

SNAPPER Digital Camera Guide

DataCell Limited

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Part Information

Part Number: SNP-MAN-DIG-CAM

Version v4.0.1 September 1999

Printed in the United Kingdom.

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Introduction

This section describes details specific to each of the most popular cameras supported.

DALSA CA-DX

This section applies to the Dalsa CA-Dx series of line scan cameras.

SERIAL CONFIGURATION

The RS-232/RS-422 jumper selection does not matter, as the CA-Dx series of cameras do not use serial communications.

CONNECTING TO SNAPPER-DIG16

For cameras manufactured before 1996, use cable [CBL-68-DALSA-CAD-A-3M](#) to connect the camera to Snapper. However for cameras manufactured after 1996, use Snapper cable CBL-68-DALSA-A-3M. This is necessary due to Dalsa changing the pinout of the OS1/OS2 and control connectors during 1996.

For cameras manufactured in 1996, the location of the LineEnable signal must be determined. If it is output on OS1/OS2 then use CBL-68-DALSA-A-3M.

The year of manufacture can be determined from the first two digits of the camera serial number.

Connect: the 25 way socket labelled “Control” to the 25 way plug on the back of the camera; the 20 way IDC connector labelled “OS1” to the OS1 socket on the back of the camera; similarly for the OS2 where fitted; the 25 way plug labelled PSU should be connected to a suitable power supply (the power pins are the same as the camera itself); and the 68 way end to the Snapper.

DALSA CL-CX

This section applies to the Dalsa CA-Dx series of line scan cameras.

SERIAL CONFIGURATION

The RS-232/RS-422 jumper selection does not matter, as the CL-Cx series of cameras do not use serial communications.

CONNECTING TO SNAPPER-DIG16

For cameras manufactured before 1996, use cable [CBL-68-DALSA-CLC-A-3M](#) to connect the camera to Snapper. However for cameras manufactured after 1996, use Snapper cable [CBL-68-DALSA-A-3M](#). This is necessary due to Dalsa changing the pinout of the OS1/OS2 and control connectors during 1996.

For cameras manufactured in 1996, the location of the LineEnable signal must be determined. If it is output on OS1/OS2 then use CBL-68-DALSA-A-3M.

The year of manufacture can be determined from the first two digits of the camera serial number.

Connect: the 25 way socket labelled “Control” to the 25 way plug on the back of the camera; the 20 way IDC connector labelled “OS1” to the OS1 socket on the back of the camera; similarly for the OS2 where fitted; the 25 way plug labelled PSU should be connected to a suitable power supply (the power pins are the same as the camera itself); and the 68 way end to the Snapper.

HAMAMATSU C4742

This section applies to the Hamamatsu C4742 camera.

SERIAL CONFIGURATION

The RS-232/RS-422 jumper selection does not matter, as the C4742 cameras do not use serial communications.

CONNECTING TO SNAPPER-DIG16

To connect the C4742 camera to Snapper use the Snapper cable [CBL-68-37D-A-1M](#) or CBL-68-37D-A-2M. The 37 way D end goes to the Digital Video connector on the camera head, and the 68 way end to the Snapper.

To connect the C4742-95 camera to Snapper use the CBL-68-HAM-A-2M cable.

To connect the Camera Head to the Camera Control Unit (CCU) use the standard C4742 cable.

CAMERA HEAD SETTINGS

The *MODE* switch should be set to 0 to allow the Snapper to control the camera. The settings of *EXPO TIME* and *SHUTTER DELAY* are not controlled by the Snapper and should be set to the usual values.

CAMERA CONTROL UNIT SETTINGS

The *SHUTTER* switch to *ENB* to allow the Snapper to control the camera. Also the internal switch SW1-2 must be set to *OFF* to get the correct active area. See Hamamatsu's instructions for details on how to do this. The settings of *GAIN*, *OFFSET* and *SHADING* are not controlled by the Snapper and should be set to the usual values (suggested initial values to try are 0, 0 and *OFF*).

HAMAMATSU C4880

This section applies to the Hamamatsu C4880 camera.

SERIAL CONFIGURATION

The C4880 camera supports both RS-232 and RS-422 serial levels. For RS-232 levels use Snapper cable CBL-68-C4880-232-2M; for RS-422 levels use CBL-68-HAM-A-2M. Set the Snapper-Dig16 serial control jumper accordingly.

CONNECTING TO SNAPPER-DIG16

To connect the Camera to the Snapper with RS-232 levels, use the Snapper cable [CBL-68-C4880-232-2M](#). If using RS-422 levels (preferred) use Snapper cable CBL-68-HAM-A-2M. In both cases the 68 way SCSI-2 connector is fitted to the Snapper-Dig16, and the other to the CCU.

On both cables there is a BNC TTL trigger input connector. On the CBL-68-HAM-A-2M cable there is also a BNC TTL output trigger.

To connect the Camera Head to the Camera Control Unit (CCU) use the standard C4880 cable.

KODAK MEGAPLUS 1.4 & 4.2

This section applies to the Kodak Megaplug 1.4 and 4.2 cameras. A separate section covers the Megaplug 1.4i, 1.6 and 1.6i cameras.

SERIAL CONFIGURATION

The RS-232/RS-422 jumper selection does not matter, as these MegaPlus cameras do not use serial communications.

CONNECTING TO SNAPPER-DIG16

To connect the Camera to the Snapper use the Snapper cable [CBL-68-37D-A-1M](#) or CBL-68-37D-A-2M. The 37 way D end goes to the Digital Video connector on the CCU, and the 68 way end to the Snapper. The Kodak supplied cable is not required.

To connect the Camera Head to the Camera Control Unit (CCU) use the standard Kodak cable.

CAMERA CONTROL UNIT SETTINGS

The *MODE* switch should be set to *Computer* and the *SHUTTER* switch to *Off* to allow the Snapper to control the camera. The settings of *EXPOSURE*, *GAIN* and *BLACK LEVEL* are not controlled by the Snapper and should be set to the usual values (suggested initial values to try are *100ms*, *+6dB* and *Fixed*). Note that for maximum update rate use a 10ms exposure, and then adjust the lens aperture to obtain a good picture.

Conversely for best image sharpness stop down the aperture and adjust the exposure to obtain a good picture.

KODAK MEGAPLUS 1.4I, 1.6 & 1.6I

This section applies to the Kodak Megaplug 1.4i, 1.6 and 1.6i cameras. A separate section covers the Megaplug 1.4 and 4.2 cameras.

SERIAL CONFIGURATION

The RS-232/RS-422 jumper selection should be changed to match that of the camera. If a camera supports both signal levels, use of RS-422 is recommended.

CONNECTING THE MEGAPLUS 1.6 TO SNAPPER-DIG16

To connect the Camera Control Unit (CCU) to the Snapper use a standard AIA cable such the one supplied by Kodak, or Snapper cable [CBL-68-AIA-A-6M](#). The cable can be connected either way round.

To connect the Camera Head to the CCU use the standard Kodak cable.

There is no need to connect to the serial port on the CCU because the camera can be controlled from the front panel of the CCU. However, if serial control is required from the host machine, connect a serial cable between the 9 way D-type on the CCU and a suitable comms port. The Kodak 1.6 User's Manual shows the required pinout. The switch on the back of the CCU should be set to RS-232.

HOW TO CONNECT THE MEGAPLUS 1.4I OR 1.6I TO SNAPPER-DIG16

To connect the Camera Head to the Snapper use the Kodak AIA cable which has an additional 9 pin D-type connector. Connect the 9 pin D-type to either COM1 or COM2 on the PC, and the AIA connector with the D-type to the Snapper-DIG16. Connect the AIA connector without the D-type to the Camera Head.

PULNIX TM1000, TM1001, TM9700 & TM9701

This section applies to the Pulnix TM1000, TM1001, TM9700 & TM9701 cameras.

SERIAL CONFIGURATION

The RS-232/RS-422 jumper selection does not matter, as these Pulnix TM1000, TM1001, TM9700 & TM9701 cameras do not use serial communications.

CONNECTING TO SNAPPER-DIG16

To connect the Camera to the Snapper use one of the Snappers cable [CBL-68-PULNIX1000-2M](#) or [CBL-68-PULNIX1000-ADP](#). The 68 way end of both these cables connects to the Snapper. The cable CBL-68-PULNIX1000-2M is designed to connect directly to the 31 way connector on the Pulnix, while the cable CBL-68-PULNIX1000-ADP is an adapter for use with the Pulnix cable part 30DG-02.

CAMERA SETTINGS

Recommended rear panel switch settings are the rotary switch set to *0*, and where fitted the *NSP/DSP* switch to *NSP* and the *NRM/ASY* switch to *ASY*.

XILLIX MICROIMAGER 1400

This section applies to the Xillix MicroImager 1400 camera.

SERIAL CONFIGURATION

The RS-232/RS-422 jumper selection does not matter, as the CL-Cx series of cameras do not use serial communications.

CONNECTING TO SNAPPER-DIG16

To connect the Camera Control Unit (CCU) to the Snapper use the Snapper cable [CBL-68-XILLIX1400-3M](#). The 50 way end goes to the Digital Video connector on the CCU, and the 68 way end to the Snapper. The Xillix cable is not needed.

SOFTWARE OPTIONS

There are two camera types available:

Xillix MI1400	normal binning option
Xillix MI1400 x2 binning	2x2 binning

XILLIX PMI

This section applies to the Xillix Programmable MicroImager (PMI) 1400 camera.

SERIAL CONFIGURATION

The PMI camera supports both RS-232 and RS-422 serial comms settings.

If using the PMITEST program available from Xillix, then set the CCU to use RS-232 serial comms. Connect a cable from the 9 way D-Type connector on the CCU to a suitable serial port.

Alternatively, if the users application supports the necessary serial comms protocols, then set the CCU to the AIA setting. Also set the Snapper-Dig16 to use RS-422. In this mode the additional 9 way serial cable is not required.

CONNECTING TO SNAPPER-DIG16

To connect the CCU to the Snapper use the cable provided by Xillix. The 50 way end goes to the Digital Video connector on the CCU, and the 68 way end to the Snapper.

Demo Software

Supplied with the Windows 3.1x/9x/NT and Solaris SDKs there are some example applications which provide simple example applications.

D16 APPLICATION (WINDOWS 3.1X/9X/NT)

Having installed the software (see the Installation Guide) run *d16*.

From the *Snapper Options* Menu select *Snapper Configuration*, and select the appropriate camera from the *Camera Type* list. Then press the *Initialize Snapper* button. From the *Acquisition and Display* Menu click *Live* - this should give an image. If the picture is too dark or too light adjust the lens aperture, *EXPOSURE* and *GAIN* until the picture is good.

Alternatively, if the camera supports exposure control, tick *Snapper Controlled Exposure*. Using the drop down menu, select the required exposure time.

D16OW APPLICATION (SOLARIS 2)

Having installed the software (see the Installation Guide) run *d16ow*. From the *Properties* Menu select *Snapper Setup*, and select the appropriate camera from the *Camera Type* list and press the *Initialize Camera* button. Now click *Live* - this should give an image. If the picture is too dark or too light adjust the lens aperture until the picture is good.

There are currently two separate SDK versions available for use with Solaris 2.3 and Solaris 2.6. The Solaris 2.3 release is purely for maintenance only of existing customers and no further releases will be provided. The Solaris 2.6 release is recommended for all new customers, and is essential for customers using PCI based products.

The *D16OW* application is written using OpenWindows, which although it is no longer supported by Sun on Solaris 2.6, is binary compatible. Therefore Solaris 2.6 users can run the application, but cannot recompile it.

Cable Pinouts

CABLE CROSS REFERENCE TABLE

Manufacturer	Camera	Snapper Cable
Basler	L120 series	CBL-68-37D-232-A-2M
Dalsa	CL-Cx (pre 1996)	CBL-68-DALSA-CLC-A-2M
	CA-Dx (pre 1996)	CBL-68-DALSA-CAD-A-2M
	CL-Cx (post 1996)	CBL-68-DALSA- A-3M
	CL-Ex (post 1996)	CBL-68-DALSA- A-3M
	CA-Dx (post 1996)	CBL-68-DALSA- A-3M
Hamamatsu	C4742	CBL-68-37D-A-2M
	C4742-95	CBL-68-HAM-A-2M (or CBL-68-HAM-A-5M)
	C4880	CBL-68-HAM-A-2M (or CBL-68-HAM-A-5M)
Kodak	MegaPlus 1.4	CBL-68-37D-A-2M
	MegaPlus 1.4i	CBL-68-AIA-6M
	MegaPlus 1.6	CBL-68-AIA-6M
	MegaPlus 1.6i	CBL-68-AIA-6M
	MegaPlus 4.2	CBL-68-37D-A-2M
Pulnix	TM1000 / TM1001	CBL-68-PULNIX1000-2M (or CBL-68-PULNIX1000-ADP)
	TM9700 / TM9701	CBL-68-PULNIX1000-2M (or CBL-68-PULNIX1000-ADP)
Xillix	MicroImager1400	CBL-68-XILLIX1400-3M

For pinout information and availability of other cables, please contact DataCell.

CBL-68-37D-A-1M / CBL-68-37D-A-2M

SNAPPER CONNECTOR (68 way SCSI-2)	SNAPPER SIGNAL NAME	AIA SIGNAL NAME	DIR	CAMERA CONNECTOR (37 D-type skt)
1	GND	GND		16
2	MSB+	MSB+	⇄	6
3	MSB-1+	MSB-1+	⇄	7
4	MSB-2+	MSB-2+	⇄	8
5	MSB-3+	MSB-3+	⇄	9
6	MSB-4+	MSB-4+	⇄	10
7	MSB-5+	MSB-5+	⇄	11
8	MSB-6+	MSB-6+	⇄	12
9	MSB-7+	MSB-7+	⇄	13
10	MSB-8+	MSB-8+	⇄	14
11	MSB-9+	MSB-9+	⇄	15
12	GND	GND		35
13	MSB-10+	MSB-10+		
14	MSB-11+	MSB-11+		
15	MSB-12+	MSB-12+		
16	MSB-13+	MSB-13+		
17	TTL_TRIG_1	N/C		
18	TTL_TRIG_2	N/C		
19	MSB-14+	MSB-14+		
20	MSB-15+	MSB-15+		
21	IO_A+	RESERVED	⇄	36
22	CAM_SER_OUT0	SER_OUT+		
23	CAM_SER_IN0	SER_IN+		
24	IO_B+	FIELD_ID+	⇄	5
25	FRAME_EN+	FRAME_EN+	⇄	3
26	LINE_EN+	LINE_EN+	⇄	2
27	IO_C+	CHNL_0+		
28	IO_D+	CHNL_1+		
29	STROBE+	STROBE+	⇄	1
30	OUT_A+	MODE_0+	⇄	17
31	OUT_B+	MODE_1+	⇄	18
32	OUT_C+	MODE_2+	⇄	37
33	OUT_D+	MODE_3+	⇄	19
34	GND	GND		
35	GND	GND		16
36	MSB-	MSB-	⇄	25
37	MSB-1-	MSB-1-	⇄	26
38	MSB-2-	MSB-2-	⇄	27
39	MSB-3-	MSB-3-	⇄	28
40	MSB-4-	MSB-4-	⇄	29
41	MSB-5-	MSB-5-	⇄	30
42	MSB-6-	MSB-6-	⇄	31
43	MSB-7-	MSB-7-	⇄	32
44	MSB-8-	MSB-8-	⇄	33
45	MSB-9-	MSB-9-	⇄	34
46	GND	GND		35
47	MSB-10-	MSB-10-		
48	MSB-11-	MSB-11-		
49	MSB-12-	MSB-12-		
50	MSB-13-	MSB-13-		
51	N/C	N/C		
52	N/C	N/C		
53	MSB-14-	MSB-14-		
54	MSB-15-	MSB-15-		
55	IO_A-	RESERVED		
56	CAM_SER_OUT1	SER_OUT-		
57	CAM_SER_IN1	SER_IN-		
58	IO_B-	FIELD_ID-	⇄	24
59	FRAME_EN-	FRAME_EN-	⇄	22
60	LINE_EN-	LINE_EN-	⇄	21
61	IO_C-	CHNL_0-		
62	IO_D-	CHNL_1-		
63	STROBE-	STROBE-	⇄	20
64	OUT_A-	MODE_0-		
65	OUT_B-	MODE_1-		
66	OUT_C-	MODE_2-		
67	OUT_D-	MODE_3-		
68	GND	GND		

CBL-68-37D-232-2M

SNAPPER CONNECTOR (68 way SCSI-2)	SNAPPER SIGNAL NAME	AIA SIGNAL NAME	DIR	CAMERA CONNECTOR (37 D Type skt)	RS-232 CONNECTOR (9 D Type skt)	TRIG IN (BNC)
1	GND	GND				Screen
2	MSB+	MSB+	⇐	6		
3	MSB-1+	MSB-1+	⇐	7		
4	MSB-2+	MSB-2+	⇐	8		
5	MSB-3+	MSB-3+	⇐	9		
6	MSB-4+	MSB-4+	⇐	10		
7	MSB-5+	MSB-5+	⇐	11		
8	MSB-6+	MSB-6+	⇐	12		
9	MSB-7+	MSB-7+	⇐	13		
10	MSB-8+	MSB-8+	⇐	14		
11	MSB-9+	MSB-9+	⇐	15		
12	GND	GND		16		
13	MSB-10+	MSB-10+	⇐	4		
14	MSB-11+	MSB-11+	⇐	5		
15	MSB-12+	MSB-12+				
16	MSB-13+	MSB-13+				
17	TTL_TRIG_1	N/C	⇐			Centre
18	TTL_TRIG_2	N/C				
19	MSB-14+	MSB-14+				
20	MSB-15+	MSB-15+				
21	IO_A+	RESERVED				
22	CAM_SER_OUT0	SER_OUT+	⇐		3	
23	CAM_SER_IN0	SER_IN+	⇒		2	
24	IO_B+	FIELD_ID+	⇐			
25	FRAME_EN+	FRAME_EN+	⇐	3		
26	LINE_EN+	LINE_EN+	⇐	2		
27	IO_C+	CHNL_0+				
28	IO_D+	CHNL_1+				
29	STROBE+	STROBE+	⇐	1		
30	OUT_A+	MODE_0+	⇒	37		
31	OUT_B+	MODE_1+	⇒	18		
32	OUT_C+	MODE_2+				
33	OUT_D+	MODE_3+				
34	GND	GND		35		
35	GND	GND			5	
36	MSB-	MSB-	⇐	25		
37	MSB-1-	MSB-1-	⇐	26		
38	MSB-2-	MSB-2-	⇐	27		
39	MSB-3-	MSB-3-	⇐	28		
40	MSB-4-	MSB-4-	⇐	29		
41	MSB-5-	MSB-5-	⇐	30		
42	MSB-6-	MSB-6-	⇐	31		
43	MSB-7-	MSB-7-	⇐	32		
44	MSB-8-	MSB-8-	⇐	33		
45	MSB-9-	MSB-9-	⇐	34		
46	GND	GND				
47	MSB-10-	MSB-10-	⇐	23		
48	MSB-11-	MSB-11-	⇐	24		
49	MSB-12-	MSB-12-				
50	MSB-13-	MSB-13-				
51	N/C	N/C				
52	N/C	N/C				
53	MSB-14-	MSB-14-				
54	MSB-15-	MSB-15-				
55	IO_A-	RESERVED				
56	CAM_SER_OUT1	SER_OUT-	⇐		4	
57	CAM_SER_IN1	SER_IN-	⇒		8	
58	IO_B-	FIELD_ID-	⇐			
59	FRAME_EN-	FRAME_EN-	⇐	22		
60	LINE_EN-	LINE_EN-	⇐	21		
61	IO_C-	CHNL_0-				
62	IO_D-	CHNL_1-				
63	STROBE-	STROBE-	⇐	20		
64	OUT_A-	MODE_0-	⇒	36		
65	OUT_B-	MODE_1-	⇒	17		
66	OUT_C-	MODE_2-				
67	OUT_D-	MODE_3-				
68	GND	GND				

CBL-68-AIA-A-6M / CBL-68-AIA-3M-NC

SNAPPER CONNECTOR (68 way SCSI-2)	SNAPPER SIGNAL NAME	AIA SIGNAL NAME	DIR	AIA CONNECTOR (68 way SCSI-2)
1	GND	GND		1
2	MSB+	MSB+	⇄	2
3	MSB-1+	MSB-1+	⇄	3
4	MSB-2+	MSB-2+	⇄	4
5	MSB-3+	MSB-3+	⇄	5
6	MSB-4+	MSB-4+	⇄	6
7	MSB-5+	MSB-5+	⇄	7
8	MSB-6+	MSB-6+	⇄	8
9	MSB-7+	MSB-7+	⇄	9
10	MSB-8+	MSB-8+	⇄	10
11	MSB-9+	MSB-9+	⇄	11
12	GND	GND		12
13	MSB-10+	MSB-10+	⇄	13
14	MSB-11+	MSB-11+	⇄	14
15	MSB-12+	MSB-12+	⇄	15
16	MSB-13+	MSB-13+	⇄	16
17	TTL_TRIG_1	N/C		17
18	TTL_TRIG_2	N/C		18
19	MSB-14+	MSB-14+	⇄	19
20	MSB-15+	MSB-15+	⇄	20
21	IO_A+	RESERVED	⇄	21
22	CAM_SER_OUT0	SER_OUT+	⇄	22
23	CAM_SER_IN0	SER_IN+	⇄	23
24	IO_B+	FIELD_ID+	⇄	24
25	FRAME_EN+	FRAME_EN+	⇄	25
26	LINE_EN+	LINE_EN+	⇄	26
27	IO_C+	CHNL_0+	⇄	27
28	IO_D+	CHNL_1+	⇄	28
29	STROBE+	STROBE+	⇄	29
30	OUT_A+	MODE_0+	⇄	30
31	OUT_B+	MODE_1+	⇄	31
32	OUT_C+	MODE_2+	⇄	32
33	OUT_D+	MODE_3+	⇄	33
34	GND	GND		34
35	GND	GND		35
36	MSB-	MSB-	⇄	36
37	MSB-1-	MSB-1-	⇄	37
38	MSB-2-	MSB-2-	⇄	38
39	MSB-3-	MSB-3-	⇄	39
40	MSB-4-	MSB-4-	⇄	40
41	MSB-5-	MSB-5-	⇄	41
42	MSB-6-	MSB-6-	⇄	42
43	MSB-7-	MSB-7-	⇄	43
44	MSB-8-	MSB-8-	⇄	44
45	MSB-9-	MSB-9-	⇄	45
46	GND	GND		46
47	MSB-10-	MSB-10-	⇄	47
48	MSB-11-	MSB-11-	⇄	48
49	MSB-12-	MSB-12-	⇄	49
50	MSB-13-	MSB-13-	⇄	50
51	N/C	N/C		51
52	N/C	N/C		52
53	MSB-14-	MSB-14-	⇄	53
54	MSB-15-	MSB-15-	⇄	54
55	IO_A-	RESERVED	⇄	55
56	CAM_SER_OUT1	SER_OUT-	⇄	56
57	CAM_SER_IN1	SER_IN-	⇄	57
58	IO_B-	FIELD_ID-	⇄	58
59	FRAME_EN-	FRAME_EN-	⇄	59
60	LINE_EN-	LINE_EN-	⇄	60
61	IO_C-	CHNL_0-		61
62	IO_D-	CHNL_1-		62
63	STROBE-	STROBE-	⇄	63
64	OUT_A-	MODE_0-	⇄	64
65	OUT_B-	MODE_1-	⇄	65
66	OUT_C-	MODE_2-	⇄	66
67	OUT_D-	MODE_3-	⇄	67
68	GND	GND		68

CBL-68-DALSA-A-3M

SNAPPER CONNECTOR (68 way SCSI-2)	SNAPPER SIGNAL NAME	LINE SCAN SIGNAL NAME	DIR	DALSA SIGNAL NAME	TRIGGER (9 way D plug)	CONTROL (25 way D skt)	OS1 (20 way DIN41651 skt)	OS2 (20 way DIN41651 skt)
1	GND			GND		7		
2	MSB+		⇐	AD0+			15	
3	MSB-1+		⇐	AD1+			13	
4	MSB-2+		⇐	AD2+			11	
5	MSB-3+		⇐	AD3+			9	
6	MSB-4+		⇐	AD4+			7	
7	MSB-5+		⇐	AD5+			5	
8	MSB-6+		⇐	AD6+			3	
9	MSB-7+		⇐	AD7+			1	
10	MSB-8+		⇐	BD0+				15
11	MSB-9+		⇐	BD1+				13
12	GND			GND		20		
13	MSB-10+		⇐	BD2+				11
14	MSB-11+		⇐	BD3+				9
15	MSB-12+		⇐	BD4+				7
16	MSB-13+		⇐	BD5+				5
17	TTL_TRIG_1				3			
18	TTL_TRIG_2				6			
19	MSB-14+		⇐	BD6+				3
20	MSB-15+		⇐	BD7+				1
21	IO_A+		⇐	CCLK+		14		
22	CAM_SER_OUT0							
23	CAM_SER_IN0							
24	IO_B+		⇐	PVAL+		10		
25	FRAME_EN+	LINE TRIGGER IN+	⇐		1			17
26	LINE_EN+	LINE START IN+	⇐	LVAL+			19	
27	IO_C+				4			
28	IO_D+				7			
29	STROBE+	STROBE+	⇐	STROBE+			17	
30	OUT_A+	EXPOSURE+	⇒	PRIN+		17		
31	OUT_B+	CLOCK OUT+	⇒	MCLK+		6		
32	OUT_C+	LINE START OUT+	⇒	EXSYNC+		5		
33	OUT_D+		⇒					19
34	GND							
35	GND							
36	MSB-		⇐	AD0-			16	
37	MSB-1-		⇐	AD1-			14	
38	MSB-2-		⇐	AD2-			12	
39	MSB-3-		⇐	AD3-			10	
40	MSB-4-		⇐	AD4-			8	
41	MSB-5-		⇐	AD5-			6	
42	MSB-6-		⇐	AD6-			4	
43	MSB-7-		⇐	AD7-			2	
44	MSB-8-		⇐	BD0-				16
45	MSB-9-		⇐	BD1-				14
46	GND							
47	MSB-10-		⇐	BD2-				12
48	MSB-11-		⇐	BD3-				10
49	MSB-12-		⇐	BD4-				8
50	MSB-13-		⇐	BD5-				6
51	N/C							
52	N/C							
53	MSB-14-		⇐	BD6-				4
54	MSB-15-		⇐	BD7-				2
55	IO_A-		⇐	CCLK-		1		
56	CAM_SER_OUT1							
57	CAM_SER_IN1							
58	IO_B-		⇐	PVAL-		23		
59	FRAME_EN-	LINE TRIGGER IN-	⇐		2			18
60	LINE_EN-	LINE START IN-	⇐	LVAL-			20	
61	IO_C-				5			
62	IO_D-				8			
63	STROBE-	STROBE-	⇐	STROBE-			18	
64	OUT_A-	EXPOSURE-	⇒	PRIN-		4		
65	OUT_B-	CLOCK OUT-	⇒	MCLK-		19		
66	OUT_C-	LINE START OUT-	⇒	EXSYNC-		18		
67	OUT_D-		⇒					20
68	GND				9			

CBL-68-DALSA-CAD-A-3M

SNAPPER CONNECTOR (68 way SCSI-2)	SNAPPER SIGNAL NAME	LINE SCAN SIGNAL NAME	DIR	DALSA SIGNAL NAME	TRIGGER (9 way D plug)	CONTROL (25 way D skt)	OS1 (20 way DIN41651 skt)	OS2 (20 way DIN41651 skt)
1	GND			GND		7		
2	MSB+		⇄	AD0+				15
3	MSB-1+		⇄	AD1+				13
4	MSB-2+		⇄	AD2+				11
5	MSB-3+		⇄	AD3+				9
6	MSB-4+		⇄	AD4+				7
7	MSB-5+		⇄	AD5+				5
8	MSB-6+		⇄	AD6+				3
9	MSB-7+		⇄	AD7+				1
10	MSB-8+		⇄	BD0+			15	
11	MSB-9+		⇄	BD1+			13	
12	GND			GND		20		
13	MSB-10+		⇄	BD2+			11	
14	MSB-11+		⇄	BD3+			9	
15	MSB-12+		⇄	BD4+			7	
16	MSB-13+		⇄	BD5+			5	
17	TTL_TRIG_1				3			
18	TTL_TRIG_2							
19	MSB-14+		⇄	BD6+			3	
20	MSB-15+		⇄	BD7+			1	
21	IO_A+		⇄	CCLK+		14		
22	CAM_SER_OUT0							
23	CAM_SER_IN0							
24	IO_B+		⇄	PVAL+		16		
25	FRAME_EN+	LINE TRIGGER IN+	⇄			23		
26	LINE_EN+	LINE START IN+	⇄	LVAL+		2		
27	IO_C+				4			
28	IO_D+				7			
29	STROBE+	STROBE+	⇄	STROBE+			17	
30	OUT_A+	EXPOSURE+	⇄	PRIN+		17		
31	OUT_B+	CLOCK OUT+	⇄	MCLK+		6		
32	OUT_C+	LINE START OUT+	⇄	EXSYNC+		5		
33	OUT_D+							
34	GND							
35	GND				6			
36	MSB-		⇄	AD0-				16
37	MSB-1-		⇄	AD1-				14
38	MSB-2-		⇄	AD2-				12
39	MSB-3-		⇄	AD3-				10
40	MSB-4-		⇄	AD4-				8
41	MSB-5-		⇄	AD5-				6
42	MSB-6-		⇄	AD6-				4
43	MSB-7-		⇄	AD7-				2
44	MSB-8-		⇄	BD0-			16	
45	MSB-9-		⇄	BD1-			14	
46	GND							
47	MSB-10-		⇄	BD2-			12	
48	MSB-11-		⇄	BD3-			10	
49	MSB-12-		⇄	BD4-			8	
50	MSB-13-		⇄	BD5-			6	
51	N/C							
52	N/C							
53	MSB-14-		⇄	BD6-			4	
54	MSB-15-		⇄	BD7-			2	
55	IO_A-		⇄	CCLK-		1		
56	CAM_SER_OUT1							
57	CAM_SER_IN1							
58	IO_B-		⇄	PVAL-		3		
59	FRAME_EN-	LINE TRIGGER IN-	⇄			10		
60	LINE_EN-	LINE START IN-	⇄	LVAL-		15		
61	IO_C-				5			
62	IO_D-				8			
63	STROBE-	STROBE-	⇄	STROBE-			18	
64	OUT_A-	EXPOSURE-	⇄	PRIN-		4		
65	OUT_B-	CLOCK OUT-	⇄	MCLK-		19		
66	OUT_C-	LINE START OUT-	⇄	EXSYNC-		18		
67	OUT_D-							
68	GND				9			

CBL-68-DALSA-CLC-A-3M

SNAPPER CONNECTOR (68 way SCSI-2)	SNAPPER SIGNAL NAME	LINE SCAN SIGNAL NAME	DIR	DALSA SIGNAL NAME	TRIGGER (9 way D plug)	CONTROL (25 way D skt)	OS1 (20 way DIN41651 skt)	OS2 (20 way DIN41651 skt)
1	GND			GND		7		
2	MSB+		⇐	AD0+				15
3	MSB-1+		⇐	AD1+				13
4	MSB-2+		⇐	AD2+				11
5	MSB-3+		⇐	AD3+				9
6	MSB-4+		⇐	AD4+				7
7	MSB-5+		⇐	AD5+				5
8	MSB-6+		⇐	AD6+				3
9	MSB-7+		⇐	AD7+				1
10	MSB-8+		⇐	BD0+			15	
11	MSB-9+		⇐	BD1+			13	
12	GND			GND		20		
13	MSB-10+		⇐	BD2+			11	
14	MSB-11+		⇐	BD3+			9	
15	MSB-12+		⇐	BD4+			7	
16	MSB-13+		⇐	BD5+			5	
17	TTL_TRIG_1							
18	TTL_TRIG_2							
19	MSB-14+		⇐	BD6+			3	
20	MSB-15+		⇐	BD7+			1	
21	IO_A+		⇐	CCLK+		14		
22	CAM_SER_OUT0							
23	CAM_SER_IN0							
24	IO_B+		⇐	PVAL+		16		
25	FRAME_EN+	LINE TRIGGER IN+	⇐		1			
26	LINE_EN+	LINE START IN+	⇐	LVAL+			19	
27	IO_C+				4			
28	IO_D+				7			
29	STROBE+	STROBE+	⇐	STROBE+			17	
30	OUT_A+	EXPOSURE+	⇒	PRIN+		5		
31	OUT_B+	CLOCK OUT+	⇒	MCLK+		6		
32	OUT_C+	LINE START OUT+	⇒	EXSYNC+		17		
33	OUT_D+							
34	GND							
35	GND				6			
36	MSB-		⇐	AD0-				16
37	MSB-1-		⇐	AD1-				14
38	MSB-2-		⇐	AD2-				12
39	MSB-3-		⇐	AD3-				10
40	MSB-4-		⇐	AD4-				8
41	MSB-5-		⇐	AD5-				6
42	MSB-6-		⇐	AD6-				4
43	MSB-7-		⇐	AD7-				2
44	MSB-8-		⇐	BD0-			16	
45	MSB-9-		⇐	BD1-			14	
46	GND							
47	MSB-10-		⇐	BD2-			12	
48	MSB-11-		⇐	BD3-			10	
49	MSB-12-		⇐	BD4-			8	
50	MSB-13-		⇐	BD5-			6	
51	N/C							
52	N/C							
53	MSB-14-		⇐	BD6-			4	
54	MSB-15-		⇐	BD7-			2	
55	IO_A-		⇐	CCLK-		1		
56	CAM_SER_OUT1							
57	CAM_SER_IN1							
58	IO_B-		⇐	PVAL-		3		
59	FRAME_EN-	LINE TRIGGER IN-	⇐		2			
60	LINE_EN-	LINE START IN-	⇐	LVAL-			20	
61	IO_C-				5			
62	IO_D-				8			
63	STROBE-	STROBE-	⇐	STROBE-			18	
64	OUT_A-	EXPOSURE-	⇒	PRIN-		18		
65	OUT_B-	CLOCK OUT-	⇒	MCLK-		19		
66	OUT_C-	LINE START OUT-	⇒	EXSYNC-		4		
67	OUT_D-							
68	GND				9			

CBL-68-HAM-A-2M / CBL-68-HAM-A-5M

SNAPPER CONNECTOR (68 way SCSI-2)	SNAPPER SIGNAL NAME	AIA SIGNAL NAME	DIR	HAMAMATSU SIGNAL NAME	HAMAMATSU CONNECTOR (68 way Blade)	TRIG IN (BNC)	TRIG OUT (BNC)
1	GND	GND					
2	MSB+	MSB+	↔	DB0+	38		
3	MSB-1+	MSB-1+	↔	DB1+	39		
4	MSB-2+	MSB-2+	↔	DB2+	40		
5	MSB-3+	MSB-3+	↔	DB3+	41		
6	MSB-4+	MSB-4+	↔	DB4+	42		
7	MSB-5+	MSB-5+	↔	DB5+	43		
8	MSB-6+	MSB-6+	↔	DB6+	44		
9	MSB-7+	MSB-7+	↔	DB7+	45		
10	MSB-8+	MSB-8+	↔	DB8+	46		
11	MSB-9+	MSB-9+	↔	DB9+	47		
12	GND	GND		GND	55		
13	MSB-10+	MSB-10+	↔	DB10+	48		
14	MSB-11+	MSB-11+	↔	DB11+	49		
15	MSB-12+	MSB-12+	↔	DB12+	50		
16	MSB-13+	MSB-13+	↔	DB13+	51		
17	TTL_TRIG_1	N/C				Centre	
18	TTL_TRIG_2	N/C			30		
19	MSB-14+	MSB-14+	↔	DB14+	52		
20	MSB-15+	MSB-15+	↔	DB15+	53		
21	IO_A+	RESERVED					
22	CAM_SER_OUT0	SER_OUT+	↔	TXD+	66		
23	CAM_SER_IN0	SER_IN+	↔	RXD+	65		
24	IO_B+	FIELD_ID+	↔	A/D_OVF+	54		
25	FRAME_EN+	FRAME_EN+	↔	VVALID+	37		
26	LINE_EN+	LINE_EN+	↔	HVALID+	36		
27	IO_C+	CHNL_0+		DTR+	67		
28	IO_D+	CHNL_1+		DSR+	68		
29	STROBE+	STROBE+	↔	PIXCLK+	35		
30	OUT_A+	MODE_0+	⇒		58		Centre
31	OUT_B+	MODE_1+					
32	OUT_C+	MODE_2+					
33	OUT_D+	MODE_3+					
34	GND	GND				Screen	
35	GND	GND		GND	21		
36	MSB-	MSB-	↔	DB0-	4		
37	MSB-1-	MSB-1-	↔	DB1-	5		
38	MSB-2-	MSB-2-	↔	DB2-	6		
39	MSB-3-	MSB-3-	↔	DB3-	7		
40	MSB-4-	MSB-4-	↔	DB4-	8		
41	MSB-5-	MSB-5-	↔	DB5-	9		
42	MSB-6-	MSB-6-	↔	DB6-	10		
43	MSB-7-	MSB-7-	↔	DB7-	11		
44	MSB-8-	MSB-8-	↔	DB8-	12		
45	MSB-9-	MSB-9-	↔	DB9-	13		
46	GND	GND					Screen
47	MSB-10-	MSB-10-	↔	DB10-	14		
48	MSB-11-	MSB-11-	↔	DB11-	15		
49	MSB-12-	MSB-12-	↔	DB12-	16		
50	MSB-13-	MSB-13-	↔	DB13-	17		
51	N/C	N/C					
52	N/C	N/C					
53	MSB-14-	MSB-14-	↔	DB14-	18		
54	MSB-15-	MSB-15-	↔	DB15-	19		
55	IO_A-	RESERVED					
56	CAM_SER_OUT1	SER_OUT-	↔	TXD-	32		
57	CAM_SER_IN1	SER_IN-	↔	RXD-	31		
58	IO_B-	FIELD_ID-	↔	A/D_OVF-	20		
59	FRAME_EN-	FRAME_EN-	↔	VVALID-	3		
60	LINE_EN-	LINE_EN-	↔	HVALID-	2		
61	IO_C-	CHNL_0-		DTR-	33		
62	IO_D-	CHNL_1-		DSR-	34		
63	STROBE-	STROBE-	↔	PIXCLK-	1		
64	OUT_A-	MODE_0-					
65	OUT_B-	MODE_1-					
66	OUT_C-	MODE_2-					
67	OUT_D-	MODE_3-					
68	GND	GND					

CBL-68-C4880-232-2M

SNAPPER CONNECTOR (68 way SCSI-2)	SNAPPER SIGNAL NAME	AIA SIGNAL NAME	DIR	C4880 SIGNAL NAME	C4880 CONNECTOR (68 way blade)	RS-232 CONNECTOR (9 D-type skt)	TRIGGER (BNC)
1	GND	GND				5	
2	MSB+	MSB+	⇄	DB0+	38		
3	MSB-1+	MSB-1+	⇄	DB1+	39		
4	MSB-2+	MSB-2+	⇄	DB2+	40		
5	MSB-3+	MSB-3+	⇄	DB3+	41		
6	MSB-4+	MSB-4+	⇄	DB4+	42		
7	MSB-5+	MSB-5+	⇄	DB5+	43		
8	MSB-6+	MSB-6+	⇄	DB6+	44		
9	MSB-7+	MSB-7+	⇄	DB7+	45		
10	MSB-8+	MSB-8+	⇄	DB8+	46		
11	MSB-9+	MSB-9+	⇄	DB9+	47		
12	GND	GND		GND	55		
13	MSB-10+	MSB-10+	⇄	DB10+	48		
14	MSB-11+	MSB-11+	⇄	DB11+	49		
15	MSB-12+	MSB-12+	⇄	DB12+	50		
16	MSB-13+	MSB-13+	⇄	DB13+	51		
17	TTL_TRIG_1	N/C					
18	TTL_TRIG_2	N/C					
19	MSB-14+	MSB-14+	⇄	DB14+	52		
20	MSB-15+	MSB-15+	⇄	DB15+	53		
21	IO_A+	RESERVED					
22	CAM_SER_OUT0	SER_OUT+	⇄			2	
23	CAM_SER_IN0	SER_IN+	⇒			3	
24	IO_B+	FIELD_ID+	⇄	A/D_OVF+	54		
25	FRAME_EN+	FRAME_EN+	⇄	VVALID+	37		
26	LINE_EN+	LINE_EN+	⇄	HVALID+	36		
27	IO_C+	CHNL_0+	⇄	DTR+	67		
28	IO_D+	CHNL_1+	⇒	DSR+	68		
29	STROBE+	STROBE+	⇄	PIXCLK+	35		
30	OUT_A+	MODE_0+					Centre
31	OUT_B+	MODE_1+					
32	OUT_C+	MODE_2+					
33	OUT_D+	MODE_3+					
34	GND	GND					Screen
35	GND	GND		GND	21		
36	MSB-	MSB-	⇄	DB0-	4		
37	MSB-1-	MSB-1-	⇄	DB1-	5		
38	MSB-2-	MSB-2-	⇄	DB2-	6		
39	MSB-3-	MSB-3-	⇄	DB3-	7		
40	MSB-4-	MSB-4-	⇄	DB4-	8		
41	MSB-5-	MSB-5-	⇄	DB5-	9		
42	MSB-6-	MSB-6-	⇄	DB6-	10		
43	MSB-7-	MSB-7-	⇄	DB7-	11		
44	MSB-8-	MSB-8-	⇄	DB8-	12		
45	MSB-9-	MSB-9-	⇄	DB9-	13		
46	GND	GND					Screen
47	MSB-10-	MSB-10-	⇄	DB10-	14		
48	MSB-11-	MSB-11-	⇄	DB11-	15		
49	MSB-12-	MSB-12-	⇄	DB12-	16		
50	MSB-13-	MSB-13-	⇄	DB13-	17		
51	N/C	N/C					
52	N/C	N/C					
53	MSB-14-	MSB-14-	⇄	DB14-	18		
54	MSB-15-	MSB-15-	⇄	DB15-	19		
55	IO_A-	RESERVED					
56	CAM_SER_OUT1	SER_OUT-	⇄				
57	CAM_SER_IN1	SER_IN-	⇒				
58	IO_B-	FIELD_ID-	⇄	A/D_OVF-	20		
59	FRAME_EN-	FRAME_EN-	⇄	VVALID-	3		
60	LINE_EN-	LINE_EN-	⇄	HVALID-	2		
61	IO_C-	CHNL_0-	⇄	DTR-	33		
62	IO_D-	CHNL_1-	⇒	DSR-	34		
63	STROBE-	STROBE-	⇄	PIXCLK-	1		
64	OUT_A-	MODE_0-					
65	OUT_B-	MODE_1-					
66	OUT_C-	MODE_2-					
67	OUT_D-	MODE_3-					
68	GND	GND				5	

CBL-68-PULNIX1000-2M

SNAPPER CONNECTOR (68 way SCSI-2)	SNAPPER SIGNAL NAME	AIA CAMERA SPECIFICATION	DIR	PULNIX SIGNAL NAME	PULNIX CONNECTOR (31 way)
1	GND	GND			
2	MSB+	MSB+	↺	D0+	8
3	MSB-1+	MSB-1+	↺	D1+	9
4	MSB-2+	MSB-2+	↺	D2+	10
5	MSB-3+	MSB-3+	↺	D3+	11
6	MSB-4+	MSB-4+	↺	D4+	12
7	MSB-5+	MSB-5+	↺	D5+	13
8	MSB-6+	MSB-6+	↺	D6+	14
9	MSB-7+	MSB-7+	↺	D7+	15
10	MSB-8+	MSB-8+			
11	MSB-9+	MSB-9+			
12	GND	GND		GROUND	4
13	MSB-10+	MSB-10+			
14	MSB-11+	MSB-11+			
15	MSB-12+	MSB-12+			
16	MSB-13+	MSB-13+			
17	TTL_TRIG_1	N/C			
18	TTL_TRIG_2	N/C			
19	MSB-14+	MSB-14+			
20	MSB-15+	MSB-15+			
21	IO_A+	RESERVED			
22	CAM_SER_OUT0	SER_OUT+			
23	CAM_SER_IN0	SER_IN+			
24	IO_B+	FIELD_ID+			
25	FRAME_EN+	FRAME_EN+	↺	FDV+	3
26	LINE_EN+	LINE_EN+	↺	LDV+	2
27	IO_C+	CHNL_0+			
28	IO_D+	CHNL_1+			
29	STROBE+	STROBE+	↺	CLK+	1
30	OUT_A+	MODE_0+	↺	VINIT	20
31	OUT_B+	MODE_1+	↺	EN INTEG	22
32	OUT_C+	MODE_2+	↺	INTEG	6
33	OUT_D+	MODE_3+			
34	GND	GND			
35	GND	GND		GROUND	16
36	MSB-	MSB-	↺	D0-	24
37	MSB-1-	MSB-1-	↺	D1-	25
38	MSB-2-	MSB-2-	↺	D2-	26
39	MSB-3-	MSB-3-	↺	D3-	27
40	MSB-4-	MSB-4-	↺	D4-	28
41	MSB-5-	MSB-5-	↺	D5-	29
42	MSB-6-	MSB-6-	↺	D6-	30
43	MSB-7-	MSB-7-	↺	D7-	31
44	MSB-8-	MSB-8-			
45	MSB-9-	MSB-9-			
46	GND	GND		GROUND	23
47	MSB-10-	MSB-10-			
48	MSB-11-	MSB-11-			
49	MSB-12-	MSB-12-			
50	MSB-13-	MSB-13-			
51	N/C	N/C			
52	N/C	N/C			
53	MSB-14-	MSB-14-			
54	MSB-15-	MSB-15-			
55	IO_A-	RESERVED			
56	CAM_SER_OUT1	SER_OUT-			
57	CAM_SER_IN1	SER_IN-			
58	IO_B-	FIELD_ID-			
59	FRAME_EN-	FRAME_EN-	↺	FDV-	19
60	LINE_EN-	LINE_EN-	↺	LDV-	18
61	IO_C-	CHNL_0-			
62	IO_D-	CHNL_1-			
63	STROBE-	STROBE-	↺	CLK-	17
64	OUT_A-	MODE_0-			
65	OUT_B-	MODE_1-			
66	OUT_C-	MODE_2-			
67	OUT_D-	MODE_3-			
68	GND	GND			

CBL-68-PULNIX1000-ADP

SNAPPER CONNECTOR (68 way SCSI-2)	SNAPPER SIGNAL NAME	AIA CAMERA SPECIFICATION	DIR	PULNIX SIGNAL NAME	30DG-02 CONNECTOR (37 way)
1	GND	GND			
2	MSB+	MSB+	↔	D0+	8
3	MSB-1+	MSB-1+	↔	D1+	9
4	MSB-2+	MSB-2+	↔	D2+	10
5	MSB-3+	MSB-3+	↔	D3+	11
6	MSB-4+	MSB-4+	↔	D4+	12
7	MSB-5+	MSB-5+	↔	D5+	13
8	MSB-6+	MSB-6+	↔	D6+	14
9	MSB-7+	MSB-7+	↔	D7+	15
10	MSB-8+	MSB-8+			
11	MSB-9+	MSB-9+			
12	GND	GND		GROUND	16
13	MSB-10+	MSB-10+			
14	MSB-11+	MSB-11+			
15	MSB-12+	MSB-12+			
16	MSB-13+	MSB-13+			
17	TTL_TRIG_1	N/C			
18	TTL_TRIG_2	N/C			
19	MSB-14+	MSB-14+			
20	MSB-15+	MSB-15+			
21	IO_A+	RESERVED			
22	CAM_SER_OUT0	SER_OUT+			
23	CAM_SER_IN0	SER_IN+			
24	IO_B+	FIELD_ID+			
25	FRAME_EN+	FRAME_EN+	↔	FDV+	3
26	LINE_EN+	LINE_EN+	↔	LDV+	2
27	IO_C+	CHNL_0+			
28	IO_D+	CHNL_1+			
29	STROBE+	STROBE+	↔	CLK+	1
30	OUT_A+	MODE_0+	⇒	VINIT	17
31	OUT_B+	MODE_1+	⇒	EN INTEG	18
32	OUT_C+	MODE_2+	⇒	INTEG	37
33	OUT_D+	MODE_3+			
34	GND	GND			
35	GND	GND			
36	MSB-	MSB-	↔	D0-	27
37	MSB-1-	MSB-1-	↔	D1-	28
38	MSB-2-	MSB-2-	↔	D2-	29
39	MSB-3-	MSB-3-	↔	D3-	30
40	MSB-4-	MSB-4-	↔	D4-	31
41	MSB-5-	MSB-5-	↔	D5-	32
42	MSB-6-	MSB-6-	↔	D6-	33
43	MSB-7-	MSB-7-	↔	D7-	34
44	MSB-8-	MSB-8-			
45	MSB-9-	MSB-9-			
46	GND	GND		GROUND	23
47	MSB-10-	MSB-10-			
48	MSB-11-	MSB-11-			
49	MSB-12-	MSB-12-			
50	MSB-13-	MSB-13-			
51	N/C	N/C			
52	N/C	N/C			
53	MSB-14-	MSB-14-			
54	MSB-15-	MSB-15-			
55	IO_A-	RESERVED			
56	CAM_SER_OUT1	SER_OUT-			
57	CAM_SER_IN1	SER_IN-			
58	IO_B-	FIELD_ID-			
59	FRAME_EN-	FRAME_EN-	↔	FDV-	22
60	LINE_EN-	LINE_EN-	↔	LDV-	21
61	IO_C-	CHNL_0-			
62	IO_D-	CHNL_1-			
63	STROBE-	STROBE-	↔	CLK-	20
64	OUT_A-	MODE_0-			
65	OUT_B-	MODE_1-			
66	OUT_C-	MODE_2-			
67	OUT_D-	MODE_3-			
68	GND	GND			

CBL-68-XILLIX1400-3M

SNAPPER CONNECTOR (68 way SCSI-2)	SNAPPER SIGNAL NAME	AIA CAMERA SPECIFICATION	DIR	XILLIX SIGNAL NAME	XILLIX CONNECTOR (50 way)
1	GND	GND		GROUND	1
2	MSB+	MSB+	↺	DATA1	2
3	MSB-1+	MSB-1+	↺	DATA2	3
4	MSB-2+	MSB-2+	↺	DATA3	4
5	MSB-3+	MSB-3+	↺	DATA4	5
6	MSB-4+	MSB-4+	↺	DATA5	6
7	MSB-5+	MSB-5+	↺	DATA6	7
8	MSB-6+	MSB-6+	↺	DATA7	8
9	MSB-7+	MSB-7+	↺	DATA8	9
10	MSB-8+	MSB-8+	↺	DATA9	10
11	MSB-9+	MSB-9+	↺	DATA10	11
12	GND	GND		GROUND	26
13	MSB-10+	MSB-10+	↺	DATA11	12
14	MSB-11+	MSB-11+	↺	DATA12	13
15	MSB-12+	MSB-12+			
16	MSB-13+	MSB-13+			
17	TTL_TRIG_1	N/C			
18	TTL_TRIG_2	N/C			
19	MSB-14+	MSB-14+			
20	MSB-15+	MSB-15+			
21	IO_A+	RESERVED			
22	CAM_SER_OUT0	SER_OUT+			
23	CAM_SER_IN0	SER_IN+			
24	IO_B+	FIELD_ID+			
25	FRAME_EN+	FRAME_EN+			
26	LINE_EN+	LINE_EN+	↺	LINE CLOCK+	19
27	IO_C+	CHNL_0+			
28	IO_D+	CHNL_1+			
29	STROBE+	STROBE+	↺	PIXEL CLOCK+	22
30	OUT_A+	MODE_0+	↺	EXPOSURE+	24
31	OUT_B+	MODE_1+	↺	MODE+	17
32	OUT_C+	MODE_2+	↺	FREQ2+	16
33	OUT_D+	MODE_3+	↺	FREQ1+	15
34	GND	GND		GROUND	18
35	GND	GND			
36	MSB-	MSB-	↺	DATA1-	27
37	MSB-1-	MSB-1-	↺	DATA2-	28
38	MSB-2-	MSB-2-	↺	DATA3-	29
39	MSB-3-	MSB-3-	↺	DATA4-	30
40	MSB-4-	MSB-4-	↺	DATA5-	31
41	MSB-5-	MSB-5-	↺	DATA6-	32
42	MSB-6-	MSB-6-	↺	DATA7-	33
43	MSB-7-	MSB-7-	↺	DATA8-	34
44	MSB-8-	MSB-8-	↺	DATA9-	35
45	MSB-9-	MSB-9-	↺	DATA10-	36
46	GND	GND			
47	MSB-10-	MSB-10-	↺	DATA11-	37
48	MSB-11-	MSB-11-	↺	DATA12-	38
49	MSB-12-	MSB-12-			
50	MSB-13-	MSB-13-			
51	N/C	N/C			
52	N/C	N/C			
53	MSB-14-	MSB-14-			
54	MSB-15-	MSB-15-			
55	IO_A-	RESERVED			
56	CAM_SER_OUT1	SER_OUT-			
57	CAM_SER_IN1	SER_IN-			
58	IO_B-	FIELD_ID-			
59	FRAME_EN-	FRAME_EN-			
60	LINE_EN-	LINE_EN-	↺	LINE CLOCK-	44
61	IO_C-	CHNL_0-			
62	IO_D-	CHNL_1-			
63	STROBE-	STROBE-	↺	PIXEL CLOCK-	47
64	OUT_A-	MODE_0-	↺	EXPOSURE-	49
65	OUT_B-	MODE_1-	↺	MODE-	42
66	OUT_C-	MODE_2-	↺	FREQ2-	41
67	OUT_D-	MODE_3-	↺	FREQ1-	40
68	GND	GND		GROUND	43