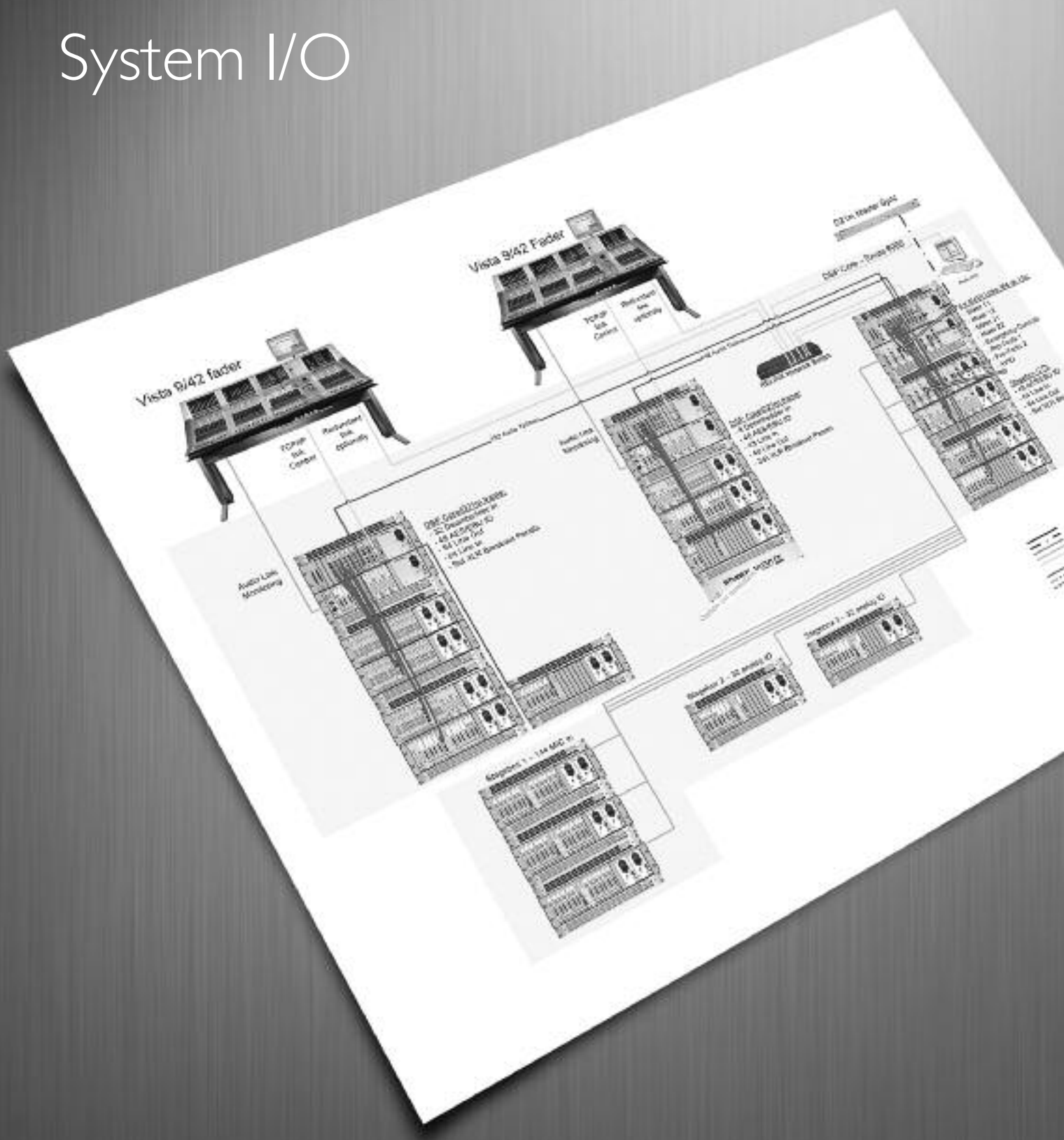
Studer I/O Solutions & Specifications

D21m Modular I/O System • Studer Compact Stagebox

STUDER by HARMAN

System I/O



Studer
I/O Systems

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Studer D21m I/O System

The D21m I/O system provides very cost-effective inputs and outputs with maximum flexibility while maintaining the well-known Studer sound quality, available in full 96 kHz operation.

Different I/O modules can be plugged into a frame, providing I/O systems tailor-made to customer needs. And all this comes with an unequalled form factor. Full redundancy is available starting from power supplies going up to redundant interconnections and DSP cards.

When using the D21m I/O system the DSP core itself does not provide I/O, but is connected to the first D21m frame within the system (acting as a hub) by using Studer proven 'HD Link' technology. At the DSP core side, the connection is made directly to the DSP card(s). From that frame it is possible to run optical-fiber MADI links to multiple places, up to several kilometres away. A maximum of six remote I/O boxes (stage boxes) may be connected to one hub frame.

Should more I/O channels be required then multiples of the 'local frames' (hubs) may be used within the system.

D21m Stageboxes

The D21m frames may also be housed in custom flightcases and used as portable remote stageboxes, with convenient multiway cable links and break-out panels.

Studer Compact Stagebox

The Compact Stagebox adds a cost-effective expansion option, offering a high density of I/O connections in only 4U of rack space. The modular unit is fully configurable but is offered with a standard configuration of 32 mic/line inputs and 16 line outputs. It is possible to equip the Compact Stagebox with an additional 16 mic/line input module instead of the output module, then providing 48 inputs. In this case, analogue or AES/EBU outputs can still be obtained on D-Type connectors via D21m cards fitted to the expansion slots.

Redundancy

Redundancy issues are regarded as highly important, so it is possible to run any MADI links with redundant cables. The system automatically switches to the redundant connection in case the primary connection fails. For 96 kHz operation the second link can be used as a channel count extension, transferring a total of 64 MADI channels even at a 96 kHz sampling rate. The 'redundant' MADI link may also be used for sharing an I/O box between two consoles.

The following pages give an overview of all optional cards for the D21m slots, together with technical specifications and details on the I/O on the Compact Stagebox and its specifications.

Full installation and user details may be found in the Studer D21m Operating Instructions, available on the Studer website, www.studer.ch.

D21m Modules

Name	I/O Format	# of Console Input Channels	# of Console Output Channels	Connector Type	Width (Slots)	Order No.	Page
Analogue I/O Cards							
*Mic/Line Input (incl. Dir. Outs)	Mic/Line	4	(4 Dir. Outs)	D25f	single	A949.0427	6
*Analogue Insert	Line	4	4	D25f	single	A949.0428	6
*HD Mic/Line Input with Input Transformers (incl. Dir. Outs)	Mic/Line	4	(4 Dir. Outs)	D25f	single	A949.0447	6
Analogue Line In	Line	8	-	D25f	single	A949.0421	6
Analogue Line Out	Line	-	8	D25f	single	A949.0420	6
Digital I/O Cards							
AES I/O M1 (no SRCs)	AES/EBU	8 stereo (16 mono)	8 stereo (16 mono)	2 x D25f	double **	A949.0422	7
AES I/O M1 (Input SRCs)	AES/EBU	8 stereo (16 mono)	8 stereo (16 mono)	2 x D25f	double **	A949.0423	7
AES I/O M1 (In/Out SRCs)	AES/EBU	8 stereo (16 mono)	8 stereo (16 mono)	2 × D25 f; ext. sync XLR	double **	A949.0424	7
Intercom BNC Intercom Sub-D	AES AES	4 stereo 4 stereo	4 stereo 4 stereo	4 × BNC D25 f	single single	5037475 5037474	9
MADI I/O ***/****	MADI	64 at 48kHz (32 with red., 64 without red. at 96kHz)	64 at 48kHz (32 with red., 64 without red. at 96kHz)	SC (optical) SC (optical) 2 × RJ45	double **	A949.0430 A949.0431 A949.0433	7
ADAT I/O	ADAT	16 at 48kHz (8 at 96kHz)	16 at 48kHz (8 at 96kHz)	TOSLINK (optical)	single	A949.0425 A949.0429	7
TDIF I/O	TDIF	16 at 48kHz (8 at 96kHz)	16 at 48kHz (8 at 96kHz)	2 x D25f	double **	A949.0426	7
3G/HD/SD SDI Input	3G/SD/HD	8/16	-	2 × BNC	single	A949.0452	8
3G/HD/SD SDI I/O	3G/SD/HD	8/16	8/16	4 × BNC	single	A949.0451 A949.0457	8
Dolby® E/Digital Decoder	AES/EBU	8 16	2 stereo (4 mono) 4 stereo (8 mono)	D15 f	single	A949.0443 A949.0444	9
CobraNet® I/O	CobraNet	32	32	2 × RJ45	single	A949.0445	9
Aviom A-Net® Output	A-Net	-	16	RJ45	single	A949.0446	9
EtherSound® I/O ***	EtherSound	64	64	3 × RJ45	double **	-	9
RockNet		48	48		double **		10
Axia Livewire™		32	32	2 x RJ45	single	5014376	10
BCD DTMF Dec./Glits Gen.	Internal	16	8	-	single	-	10
BCD Blits/Glits Gen.	Internal	-	8	-	single	-	10
BCD Minimixer	Internal	16 (with GP inputs) 32 (without GPIO)	16 32	-	single single	- -	10

Name	I/O Format	# of Console Input Channels	# of Console Output Channels	Connector Type	Width (Slots)	Order No.	Page
GPIO Cards							
GPIO w. Open-Collector Outp.	GPIO	16	16	2 × D25 f	double **	A949.0435	10
GPIO w. Relay Outputs	GPIO	16	16	2 × D37 f	double **	A949.0436	10
HD Cards							
HD S	HD Link	max. 192	max. 192	4 × RJ45	single	A949.0412	11
HD RS422	HD Link + RS422	max. 192	max. 192	4 × RJ45, D9 f	double **	A949.0415	11
MADI HD	MADI	64 at 48kHz (32 with red., 64 without red. at 96kHz)	64 at 48kHz (32 with red., 64 without red. at 96kHz)	SC (optical) SC (optical) RJ45	double **	A949.0411.3x A949.0413.3x A949.0414.3x	11
Serial / Merger Cards							
Serial	RS422	-	-	D9 f	single	A949.0437	12
Serial Merger	RS422	-	-	2 x D9 f	single	A949.0438	12
Serial RJ45	RS422	-	-	RJ45	single	A949.0439	12
Dual Merger RJ45	RS422	-	-	4 x RJ45	single	A949.0440	12

Compact Stagebox Modules

Name	I/O Format	# of Console Input Channels	# of Console Output Channels	Connector Type	Order No.	Page
HQ Mic/Line Input Module	Mic/Line	16	0	XLR	5032172	12
Line Output Module	Line	0	16	XLR	5023745	12
AES/EBU Input/Output Module	AES/EBU	8 x 2Ch	8 x 2Ch with SRC	XLR	5019847	12
Line/AES Output Module	AES/EBU/Line	0	8 analogue 4 x 2Ch AES/EBU	XLR	A.947.043700	12

* The Analog Insert card is fitted to the left of the Mic/Line Input card A949.0427. The insert send signal is always present and may be used as an additional direct output. The insert return is activated from the console.
Please note that the Analog Insert card does not communicate with the HD card, and it is not supported by the HD Mic/Line Input card A949.0447.

** Double-width cards must be inserted into odd slot numbers (e.g. slots 1, 3, 5…).

*** The number of channels transmitted to and from a card may be defined in steps of 8 channels by using DIP switches on the card.

**** Regardless of the number of channels defined with the DIP switches, a switch on the front panel switches the MADI protocol between the standard 56-channel format and the extended 64-channel format. Therefore this switch may have to be set to '56 channel' protocol in order to operate correctly with third party MADI devices. In this case the number of channels set internally should not exceed 56.

Analogue I/O Cards

Mic/Line In Card
A949.0427

VISTA OnAir

Four analog microphone/line inputs, electronically balanced, with 24bit, 44.1/48/88.2/96kHz delta-sigma A/D converters. Four analog split outputs, electronically balanced. Mic/line sensitivity, gain setting in 1dB steps, lowcut filter, soft clipping and 48 V phantom power on/off are controlled by the console software.

Input sensitivity (for 0dB$_{FS}$)		–60…+26dBu
Input impedance		1.8kΩ
Split out gain	(input sensitivity –60…+3dBu)	0dB
	(input sensitivity +4…+26dBu)	–20dB
Split out impedance		50Ω
Equivalent input noise (Ri 200Ω, max. gain)		–124dBu
Crosstalk (1 kHz)		< –110dB
Frequency response (30 Hz-20 kHz)		–0.2dB
THD&N	(1kHz, –1 dB$_{FS}$)	< –97dB$_{FS}$
	(20Hz-20kHz, –30dB$_{FS}$)	< –111dB$_{FS}$
CMRR	(30Hz-20kHz, all gain settings)	> 55dB
	(1kHz, input sensitivity –10 to +26dBu for 0dB$_{FS}$)	typ. 100dB
Low-cut filter		75Hz / 12dB/oct.
Input delay	(local)	38 samples (0.79ms @ 48kHz)
	(remote)	45 samples (0.94 ms @ 48kHz)
Current consumption	(7V)	0.2A
	(±15V)	0.25A
Operating temperature		0-40°C

Analog Insert Card
A949.0428

VISTA OnAir

This card is intended for use with a D21m Mic/Line In card (A949.0427) and features four electronically balanced analog inserts. The insert sends are always active, return on/off is controlled by the console software (default off). Insert sends and returns on standard 25-pin D-type connector (female).

In/out level (for 0dB$_{FS}$)	15dBu (6 or 24dBu w. soldering jumper)
Input impedance	10kΩ
Output impedance	50Ω
Current consumption (±15V)	0.05A
Operating temperature	0-40°C

HD Mic/Line In Card
A949.0447

VISTA OnAir

Four analog microphone/line inputs, transformer-balanced, with 24-bit, 44.1/48/88.2/96 kHz delta-sigma A/D converters. Four analog split outputs, electronically balanced. Mic/line sensitivity, gain setting in 1 dB steps, hi-pass filter, soft clipping and 48 V phantom power on/off are controlled by the console software. Inputs and split outputs on a standard 25-pin female D-type connector (female).

As opposed to the Mic/Line Input card A949.0427, the gain of the split outputs is always unity, i.e., 0 dB. This card does not support the Analog Insert Card A949.0428.

Input sensitivity (for 0 dB$_{FS}$)		–60…+26 dBu
Input impedance		2.2 kΩ
Split out gain		0 dB
Split out impedance		100 Ω
Equivalent input noise (Ri 200 Ω, max. gain)		–124 dBu
Crosstalk (1 kHz)		< –110 dB
Frequency response (30 Hz-20 kHz)		–0.2 dB
THD&N	(1 kHz, input level –6 dBu)	< –88 dB
	(40 Hz-20 kHz, input level –30 dBu)	< –100 dB
CMRR (30 Hz-20 kHz, all gain settings)		> 60 dB
High-pass filter		75 Hz, 12 dB/oct.
Input delay	(local)	38 samples (0.79 ms @ 48 kHz)
	(remote)	45 samples (0.94 ms @ 48 kHz)
Current consumption	(7 V)	0.2 A
	(±15 V)	0.25 A
Operating temperature		0-40 °C

Line In Card
A949.0421

VISTA OnAir

Eight-channel line input card with 24-bit, 44.1/48/88.2/96kHz A/D Converter, delta-sigma conversion. Transformer-balanced inputs. 96kHz, 88.2kHz, 48 kHz, or 44.1 kHz operation. 7-26dBu input sensitivity. 'Signal present' LED indicator. Inputs on standard 25-pin female D-type connector.

Input level (for 0 dB$_{FS}$)		15/24 dBu (fixed, jumper-selectable), or 7-26 dBu (adjustable)
Input impedance		> 10kΩ
Frequency response (20Hz-20kHz)		–0.2dB
THD&N (35 Hz-20 kHz, –1 dBFS, 15dBu setting)		< –97dB$_{FS}$
(1 kHz, –30dBFS, 15dBu setting)		< –111dB$_{FS}$
Crosstalk (1kHz)		< –110dB
Input delay	(local)	38 samples (0.79ms @ 48kHz)
	(remote)	45 samples (0.94ms @ 48kHz)
Current consumption	(7V)	0.42A
	(±15V)	0.1A
Operating temperature		0-40°C

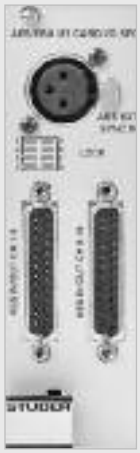
Line Out Card
A949.0420

VISTA OnAir

Eight-channel, 24 bit line output card with 24-bit D/A converters with 96 kHz, 88.2 -kHz, 48 -kHz, or 44.1kHz operation. Electronically balanced outputs. 7…26 -dBu max. output level. Outputs on standard 25-pin female D-type connector.

Output level (for 0dB$_{FS}$)		15/24dBu (fixed, jumper-selectable), or 7-2 dBu (adjustable)
Output impedance		40Ω
Min. load (at +24dBu)		600Ω
Frequency response (20Hz-2kHz)		–0.2dB
THD&N (20Hz-20kHz, –1 dB$_{FS}$, jumper at 15dBu fixed)		< –90dB$_{FS}$
(1kHz, –30 dB$_{FS}$, jumper at 15dBu fixed)		< –110dB$_{FS}$
Crosstalk (1 kHz)		< –110dB
Output delay (local)		28 samples (0.58ms @ 48kHz)
(remote)		32 samples (0.67ms @ 48kHz)
Current consumption	(7V)	0.23A
	(± V)	0.25A
Operating temperature		0-40°C

Digital I/O Cards



AES/EBU M1 Cards
A949.0422, A949.0423, A949.0424

AES/EBU input/output card with 16 Ch I/O, available in 3 different versions:

A949.0422xx without SRCs (Sampling Rate Converters; Vista only)
A949.0423xx with input SRCs only
A949.0424xx with input and output SRCs (see adjacent picture).

Selectable output sampling rates: 96 kHz, 48 kHz, 44.1 kHz, or external reference (22-108 kHz).

Input / output impedance	110Ω
Input sensitivity	min. 0.2 V
Output level (into 110Ω)	4.0 V
THD + noise	max. –115dB
SRC range	22-108kHz
Current consumption	
(3.3V) A949.0454: 0.43 A/.0455: 0.67 A/.0456:	0.94A
(5V)	0.45A
Operating temperature	0-40°C

A949.0430xx
A949.0431xx

A949.0433xx

MADI I/O Cards
A949.0430, A949.0431, A949.0433

The MADI I/O cards can establish a 64-channel MADI input and output to the D21m frame, with 44.1/48/88.2/96 kHz operation. Three different versions are available:

A949.0430xx Optical / multi-mode fibre
A949.0431xx Optical / single-mode fibre
A949.0433xx Cat5e twisted-pair (+ additional word clock out).

Optical inputs and outputs are provided on SC connectors. The Cat5e version with RJ45 connectors for twisted-pair cable features an additional word clock output on a BNC socket. The auxiliary interface can be used as a redundant link or, in 96 kHz operation, to extend the number of channels from 32 back to 64.

Max. cable length	(A949.0430, multi-mode fibre, wavelength 1300nm*, ø either 62.5 or 50µm)	2km
	(A949.0431, single-mode fibre, wavelength 1300 nm*, ø 9 µm)	15km
	(A949.0433, CAT5e or better, flexible braid)	75m
	(A949.0433, CAT7, solid core)	120 m
Input frequencies		44.1/48/88.2/96kHz ±100ppm
Current consumption	(3.3V)	0.4A
	(5V)	0.4A
Operating temperature		0-40°C

* different wavelengths on request

ADAT I/O Cards
A949.0425, A949.0429

These cards feature two optical eight-channel ADAT inputs and outputs with 44.1/48/88.2/96 kHz operation. Two versions are available:

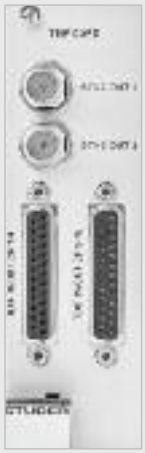
A949.0425xx Standard version for all-plastic fibre (APF)
A949.0429xx Long-distance version for plastic-clad fibre (PCF; optional).

Optical inputs and outputs are provided on TosLink connectors available in APF (980/1000 µm all-plastic fibre) and PCF (200/300 µm plastic-clad fibre) versions. In 96 kHz operation, the number of channels is limited to eight, i.e. four per I/O.

Maximum distance	(A949.0425, APF version)	5m
	(A949.0429, PCF version)	300m
		(on request: up to 1000m)
Transmitter wavelength	(A949.0425, APF version)	660nm
	(A949.0429, PCF version)	800nm
Transmitter aperture	(A949.0425, APF version)	980/1000µm
	(A949.0429, PCF version)	200/300µm
Receiver wavelength	(both versions)	660 or 800nm
Receiver aperture	(both versions)	200/300µm*
Current consumption	(3.3V)	0.1A
	(5V)	0.2A
Operating temperature		0-40°C

* use with 980/1000 µm AP fibre possible for distances up to 5m.

Digital I/O Cards Cont.



TDIF I/O Card
A949.0426

This card provides two eight-channel TDIF I/O interfaces with 96 kHz, 88.2 kHz, 48 kHz, or 44.1 kHz operation with wordclock sync outputs on BNC connectors. Inputs and outputs are provided on standard 25-pin D-type female connectors.

In 96/88.2 kHz operation, the number of channels is limited to eight, i.e. four per I/O.

TDIF inputs/outputs according to TDIF specifications
Current consumption (3.3V) 5mA
(5V) 0.1A
Operating temperature 0-40°C

3G SDI Input Card
A949.0452

The 3G/HD/SD SDI (serial digital interface) de-embedder card is able to handle video signals according to the 3G (full HD), HD and SD standards; both level A and B versions of 3G signals are supported. The card acts as an eight- or 16-channel embedder, i.e an eight- or 16-channel audio input card.

Operating modes 8- or 16-ch console input (de-embedder)
Selectable SDI groups Groups 1&2, 3&4 or all
Connectors IN, THROUGH (BNC, 75Ω)
Cable length max. 50m
Latency*
(de-embedder) < 360µs + D (D = SRC delay if active; s. above)
Current consumption (5 V) 0.9A
Operating temperature 0-40°C

* Audio latency times are identical for all channels and all groups.

3G SDI I/O Card
A949.0457

The 3G/HD/SD SDI (serial digital interface) embedder/de-embedder card is able to handle video signals according to the 3G (full HD), HD and SD standards; both level A and B versions of 3G signals are supported. The card can act as an eight- or 16-channel embedder (output), an eight- or 16-channel (input), or any combination thereof. It can be an eight- or 16-channel audio input card, an eight- or 16-channel audio output card, or an eight- or 16-channel input/output card. Available December 2013.

Operating modes 8- or 16-ch console output (embedder) and/or 8- or 16-ch console input (de-embedder)
Selectable SDI groups Groups 1&2, and/or 3&4
Connectors IN, OUT A, OUT B, THROUGH (BNC, 75Ω)
Cable length max. 50m
Video delay max. 4 frames (3G); 8 frames (HD); 15 frames (SD)
Audio latency*
(de-embedder + embedder) 3G/HD: <800µs; SD: <2.6ms
Current consumption (5 V) 1A
Operating temperature 0-40°C

* Latency times are identical for all channels and all groups.

Dolby® E/Digital Decoder Card
A949.0443, A494.0444

The D21m Dolby® E/Digital decoder card is available in 2 versions:

A949.0443xx with one, or
A949.0444xx with two Dolby® E decoder modules.

Each one is functionally similar to a Dolby® DP572 decoder. Both operate independently; the information given below is valid independently for both decoders as well.

Current consumption
(3.3V) 0.2A
(5 V) 0.8 A (A949.0443); 1.3 A (A949.0444)
Operating temperature 0-40°C

CobraNet® Card
A949.0445

This card allows sending and receiving up to 32 audio channels to/from a CobraNet®. DIP switches on the card allow setting the number of input or output channels seen by the console. Default setting is 32 output and no input channels.

Current consumption (5V) 800mA
Operating temperature 0-40°C

Aviom A-Net® Card
A949.0446

This card allows implementing the head of an Aviom A-Net® Pro-16 chain. With this standard, 16 mono signals can be fed to an infinite number of Aviom personal mixers (such as the A-16 II) may be connected in a daisy chain configuration.

This card works at sampling rates of 44.1 or 48 kHz only.

Current consumption (5V) 250mA
Operating temperature 0-40°C

EtherSound® Card

VISTA OnAir

Details: www.digigram.com

The EtherSound® card allows the connection of the D21m I/O System to an EtherSound® network. It acts in a similar manner to a MADI card combined with a GPIO card. The number of audio channels used can be configured with DIP switches. The included, virtual GPIO card allows routing a GPO of the mixing console to the GPO of a distant EtherSound® device on the network.

Current consumption (5V)	750mA max.
Operating temperature	0-40°C

Intercom Cards

VISTA OnAir

5037475, 5037474

This single-width I/O card is intended for intercom applications via a Studer D21m system. It allows embedding of the intercom audio and control signals into the standard digital multi-channel link (such as MADI) between Studer Vista or OnAir DSP cores and a remote stagebox. See flyer 5034584. Available December 2013.

No. of channels	4 stereo inputs and outputs
Connectors	4 × BNC (option: 25-pin D-type)
I/O Impedance	75Ω (BNC) or 110Ω (D-type)
Sample rate	48kHz
C/U bits	Transparent

BNC - 5037475
Sub-D - 5037474

Riedel RockNet® Card

VISTA OnAir

Details: www.riedel.com

The RN.343.VI enables a Studer Vista or OnAir console to become a part of the RockNet digital audio network and enables remote control of any RockNet microphone pre-amplifier. It fits into a console's SCore Live or D21m card expansion slot and gives access to 64 input and 64 output channels. A wordclock input is featured via the backplane connector, while a wordclock output is available at the front panel.

Axia Livewire™ Card

VISTA OnAir

5014376

The Axia Livewire™ card is a single-slot unit accommodating two Livewire SIM modules. Each Livewire SIM module can send and receive up to eight stereo signals to and from the Livewire network. This Livewire audio clock may be used as clock reference for a Studer OnAir or Vista console, or, If required, the mixing console can be the Livewire clock master.

Current consumption		
	(24V)	7.2 / 6.25W (Audio Configuration / no Ethernet connection and AES In not connected)
	(5V)	0W (on board generated from 24V)
	(3.3V)	0.2W
Operating temperature		0-40 °C

BCD DTMF / GLITS / BLITS / Minimixer Cards

VISTA OnAir

Details: www.bcd-audio.co.uk

Three versions of this card are available, differing only by their firmware.

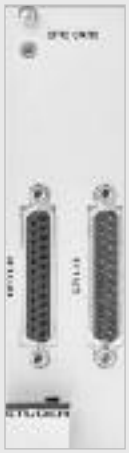
DTMF: This version is used to detect DTMF tone on up to 16 incoming lines and will generate 16 corresponding internal GPI signals when #1 is detected.

GLITS/BLITS: This version provides stereo and surround tone sequences according to EBU and UK standards. Tone generator level is adjustable between -24 and -9dBfs in one dB steps.

Minimixer: This version provides up to 32 small fixed mixes. These are useful for adding talkback, mono summing and similar.

Current consumption (5V)	0.5W

GPIO Cards

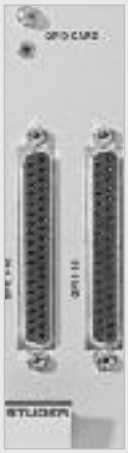


GPIO Card
A949.0435

VISTA OnAir

For general-purpose input/output control signals, this card provides 16 electrically isolated opto-coupler inputs (5-12 VDC) and 16 open-collector outputs. 5V DC supply pins are available. Inputs and outputs on standard 25-pin female D-type connectors.

Current consumption (5V)	max. 0.65A
Operating temperature	0-40°C



GPIO Card with Relay Outputs
A949.0436

VISTA OnAir

For general-purpose applications requiring total electrical isolation, this card provides 16 electrically isolated opto-coupler inputs with integrated current sink (5-24 VDC) and 16 electrically isolated outputs using SPST relay contacts.
5V DC supply pins are available. Inputs and outputs on standard 37-pin female D-type connectors.

Current consumption (5V)	0.8A max. (earlier version: 1.1 A max.)
Operating temperature	0-40°C
Output contact rating	0.5 A/125 VAC; 0.7 A/30 VDC; 0.3 A/100 VDC

HD Cards

HD Card S
A949.0412

OnAir

The D21m HD card S provides the link to the OnAir DSP core systems. Each input and output can handle up to 96 channels in each supported sampling rate (in combination with the Performa core, the number of I/O channels is restricted to 48). The system clock used is taken from the host DSP system, so no extra synchronization is needed.

Host link interface cable type		CAT-5 UTP Cable
Cable length		up to 10 m
Connector		RJ-45
Capacity of one CAT-5 connection		96 channels
Current consumption	(3.3V)	approx. 600mA
	(5.0V)	<50mA
Operating temperature		0-40°C

HD RS422 Card
A949.0415

VISTA

The D21m HD RS422 card provides the link to the Vista DSP core systems. Each input and output can handle up to 96 channels in each supported sampling rate (in combination with the Performa core, the number of I/O channels is restricted to 48). The system clock used is taken from the host DSP system, so no extra synchronization is needed.

Host link interface cable type		CAT-5 UTP Cable
Cable length		up to 10 m
Connector		RJ-45
Capacity of one CAT-5 connection		96 channels
Max. RS422 cable length		1000m
Current consumption	(3.3V)	approx. 600mA
	(5.0V)	<50mA
Operating temperature		0-40°C

A949.04113x
A949.04133x

A949.04143x

MADI HD Cards
A949.04113x, A949.04133x, A949.04143x

VISTA OnAir

The D21m MADI HD card is plugged into an HD card slot in the remote I/O box and provides the link to the hub frame. 3 versions are available:

A949.04113x	Optical / multi-mode fibre version
A949.04133x	Optical / single-mode fibre version
A949.04143x	Twisted-pair version.

The two interfaces offer up to 64 audio channels with 44.1/48/88.2/96 kHz operation, together with embedded control and user-accessible serial connection in each direction.

Max. cable length	(A949.0411, multi-mode fibre, wavelength 1300 nm*, ø 62.5 or 50µm)	2km
	(A949.0413, single-mode fibre, wavelength 1300 nm*, ø 9µm)	15km
	(A949.0414, CAT5e or better, flexible braid)	75m
	(A949.0414, CAT7, solid core)	120m
Input sampling rates	44.1/48/88.2/96 kHz ±100ppm	
Current consumption (3.3 V/5 V)		0.9 A/0.25A
Operating temperature		0-40°C

* different wavelengths on request

Serial/Merger Cards

Serial Card
A949.0437

VISTA OnAir

It is possible to transmit any RS422 serial signals, such as MIDI or Sony 9-pin (machine control) through a MADI connection without losing any audio channels or microphone control of the remote I/O box.

Max. RS422 cable length	1000m
Current consumption (5V)	20mA
Operating temperature	0-40°C

Serial Merger Card
A949.0438

VISTA OnAir

This card is used to feed any Studer-internal control signals into the hub I/O frame. A serial connection is made between the Studer product (such as a Vista or OnAir 3000 console) and the MASTER connector of the card.

Max. RS422 cable length	1000m
Current consumption (5 V)	80mA
Operating temperature	0-40°C

Serial RJ45 Card
A949.0439

OnAir

It is possible to transmit any RS422 serial signals, such as MIDI or Sony 9-pin (machine control) through a MADI connection without losing any audio channels or microphone control of the remote I/O box.

Max. UTP (CAT5) cable length		25m
Current consumption	(5V)	20mA
	(5V, 24V supply loaded)	5A
Operating temperature		0-40°C

Dual Merger Card
A949.0440

OnAir

This card is used to feed any Studer-internal control signals into the hub I/O frame. A serial connection is made between the Studer product (such as Vista or OnAir 3000 consoles) and the HOST connector of the card. In certain SCore applications the host port is connected internally through the backplane. The non-host ports may be used to connect other local I/O frames. OnAir 3000 desk modules connected to the RJ45 connectors may be supplied by the card (24 V; 20 W total per Dual Merger card), can be activated with a DIP switch.

Max. CAT5 cable length		25m
Current consumption	(5V)	160mA
	(5 V, 24 V supply loaded)	5.16A
Operating temperature		0-40°C

Compact
Stagebox

The Compact Stagebox adds a cost effective expansion option, offering a high density of I/O connections in only 4U of rack space. The modular unit is fully configurable but is offered with a standard configuration of 2 x HQ mic/line input modules, line output module, D21m MADI HD RJ45 card and blank panels for the D21m slots.

The expansion slots for standard Studer D21m I/O cards may be used for interfaces connecting to most popular digital formats, including CobraNet®, Axia Livewire™, or Aviom A-Net® 16, Ethersound, ADAT, TDIF, SDI (SD/HD/3G), Dolby® E and Dolby® Digital. A MADI recording interface can be fitted to the expansion slots as well. For more information, refer to the overview on page 5.

The Compact Stagebox is connected to the host console using either Cat5/7 or Optical-fibre MADI, with redundant MADI capability. The unit comes complete with twin redundant power supplies, thermostatically-controlled fan cooling and full LED status monitoring. An 8-channel GPIO interface is also provided.

Available I/O modules (optional):

- 16-channel HQ XLR Mic/Line In
- 8x2 AES/EBU Input and 8x2 AES/EBU Output
- 16-channel XLR Line Out
- 8-channel XLR Line Out + 4x2- channel AES/EBU Out

Available D21m I/O expansion cards (optional):

- 4-channel D-type Mic/Line In with 4 Direct Outputs
- 8-channel D-type Line In
- 8-channel D-type Line Out
- *8-channel D-type AES/EBU In/Out
- *MADI (RJ45 or optical SC), max. 64 channels of I/O
- 16-channel ADAT In/Out (optical)
- *16-channel TDIF In/Out (D-type)
- 8 to 16-channel SDIF (SD/HD/3G) In or I/O on BNC sockets
- 8 or 16-channel Dolby® E/Digital In on BNC sockets
- CobraNet® 32-channel In/Out on RJ45 sockets
- Axia Livewire™ 8 stereo signals In/Out on RJ45 sockets
- Aviom A-Net® 16-channel Out on RJ45 sockets
- *Ethersound® 64-channel In/Out on RJ45 sockets

(* double-width cards)

Technical Specifications Compact Stageboxes

HQ Mic / Line Input Module	Conditions / Details	Value
General Conditions:	***Gain Setting 15 dBu 0 dBFS unless otherwise noted.***	
Input Impedance	(electronically balanced)	3.6 kΩ
Gain	for $0dB_{FS}$ (adjustable in steps of 1dB)	–11 to +75dB
Maximum Input Level	–11dB gain, Rsource = 600Ω	+26dBu
	0dB gain, Rsource = 150Ω	+15dBu
Frequency Response	20Hz to 20kHz, 40 dB gain	+0 / –0.9dB
	30Hz to 20kHz, 40 dB gain	+0 / –0.6dB
THD + Noise	1kHz, $-1dB_{FS}$	< –87dB
	1kHz, $-9dB_{FS}$ (nominal level)	< –94dB
	20Hz to 20kHz, $-30dB_{FS}$	< $-102dB_{FS}$
Equivalent Input Noise / Noise Figure (NF)	Ri = 200Ω, gain > 60dB	–127.6dBu / NF ≤ 2
Crosstalk	1kHz (nominal level)	< –100dB
Input Delay		12 samples 250µs @ 48kHz
Common Mode Rejection Ratio (CMRR)	30Hz to 20kHz, all gain settings	> 46dB
	1kHz, –11dB to +26dB gain	60dB typ.

Line Output Module	Conditions / Details	Value
Output Impedance	(electronically balanced)	50Ω
Frequency Response	20Hz to 20kHz	+0dB / –0.3dB
THD + Noise	–1 dBFS, 1kHz	–90dB
	–30 dBFS, 20Hz to 20kHz	–103dB
Crosstalk	1kHz	–115dB
Output Level	RL ≥ 600Ω; globally adjustable with hardware switches (steps: +24, +22, +20, +18, +15, +12, +9, +6 dBu)	+6 to +24dBm for $0dB_{FS}$
Output Delay		10.4 samples 217µs @ 48kHz

AES / EBU Input / Output Module	Conditions / Details	Value
Input/Output Impedance		110Ω
Input Sensitivity		min. $0.2V_{RMS}$
Ouptut Level	into 110Ω	$4.0V_{RMS}$
THD + Noise		max. –115dB
SRC Range		22-108kHz

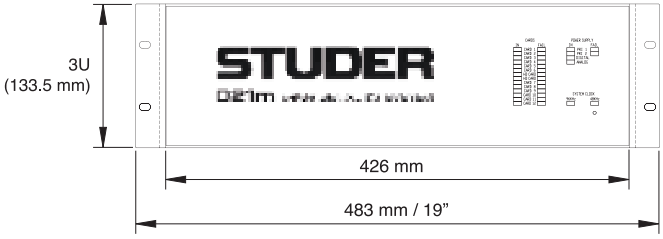
Power Supply	Conditions / Details	Value
Primary Input Voltage Range	Power supply auto-ranging, with power factor correction (PFC); EN/UL approved	100 to 240 V AC ± 10% 50 to 60 Hz
Power Consumption	Dependant on installed modules/cards	max. 300W

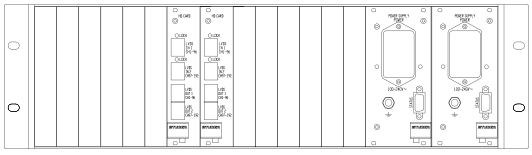
Ambient Conditions	Details	Value
Operating Temperature Range		–5 to 45°C / 23 to 113°F
Relative Humidity	non-condensing	95%

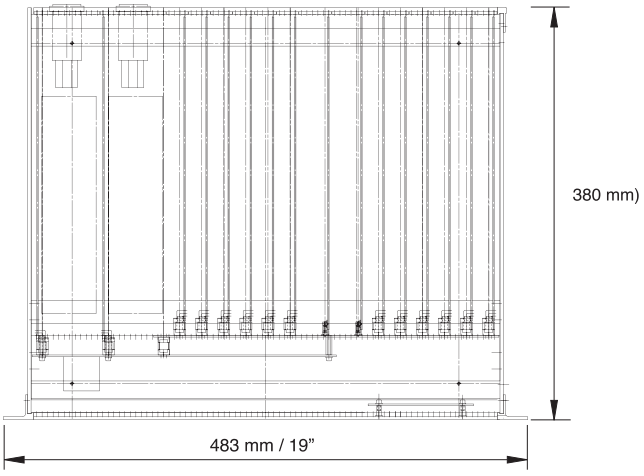
Weights (approx.)		Value
Studer Compact Stagebox, recommended standard configuration	2 × HQ mic/line input modules 1 × line output module 1 × D21m MADI HD card (optical or RJ45) no D21m I/O cards (2 × blank panels only)	10 kg / 22 lbs

Dimensions

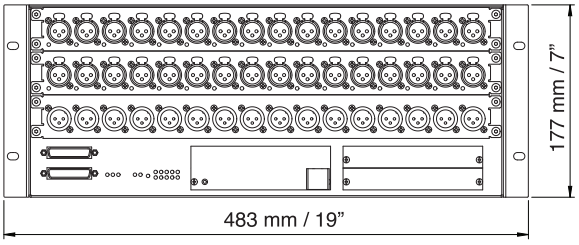
D21m

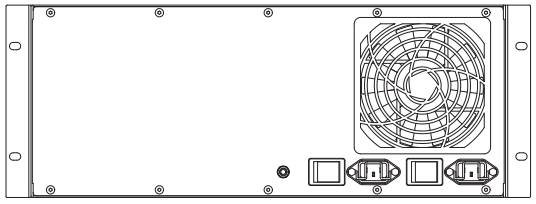


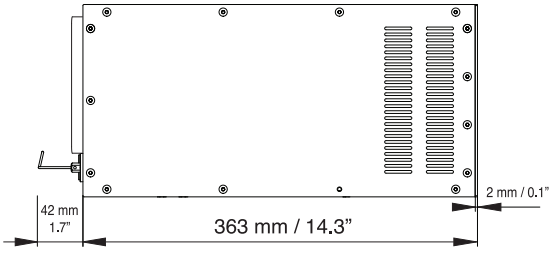




Compact Stagebox







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