12
9	CE	common Emitter			5
10	K2	In	Kathode Bit 2 (*)	Linescan cameras: input of single channel or channel B of external encoder	13
11	GND/A0	Power/ In	Logic GND/ Anode Bit 0 (*)		6
12	K3	In	Kathode Bit 3 (*)		14
13	A1	In	Anode Bit 1 (*)		7
14	A3	In	Anode Bit 3 (*)		15
15	A2	In	Anode Bit 2		8 (*)
16	GND	Power	Logic GND		-

(*) On the hardware inputsbits 0..3 are connected to bits 4..7 of the input port. Driversoftware shifts those bits four times right, thus they appear as bits 0..3 when using function m(v)fg_ppin ().

OC = open collektor of the optocouplers -
CE = common emitter of the optocouplers.

The anodes of the input LEDs are connected to a replaceble single-in-line resistor of 330 Ohms (RS3). The common pin of the single-in-line resistor is connected to pin 4 of the 16-pin header or pin 10 of the 15pin D-connector on the rear side.

The output opto coupler is a darlington type. The collectors are connected with a replacable single-in-line resistor RSC (see table 1) 4.7KOhm/0.25W. See technical data of the opto-couplers and a scematic on the following pages.

The cathodes of the input-LEDs are connected to a resistor array RSA (see table 1). This resistor array is replaceable. The common pin of the resistors is pin 5 at 15-pin D-connector.

		Part Name / Value		
Inspecta	**M-Number**	**RSA**	**RSB**	**RSC**
2	M405	RS7 / n. a.	RS8 / 330 Ω	RS6
3	M482	RS7 / n. a.	RS8 / 330 Ω	RS6
4A	M506	RS9 / n. a.	RS10 / 330 Ω	RS12
4B	M528	RS9 / n. a.	RS10 / 330 Ω	RS12
4C	M531	RS9 / n. a.	RS10 / 330 Ω	RS12

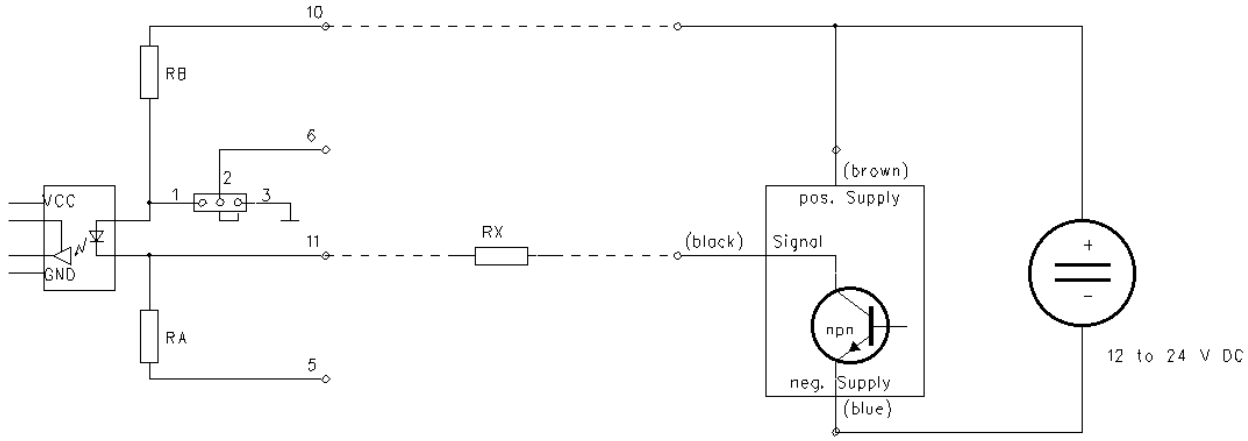
n. a. : not applicable

Table 1: Inspecta 2-4 Resistor Array Names

2.2.5.1 Example for Connecting a Light-Barrier to Input-bit 0

Input-bit 0 is designed for generating an intererrupt and is therefore used to control capture of a frame.

2.2.5.1.1 Light-Barrier with npn-Transistor

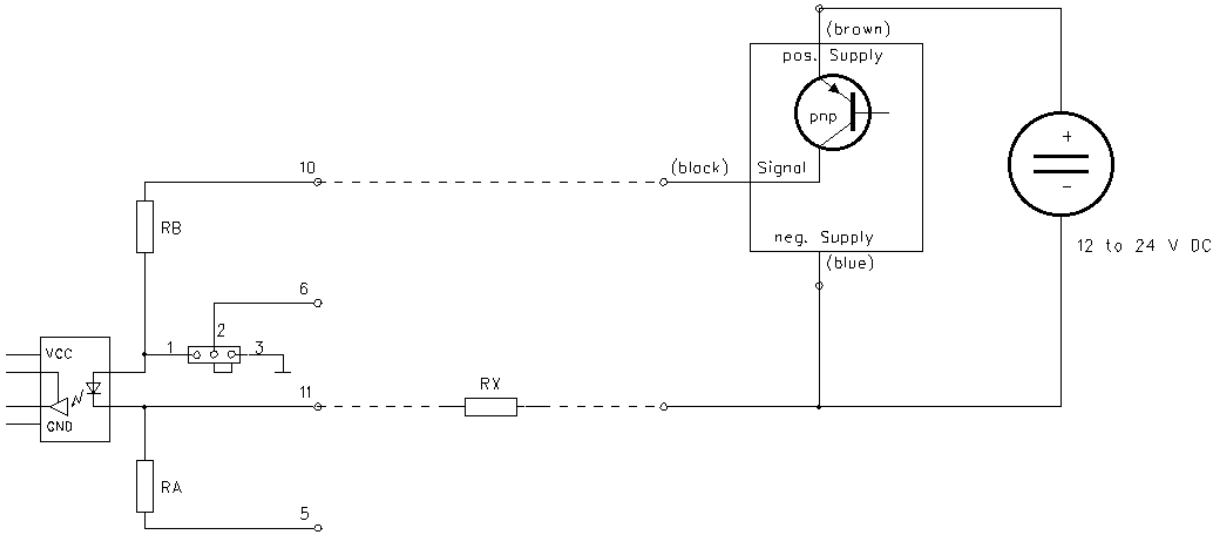


Resistor RX must be built into the connection between the light-barrier and the parallel plug.
Ist value is calculated as follows:

RX [Ω] = ((SupplyVoltage – 2) [V]/ 0.015 [A]) – RB [Ω]
RX [Ω] ≥ 0 [Ω]

RX = 0 Ω for 5 V Supply
RX = 330 Ω / 0.25 W for 12 V Supply
RX = 1.2 kΩ / 0.25 W for 24 V Supply

2.2.5.1.2 Light-Barrier with pnp-Transistor



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RX [Ω] ≥ 0 [Ω]

RX = 0 Ω for 5 V Supply
RX = 330 Ω / 0.25 W for 12 V Supply
RX = 1.2 kΩ / 0.25 W for 24 V Supply

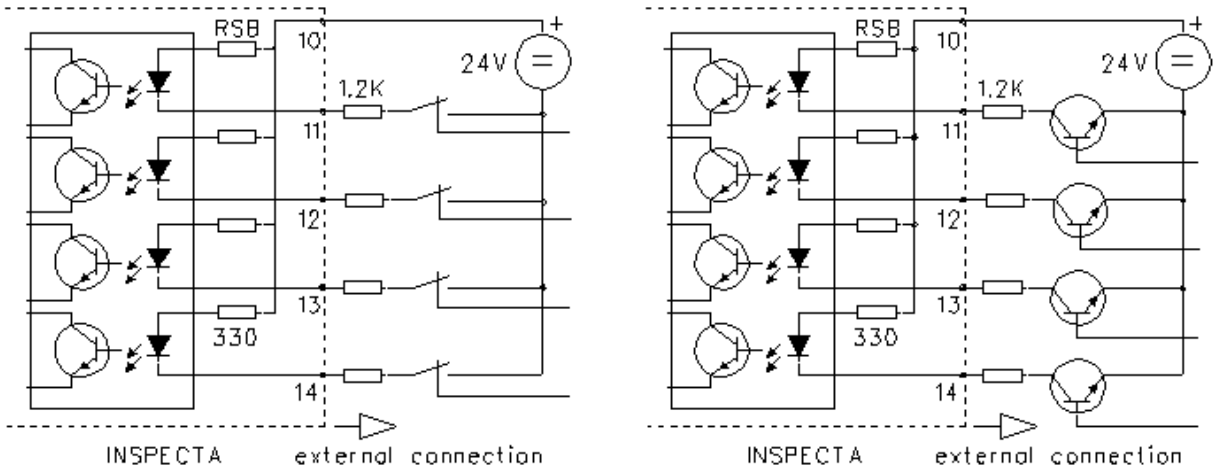
2.2.5.2 Connecting to the Inputs

The other inputs may also be used as free programmable input lines.
In the following scematics, the external device supplies 24 Volts.

The first example connects the positive pin of external 24V with pin 10 of the 15-pin D-connector. The inputs 11, 12, 13 and 14 are connected via a series-resistor 1,2KOhm 1/3W and an external contact or an NPN transistor to the negative pin of the external 24V.

In this example, the resistor network RSB must be present while RSA (see table 1) must be ommitted.

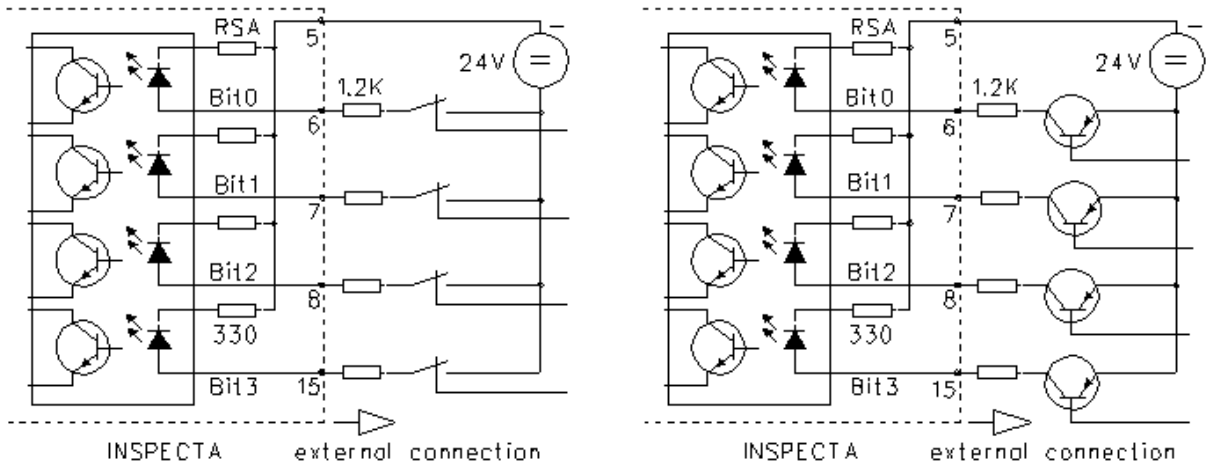
Optoinputs - connected to relais or NPN transistors



In the second example, the negative pin of an external 24V is connected to pin 5 of the 15-pin D-connector. The inputs 6, 7, 8, and 15 are connected via a series-resistor 1,2KOhm 1/3W an an contact or an PNP transistor with the positive pin of the external 24V.

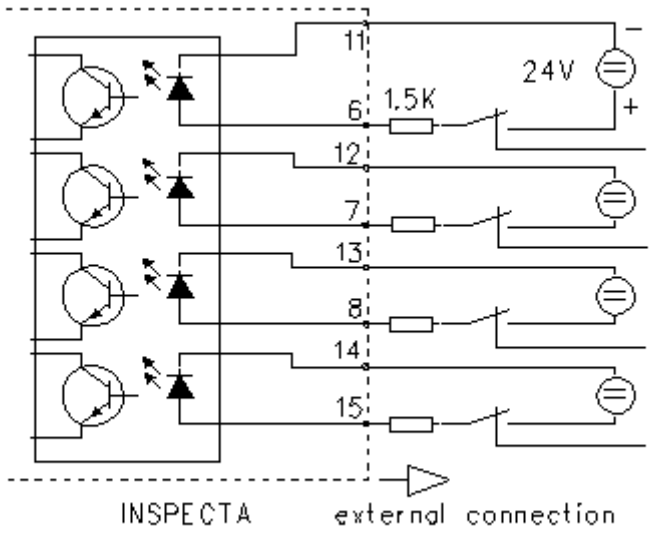
The resistor-network RSB must be plugged into the position of resistor-network RSA (see table 1). Pins 1 and 2 of the Solder-jumper must be closed.

Optoinputs - connected to relais or PNP transistors



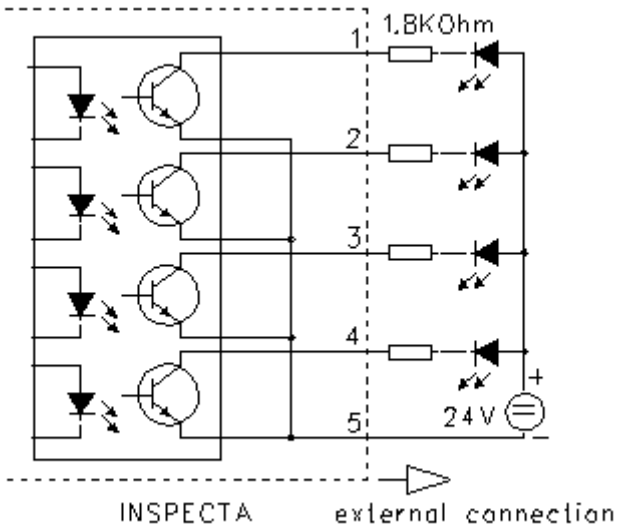
The third example separates each input from the other. RSA and RSB must be ommitted. Pins 1 and 2 of the Solder-jumper must be closed.

Optoinputs - random access



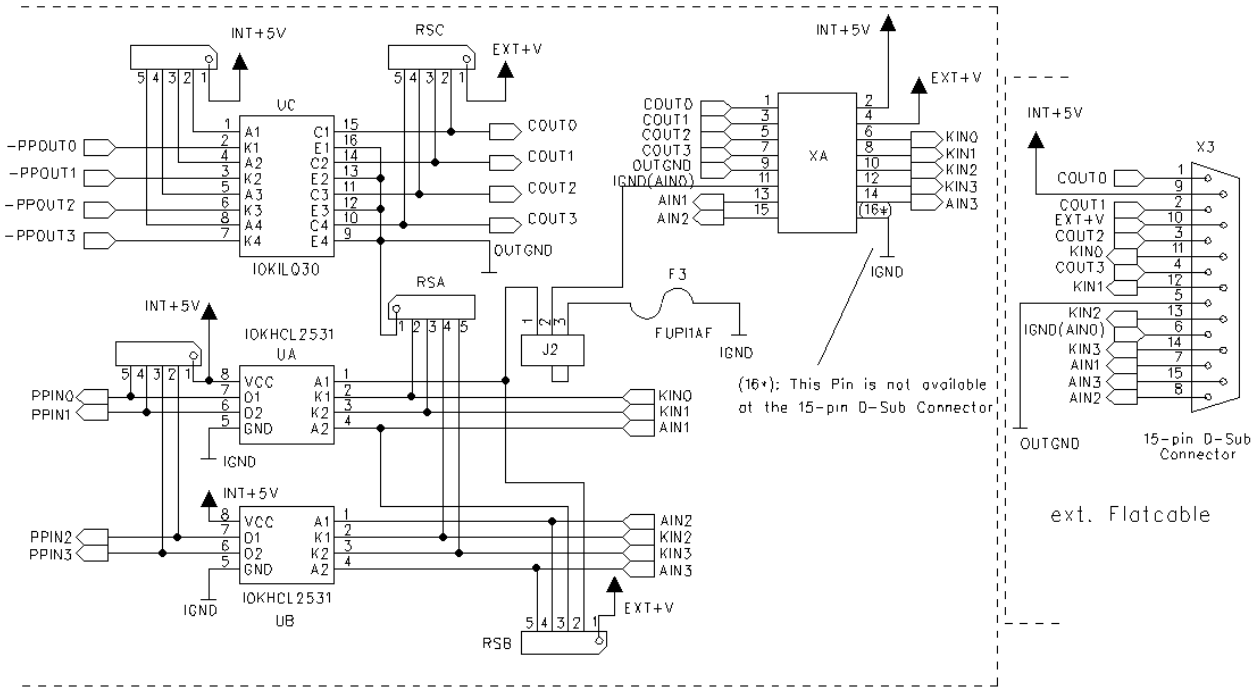
2.2.5.3 Connection to the outputs

The output opto coupler is a darlington type. The collectors are connected with a replacable single-in-line resistor RSC (see table 1) 4.7KOhm/0.25W.



This example shows the connection of the outputs with LEDa on an external 24V power supply.

2.2.5.4 Diagram Opto I/O



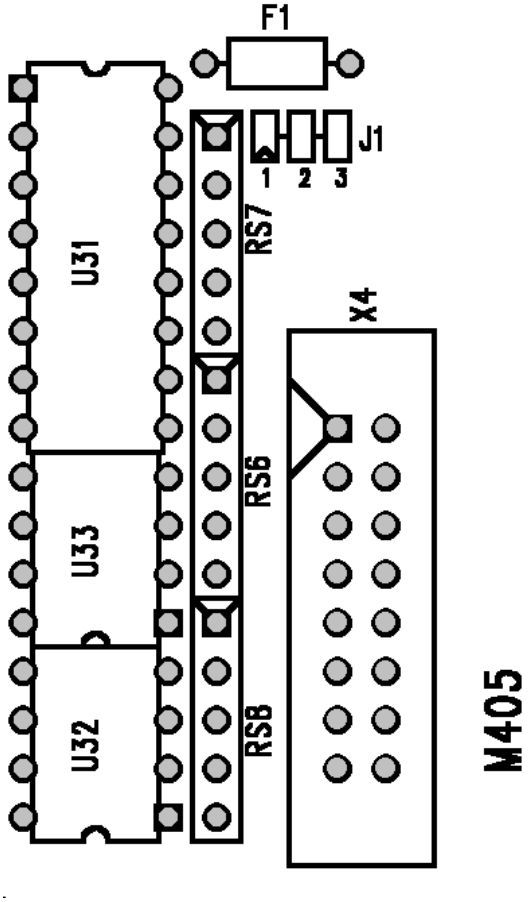
		Part Name / Value				
Inspecta	**M-Number**	**RSA**	**RSB**	**RSC**	**XA**	**Jumper**
2	M405	RS7 / n. a.	RS8 / 330 Ω	RS6	X4	J1
3	M482	RS7 / n. a.	RS8 / 330 Ω	RS6	X4	J1
4A	M506	RS9 / n. a.	RS10 / 330 Ω	RS12	P5	J2
4B	M528	RS9 / n. a.	RS10 / 330 Ω	RS12	P5	J2
4C	M531	RS9 / n. a.	RS10 / 330 Ω	RS12	P5	J2

n. a. : not applicable

Table 2: Inspecta 2-4 Component Names

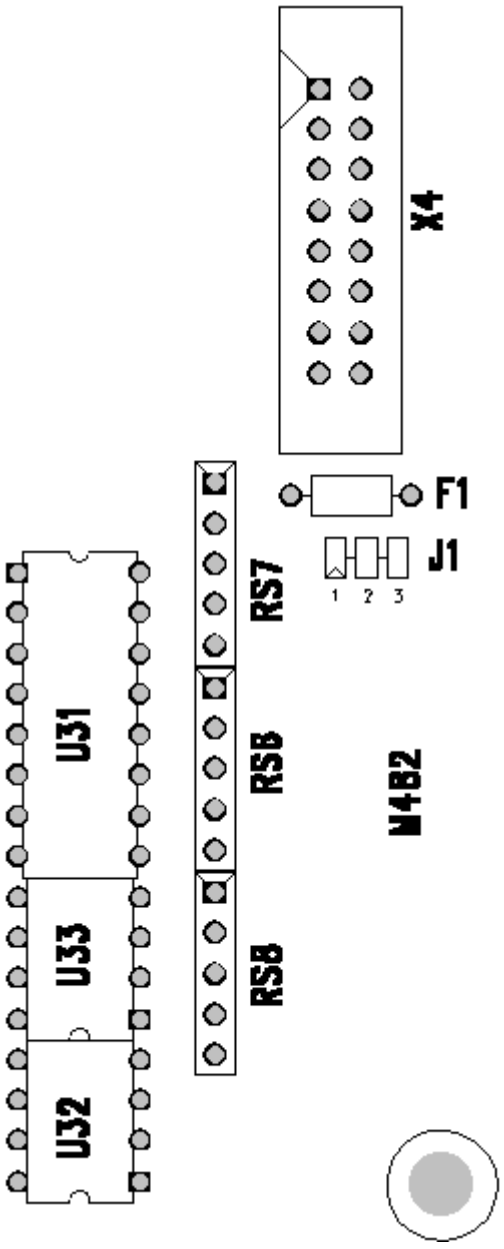
2.2.5.5 Assembly Drawing INSPECTA-2, Opto I/O

This is a detail of the assembly drawing of INSPECTA-2, showing the components of the optically insulated I/O-Port:



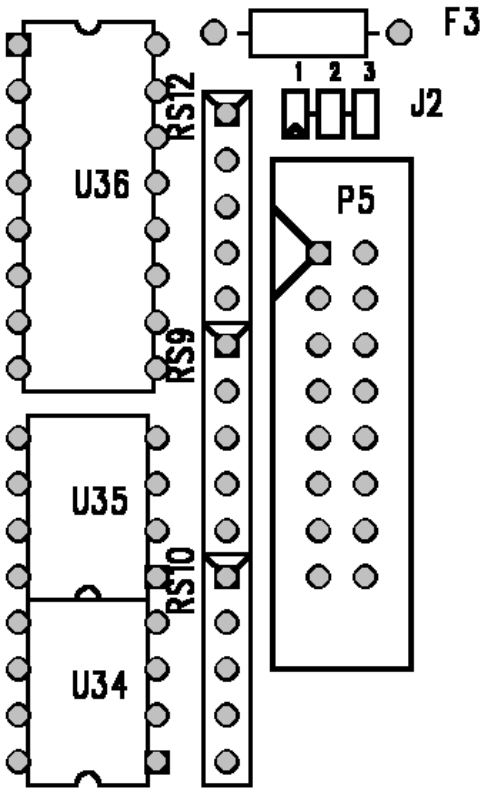
2.2.5.6 Assembly Drawing INSPECTA-3, Opto I/O

This is a detail of the assembly drawing of INSPECTA-3, showing the components of the optically insulated I/O-Port:



2.2.5.7 Assembly Drawing INSPECTA-4A, –4C, -4D Opto I/O

This is a detail of the assembly drawing of INSPECTA-4A, -4C, 4D, showing the components of the optically insulated I/O-Port:



2.2.5.8 Opto-couplers, specifications:

Typ	Current transfer ratio	Isolation Voltage	Diode Forward Current	Diode Reverse Voltage	Transistor Collector Current	Transistor Collector Voltage	Band-width
ILD30 Opto-Out	>100%	6000V	50 mA	3V	125mA UCE 10V	30V	-
HCPL2531 Opto-In	27% typ 19% min	2500V	16mA	5V	TTL level		3 Mhz

2.2.5.9 Rise- and fall times, opto inputs

All four opto inputs can be read by Inspectas driver software (mvfg_ppin ()). Rise- and fall times are not critical then.

Opto input 0 is also used as hardware trigger for cameras with asynchronous shutter. (mvfg_Snapx (4, x, x)). From Inspectas firmware IMP-Nr >700 (Inspecta-2/3/4A) and driver version > 3.07 (Inspecta-4D/C) this hardware trigger is edge triggered on the rising edge.(current starts flowing in the opto couplers LED).

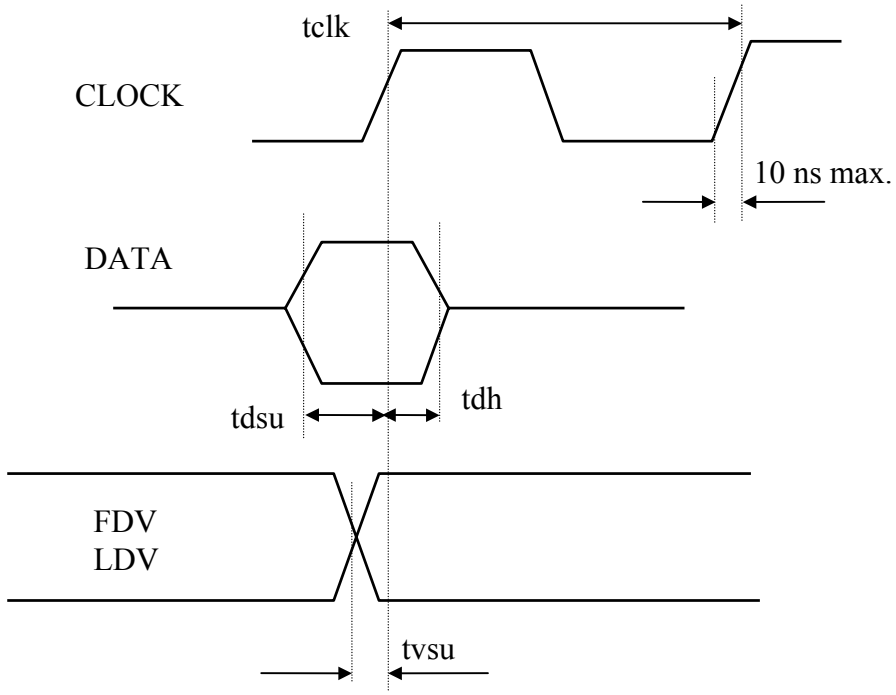
To avoid multiple triggering this input is synchronised with the cameras HD signal. Therefore the pulse width of the trigger signal must be at least as long the cameras horizonzal time (typ. 64us). It is recommended to keep rise and fall times less than 1 us.

With Inspecta-4D/C and linescan cameras, opto inputs 1 und 2 can be used as inputs for an external encoder. Rise and fall times of these inputs must be less 1 us to avoid false counts.

2.3 Digital video timimg

With matrix cameras the falling edge of frame-data-valid (FDV) or line-data-valid (LDV) is significant.
With linescsan cameras the rising edge of LDV is significant. Linescan cameras do usually not provide the signal FDV.
All timings are measured on the **outputs** of the RS-644 line receivers.

tclk	tdsu	tdh	tvsu
25 ns min	10ns min	10ns min	10 ns min



2.4 multi-camera operation

INSPECTA can grab images of up to four cameras at the same time. These cameras can be synchronous or asynchronous-shutter cameras and of interlace or progressive scan type. The images can be stored to different areas in memory (multiplane) or stored in one image where a pixel of one camera follows the pixel of another camera.

Multiplane-grabbing is more time consuming in the INSPECTA hardware. Therefore more cameras are allowed in singleplane operation than in multiplane operation.

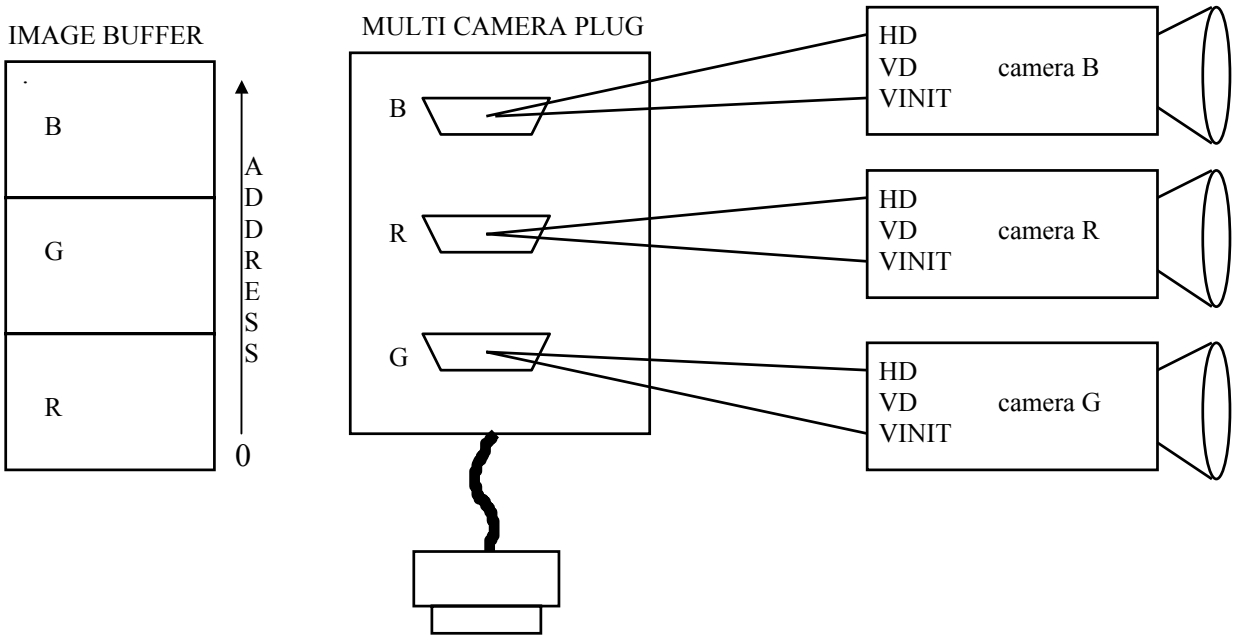
2.4.1 multiple PULNIX TM 6701/6705/9701 asynchronous shutter, multiplane

The following tables show the cameras and their parameters. The camera-numbers R,G,B show the marking of the multi-camera plug M408. At least camera G must be connected.

The asynchronous shutter-pulse (VINIT) is generated with the function: **m(v)fg_photo (..)**.

type	camera nr.	camera-switches	shutterwheel	m(v)fg_photo (..)
TM6705	G,R	Async, Normal, O, PRG	1-9	DWORD -1
TM6701	G,R	Async, Normal, O	1-4 9	DWORD -1 DWORD >0
TM9701 analog	G,R,B	Async	1-4 9	DWORD -1 DWORD >0
TM9701 digital	DIG, DIG1, DIG2	Async	1-4 9	DWORD -1 DWORD >0

type	camera mode	total lines	black-lines begin	black-lines end	pixel/ line visible	black pixel/ begin of line
TM 6705	0x30F	522	14	24	644	85
TM 6701	0x30F	522	35	3	632	89
TM 9701 analog	0x1FF	501	7	9	732	79
TM 9701 digital	0x5AF	525	38	3	771	59



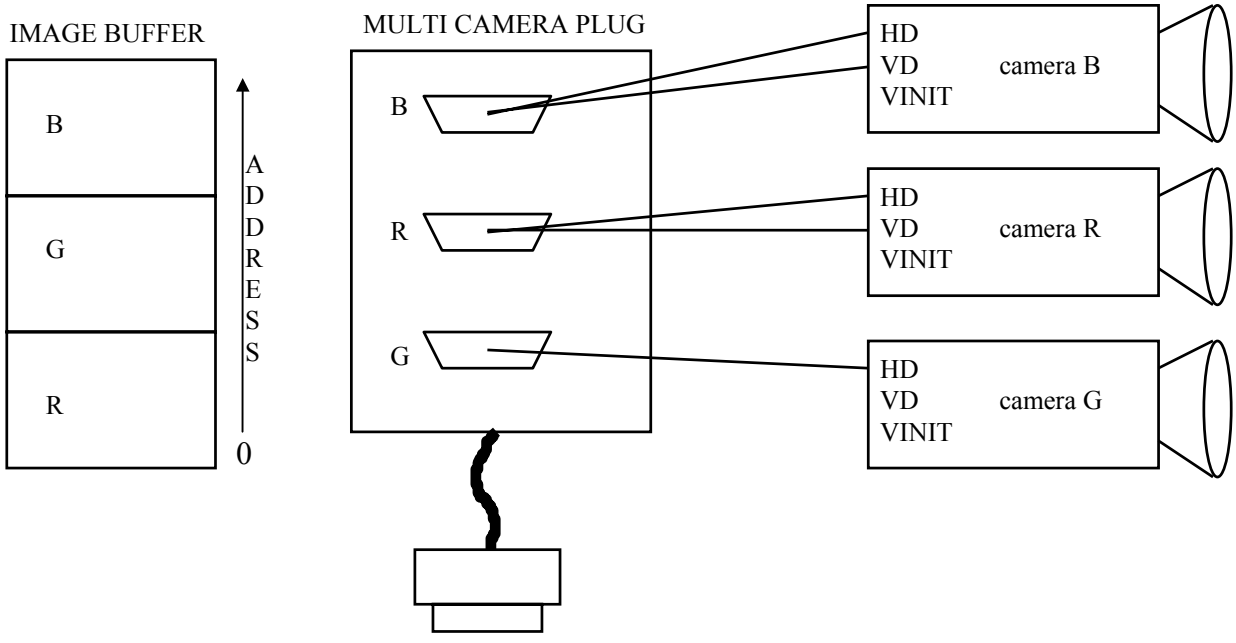
2.4.2 multiple PULNIX TM 6701 / 6705 / 9701 synchonous shutter, multiplane

The following tables show the cameras and their parameters. The camera-numbers R,G,B show the marking of the multi-camera plug M408. At least camera G must be connected.

The signal VD is connected to cameras R and B only. The signal VINIT is not connected to any camera.

Typ	Kamera Nr.	Schalterstellung	Shutterrad
TM6705	G,R	Sync, Normal, O, PRG	1-9
TM6701	G,R	Sync, Normal, O	1-9
TM9701 analog	G,R,B	Sync	1-9
TM1001 digital	DIGA, DIGB, DIGC	NRM, NSP	1-9

camera mode	Kamera Nr.	Typ	total lines	black-lines begin	black-lines end	pixel/ line visible	black pixel/ begin of line
0x30F	G,R	TM 6705	522	14	24	644	85
0x30F	G,R	TM 6701	522	35	3	632	89
0x1FF	G,R,B	TM 9701	501	7	9	732	79
0x2DE	G,R	TM 6705	522	14	24	644	85
0x2DE	G,R	TM 6701	522	35	3	632	89
0x2FE	G,R,B,X	TM 6705	522	14	24	644	85
0x2FE	G,R,B,X	TM 6701	522	35	3	632	89
0x5EC	DIGA,DIGB	TM9701	525	38	3	771	59
0x5FC	DIGA, DIGB, DIGC	TM9701	525	38	3	771	59
0x60C	DIGA, DIGB	TM9701	525	38	3	771	59
0x5EF	DIGA, DIGB	TM1001	1047	23	0	1000	133
0x5FF	DIGA, DIGB, DIGC	TM1001	1047	23	0	1000	133
0x60C	DIGA, DIGB	TM1001	1047	23	0	1000	133



2.4.3 multiple MIKROTRON CV-M10BX, multiplane

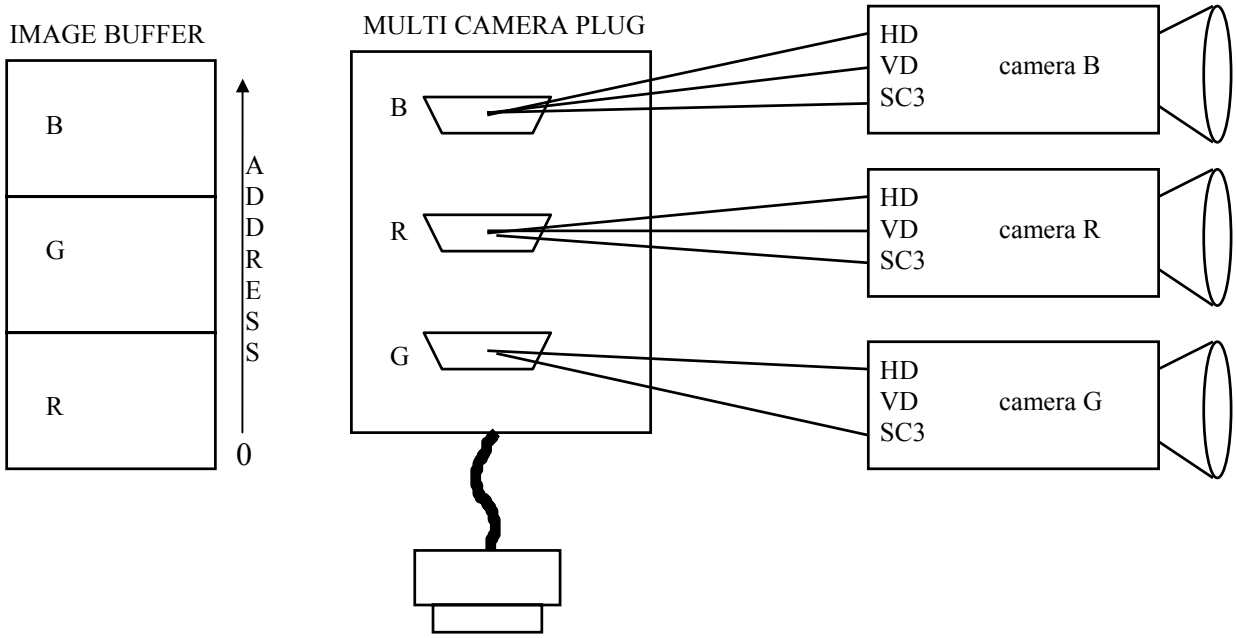
The following tables show the cameras and their parameters. The camera-numbers R,G,B show the marking of the multi-camera plug M408. At least camera G must be connected.

Use camera mode 0x33F for three CV-M10BX with progressive scan and asynchronous shutter. The asynchronous shutter-pulse is generated with the function: **m(v)fg_photo (0)**.

Use camera mode 0x34F for three CV-M10BX with progressive scan and synchronous shutter.

camera mode	camera nr.	camera switches	m(v)fg_photo (..)
0x33F	G,R,B	1-3: shutter-time, 4 off, 5 on	DWORD 0
0x34F	G,R,B	1-3: shutter-time, 4 on, 5 on	-

camera mode	total lines	black-lines begin	black-lines end	pixel/ line visible	black pixel/ begin of line
0x33F	579	0	0	736	72
0x34F	611	32	0	736	72



2.4.4 multiple PULNIX TM 6701 / 6705 / 9701 asynchonous shutter, singleplane

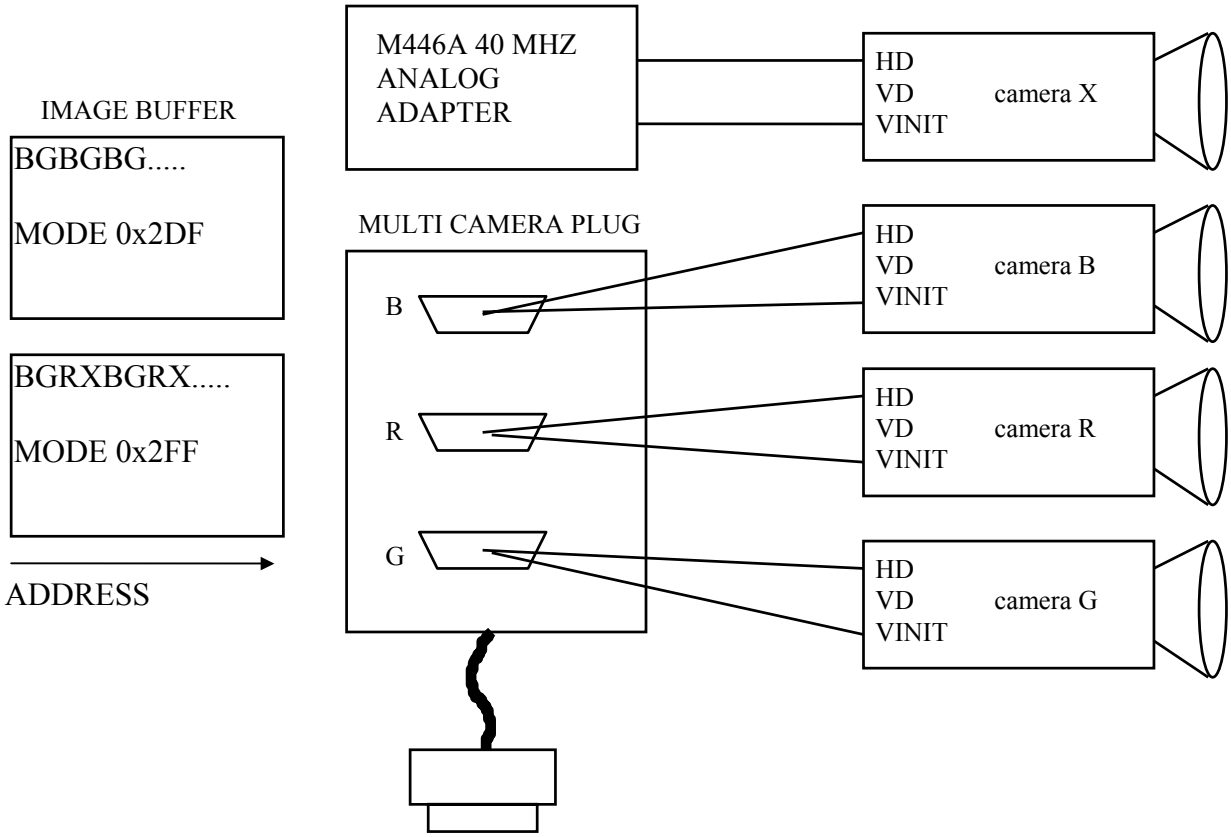
The following tables show the cameras and their parameters. The camera-numbers R,G,B show the marking of the multi-camera plug M408. At least camera G must be connected. The fourth camera can be connected via the additional 40Mhz analog adapter.

Use camera mode 0x2DF for two cameras that are stored in one word. Mode 0x2FF allows four cameras and stores one DWORD for one pixel of four cameras.

The asynchronous shutter-pulse is generated with the function: **m(v)fg_photo (0)**.

type	camera nr.	camera switches	shutterwheel	m(v)fg_photo (..)
TM6705	G,R,B,X	Async, Normal, O, PRG	1-9	DWORD -1
TM6701	G,R,B,X	Async, Normal, O	1-4 9	DWORD -1 DWORD >0

camera mode	Kamera Nr.	Typ	total lines	black-lines begin	black-lines end	pixel/ line visible	black pixel/ begin of line
0x2DF	G,R	TM 6705	522	14	24	644	85
0x2DF	G,R	TM 6701	522	35	3	632	89
0x2FF	G,R,B,X	TM 6705	522	14	24	644	85
0x2FF	G,R,B,X	TM 6701	522	35	3	632	89



2.4.5 multiple standard interlace cameras, singleplane

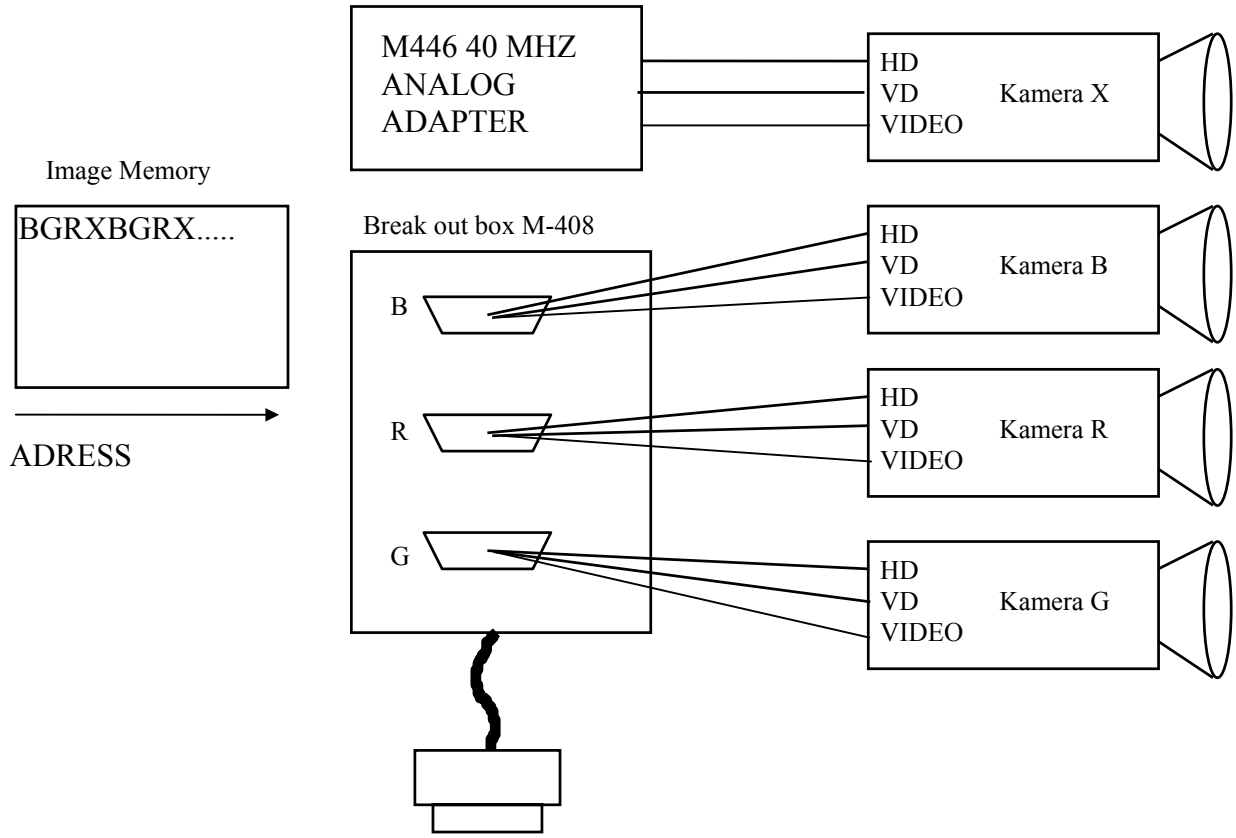
The following tables show the cameras and their parameters. The camera-numbers R,G,B show the marking of the break out box M408. At least camera G must be connected. The fourth camera can be connected via the additional 40Mhz analog adapter.

Mode 0x35F is internally synchronised, e.g.: the connected cameras are synchronized by their HD and VD input, Inspecta delivers the necessary TTL sync signals. (see scematics below)

Mode 0x40F is externally synchronized, e.g.: the connected cameras must be synchronized by themselves. INSPECTA uses composite SYNC of camera G.

The below mentioned parameters are parameters, which are loaded with the camera mode. Depending on the actual connected camera brand, it might be necessary to adjust them with the functions: m(v)fg_blacklines(), m(v)fg_blacklend (), m(v)fg_black () and mvfg_hstart ().

camera mode	Kamera Nr.	sync	total lines	black-lines begin	black-lines end	pixel/ line visible	black pixel/ begin of line
0x35F	G,R,B,X	intern	603	26	2	728*4	86
0x40F	G,R,B.X	composite	603	26	2	728*4	86



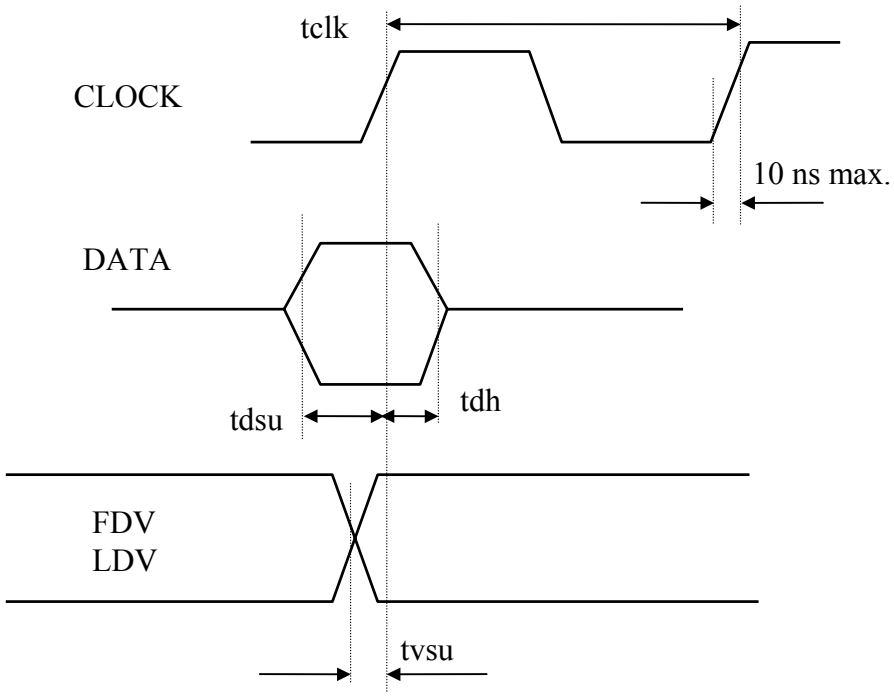
2.5 Digital Video timing

The **falling** edge of either LDV or FDV with respect to the next rising edge of clock is significant when **area cameras** are selected.

The **rising** edge of LDV with respect to the next rising edge of clock is significant when **linescan cameras** are selected.

The below timings are measured at the outputs of the RS-644 linereceivers.

tclk	tdsu	tdh	tvsu
25 ns min	10ns min	10ns min	10 ns min



2.6 Installation INSPECTA using DOS

The following items are recommended for an easy installation of the MVFG Frame Grabber:

- Mikrotron specified Pentium motherboard
- at least 8MB main memory
- INSPECTA
- VGA video adapter, harddisk

After connecting a video camera (if available), the test programme ICAM can be started.

2.6.1 Testprogramme ICAM.EXE

The testprogramme ICAM is used to interactively check all possible camera-modes and the according parameters. With the embedded mouse, the displayed window can be panned and scrolled throughout the whole image memory. The actual coordinates or the intensity at the mouse pointer can be displayed.

After starting ICAM, the screen is switched to VGA mode 12h, a mode with 640*480 resolution and 16 greyscales. This mode is quite slow, and because of only 16 greyscales, the display is not very detailed, but it works on any PC-compatible VGA graphic adapter.

Other, much faster VGA-modes with more resolution can be selected within ICAM.

Some seconds (up to 20 seconds if there is an EMM386 active and a lot of main memory provided) after calling ICAM, a vertical-stripe-pattern should appear. This is the image of the internal greyscale generator.

If instead a DOS-Extender related error message appears, boot the PC with a system disc **without** config.sys and autoexec.bat and read the chapter about configuring DOS in this manual.

If neither the test pattern nor a DOS-Extender related error message appears, probably one of the following error messages will appear:

```
-2 memory base address not found
-3 cant map phys -> lin
-8 no clock from self test
-10 no frame data valid from self test
-11 no line data valid from self test
-13 WRONG CPU (386)
```

2.6.2 ICAM -commands

The topmost line in ICAM screen is the command line. The first four digits show parameters (in Hex) for the chosen functions. Next seven characters show a short description of chosen command (see below). The rightmost four digits show the intensity at the mouse cursor or the y-coordinates in coordinate command.

The commands are chosen from the alpha characters. The parameters that belong to a specific command can be incremented or decremented with the „+“ or „-“ key. For commands „m“ and „D“ a 3-digit hex input can be enterd. Every command uses one or more functions of MPFGDRVA.

Command line:
0000 =Parity, keys: alfa,0..9,+,-,q=quit c=00XX

The commands have the following functions:

```
Key   Description                              Function name
p:    display parity error counter
m:    select camera mode                       mfg_modcam
f:    display frame counter                    mfg_stat
```

```
c:    choose one camera                          mfg_camsel, mfg_digsel
s:    record one or more consequtive frames      mfg_selframe
u:    shutter time                               mfg_photo
v:    zoom                                       mvga, m13vga,
                                                       vmfg_put2win/vmfg_put4win
d:    delta image, only in Z-mode=0              mvga
b:    black porch at begin of line               mfg_blank
l:    number of lines per image                  mfg_blacklines/ h_start
n:    number of recorded pixel per line          h_start
e:    number of black lines at begin of image    h_start
w:    video white level                          mfg_whitelevel
x:    video black level                          mfg_blacklevel
y:    composite sync separation threshhold       mfg_synclevel
z:    VGA mode                                   palette, palette928, mvga,
                                                 m13vga, vmfg_put2win,
                                                 vmfg_put4win, mvfg_dmawin
Z:    direct VGA transfer                        mfg_PhysBuffer
i:    integrate exposure by number of frames     mfg_integration
t:    shutter on/ off                            mfg_photo
a:    CCIR/ NTSC format                          mfg_pal, h_start
g:    write mvfg000x.bmp file                    mfg_bmp
o:    test opto coupled I/O                      mfg_ppin, mfg_ppout
j:    black lines at end of frame                h_start
D:    switch digital multiplexer                 mfg_digsel
k:    show x-y coordinates

The leftmost for digits show parameters for chosen command.

XXXX=Parity       : number of parity errors
FFFF=Parity       :parity off

00XX=Mode         :chosen camera mode
000X=Frame #      :actual frame number
000X=Camera#      :chosen camera
000X=Sync         :choose which image to write
FFFF=Sync         :write as many images as fit into 4/8 MB
XXXX=Shutter      :shutter sime in msec for MEGA+ or
                  : mod 63usec for Pulnix cameras)
000X=Vga_res      :zoom out >0 / zoom in <0)
000X=Delta        :delta image no/yes 0/1
00XX=Blank        :length of internal HD pulse
0XXX=# lines      :number of lines per image (incl. black lines)
0XXX=pel/liN      :number of pixel per line
0XXX=# black      :number of black lines at begin of frame
00XX=White_l      :video white threshhold
00XX=black_l      :video black threshhold
00XX=sYnc_l       :composite sync separation threshhold
000X=Z-mode       :VGA mode
000X=Integ        :integrate exposure for more than one frame
000X=Trigger      :asynchronous shutter
000X=pAl          :CCIR=1 or NTSC=0
0000=mfg.bmp      :1 = write mvfg000x.bmp file
0000=port_in      :shows value of input port
0000=black_e      :number of black lines at end of frame
0XXX=x-coord      :show x-y coordinates.
0000=mpx_msg      :switch external MPX-5000
quit=q            :end
```

Within the selected commands, their parameters are incremented or decremented with the „+“ or „-“ key.

2.6.2.1 Command description

The **z**-command selects one of six VGA mode.

Z-mode = 0 VGA mode 12h 640 x 480 x 16 grey (function: palette, mvga)

Z-mode = 1 VGA mode 13h 320 x 200 x 256 grey (function: palette928(0), m13vga)

Z-mode = 2 S3 mode 201h 640 x 480 x 256 grey, VGA memory access via S3 grafik engine with zoom out/in, clip-windows, overlay, bitblt, poly-Line.
(functions: palette928 (0), vmfg_put2win, vmfg_put4win)

Z-mode = 3 VESA Mode 112h, 640 x 480 x 24 bit color or 800*600*16 bit color, direct VGA memory access.
(functions: init928 (5), palette928 (2), mvfg_dmawin (color=2))

Z-mode = 4 S3 Mode 101h/201h, 640 x 480 x 256 grey, direct VGA memory access
(functions: init928 (0), palette928 (0), mvfg_dmawin (color=0))

Z-mode = 5 S3 Mode 103/203h, 1024 x 768 x 256 grey, direct VGA memory access.
(functions: init928 (4), palette928 (0), mvfg_dmawin (color=0))

All Z-mode >1 need a VESA driver.

The **Z**-command activates (INSPECTA only) the direct transfer of video data into VGA when Z-mode 4 is selected. After pressing „Z“ once, direct VGA transfer is activated with key „+“ and deactivated with key „-„.

The **v**-command zooms the displayed image out. This works only in the z-modes 0, 1, and 2. Zooming-in is done by ommitting pixels and lines.
In z-mode 2 a zoom-in function is provided by selecting a negative value within v-command. (use „-“ key for values FFFE to FFF5)

The **d**-command needs a z-mode = 0 and the sync mode = FFFF (see s-command).It subtracts the grey values of the same pixel in consecutive images. The difference is displayed as a color coding for each pixel. (black=0, blue=1, green=2, cyan=3 etc.) The delta function gives a quick look to the noise generated by the camera and the anlog section in the frame grabber.

The **m**-command (mfg_modcam) selects video source, (internal test pattern analog, or digital) the sync source (internal, external or comosite) and the clock source (intern or extern).

A selected camera mode uses all necessary format information from default values within MPFGDRVA. Especially with standard analog cameras, these defaults will not always match with those values which are necessary for the specific plugged camera. Use commands e, n, l, b, w, x, y to interactively change the parameters for a specific camera and use those parameters within the application.

See Appendix C for available camera modes

If for a chosen mode, no or a wrong camera is connected, the test pattern appears.

The **n**-command changes the number pixels per line to store. It changes the global variable *linelen* and calls the function *h_start* to make the change effective.

The **b**-command chnges the number of black pixel at begin of a line.

The **l**-command changes the global variable *numlin* and calls the function *h_start* to make the change effective. Note that the value of *numlin* includes back lines at begin end end of frame (commands e, j)

The **e**-command changes the global variable *mfg_blacklines* and calls the function *h_start* to make the change effective. Thus the number of black lines at begin of frame are is adjusted.

The **w**-command (*mfg_whitelevel*) changes the white threshhold of the A/D converter

The **x**-command (*mfg_blacklevel)* changes the black threshhold of the A/D converter.

The **y**-command (*mfg_synclevel*) changes the sync-separation threshhold.

The **t**-command shutters an asynchronous camera. (modes: 16h, 17h, 8Ch, 9Ch, ACh, BCh). The programme determines shutter-time if shUttime>0 (**u**-command). In mode 17h this time is derived from a DOS call and is therefore not very accurate.

In modes 8Ch, 9Ch, ACh, and BCh this time is derived from counting hsyncs, and therefore very accurate.

The **a**-command (*mfg_pal*) selects CCIR (625 lines, 50Hz) or NTSC (525 lines, 60Hz) standard.

The **s**-command (*mfg_selframe*) changes the way of storing images.
With **s>=0** the images are always stored in the same region of image memory so that their starting address is calculated from the formula: starting_address = s******linelen*(numlin-blacklines-blacklinesend).*
With **s=-1 (FFFF)** rotating mode, where as many frames as fit into the image memory are continuously written.

The **u**-command (*mfg_photo*) adjusts shutter time in 63 usec steps, (modes 8Ch, 9Ch, ACh, Bch) or in msec (mode 17h).

The **i**-command (*mfg_integration*) selects the number of frames while exposure should integrate. For those frames which are exposed, no display takes place.

The **g**-command (*mfg_bmp*) writes the stored image to a MVFGXXXX.BMP file. XXXX is a consecutive hex number which is incremented every time the „+“ key is pressed, and thus a new image is recorded.. XXXX is set to 0 every time ICAM is started. The file format is standard WINDOWS *.BMP with either 8-bit greyscale ore 24-bit true color in modes 78h, D0h, or E0h.

The **o**-command reads the opto-coupled input port, and displays its value (an non connected input port reads 0Fh!). The value is then presented to the output port.

The **j**-command changes, analog to the **e**-command, the number of black lines at the **end** of a frame.

The **k**-command (when activated with the „+“ key), displays the x-coordinates of the mouse cursor (number of pixel in hex) in the leftmost digit-field and the y-coordinates (.number of lines) in the rightmost digit-field.

Das **D**-command selects an external channel on a n MUX-5000 multiplexer.

2.7 VCAM95

The testprogramme VCAM95 is used for all Windows operating systems as a testtool for all functions of INSPECTA hard- and software.

Camera	provides *Profile load/save* and *Capture*.
Profile load/save	reads or writes an ASCII file with all parameters for the setup of a specific camera.
Capture	activates the selected camera profiles and shows a live image.
Frame	provides *Framevalues*, *Input* and *CaptureMode*.
Framevalues	defines image format in frame memory. Parameters in this window correspond to the specific values of the selected camera..
Input	defines camera mode and camera number. Parameters in this window correspond to the specific values of the selected camera..
Inspecta	selection of available Inspectas
Misc	menue is used to zoom the image, to input external signals via the opto – coupled inputs and select timeouts for these inputs, write *.BMP images to disk, activate a display look-up table and send a camera configuratiosstring via the integrated serial communication port.

3 Software

See the Software description in the Inspecta Software manual!

4 Appendix A: Inspecta Family

Order Nr. **B482S** is the single channel version of the INSPECTA-3. Up to six analog cameras can be connected at the same time. Up to four digital Cameras can be connected using the B422 or B454 digital adapter Board. Only one 8-bit channel at a time is digitized. Linescan cameras are not supported.

Order Nr. **B482MZ** is the multi channel version of the INSPECTA-3. Up to six analog cameras can be connected at the same time, with the additional M437 fast A/D board eight cameras, and four channels can be digitized at the same time. Up to four digital Cameras can be connected using the B422 or B454 digital adapter Board. Cameras with up to 32 bits video are supported. Linescan cameras are also supported.

Order Nr. **B506** is the multi channel **INSPECTA-4A**. Up to **six analog area- or linescan** cameras can be connected, and three channels can be digitized at the same time.

Order Nr. **B531** is the multi channel **INSPECTA-4D** for **digital area- or linescan** cameras. The interface standard is **parallel RS-644 (LVDS)**.

Order Nr. **B528** is the multi channel **INSPECTA-4C** for **digital area- or linescan** cameras. The interface standard is **CameraLink™**

4.1 Versions

INSPECTA is constantly improved. To distinguish the different versions, the hardwarerevision (label on the backside of the board), the „IMP number“ (label on one of the PLD’s) and the driverversion must be known.

5 Appendix B: List of Camera modes

Adimec				
Nr. of cameras simulta-neously	Model	Image size HxV (visible pixel)	Description	Camera Mode
1	MX 12	1052x1031	analog, async shutter, interlaced, 15 fps	0x108
1	MX12P	1024x1024	analog, async shutter, progressive, 15/30 fps	0x638
1	Adimec 1000m	1004x1004	8 or 10-Bits, CameraLink Base, 23fps, random variable/fixed shutter	0x10DC
1	Adimec 1000m	1004x1004	2x8-Bits, CameraLink Base, 47fps, random variable/fixed shutter	0x124C
Atmel				
Nr. of cameras simulta-neously	Model	Image size HxV (visible pixel)	Description	Camera Mode
1	AVIIVA M2 CL 4010	4096	Colour linescan, 4096 total Pixel, 10um pixelsize,Camera Link,20 to 60 MHz data rate, 8-Bit serial data, With FlatField correcture	0x10E8
1	AVIIVA M2 CL 0514	512	linescan, 14um pixelsize,Camera Link,20 to 60 MHz data rate 8-Bit 10-Bit 12-Bit With FlatField correcture	 0x49A 0x1038 0x1048
1	AVIIVA M2 CL 1010	1024	linescan, 10um pixelsize,Camera Link,20 to 60 MHz data rate 8-Bit 10-Bit 12-Bit With FlatField correcture	 0x49A 0x1038 0x1048
1	AVIIVA M2 CL 1014	1024	linescan, 14um pixelsize,Camera Link,20 to 60 MHz data rate 8-Bit 10-Bit 12-Bit With FlatField correcture	 0x49A 0x1038 0x1048
1	AVIIVA M2 CL 2010	1024	linescan, 10um pixelsize,Camera Link,20 to 60 MHz data rate 8-Bit 10-Bit 12-Bit With FlatField correcture	 0x49A 0x1038 0x1048
1	AVIIVA M2 CL 2014	2048	linescan, 14um pixelsize,Camera Link,20 to 60 MHz data rate 8-Bit 10-Bit 12-Bit With FlatField correcture	 0x49A 0x1038 0x1048

1	AVIIVA M2 CL 4010	4096	linescan, 10um pixelsize,Camera Link,20 to 60 MHz data rate 8-Bit 10-Bit 12-Bit With FlatField correcture	 0x49A 0x1038 0x1048
1	AVIIVA M4 CL 2014	2048	linescan, 14um pixelsize,Camera Link,30 to 120 MHz data rate 8-Bit 10-Bit	 0x49A 0x1038
1	AVIIVA M4 CL 6007	6144	6144 active pixels, 7 µm pixel, from 40 MHz to 160 MHz data rate, 8-Bit 10-Bit	 0x49A 0x1038
1	AVIIVA M4 CL 8007	8192	8192 active pixels, 7 µm pixel, from 40 MHz to 160 MHz data rate, 8-Bit 10-Bit	 0x49A 0x1038

Basler

Nr. of cameras simulta-neously	Model	Image size HxV (visible pixel)	Description	Camera Mode
1	L101-L104, 1K L101-L104, 2K	1024 2048	linescan, b/w, digital RS644, 18.8-58 khz line freq. max. linescan, b/w, digital RS644, 9.6-29.5 khz line freq. max	0x498
1	L201-L203	4096	linescan, b/w, digital RS644, 4.8-9.6 Khz max.	0x498
1	A101p/c,	1300x1000	matrix, b/w, digital RS644, sync/async shutter, fixed timing, no partial scan	0xDEC
1	A101p/c,	1300x1000	matrix, b/w, digital RS644, async shutter, flexible timing, partial scan, Inspecta-3 only	0x898
1	A201b/c	1008x1018	matrix, b/w, channel link, async shutter, flexible timing.	0xB64
1	A202k	996x1004	matrix, b/w, CameraLink, async shutter.	0xF0C
1	L301kc	2098x3	linescan, color trilinear, CameraLink, Inspecta-4C	0xCF8
1	L401k	4096	linescan, b/w, Camera Link, 7.2 khz line freq. 8-Bit 10-Bit	 0x49A 0x1038

Dalsa

Nr. of cameras simulta-neously	Model	Image size HxV (visible pixel)	Description	Camera Mode
1	CA-D1	256 x 256	matrix, b/w, digital 12 bit, progressive, shutter	0x6BC
1	CL-P1	512-4096	linescan, b/w, digital 8 bit, scan rate 79.1-11.8Khz	0x5B8
1	SP-13/14	512-2048	linescan, b/w, digital 8 bit, 30/40Mhz, Inspecta-4D: up tp 65000 lines, exposure control & encoder	0xEA8
1	EC-11-01k40	1024x100	linescan, b/w, 8-bit digital, 40Mhz TDI, Inspecta-4D up to 34Khz line rate	0x49A

1	EC-11-02k40	2048x100	linescan, b/w, 8-bit digital, 40Mhz TDI, Inspecta-4D up to 17Khz line rate	0x49A
1	EC-11-05h40	512x100	linescan, b/w, 8-bit digital, 40Mhz TDI, Inspecta-4D up to 64Khz line rate	0x49A
1	Piranha P2-2x	1024-8192	linescan, b/w, 8/10-Bit CameraLink, dual output, 40Mhz	0x1208

Hitachi

Nr. of cameras simulta-neously	Model	Image size HxV (visible pixel)	Description	Camera Mode
1	KP-F100	1300x1028	matrix, b/w, digital 10 bit, progressive, variable/fixed async shutter, 12fps	0x68C
1	KP-F100	1300x1028	matrix, b/w, digital 10->8 bit, progressive, variable/fixed async shutter, 12fps	0x69C
1	KP-F100	1300x1028	matrix, b/w, digital 8 bit, progressive, variable/fixed async shutter, 12fps	0x6AC
1	KP-F100	1012x1016	matrix, b/w, digital 10 bit, progressive, variable/fixed async shutter, 30fps	0x27F
1	KP-F100	984x1016	matrix, b/w, digital 10->8 bit, progressive, variable/fixed async shutter, 30fps	0x39F
1	KP-F100	1000x1024	matrix, b/w, digital 8 bit, progressive, variable/fixed async shutter, 30fps	0xAF
1	KP-M2/3	736x286	matrix, b/w, analog, single field, fixed/variable async shutter, 30/25fps	0x3E0
1	KP-M2/3	736x575	matrix, b/w, analog, interlace, fixed sync shutter, 30/25fps	0x3F0
1	KP-F1	736x591	matrix, b/w, analog, progressive, fixed/variable async shutter, 25fps	0x77C
2	KP-F1	736x591	matrix, b/w, analog, progressive, fixed/variable async shutter, 25fps 2-cameras multiplane	0x78C
3	KP-F1	736x591	matrix, b/w, analog, progressive, fixed/variable async shutter, 25fps 3-cameras multiplane	0x79C
4	KP-F1	736x591	matrix, b/w, analog, progressive, fixed/variable async shutter, 25fps 4-cameras multiplane	0x7AC
   1 2 3 4 2 4	KP-F3S2	640x480	matrix, b/w, analog, progressive, fixed/variable async shutter, 30fps, Sony XC-55 replacement 1-camera 2-cameras multiplane (Inspecta-3MZ only) 3-cameras multiplane (Inspecta-3MZ only) 4-cameras multiplane (Inspecta-3MZ only) 2-cameras 16bpp 4-cameras 32bpp	 0x112C 0x113C 0x114C 0x115C 0x116C 0x117C
1	KP-F120CL	1392x1040	matrix, b/w, Cameralink, progressive, fixed/variable async shutter, 30fps 10->8-Bit, Driver Ver. >= 3.29 10-Bit, Driver Ver. >= 3.30	 0x111C 0x119C
1	HV-D30	768x502	matrix, color 3-chip RGB, analog interlace, fld/frm async shutter, 32bpp	0x1268
1	HV-D30	768x502	matrix, color 3-chip RGB, analog interlace, fld/frm async shutter, 24bpp	0x1258

Ikegami

Nr. of cameras simulta-neously	Model	Image size HxV (visible pixel)	Description	Camera Mode
1	SKC-141	1392x1040	matrix, b/w, analog, progressive, variable/fixed async shutter, 10-15fps, infrared sensitive	0xA7C
2	SKC-141	1392x1040	matrix, b/w, analog, progressive, variable/fixed async shutter, 10-15fps, 2-planes, Inspecta-3 only, infrared sensitive	0xA8C
3	SKC-141	1392x1040	matrix, b/w, analog, progressive, variable/fixed async shutter,10-15fps, 3-planes, Inspecta-3 only, infrared sensitive	0xA9C
2	SKC-141	1392x1040	matrix, b/w, analog, progressive, variable/fixed async shutter,10-15fps, 16-bpp, infrared sensitive	0xAAC
4	SKC-141	1392x1040	matrix, b/w, analog, progressive, variable/fixed async shutter, 10-15fps, 32-bpp, infrared sensitive	0xABC

JAI

Nr. of cameras simulta-neously	Model	Image size HxV (visible pixel)	Description	Camera Mode
1	JAI-M1	1284x1026	matrix, b/w, analog, progressive, variable/fixed async shutter, 12fps	0x8AC
1	JAI-M1	1284x1026	matrix, b/w, analog, progressive, synchronous shutter, 12fps	0x8A0
2	JAI-M1	1284x1026	matrix, b/w, analog, progressive, variable/fixed async shutter, 12fps	0x8BC
3	JAI-M1	1284x1026	matrix, b/w, analog, progressive, variable/fixed async shutter, 12fps	0x95C
1 2 3 2 3	JAI-A1	1380x1035	matrix, b/w, analog, progressive, synchronous shutter, 16fps 2-planes, Inspecta-3 only 3-planes, Inspecta-3 only 16 bpp 32 bpp	0x1075 0x1095 0x10A5 0x10B5 0x10C5
1 2 3 4 2 3-4	JAI-A11	648x492	matrix, b/w, analog, progressive, synchronous shutter, 30fps 2-planes, Inspecta-3 only 3-planes, Inspecta-3 only 4-planes, Inspecta-3 only, with B422 16 bpp 32 bpp, 4-cameras with Inspecta-3 and B422	0x136C 0x137C 0x138C 0x139C 0x13AC 0x13BC
1	JAI-M10	740x581	matrix, b/w, analog, progressive, fixed sync shutter, 30/25fps	0x31F
1	JAI-M10	740x581	matrix, b/w, analog, progressive, fixed async shutter, 30/25fps	0x32F
2	JAI-M10	740x581	matrix, b/w, analog, progressive, fixed async shutter, 30/25fps, 2-planes, Inspecta-3 only	0x4AF
3	JAI-M10	740x581	matrix, b/w, analog, progressive, fixed async shutter, 30/25fps, 3-planes,, Inspecta-3 only	0x33F

4	JAI-M10	740x581	matrix, b/w, analog, progressive, fixed/variable async shutter, 25fps	0x5DF
1	JAI-M10RevF	740x581	matrix, b/w, analog, progressive, fixed sync shutter, 30/25fps	0xDFF
1	JAI-M10RevF	740x581	matrix, b/w, analog, progressive, fixed async shutter, 30/25fps	0xE0F
2	JAI-M10RevF	740x581	matrix, b/w, analog, progressive, fixed async shutter, 30/25fps, 2-planes, Inspecta-3 only	0xE1F
3	JAI-M10RevF	740x581	matrix, b/w, analog, progressive, fixed async shutter, 30/25fps, 3-planes, Inspecta-3 only	0xE2F
4	JAI-M10RevF	740x581	matrix, b/w, analog, progressive, fixed async shutter, 30/25fps, 4-planes, Inspecta-3 only	0xE3F
2	JAI-M10RevF	740x581	matrix, b/w, analog, progressive, fixed async shutter, 30/25fps, 16bpp	0xE4F
4	JAI-M10RevF	740x581	matrix, b/w, analog, progressive, fixed async shutter, 30/25fps, 32bpp	0xE5F
1	JAI-M30	752x58	matrix, b/w, analog, progressive, fixed sync shutter, 300fps	0x58F
2	JAI-M50	728x574	matrix, b/w, analog, interlace, fixed sync shutter, 25fps	0x28
3	JAI-M50	728x574	matrix, b/w, analog, interlace, fixed sync shutter, 25fps, 3-planes	0x168
4	JAI-M70	1448x494	matrix, RGB, analog, progressive, fixed async shutter, 30fps, 16bpp	0x50F
1	JAI-M70	2896x494	matrix, RGB, analog, progressive, fixed async shutter, 30fps, 32bpp	0x4FF
1	JAI-M70	752x582	matrix, RGB, analog, progressive, fixed async shutter, 30fps, 3-planes	0x4EF
1	JAI-M1000k	752x582	remote head matrix, RGB, analog, CCIR interlaced, fixed/auto shutter, 25fps, 3-planes 16bpp 32bpp	0x368 0x368 0x368
1 2 3 2 4	JAI-M40	640x502	matrix, b/w, analog, progressive, synchronous shutter, 60fps 2-planes 3-planes 16bpp 32bpp	0xBEF 0xBFF 0xC0F 0xC1F 0xC2F
1 2 3 2 4	JAI-M40	640x502	matrix, b/w, analog, progressive, synchronous shutter, 120fps 2-planes 3-planes 16bpp 32bpp	0xC3F 0xC4F 0xC5F 0xC6F 0xC7F
1	JAI-M4	1392x1033	matrix, b/w, analog, progressive, asynchronous shutter, 24fps, 10-Bit CameraLink	0xEBC
1	JAI-M4	1392x1033	matrix, b/w, analog, progressive, asynchronous shutter, 24fps, 10->8-Bit CameraLink	0xECC
1	JAI-M7	1392x1033	matrix, color, beyer data 10->8 BitCameraLink, progressive, async shutter, 24fps	0xECC
1	JAI-M77	1028x770	matrix, RGB, analog, progressive, async shutter, 25fps, 32bpp Inspecta-3/4A	0x128C
1	JAI-M77	1028x770	matrix, RGB, analog, progressive, async shutter, 25fps, 24bpp Inspecta-4A	0x127C

Mikrotron

Nr. of cameras simulta-neously	Model	Image size HxV (visible pixel)	Description	Camera Mode
1	MC130x 1280x1024	1280x1024	matrix, b/w, analog, progressive, CMOS, 47 fps	0xA41
1	MC130x 640x480	640x480	matrix, b/w, analog, progressive, CMOS, 202fps	0xD31
1	MC130x 240x240	240x240	matrix, b/w, dgital, progressive, CMOS, 960fps	0xD41
1	MC130x 100x100	100x100	matrix, b/w, dgital, progressive, CMOS, 4800fps	0xD51

Opti-Sens

Nr. of cameras simulta-neously	Model	Image size HxV (visible pixel)	Description	Camera Mode
1	UniLine-2048	2048	linescan, b/w, analog/digital, up to 10Mhz	digital: 0x498

JAI-Pulnix

Nr. of cameras simulta-neously	Model	Image size HxV (visible pixel)	Description	Camera Mode
1	TM-7 EX	750x484	1/2" matrix, b/w, analog interlace	0x28
3	TM-72EX	750x484	2/3" matrix, b/w, analog interlace	0x168 0x768
4	TM-6 EX	728x575	11/2" matrix, b/w, analog interlace	0x28
3	TM-62EX	728x575	2/3" matrix, b/w, analog interlace	0x168 0x768
1	TMC-7	 1427x484 2854x484 713x484	1/2" matrix, RGB, analog interlace, 16bpp 32bpp 3-planes	 0x188 0x1E8 0x368
1	TMC-9700	 1426x484 2850x484 713x484 2990x482	2/3", matrix, analog, progressive, 16bpp 32bpp 3-planes 2/3", matrix, digital, progressive, 32bpp	 0x198 0x1D8 0x3E8 0x3FC
 1 2 3 3	TM-1001	1004x1019	matrix, digital, progressive, async. shutter 2-planes 3-planes 32bpp	 0xAF 0x5EC 0x5FC 0x60C
 1 2 3 3	TM-1010	1012x1016	matrix, digital, progressive, async. shutter, 20Mhz 2-planes 3-planes 32bpp	 0xAF 0x5EC 0x5FC 0x60C
1	TM-1010	1012x1016	matrix, digital, progressive,	0xAF 0x5EC 0x5FC 0x60C

1	TM-1040	1012x1016	async. shutter, 10->8 bit <= 20Mhz > 20Mhz	 0x39D 0x39F
	TM-1300	1300x1042	matrix, digital, progressive, async. shutter, 10 bit 10->8 bit 8 bit analog, progressive	 0x6BC 0x6DC 0x6CC 0x8DC
1 3 4 1 2 3 4	TM-9701	758x484 758x484 758x484 767x484 767x484 767x484 767x484	matrix, analog/digital, progressive, async. variable/fixed shutter analog analog 3-planes, Inspecta-3 only analog 4-planes, Inspecta-3 only digital digital, 2-planes, Inspecta-3 only digital, 3-planes, Inspecta-3 only digital, 4-planes, Inspecta-3 only	0x70D 0x96E 0xA6E 0x8C 0x63C 0x64C 0x65C
 1 2 2 4	TM-6705 AN	 644x485 644x485 644x485 644x485	matrix, analog, progressive, async. variable/fixed shutter 2-planes, Inspecta-3 only 16bpp 32bpp	 0x1BF 0x30E 0x2DE 0x2FE
 1 2 3 2 3	TM-6702 TM-6703	636x481	matrix, analog, progressive, async., variable/fixed shutter, 60Hz, non continuous sync 2-planes, Inspecta-3 only 3-planes, Inspecta-3 only 16bpp 24bpp, Inspecta-4A only	 0x7BF 0x7CE 0x7DE 0x11BE 0x11CE
 1 2 3 4 2 3	TM-6702 TM-6703	636x481	matrix, analog, progressive, async., variable/fixed shutter,30Hz, non continuous sync 2-planes, Inspecta-3 only 3-planes, Inspecta-3 only 4-planes, Inspecta-3 only 16bpp 24bpp, Inspecta-4A only	 0x7EF 0x7FE 0x80E 0x81E 0x11DE 0x11EE
1 2 3 2 3	TM-6702 TM-6703	636x481	matrix, analog, progressive,synchronous shutter, 60Hz 2-planes, Inspecta-3 only 3-planes, Inspecta-3 only 16bpp 24bpp, Inspecta-4A only	0x82F 0x83E 0x84E 0x11BE 0x11CE

1 2 3 4 2 3	TM-6702 TM-6703	636x481	matrix, analog, progressive synchronous shutter, 30Hz 2-planes, Inspecta-3 only 3-planes, Inspecta-3 only 4-planes, Inspecta-3 only 16bpp 24bpp, Inspecta-4A only	0x85F 0x86E 0x87E 0x88E 0x11DE 0x11EE
1	TMC-6700	640x484	matrix, camera-link, progressive, async., variable/fixed shutter, 60Hz 16bpp 32bpp	 0x93C 0x934
1	TMC-6760	638x480	matrix, colour with Bayer filter, camera-link, progressive, async., variable/fixed shutter, CameraLink	0xC8C
1	TMC-1000	1012x1016	matrix, camera-link, progressive, async., variable/fixed shutter, 16bpp 32bpp	 0x93C 0x934
1	TM-6710	688x491	matrix, digital, progressive, sync/async., variable/fixed shutter, 120Hz, Inspecta-3 Inspecta-4D	 0x66D 0xF1D
1	TM-6710CL	688x490	matrix, digital, progressive, sync/async., variable/fixed shutter, 120Hz, Inspecta-4C	0x100C
1	TM-1020-15-30CL	1002x1018	matrix, camera-link, progressive, async., variable/fixed shutter, digital/CameraLink	0xC8C (Rem 1)
1	TM-1320-CL TM-1325-CL	1296x1029	matrix, camera-link, progressive, async., variable/fixed shutter, digital/CameraLink	0xC8C (Rem 1)
1	TM-2016-8 (CL)	1915x1081	matrix, camera-link, progressive, async., variable/fixed shutter, digital/CameraLink (Rem 1)	0xC8D (Rem 1)
1	TM-2020-8 (CL)	1596x1200	matrix, camera-link, progressive, async., variable/fixed shutter, digital/CameraLink Remark1: Camera specific section in Inspecta-x.cam necessary	0xC8D (Rem 1)
1	TM-4000	2048x2048	matrix, camera-link, progressive, async., variable/fixed shutter, CameraLink	tm4000sync.mfg
1	TM-1400	1394x1040	matrix, camera-link, progressive, async., variable/fixed shutter, CameraLink	0xC8C

Redlake

Nr. of cameras simulta-neously	Model	Image size HxV (visible pixel)	Description	Camera Mode
1	Megaplus 1.4i	1317x1035	matrix, b/w, analog, progressive, frame transfer, 6.9fps	0x10
1	Megaplus 1.6i	1534x1024	matrix, b/w, analog, progressive, frame transfer, 5.46fps	0x10
1	Megaplus 4.2i	2030x2047	matrix, b/w, dgital, progressive, frame transfer, 2.1 fps	0x150
1	Megaplus 16.8i	4098x4098	matrix, b/w, dgital, progressive, frame transfer	0x150
1	Megaplus ES 1.0	1020x1020	matrix, b/w, 2x8 bit digital, progressive, variable/fixed async shutter, 30fps	0x530
1	Megaplus ES 1.0	1020x1020	matrix, b/w, 2x8 bit digital, progressive, double exposure, 15fps	0x531

1	Megaplus ES 1.0	1020x1020	matrix, b/w, 8 bit digital, progressive, variable/fixed async shutter, 15fps	0x89C
1	Megaplus ES 4.0	2048x2048	matrix, b/w, 8 bit digital, progressive, variable/fixed async shutter, 15fps	0x98C

Schäfer&Kirchhoff

Nr. of cameras simulta-neously	Model	Image size HxV (visible pixel)	Description	Camera Mode
1 2 3 4	SK128xx- SK7926xx	128-7926	linescan, b/w, analog	0x268 0x9D8 0x548 0x558
1	SK2048xx- SK5000xx	2048-5000	linescan, b/w, digital	0x49A
1	SK7500 DJR	7500	linescan, b/w, digital	0x11F8
1	SK16080 DJRC	3x5360	linescan, RGB, digital	sk16080 linescan 3x5360.mfg

Sony

Nr. of cameras simulta-neously	Model	Image size HxV (visible pixel)	Description	Camera Mode
1	XC-77/75CE	733x602	matrix, b/w, analog interlace	0x8E8
2 3 4	XC- ST30/50/70CE			0x768
1	XC-77/75 XC-ST30/50/70	752x502	matrix, b/w, analog interlace,EIA	0x8F8 0x768
1	XC-55	752x502	matrix, b/w, progressive, async fixed/variable shutter, 30fps 2-planes, Inspecta-3 only 3-planes, Inspecta-3 only 4-planes, Inspecta-3 only 16 bpp 32 bpp	 0x71C 0x72C 0x73C 0x74C 0xDCC 0xDDC
1	XC-003P	723x574	matrix, analog, interlace, RGB color, 3CCD prism block, 3-planes, Inspecta-3 only	0x758
1	DXC-9100P DXC-9100P + XC-75	 723x574 723x574	matrix, analog, progressive, RGB color, 3CCD prism block, 3-planes, Inspecta-3 only colour & b/w camera on 4-planes, Inspecta-3 only	 0x758 0x768
1 2 3 2 4	XC-HR50	640x500	matrix, b/w, progressive, async fixed/variable shutter, 60fps 2-planes, Inspecta-3 only 3-planes, Inspecta-3 only 16 bpp 32 bpp	0xD7D 0xD8D 0xD9D 0xDAD 0xDBD
1 2 2 3	XC-HR70	1024x 794	matrix, b/w, progressive, async fixed/variable shutter, SW7,8 on 30fps 2-planes, Inspecta-3 only 16 bpp 24 bpp, Inspecta-4A only	 0x12BD 0x12ED 0x12CD 0x12DD

Vistek

Nr. of cameras simulta-neously	Model	Image size HxV (visible pixel)	Description	Camera Mode
1	SVCam084CL	640x480	matrix, b/w, digital CameraLink, async shutter	0xE68
1	SVCam204CL	1032x768	matrix, b/w, digital CameraLink, async shutter	0xE68
1	SVCam285CL	1280x1024	matrix, b/w, digital CameraLink, async shutter	0xE68
1	SVCam282CL	2580x1944	matrix, b/w, digital CameraLink, async shutter	0xE68

Teli

Nr. of cameras simulta-neously	Model	Image size HxV (visible pixel)	Description	Camera Mode
1	CS8530D	640x500	matrix, b/w, analog, async shutter	0xD7C
2	CS8530D	640x500	matrix, b/w, analog, async shutter	0xD8C
3	CS8530D	640x500	matrix, b/w, analog, async shutter	0xD9C
4	CS8530D	640x500	matrix, b/w, analog, async shutter	0xDAC
2	CS8530D	640x500	matrix, b/w, analog, async shutter	0xDBC
4	CS8530D	640x500	matrix, b/w, analog, async shutter	0xDCC
1	CS8531D	640x500	matrix, b/w, analog, async shutter	0xFAC
2	CS8531D	640x500	matrix, b/w, analog, async shutter	0xFBC
3	CS8531D	640x500	matrix, b/w, analog, async shutter	0xFCC
4	CS8531D	640x500	matrix, b/w, analog, async shutter	0xFDC
2	CS8531D	640x500	matrix, b/w, analog, async shutter	0xFEC
1	CSB4000CL	2010x2047	matrix, b/w, 8/10-Bit CameraLink, async global lin/log shutter, 16 ROI	0x118C

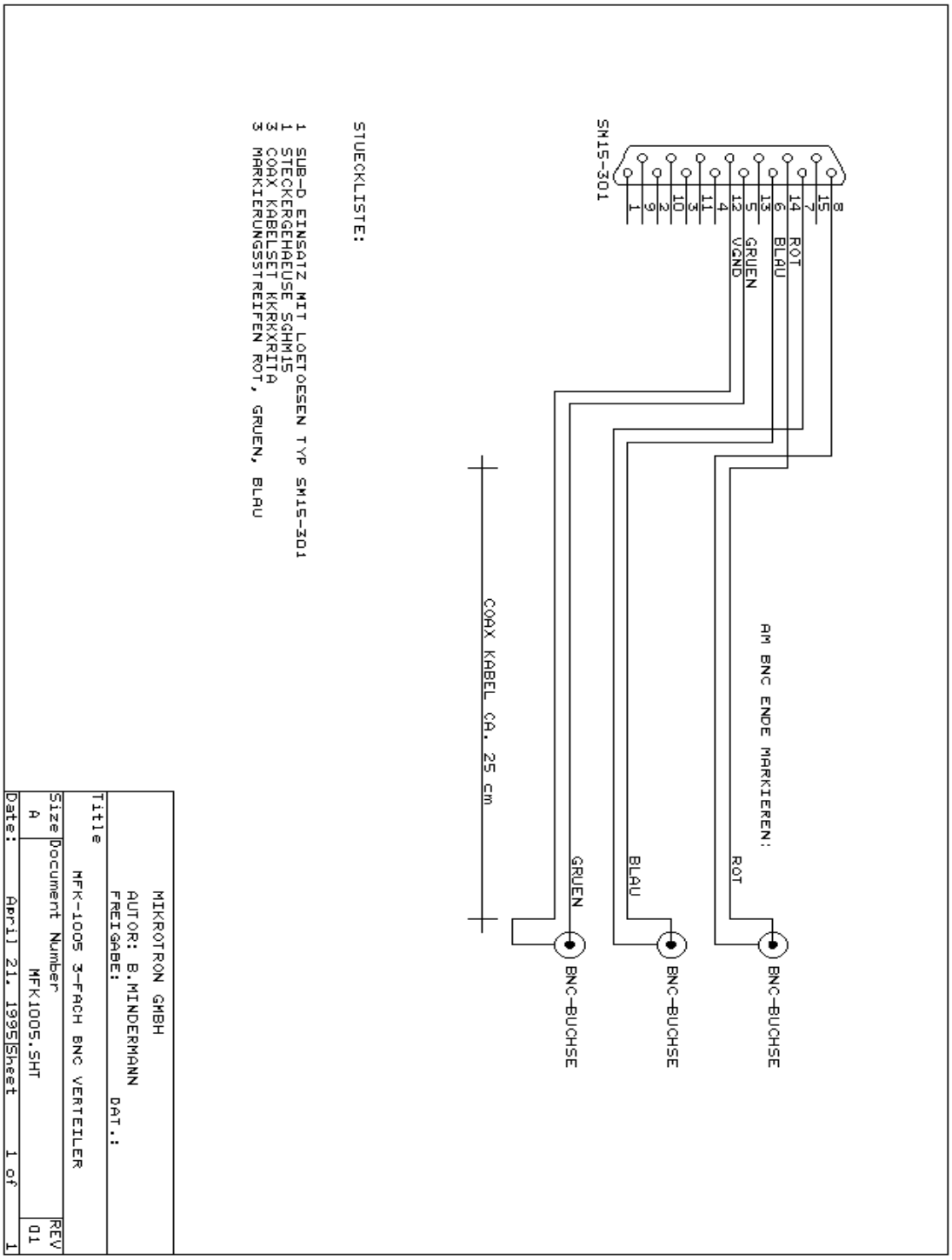
TVI

Nr. of cameras simulta-neously	Model	Image size HxV (visible pixel)	Description	Camera Mode
1	PRICOLOR COLIBRI	1024/2048	linescan, digital, 3 Chip RGB beamsplitter, parallel 3x10-Bit data out, 18/9 (Pricolor) or 27/14 (Colibri) khz linefrequency max., no exp. control, Inspecta-3	0xA28
1	PRICOLOR	1024/2048	linescan, digital, 3 Chip RGB beamsplitter, serial 3x8-Bit data out, 6/3 khz linefrequency max.	0x2C8
1	PRICOLOR	1024/2048	linescan, digital, 3 Chip RGB beamsplitter, parallel 3x8-Bit data, 18/9 khz linefrequency max, exp. control, Inspecta-4D only	0x1108
1	PRICOLOR COLIBRI	1024/2048	linescan, digital, 3 Chip RGB beamsplitter, parallel 3x8-Bit data, 27/14 khz linefrequency max, ext encoder, exp. control, Inspecta-4D only	0x1108

6 Appendix C: Cables for cameras

6.1 3-fold BNC connector

The following scematic shows the 3-fold BNC connector:



6.2 ADIMEC MX-12P 8123, 8143

(Part # KKRH**81X3)

for MX-12P 8123, 8143

Camera-modes: mfg_modcam (0x628) ; progressive
use driver version >= 1.75

6.3 Analog - camera universal

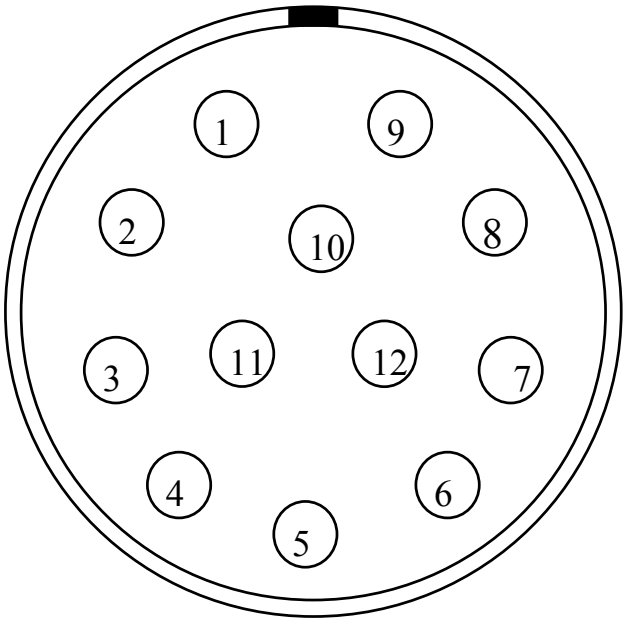
Connector to INSPECTA-2, -3, -4A	Connector on camera:
15-pol D male	PC-XC12

Pin Nr.	comment	color	Pin Nr.
1	+12V power	yellow	2
5	Video channel 0	red	4
12	Video channel 0 shield	grey	1
9	GND, power return	orange	9
connector case	cable shield		connector case

Use this cable with almost all standrad analog cameras with a video signal to CCIR or NTSC specification.

Camera-mode: mfg_modcam (0x68)

The pin-numbers of the 12-pin Hirose cameraconnector are shown from the view to the solder-pins:



6.4 Atmel Aviiva linescan, 8-12 Bits, 0.5-4k

Camera Link cable: Part # KKRDCLSR**
Power.cable:.Part.#.KKRPMC13XX**

(** = length in m)

6.5 Atmel Camelia 2.5M

(Part # KKRDATCAM12B**)

for Atmel Camelia 2.5M

camera mode: 0x1311 for 12-bit in 2 bytes, trigger input with camera internal exposure time provided.

power connector type Hirose 6-pin:

pin 5,6 = +24V
pin 1,2 = GND
Part # KKRPMC1300**can be used but check for proper power polarity.

RS-232 cable

D-Sub D9P female, PC	D-Sub D9P female, CameraC	
3	2	
2	3	
5	5	
8	7	
7	8	

Camera control software: Atmel CommCam, 6.50Beta, Profile camelia.cam

Camera Version command (hyperlink terminal or Commcam software):

9600Bd, !=0 <CR>

return string:
CAMEL_2.5M-C1-xxxxxxx, x = serial number

6.6 Atmel Camelia M1 CL 8M

Camera Link cable is standard Base Camera Link.

camera mode: 0x1301 for 12-bit in 2 bytes, trigger input with camera internal or Inspecta controlled exposure time on CC1 signal provided.

power connector type Hirose 6-pin:

pin 1,2 = +24V
pin 5,6 = GND
Part # KKRPMC1300**can be used but check for proper power polarity.

Camera control software: Atmel CommCam, 6.50Beta, Profile camelia8M_M1 or _C1.cam, 9600Bd, communcation via CameraLink sertc, serfg signals.

Camerlink terminal software can be used, insert <CR> as command delimiter.

See Camelia manuals for command description.

6.7 Basler areascan 16-Bit

(Part # KKRDBAXX16B**)

for Basler A201BC (CAMA201BC)

camera mode: 0xB54 for 8bpp, dual output

power connector type BINDER 4-pin: pin 1,2 = GND, 3,4 = 24V
(power cable KKRPBAXX**)

RS-232 connector type D9P female:
pin 5 = GND
pin 2 = RX
pin 3 = TX
other pins: NC

6.8 BASLER areascan, 8-Bit

(Part # KKRDA113**) do not use anymore
(Part # KKRDBAXX08B**)

for Basler A101 (CAMA113), A101P (CAMA113P), A101C (CAMA113C),
A101CP (CAMA113CP)

power connector type BINDER 4-pin: pin 1,2 = GND, 3,4 = 24V
(power cable KKRPBAXX**)

camera mode:

camera mode	Basler Exposure mode description	Remark	Basler exposure mode to configure the camera
0xAC	Free-run mode, fixed timing	Only with cable KKRDA113**	6
0xAC	Programmable exposure time, Fixed timing	Only with cable KKRDA113**	2
0xAC	Level controlled exposure time, Fixed timing	Only with cable KKRDA113**	3
0x898	Programmable exposure time, Flexible timing	Only with cable KKRDA113** and Inspecta-2/3	0
0xDEC	Free run, programmable or level controlled exposure, Fixed timing	Only with cable KKRDBAXX08B**	6,2,3

Use partial scan (A101P) only with flexible timing (mode 0x898)and Inspecta-2/3

6.9 Basler channel-link digital/RS-232/power

(Part # KKRDBASCHL**)

for Basler A201B (CAMA201B), A201BC (CAMA201BC)

The cable is split into three branches (each app. 30cm) on the Inspecta side. One branch is connected to a female 3-row 15-pin HD-sub (channel link data), the other to a female 9-pin D-sub (COMx), and the power supply lines to a male 15-pin D-sub connector (Inspecta analog/power connector).

Camera modes: use Basler digital camera modes

6.10 BASLER L1xx linescan, 8-Bit

(Part # KKRDBAXX08B**)

for Basler L101 (CAML1201K8), L102 (CAML1301K8), L103 (CAML1401K8)
L101 (CAML1202K8), L102 (CAML1302K8), L103 (CAML1402K8)
L201 (CAML2204K8), L202 (CAML2304K8), L203 (CAML2404K8)

power connector type BINDER 4-pin: pin 1,2 = GND, 3,4 = 24V
(power cable KKRPBAXX**)

camera mode	bpp
0x49A	8

6.11 BASLER linescan, 16-Bit

(Part # KKRDBAXX16B**)

for Basler L103 (CAML1401K16), L104 (CAML1601K16)
L103 (CAML1402K16), L104 (CAML1602K16)
K203 (CAML2404K16)

power connector type BINDER 4-pin: pin 1,2 = GND, 3,4 = 24V
(power cable KKRPBAXX**)

RS-232 connector type D9P female:
pin 5 = GND
pin 2 = RX
pin 3 = TX
other pins: NC

camera mode	bpp
0x5BA	8, dual output

6.12 Basler.Linescan.L401k

Camera Link cable: Part # KKRDCLSR**
Power.cable:.Part.#.KKRPMC13XX**

(** = length in m)

1	L401k	4096	linescan, b/w, Camera Link, 7.2 khz line freq.	
			8-Bit	0x49A
			10-Bit	0x1038

6.13 Dalsa CL-P1 xxxxW linescan, dual output

(Part # KKRDCLP1W16B**)

for Dalsa CL-P1

The cable is split on the camera side. The 37-pin Sub-D connector carries data, whereas the 15-pin male Sub-D connector carries the EXSYNC signal.

camera mode	bpp
0x5B8	8, dual output

6.14 Dalsa Spyder SP-14

(Part # KKRDDALS**)

for DALSA SPYDER SP-14

Inspecta	camera mode
Inspecta-4D	0x49A

Camera set to:
EXSYNC = Level Mode
GAIN = 4
SPEED = 40Mhz

6.15 Power Cable for Dalsa Spyder SP-14

(Part # KKRPDALS**)

use this cable to supply Dalsa Spyder SP-14 by the PC.

6.16 Power Cable for Hitachi KPF-1xx

(Part # KKRPKPF**)

use this power cable for Hitachi KPF-1xx.

6.17 Digital Cameras Power Cable

(Part # KKRPDIG**)

use this power cable for all Digital cameras with 12-pin Hirose connector, except Hitachi KPF-1xx (KKRPKPF**)

6.18 Hitachi HV-D30 3-chip analog

(Part # KKRH**HVD30)

Camera modes for Hitachi HV-D30:

camera mode	bits per pixel	HV-D30 settings, menu buttons
0x578	32bpp, Inspecta-3/4A	Special menu: UP+MENU SW on (1 sec)-> OUTPUT/SYNC -> SYNC ON G: on

0x568	3x8Bit, Inspecta-3 only	TRIGGER MODE -> MODE1 DELAY TIME -> <=3H If external trigger: SUB MENU1 -> SHUTTER EXTERNAL

6.19 Hitachi KP-F100 8-bit digital

(Part # KKRDF10008B** with D-62P HD)

for HITACHI KP-F100 (CAMF100)
use this cable for 8 -bit data from camera

Camera modes for 8-bit KP-F100:

camera mode	bits per pixel	remark KP-F100
0x6AC	8	any mode

Inspecta-3: Use Powercable KKRPF100**
Set FOD mode switch to mode 2 (two trigger) if async shutter
Inspecta-4D/C: Use Powercable KKRPF**
Set FOD mode switch to mode 3 (one trigger) if async shutter

6.20 Hitachi KP-F100 10-Bit digital

(Part # KKRDF10010B** with D-62P HD)

for HITACHI KP-F100 (CAMF100)

use this cable for 10 -bit data from camera

Camera modes for KP-F100 only (Inspecta2/3MZ or Inspecta-4D):

camera mode	bits per pixel	remark KP-F100
0x68C	10	any mode
0x69C	10->8	any mode

Inspecta-3: Use Powercable KKRPF100**
Set FOD mode switch to mode 2 (two trigger) if async shutter
Inspecta-4D/C: Use Powercable KKRPF**
Set FOD mode switch to mode 3 (one trigger) if async shutter

6.21 Powercable KP-F100

Inspecta-3: Use Powercable KKRPF100**
Inspecta-4D/C: Use Powercable KKRPF**

6.22 Hitachi KP-F110 16-bit digital

(Part # KKRDF11016B**)

for KP-F110

Camera modes for KP-F110 (Inspecta2/3MZ or Inspecta-4D):

camera mode	bits per pixel	Remark
0x9EC	8	FD off: synchronous
0x9FC	8	FD on, 1T: async variable shutter

Inspecta-3: Use Powercable KKRPF110**

Inspecta-4D/C: Use Powercable KKRPF**

6.22.1 Powercable KP-F110

Inspecta-3: Use Powercable KKRPF110**
Inspecta-4D/C: Use Powercable KKRPF**

6.23 Ikegami SKC-13x analog/power

(Part # KKRH**IKE)

for SKC-131-12AE (CAMSKC13112AE), SKC-131-12E (CAMSKC13112E)
SKC-131-E (CAMSKC13115E), SKC-133 2/3" (CAMSKC13330)

Camera mode	Number of cameras	Remark
0xA7C	1	analog 12Hz
0xA8C	2	analog 12Hz multiplane
0xA9C	3	analog 12Hz multiplane
0xAAC	2	analog 12Hz, 16bpp: even/odd pixel = camera 0/1
0xABC	1 .. 4	analog 12Hz, 32bpp: pixel 0..3 = camera 0..3

Camera mode select wheel: async shutter: 1 or 7, synchron: 0
Shutter speed wheel: 0xF for variable Inspecta controlled shutter

6.23.1 Additional serial cable for mode control of SKC-13x

(Part # KKRH**IKER)

6.24 Ikegami SKC-13x digital 8-Bit

(Part # KKRDIK08B**)

for SKC-131-12E (CAMSKC13112E), SKC-131-E (CAMSKC13115E),
SKC-133 2/3" (CAMSKC13330)

Camera mode	bpp
0xB3C	8bit

Camera mode select wheel: async shutter: 1 or 7, synchron: 0
Shutter speed wheel: 0xF for variable Inspecta controlled shutter

6.25 Ikegami SKC-13x digital 10-Bit

(Part # KKRDIK10B**)

for SKC-131-12E (CAMSKC13112E), SKC-131-E (CAMSKC13115E),
SKC-133 2/3" (CAMSKC13330)

Camera mode		Remark
0xB1C		10bit(16bit in memory)
0xB2C		10bit to 8bit

Camera mode select wheel: async shutter: 1 or 7, synchron: 0

Shutter speed wheel: 0xF for variable Inspecta controlled shutter

6.26 JAI CV M1000K

(Part # KKRH**M1000K)

for CV M1000K

M1000K is connected to the Inspecta via one cable. The cable is split on the camera side. One end is the Hirose 6-P and the other end is the 9-pin Sub-D-connector.

camera modes for M1000K CCIR color cameras:

camera mode	bpp
0x368	3-planes, 8:8:8 RGB
0x378	16p, 5:6:5, R:G:B
0x388	32p, 8:8:8:8 R:G:B:x

6.27 JAI CV M2200

(Part # KKRH**M2200)

for CV M2200

M2200 is connected to the Inspecta via one cable. The cable is split on the camera side. One end is the Hirose 6-P and the other end is the 9-pin Sub-D-connector.

camera modes for M2200 CCIR color cameras:

camera mode	bpp
0x368	3-planes, 8:8:8 RGB
0x378	16p, 5:6:5, R:G:B
0x388	32p, 8:8:8:8 R:G:B:x

6.28 JAI CV-M1

(Part # KKRH**M1)

for JAI CV-M1 (CAMM1)

JAI CV-M1 is connected to the Inspecta via one cable. There are two connectors on the camera side, the Hirose 12-P and the Hirose 6-P connector.

camera mode JAI CV-M1	Nr. of cameras	Async shutter
0x8A0	1	no
0x8AC	1	single pulse
0x8BC	2	single pulse
0x95C	3	single pulse

camera mode JAI CV-M1 >Rev D	Nr. of cameras	Async shutter
0xB7C	1	No or single or double pulse

0xB8C	2	No or single or double pulse
0xB9C	3	No or single or double pulse

For multiple JAI CV-M1 use single trigger shutter mode. See camera switch setting below for shutter speed selection.

Camera back-panel switches:
1: shutter speed (see camera manual)
2: shutter speed (see camera manual)
3: shutter speed (see camera manual)
4: shutter speed (see camera manual)
on if double pulse trigger selected
5: off: single or double pulse trigger
on: no trigger but double speed at 500 lines
6,7: off/off: low speed,
off/on: high speed,
on/on: double pulse
8: off: sw1-4 for shutter speed selection
on: RS-232 shutter speed selection

Inside camera switches & jumpers:
Standard factory setup, HD/VD in

6.29 JAI CV-M1 with RS-232

(Part # KKRH**M1R)

for JAI CV-M1 (CAMM1), CV-A1, CV-A11

One of the above cameras is connected to the Inspecta via one cable. There are two connectors on the camera side, the Hirose 12-P and the Hirose 6-P connector.

The cable is split on the Inspecta side for an additional connection to one of the serial connectors (9-pin D-Sub female). This optional cable is app. 20cm long

CV-M1 modes:

camera mode	Nr. of cameras	Async shutter
0x8A0	1	no
0x8AC	1	single pulse
0x8BC	2	single pulse
0x95C	3	single pulse

For multiple JAI CV-M1 use single trigger shutter mode. See camera switch setting below for shutter speed selection.

Camera back-panel switches:
1: shutter speed (see camera manual)
2: shutter speed (see camera manual)
3: shutter speed (see camera manual)
4: shutter speed (see camera manual)
on if double pulse trigger selected
5: off: single or double pulse trigger
on: no trigger but double speed at 500 lines
6,7: off/off: low speed,
off/on: high speed,
on/on: double pulse
8: off: sw1-4 for shutter speed selection
on: RS-232 shutter speed selection

Inside camera switches & jumpers:
Standard factory setup, HD/VD in

CV-A1 modes:

camera mode	Nr. of cameras	Async shutter
0x1074	1	No, or pulse width
0x1084	2, 2-plane Inspecta-3	No, or pulse width
0x1094	3, 3-plane Inspecta-3	No, or pulse width
0x10A4	2, 16bpp	No, or pulse width
0x10B4	3, 24bpp, Inspecta-4A	No, or pulse width
0x10C4	4, 32bpp, 4 cameras with Inspecta-3 and B422	No, or pulse width

Use Jai-A1 camera control tool to select:

Shutter normal/Pulse width control
Sync Signal Output: on
Binning: according to customers needs, change Numlin and Linelen accordingly

CV-A11 modes:

camera mode	Nr. of cameras	Async shutter
0x136C	1	No, or pulse width
0x137C	2, 2-plane Inspecta-3	No, or pulse width
0x138C	3, 3-plane Inspecta-3	No, or pulse width
0x139C	4, 4-plane Inspecta-3	No, or pulse width
0x13AC	2, 16bpp	No, or pulse width
0x13BC	4, 32bpp, 4 cameras with Inspecta-3 and B422	No, or pulse width

Use Jai-A11 camera control tool to select:

Shutter normal/Pulse width control
Sync Signal Output: on
Binning: according to customers needs, change Numlin and Linelen accordingly

6.30 JAI CV-M10BX

(Part # KKRH**M10)
for JAI CV-M10BX (CAMM10BX)

camera mode	Nr. of cameras	Async shutter
0x31F	1	non interlaced, no shutter, one plane
0x32F	1	non interlaced, async. shutter, one plane
0x33F	3	non interlaced, async shutter, three planes
0x4AF	2	non interlaced, async shutter, two planes

For the following modes use B446A high speed analog video interface:

camera mode	Nr. of cameras	Async shutter
0x5CC	4	non interlaced, async shutter, four planes
0x5DC	4	non interlaced, async shutter, one plane

Camera back-panel switches:
1: shutter speed (see camera manual)
2: shutter speed (see camera manual)
3: shutter speed (see camera manual)
4: off --> async shutter enable, SW3 on internal PK7945 „on“

```
                on --> async shutter disable, mode 0x31f
          5:    on, progressive scan, off dual channel
          6:    gamma correction
          7:    AGC
          8:    Manual gain
```

6.31 JAI CV-M10BX Rev. F

(Part # KKRH**M10F)
for JAI CV-M10BX Rev. F

camera mode	Nr. of cameras	
0xDFF	1	progressive
0xE0F	1	progressive, async. fixed or variable shutter

Jumper 12/13 on PK8206 board (or PK8190 for RS version)inside camera must be changed for fixed or variable shutter:

JP 12	JP 13	
Open	open	Fixed shutter
Close	close	Variable shutter

Use driver software ≥ 3.01
Camera back-panel switches:

```
          1:    shutter speed  ( see camera manual )
          2:    shutter speed  ( see camera manual )
          3:    shutter speed  ( see camera manual )
          4:    off --> async shutter enable
                on --> async shutter disable, mode 0x31f
          5:    on, progressive scan, off dual channel
          6:    gamma correction
          7:    AGC
          8:    Manual gain
```

6.32 JAI CV-M30

(Part # KKRH**M30)

for JAI CV-M30 (CAMM30)

camera mode	Nr. of cameras	Async shutter
0x588	4	non interlaced, no shutter, one channel

Camera back-panel switches:

```
           1:    shutter speed  ( see camera manual )
           2:    shutter speed  ( see camera manual )
           3:    shutter speed  ( see camera manual )
           4,6:  off, off: 100% scan, on, off: 50% scan, on, on: 33%scan
           5:    on: double speed
           7:    off: not external trigger
           8:    off: AGC off, on: AGC on
```

6.33 JAI CV-M40

(Part # KKRH**M40)

for CV-M40

JAI CV-M40 is connected to the Inspecta via one cable. There are two connectors on the camera side, the Hirose 12-P and the Hirose 6-P connector.

6.34 JAI CV-M40 with RS-232

(Part # KKRH**M40R)

for CV-M40

JAI CV-M40 is connected to the Inspecta via one cable. There are two connectors on the camera side, the Hirose 12-P and the Hirose 6-P connector.

The cable is split on the Inspecta side for an additional connection to one of the serial connectors (9-pin D-Sub female). This optional cable is app. 30cm long

6.35 JAI CV-M50

(Part # KKRH**HDVD)

for JAI CV-M50 (CAMM50)

6.36 JAI CV-M300

(Part # KKRH**HDVDCD)

for JAI CV-M300

6.37 JAI CV-M70

(Part # KKRH**M70)

for JAI CV-M70 (CAMM70)

JAI CV-M70 is connected to the Inspecta via one cable. There are three connectors on the camera side, one D-9P, the Hirose 12-P and the Hirose 6-P connector.

camera mode	bits per pixel	Shutter
0x4BF	24	N
0x4CF	16p	N
0x4DF	32p	N
0x4EF	24	Y

Camera back-panel switches:

1: shutter speed (see camera manual)
2: shutter speed (see camera manual)
3: shutter speed (see camera manual)
4: off --> async shutter enable, mode 0x4ef - 0x50f

```
                ( SW3 on internal PK7945 must be „on“)
            4:  on --> async shutter disable, mode 0x4bf-0x4df
            5:  on
            6:  gamma correction
            7:  AGC
            8:  Manual gain

Inside camera switches & jumpers:
PK 8050 board:  SW3 all off
PK 8051 board:  JP1 open
                JP2 close
                JP3 open
                JP4 close
                JP5 close
                JP6 close
                JP7 open
                JP10 close
                JP11 open
```

6.38 JAI CV-M70/R

(Part # KKRH**M70R)

for JAI CV-M70 (CAMM70)

JAI CV-M70 is connected to the Inspecta via one cable and one male D15P connector. The cable is split on the frame-grabbers end for an additional female D9P connector for connection with COMx of PC. There are three connectors on the camera side, one D-9P, the Hirose 12-P and the Hirose 6-P connector.

camera mode	bpp	clock Mhz	sync	il	shu	hfreq Khz	CCIR/NTSC
0x4BF	24	14.1875	cs/sep	N	N	ext	NTSC
0x4CF	16p	14.1875	cs/sep	N	N	ext	NTSC
0x4DF	32p	14.1875	cs/sep	N	N	ext	NTSC
0x4EF	24	14.1875	cs/sep	N	(5)	ext	NTSC
0x4FF	16p	14.1875	cs/sep	N	(5)	ext	NTSC
0x50F	32p	14.1875	cs/sep	N	(5)	ext	NTSC

```
Camera back-panel switches:
            1:  shutter speed  ( see camera manual )
            2:  shutter speed  ( see camera manual )
            3:  shutter speed  ( see camera manual )
            4:  off --> async shutter enable, mode 0x4ef - 0x50f
                ( SW3 on internal PK7945 must be „on“)
            4:  on --> async shutter disable, mode 0x4bf-0x4df
            5:  on
            6:  gamma correction
            7:  AGC
            8:  Manual gain

Inside camera switches & jumpers:
PK 8050 board:  SW3 all off
PK 8051 board:  JP1 open
                JP2 close
                JP3 open
                JP4 close
                JP5 close
                JP6 close
                JP7 open
                JP10 close
                JP11 open
```

6.39 JAI CV-235

(Part # KKRH**HDVD)

for JAI CV-235 (CAM235)

6.40 JVC KY-F70U

(PART # KKRH**KYF70)

for JVC KY-F70U (CAMKYF70U)

Camera mode: 0xA08

Attn.: use 10MB image buffer length
Driver version >= 2.16, **INSPECTA-2MZ, IMP Nr. IMP484 only**

6.41 ROPER (Kodak) ES Series 16-bit with RS-232

(Part # KKRDES16B**)

for Megaplus ES:1.0

The cable is split on the Inspecta side for an additional connection to one of the serial connectors (9-pin D-Sub female)

This additional cable is app. 30cm long

camera mode	triggered	size	Blank time	exposure	Camera settings as needed
0x530	free run	1020H x 1022 V	126		MDE CS, EXE
0x531	yes	1020H x 1022 V	126	single	STS AIA, MDE TR, TRM N, EXE
0x531	yes	1020H x 1022 V	126	single	STS AIA, MDE DE, TRM N, EXE

do **not** use camera mode: controlled

6.42 Mikrotron MC1020, connecting to B422A, B454

(Part # KKRDMC1020**R)

for Mikrotron MC1020 (CAMMC1020) and MC1300 (CAMMC1300)

The camera cable is split on the Inspecta side into three branches, each app. 25cm long:
One branch with 62P-HD male for B422A, B545 parallel interface
One branch with 9P-D female for COMx of PC
One branch with 15P-D male for +12V power from Inspecta

camera mode	bits per pixel	Comment

0xA4C	8	dual output

6.43 Mikrotron MC1020 connecting to INSPECTA-4D

(Part # KKRDMC1020**RD)

for Mikrotron MC1020 (CAMMC1020) and MC1300 (CAMMC1300)

The camera cable is split on the Inspecta side into three branches, each app. 25cm long:
One branch with 62P-HD male for B422A, B545 parallel interface
One branch with 9P-D female for COMx of PC
One branch with 7P-MINI-DIN male for +12V power from Inspecta-4D

camera mode	bits per pixel	Comment
0xA4C	8	dual output

6.44 Mikrotron MC1020 connecting to INSPECTA-4D

(Part # KKRDMC1020**)

for Mikrotron MC1020 (CAMMC1020) and MC1300 (CAMMC1300)

This camera cable is a „all in one", as INSPECTA-4D supplies power and serial communication via the 62pin HD plug.

camera mode	bits per pixel	Comment
0xA4C	8	dual output

6.45 Power Cable for Mikrotron MC1020 (general Connection)

(Part # KKRPMC1020**)

for Mikrotron MC1020 (CAMMC1020)

Cable with open ends at the grabber side.

6.46 Power Cable for Mikrotron MC1300 and MC1301 (general Connection)

(Part # KKRPMC1300**)

for Mikrotron MC1300 (CAMMC1300) and MC1301 (CAMMC1301)

Cable with open ends at the grabber side.

6.47 Power Cable for connecting Mikrotron MC1301 to INSPECTA-4C

(Part # KKRPMC1301**)

for Mikrotron MC1301 (CAMMC1301)

6.48 OptiSens UniLine-2048 Linescan Camera 8 bit RS422

(Part # Part # KKRDOS2048**)

for OptiSens UniLine-2048 Linescan Cameras connected to Insprecta-4D

camera mode	bits per pixel	Comment
0x49A	8	

6.49 Pulnix AccuPiXEL.Cameras

Camera Link cable: Part # KKRDCLSR**
Power.cable:.Part.#.KKRP4D4C**

(** = length in m, camera modes: see mode list)

6.50 Pulnix analog camera (progressive scan) with async. Reset (VINIT)

(Part # KKRH**PULPROG)

for PULNIX TM-1001 (CAM1001), TM-1010 (CAM1010),
TM-6701AN (CAM6701AN), TM-6702 (CAM6702),
TM-6703 (CAM6703), TM-6705 (CAM6705)
TM-9701 (CAM9701),

This cable can be used for all Pulnix progressive scan cameras with async reset (VINIT) and analog video output on 12-pin Hirose connector.

cameras modes for cameras with continuous sync (no option)

camera mode	camera	Comment
0x1BF	TM-670x	1 camera
0x30E	TM-670x	2 cameras, multiplane
0x2DE	TM-670x	2 cameras, singleplane
0x2FE	TM-670x	4 cameras, singleplane

(HTM.doc)	TM-9701	

TM6702 with Option: non-continuous sync (...)

camera mode	camera	shutter	Comment
0x85E	TM-6702 30Hz	sync	1 camera
0x86E	TM-6702 30Hz	sync	2 cameras, multiplane
0x87E	TM-6702 30Hz	sync	3 cameras, multiplane
0x88E	TM-6702 30Hz	sync	4 cameras, multiplane

camera mode	camera	shutter	Comment
0x7EE	TM-6702 30Hz	async	1 camera
0x7FE	TM-6702 30Hz	async	2 cameras, multiplane
0x80E	TM-6702 30Hz	async	3 cameras, multiplane
0x81E	TM-6702 30Hz	async	4 cameras, multiplane

camera mode	camera	shutter	Comment
0x82F	TM-6702 60Hz	sync	1 camera
0x83F	TM-6702 60Hz	sync	2 cameras, multiplane
0x84F	TM-6702 30Hz	sync	3 cameras, multiplane

camera mode	camera	shutter	Comment
0x7BF	TM-6702 60Hz	async	1 camera
0x7CF	TM-6702 60Hz	async	2 cameras, multiplane
0x7DF	TM-6702 30Hz	aasync	3 cameras, multiplane

6.51 Pulnix analog interlaced camera with VD

(Part # KKRH**PULHDVD)

for PULNIX TM-6 EX, TM-7 EX, TM76

This cable can be used for all Pulnix interlace cameras with HD and VD input (TM6/7 EX, mvfg_modcam (0x28))+ multicamera mode *(see Hardware-Manual)* and analog video output on 12-pin Hirose connector.

camera mode	camera	Comment
0x28	TM-6/7 EX	
0x28	TM-76	

6.52 Pulnix Remote Kabel for Hirose 6-Pin

(Part # KKRH**6PULR)

Use this cable for remote control of all Pulnix cameras with 6-pin Hirose connector

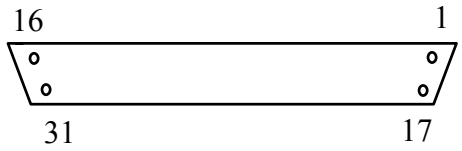
6.53 Pulnix TM1001/TM-1010/TM-1020/TM-1040/TM-1300/TM9701 8 Bit 37-pin

with D-Sub 37-pin

(Part # KKRD10XX08B37**)

for PULNIX TM-1001 (CAM1001), TM-1010 (CAM1010), TM-1040 (CAM1040), TM-1300 (CAM1300), TM-9701 (CAM9701)

31 pin Airborn plug, view on solder pins:



Use Digital Camera Powercable with 12-pin Hirose connector
Part # KKRPDIG**)

camera modes:

camera-mode	camera	bpp	Clock Mhz	INSPECTA-2
0xAC	TM-1010	8	5-20Mhz	MFGI31S(MZ)
0xAF	TM-1040	8	40Mhz	MFGI31S(MZ)
0x6DC	TM-1300	8	20Mhz	MFGI31S(MZ)

TM-1010/1040 async. shutter camera setting:
Mode2/down

TM-1300 async. shutter camera setting:
Mode2/down, Mode5/down, select shutter speed with red shutter wheel

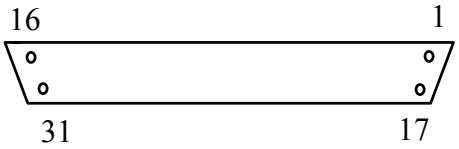
6.54 Pulnix TM1001/TM-1010/TM-1020/TM-1040/TM-1300/TM9701 8 Bit 62-pin

with D-Sub 62-pin HD

(Part # KKRD10XX08B62**)

for PULNIX TM-1001 (CAM1001), TM-1010 (CAM1010), TM-1040 (CAM1040),
TM-1300 (CAM1300), TM-9701 (CAM9701)

31 pin Airborn plug, view on solder pins:



Use Digital Camera Powercable with 12-pin Hirose connector (Part # KKRPDIG**)

camera modes:

camera-mode	camera	bpp	Clock Mhz	INSPECTA-2
0xAC	TM-1010	8	5-20Mhz	MFGI31S(MZ)
0xAF	TM-1040	8	40Mhz	MFGI31S(MZ)
0x6DC	TM-1300	8	20Mhz	MFGI31S(MZ)

TM-1010/1040 async. shutter camera setting:
Mode2/down

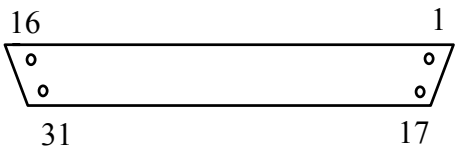
TM-1300 async. shutter camera setting:
Mode2/down, Mode5/down, select shutter speed with red shutter wheel

6.55 Pulnix TM-1010/ TM-1020/ TM-1040/ TM-1300 10-Bit

(Part # KKRD10XX10B62**)

for PULNIX TM-1010 (CAM1010), TM-1040 (CAM1040), TM-1300 (CAM1300)

31 pin Airborn plug, view on solder pins:



Use Digital Camera Powercable with 12-pin Hirose connector
(Part # KKRPDIG**)

Camera modes:

camera-mode	camera	bpp	clock Mhz	INSPECTA-2	remark
0x27F	TM-1010	10	20Mhz	MFGI31MZ	
0x27C	TM-1010	10	10Mhz	MFGI31MZ	

0x27C	TM-1010	10	5Mhz	MFGI31MZ	
0x39F	TM-1010	10->8	20Mhz	MFGI31MZ	
0x39C	TM-1010	10->8	10Mhz	MFGI31MZ	
0x39C	TM-1010	10->8	5Mhz	MFGI31MZ	
0xAC	TM-1010	8	20Mhz	MFGI31S	(1), (2)
0xAC	TM-1010	8	10Mhz	MFGI31S	(1), (2)
0xAC	TM-1010	8	5Mhz	MFGI31S	(1), (2)
0x27F	TM-1040	10	40Mhz	MFGI31MZ	
0x39F	TM-1040	10->8	40Mhz	MFGI31MZ	
0xAF	TM-1040	8	40Mhz	MFGI31S	(1), (2)
0x6BC	TM-1300	10	20Mhz	MFGI31MZ	(3)
0x6CC	TM-1300	10->8	20Mhz	MFGI31MZ	(3)
0x6DC	TM-1300	8	20Mhz	MFGI31MZ	(3)

remark (1) With the 8-bit INSPECTA-2S (MFGI31S), this cable can be used together with 10-bit camera (TM-1010/1040), if the camera gain is reduced to avoid data bits 8&9 going active.

remark (2) For less noise use the „Pulnix TM-1010/ TM-1040 10->8 Bit" cable below. Do not use the „Pulnix TM-9701/ TM-1001" cable.

remark (3) TM-1300: For async shutter Inspecta-2 must have IMP Number >= IMP 383, camera setting: Mode2/down, Mode5/down, select shutter speed with red shutter wheel

TM-1010/1040 async. shutter camera setting: Mode2/down

6.56 Pulnix TM-1300 analog

(Part # KKRH**1300)

for PULNIX TM-1300 (CAM1300)

TM-1300 is connected to the Inspecta via one cable. There are two connectors on the camera side, the Hirose 12-P and the 15P three row D-connector.

Remark 1: modification inside TM-1300 camera. Connect this pin with pin 1 of 31-pin Airborn connector (signal: CLK+)

camera mode control switch: pos 5/down for 12fps analog output
pos 2/up for manual shutter
pos 2/down for async shutter

camera mode		
0x8DC		

6.57 Pulnix TM-1300 analog with RS-232

(Part # KKRH**1300R)

for PULNIX TM-1300 (CAM1300)

TM-1300 is connected to the Inspecta via one cable. The cable is split on the Inspecta side (15-pin D-Sub) for the additional COMx connector. (ca 30cm, 9-pin D-Sub)
There are two connectors on the camera side, the Hirose 12-P and the 15P three row D-connector.

Remark 1: modification inside TM-1300 camera. Connect this pin with pin 1 of 31-pin Airborn connector (signal: CLK+)

camera mode control switch: pos 5/down for 12fps analog output
pos 2/up for manual shutter
pos 2/down for async shutter

camera mode		
0x8DC		

6.58 Pulnix TM-6700 KM analog

(Part # KKRBNC6700KM**)

for PULNIX TM-6700 KM

cameras modes for cameras with continuous sync (no option)

camera mode	camera	Comment
0x1BF	TM-670x	1 camera
0x30E	TM-670x	2 cameras, multiplane
0x2DE	TM-670x	2 cameras, singleplane
0x2FE	TM-670x	4 cameras, singleplane

6.59 Pulnix TM-6710 digital

(Part # KKRD671016B**)

for PULNIX TM-6710 (CAM6710)

camera mode	bpp	Remark
0x66D	8	Not Inspecta-4D
0xF1D	Even pixel/odd line Odd pixel/even line	Inspecta-3/4D Software >= Rev. 2.84

6.60 Pulnix TM-6710 Power/remote

(Part # KKRP6710**)

The cable is split on the Inspecta side (15-pin D-Sub) for the additional COMx connector. (ca 30cm, 9-pin D-Sub)

6.61 Pulnix TMC-1000/6700 channel-link

(Part # KKRDTMCCL**)

for PULNIX TMC-1000 (CAMTMC1000), TMC-6700 (CAMTMC6700)

camera mode	bpp	planes
0x93C	32	1-plane

0x934	16	1-plane

6.62 Pulnix TMC-74/76/6/7 RGB camera without pixel clock

(Part # KKRH**TMC-7X)

for PULNIX TMC-74, TMC-76, TMC-6, TMC-7

camera modes for TMC-74/7 (NTSC) color cameras without pixel clock:

mode hex	bpp	clock Mhz	sync	il	shu	hfreq Khz
0x148	24	14.1875	cs/sep	Y	N	ext
0x188	16p	14.1875	cs/sep	Y	N	ext
0x1E8	32p	14.1875	cs/sep	Y	N	ext

camera modes for TMC-76/6 CCIR color cameras without pixel clock:

mode hex	bpp	clock Mhz	sync	il	shu	hfreq Khz
0x368	24	14.1875	cs/sep	Y	N	ext
0x378	16p	14.1875	cs/sep	Y	N	ext
0x388	32p	14.1875	cs/sep	Y	N	ext

camera modes for TMC-76/6 CCIR color cameras with pixel clock:

mode hex	bpp	clock Mhz	sync	il	shu	hfreq Khz
0x078	24	ext	cs/sep	Y	N	ext
0x178	16p	ext	cs/sep	Y	N	ext
0x1A8	32p	ext	cs/sep	Y	N	ext

6.63 PULNIX TMC-9700 analog with RS-232

(Part # KKRH**C9700)

for PULNIX TMC-9700 (CAMC9700)

TMC-9700 is connected to the Inspecta via one cable. There are three connectors on the camera side, the D-Sub 9-P male, the Hirose 12-P and the Hirose 6-P connector.

The cable is split on the Inspecta side for an additional connection to one of the serial connectors (9-pin D-Sub female). This cable is app. 20cm long

6.64 Schaefter + Kirchhoff digital linescan

(Part # KKRDSK08B**)

for Shaefter & Kirchhoff SK5000 DJR, SK7500 DJR
and others

NOTE: S&K digital Cameras must be modified for MIKROTRON!

All signals marked with +/- are twisted pairs.
Remark 1: Power supply wires (same AWG as signal wires) are split at the D62P-HD connector with open end (app. 20 cm long)

camera mode	bpp	
0x49A	8	

6.65 Shaefter & Kirchhoff SK2592/5000 JR

(Part # KKRH**LINE)

for Shaefter & Kirchhoff SK2592/5000 JR

There are two cables coming out of the INSPECTA 15-pin D connector:
One cable to 15 pin D-connector on SK2592JR camera and one cable with a BNC connector for the video signal.

There are two cables coming out of the 15 pin D-connector on SK2592JR camera:
One cable to 15 pin D-connector on INSPECTA and one cable to an external power supply.

camera mode	camera(s)	comment
0x558	4 SK2592/5000JR	high-speed A/D converter M446
0x268 or 0x3D8	1 SK2592/5000JR	
0x9D8	2 SK2592/5000JR	

6.66 Sony DXC-9100(P), Sony XC-003(P)

(Part # KKRH**DXC)

for Sony DXC-9100(P), Sony XC-003(P)

camera mode	bpp	clock Mhz	sync	il	shu	hfreq Khz
0x368	24	14.1875	cs/sep	Y	N	ext
0x378	16p	14.1875	cs/sep	Y	N	ext
0x388	32p	14.1875	cs/sep	Y	N	ext

Cable is split at Camera. 12V power supply from INSPECTA

6.67 SONY XC-55

(Part # KKRH**XC55)

for Sony XC-55 (CAMXC55)

camera modes XC-55	Cameras	Inspecta 2 + 3
0x71C	1x SONY XC-55	8bpp
0x72C	2x SONY XC-55	8bpp, multiplane
0x73C	3x SONY XC-55	8bpp, multiplane
0x74C	4x SONY XC-55	8bpp, multiplane

camera modes XC-55	Cameras	Inspecta 2 + 3 + 4
0x71C	1x SONY XC-55	8bpp
0xDCC	2x SONY XC-55	16bpp
0xDDC	4x SONY XC-55	32bpp

camera setting: 1N, factory default

sync shutter: S2 on SG257 board inside camera = N (factory default)
trigger (async) shutter, 1N mode: S2 on SG257 board inside camera = E, S3 on SG257 board inside camera = OFF

6.68 SONY XC-HR50

(Part # KKRH**XCHR50)

for Sony XC-HR50 (CAMXCHR50)

camera modes XC-HR50	Cameras	Inspecta 2 + 3
0xD7C	1x SONY XC-HR50	8bpp
0xD8C	2x SONY XC-HR50	8bpp, multiplane
0xD9C	3x SONY XC-HR50	8bpp, multiplane

camera modes XC-HR50	Cameras	Inspecta 2 + 3 + 4
0xD7C	1x SONY XC-HR50	8bpp
0xDAC	2x SONY XC-HR50	16bpp
0xDBC	4x SONY XC-HR50	32bpp

camera setting: Trigger mode 1: SW 7,8 on all others off

6.69 SONY XC-HR70

Cable Part # KKRH**XCHR50

(** = length in m)

for Sony XC-HR70 (CAMXCHR70)

camera setting: Trigger mode 1: SW 7,8 on all others off

1	1024x 794	matrix, b/w, progressive, async fixed/variable shutter, SW7,8 on 30fps	0x12BD
2		2-planes, Inspecta-3 only	0x12ED
2		16 bpp	0x12CD
3		24 bpp, Inspecta-4A only	0x12DD

6.70 SONY XC-ST30/50/70 (CE)

(Part # KKRH**HDVD)

for Sony XC-ST30, XC-ST 50, XC-ST 70 (CE)

cameras modes:

camera mode	camera(s)	settings
0x28	1	30Hz (EIA) mvfg_pal (0)
0x168	3 multiplane	30Hz (EIA) mvfg_pal (0)
0x768	4 multiplane	30Hz (EIA) mvfg_pal (0)
0x28	1	25Hz (CCIR) mvfg_pal (1)
0x168	3 multiplane	25Hz (CCIR) mvfg_pal (1)
0x768	4 multiplane	25Hz (CCIR) mvfg_pal (1)

```
[Sony XC-ST50 EIA]
CamMode=0x28
LineLen=748
NumLin=502
BlackLinesBegin=16
BlackLinesEnd=4
```

```
BlankTime=79
WhiteLevel=152
BlackLevel=0
Videonorm=0
Interlaced=1
Videoclock=14187500
```

6.71 SVS-Vistek CA085-xx/CA204-xx

(Part # KKRDVISTEC**)

for CA084A-8, CA085A-8, CA085A-10, CA204A

camera mode	bpp	
0x998	10	
0x9a8	10 -> 8	
0x9b8	8	

6.72 TELI CS8530D-01

(Part # KKRH**XC55)

for TELI CS8530D-01 (CAMCS8530D)

DIP-Switch setting: Switch 2 on, all others off

camera modes TELI	Cameras	
0xD7C	1x TELI CS8530D	60 fps
0xD8C	2x TELI CS8530D	60 fps, multiplane
0xD9C	3x TELI CS8530D	60 fps, multiplane
0xDAC	2x TELI CS8530D	60 fps, single plane, 16bpp
0xDBC	4x TELI CS8530D	60 fps, single plane, 32bpp

6.73 T.V.I. Pricolor, Colibri linescan, 3x8-bit parallel data output

(Part # KKRD2048**)

for TVI PRICOLOR 1024R (CAMPRI1024), PRICOLOR 2048R (CAMPRI2048),
COLIBRI 1024XX (CAMCOL1024), COLIBRI 2048XX (CAMCOL2048)

connected to Inspecta-2, Inspecta-3

camera mode	bpp	
0xA28	32	

6.74 T.V.I. Pricolor, Colibri linescan, 3x8-bit parallel data output

(Part # KKRD2048E**)

for TVI PRICOLOR 1024R (CAMPRI1024), PRICOLOR 2048R (CAMPRI2048),
COLIBRI 1024XX (CAMCOL1024), COLIBRI 2048XX (CAMCOL2048)

connected to Inspecta-4

camera mode	bpp	Exposure Control
0xCF8	32	no
0xD08	32	yes

6.75 T.V.I. Pricolor linescan camera, 3x8-bit serial data output

(Part # KKRD2048-3x8**)

camera mode	bpp	
0x2C8	3*8	

6.76 Power cable for INSPECTA-4C/4D

for Digital / Camera Link Cameras with 12-pin Hirose

(Part # KKRP4D4C**)

This cable is used to supply the above mentioned cameras with power from INSPECTA-4C/4D via Mini-Din Connector of these boards.

6.77 Universal RGB Video cable

This cables connects the 9-pin D-connector of a standard RGB camera with INSPECTA-2, -3, -4A. A second cable for power & control signals is needed.

Connector on Inspecta-2, -3, -4A:	Connector on: Standard RGB:
15-pin D male.	9-pol. D male

Pin Nr.	Description	Color	Pin Nr.	Description
14	VIDEO1	red	3	R Output
7	GND	red shield	2	
5	VIDEO0	white	4	G Output
12	GND	white shield	2	
6	VIDEO2	black	5	B Output
7	GND	black shield	2	
10	VSYNC0	brown	7	Syncout
connector case	cable shield		connector case	

Camera-modes:
camera synchronized by INSPECTA, connect to HD/VD input of camera:

camera mode	bpp	clock Mhz	sync	il	shu	hfreq Khz
0x0C0	24	14.1875	int	Y	N	15.728

camera free running, use separate composite sync and clock from camera:

camera mode	bpp	clock Mhz	sync	il	shu	hfreq Khz
0x078	24	ext	cs/sep	Y	N	ext
0x178	16p	ext	cs/sep	Y	N	ext
0x1A8	32p	ext	cs/sep	Y	N	ext

camera free running, use separate composite sync from camera:

camera mode	bpp	clock Mhz	sync	il	shu	hfreq Khz	CCIR/NTSC
0x0EC	24	14.1875	cs/sep	N	(3)	ext	NTSC

0x19C	16p	14.1875	cs/sep	N	(3)	ext	NTSC
0x1DC	32p	14.1875	cs/sep	N	(3)	ext	NTSC
0x148	24	14.1875	cs/sep	Y	N	ext	NTSC
0x188	16p	14.1875	cs/sep	Y	N	ext	NTSC
0x1E8	32p	14.1875	cs/sep	Y	N	ext	NTSC
0x368	24	14.1875	cs/sep	Y	N	ext	CCIR
0x378	16p	14.1875	cs/sep	Y	N	ext	CCIR
0x388	32p	14.1875	cs/sep	Y	N	ext	CCIR

camera synchronized by INSPECTA, use separate composite sync from camera:

camera mode	bpp	clock Mhz	sync	il	shu	hfreq Khz	CCIR/NTSC
0x208	24	14.1875	cs/int	N	(3)	15.905	NTSC
0x218	16p	14.1875	cs/int	N	(3)	15.905	NTSC
0x228	32p	14.1875	cs/int	N	(3)	15.905	NTSC
0x23C	24	14.1875	cs/int	Y	(3)	15.905	NTSC
0x24C	16p	14.1875	cs/int	Y	(3)	15.905	NTSC
0x25C	32p	14.1875	cs/int	Y	(3)	15.905	NTSC

7 Cable Connection Lists

7.1 Part # KKRBNC6700KM**

Connector on INSPECTA-2, -3, -4A:	Connector on
15 pin D male	Analog Camera:
	3 x Chinch male, open ends ca. 10 cm long

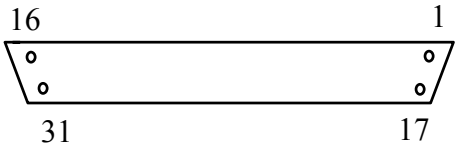
Pin Nr.	Description	Color	Pin Nr.
1	+12V Power		open end +12V
2	Horizontal Drive (HD) (coax)		Chinch 1 center
3	Shutter Control 0		
4	Shutter Control 1		
5	Video Channel 0 (coax)		Chinch 2 center
6	Video Channel 2		
7	Common, VINIT Shield, HD Shield		Chinch 3 shield Chinch 1 shield
8	PWR return		open end GND
9	Common, VINIT shield		
10	VD		
11	Async. Reset, VINIT (coax)		Chinch 3 center
12	Video Channel 0 Shield		Chinch 2 shield
13	Integration Control		
14	Video Channel 1		
15	-		
connector case	cable shield		

7.2 Part # KKRD10XX08B37**

Connector on B545, or B422A and Inspecta-4A with adapter	Connector on Pulnix Camera
	Airborn 31P

Pin Nr. D-37P male (1)	signal name		Pin Nr. Airborn 31P	signal name
1	PCLKA		1	CLK+
2	LDVA		2	LDV+
3	FDVA		3	FDV+
14	D6A		14	D8+
15	D7A		15	D9+
16	GND		16	GND
8	D0A		8	D2+
9	D1A		9	D3+
10	D2A		10	D4+
11	D3A		11	D5+
12	D4A		12	D6+
13	D5A		13	D7+
19	MC2		20	VINIT
20	PCLKB		17	CLK-
21	LDVB		18	LDV-
22	FDVB		19	FDV-
33	D6B		30	D8-
34	D7B		31	D9-
27	D0B		24	D2-
28	D1B		25	D3-
29	D2B		26	D4-
30	D3B		27	D5-
31	D4B		28	D6-
32	D5B		29	D7-
35	GND		4	GND
connector -case	Shield			SHIELD

31 pin Airborn plug, view on solder pins:



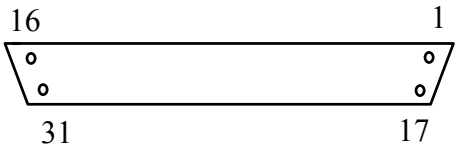
7.3 Part # KKRD10XX08B62**

Connector on B422A, B454, Inspecta-4D:	Connector on Pulnix Camera
	Airborn 31P

Pin Nr. D-62P HD male (2)	signal name		Pin Nr. Airborn 31P	signal name
23	PCLKA		1	CLK+
24	LDVA		2	LDV+
25	FDVA		3	FDV+
36	D6A		14	D8+
37	D7A		15	D9+
1	GND		16	GND
30	D0A		8	D2+
31	D1A		9	D3+
32	D2A		10	D4+
33	D3A		11	D5+

34	D4A		12	D6+
35	D5A		13	D7+
18	MC2		20	VINIT
2	PCLKB		17	CLK-
3	LDVB		18	LDV-
4	FDVB		19	FDV-
15	D6B		30	D8-
16	D7B		31	D9-
9	D0B		24	D2-
10	D1B		25	D3-
11	D2B		26	D4-
12	D3B		27	D5-
13	D4B		28	D6-
14	D5B		29	D7-
42	GND		4	GND
connector -case	Shield			SHIELD

31 pin Airborn plug, view on solder pins:



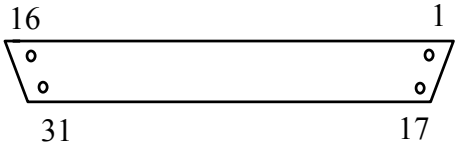
7.4 Part # KKRD10XX10B62**

Connector on B422A, B454, Inspecta-4D:	Connector on Pulnix Camera
	Airborn 31P

Pin Nr. D-62P HD male (2)	signal name		Pin Nr. Airborn 31P	signal name
23	PCLKA		1	CLK+
24	LDVA		2	LDV+
25	FDVA		3	FDV+
26	D8A		14	D8+
27	D9A		15	D9+
30	D0A		6	D0+
31	D1A		7	D1+
32	D2A		8	D2+
33	D3A		9	D3+
34	D4A		10	D4+
35	D5A		11	D5+
36	D6A		12	D6+
37	D7A		13	D7+
18	MC2		20	VINIT
2	PCLKB		17	CLK-
3	LDVB		18	LDV-
4	FDVB		19	FDV-
5	D8B		30	D8-
6	D9B		31	D9-
9	D0B		22	D0-
10	D1B		23	D1-
11	D2B		24	D2-
12	D3B		25	D3-
13	D4B		26	D4-

14	D5B		27	D5-
15	D6B		28	D6-
16	D7B		29	D7-
21,42	GND		4	GND
	shield/ connector-case		16	SHIELD

31 pin Airborn plug, view on solder pins:



7.5 Part # KKRD2048**

plugs into B422A, B454, INSPECTA-4D D62P-HD, male			plugs into T.V.I. camera, SCSI100P	
Pin Nr.	Descrip-tion	Color	Pin Nr.	description
21	GND	White/black	2	GND
23	PCLKA	Blue/black	18	PixelStrobeR+
24	LDVA	Grey/white	16	LineValid+
		Blue/orange/white	100	Red0+
		Orange/green/white	98	Red1+
30	D0A	Green/brown/white	96	Red2+
31	D1A	Brown/grey/white	94	Red3+
32	D2A	Grey/blue/white	92	Red4+
33	D3A	Orange/green	90	Red5+
34	D4A	Yellow/black	88	Red6+
35	D5A	Yellow/red	86	Red7+
36	D6A	Grey/yellow	50	Red8+
37	D7A	Brown/yellow	48	Red9+
1	GND	Black/white	1	GND
	Not conn.	Orange/yellow	8	ExpCntrlR+
18	MC2	Orange/white	10	NewFrame+
2	PCLKB	Black/blue	17	PixelStrobeR-
3	LDVB	White/grey	15	LineValid-
		White/orange/blue	99	Red0-
		White/green/orange	97	Red1-
9	D0B	White/brown/green	95	Red2-
10	D1B	White/grey/brown	93	Red3-
11	D2B	White/blue/grey	91	Red4-
12	D3B	Green/orange	89	Red5-
13	D4B	Black/yellow	87	Red6-
14	D5B	Red/yellow	85	Red7-
15	D6B	Yellow/grey	49	Red8-
16	D7B	Yellow/brown	47	Red9-
	Not conn.	Yellow/orange	7	ExpCntrlR-
39	MC1	White/orange	9	NewFrame-
connector case	cable shield		Connec-tor case	

KKRD2048** continued

Pin Nr.	Descrip-tion	color	Pin Nr.	description
			46	Green0+
			44	Green1+
26	D8A	Orange/purple	42	Green2+
27	D9A	Blue/purple	40	Green3+
28	D10A	Green/purple	38	Green4+
29	D11A	Blue/red	36	Green5+
43	D12A	Blue/green	84	Green6+
45	D13A	Green/brown	82	Green7+
47	D14A	Yellow/white	80	Green8+
49	D15A	Blue/brown	78	Green9+
			99	Green0-
			97	Green1-
5	D8B	Purple/orange	41	Green2-
6	D9B	Purple/blue	39	Green3-
7	D10B	Purple/green	37	Green4-
8	D11B	Red/blue	35	Green5-
44	D12B	Green/blue	83	Green6-
46	D13B	Brown/green	81	Green7-
48	D14B	White/yellow	79	Green8-
50	D15B	Brown/blue	77	Green9-
			46	Blue0+
			44	Blue1+
51	D16A	Green/red	30	Blue2+
53	D17A	Orange/red	28	Blue3+
55	D18A	Blue/orange	76	Blue4+
57	D19A	Brown/orange	74	Blue5+
59	D20A	Red/purple	72	Blue6+
61	D21A	Yellow/purlpe	70	Blue7+
40	D22A	Red/white	26	Blue8+
41	D23A	Brown/red	24	Blue9+
			99	Blue0-
			97	Blue1-
52	D16B	Red/green	29	Blue2-
54	D17B	Red/orange	27	Blue3-
56	D18B	Orange/blue	75	Blue4-
58	D19B	Orange/brown	73	Blue5-
60	D20B	Purple/red	71	Blue6-
62	D21B	Purple/yellow	69	Blue7-
19	D22B	White/red	25	Blue8-
20	D23B	Red/brown	23	Blue9-

7.6 Part # KKRD2048E**

plugs into B422A, B454, INSPECTA-4D D62P-HD, male	plugs into T.V.I. camera, SCSI100P

Pin Nr.	Descrip-tion	Color	Pin Nr.	description
21	GND	White/black	2	GND
23	PCLKA	Blue/black	18	PixelStrobeR+
24	LDVA	Grey/white	16	LineValid+
		Blue/orange/white	100	Red0+
		Orange/green/white	98	Red1+
30	D0A	Green/brown/white	96	Red2+

31	D1A	Brown/grey/white	94	Red3+
32	D2A	Grey/blue/white	92	Red4+
33	D3A	Orange/green	90	Red5+
34	D4A	Yellow/black	88	Red6+
35	D5A	Yellow/red	86	Red7+
36	D6A	Grey/yellow	50	Red8+
37	D7A	Brown/yellow	48	Red9+
1	GND	Black/white	1	GND
38	MC3	Orange/yellow	8	ExpCntrlR+
18	MC2	Orange/white	10	NewFrame+
2	PCLKB	Black/blue	17	PixelStrobeR-
3	LDVB	White/grey	15	LineValid-
		White/orange/blue	99	Red0-
		White/green/orange	97	Red1-
9	D0B	White/brown/green	95	Red2-
10	D1B	White/grey/brown	93	Red3-
11	D2B	White/blue/grey	91	Red4-
12	D3B	Green/orange	89	Red5-
13	D4B	Black/yellow	87	Red6-
14	D5B	Red/yellow	85	Red7-
15	D6B	Yellow/grey	49	Red8-
16	D7B	Yellow/brown	47	Red9-
17	MC0	Yellow/orange	7	ExpCntrlR-
39	MC1	White/orange	9	NewFrame-
connector case	cable shield		Connec-tor case	

KKRD2048E** continued

Pin Nr.	Descrip-tion	color	Pin Nr.	description
			46	Green0+
			44	Green1+
26	D8A	Orange/purple	42	Green2+
27	D9A	Blue/purple	40	Green3+
28	D10A	Green/purple	38	Green4+
29	D11A	Blue/red	36	Green5+
43	D12A	Blue/green	84	Green6+
45	D13A	Green/brown	82	Green7+
47	D14A	Yellow/white	80	Green8+
49	D15A	Blue/brown	78	Green9+
			99	Green0-
			97	Green1-
5	D8B	Purple/orange	41	Green2-
6	D9B	Purple/blue	39	Green3-
7	D10B	Purple/green	37	Green4-
8	D11B	Red/blue	35	Green5-
44	D12B	Green/blue	83	Green6-
46	D13B	Brown/green	81	Green7-
48	D14B	White/yellow	79	Green8-
50	D15B	Brown/blue	77	Green9-
			46	Blue0+
			44	Blue1+
51	D16A	Green/red	30	Blue2+
53	D17A	Orange/red	28	Blue3+
55	D18A	Blue/orange	76	Blue4+
57	D19A	Brown/orange	74	Blue5+
59	D20A	Red/purple	72	Blue6+
61	D21A	Yellow/purlpe	70	Blue7+
40	D22A	Red/white	26	Blue8+
41	D23A	Brown/red	24	Blue9+
			99	Blue0-
			97	Blue1-
52	D16B	Red/green	29	Blue2-
54	D17B	Red/orange	27	Blue3-
56	D18B	Orange/blue	75	Blue4-
58	D19B	Orange/brown	73	Blue5-
60	D20B	Purple/red	71	Blue6-
62	D21B	Purple/yellow	69	Blue7-
19	D22B	White/red	25	Blue8-
20	D23B	Red/brown	23	Blue9-

7.7 Part # KKRD2048-3x8**

plugs into B422A, B454, INSPECTA-4D D62P-HD, male	plugs into T.V.I. camera, SCSI100P

Pin Nr.	Descrip-tion	color	Pin Nr.	description
21	GND	White/black	2	GND
23	PCLKA	Blue/black	18	PixelStrobeR+
24	LDVA	Grey/white	16	LineValid+
		Blue/orange/white	100	Red0+
		Orange/green/white	98	Red1+
30	D0A	Green/brown/white	96	Red2+
31	D1A	Brown/grey/white	94	Red3+

32	D2A	Grey/blue/white	92	Red4+
33	D3A	Orange/green	90	Red5+
34	D4A	Yellow/black	88	Red6+
35	D5A	Yellow/red	86	Red7+
36	D6A	Grey/yellow	50	Red8+
37	D7A	Brown/yellow	48	Red9+
1	GND	Black/white	1	GND
	Not conn.	Orange/yellow	8	ExpCntrlR+
18	MC2	Orange/white	10	NewFrame+
2	PCLKB	Black/blue	17	PixelStrobeR-
3	LDVB	White/grey	15	LineValid-
		White/orange/blue	99	Red0-
		White/green/orange	97	Red1-
9	D0B	White/brown/green	95	Red2-
10	D1B	White/grey/brown	93	Red3-
11	D2B	White/blue/grey	91	Red4-
12	D3B	Green/orange	89	Red5-
13	D4B	Black/yellow	87	Red6-
14	D5B	Red/yellow	85	Red7-
15	D6B	Yellow/grey	49	Red8-
16	D7B	Yellow/brown	47	Red9-
	Not conn.	Yellow/orange	7	ExpCntrlR-
39	MC1	White/orange	9	NewFrame-
connector case	cable shield		Connec-tor case	

7.8 Part # KKRD671016B**

Connector on B422A, M454, Inspecta-4D:	Connector on TM-6710
D-62P HD male	Airborn 51P

Pin Nr.	signal name	Pin Nr.	signal name
23	PCLKA	18	CLK+
24	LDVA	48	LDV+
25	FDVA	50	FDV+
26	D8A	2	B0+
27	D9A	4	B1+
28	D10A	6	B2+
29	D11A	8	B3+
43	D12A	10	B4+
45	D13A	12	B5+
47	D14A	14	B6+
49	D15A	16	B7+
30	D0A	1	A0+
31	D1A	3	A1+
32	D2A	5	A2+
33	D3A	7	A3+

34	D4A	9	A4+
35	D5A	11	A5+
36	D6A	13	A6+
37	D7A	15	A7+
38	MC3	44	INTEG
18	MC2	43	VINIT
2	PCLKB	35	CLK-
3	LDVB	47	LDV-
4	FDVB	49	FDV-
5	D8B	20	B0-
6	D9B	22	B1-
7	D10B	24	B2-
8	D11B	26	B3-
44	D12B	28	B4-
46	D13B	30	B5-
48	D14B	32	B6-
50	D15B	34	B7-
9	D0B	19	A0-
10	D1B	21	A1-
11	D2B	23	A2-
12	D3B	25	A3-
13	D4B	27	A4-
14	D5B	29	A5-
15	D6B	31	A6-
16	D7B	33	A7-

KKRD671016B** continued:

Connector on M422/M454:	Connector on TM-6710
D-62P HD male	Airborn 51P

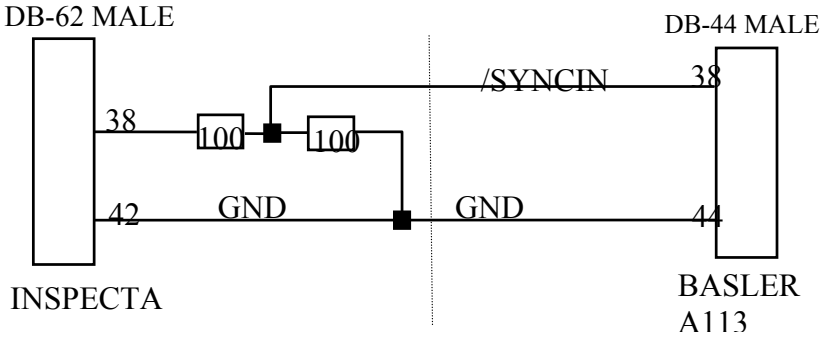
21	GND	17	GND
42	GND	51	GND
	Shield/ connector-case		SHIELD

7.9 Part # KKRDA113**

plugs into backplane, INSPECTA	plugs into BASLER camera
D62P-HD, male	D44HD, male

Pin Nr.	description	color	Pin Nr.	description
22	GND	black	43	GND
23	PCLKA	black	35	PCLKOUT
24	LDVA	white	33	LVALOUT
30	D0A	white	1	DOUT0
31	D1A	white	2	DOUT1
32	D2A	white	3	DOUT2
33	D3A	white	4	DOUT3
34	D4A	white	5	DOUT4
35	D5A	white	6	DOUT5
36	D6A	white	7	DOUT6
37	D7A	white	8	DOUT7
42	GND	yellow	44	GND
18	MC2	black	37	SYNCIN
2	PCLKB	brown	36	/PCLKOUT
3	LDVB	grey	34	/LVALOUT
9	D0B	black	16	/DOUT0
10	D1B	brown	17	/DOUT1
11	D2B	red	18	/DOUT2
12	D3B	orange	19	/DOUT3
13	D4B	yellow	20	/DOUT4
14	D5B	green	21	/DOUT5
15	D6B	blue	22	/DOUT6
16	D7B	pink	23	/DOUT7
38	remark 1	red	38	/SYNCIN
25	FDVA	black	39	FVAL
4	FDVB	orange	40	/FVAL
connector case	cable shield		connector case	

remark1:
For compatibility with other digital cameras drive the BASLER A113 with a single ended SYNCIN pulse. Use two 100 Ohm resistors in series between pin 38 & 42 of 62 pin D-connector to provide a voltage level above GND for the /SYNCIN input of camera.



7.10 Part # KKRDATCAM12B**

plugs into B422A , B454, INSPECTA-4D	plugs into Atmel Camelia camera
D62P-HD, male	HIROSE DX40-50P, male

Pin Nr.	Description		Pin Nr.	description
22	GND		19,20	GND
23	PCLKA		1	PCK+
3	LDVB	Reversed/LDVB	26	LEN+
30	D0A		7	PDATA0+
31	D1A		32	PDATA1+
32	D2A		9	PDATA2+
33	D3A		34	PDATA3+
34	D4A		11	PDATA4+
35	D5A		36	PDATA5+
36	D6A		13	PDATA6+
37	D7A		38	PDATA7+
26	D8A		15	PDATA8+
27	D9A		40	PDATA9+
28	D10A		17	PDATA10+
29	D11A		42	PDATA11+
42	GND		30,31	GND
38	MC3		46	TRIG_ITC+
2	PCLKB		2	PCK-
24	LDVA	Reversed/LDVA	27	LEN-
9	D0B		8	PDATA0-
10	D1B		33	PDATA1-
11	D2B		10	PDATA2-
12	D3B		35	PDATA3-
13	D4B		12	PDATA4-
14	D5B		37	PDATA5-
15	D6B		14	PDATA6-
16	D7B		39	PDATA7-
5	D8B		16	PDATA8-
6	D9B		41	PDATA9-
7	D10B		18	PDATA10-
8	D11B		43	PDATA11-
17	MC0		47	TRIG_ITC-
4	FDVB	Reversed/ FDVA/FDVB	3	FEN+
25	FDVA		4	FEN-
connector case	cable shield		connector case	

7.11 Part # KKRDBASCHL**

The cable is split into three branches (each app. 30cm) on the Inspecta side. One branch is connected to a female 3-row 15-pin HD-sub (channel link data), the other to a female 9-pin D-sub (COMx), and the power supply lines to a male 15-pin D-sub connector (Inspecta analog/power connector).

B487 mating connector 15 pin HD-Sub female, 3 rows	Description	Basler channel link HD-Sub 26 pins, female, 3 rows
11	EXSYNC+	11

12	EXSYNC-	10
4	CH CLK+	17
9	CH CLK-	16
1	CH0+	4
6	CH0-	3
2	CH1+	15
7	CH1-	14
3	CH2+	6
8	CH2-	5
5	CH3+	8
10	CH3-	7
15	GND	18
15-pin D-sub		
1	+12V	2,20
8	GND	1,9
9-pin COMx connector, female		
2	RXD	24 (TXD)
3	TXD	22 (RXD)
5	GND	19
7,8	connect Pin 7 and 8	
1,4,6	connect Pin 1,4 and 6	
connector case	cable shield	connector case

7.12 Part # KKRDBAXX08B**

plugs into B422A , B454, INSPECTA-4D	plugs into BASLER camera
D62P-HD, male	D44HD, male

Pin Nr.	Description	color	Pin Nr.	description
22	GND	black	43	GND
23	PCLKA	black	35	PCLKOUT
24	LDVA	white	33	LVALOUT
30	D0A	white	1	DOUT0
31	D1A	white	2	DOUT1
32	D2A	white	3	DOUT2
33	D3A	white	4	DOUT3
34	D4A	white	5	DOUT4
35	D5A	white	6	DOUT5
36	D6A	white	7	DOUT6
37	D7A	white	8	DOUT7
42	GND	yellow	44	GND
18	MC2	black	37	SYNCIN
2	PCLKB	brown	36	/PCLKOUT
3	LDVB	grey	34	/LVALOUT
9	D0B	black	16	/DOUT0
10	D1B	brown	17	/DOUT1
11	D2B	red	18	/DOUT2
12	D3B	orange	19	/DOUT3
13	D4B	yellow	20	/DOUT4
14	D5B	green	21	/DOUT5
15	D6B	blue	22	/DOUT6
16	D7B	pink	23	/DOUT7
39	MC1	red	38	/SYNCIN
25	FDVA	black	39	FVAL
4	FDVB	orange	40	/FVAL

connector case	cable shield		connector case	

7.13 Part # KKRDBAXX16B**

plugs into B422A, B454, INSPECTA-4D	plugs into Basler camera
D62P-HD, male	D44HD, male

Pin Nr.	description		Pin Nr.	description
23	PCLKA		35	Pixel Clock
24	LDVA		33	LVAL
25	FDVA		39	FVAL
30	D0A		1	DOUT0
31	D1A		2	DOUT1
32	D2A		3	DOUT2
33	D3A		4	DOUT3
34	D4A		5	DOUT4
35	D5A		6	DOUT5
36	D6A		7	DOUT6
37	D7A		8	DOUT7
22	GND		43	GND
42	GND		44	GND
18	MC2		37	EXSYNC
2	PCLKB		36	/Pixel Clock
3	LDVB		34	/LVAL
4	FDVB		40	/FVAL
9	D0B		16	/DOUT0
10	D1B		17	/DOUT1
11	D2B		18	/DOUT2
12	D3B		19	/DOUT3
13	D4B		20	/DOUT4
14	D5B		21	/DOUT5
15	D6B		22	/DOUT6
16	D7B		23	/DOUT7
39	MC1		38	/EXSYNC
connector case	cable shield		connector case	

26	D8A		9	DOUT8
27	D9A		10	DOUT9
28	D10A		11	DOUT10
29	D11A		12	DOUT11
43	D12A		13	DOUT12
45	D13A		14	DOUT13
47	D14A		15	DOUT14
49	D15A		31	DOUT15
5	D8B		24	/DOUT8
6	D9B		25	/DOUT9
7	D10B		26	/DOUT10
8	D11B		27	/DOUT11
44	D12B		28	/DOUT12
46	D13B		29	/DOUT13
48	D14B		30	/DOUT14
50	D15B		32	/DOUT15

7.14 Part # KKRDCLP1W16B**

The cable is split on the camera side. The 37-pin Sub-D connector carries data, whereas the 15-pin male Sub-D connector carries the EXSYNC signal.

plugs into B422A, B454, INSPECTA-4D	plugs into Dalsa camera
D62P-HD, male	D37P, male

Pin Nr.	Description		Pin Nr.	description
23	PCLKA		17	STROBE
24	LDVA		18	LVAL
30	D0A		16	AD0
31	D1A		15	AD1
32	D2A		14	AD2
33	D3A		13	AD3
34	D4A		12	AD4
35	D5A		11	AD5
36	D6A		10	AD6
37	D7A		9	AD7
2	PCLKB		36	STROBEB
3	LDVB		37	LVALB
9	D0B		35	AD0B
10	D1B		34	AD1B
11	D2B		33	AD2B
12	D3B		32	AD3B
13	D4B		31	AD4B
14	D5B		30	AD5B
15	D6B		29	AD6B
16	D7B		28	AD7B
26	D8A		8	BD0
27	D9A		7	BD1
28	D10A		6	BD2
29	D11A		5	BD3
43	D12A		4	BD4
45	D13A		3	BD5
47	D14A		2	BD6
49	D15A		1	BD7
5	D8B		27	BD0B
6	D9B		26	BD1B
7	D10B		25	BD2B
8	D11B		24	BD3B
44	D12B		23	BD4B
46	D13B		22	BD5B
48	D14B		21	BD6B
50	D15B		20	BD7B
D62P-HD, male			plugs into Dalsa camera 15-Pin Sub-D male	
18	MC2		12	EXSYNC
39	MC1		4	EXSYNCB
22, connector case	Cable shield		connector case	

7.15 Part # KKRDES16B**

The cable is split on the Inspecta side for an additional connection to one of the serial connectors (9-pin D-Sub female)

This additional cable is app. 30cm long

B422A, B454, Inspecta-4D D62P-HD male	COMX D9P female	Inspecta name	Roper name	Roper ES D68 mini D-Sub
22		GND	GND	46
23		PCLKA	pix data strb(+)	29
24		LDVA	line ena(+)	26
25		FDVA	frme ena(+)	25
30		D0A	AMSB-7(+)	9
31		D1A	AMSB-6(+)	8
32		D2A	AMSB-5(+)	7
33		D3A	AMSB-4(+)	6
34		D4A	AMSB-3(+)	5
35		D5A	AMSB-2(+)	4
36		D6A	AMSB-1(+)	3
37		D7A	AMSB(+)	2
26		D8A	BMSB-7(+)	20
27		D9A	BMSB-6(+)	19
28		D10A	BMSB-5(+)	16
29		D11A	BMSB-4(+)	15
42		GND	GND	68
21		GND	GND	34
18		MC2	EXPOSE(+)	30
43		D12A	BMSB-3(+)	14
45		D13A	BMSB-2(+)	13
47		D14A	BMSB-1(+)	11
49		D15A	BMSB(+)	10
1		GND	GND	1
connector case		cable shield		connector case

KKRDES16B** continued:

i B422A, B454, Inspecta -4D D62P-HD male	COMX D9P female	Inspecta name	Roper name	Roper ES D68 mini D-Sub
2		PCLKB	pix data strb(-)	63
3		LDVB	line ena(-)	60
4		FDVB	frme ena(-)	59
9		D0B	AMSB-7(-)	43
10		D1B	AMSB-6(-)	42
11		D2B	AMSB-5(-)	41
12		D3B	AMSB-4(-)	40
13		D4B	AMSB-3(-)	39
14		D5B	AMSB-2(-)	38
15		D6B	AMSB-1(-)	37
16		D7B	AMSB(-)	36
5		D8B	BMSB-7(-)	54
6		D9B	BMSB-6(-)	53
7		D10B	BMSB-5(-)	50
8		D11B	BMSB-4(-)	49
44		D12B	BMSB-3(-)	48
46		D13B	BMSB-2(-)	47
48		D14B	BMSB-1(-)	45
50		D15B	BMSB(-)	44
	COMX D9P female	COMx name	Roper name	Roper ES D68 mini D-Sub
	2	RXD	TXD	22
	3	TXD	RXD	23
	5	GND	GND	35
	7	connect to Pin 8 of D9P		
	8	connect to Pin 7 of D9P		

7.16 Part # KKRDF10008B**

Connector on B422A/M454	Connector on KP-F100
	DX30AM-26P

Pin Nr. D-62P HD male (2)	signal name		Pin Nr. DX30AM 26P	signal name
23	PCLKA		25	CLK-H
24	LDVA		23	HD-H
25	FDVA		21	VD-H
36	D8A		17	D8-H
37	D9A		19	D9-H
30	D2A		5	D2-H
31	D3A		7	D3-H
32	D4A		9	D4-H
33	D5A		11	D5-H

34	D6A		13	D6-H
35	D7A		15	D7-H
2	PCLKB		26	CLK-L
3	LDVB		24	HD-L
4	FDVB		22	VD-L
15	D8B		18	D8-L
16	D9B		20	D9-L
9	D2B		6	D2-L
10	D3B		8	D3-L
11	D4B		10	D4-L
12	D5B		12	D5-L
13	D6B		14	D6-L
14	D7B		16	D7-L
42	GND, shield/ connector-case			SHIELD, GND

7.17 Part # KKRDF10010B**

Connector on B422A/M454	Connector on KP-F100
	DX30AM-26P

Pin Nr. D-62P HD male (2)	signal name		Pin Nr. DX30AM 26P	signal name
23	PCLKA		25	CLK-H
24	LDVA		23	HD-H
25	FDVA		21	VD-H
26	D8A		17	D8-H
27	D9A		19	D9-H
30	D0A		1	D0-H
31	D1A		3	D1-H
32	D2A		5	D2-H
33	D3A		7	D3-H
34	D4A		9	D4-H
35	D5A		11	D5-H
36	D6A		13	D6-H
37	D7A		15	D7-H
2	PCLKB		26	CLK-L
3	LDVB		24	HD-L
4	FDVB		22	VD-L
5	D8B		18	D8-L
6	D9B		20	D9-L
9	D0B		2	D0-L
10	D1B		4	D1-L
11	D2B		6	D2-L
12	D3B		8	D3-L
13	D4B		10	D4-L
14	D5B		12	D5-L
15	D6B		14	D6-L
16	D7B		16	D7-L
42	GND, connector case			SHIELD, conn. case

7.18 Part # KKRDF11016B**

Connector on B422A, B545:	Connector on KP-F110

	Hirose DX10G1M-50S

Pin Nr. D-62P HD male	Description		Pin Nr. DX10G1M-50S	description
23	PCLKA		46	CLK+
24	LDVA		25	HD+
25	FDVA		48	VD+
30	D0A		30	DA2+
31	D1A		32	DA3+
32	D2A		34	DA4+
33	D3A		36	DA5+
34	D4A		38	DA6+
35	D5A		40	DA7+
36	D6A		42	DA8+
37	D7A		44	DA9+
2	PCLKB		47	CLK-
3	LDVB		50	HD-
4	FDVB		49	VD-
9	D0B		31	DA2-
10	D1B		33	DA3-
11	D2B		35	DA4-
12	D3B		37	DA5-
13	D4B		39	DA6-
14	D5B		41	DA7-
15	D6B		43	DA8-
16	D7B		45	DA9-
26	D8A		5	DB2+
27	D9A		7	DB3+
28	D10A		9	DB4+
29	D11A		11	DB5+
43	D12A		13	DB6+
45	D13A		15	DB7+
47	D14A		17	DB8+
49	D15A		19	DB9+
5	D8B		6	DB2-
6	D9B		8	DB3-
7	D10B		10	DB4-
8	D11B		12	DB5-
44	D12B		14	DB6-
46	D13B		16	DB7-
48	D14B		18	DB8-
50	D15B		20	DB9-
22	GND		23	GND
42	GND		24	GND
Connector case	shield		Connector case	shield

7.19 Part # KKRDIK08B**

Connector on B422A, B545, Inspecta-4D	Connector on SKC-131 camera
	Hirose DX30AM 36P

Pin Nr. D-62P HD male	signal name	colour	Pin Nr. DX30AM	signal name
23	PCLKA	Orange1red	1	CLK+
24	LDVA	Grey1red	3	HD+
25	FDVA	White1red	5	VD+
36	D6A	Orange4red	31	D8+
37	D7A	Grey4red	33	D9+

30	D0A	Pink2red	19	D2+
31	D1A	Orange3red	21	D3+
32	D2A	Grey3red	23	D4+
33	D3A	White3red	25	D5+
34	D4A	Yellow3red	27	D6+
35	D5A	Pink3red	29	D7+
18	MC2	Grey2blue	14	EXT TRIG
2	PCLKB	Orange1blue	2	CLK-
3	LDVB	Grey1blue	4	HD-
4	FDVB	White1blue	6	VD-
15	D6B	Orange4blue	32	D8-
16	D7B	Grey4blue	34	D9-
9	D0B	Pink2blue	20	D2-
10	D1B	Orange3blue	22	D3-
11	D2B	Grey3blue	24	D4-
12	D3B	White3blue	26	D5-
13	D4B	Yellow3blue	28	D6-
14	D5B	Pink3blue	30	D7-
21,42	GND	White4red	35	GND
	shield/ connector-case		16	SHIELD

7.20 Part # KKRDIK10B**

Connector on B422A, B545, Inspecta-4D	Connector on SKC-131 camera
	Hirose DX30AM 36P

Pin Nr. D-62P HD male	signal name	colour	Pin Nr. DX30AM	signal name
23	PCLKA	Orange1red	1	CLK+
24	LDVA	Grey1red	3	HD+
25	FDVA	White1red	5	VD+
26	D8A	Orange4red	31	D8+
27	D9A	Grey4red	33	D9+
30	D0A	White2red	15	D0+
31	D1A	Yellow2red	17	D1+
32	D2A	Pink2red	19	D2+
33	D3A	Orange3red	21	D3+
34	D4A	Grey3red	23	D4+
35	D5A	White3red	25	D5+
36	D6A	Yellow3red	27	D6+
37	D7A	Pink3red	29	D7+
18	MC2	Grey2blue	14	EXT TRIG
2	PCLKB	Orange1blue	2	CLK-
3	LDVB	Grey1blue	4	HD-
4	FDVB	White1blue	6	VD-
5	D8B	Orange4blue	32	D8-
6	D9B	Grey4blue	34	D9-
9	D0B	White2blue	16	D0-
10	D1B	Yellow2blue	18	D1-
11	D2B	Pink2blue	20	D2-
12	D3B	Orange3blue	22	D3-
13	D4B	Grey3blue	24	D4-
14	D5B	White3blue	26	D5-
15	D6B	Yellow3blue	28	D6-

16	D7B	Pink3blue	30	D7-
21,42	GND	White4red	35	GND
	shield/ connector-case		36	SHIELD

7.21 Part # KKRDMC1020**

plugs into INSPECTA-4D	plugs into MC1020 camera
D62P-HD, male	D44HD, male

Pin Nr.	description		Pin Nr.	description
22	+12V		42	+12V
23	PCLKA		35	Pixel Clock
24	LDVA		33	LVAL
25	FDVA		39	FVAL
30	D0A		1	DOUT0
31	D1A		2	DOUT1
32	D2A		3	DOUT2
33	D3A		4	DOUT3
34	D4A		5	DOUT4
35	D5A		6	DOUT5
36	D6A		7	DOUT6
37	D7A		8	DOUT7
42	GND		44	GND
18	MC2		37	EXSYNC
2	PCLKB		36	/Pixel Clock
3	LDVB		34	/LVAL
4	FDVB		40	/FVAL
9	D0B		16	/DOUT0
10	D1B		17	/DOUT1
11	D2B		18	/DOUT2
12	D3B		19	/DOUT3
13	D4B		20	/DOUT4
14	D5B		21	/DOUT5
15	D6B		22	/DOUT6
16	D7B		23	/DOUT7
17	TXD		43	RXD
39	MC1		38	/EXSYNC
26	D8A		9	DOUT8
27	D9A		10	DOUT9
28	D10A		11	DOUT10
29	D11A		12	DOUT11
43	D12A		13	DOUT12
45	D13A		14	DOUT13
47	D14A		15	DOUT14
49	D15A		31	DOUT15
5	D8B		24	/DOUT8
6	D9B		25	/DOUT9
7	D10B		26	/DOUT10
8	D11B		27	/DOUT11
44	D12B		28	/DOUT12
46	D13B		29	/DOUT13
48	D14B		30	/DOUT14
50	D15B		32	/DOUT15
connector case	cable shield		connector case	

7.22 Part # KKRDMC1020**R

The camera cable is split on the Inspecta side into three branches, each app. 30 cm long:
One branch with 62P-HD male for B422A, B545 parallel interface
One branch with 9P-D female for COMx of PC
One branch with 15P-D male for +12V power from Inspecta

plugs into B422A, B454	plugs into MC1020 camera
D62P-HD, male	D44HD, male

Pin Nr.	description		Pin Nr.	description
23	PCLKA		35	Pixel Clock
24	LDVA		33	LVAL
25	FDVA		39	FVAL
30	D0A		1	DOUT0
31	D1A		2	DOUT1
32	D2A		3	DOUT2
33	D3A		4	DOUT3
34	D4A		5	DOUT4
35	D5A		6	DOUT5
36	D6A		7	DOUT6
37	D7A		8	DOUT7
42	GND		44	GND
18	MC2		37	EXSYNC
2	PCLKB		36	/Pixel Clock
3	LDVB		34	/LVAL
4	FDVB		40	/FVAL
9	D0B		16	/DOUT0
10	D1B		17	/DOUT1
11	D2B		18	/DOUT2
12	D3B		19	/DOUT3
13	D4B		20	/DOUT4
14	D5B		21	/DOUT5
15	D6B		22	/DOUT6
16	D7B		23	/DOUT7
39	MC1		38	/EXSYNC
26	D8A		9	DOUT8
27	D9A		10	DOUT9
28	D10A		11	DOUT10
29	D11A		12	DOUT11
43	D12A		13	DOUT12
45	D13A		14	DOUT13
47	D14A		15	DOUT14
49	D15A		31	DOUT15
5	D8B		24	/DOUT8
6	D9B		25	/DOUT9
7	D10B		26	/DOUT10
8	D11B		27	/DOUT11
44	D12B		28	/DOUT12
46	D13B		29	/DOUT13
48	D14B		30	/DOUT14
50	D15B		32	/DOUT15
connector case	cable shield		connector case	

KKRDMC1020**R continued:

COMX D9P	COMx name	MC-1020 D44HD, male	MC1020 name

female		D-Sub	
2	RXD	41	TXD
3	TXD	43	RXD
5	GND	44	GND
4	connect to Pin 6 of D9P		
6	connect to Pin 4 of D9P		
7	connect to Pin 8 of D9P		
8	connect to Pin 7 of D9P		

Insp D15P male	Insp name	MC-1020 D44HD, male D-Sub	MC1020 name
1	+12V	42	+12V
9	GND	44	GND

7.23 Part # KKRDMC1020**RD

The camera cable is split on the Inspecta side into three branches, each app. 30 cm long:
One branch with 62P-HD male for B422A, B545 parallel interface
One branch with 9P-D female for COMx of PC
One branch with 7P-MINI-DIN male for +12V power from Inspecta

plugs into B422A, B454	plugs into MC1020 camera
D62P-HD, male	D44HD, male

Pin Nr.	description		Pin Nr.	description
23	PCLKA		35	Pixel Clock
24	LDVA		33	LVAL
25	FDVA		39	FVAL
30	D0A		1	DOUT0
31	D1A		2	DOUT1
32	D2A		3	DOUT2
33	D3A		4	DOUT3
34	D4A		5	DOUT4
35	D5A		6	DOUT5
36	D6A		7	DOUT6
37	D7A		8	DOUT7
42	GND		44	GND
18	MC2		37	EXSYNC
2	PCLKB		36	/Pixel Clock
3	LDVB		34	/LVAL
4	FDVB		40	/FVAL
9	D0B		16	/DOUT0
10	D1B		17	/DOUT1
11	D2B		18	/DOUT2
12	D3B		19	/DOUT3
13	D4B		20	/DOUT4
14	D5B		21	/DOUT5
15	D6B		22	/DOUT6
16	D7B		23	/DOUT7
39	MC1		38	/EXSYNC
26	D8A		9	DOUT8
27	D9A		10	DOUT9
28	D10A		11	DOUT10
29	D11A		12	DOUT11
43	D12A		13	DOUT12

45	D13A		14	DOUT13
47	D14A		15	DOUT14
49	D15A		31	DOUT15
5	D8B		24	/DOUT8
6	D9B		25	/DOUT9
7	D10B		26	/DOUT10
8	D11B		27	/DOUT11
44	D12B		28	/DOUT12
46	D13B		29	/DOUT13
48	D14B		30	/DOUT14
50	D15B		32	/DOUT15
connector case	cable shield		connector case	

KKRDMC1020**RD continued:

COMX D9P female	COMx name	MC-1020 D44HD, male D-Sub	MC1020 name
2	RXD	41	TXD
3	TXD	43	RXD
5	GND	44	GND
4	connect to Pin 6 of D9P		
6	connect to Pin 4 of D9P		
7	connect to Pin 8 of D9P		
8	connect to Pin 7 of D9P		

Insp MINI-DIN 7 Pin male	Insp name	MC-1020 D44HD, male D-Sub	MC1020 name
1, 2	+12V	42	+12V
3, 4	GND	44	GND

7.24 Part # KKRDOS2048** Rev. 2

plugs into B422A , B454, INSPECTA-4D	plugs into Opti-Sens camera
D62P-HD, male	D44HD, male

Pin Nr.	Description	color	Pin Nr.	description
23	PCLKA		25	+PVAL
24	LDVA		10	+LVAL
30	D0A		40	+D0
31	D1A		12	+D1
32	D2A		27	+D2
33	D3A		42	+D3
34	D4A		14	+D4
35	D5A		29	+D5
36	D6A		44	+D6
37	D7A		15	+D7
2	PCLKB		24	-PVAL
3	LDVB		9	-LVAL
9	D0B		39	-D0
10	D1B		11	-D1
11	D2B		26	-D2
12	D3B		41	-D3

13	D4B		13	-D4
14	D5B		28	-D5
15	D6B		43	-D6
16	D7B		30	-D7
18	CM2		19	+EX Sync
39	CM1		18	-EX Sync
open end			2	+Shutter
open end			1	-Shutter
1	GND		6	OVD
1	GND		5	OVD
42	GND		20	OVD
22	SUPPLY		23	12VR POWER
22	SUPPLY		8	12VR POWER
21	GND		7	0VR POWER
21	GND		22	0VR POWER
38	CM3		32	Gain1
17	CM0		21	Gain0
connector case	cable shield		connector case	

7.25 Part # KKRDPCLSR**

All signals marked with +/- are twisted pairs.

Remark:
Cable is split on both sides: one branch connected to MDR 26, other branch connected to Power Connector.
Each branch app. 15 cm long, measured to the front end of the plugs.
Use flexible wires 0.25 mm^2 for Power in the branches.

Plugs into INSPECTA-4C (B528)			Plugs into MC1301	
MDR 26 male locked by Screws	Mini-DIN 7 male	Name	MDR 26 male locked by Screws	Hirose 6 pin female
1		Inner Shield	1	
14		Inner Shield	14	
25		X0-	2	
12		X0+	15	
24		X1-	3	
11		X1+	16	
23		X2-	4	
10		X2+	17	
22		Xclk-	5	
9		Xclk+	18	
21		X3-	6	
8		X3+	19	
20		SerTC+	7	
7		SerTC-	20	
19		SerTFG-	8	
6		SerTFG+	21	
18		CC1-	9	
5		CC1+	22	
17		CC2+	10	
4		CC2-	23	
16		CC3-	11	
3		CC3+	24	
	1, 2	CC4+ / +12V		1, 2
	3, 4	CC4- / GND		5, 6
13		Inner Shield	13	

26		Inner Shield	26	
Connector Case		Outer Shield	Connector Case	

7.26 Part # KKRDSK08B**

All signals marked with +/- are twisted pairs.
Remark 1: Power supply wires (same AWG as signal wires) are split at the D62P-HD connector with open end (app. 20 cm long)

plugs into B422A, B454, INSPECTA-4D	plugs into S+K digital linescan camera
D62P-HD, male	Mini centronix, 36-pin female

Pin Nr.	description	Pin Nr.	description
22	GND	16	GND
38	MC3	7	MCLK+
23	PCLKA	13	CCLK+
24	LDVA	11	LVAL+
30	D0A	19	D0+
31	D1A	21	D1+
32	D2A	23	D2+
33	D3A	25	D3+
34	D4A	27	D4+
35	D5A	29	D5+
36	D6A	31	D6+
37	D7A	33	D7+
42	GND	36	GND
17	MC0	8	MCLK-
18	MC2	9	SOS+
2	PCLKB	14	CCLK-
3	LDVB	12	LVAL-
9	D0B	20	D0-
10	D1B	22	D1-
11	D2B	24	D2-
12	D3B	26	D3-
13	D4B	28	D4-
14	D5B	30	D5-
15	D6B	32	D6-
16	D7B	34	D7-
39	MC1	10	SOS-
	Power lines		
+5V	Remark 1	35	VCC
+5V	Remark 1	17	VCC
+5V	Remark 1	15	VCC
GND	Remark 1	18	GND
GND	Remark 1	16	GND
GND	Remark 1	2	GND
GND	Remark 1	6	GND
-15V	Remark 1	5	VEE
+15V	Remark 1	3	VDD
connector case	cable shield	connector case	

7.27 Part # KKRDDALS**

plugs into INSPECTA-4D	plugs into Dalsa SP-14 camera
D62P-HD, male	3M 10136-6000EC, MDR36

Pin Nr.	Description	remark	Pin Nr.	description
23	PCLKA		17	STROBE
24	LDVA		18	LVAL
30	D0A		16	D0
31	D1A		15	D1
32	D2A		14	D2
33	D3A		13	D3
34	D4A		12	D4
35	D5A		11	D5
36	D6A		10	D6
37	D7A		9	D7
18	MC2		25	EXSYCB
2	PCLKB		35	STROBEB
3	LDVB		36	LVALB
9	D0B		34	D0B
10	D1B		33	D1B
11	D2B		32	D2B
12	D3B		31	D3B
13	D4B		30	D4B
14	D5B		29	D5B
15	D6B		28	D6B
16	D7B		27	D7B
39	MC1		7	EXSYNC
17	MC0	Remark 1	6	PRIN
38	MC3	Remark 1	24	PRINB
21	GND		20, 22, 21	GAIN0B, GAIN1B, FutureUse
connector case	cable shield		connector case	

Remark 1:
Camera set to:
EXSYNC = Level Mode
GAIN = 4
SPEED = 30/40Mhz

7.28 Part # KKRPDALS**

Power cable, round, 4 x 0.5qmm

D-Sub 9-pin male	Description	Power connector on camera side, Hirose 6-pin female
1 .. 5	+12V	1, 2
6 .. 9	GND	5, 6

7.29 Part # KKRDTMCCL**

B487 mating connector 15 pin HD-Sub female, 3 rows	Description	TMC-1000/6700 connector Airborn MP221, 15 pin
4	CH CLK+	1
9	CH CLK-	9
1	CH0+	2
6	CH0-	10
2	CH1+	3
7	CH1-	11

3	CH2+	4
8	CH2-	12
5	CH3+	5
10	CH3-	13
15	GND	8
11	VINIT+	6
12	VINIT-	14
connector case	cable shield	connector case

7.30 Part # KKRDVISTEC**

plugs into B422A, B454, INSPECTA-4D	Connector on SVS-Vistek camera side
D62P-HD, male	D-Sub 50P

Pin Nr. D-62P HD male	signal name	Remark	Pin Nr. D-Sub 50P male	signal name
23	PCLKA		29	STRB-
24	LDVA		46	LVAL-
25	FDVA		14	FVAL-
26	D8A		39	D8+
27	D9A		7	D9+
30	D0A		1	D0+
31	D1A		18	D1+
32	D2A		35	D2+
33	D3A		3	D3+
34	D4A		20	D4+
35	D5A		37	D5+
36	D6A		5	D6+
37	D7A		22	D7+
39	MC1		48	PRIN-
17	MC0		16	EXSYNC-
38	MC3		32	EXSYNC+
18	MC2		15	PRIN+
2	PCLKB		45	STRB+
3	LDVB		13	LVAL+
4	FDVB		30	FVAL+
5	D8B		23	D8-
6	D9B		40	D9-
9	D0B		34	D0-
10	D1B		2	D1-
11	D2B		19	D2-
12	D3B		36	D3-
13	D4B		4	D4-
14	D5B		21	D5-
15	D6B		38	D6-
16	D7B		6	D7-
21,42	GND		49,33	GND
	shield/ connector-case			SHIELD

7.31 Part # KKRH**1300

The camera is connected to the Inspecta via one cable. There are two connectors on the camera side, the Hirose 12-P and the 15P three row D-connector.

Connector on Inspecta-2, -3, -4A: 15-pin D male.	Connector on TM-1300 PC-XC12	Connector on TM-1300 15P HD male (three rows)

Pin Nr.	Description	Pin Nr.	Pin Nr.	Remark
1	+12V	2		
2	HSYNC		13	HSYNC output
5	VIDEO0 (G)		2	G Coax
7	GND		11	CLK Coax shield
9	GND	1		
10	VSYNC		14	VSYNC output
11	SC2/VINIT	6		
12	GND		7	G Coax shield
13	SC3/INTCNT	11		
15	CLK		5	CLK Coax (Remark 1)

7.32 Part # KKRH**1300R

The camera is connected to the Inspecta via one cable. The cable is split on the Inspecta side (15-pin D-Sub) for the additional COMx connector. (ca 30cm, 9-pin D-Sub)
There are two connectors on the camera side, the Hirose 12-P and the 15P three row D-connector.

Connector on Inspecta-2, -3, -4A: 15-pin D male.	Connector on TM-1300 PC-XC12	Connector on TM-1300 15P HD male (three rows)

Pin Nr.	Description	Pin Nr.	Pin Nr.	Remark
1	+12V	2		
2	HSYNC		13	HSYNC output
5	VIDEO0 (G)		2	G Coax
7	GND		11	CLK Coax shield
9	GND	1		
10	VSYNC		14	VSYNC output
11	SC2/VINIT	6		
12	GND		7	G Coax shield
13	SC3/INTCNT	11		
15	CLK		5	CLK Coax (Remark 1)
9-Pin D-Sub female	**COMx description**			
1	DCD connect to pin 7			
2	RXD	9	TxD	
3	TXD	10	RxD	
4	DTR connect to pin 6, 9			
6	DSR connect to pin 4			
7	RTS connect to pin 1			
8	CTS			
9	RI connect to pin 4			
connector case	cable shield	connector case	connector case	

7.33 Part # KKRH**6PULR

COMx connector 9 pin D-Sub female Pin Nr.	Description	Pulnix Camera Hirose 6 pin connector female Pin Nr.
1	DCD connect to pin 7	
2	RXD	2
3	TXD	1
4	DTR connect to pin 6, 9	
5	GND	4
6	DSR connect to pin 4	
7	RTS connect to pin 1	
8	CTS	
9	RI connect to pin 4	
connector case	cable shield	connector case

7.34 Part # KKRH**81X3

Connector to INSPECTA-2, -3, -4A	Connector on camera
15-pol D male	MX-12P

Pin Nr.	comment	color	Pin Nr.
1	+12V power	yellow	2
5	Video channel 0	red	4
12	Video channel 0 shield	grey	1
9	GND, power return	orange	9
connector case	cable shield		connector case

connector to INSPECTA-2, -3, -4A D15P male	comment	comment MX-12P 8X23	connector to MX-12P D25P male
Connector to INSPECTA-2, -3, -4A		Connector on camera	
15-pol D male		PC-XC12	
1			
2	HSYNC	LEN	3
3	shutter control 0		
4	shutter control 1		
5	video	VBS	21
6	video blue		
7	GND		12
8	GND	Pixel clock return	13
9	GND	shield	10
10	VSYNC	FEN	4
11	shutter control 2	TRG	15
12	video green shield	VBS shield	22
13	integration control		
14	video red		
15	PCLK	Pixel clock	1
connector case	cable shield		connector case

7.35 Part # KKRH**C9700

The camera is connected to the Inspecta via one cable. There are three connectors on the camera side, the D-Sub 9-P male, the Hirose 12-P and the Hirose 6-P connector.

The cable is split on the Inspecta side for an additional connection to one of the serial connectors (9-pin D-Sub female). This cable is app. 20cm long

Connector on Inspecta -2, -3, -4A: D-15P male	Connector for COMx: D-9P female		TMC-9700: D-9P male (RGB)	TMC-9700: 12-pin Hirose (PWR/Sync)	TMC-9700: 6-pin Hirose (RS-232)

Pin Nr.	Pin Nr.	Descrip-tion	Descrip-tion	Pin Nr.	Pin Nr.	Pin Nr.
1		+12V			2	
14		VIDEO1	R Output	3		
7		GND		2		
5		VIDEO0	G Output	4		
12		GND		8		
6		VIDEO2	B Output	5		
7		GND		2		
9		GND			1, 5	
11		VINIT/SC2	VINIT		6	
2		HD	HD input		9	
10		VD	VD input		7	
	2		TXD			2
	3		RXD			1
	5		GND			4, 5, 6
	1, 7	DCD-RTS				
	4, 6, 9	DTR-DSR-RI				
connector case	cable shield			connect or case	connector case	connector case

7.36 Part # KKRH**DXC

Cable is split at Camera. 12V power supply from INSPECTA

Connector on Inspecta -2, -3, -4A 15-pin D male.	Connector on DXC-9100 PC-XC12	Connector on DXC-9100, DXC003 9-pol. D male

Pin Nr.	Description	Pin Nr.	Pin Nr.	Remark
14	VIDEO1 (R)		3	R Coax
7	GND		2	R Coax shield
5	VIDEO0 (G)		4	G Coax
12	GND		2	G Coax shield
6	VIDEO2 (B)		5	B Coax
7	GND		2	B Coax shield
10	VSYNC0		7	Syncout
1	+12V	2, 11		+12V
2	HD	6		HD input Coax
7	GND	5		HD input Coax shield
9	GND	1, 10		gnd
10	VD	7		VD input

connector case	cable shield	connector case	connector case	cable shield

7.37 Part # KKRH**HDVD

Connector on Inspecta-2, -3, -4A:	Connector on JAI CV-235:
15-pol D male	PC-XC12

Pin Nr.	Comment	Color	Pin Nr.
1	+12V Power	yellow	2
2	Horizontal Drive (HD)	orange	6
5	Video Channel 0	red	4
7	GND, VD shield	black shield	8
8	GND	grey	5, 12
9	GND, HD Shield	orange shield	1
10	Vertical Drive (VD)	black	7
12	Video Channel 0 Shield	red shield	3
		nc	9
connector case	cable shield		connector case

7.38 Part # KKRH**HDVDCD

Connector on Inspecta-2, -3, -4A:	Connector on JAI CV-M300:
15-pol D male	PC-XC12

Pin Nr.	Comment	Color	Pin Nr.
1	+12V Power		2
2	Horizontal Drive (HD)		6
5	Video Channel 0		4
7	Clock Shield		8
7	VD Shield		12
8	HD Shield		5
9	GND		1
10	Vertical Drive (VD)		7
12	Video Channel 0 Shield		3
15	Clock		9
connector case	cable shield		connector case

7.39 PART # KKRH**HVD30

The camera is connected to the Inspecta via one cable. There is one 15-pin male high density D-Sub connector on the camera side.
The cable is split on the Inspecta side for an additional connection to one of the serial connectors (9-pin D-Sub female). This cable is app. 20cm long

Connector on Inspecta 15-pin D male.	COMX D9P female	Connector on HVD30 15-pin HD male

Pin Nr.	Description	Pin Nr.	Description	Pin Nr.	Remark
14	VIDEO1 (R)			1	R Coax
8	GND			6	R Coax shield
5	VIDEO0 (G)			2	G Coax
12	GND			7	G Coax shield
6	VIDEO2 (B)			3	B Coax
7	GND			8	B, SYNCOUT Coax shield
10	SYNCOUT			13	Coax if available
11	TRIGIN			10	
1	+12V			9	
		2	RxD	15	TxD
		3	TxD	12	RxD
		7,8	connect Pin 7 and 8		
		1,4,6	connect Pin 1,4 and 6		
		5	GND	5	GND
connector case	cable shield	connector case	cable shield	connector case	cable shield

7.40 Part # KKRH**IKE

Connector on Inspecta-2, -3, -4A:	Connector SKC-13x
15-pol D male	PC-XC12

Pin Nr.	Comment	Pin Nr.
1	+12V Power	2
11	Ext Trigger	11
2	Horizontal Drive (HD)	6
5	Analog Video	4
7	GND	5, 8
8	GND	12
9	HD Shield	1
12	Analog Video Shield	3
connector case	cable shield	connector case

7.41 Part # KKRH**IKER

Connector on PC (COMX):	Connector on SKC-13x
9pin D female.	PC-6P

Pin	Description	Color	Pin	Description
1	DCD auf 7(COMX)			
2	RXD		6	TXD
3	TXD		1	RXD

4	DTR auf 6 and 9(COMX)			
5	GND		2	GND
6	DSR auf 4(COMX)			
7	RTS auf 1(COMX)			
9	RI auf 4(COMX)			

7.42 PART # KKRH**KYF70

Connector on Inspecta-2 15-pin D male.	Connector on KY-F70U 15-pin HD male

Pin Nr.	Description	Pin Nr.	Remark
14	VIDEO1 (R)	1	R Coax
8	GND	6	R Coax shield
5	VIDEO0 (G)	2	G Coax
12	GND	7	G Coax shield
6	VIDEO2 (B)	3	B Coax
7	GND	8	B Coax shield
2	HSYNC	13	Coax if available
10	VSYNC	14	
connector case	cable shield	connector case	cable shield

7.43 Part # KKRH**LINE

There are two cables coming out of the INSPECTA 15-pin D connector:
One cable to 15 pin D-connector on the camera and one cable with a BNC connector for the video signal.

There are two cables coming out of the 15 pin D-connector on the camera:
One cable to 15 pin D-connector on INSPECTA and one cable to an external power supply.

Connector to Inspecta -2, -3, -4A D15P male	comment INSPECTA	comment SK2594JR	connector to SK2594JR D15P female	video SK2594JR BNC
1	+12V power			
2	HSYNC, connected to pin 11			
3	SC0	CLK-	8	
4	SC1	SOS+	14	
5	video			BNC inside
6	video blue			
7	GND		2	
8	GND		10	
9	GND			
10	VSYNC			
11	SC2, connected to pin 2	SOS-	7	
12	video green shield			BNC outside
13	INTCNT, connected to pin 15	CLK+	15	
14	video red			

15	PCLK, connected to pin 13			
connector case	cable shield		connector case	
ext. power supply	black	GND	10	
ext. power supply	red	+15V	11	
ext. power supply	green	-15V	13	
ext. power supply	blue	+5V	12	

7.44 Part # KKRH**M1

The camera is connected to the Inspecta via one cable. There are two connectors on the camera side, the Hirose 12-P and the Hirose 6-P connector.

Connector on Inspecta-2, -3, -4A: D-15P male	COMX D9P female		JAI CV-M1: 12-pin Hirose female	JAI CV-M1: 6-pin Hirose female
Pin Nr.		Description	Pin Nr.	Pin Nr.
1		+12V	2	
2		HSYNC	6	
5		VIDEO0	4	
7		GND	1	
8		GND	8	3 (Schirm v.4,5)
9		GND	12	
12		GND	5	
11		SC2/VINIT		5
13		SC3		4

7.45 Part # KKRH**M10

Connector on Inspecta-2, -3, -4A: 15-pol D male	Connector on JAI CV-M10: PC-XC12

Pin Nr.	Comment	Pin Nr.
1	+12V Power	2
2	Horizontal Drive (HD)	6
5	Video Channel 0	4
7	SC3 shield	8
8	GND	1
9	VD shield HD Shield	12 5
10	Vertical Drive (VD)	7
12	Video Channel 0 Shield	3
13	SC3	9
connector case	cable shield	connector case

7.46 Part # KKRH**M10F

Connector on Inspecta-2, -3, -4A: 15-pol D male	Connector on JAI CV-M10: PC-XC12

Pin Nr.	Comment	Pin Nr.
1	+12V Power	2
2	Horizontal Drive (HD)	6
5	Video Channel 0	4
7	SC2 shield	8
8	GND	1
9	VD shield HD Shield	12 5
10	Vertical Drive (VD)	7
12	Video Channel 0 Shield	3
11	SC2	9
connector case	cable shield	connector case

7.47 Part # KKRH**M1000K

The camera is connected to the Inspecta via one cable. The cable is split on the camera side. One end is the Hirose 6-P and the other end is the 9-pin Sub-D-connector.

Connector on Inspecta-2, -3, -4A:	Connector on M1000K:
15-pin D male.	9-pol. D male

Pin Nr.	Description	Pin Nr.	Description
6	VIDEO2 coax	5	R Output
7	VIDEO2 shield	2	GND
5	VIDEO0	4	G Output
12	VIDEO0 shield	8	GND
14	VIDEO1	3	B Output
8	VIDEO1 shield	9	GND
10	Composite sync	7	Sync output
connector case	cable shield	connector case	

Connector on Inspecta-2, -3, -4A:	Connector on M1000K:
15-pin D male.	PC-XC6

Pin	Description	Pin	Description
1	+12V	6	+12V
9	GND	1	GND
connector case	cable shield	connector case	

7.48 Part # KKRH**M2200

The camera is connected to the Inspecta via one cable. The cable is split on the camera side. One end is the Hirose 6-P and the other end is the 9-pin Sub-D-connector.

Connector on Inspecta-2, -3, -4A:	Connector on M2200:
15-pin D male.	9-pol. D male

Pin Nr.	Description	Pin Nr.	Description
6	VIDEO2 coax	5	R Output
7	VIDEO2 shield	2	GND
5	VIDEO0	4	G Output
12	VIDEO0 shield	8	GND
14	VIDEO1	3	B Output
8	VIDEO1 shield	9	GND
10	Composite sync	7	Sync output
connector case	cable shield	connector case	

Connector on Inspecta-2, -3, -4A:	Connector on M1000K:
15-pin D male.	PC-XC6

Pin	Description	Pin	Description
1	+12V	6	+12V
9	GND	3	GND
connector case	cable shield	connector case	

7.49 Part # KKRH**M1R

The camera is connected to the Inspecta via one cable. There are two connectors on the camera side, the Hirose 12-P and the Hirose 6-P connector.
The cable is split on the Inspecta side for an additional connection to one of the serial connectors (9-pin D-Sub female). This optional cable is app. 20cm long

Connector on Inspecta-2, -3, -4A: D-15P male	COMX D9P female		JAI CV-M1: 12-pin Hirose female	JAI CV-M1: 6-pin Hirose female
Pin Nr.		Description	Pin Nr.	Pin Nr.
1		+12V	2	
2		HSYNC	6	
5		VIDEO0	4	
7		GND	1	
8		GND	8	
9		GND	12	
12		GND	5	
11		SC2/VINIT		5
13		SC3		4
Optional RS-232 connector	COMX D9P female	COMx name		JAI CV-M1: 6-pin Hirose
	2	RXD		1
	3	TXD		2
	7,8	connect Pin 7 and 8		
	1,4,6	connect Pin 1,4 and 6		
connector case	connector case	cable shield		connector case

7.50 Part # KKRH**M30

Connector on Inspecta-2, -3, -4A:	Connector on JAI CV-M30:
15-pol D male	PC-XC12

Pin Nr.	Comment	Color	Pin Nr.
1	+12V Power	yellow	2
2	Horizontal Drive (HD)	orange	6
5	Video Channel 0	red	4
7	GND	grey	5 8
8	GND		12
9	HD Shield	orange shield	1
12	Video Channel 0 Shield	red shield	3
connector case	cable shield		connector case

7.51 Part # KKRH**M40

There are two connectors on the camera side, the Hirose 12-P and the Hirose 6-P connector.

Connector on Inspecta-2, -3, -4A: D-15P male	COMX D9P female		JAI CV-M40: 12-pin Hirose female	JAI CV-M40: 6-pin Hirose female
Pin Nr.		Description	Pin Nr.	Pin Nr.
1		+12V	2	
2		HSYNC	6	
5		VIDEO0	4	
7		GND	1	
8		GND	8	
9		GND	12	
12		GND	5	
11		SC2/VINIT		5

7.52 Part # KKRH**M40R

There are two connectors on the camera side, the Hirose 12-P and the Hirose 6-P connector.
The cable is split on the Inspecta side for an additional connection to one of the serial connectors (9-pin D-Sub female). This optional cable is app. 30cm long

Connector on Inspecta-2, -3, -4A: D-15P male	COMX D9P female		JAI CV-M40: 12-pin Hirose female	JAI CV-M40: 6-pin Hirose female
Pin Nr.		Description	Pin Nr.	Pin Nr.
1		+12V	2	
2		HSYNC	6	
5		VIDEO0	4	
7		GND	1	
8		GND	8	
9		GND	12	
12		GND	5	
11		SC2/VINIT		5

Optional RS-232 connector	COMX D9P female	COMx name		JAI CV-M40: 6-pin Hirose
	2	RXD		1
	3	TXD		2
	7,8	connect Pin 7 and 8		
	1,4,6	connect Pin 1,4 and 6		
connector case	connector case	cable shield		connector case

7.53 Part # KKRH**M70

There are three connectors on the camera side, one D-9P, the Hirose 12-P and the Hirose 6-P connector.

Connector for Inspecta-2, -3, -4A D-15P male	Connector for COMx: D-9P female		JAI CV-M70: D-9P male	JAI CV-M70: 12-pin Hirose	JAI CV-M70: 6-pin Hirose

Pin Nr.	Pin Nr.	Descrip-tion	Descrip-tion	Pin Nr.	Pin Nr.	Pin Nr.
1		+12V			2	
14		VIDEO1	R Output	3		
7		GND		2		
5		VIDEO0	G Output	4		
12		GND		2		
6		VIDEO2	B Output	5		
7		GND		2		
10		VSYNC0	Syncout	7		
9		GND			1	
2		HSYNC	WEN			6
13		SC3	Trigger			5
connector case	cable shield			connect or case	connect or case	connecto r case

7.54 Part # KKRH**M70R

The camera is connected to Inspecta via one cable and one male D15P connector. The cable is split on the frame-grabbers end for an additional female D9P connector for connection with COMx of PC. There are three connectors on the camera side, one D-9P, the Hirose 12-P and the Hirose 6-P connector.

Connector for Inspecta-2, -3, -4A: D-15P male	Connector for COMx: D-9P female		JAI CV-M70: D-9P male	JAI CV-M70: 12-pin Hirose	JAI CV-M70: 6-pin Hirose

Pin Nr.	Pin Nr.	Descrip-tion	Descrip-tion	Pin Nr.	Pin Nr.	Pin Nr.
1		+12V			2	
14		VIDEO1	R Output	3		
7		GND		2		

5		VIDEO0	G Output	4		
12		GND		2		
6		VIDEO2	B Output	5		
7		GND		2		
10		VSYNC0	Syncout	7		
9		GND			1	
2		HSYNC	WEN			6
13		SC3	Trigger			5
	2		TXD			1
	3		RXD			2
	5		GND			3
connector case	cable shield			connector case	connector case	connector case

7.55 Part # KKRH**PULPROG

Connector on INSPECTA-2, -3, -4A:	Connector on
15 pin D male	Analog Camera:
	PC - 12P

Pin Nr.	Description	Color	Pin Nr.
1	+12V Power	yellow	2
2	Horizontal Drive (HD) (no coax)	white	9
3	Shutter Control 0	-	-
4	Shutter Control 1	-	-
5	Video Channel 0	red	4
6	Video Channel 2	-	-
7	Common,		8
8	PWR return	grey	5
9	Common, VINIT shield	orange shield	1
10	VD	-	-
11	Async. Reset, VINIT	orange	6
12	Video Channel 0 Shield	red shield	3
13	Integration Control	blue	11
14	Video Channel 1	-	-
15	-	-	-
connector case	cable shield		connector case

7.56 Part # KKRH**PULHDVD

Connector on INSPECTA-2, -3, -4A:	Connector on
15 pin D male	Analog Camera:
	PC - 12P

Pin Nr.	Description	Color	Pin Nr.
1	+12V Power		2
2	Horizontal Drive (HD) (no coax)		9
3	Shutter Control 0		-
4	Shutter Control 1		-
5	Video Channel 0		4
6	Video Channel 2		-

7	Common,		8
8	PWR return		5
9	Common, VINIT shield		1
10	VD		7
11	Async. Reset, VINIT		6
12	Video Channel 0 Shield		3
13	Integration Control		11
14	Video Channel 1		-
15	-		-
connector case	cable shield		connector case

7.57 Part # KKRH**TMC-7X

Connector on Inspecta-2, -3, -4A:	Connector on
15 pin D male	Analog Camera:
	PC - 12P

Pin Nr.	Description	Color	Pin Nr.
1	+12V Power	yellow	2
2	Horizontal Drive (HD)	-	-
3	Shutter Control 0	-	-
4	Shutter Control 1	-	-
5	Video Green	white	9
6	Video Blue	red	4
7	Composite Sync Shield	orange shield	5
8	Common	brown	3
9	Common (Power Return)	grey	1
10	Composite Sync	orange	6
11	Shutter Control 2	-	
12	Video Green Shield Video Red Shield Video Blue Shield	white Shield black Shield red Shield	10 8 12
13	Integration Control	-	
14	Video Red	black	7
connector case	cable shield		connector case

7.58 Part # KKRH**XC003

Both cable trunks are connected to **one** 15-pin D-connector of the INSPECTA. 12V power supply from INSPECTA

Connector on Inspecta-2, -3, -4A	Connector on: XC-003:
15-pin D male.	9-pol. D male

Pin Nr.	Description	Color	Pin Nr.	Description
12	VGND		2	RGB output gnd
14	VIDEO2	red	3	R Output
5	VIDEO0	green	4	G Output
6	VIDEO1	blue	5	B Output
connector case	cable shield		connector case	

Connector on Inspecta-2, -3, -4A	Connector on XC-003:

15-pin D male.	PC-XC12

Pin	Description	Color	Pin	Description
1	+12V	yellow	2	+12V
1	+12V	blue	11	+12V
2	HD	orange	6	HD input
7	GND		5	HD input gnd
7	GND		12	VD input gnd
9	GND	grey	1	Ground
9	GND	brown	10	Ground
10	VD	white	7	VD input
connector case	cable shield		connector case	

7.59 Part # KKRH**XCHR50

Connector on Inspecta-2, -3, -4A:	Connector on XC-HR50
15-pol D male	PC-XC12

Pin Nr.	Comment	comment	Pin Nr.
1	+12V Power	+12V	2
2	Horizontal Drive (HD)	HD IN	6
5	Video Channel 0	VIDEO OUT	4
7	SC3 shield	TRIGGER GND	12
8	GND	GND	12
9	HD Shield, VD Shield	HD GND VD GND	1, 5
10			
11	SC2	VD IN	7
12	Video Channel 0 Shield	VIDEO GND	3
13	SC3	TRIGGER IN	11
connector case	cable shield		connector case

7.60 Part # KKRH**XC55

Connector on Inspecta-2, -3, -4A:	Connector on XC-55
15-pol D male	PC-XC12

Pin Nr.	Comment	comment	Pin Nr.
1	+12V Power	+12V	2
2	Horizontal Drive (HD)	HD IN	6
5	Video Channel 0	VIDEO OUT	4
7	SC3 shield	TRIGGER GND	8
8	GND	GND	12
9	HD Shield, VD Shield	HD GND VD GND	1, 5
10			
11	SC2	VD IN	7
12	Video Channel 0 Shield	VIDEO GND	3
13	SC3	TRIGGER IN	9
connector case	cable shield		connector case

7.61 Part # KKRP4D4C**

Inspecta -4D, -4C Mini-DIN male 7-pin	Description	Connector Hirose 12 pin female Pin Nr.
1, 2	+12V power	2
3, 4	GND	1
connector case	cable shield	connector case

7.62 Part # KKRP6710**

The cable is split on the Inspecta side (15-pin D-Sub) for the additional COMx connector. (ca 30cm, 9-pin D-Sub)

Inspecta -2, -3, -4A 15 pin D-Sub male	COMx connector 9 pin D-Sub female Pin Nr.	Description	TM-6710 connector Hirose 12 pin female Pin Nr.
1		+12V power	2
7		GND	8
8		GND	1
11		VINIT	6
13		integration control	11
		COMx description	
	1	DCD connect to pin 7	
	2	RXD	12
	3	TXD	10
	4	DTR connect to pin 6, 9	
	6	DSR connect to pin 4	
	7	RTS connect to pin 1	
	8	CTS	
	9	RI connect to pin 4	
connector case	connector case	cable shield	connector case

7.63 Part # KKRPBAXX**

Inspecta side: separate	Description	Camera Binder 4-pin

Powersupply 24V		female Pin Nr.
red open end	+24V power	3, 4
black open end	GND	1, 2

7.64 Part # KKRPDIG**

Inspecta connector 15 pin D-Sub male	Description	Digital Camera Hirose 12 pin connector female Pin Nr.
1	+12V power	2
8	GND	1
connector case	cable shield	connector case

7.65 Part # KKRPF100**

Connector on Inspecta-2, -3:	Connector on KP-F100
15 pin D male	PC-XC12

Pin	Description	Pin	Description
1	+12V	2	+12V
2	HDout	6	EXT HD
7	GND	1	GND
8	GND	10	GND
10	VD	4	WEN
11	SC2	7	TRIGA
13	SC3	9	TRIGB
connector case	cable shield	connector case	

7.66 Part # KKRPF110**

Connector on Inspecta-2, -3:	Connector on KP-F110
15 pin D male	PC-XC12

Pin	Description	Pin	Description
1	+12V	2	+12V
7	GND	1	GND
8	GND	10	GND
11	SC2	7	TRIGA

connector case	cable shield	connector case	

7.67 Part # KKRPKPF**

Connector on Inspecta-4C/D:	Connector on KP-F110/120
Mini-DIN	PC-XC12

Pin	Description	Pin	Description
1	+12V	2	+12V
3	GND	1	GND
4	GND	10	GND
7	CC1	7	TRIGA
connector case	cable shield	connector case	

7.68 Part # KKRPMC1020**

round Cable, 2 x 0.5 mm^2

connect to Power Supply Unit	Connector to MC1300
Cable open end	Binder 99-0410-00-04 (SW04-400)

Color	Description	Pin	Description
white	+8V .. +35V	3, 4	+ Power in
brown	GND	1, 2	GND in

7.69 Part # KKRPMC1300**

round Cable, 4 x 0.5 mm^2, shielded

connect to Power Supply Unit	Connector to MC1300/MC1301
Cable open end	Hirose 6-pin female

Color	Description	Pin	Description
white	+8V .. +35V	1, 2	+ Power in
brown	GND	5, 6	GND in
green	STRB	3	Strobe
yellow	DGND	4	digital GND for Strobe signal
shield	cable shield	connector case	

7.70 Part # KKRPMC1301**

round Cable, 4 x 0.5 mm^2, shielded

connect to Inspecta 4C	Connector to MC1300/MC1301

Mini-DIN 7-pin male	Hirose 6-pin female

Pin	Color	Description	Pin
1, 2	white, yellow	+8V .. +35V	1, 2
3, 4	green, brown	GND	5, 6
connector case	shield	cable shield	connector case

7.71 Part # KKRPMV10**

round Cable, 4 x 0.5 mm^2, shielded

connect to Inspecta 4C	Connector to Soliton MV10-14
Mini-DIN 7-pin male	Hirose 6-pin female

Pin	Description	Pin
1	+12V Power	1
3	GND	6
7	Trigger	2
connector case	cable shield	connector case