

Installation

Unpacking the Archangel Units

The units are packed in separate flight cases. The contents of the flight cases are as follows:

- Archangel One
- Archangel Two
- Tangent Synergy Timeline Controller (option)
- Operator's Manual
- Power cable
- Spare Fuse 6.3 A (T)
- RS422 Cable

Unpack the flight cases carefully and check for any shortages or shipping damage. Immediately report any shortages or damage to Snell and Wilcox Limited.

POWER CONNECTIONS

Power Supply

Mains power is supplied to the units via a filtered IEC connector.

The mains power fuse rating is 6.3 A (T) and the rated current for the unit is 4.5 A at 115 V and 2.2 A at 230 V.

The power supply ON/OFF switch is located on the front of the power supply inside the front panel.



CAUTION:

Note that the fan ventilation holes on the rear panel must not be obscured.

SWITCHING ON

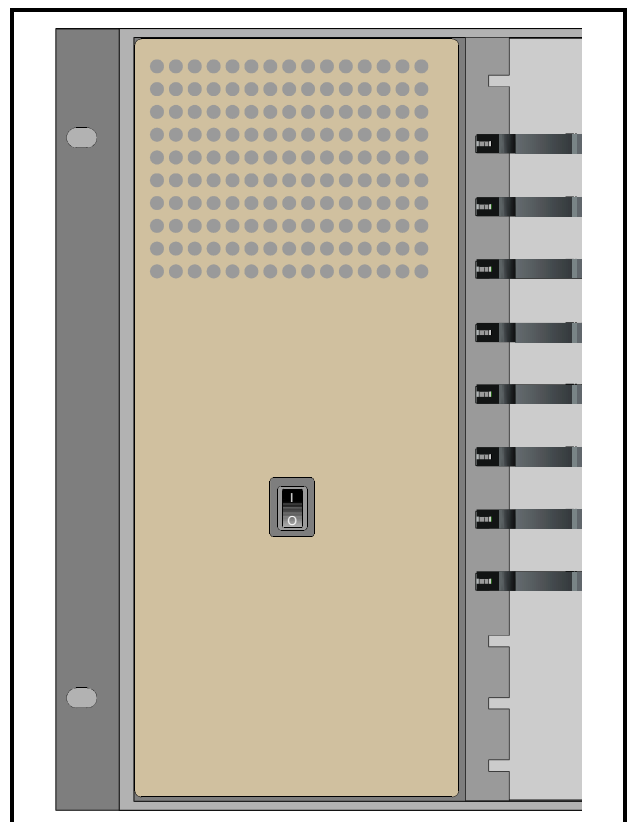
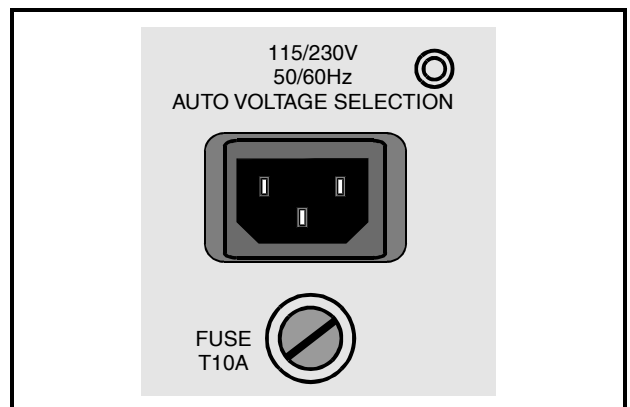
Open the front panel. Check that power is connected to the Archangel units. Set the power switch on the front of the power unit to ON (I). The opening alphanumeric display will appear on the front panel. Close the front panel.

Supply Voltage

The power supply is auto switching for the rated input voltages.

No voltage adjustment procedure is required.

CAUTION THIS UNIT MUST NOT BE OPERATED WITHOUT AN EARTH CONNECTION.



Environment

Although ruggedly constructed to meet the normal environmental requirements, it is important that there is a free flow of air at the front and rear to dissipate the heat produced during operation. Installations should be designed to allow for this.

If servicing is to be carried out in situ allow space (approximately 230mm) at the rear for the rear panel to be hinged down.

Remote Control

The unit may be controlled via the RollCall remote control system using the RollCall PC templates. For details of the RollCall system consult the Modular System Operation manual.

The unit may also be controlled using the Tangent Devices Synergy Timeline Controller. For details please see the Synergy Timeline Controller User Manual.

For information regarding use of other third party controllers please contact Snell & Wilcox.

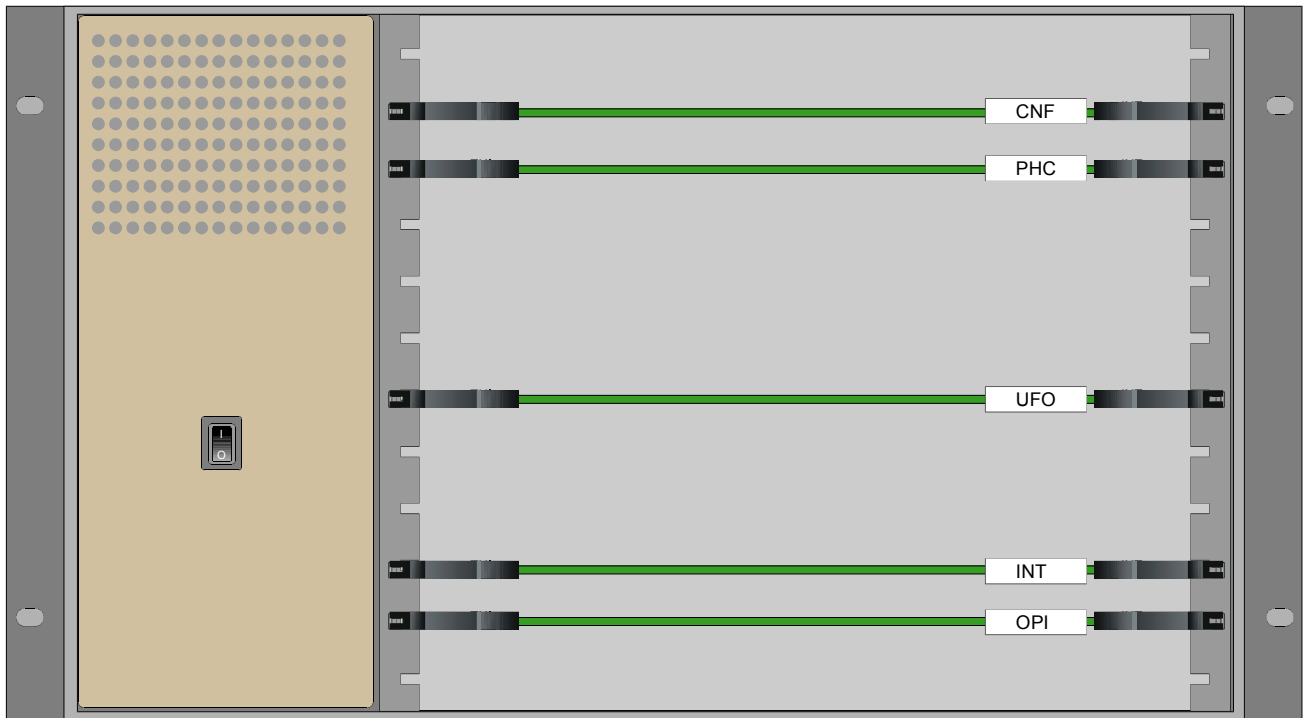
OPENING THE FRONT PANEL

To open the front panel start by grasping the panel at either end, lifting up the two black levers, pulling the panel slightly forward and then hinging it to the left.

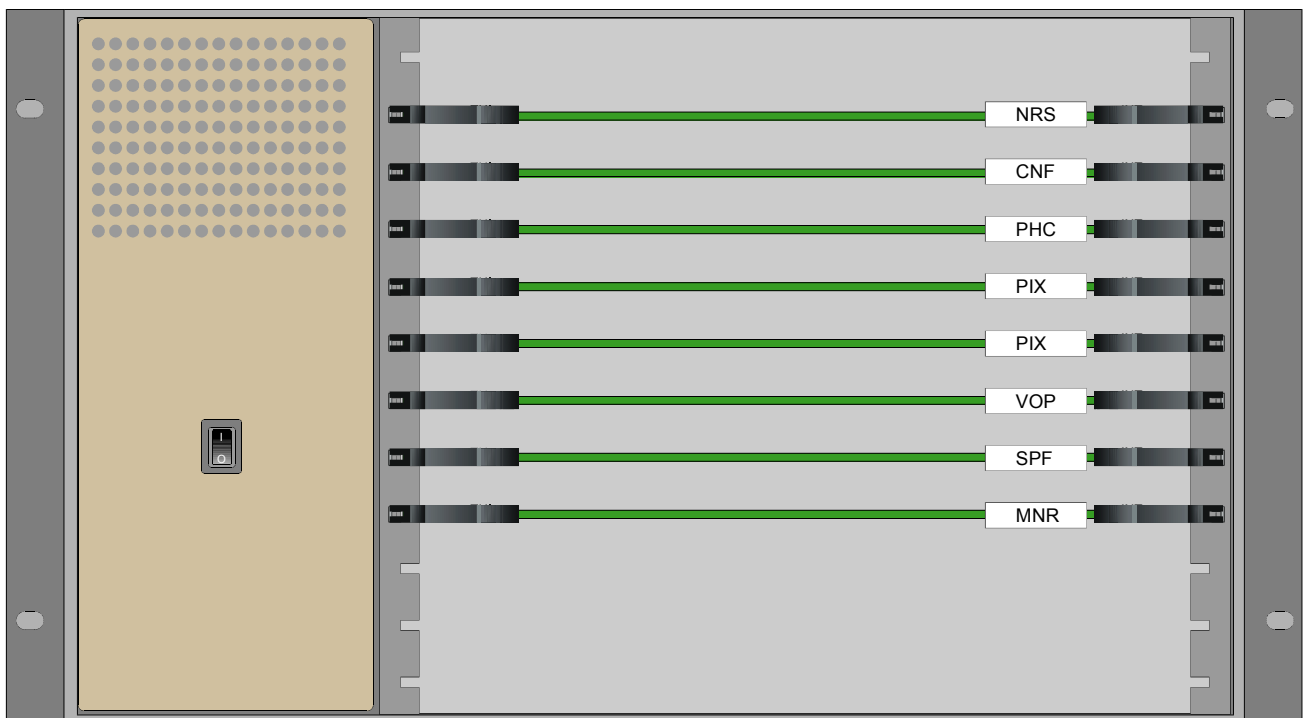
The Rack mount fixing "ears" are revealed when the panel is open.

Refit the front panel by pushing it back into position (the levers will click into place)

Card Positions



Archangel One



Archangel Two

**Unpacking the Tangent Synergy Timeline
Controller Option**

For more information please refer to the Tangent Synergy Timeline Controller Installation manual

Unpack the case carefully and check for any shortages or shipping damage. Immediately report any shortages or damage to Snell and Wilcox Limited.

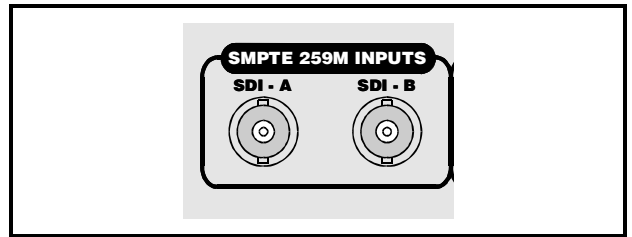
REAR PANEL CONNECTIONS

Signal Connections (Archangel One)

All the connectors are mounted on the rear panel of the unit and are appropriately annotated.

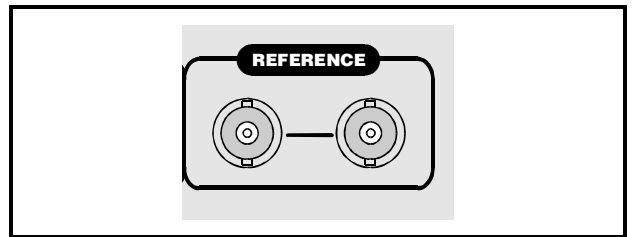
D1 Serial Digital Inputs A and B

These are the two SDI serial digital inputs.



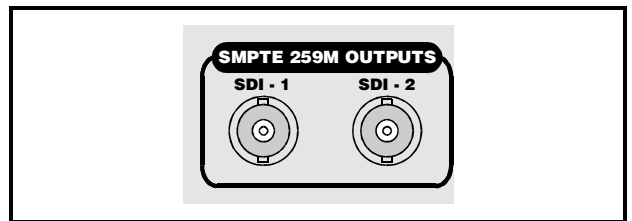
Reference

An external analog reference signal may be connected to these loop-through BNC connectors.



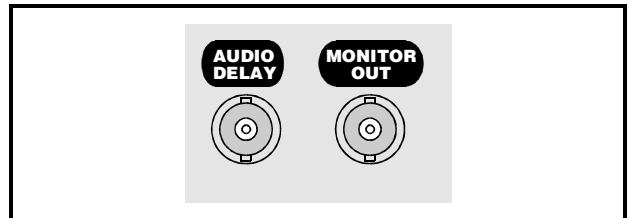
D1 Digital Output

Archangel One provides two serial D1 outputs.



AUDIO DELAY

This BNC connector provides a TTL level pulse that remains high for a period of time equal to the delay through the unit.



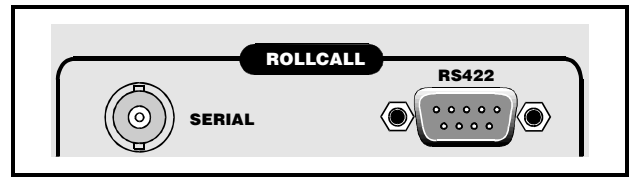
MONITOR OUT

A standard composite video output is provided for monitoring purposes.

Communication Connections (Archangel One)

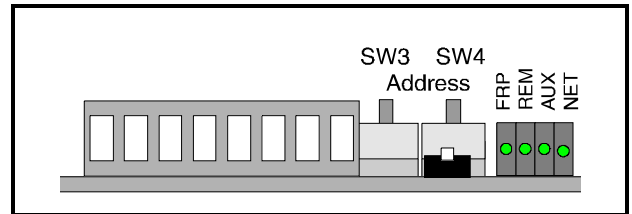
SERIAL (RollCall)

The unit can be controlled via RollCall using this BNC connector. Control can be also provided from an external source via an RS-422 9-way D-type connector.



The RollCall system should be connected using 75 Ohm "T" pieces in a similar manner to an "Ethernet" system. Both extremities of the system must be terminated in 75 Ohms.

A unique address for each unit on the RollCall system must be set by two Hex switches SW3 and SW4 on the OPI card. The address 00 is reserved and must not be used.



Hex Switches (Behind Card Edge Controls)

Both of these switches are used to define the Unit Address code for the equipment. They are only read at power-up.

All positions on these switches may be used to set the Unit Address code in Hex (SW3 switch 0 to F, SW4 switch 0 to F).

If an address is already in use by RollCall™ a message will be displayed on the front panel at power-up. The unit must then be powered-down, the code reset, and the unit powered-up again.

Note that in a RollCall™ segment, all units must have different unit address codes. For more information see RollCall™ section.

Note The coaxial link is bi-directional and therefore must not be passed through signal switching networks. Also, to allow hum and noise cancellation the screen of the coaxial connection must not be earthed.

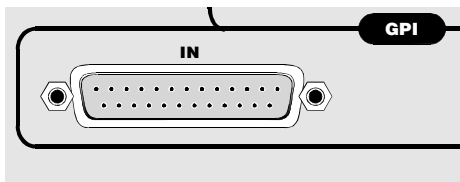
RS-422 Port

Pin	Function	Direction
1	Ground	
6	Rx signal common	
2	Receive -	Archangel One ← Remote
7	Receive +	Archangel One ← Remote
3	Transmit +	Archangel One → Remote
8	Transmit -	Archangel One → Remote
4	Tx signal common	
9	Ground	
5	Spare	

GPI (Archangel One)

GPI functions are implemented as follows:

GPI Inputs

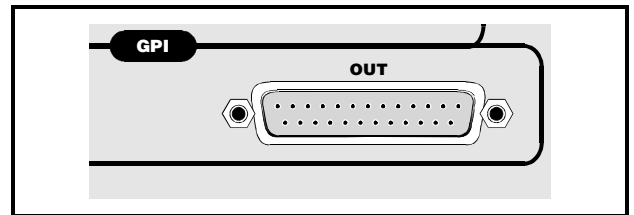


These are accessed via a 25 way D type connector labeled GPI Input.

GPI = GPI input

GPI input	Contact pins	Action
0	12, 25	Recall Memory 1
1	11, 24	Recall Memory 2
2	10, 23	Recall Memory 3
3	9, 22	Recall Memory 4
4	8, 21	Not yet used
5	7, 20	Not yet used
6	6, 19	Not yet used
7	5, 18	Not yet used
8	4, 17	Not yet used
9	3, 16	Not yet used
10	2, 15	Not yet used
11	1, 14	Not yet used
	13	Ground

GPI Outputs



These are accessed via a 25-way D type connector and connections are as follows:

GPO = GPI output

GPI output	Contact pins	Action
0	2, 14	Recall Memory 1
1	3, 15	Recall Memory 2
2	4, 16	Recall Memory 3
3	5, 17	Recall Memory 4
4	6, 18	Open
5	7, 19	Open
6	8, 20	Open
7	9, 21	Open
8	10, 22	Open
9	11, 23	Open
10	12, 24	Open
11	13, 25	Open
	1	Ground

The GPO output characteristics are as follows:

Operating Voltage Range	0 to ±60 V (DC/AC peak)
Maximum Load current	1.0 A (AC/DC)
Maximum On-State Resistance @ Tamb =+25°C	500 mOhm
Minimum Off-State Resistance @Tamb =+25°C,V=±48V	100 MOhm

GPI Overview (Archangel One)

The GPO provides contact closure tally outputs that can be used to turn on lamps etc.

GPO 0 tracks GPI 0 so if the display memory that GPI 0 recalls is active then GPO 0 will close. Similarly, GPO 1 tracks GPI 1 etc.

This functions even if the GPI inputs have been assigned different recall memories and if the memory was recalled via a front panel button rather than via the GPI.

GPI interface Delay

The GPI interface has a delay that matches the video processing delay through the unit.

Ideally, the contact should be closed a few lines after the vertical sync group of the reference video, and, should remain closed for at least one field period.

REAR PANEL CONNECTIONS

Signal Connections (Archangel Two)

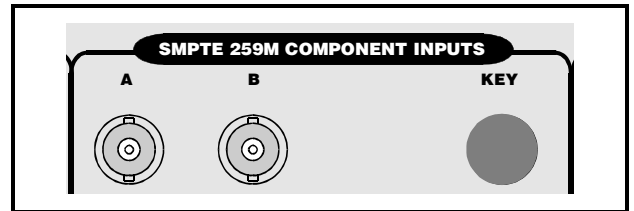
All the connectors are mounted on the rear panel of the unit and are appropriately annotated.

SMPTE259M Component Inputs – A ,B

These are the two SDI serial digital inputs.

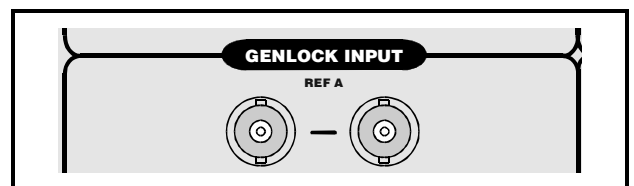
SMPTE259M Component Inputs - KEY

This input is not used.



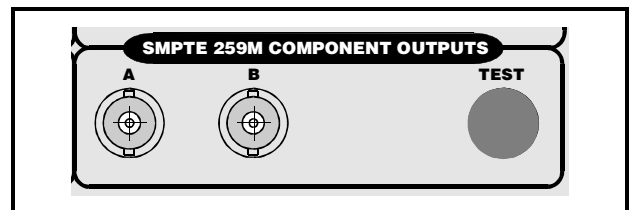
Genlock Reference

An external analog reference signal may be connected to these loop-through BNC connectors.



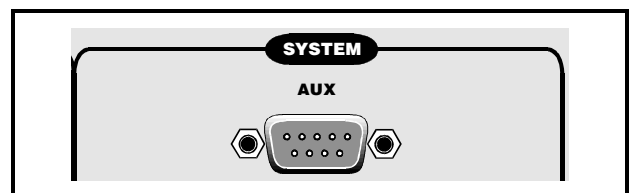
SMPTE 259M Component Outputs

Archangel Two provides two serial D1 outputs



System Aux

This is a RS422 slave interface which may be used to control Archangel Two by a control device.

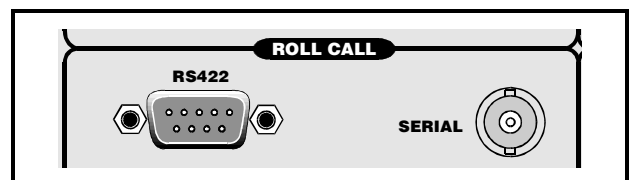


ROLLCALL (Serial)

The unit can be controlled via RollCall using this BNC connector.

The RollCall system should be connected using 75 Ohm "T" pieces in a similar manner to an "Ethernet" system. Both extremities of the system must be terminated in 75 Ohms.

A unique address for each unit on the RollCall system must be set. This is set using via the front panel or via RollCall. The address 00 is reserved and must not be used.



Note The coaxial link is bi-directional and therefore must not be passed through signal switching networks. Also, to allow hum and noise cancellation the screen of the coaxial connection must not be earthed.

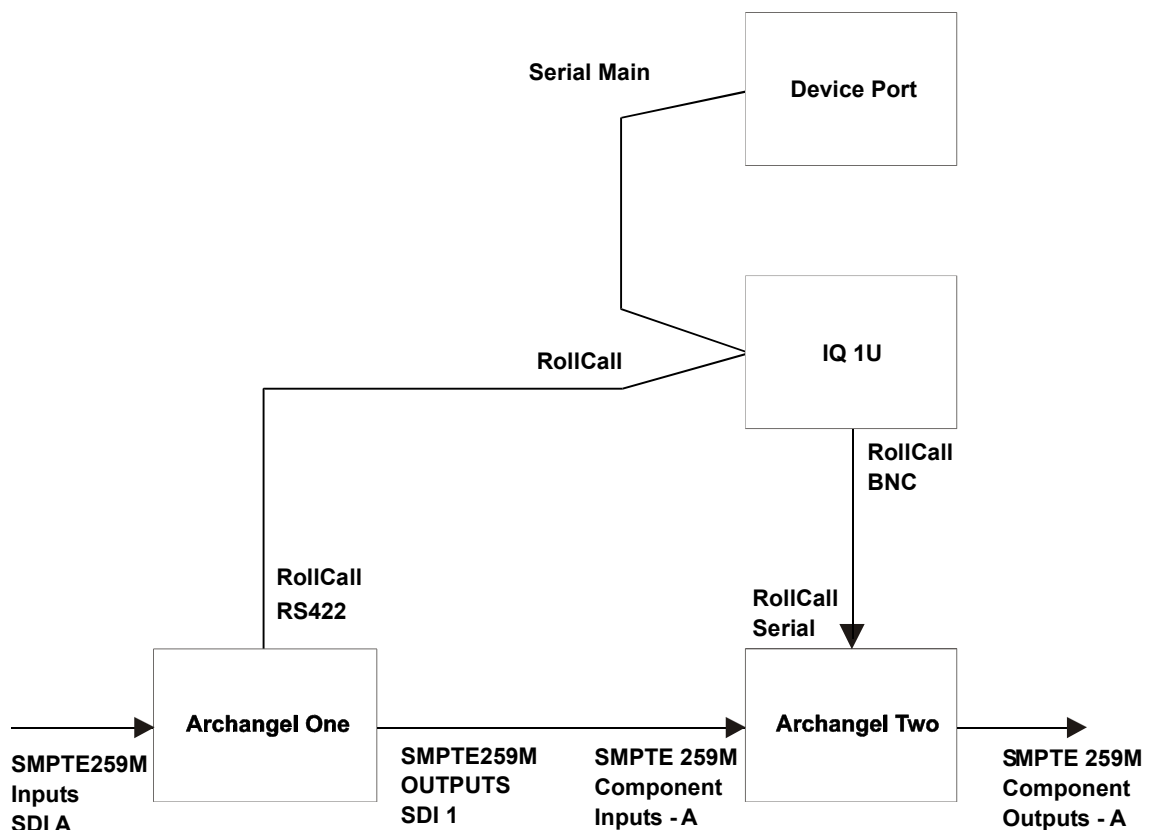
Installation with the Tangent Devices Synergy System

Archangel can be controlled using the Synergy system from Tangent Devices. The Synergy system is a flexible and expandable timeline controller that is used to control transport devices such as VTRs and processing devices such as Archangel.

For Full details of the Synergy system please see the Synergy User Manual and the the Synergy Instalation Manual from Tangent Devices Ltd.

Installation of Archangel with Synergy.

A Synergy device port is used to send real-time control commands to the Archangel on a serial RS422 link. A special cable (see Annex A) is supplied with the Archangel system for this purpose. The diagram below indicates how this cable is used.



The cable should be connected as follows: -

'Arch1' is connected to Archangel One connector named 'RollCall RS422'

'S Box' (middle connector) is connected to the IQ 1U connector named 'Remote'.

'Pogle' is connected to the device port allocated to control the Archangel on the connector named 'Serial Main'.

A RollCall connection must be made between the IQ1U and Archangel Two. This should be done using 75ohm cable terminated at each end with 75 Ohm. This is a RollCall connection, no other units should be connected to this network.

Note: A RollCall BNC connection should not be made to Archangel One. Since no other RollCall connections should be made the audio delay should be set manually. In the case where both Archangel are reference locked then the delay is 16 Frames (PAL) and 17 Frames (NTSC).

Archangel Configuration

Archangel One must be set to real-time, this is done from the front panel 'Real-time' is found in the Utils menu.

The RollCall address of Archangel Two should be set to 42.

Video Path

Archangel One: The input SDI video path should be connected, Input A or B can be used and this should be selected from the front panel. Either Output may be used.

Archangel Two: The output of Archangel One should be connected to Archangel 2. Input A or B can be used and this should be selected from the front panel. The SDI video output should be taken from Archangel 2, either of the outputs can be used.

Reference

The Reference inputs to Archangel One and Archangel Two should be connected to the same reference that is used for the video source and video recorder and the Synergy device ports. Genlock should be enabled on both units and any timing adjustments can be made.

The sync frequency in the Synergy system window should be selected to match the video and reference.

Protocol Version

The Synergy system allows for different version of the Archangel real-time control protocol to be used. The protocol is selected from the 'Room Configuration Window' section of the Synergy GUI, select the required protocol for the device port allocated to control the Archangel. The table below indicates which protocol should be selected.

Archangel protocol on Synergy	v2	v3
Archangel One	OPI 7,8	OPI 9 onwards
Archangel Two	NRS 2.xx	NRS 3.xx

The software versions on Archangel One can be selected from the front panel in the Utils\Diag\Test\Boards menu.

The software versions on Archangel Two can be selected from the front panel in the Utils\Ver menu.

All systems are currently shipped with the v3 protocol.

Archangel Control Cable Pin Connections

Archangel 1			3	8
IQ 1U	2	7	3	8
Device Port	2	7	3	8

Note that this cable is supplied with the Archangel Synergy system.

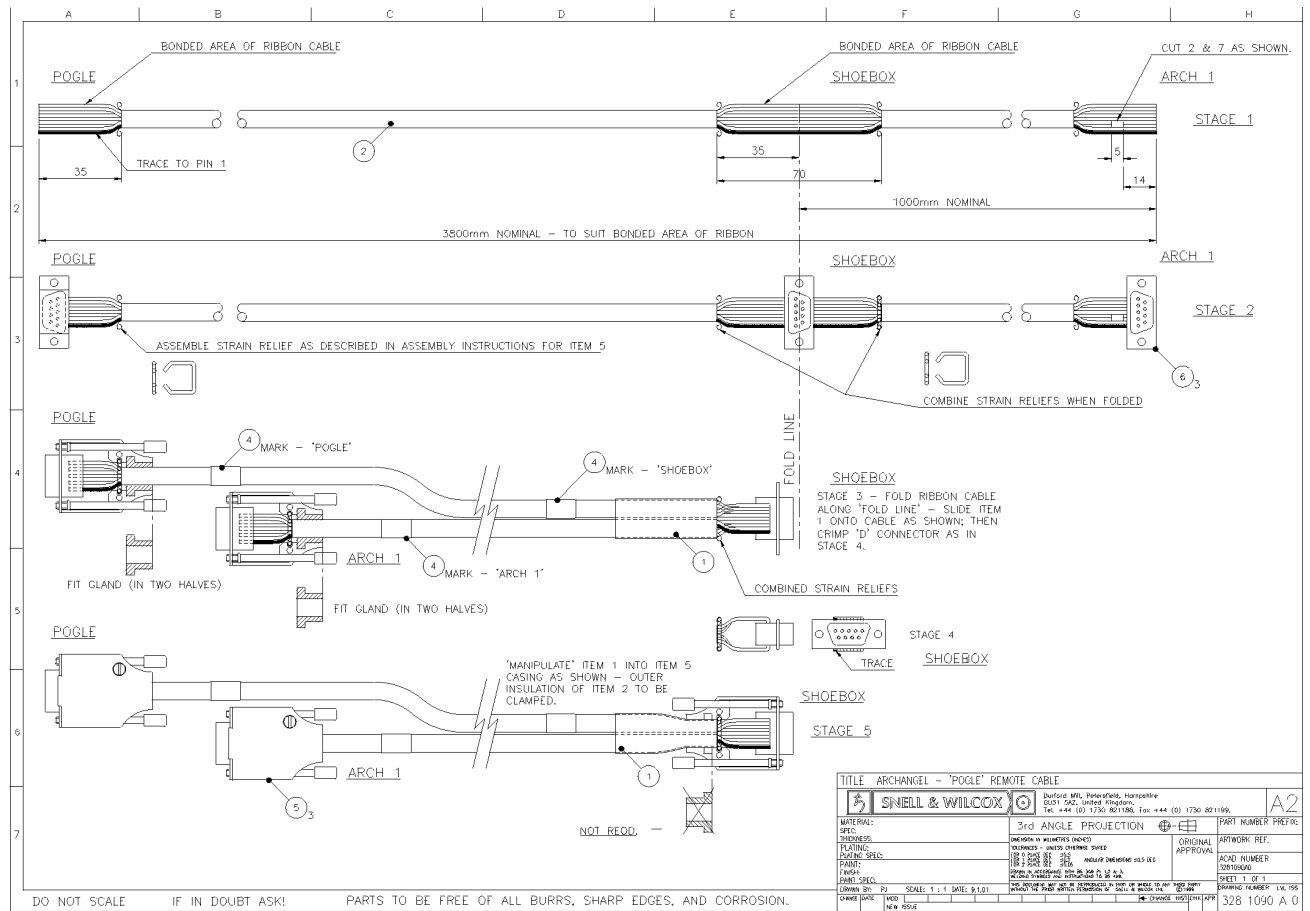
Configuration of IQ1U Enclosure

The toggle switch to the left of the Power Switch (front left of IQ1U) should be down (RS422 comms, NOT RS485).

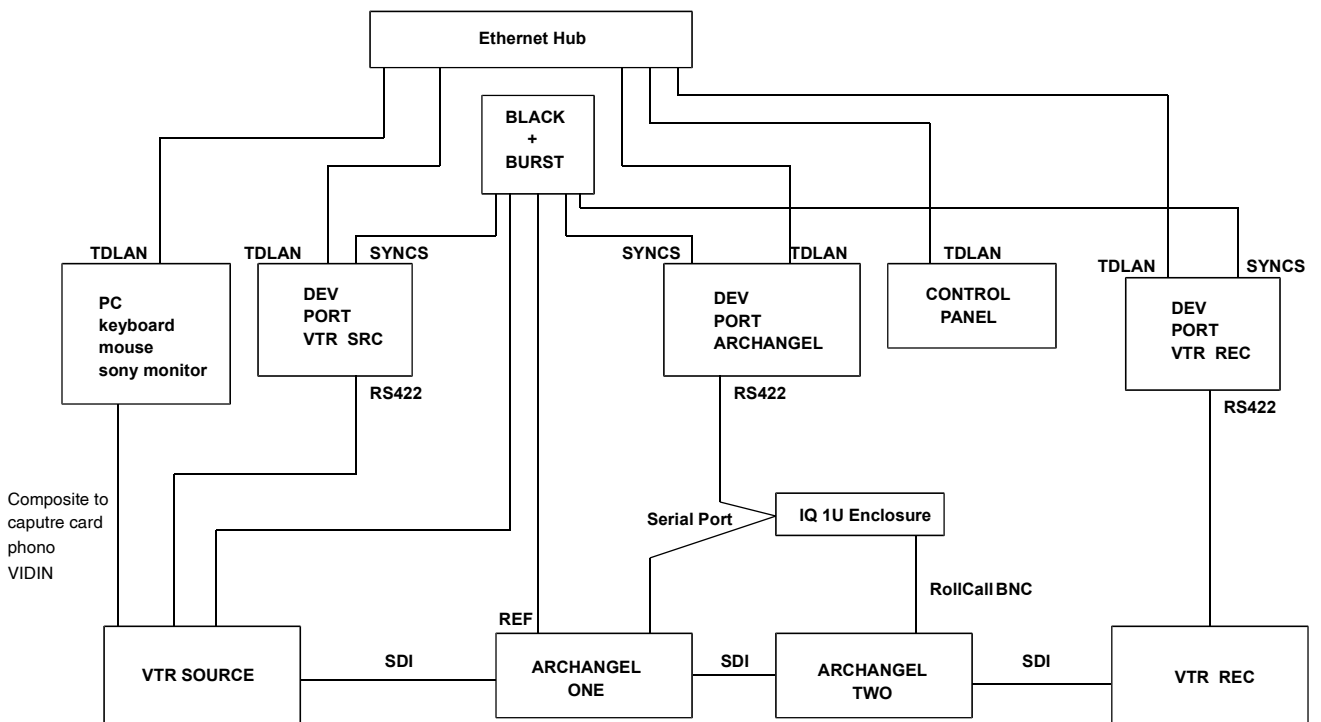
The following parameters should be set:

Port – 38400
System - blind ctrl

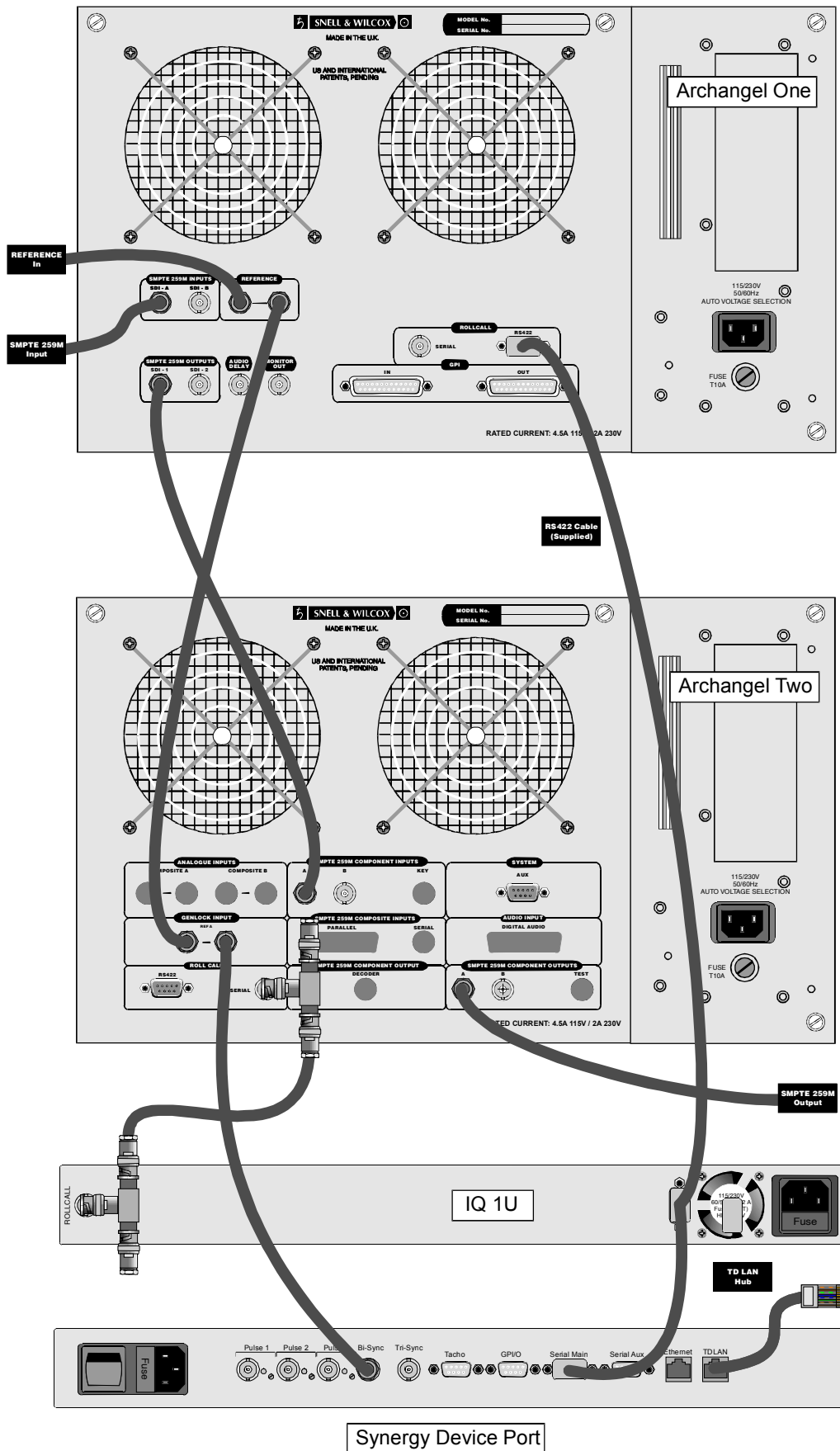
POGLE Remote Cable



System Block Diagram



System Rear Panel Interconnections



Technical Profile

Archangel One

Signal Inputs

Serial Digital To Rec 656 standard via 2 x BNC connectors.

Genlock Reference Loop-through input via BNC connectors. Analog Black and Burst

GPI 1 x 25 way D-Type Recall of memory settings 1-4

Signal Outputs

Serial Digital To Rec. 656 serial via 2 x BNC connectors.

Analog Composite (output monitoring) 1 via BNC Connector

GPI 1 x 25 way D-Type tally of memory settings 1-4

Delay Audio delay pulse, TTL high for delay time through unit, via BNC connector

Communications

Network Control RollCall via BNC connector

Remote Interface RS422 via 1 x 9 way D-Type.

Input Select SDI-A, SDI-B

Input Standard Select 625, 525 or Auto Select

Input Type Video, Film

Film Phase Auto 2:2 phase detect. Overrides: f1>f2, f2:f1 (625)
Auto 3:2 phase detect.

Latency 320ms (625Lines 50Hz)
Genlock Off / Input / External Reference

Genlock Horizontal Timing 0 to 863 pixels (625)
0 to 857 pixels (525)
in steps of 1 pixel.

Genlock Vertical Timing 0 to 624 (625) or
0 to 524 (525) lines
in steps of 1 line

Archangel Two

Signal Inputs

SMPTE 259M Inputs SMPTE 259M - C A input
SMPTE 259M - C B input

Input Return Loss Reference Loop Better than 17 dB at 270 MHz
Analogue loop-through input 1V pk-pk, 75 Ohm impedance

Reference Return Loss Better than 35 dB to 5.0 MHz

Signal Outputs

SMPTE 259M - C Outputs 2 off Outputs

Output Return Loss Better than 17 dB at 270 MHz

Communications

Serial Net RollCall™ Proprietary Snell & Wilcox interface
multi-drop via BNC-T network
System Communication 9 Pin D-Type RS422 Slave

Input Select SDI-A, SDI-B

Input Standard Select 625, 525 or Auto Select

Transfer Mode Can be field or frame based set by user or left to automatic detection.
Auto/Field Mode/Frame Mode
Film Phase Film 3:2 phase can be left in automatic mode or set to fixed phase.

(525) AUTO/Fixed Phase 0..4
(625) AUTO/F1/F2
Latency 340ms (625Lines 50Hz)
Genlock Off - Output free runs.
On (Ref/Input) - If the reference is not present or invalid, then the genlock source will be the Input

H-Lock 0 - 63455nsec (625)
[0 - 1727 samples]
0 - 63899nsec (525)
[0 - 1715 samples]

V-Lock 0 - 624 lines (625)
0 - 524 lines (525)

Archangel One

Memory	4 Locations (contain front panel control settings)
Output Blanking Horizontal	Off / 704/696/688 pixels preset plus adjustable to individual pixels.
Output Blanking Vertical	Off / 4:3 / 14:9 / 16:9 letterbox presets plus adjustable to individual lines.
Aperture Correction Horizontal	Up to +9 dB Enhancement (at 3.375 MHz)
Aperture Correction Vertical	Up to +6 dB Enhancement (at 156.25 cph)
Color Balance	Red/White: ±25% Red/Black Level: ±25% Blue/White: ±25% Blue/Black Level: ±25%
Black Level	±88 mV
Video Gain	±6dB
Chroma Gain	±6 dB
Y/C Displacement Horizontal	-450 ns to +600 ns with 1/32 pixel resolution (2.31 ns)
Luminance Clipping	Off / On
Gamut Limit	Off / On
Utilities	Monochrome Freeze: Field / Frame
Demonstration Modes	Unsteadiness cross hairs and graph Diagnostics Internal Temperature Checking Internal Voltage Checking GPI group containing Input On/Off and Output On/Off
Rollcall	RollCall Name LogServer and Logging On/Off
Audio	RollTrack™
Patterns	Internal Test patterns 100% Bars,75% Bars,EBU Bars,Y Ramp, UV Ramp, Y Sweep, UV Sweep, Bowtie
Bypass	Non-corrected output Modes: Unsteadiness & Flicker / Unsteadiness, Flicker & ProcAmp

Archangel Two

User Memories	Store Recall User Recall Preset Set name	User defined memory slots 1 - 8 User defined memories 1 - 8 Recall Preset memories or Factory Set Memory Name 1-8(user defined) 19 characters ASCII character set
Profiles		A range of preset profiles are provided to cater for a wide range of noise types and impairments.
Utilities		Monochrome Freeze: Field / Frame PhC On/Off
Demonstration Keys		Allows split screen facilities to monitor effect of digital filtering applied to the key area only Off, H-Split, V-Split, H-Repeat, PhC Repeat
Rollcall		RollCall Name LogServer and Logging On/Off
Audio		RollTrack™
Patterns		Internal Test patterns Black/EBU Bars/100% Bars/100% Ramp/UV Ramp/Y Sweep/UV Sweep/Bowtie
Bypass		Single command BYPASSES ALL filters

Signal Processing Specifications – Archangel One

Unsteadiness	
Correction Level	0 – 60% of picture in steps of 0.25%
Overscan	None (add blanking around edges)/ Correction Level (overscan to fill screen)
Unsteadiness Process	Off / On
Cut Detector	Off / On
Algorithm Adjustments	Select screen area Unsteadiness effort unsteadiness motion profile (rock steady, pan, etc.) Cut detector sensitivity
Interpolation	Selection of proprietary temporal-spatial apertures
Internal Processing	13.5 MHz 10-bit (Y) 6.75 MHz 10-bit (Cb, Cr)
Video Apertures	Video Normal Video to Film Video Anti-Alias
Film Apertures	Film Normal Film Sharp Film Anti-Alias
Flicker	
Flicker Process	Off / On

Signal Processing Specifications - Archangel Two

Dirt	Controls the parameters of the dirt detector	Keys	
Level	Sets for dirt filter -3 to -1, Normal, 1 to 9	Keys 1 to 4	Up to 4 rectangular user defined keys can be specified to control the area processed by the dirt or scratch filter. If none of the keys are enabled the entire picture is processed. The keys are processed on a priority basis, highest enabled key number has priority. Key controls for each key are:- Key Enable
Type	Controls the type of dirt to be filtered:- All, White + Dust, Black + Dust, White, Black, Black + White, Dust	Key	
View	View detected dirt and protected areas	Dirt/Tramline Left	Select which filter is to be processed by the key Left key coordinate in Y pixels
Tramline Scratch		Width Top	Key width in Y pixels Top of key as a percentage of picture height
Scratch strength	Variable 1-4, Full	Height	Height of key as a percentage of picture height
Scratch Width	Variable scratch width setting, range 1 to 5	Invert	Process area outside the key
Overshoot	Scratch overshoot correction 1 to 4	View	Colored overlay for key if key is enabled.
View	View detected scratch.		

Noise and Grain Recursive Filter	Motion-compensated Recursive Noise reduction	Dropout	Non correlated dropout enable/disable
Level	This defines the maximum amount of recursive noise reduction, level 0-15	Level	ON/OFF
Threshold	This defines the sensitivity of the recursive filter to movement, level Auto/1..15	View	View detected dropouts
Fallback	This defines the amount of spatial fallback, level 0..15		
View	View corrected recursive noise	2 Inch Scratch	Filter targeted specifically at repetitive defects from 2 inch tape machines
		Repeat	Special filter for correlated scratches range 1 to 62
Enhancer	Spatial 2D enhancer utilizing separately derived non-linear and linear edge detection and compression	Rep Level	View detected scratch
Gain	range -7 to +31	View	
Coring	range 0 to 4	Linear Filter	15 tap linear digital filter
Horizontal Boost Frequency	1MHz to 5MHz	Mode	Brickwall with Boost, Brickwall, Gaussian
H/V Balance Advanced	range -15 to +15	Cut-Off	Full bandwidth 4.2MHz to 2.5MHz Brickwall Low Pass.
Diagonal Control	range -2 to +2	Boost	Can be used to correct for HF loss with boost setting on full bandwidth. Level : None/1/2/3/4.5/6dB
Adaptation	off/med/full	Cut-Off	Extra low pass filters, no boost 2.44MHz to 0.94MHz
		Gaussian	Gaussian filters can be used to de-enhance previously enhanced material without substantial loss of horizontal resolution. -4 to -40dB (6.75MHz) in 4dB steps.
Spatial Filter	Multiband spatial filter	View	View removed noise
Luminance/Chrominance Spatial band	AUTO, 0- 31 Level Setting for each band high frequency diagonal, vertical horizontal low frequency diagonal, vertical ,horizontal		
View	View detected noise for <u>all</u> spatial bands		
Solo	View detected noise <u>within</u> selected band		