

# SIRIUS 3G HD INPUT/OUTPUT CARDS USER GUIDE



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## 1 Introduction

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### 1.1 The 3G HD range

There are two builds of 3G High Definition Digital Video card in the Sirius range:

- 3972: 8 channel Reclocking input card
- 3978: 8 channel Reclocking output card

These cards are designed to pass Standard Definition and High Definition digital video to 3G signals through a Sirius router. These cards are suitable for use in all frames but are only capable of 3G operation in 4U, 7U and 16U frames equipped with 3969 or 3962 crosspoint cards. The input card will accept digital video signals in the range 270Mb/s to 2.97Gb/s, and automatically equalize 3G HD signals for cable runs of up to 100m, up to 150m for HD, and up to 350m for SD signals. Both the input and output card has re-clocking circuitry fitted as standard, and will operate at the following fixed data rates; it will also detect and reclock ASI format signals:

- 270Mb/s
- 1.485Gb/s
- 2.97Gb/s

All cards have on-board circuitry for input and output monitoring via the Sirius monitoring card. For 3G operation the 2436 monitoring card is required.

It must be noted that these input and output cards each use a specific 'spine' card, which provide connections to the card from the rear of the frame. The input spine card is fitted with the equalization circuits, which are kept separate from the main card to ensure good return loss and low crosstalk. The 3G spine cards have the following codes:

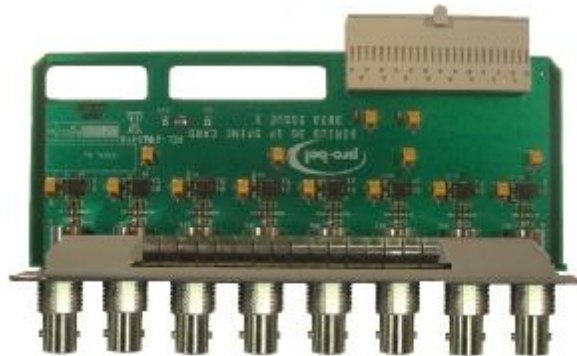
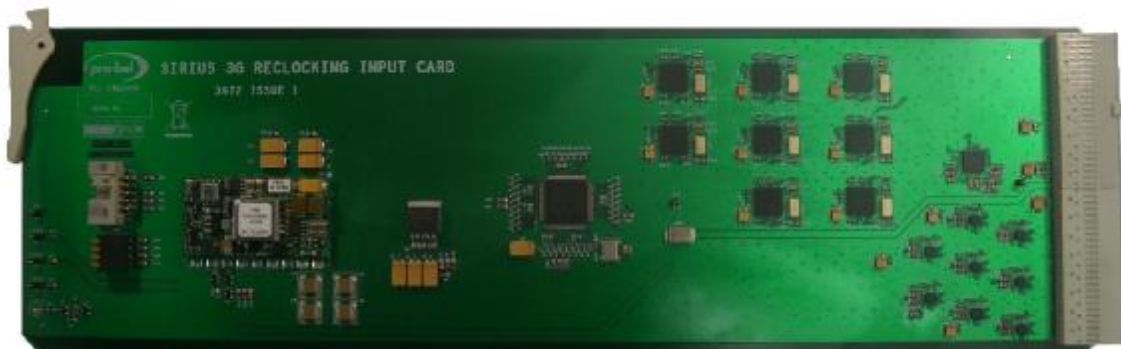
- 3G input spine card: 3973
- Output spine card: 1774

Note: the 1774 is the common output spine card used with previous generations of SD and HD output cards, meaning frames already equipped with these cards but fitted with older HD cards can be used with 3G cards with no re-cabling.

## 2 3G HD card details

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### 2.1 3972 input card and 3973 spine card

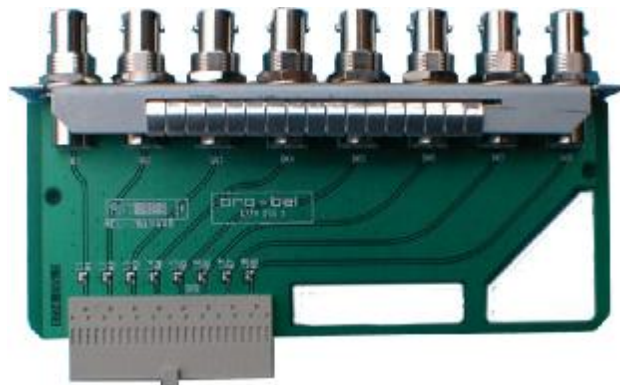
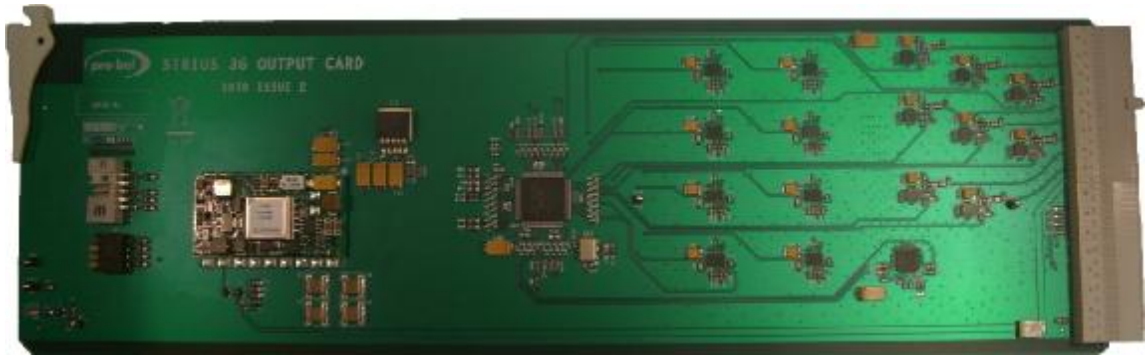


3973 3G input spine card

Eight inputs of 3G, HD or SD serial digital video, each with automatic equalization provided on the spine card. For use in 16U, 7U or 4U frames with 3969 or 3962 crosspoint cards. The 3972 reclocks all input signals.

The card has one bank of switches on the front of the card. Switch 1 of these controls the reclockers on the card. If required by the system the reclockers can be placed in bypass by turning this switch on. All other switches have no effect on the operation of the card. A single green LED on the front edge indicates that 3.3 Volts is present on the card, having been locally converted from the Sirius 48 Volt supply.

### 2.2 3978 output card and 1774 spine card

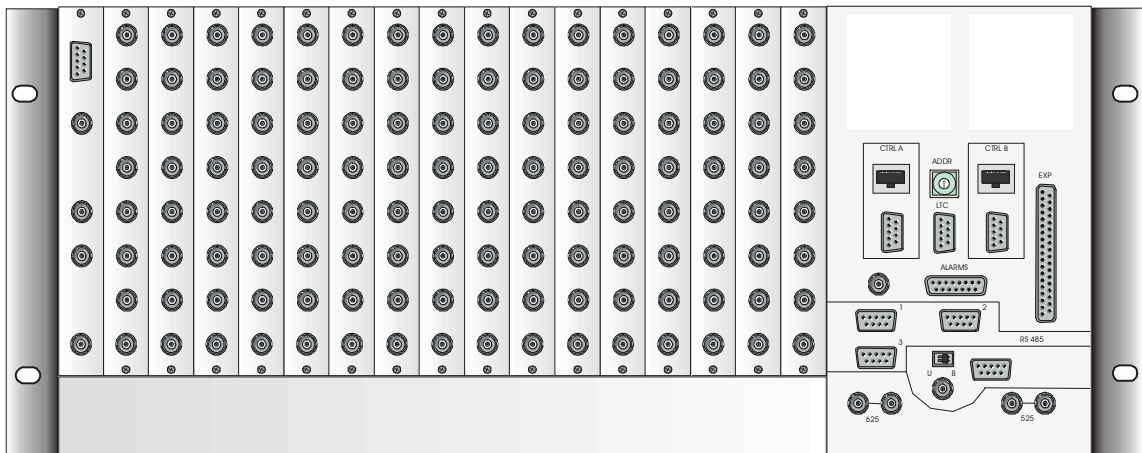


1774 3G HD SD output spine card

Eight 3G, HD or SD digital video outputs, all outputs redlocked. For use in all frames but 3G capable in a Sirius 4U, 7U or 16U frame equipped with 3969 or 3962 crosspoint cards. The card has one bank of four switches on the front of the card. For normal operation all switches should be in the off position. Turning switch 1 on forces all outputs to SD only. All other switches have no effect and should be left switched off. A single green LED on the front edge indicates that 3.3 Volts is present on the card, having been locally converted from the Sirius 48 Volt supply. The associated spine card has additional resistors fitted, and must not be used with any other card type.

## 3 Rear panel connector layouts

### 3.1 4U frame

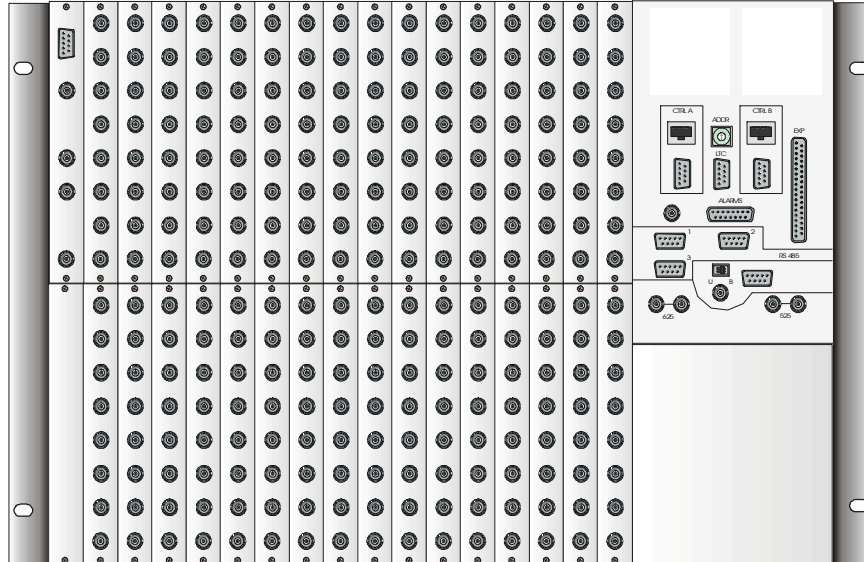


When viewed from the rear, the BNC connectors on a 4U frame fully equipped with video input and output cards will be allocated as follows:

OUTPUTS								INPUTS							
1	9	17	25	33	41	49	57	57	49	41	33	25	17	9	1
2	10	18	26	34	42	50	58	58	50	42	34	26	18	10	2
3	11	19	27	35	43	51	59	59	51	43	35	27	19	11	3
4	12	20	28	36	44	52	60	60	52	44	36	28	20	12	4
5	13	21	29	37	45	53	61	61	53	45	37	29	21	13	5
6	14	22	30	38	46	54	62	62	54	46	38	30	22	14	6
7	15	23	31	39	47	55	63	63	55	47	39	31	23	15	7
8	16	24	32	40	48	56	64	64	56	48	40	32	24	16	8

The above table represents a physical layout, and does not take account of any level mapping configured on the control or interface module, in which case appropriate offsets must be applied. See Section 4 of the main Sirius user guide.

## 3.2 7U frame



When viewed from the rear, the BNC connectors on a 7U frame fully equipped with input cards and output cards will be allocated as follows:

OUTPUTS								INPUTS							
1	9	17	25	33	41	49	57	57	49	41	33	25	17	9	1
2	10	18	26	34	42	50	58	58	50	42	34	26	18	10	2
3	11	19	27	35	43	51	59	59	51	43	35	27	19	11	3
4	12	20	28	36	44	52	60	60	52	44	36	28	20	12	4
5	13	21	29	37	45	53	61	61	53	45	37	29	21	13	5
6	14	22	30	38	46	54	62	62	54	46	38	30	22	14	6
7	15	23	31	39	47	55	63	63	55	47	39	31	23	15	7
8	16	24	32	40	48	56	64	64	56	48	40	32	24	16	8
128	120	112	104	96	88	80	72	72	80	88	96	104	112	120	128
127	119	111	103	95	87	79	71	71	79	87	95	103	111	119	127
126	118	110	102	94	86	78	70	70	78	86	94	102	110	118	126
125	117	109	101	93	85	77	69	69	77	85	93	101	109	117	125
124	116	108	100	92	84	76	68	68	76	84	92	100	108	116	124
123	115	107	99	91	83	75	67	67	75	83	91	99	107	115	123
122	114	106	98	90	82	74	66	66	74	82	90	98	106	114	122
121	113	105	97	89	81	73	65	65	73	81	89	97	105	113	121
INPUTS								OUTPUTS							

## 4 Specification

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### 4.1 Inputs

Number and type:	up to 8 on each 3972 card to SMPTE 424, SMPTE 292M and SMPTE 259M
Data rate:	270Mbit/s to 2.97Gbit/s
Impedance:	75 Ohm
Return Loss:	<-15dB DC to 1.485GHz <-10dB 1.485GHz to 2.97GHz
Equalisation: using Belden 1694A	up to 100 m at 2.97Gb/s, up to 200m at 1.485Gb/s up to 350m at 270Mb/s
Amplitude:	800mV p-p +/-10%

### 4.2 Outputs

Number and type:	up to 8 on each 3978 card to SMPTE 424, SMPTE 292M or SMPTE 259M
Data rate:	270Mb/s 1.485Gb/s and 2.97Gb/s
Impedance:	75 Ohm
Return Loss:	<-15dB DC to 1.485GHz <-10dB 1.485GHz to 2.97GHz
Rise time:	<135ps at 2.97Gb/s, <270ps at 1.485Gb/s, <800ps at 270Mb/s
Jitter:	<0.2 UI @100KHz
Overshoot/undershoot:	<10%