SL-3GHD128128

VikinX Sublime 128x128 3G/HD/SD-SDI Router

User manual

Rev. D

Nevion
Nordre Kullerød 1
3241 Sandefjord
Norway
Tel: +47 33 48 99 99
nevion.com

Nevion Support

Nevion Europe

P.O. Box 1020
3204 Sandefjord, Norway
Support phone 1: +47 33 48 99 97
Support phone 2: +47 90 60 99 99

Nevion USA

1600 Emerson Avenue
Oxnard, CA 93033, USA
Toll free North America: (866) 515-0811
Outside North America: +1 (805) 247-8560

E-mail: support@nevion.com
See http://www.nevion.com/support/ for service hours for customer support globally.

Revision history

Current revision of this document is the uppermost in the table below.

Rev.	Repl.	Date	Sign	Change description
D	3	2013-07-18	JGS	Update to new template, no change in document
3	2	2011-10-13	NBS	Corrected housing and gender spec on D-sub 9-pin contacts. Updated Chapter 2.5. Added SD-SDI Cable EQ spec in Chapter 2.4. Added one LED status in Chapter 4.2. Added Declaration of Conformity,
2	1	2010-05-21	NBS	Added information about Nevion Configurator, including version information. Updated PSU information. Added Chapter 3.1 about PSU configuration. Added Chapter 1.1 about product variants.
1	0	2010-02-26	NBS	Corrected hyperlink to Multicon and other minor corrections.
0	-	2010-02-03	NBS	First release.

Contents

Revision history 2

1 Product overview 4
1.1 Product variants 5

2 Specifications 7
2.1 Mechanics 7
2.2 Power supply 7
2.3 Control 7
2.4 Video specifications 7
2.5 Rear view 9
2.5.1 Power Supply pinout 9
2.5.2 Serial port pinout 10

3 Configuration 11
3.1 Power Supply setup 11
3.2 Router mode 11
3.3 External power alarm 13
3.4 Power-up mode 14
3.5 Configuring switching time 14

4 LED status indication 15
4.1 Start-up 15
4.2 Alarm states 15
4.3 Ethernet states 15

5 Router communication 16

6 Connecting signal cables to the router 17

General environmental requirements for Nevion equipment 18

Product Warranty 19

Important notes regarding Software in the VikinX Sublime router family range 20

Appendix A Materials declaration and recycling information 21
A.1 Materials declaration 21
A.2 Recycling information 21

1 Product overview

Nevion proudly presents Sublime SL-3GHD128128. With this router, Nevion continues a stable and proven product line including the most complete signal format and size offering available.

With the ultra slim, multi format and flexible product range, Sublime fulfils the most demanding requirements from the professional broadcast market.

This User Manual presents the features, installation and operation procedures of the SL-3GHD128128 router of the Sublime range.

The key features of SL-3GHD128128 are:

- Multi rate support; 3G/HD/SD-SDI
- Supports DVB-ASI
- Supported bitrates: 143Mbps - 3Gbps
- Reclocking on standard 3G/HD/SD-SDI signals. Reclockers may be turned off, for support of E4/STM-1e
- Ethernet and RS-232 control interfaces
- Software based Configurator for easy system set-up
- Ultra Slim frame depth
- Low Power consumption (<150W); high reliability design
- Redundant power supply system with front indicators
- Interoperability with existing VikinX routers
- Possible to split the router into independent partitions on separate levels
- Multicon is embedded in the router
- All control features that come with Multicon (VX-SLC) are available as default
- Future proof and flexible product range

VikinX Sublime provides many of the powerful control features that drove the VikinX Modular range to success. VikinX Sublime is ideal for general purpose facilities, on-air routing, mobile outside broadcast applications and sophisticated A/V applications.

VikinX Sublime SL-3GHD128128 provides most important 3rd party control interfaces allowing the control of our routers through 3rd party management software. On top of that the embedded Multicon system controller allows control of the most common 3rd party routers. This enables you to utilize existing routers and management systems from other

manufacturers and still draw the advantages of implementing VikinX Sublime in your routing application.

1.1 Product variants

There are a number of variants for this product. They all share the same hardware, and are distinguished by FW keys.

Item	Description
SL-3GHD128128	128x128 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI, Ethernet/RS-232 control, router partitioning on separate levels, 19" 8RU depth 5cm. Multicon VX-SLC embedded controller.
SL-3GHD96128	96x128 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232 control, router partitioning on separate levels, 19" 8RU depth 5cm. Multicon VX-SLC embedded controller.
SL-3GHD96128	128x96 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232 control, router partitioning on separate levels, 19" 8RU depth 5cm. Multicon VX-SLC embedded controller.
SL-3GHD64128	64x128 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232 control, router partitioning on separate levels, 19" 8RU depth 5cm. Multicon VX-SLC embedded controller.
SL-3GHD12864	128x64 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232 control, router partitioning on separate levels, 19" 8RU depth 5cm. Multicon VX-SLC embedded controller.
SL-3GHD32128	32x128 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232 control, router partitioning on separate levels, 19" 8RU depth 5cm. Multicon VX-SLC embedded controller.
SL-3GHD12832	128x32 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232 control, router partitioning on separate levels, 19" 8RU depth 5cm. Multicon VX-SLC embedded controller.
SL-3GHD9696	96x96 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232 control, router partitioning on separate levels, 19" 8RU depth 5cm. Multicon VX-SLC embedded controller.
SL-3GHD6496	64x96 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232 control, router partitioning on separate levels, 19" 8RU depth 5cm. Multicon VX-SLC embedded controller.
SL-3GHD9664	96x64 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232 control, router partitioning on separate levels, 19" 8RU depth 5cm. Multicon VX-SLC embedded controller.
SL-3GHD3296	32x96 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232 control, router partitioning on separate levels, 19" 8RU depth 5cm. Multicon VX-SLC embedded controller.
SL-3GHD9632	96x32 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128.

Item	Description
	Ethernet/RS-232 control, router partitioning on separate levels, 19" 8RU depth 5cm. Multicon VX-SLC embedded controller.
SL-3GHD64+	64x64 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232 control, router partitioning on separate levels, 19" 8RU depth 5cm. Multicon VX-SLC embedded controller.
SL-3GHD3264+	32x64 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232 control, router partitioning on separate levels, 19" 8RU depth 5cm. Multicon VX-SLC embedded controller.
SL-3GHD6432+	64x32 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232 control, router partitioning on separate levels, 19" 8RU depth 5cm. Multicon VX-SLC embedded controller.
SL-3GHD32+	32x32 HD-SDI Router (Multi rate, 270Mbps-2.970Gbps). Supports 3G-SDI, HD-SDI, SD-SDI, DVB-ASI. Upgradeable to 128x128. Ethernet/RS-232 control, router partitioning on separate levels, 19" 8RU depth 5cm. Multicon VX-SLC embedded controller.
SL-UPG-32IN	Upgrade to add 32x Inputs to your partly configured SL-3GHD128128 router.
SL-UPG-32OUT	Upgrade to add 32x Outputs to your partly configured SL-3GHD128128 router.
SL-UPG-32IN+OUT	Upgrade to add 32x Inputs and Outputs to your partly configured SL-3GHD128128 router.
Power Supply Unit	
SL-PWR-300	300W AC Power Supply Unit for Sublime 128 range. 48VDC output.

2 Specifications

2.1 Mechanics

Dimensions:	HxWxD = 355x483x50mm, (19”, 8RU).
Router weight:	7.75 kg, including 1x PSU module (1.15 kg).
Max. Power consumption:	+48V, 2.8A; 135W.
Safety/Emission standards:	Compliant with CE EN55103-1 and 2.

2.2 Power supply

SL-PWR-300:	300 W Power supply Unit.
AC Supply voltage range:	90-130VAC / 180-254VAC, switchable, 50-60Hz, 300W.
AC Mains connector:	IEC 320.
DC output:	+48V, max. 6.25A. Maximum 300 W.
DC connector:	DSUB 2V2P.
Alarms:	Power failure alarm on LED in front and GPI output from MULTICON.
Alarms connector:	RJ45.
Safety standards:	Compliant with CE EN60950, UL-1950/CSA22.2.

2.3 Control

Standard Features:

Serial port:	RS-232 for protocol conversion, to VikinX compact control protocol, or to third party protocols.
Connector(s):	DE9, D-sub 9-pin female.
Ethernet port:	10/100BaseT Ethernet bus for external router control.
Connector:	RJ45.
Reclocker option:	Bypass of reclocking (from system controller).
Input Equalizer option:	Bypass of input equalization (from system controller).
Synchronization handled by Multicon:	- Analog Black&Burst, looped. Both PAL and NTSC supported. - Tri-Level, Looped. For HD signal formats only. - Distribution of synchronization signals between several routers.
Connector(s):	BNC.

Other features:

- SNMP agent, included with Multicon.

2.4 Video specifications

Supported formats:

Telecom:	STM-1e and E4.
Broadcast:	- 143Mbps – 2.97Gbps. - DVB-ASI, SMPTE 259M, SMPTE 292M, SMPTE 310M, SMPTE 424M. - 2K, 2048x1556/23.98 and 24.

Supported standards:

SD-SDI, 270Mbps:	SMPTE 259M.
HD-SDI, 1.485Gbps:	SMPTE 292-2008.
3G-SDI, 2.97Gbps:	SMPTE 424M.
DVB-ASI:	EN50083-9.

Electrical signal inputs:

Connectors:	BNC, IEC 61169-8.
Impedance:	75 Ohm.

Return loss:
- > 15dB (5 MHz – 1.485 GHz);
- > 10dB (1.5 – 3 GHz).

Cable equalization:
- Automatic up to 70m @ 2.97Gbps, typical Belden 1694A;
- Automatic up to 100m @ 1.485Gbps, typical Belden 1694A;
- Automatic up to 300m @ 270Mbps, typical Belden 8281.

Electrical signal outputs:

Connector: BNC, IEC 61169-8.

Impedance: 75 Ohm.

Return loss:
- > 15dB (5 MHz – 1.485 GHz);
- > 10dB (1.5 – 3 GHz).

Signal level: 800mVp-p ±10%.

Rise/fall time: 20% - 80%
- SD limit: 0.4ns – 1.5ns, < 0.5ns rise/fall variation;
- HD limit: < 270ps, < 100ps rise/fall variation;
- 3G limit: < 135ps, < 50ps rise/fall variation.

Amplitude overshoot: < 10%.

Signal polarity: Non-inverting electrical with respect to inputs.

Signal transition:

Timing jitter:
- SD: < 0.2 UI;
- 3G / HD: < 1 UI.

Alignment jitter:
- SD: < 0.2 UI;
- 3G / HD: < 0.2 UI.

Reference inputs:

Number of inputs: 1.

Connector: 75 ohm BNC female, loop-thru.

Return loss: >40dB (100 kHz – 5 MHz);
>35dB (5-10 MHz).

Signal format: NTSC or PAL Black&Burst or HD Tri-Level according to SMPTE 274M, SMPTE 276M.

Signal level: Nominal 1.0Vp-p.

Field selectivity: Field 1.

Timing range:
- HD Tri-Level: 1280x720: within clock-intervals (148.5 MHz) 455 – 780 line 7;
- HD Tri-Level: 1920x1080: within clock-intervals (148.5 MHz) 625 – 1070 line 7.

2.5 Rear view

The following service connectors can be found on the rear of the SL-3GHD128128 router:

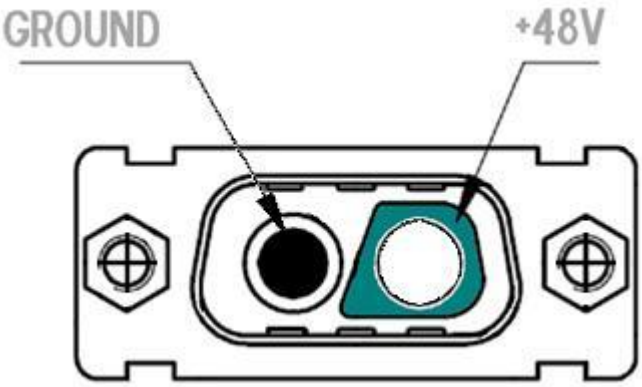
Power A (48 VDC): +48 VDC power connector[1].
Power B (48 VDC): +48 VDC power connector (if redundant supply is installed)[2].
Serial 1 and 2: RS-232 (or RS-422) ports for external control protocols.
Ethernet: 10/100Base-T Ethernet bus for external router control.
GPI: Power fail alarm relay contact. Contact closes if any of the connected power supplies fail, or the internal power level is below limit.
LED status on the power supplies indicate which one has failed. See Chapters 2.2 and 3.3 for further description.
Sync/Loop: Synchronization signal (in/out). Black&Burst/composite/tri-level sync reference input with passive loop-through for vertical interval switching.
Configuration: Configurations switch. See Chapter 3 for further descriptions.

2.5.1 Power Supply pinout

The DSUB 2V2P power pinout for Sublime routers and Control Panels are as follows;

Pin #	Description
Socket	+48VDC
Pin	GND

[1] Note that any VDC supplies with output voltage between +36VDC and +72 VDC, with sufficient power, may be applied to the router.
[2] The router is supplied with inverse diodes. This means that in a redundant power supply application the router will pull its entire load from the PSU with the highest output voltage.



There is a switch on the right hand side of the power supply module that selects mains voltage. The mains voltage can be either 110VAC or 230VAC. This switch must be set in the correct position, depending on the mains voltage on the router's site.

Failing to select correct AC mains voltage properly may damage the Power Supply Unit.

2.5.2 Serial port pinout

The DB9F connectors for the serial port(s) of the router have the following pin-out:

Pin #	RS-232 mode	RS-422 mode
1	*Not in use*	*Not in use*
2	Tx	Tx -
3	Rx	Rx +
4	*Not in use*	*Not in use*
5	GND	GND
6	GND	GND
7	RTS	Tx +
8	CTS	Rx -
9	*Do Not Connect!*	*Do Not Connect!*

Note that if the standard RS-232 cable specification (DCE) is followed:

- a cable with Male+Male or Female+Female connectors at the cable ends is used for Rx/Tx crossed connection, and

- a cable with Male+Female connectors at the cable ends is used for a straight through connection.

3 Configuration

This chapter provides an overview of the configuration options that are available on the SL-3GHD128128 router.

> Switches 1 - 4 on the configuration switch are not in use and must be kept in the OFF position (factory default).

Some of the configuration options demand software configuration, using the Nevion Configurator. This tool is supplied with each router, but can also be downloaded from our web site: www.nevion.com/support

> It is important that users apply Nevion Configurator v4.1.1 (or a higher version number) when configuring the SL-3GHD128128 and its variants.

3.1 Power Supply setup

Before proceeding with router configuration, make sure the accompanying power supply unit is configured for the right AC supply voltage.

There is a switch on the rear side of the power supply module that selects mains voltage. The mains voltage can be either 110VAC or 230VAC.

This switch *must* be set in the correct position, depending on the mains voltage on the router's site.

> Failing to select correct AC mains voltage properly may damage the Power Supply Unit.

3.2 Router mode

SL-3GHD128128 allows easy splitting of the router into a maximum of 4 pre-defined partitions.

> You may *not* control these pre-defined partitions individually if you use the DIP switches to configure partitions. Leave switches 5 – 6 in the *default* position and configure the number of individually controlled partitions you like, using the Nevion Configurator that comes with the router. Software configured partitions may be of any size.

You can choose among the following pre-defined partitions:

Router partitions	Partition sizes
1 partition	128x128
2 partitions	64x64
3 partitions	42x42
4 partitions	32x32

Switches 5 - 6 on the configuration switch set the number of pre-defined partitions. The Router Management System software must be configured according to the chosen setup.

The number of pre-defined partitions is selected according to the following pattern:

SW 5	SW 6	Router partitions
OFF	OFF	1 partition
OFF	**ON**	2 partitions
ON	OFF	3 partitions
ON	**ON**	4 partitions

Default mode is 1 partition.

Based on the configuration above, the I/O is connected to the router according to the following scheme:

- **1 partition:**
  I/O is connected according to information on the rear of the router.
- **2 partitions:**

Partition 1	Input	Partition 1	Output
1	1	1	1
2	2	2	2
3	3	3	3
…	…	…	…
64	64	64	64
Partition 2	**Input**	**Partition 2**	**Output**
1	65	1	65
2	66	2	66
3	67	3	67
…	…	…	…
64	128	64	128

- **3 partitions:**

Partition 1	Input	Partition 1	Output
1	1	1	1
2	2	2	2
3	3	3	3
…	…	…	…
42	42	42	42
Partition 2	**Input**	**Partition 2**	**Output**
1	43	1	43
2	44	2	44
3	45	3	45
…	…	…	…
42	84	42	84
Partition 3	**Input**	**Partition 3**	**Output**
1	85	1	85
2	86	2	86
3	87	3	87
…	…	…	…
42	126	42	126

In-/Outputs 127 and 128 are not in use in this router setup (3 partitions).

– **4 partitions:**

Partition 1	Input	Partition 1	Output
1	1	1	1
2	2	2	2
…	…	…	…
32	32	32	32
Partition 2	**Input**	**Partition 2**	**Output**
1	33	1	33
2	34	2	34
…	…	…	…
32	64	32	64
Partition 3	**Input**	**Partition 3**	**Output**
1	65	1	65
2	66	2	66
…	…	…	…
32	96	32	96
Partition 4	**Input**	**Partition 4**	**Output**
1	97	1	97
2	98	2	98
…	…	…	…
32	128	32	128

3.3 External power alarm

The external power alarm can be switched according to the following pattern:

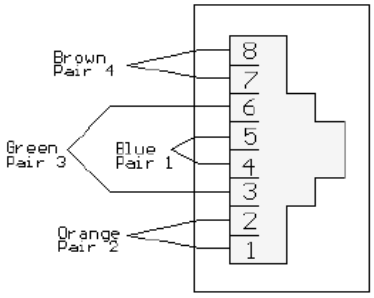
SW 7	Power alarm
OFF	Disables External Power Alarm
ON	Enables External Power Alarm

Default setting is External Power Alarm disabled.

> The Power Alarm GPI output will generate a contact closure if the internal voltage is below a certain threshold, regardless of the position of DIP #7. This DIP switch only determines if a faulty external power supply shall generate an alarm/contact closure.
>
> This means that enabling this power alarm should only be considered if you have connected both external power supplies, for redundant supply. Then, a contact closure will be generated if any of the connected power supplies fail.

The associated power fail alarm relay contact, on the rear side of the frame, is described in Chapter 2.5. The relay contact is normally open, and the contact closes according to the description in this chapter.

Pin #	Signal	Name	Mode
1		Not in use	Input
2		Not in use	Input
3		Not in use	Input
4		Not in use	Input
5	PSU Alarm	Power alarm as described above	Open Collector
6		Not in use	
7	+5V	+5V pin	+5V
8	GND	0V / Ground	GND



3.4 Power-up mode

Switch 8 on the configuration switch defines the power up mode. The sublime router provides two modes for powering up the system.

The power up options can be switched according to the following pattern:

SW 8	Power Up mode
OFF	Switches all outputs according to the buffered information in the routers processor system.
ON	Switches all outputs to input 1.

Default setting switches all outputs according to the buffered information in the routers processor system.

3.5 Configuring switching time

> This configuration is done in the Nevion Configurator.

It is possible to configure switching time in the router. The settings are made through the Nevion Configurator, but a description of the options is given here. The user can select between three options;

1. Switch according to detected sync reference signal (Default).
   Switching time is determined by the synchronization signal that feeds the router. This is useful when the video signal has the same format as the synchronization signal. Supported formats are: PAL, NTSC, 750/50p, 750/60p, 1125/50i and 1125/60i.
2. Switch according to signal format: Select format.
   Here it is possible to use one synchronization signal to switch a different video format. A prerequisite is that the synchronization signal and the video signal have the same frame rate. E.g. Use PAL as synchronization signal with a 750/50p video signal. Supported formats are: PAL, NTSC, 750/50p, 750/60p, 1125/50i, 1125/60i, 1125/50p and 1125/60p.

   > We do not support 1125/50p or 1125/60p as synchronization signal. This means that our 3G-HD routers cannot use default setting.

3. Switch to handle mixed signal formats.
   The router switches 12us after vertical sync on the synchronization signal. This will occur in line 1 on all video formats. This is useful when you have different video formats on the same router, also with different frame rate.

   > This setting is not according to recommendations in SMPTE RP 168-2002. Embedded data may become damaged or lost.

4 LED status indication

4.1 Start-up

The LED located at the front of the router indicates the status of the router. At start-up, the LED will alternate between red (R) and green (G) every 500ms for about two seconds. After the start-up sequence the LED will indicate the Alarm state of the router.

There are two LEDs located at the Ethernet bus. At start-up the boot loader is searching for update commands on the serial port for about two seconds. During this sequence both Ethernet LEDs will be blinking. After the start-up sequence the LEDs will indicate the Ethernet state.

4.2 Alarm states

The LED can either be red (R), green (G), yellow (Y) or have no light (N).

The LED state is here described with twenty letters, each representing 100ms, which totals to an alarm sequence of two seconds. The X indicates that the LED keeps the color it has the moment the alarm sequence begins (green, yellow or no light).

Description	LED state	Alarm	Comment
Continuous green light	GGGGG GGGGG GGGGG GGGGG	No alarm. Status is OK.	
Continuous yellow light	YYYYY YYYYY YYYYY YYYYY	Unable to connect to controller over Ethernet.	This alarm will be overwritten by other alarms
Long red blinks	RRRRR NNNNN RRRRR NNNNN	Power is too low.	
One short red blink	RXXXX XXXXX XXXXX XXXXX	Power A failed	Only active if power alarm dip is set.
Two short red blinks	XXXXX XXXXX RXRXX XXXXX	Power B failed	Only active if power alarm dip is set.
Red with one short yellow blink	YRRRR RRRRR RRRRR RRRRR	No valid product key.	

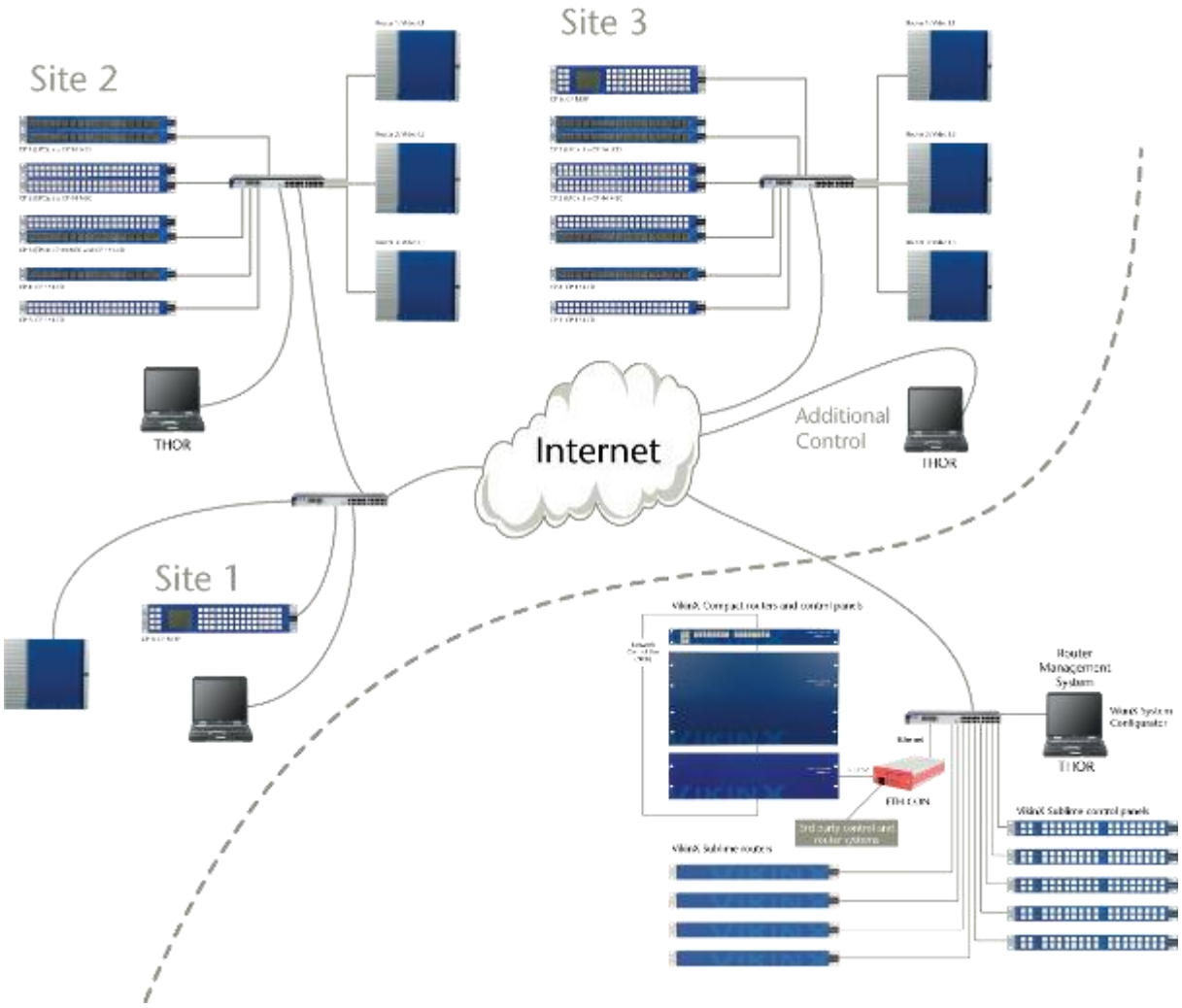
4.3 Ethernet states

The LEDs that are located at the Ethernet bus will after the Start-up sequence indicate the Ethernet states:

	On	Off / Blinking
Green	Valid link	No link
Yellow	No data	Data is transmitted or received

5 Router communication

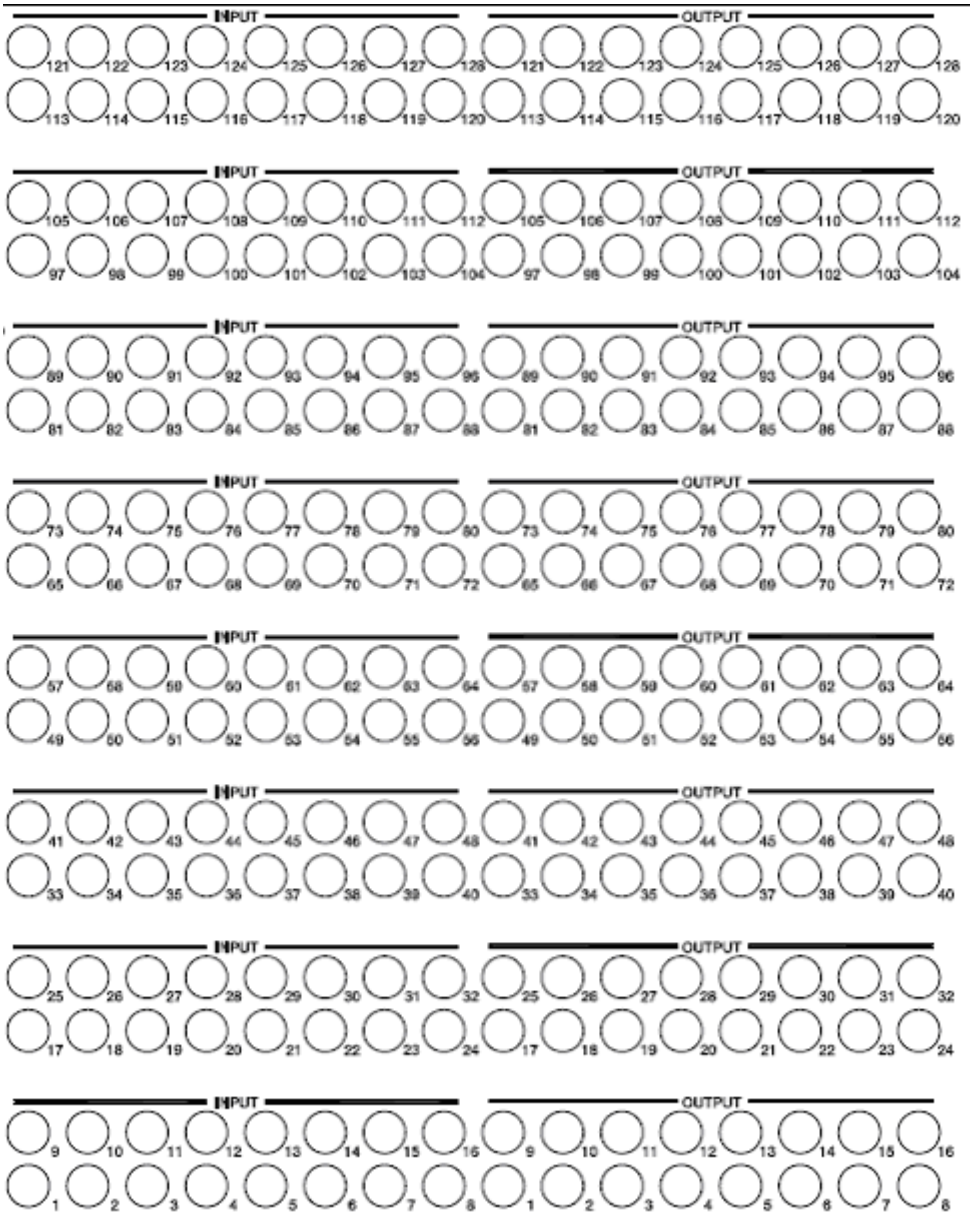
You gain access to router for communication purposes by connecting either the router's serial port to your computer and/or by using an Ethernet connection.



Please refer to the manual for Multicon VX-SLC for a detailed description of the applicable communication interfaces for your modular router.

6 Connecting signal cables to the router

The SL-3GHD128128 router offers standard 75Ohms BNC connectors for video in- and outputs. See also Chapters 2.4, 2.5 and 0 for more details. The figure below shows the I/O numbering.



General environmental requirements for Nevion equipment

1. The equipment will meet the guaranteed performance specification under the following environmental conditions:
   - Operating room temperature range: 0°C to 45°C
   - Operating relative humidity range: <95% (non-condensing)

2. The equipment will operate without damage under the following environmental conditions:
   - Temperature range: -10°C to 55°C
   - Relative humidity range: <95% (non-condensing)

Product Warranty

The warranty terms and conditions for the product(s) covered by this manual follow the General Sales Conditions by Nevion, which are available on the company web site:

www.nevion.com

Important notes regarding Software in the VikinX Sublime router family range

This product utilizes software components that are licensed with open source licenses. The source code for these components and our modifications are available from: http://labs.nevion.com/open-source/

OpenTCP includes software developed by Viola systems (http://www.violasystems.com/).

Appendix A Materials declaration and recycling information

A.1 Materials declaration

For product sold into China after 1st March 2007, we comply with the “Administrative Measure on the Control of Pollution by Electronic Information Products”. In the first stage of this legislation, content of six hazardous materials has to be declared. The table below shows the required information.

組成名稱 Part Name	Toxic or hazardous substances and elements					
	鉛 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr(VI))	多溴联苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
SL-3GHD128128	O	O	O	O	O	O
Multicon	O	O	O	O	O	O
SL-PWR-300	O	O	O	O	O	O

O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.

X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.

This is indicated by the product marking:

A.2 Recycling information

Nevion provides assistance to customers and recyclers through our web site http://www.nevion.com/. Please contact Nevion’s Customer Support for assistance with recycling if this site does not show the information you require.

Where it is not possible to return the product to Nevion or its agents for recycling, the following general information may be of assistance:

- Before attempting disassembly, ensure the product is completely disconnected from power and signal connections.
- All major parts are marked or labeled to show their material content.
- Depending on the date of manufacture, this product may contain lead in solder.
- Some circuit boards may contain battery-backed memory devices.