SEC_4861
03.25

NV LogIQ Power Supply

Technical Information & Operating Instructions

SE CONTROLS

Introduction

The NVLogiQ PSU is an adaptive Environmental Ventilation single zone control panel and can be networked in multi zone projects.

It has the ability to operate on its own through manual switches, or it can be connected to the BMS to manage the AOVs as required.

The NVLogiQ PSU can be installed into new and refurbished buildings where there is a focus on indoor air quality and energy saving.

The physical size and appearance has been purposely designed to enable surface mounting for new and refurbishment projects.

Application

The NV LogIQ Power Supply is a 24 Volt dc control system designed for 2-wire 24V dc actuators in a natural ventilation system.

Operating from a 230 V ac 2.0 A supply, the NV LogIQ Power Supply can deliver 4.8 A (NPS00010002) for short periods to motorised actuators.

The NV LogIQ Power Supply can be mounted locally to the devices to be operated or in a centralised, plant room location. Each NV LogIQ Power Supply can operate independently or can be linked to others to produce a networked control system.

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Contents

Important Notices

- The equipment has no mains on/off switch and is intended for permanent connection only.
- Do NOT make connection to the external supply using a plug.
- Do NOT allow abuse or mishandling of the device.
- Do NOT adjust or alter the device or its enclosure including labelling/marking.
- Do NOT use this controller for any other purpose other than that intended by the manufacturer.
- Do NOT allow installation of this equipment by persons not electrically qualified.
- Damage to the equipment due to failure to test the electrical integrity of external wiring will invalidate any warranties.
- Failure to install the device in accordance with the manufacturer's instructions will invalidate any warranties.
- Failure to follow current electrical regulations governing the installation of fixed equipment can lead to prosecution and may invalidate any warranties.
- Unless otherwise indicated, you must not adjust or remove existing manufacturers cabling or use terminal outputs or inputs for purposes other than their design without written authorization from SE Controls.
- Consumable items e.g. fuses & batteries where replacement is needed must be replaced with parts of equivalent manufacturing standard/ compliance and rating.

SE Controls accepts no liability for failure to comply with these statements or the installation and operation guidance in the following sections of this guide and reserves the right to invalidate the warranty of the controller

SE Controls reserves the right to introduce any modifications and improvements to the contents of this publication without the obligation of giving prior notice.

1. General Information

1.1. Packaging

The controller comes in a cardboard box labelled with the S E Controls logo.

1.2. Preparation

After unpacking the controller, use a Torx T10 screwdriver to unfasten each of the four enclosure screws to allow removal of the control unit lid. Care should be taken whilst the cover is removed to protect against damage to the internal electronic assemblies and light pipes.

1.3. Location

The NV LogIQ Power Supply is intended for indoor use only. The unit is environmentally rated to ingress protection IP20 and should not be located where exposure to damp/moisture or significant amounts of dust is likely. In particular, do not mount the controller in extreme environments such as cold rooms/ovens and those areas classified as having potentially explosive atmospheres.

Fix the NVLogIQ Power Supply onto a flat, stable surface. Ensure that the surface can support the weight of the controller once it is securely mounted. The controller may be mounted in either of the following positions: beneath the floor, or on a vertical surface such as a wall.

As the NVLogIQ is a convection-cooled power supply consideration must be given to heat radiation and safety, therefore allowing for a minimum of 25 mm air circulation gap around the unit when mounted.

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1.4. Fixing

Mark through the mounting holes (3 off) on the NV LogIQ Power Supply base plate assembly. It is important to drill pilot or fixing holes of the suitable size and employ plastic plugs or cavity fixings when necessary.
To firmly secure the base plate, make use of pan head or countersunk screws that are of the appropriate size.

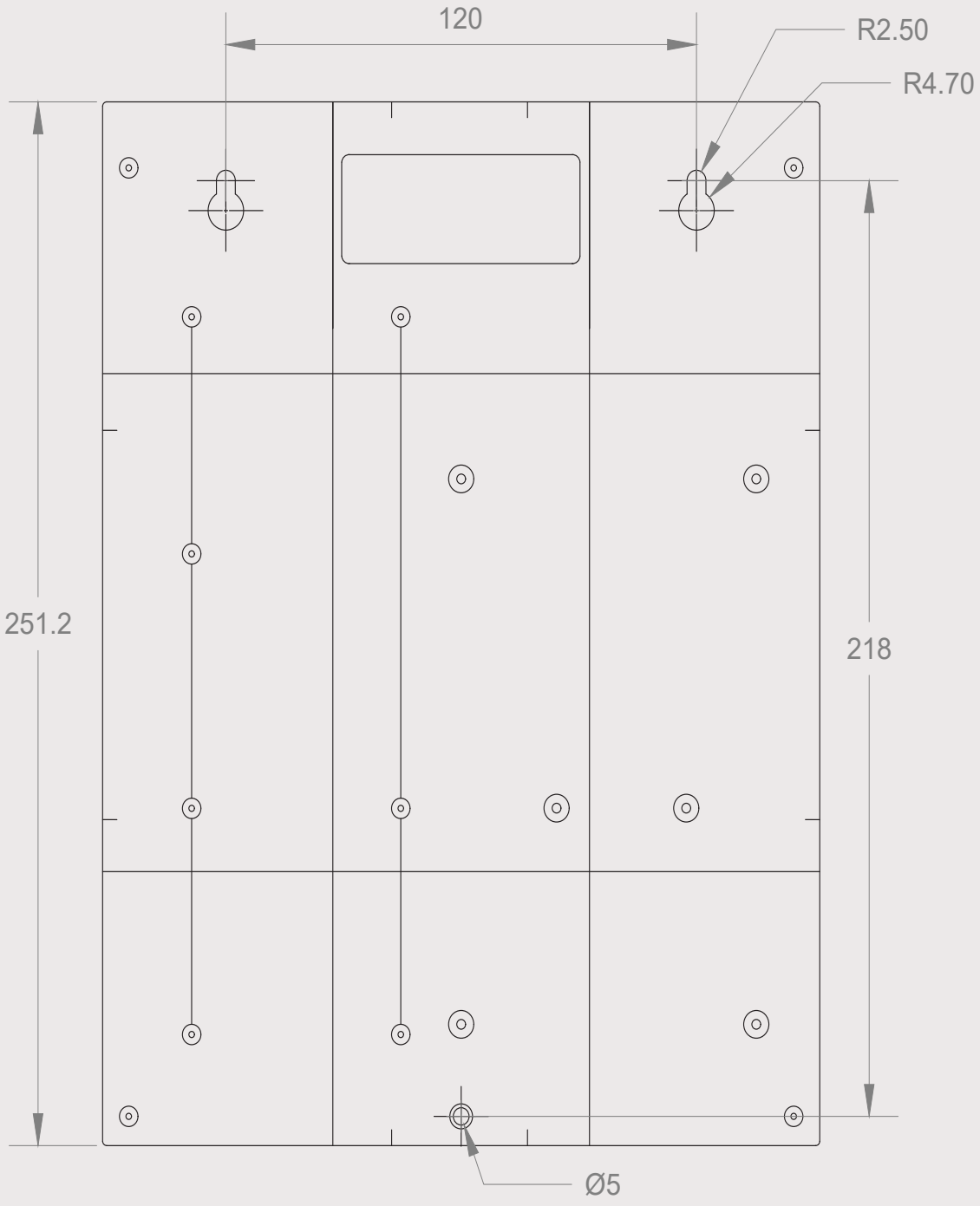


Figure 1 - Fixing Hole Locations

1.5. Disposal

Do not dispose of electronic equipment with household or general commercial waste. For advice on disposal consult the local environmental officer, a recycling or waste management specialist or have them removed for correct disposal during regular planned preventive maintenance programs (contact SE Controls for details).

1.6. Contact Information

For sales, technical support and maintenance please contact:

SE Controls
Lancaster House
Wellington Crescent
Fradley Park
Lichfield
Staffordshire
WS13 8RZ

Tel: 01543 443060

E-mail: info@secontrols.com

Website: www.secontrols.com

1.7 Certification

SE Controls hereby certify that the parts and services detailed hereon have been manufactured, inspected, tested and supplied in accordance with the conditions and requirements of the procedures as documented in the Company Quality Assurance System to ensure conformance with SE Controls' specifications, and with the contract or order conditions of our BS EN ISO9001:2015 registration.

UK CA

Our equipment is built and tested in accordance with the requirements of EN 12101-10:2005/AC:2007. Certification may be provided on request.

2. Specification

Part Number	NPS00010002
Dimensions	280 x 190 x 55 mm (W x H x D Approx)
Mass Approx	1.2 kg
Supply	Class 1 Supply 230 V ac 50/60 Hz from a fused unswitched spur
Power Consumption	Max 500 V A
Typical Output Voltage[1]	100 - 120 V ac 3.5A 200 - 240 V ac 2.0A
Output[2]	4.8 A Max actuator run current
Real Clock Battery Time	10 years
IP Rating	IP 20
Humidity Range	10% to 90% (Non-condensing)
Storage	-20°C to +75°C
Operating Temperature	-10°C to +50°C
Cable Entry	Cable entry: via five off 20 mm end mounted cable glands

[1] For 115V ac operation, the mains input voltage selection switch must be set on the internal power supply.
[2] Start up peak current needs to be considered and can vary depending on actuator type. Derate linearly to 70% load from +50 to +70°C.

Note: 0-10 Volts signals must remain stable and 'spike' free for a period of 2 seconds before the controller will respond to them. In 10% step mode, the controller only responds to 0-10V signals in steps of whole volts +- 250 mV. In 5% step mode, each step is half a volt.

3. Connections

3.1. Assembly and Mains Connection

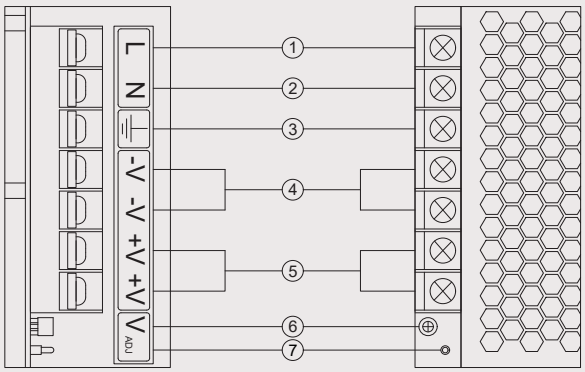
Wiring to the NV LogIQ Power Supply can be direct to the unit via the cable glands entry points. Alternatively for cosmetic flush/surface mount applications the wiring can be passed through the cavity located in the rear of the NV LogIQ Power Supply.

It is recommended that the required number of cable entry glands are assessed and fitted at this point. Blanking plugs and 22 mm glands are provided for this purpose.

Ensure that the recommended fuse is removed from the mains spur. Connect to the L; PE and N screw terminals of the mains power supply within the NV room controller to a fused un-switched spur, using flexible 2 core and earth cable capable of carrying 2A 230 V ac (3.5A for 115 V ac). Note that the terminal entries have openings suitable for use with up to 2.5 mm² cable.

If no further wiring is to be connected at this time, ensure that the recommended fuse is removed from the mains spur. This fuse must not be replaced until all assembly/connection stages have been completed.

Note: To ensure EMC and safety compliance connect FG terminal to Ground termnal (-V) of the equipment



(1) L : Input terminal Live line (Fuse in Line)

(2) N: Inout terminal Neutral Line

(3) FG ⊥ Functional Ground

(4) - V :- Output Terminal

(5) +V :+ Output Terminal

(6) Output voltage adjustable trimmer

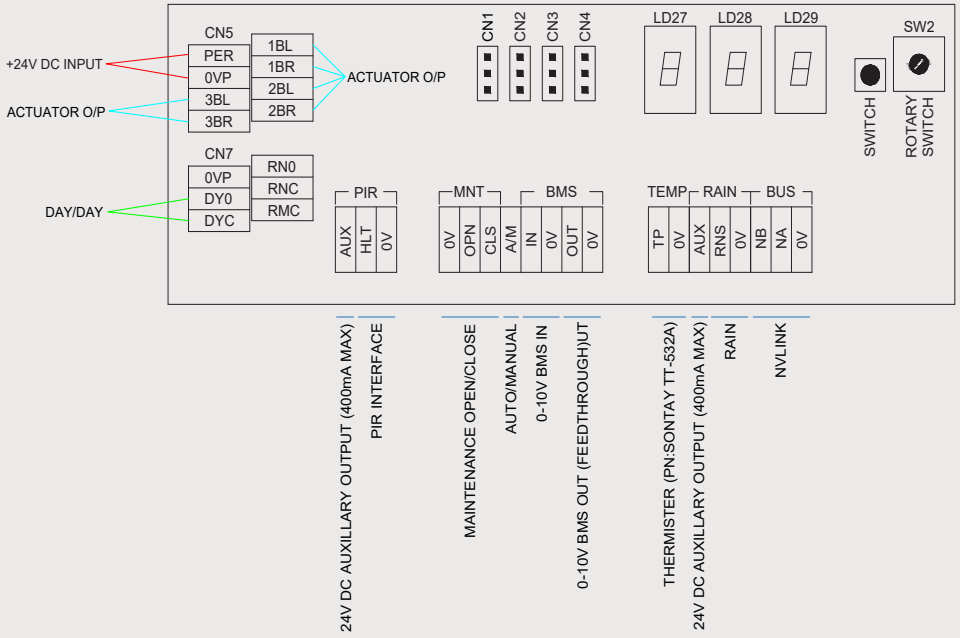
(7) Output monitoring indicactor (Green LED:ON)

Figure 2 - 4.8Amp PSU Connection

You are now ready to connect to other external devices.

3.2. NV Room Controller and Connections

Note: Connection details appear on a label affixed to the inner face of the lid of NV power supply.



3.3. ‘DYO/DYC’ - Open and Close Day/Day (VFC) Input

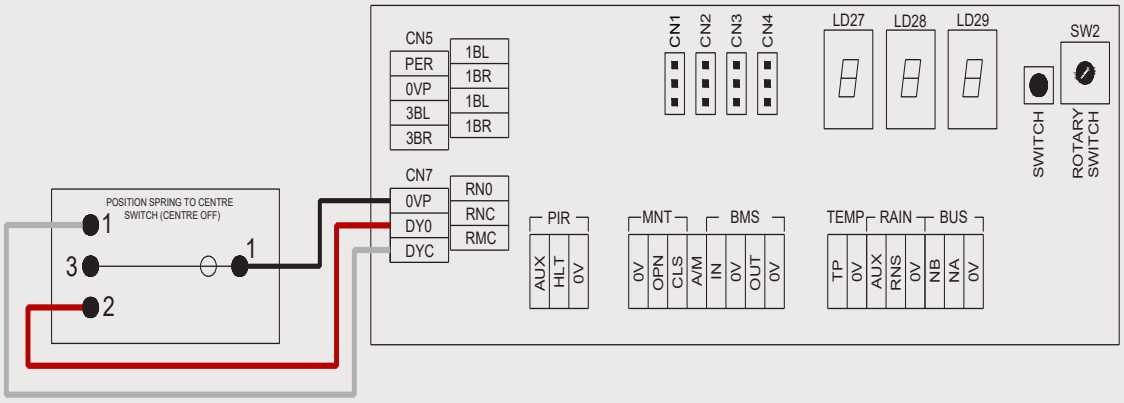
The ‘DYO’ & ‘DYC’ (Day to Day) functions are activated by means of an external volt free contact (VFC) signal (usually provided in the form of a momentary switch). An asserted input is used to manually open or close the connected actuator (via 24V dc actuator drive output connection).

Connecting DYO (open) or DYC (close) contact to 0V will open or close all attached actuators (if the auto/manual input is in manual mode). It is recommended that a retractive 3 position switch having 2 normally open contacts is used.

In operation, power is applied to the actuator only during the period when one of the switch contacts is closed.

Note #1: The ‘DYO’ & ‘DYC’ functions are only operable if the AUTO/MANUAL mode of operation is set to ‘MANUAL’ mode).

Note #2: Any operation of DYO or DYC Day to Day function will automatically lockout (override) the BMS demand input (either via the 0-10V dc input or NVLINK) for the period defined by the BMS Lockout period parameter (See SW2 – Position ‘1’ function mode).

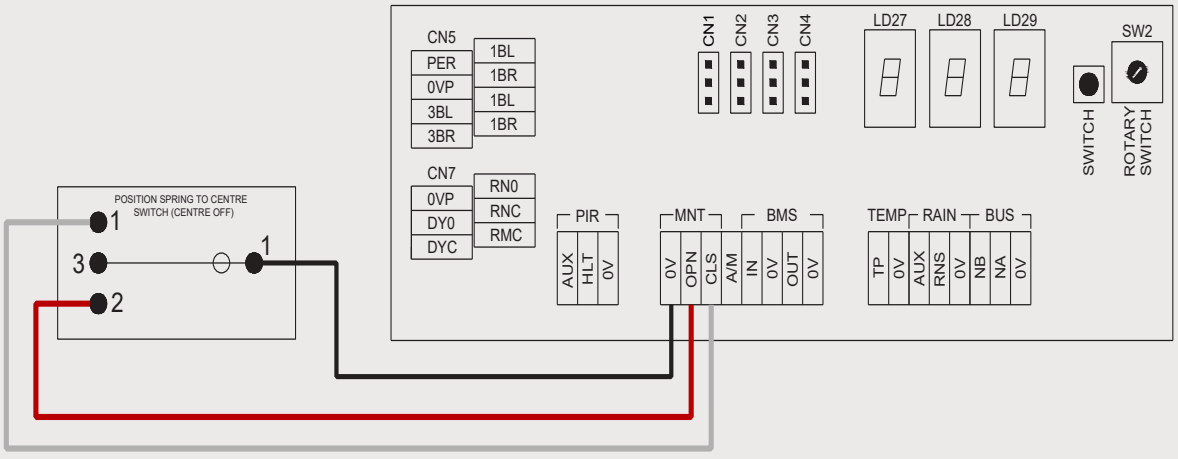


3.4. ‘OPN/CLS’ - Maintenance Open and Close (VFC) Input

The ‘OPN’ & ‘CLS’ inputs offer a remote OPEN/CLOSE window function for maintenance/caretaker purposes (e.g. building lockdown). The function is activated by means of an external volt free contact (VFC) signal (usually provided in the form of a latched key switch). An asserted input is used to open or close the connected actuator (via 24 V dc actuator drive output connection).

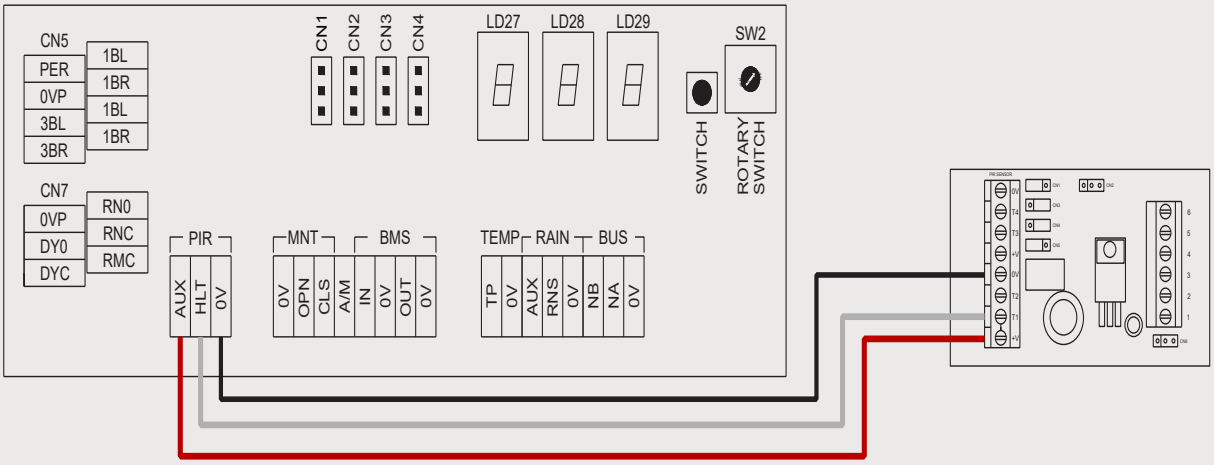
The maintenance open/close input provides a remote input for closing all actuators (e.g. for building lock down) and for opening all windows (e.g. maintenance).

Note #1: The ‘OPN’ & ‘CLS’ maintenance functions are only affected by PIR input. The Rain Sensor input (‘RNS’) will not override the maintenance open function. See Section 6 - Hierarchy of functions



3.5. ‘HLT’ - Halt (VFC) Input

The ‘HLT’ (halt) function is activated by means of an external volt free contact (VFC) signal, generated by an attached **PIR interface (SE Controls Part No: APS010PIR24)**. Power for the PIR sensor can be obtained from the ‘AUX’ contact (24 V dc auxiliary supply (current limited to 400 mA)). **Please see the PIR Sensor installation guide for wiring instructions.**



An asserted VFC signal from the PIR unit is used to halt any window actuator movement, in the closed direction only, hence, reducing the risk of potential harm due to entrapment.

The PIR input will halt the movement of any running actuator whilst the VFC is applied (shorted to 0V).The actuator will continue to move when the PIR signal is deactivated (open circuit).

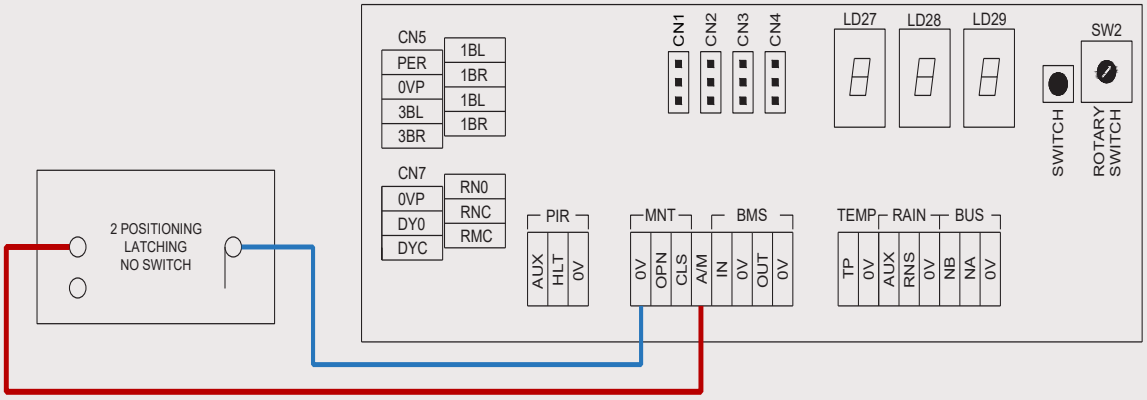
3.6. ‘A/M’ = Auto/Manual (VFC) Input

The ‘A/M’ (auto/manual) function is activated by means of an external volt free contact (VFC) signal (usually provided in the form of a latched switch).

An unasserted (open) VFC input on the AUTO/MANUAL inputs places the unit into ‘MANUAL’ mode, where the system will respond to ‘Day to Day’ manual inputs.

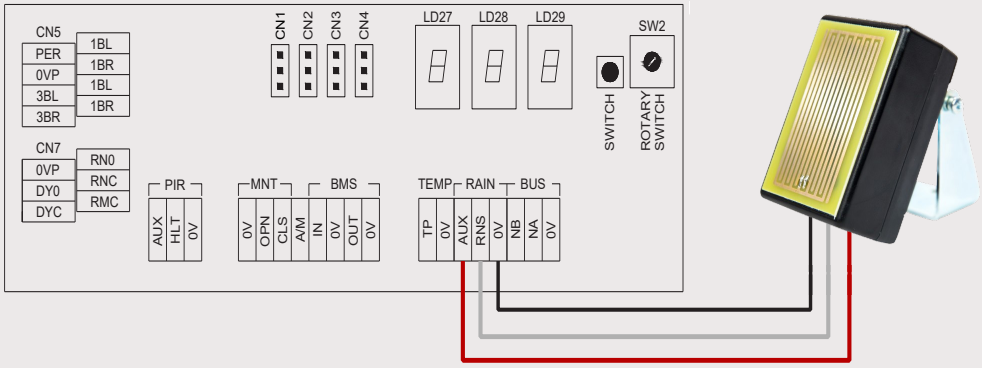
Note #1: Any operation of DYO or DYC Day to Day function will automatically lockout (override) the BMS demand input (either via the 0-10V dc input or NVLINK) for the period defined by the BMS Lockout period parameter (See SW2 – Position ‘1’ function mode).

Conversely, an asserted (shorted) VFC input on the ‘A/M’ inputs places the NV LogIQ Power Supply into‘ Auto’ mode, where any manual [DYC or DYC] Day to Day operation will not respond to user input, and, any running BMS lockout period is cancelled (i.e. the unit will immediately respond to the current BMS input demand.)



3.7. 'RNS' - Rain Sensor

The 'RNS' rain sensor function is activated by means of an external volt free contact (VFC) signal, generated by an attached rain sensor interface **(SE Controls Part No: FCS00200400)**. **Please see the rain sensor installation guide for wiring instructions.**



An asserted VFC signal from the rain sensor unit will drive the actuators to a fully closed position to mitigate the potential risk of water damage due to any open windows or vents.

Note #1: The location of the sensor is important for correct operation of the system. Please refer to the manufacturer's rain sensor instructions for installation purposes.

It may sometimes be acceptable for windows and vents to have limited opening during rain periods. In these instances the allowable amount of window opening during rain is set via SW2 – Position '3' function mode. Under these conditions the NV LogIQ Power Supply will follow the BMS demand up to the set allowable open position during rain.

The DYC manual Day to Day close function will still operate whilst the rain sensor input is active (if the AUTO/MANUAL input is in 'MANUAL' mode).

Note #2: The operation of DYC function will automatically lockout the BMS input demand (either via the 0-10V dc input or NVLINK) for the period defined by the BMS Lockout period parameter (See SW2– Position '1' function mode).

Power for the rain sensor can be obtained from the 'AUX' contacts (24 V dc auxiliary supply (current limited to 400 mA)).

Note #3: The Rain sensor input ('RNS') will not override the maintenance open function. See Section 6 - Hierarchy of functions.

When the rain sensor dries out and the RNS input clears, the rain/wind lock-out timer is initiated (see Switch Pos '4' - Rain/Wind lockout time). Once this lock-out timer elapses, all natural ventilation controls are re-enabled. If applicable, the position of the vent will automatically go to current BMS demand position.

3.8. 'IN' - BMS 0-10V Positional Demand Input

The 0-10 V dc BMS input provides proportional positional control (in 10% steps of the 100% actuator runtime (See SW2 – Position 2 function mode) via the simple high impedance (57kΩ) input.

Applying a dc voltage in the range 0-10 V to the 0-10 V BMS input relative to 0V will cause the controller to move the actuator to a position which assumes 1V=10% opening.

The user can override the demanded 0-10 V BMS by virtue of the 'DYO' & 'DYC' Day to Day inputs (if the auto/manual input is in manual mode). Any operation of DYO or DYC Day to Day function will automatically lockout (override) the BMS demand input (either via the 0-10 V dc input or NVLINK) for the period defined by the BMS Lockout period parameter (See SW2 – Position '1' function mode).

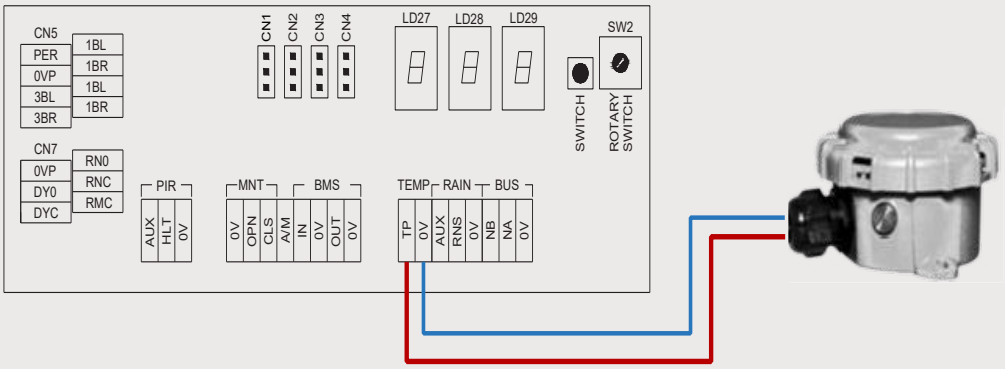
Note #1: The accuracy of the window position vs. the BMS demand may be affected by the window mass or fluctuations in the actuator drive speed. To maintain positional accuracy, the actuator can be forced to return to the home (fully closed) position before commencing movement to the demanded position. The number of movements before an enforced fully closed is governed by SW2 – Position 'B' function mode.

Note #2: The auxiliary relay can be set to trigger at a predetermined BMS input level (see SW2 –Position '7' & '8' function mode.)

3.9. 'TP' - Thermister Input - Legacy Use Only

If the NV LogIQ Power Supply is to be used in conjunction with the NV LogIQ Room controller(s), a single external temperature sensor must be fitted to one of the systems NV Power Supplies. The NV LogIQ Power Supply is designed to operate with the 'Sontay TT-532-A' outdoor air sensor (with radiation shield).

Note #1: The location of the sensor is critical to ensure the correct operation of the system. Please refer to the manufacturer's instructions for installation purposes.



Note #2: Once fitted to the NV LogIQ Power Supply, the measured temperature can be monitored on the 3 digit display by setting SW2 position to function mode 'A'.

Note #3: Room controller/external thermister is only listed for legacy use. Items are no longer available.

3.10. 'xBR' and 'xBL' Actuator Inputs - Legacy Use Only

The NV LogIQ Power Supply has a single, current limited 24 V dc actuator output channel.

The output channel has three terminals (1BL/1BR, 2BL/2BR & 3BL/3BR) to simplify the connection of multiple motors.

The output state of power supplied to the xBL & xBR terminals is indicated by the colour of LED 22 [RED = Actuator drive open / GREEN = Actuator drive close / OFF = No actuator drive]

Any connected actuator(s) should be wired ensuring this convention is maintained.

The actuator output current capacity is dictated by the installed power supply (either 3 Amps or 4.8 Amps). The actuator output current limit level is set via the position of jumper CN1. **The jumper position is set during manufacture and should not be changed. Changing the jumper position of CN1 can result in permanent damage to the system.**

Note #1: The current draw can monitored on the 3 digit display by setting SW2 position to function mode 'E'

Note #2: If the electronic current limit level is exceeded (see 'Fault Codes'), reduce the actuator load and reset the current limiter (by setting SW2 position to function mode '0' and depressing SW1for 5 seconds.)

Note#3: 3 A only reference for legacy installations. 3A version is no longer available.

3.11. 'NA' and 'NB' - NVLink

To reduce cabling, some common system signals can be linked amongst NV LogIQ Power Supplies byusing the NVLINK network:

- Rain sensor (Note: To disable this networked item fit CN4)
- Auto/Manual (Note: To disable this networked item fit CN2)
- Maintenance Open/Close (Note: To disable this networked item fit CN3)

Connections NTA and NTB are used for SE Controls NVLINK network connection. To ensure immunity from electronic interference all network connections should be made using an approved RS485 cable (e.g. Belden 9841). A good reference document for information on RS485 connections can be found at http://www.ti.com/lit/an/slla272b/slla272b.pdf

3.13. ‘PER’ and ‘OVP’ - Power Input

The PER & 0VP are the connections points for the + 24 V dc power feed from the mains transformer.

4. Switches

4.1. Rotary Switch (SW2)

The Rotary switch (SW2) provides a selection method for the required operational settings or function monitor. The push button switch (SW1) is used to increment/change the selected value operational setting and reset any system errors (e.g. actuator over current)

Switch	Detail
SW1	Push button – Used to increment the selected function parameter (see SW2) (Single press for the default increment or hold for stepped increments)
SW2	Function parameter selector (see table on page 15)

4.1. Rotary Switch (SW2), Continued.

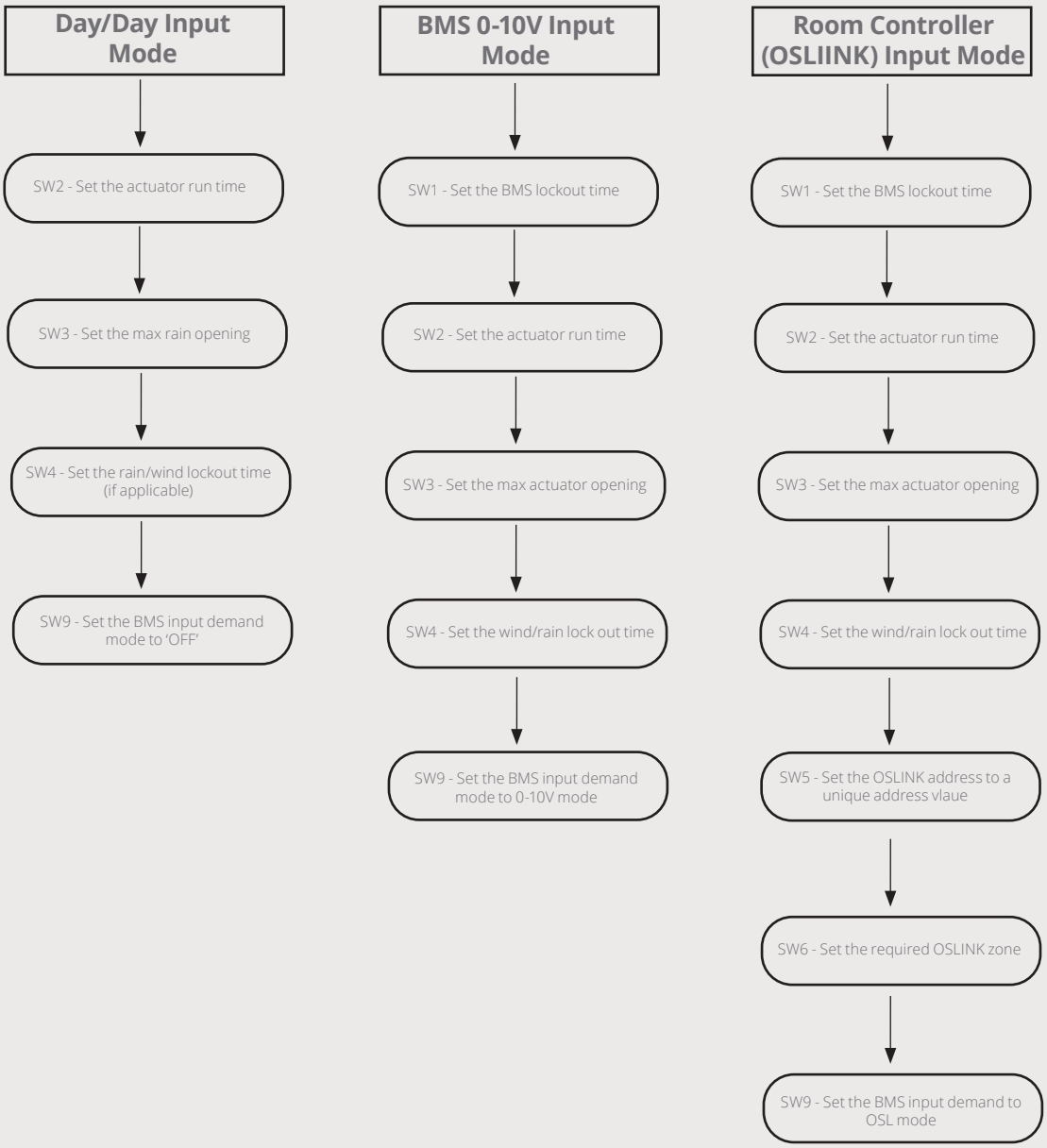
SW2 Position	Display Character or Settable Range	Description
Switch Pos '0' - Input monitor mode	'Hnd'	Unit ready & waiting for input (in 'manual/hand' mode – Local & Remote inputs are serviced)
	'aut'	Unit ready & waiting for input (in 'Auto' mode – only Remote inputs are serviced)
	'opl'	Local Open input detected
	'cll'	Local Close input detected
	'opt'	Remote Open input detected
	'clr'	Remote Close input detected
	'pir'	PIR input detected
Switch Pos '1' - BMS lockout time mode	20 (default) minutes to 600 minutes	BMS lockout time (value shown in minutes). Adjustable from 20 minutes to 600 minutes, incremented via pushbutton [SW1].
Switch Pos '2' - Run time mode	20 (default) minutes to 600 minutes	Setting for the actuator run time value from fully closed to fully open (in seconds) when it is connected to the window. Adjustable from 6 second to 180 seconds, incremented via push button [SW1]. ****IMPORTANT - The run time should NOT be set greater than the actuator run time** **Example: If the measured run time = 25.7 Seconds the board setting should be set to 25 seconds (NOT 26 seconds)****
Switch Pos '3' - Max rain opening	0% (default) to 100% opening in 10% steps	Setting for the maximum allowed actuator opening if the rain input is active. Adjustable from 0% to 100% opening in 10% steps, incremented via pushbutton [SW1].
Switch Pos '4' - Rain / Wind lockout time	1 minute to 15 minutes (default 3 minutes)	Rain / Wind lockout time (value shown in minutes). Adjustable from 1 minute to 15 minutes, incremented via pushbutton [SW1].
Switch Pos '5' - NVLink address	0 to 31 NVLINK address	Setting for the NVLINK slave address. Adjustable from 0 to 31, incremented via pushbutton (SW1) !! IMPORTANT - THE SET ADDRESS FOR EACH UNIT ON THE NETWORK SHOULD BE UNIQUE !!
Switch Pos '6' - NVLink zone	0 to 31 NVLINK Zone	Setting for the associated NVLINK Zone. Adjustable from 0 to 31, incremented via puchbutton (SW1)
Switch Pos '7' - Auxiliary relay mode	'rln'	Remote Link Mode – The auxiliary relay is remotely controlled by an NV Wall Controller through the NVLINK communication
		(Note: the NVLINK zones settings must be matched between the wall controller and the NV LogIQ Power Supply)
	'psu'	Power Supply Status Mode – The auxiliary relay indicates the status of the power supply ((PSU > 18 V dc) = Relay N/O)
	'bth'	BMS Threshold Mode – The auxiliary relay indicates if the incoming 0-10V BMS signal is greater than the BMS threshold value (value set at Switch Position 8)
	'tth'	Temperature Threshold Mode – The auxiliary relay indicates if temperature signal is greater than the temperature threshold value (value set at Switch Position 8)

4.1 Rotary Switch (SW2), Continued.

SW2 Position	Display Character or Settable Range	Description
Switch Pos '8' - BMS Threshold value or Temperature Threshold value	10% to 100% (in 10% steps) if switch 7 is set to 'bth' or 0ºC to 40ºC (in 1ºC steps) if switch 7 is set to 'tth	BMS 0-10V dc Input (0-100%) - See 'bth' mode Switch function Position '8' ((BMS 0-10 < bth) = Relay N/C]) or Temperature Threshold value - See 'tth' mode Switch function Position '8' ((Temperature < tth) = Relay N/C)
Switch Pos '9' - Use [SW1]to cycle through the BMS modes: No BMS Input 0-10V dc BMS Input NVLINK Mode	'OFF' (default) 0% to 100% (in 10% steps) 'OSL'	No 0-10 V BMS or NVLINK input used as a demand (default). The BMS input demand is derived from a 0-10V dc signal connected to the 'IN' & '0V' terminals. The LED Display shows the current 0-10 V BMS input demand level (0-100%). The BMS input demand is sent via NVLINK from an external source (such as an SE Controls NV Room Controller)
Switch Pos 'A' - External temperature monitor	Temperature in ºC	Displays the current external temperature measurement using the 'Sontay TT- 532-A' NTC thermistor (if fitted to the unit)
Switch Pos 'B' - Number of actuator movements before a forced return	'OFF' (default) or '6' to '20' cycles	The set value (6 & 20 cycles) determines the number of allowed actuator movements before an enforced return to the fully closed position after which the actuator will commence to the demanded position. [Note: This function can be used to reduce gradual positional errors that can build-up over many actuator movements]. The function can be disabled by selecting 'OFF'
Switch Pos 'C' - Actuator run offset skewtime	'000' to '020' 1-9 to -'2' seconds	Offset time for BMS operation. For use when actuator speed is different in each direction.
Switch Pos 'D' - Multipoint lock (MPL) Runtime	'000' to OBS" seconds	Run time of MPL set for BMS operation to enable the run time to be added to actuator run time to ensure BMS percentage accuracy.
Switch Pos 'E' - Output Current Monitor	Current in Amps	Displays the outgoing actuator current drawn (in Amps)
Switch Pos 'F' - Actuator Cycle Counter	'Number of actuator cycle counts	Displays the current number of system actuator cycle count operations. The counter is reset by pressing & holding the Push button whilst in Actuator Cycle Counter mode

4.2. Quick Switch Settings

The following chart can be used as a quick start guide for the switch settings that must be adjusted on the NVLogiQ Power Supply for a particular controller function.



5. Control Board Indication

5.1. External Control Board Indication

LED	Colour/Status	Detail
LD24 Power	Green LED	Lit when the 24 V dc supply is connected via PER and 0VP terminals
LD23 Status	Yellow LED	
	Off	A Change in BMS value has been monitored – waiting for the BMS value to stabilise
	Solid Yellow	Unit is ready & monitoring for a manual input or change in BMS demand
	Yellow (1 Blink)	Unit is moving to the new BMS demand (the direction of movement is indicated via the open/close LED)
	Yellow (2 Blinks)	The BMS function is locked out and will not function until the BMS lockout time has expired
	Yellow (3 Blinks)	The rain lockout function is running. The BMS input range is restricted to the max rain opening setting (See Switch Pos '3') until the rain lockout time has expired
LD22 Actuator	Red/Green LED	Lit when the controller actuator outputs (1-3BL & 1-3BR) are being driven (Red – OPEN / Green – Close)

5.2. Internal Control Board Indication

LD27,LD28 & LD29	Red Seven Segment LEDs	7 Segment display indicating the current setting for the selected function parameter (See switch SW2 settings)

5.3 Error Codes

Any error conditions encountered by the NV LogIQ Power Supply are referenced on the seven segment display:

Error Code	Description
Er1	3 Amp Power Supply Current Limit Exceeded (Legacy)
Er2	6 Amp Power Supply Current Limit Exceeded
Er3	Low Voltage Power Supply Input
Er4	3 Amp Power Supply Short Circuit (Legacy)
Er5	6 Amp Power Supply Short Circuit

Note #1: If the electronic current limit level is exceeded (see 'Fault Codes'), reduce the actuator load and reset the current limiter (by setting SW2 position to function mode '0' and depress SW1 for 5 seconds).

6. Hierarcy of Functions

6.1. Hierarcy of Functions

To avoid control conflicts, the control inputs are organised in a strict hierarchical priority order:

- PIR (highest priority)
- Maintenance - Open demand
- Maintenance - Close demand
- Rain Sensor
- Day to day switch - Open demand (* if Auto/Manual input is in Manual mode)
- Day to day switch - Close demand (* if Auto/Manual input is in Manual mode)
- 0-10 V (lowest priority)

7. Connection Schematics

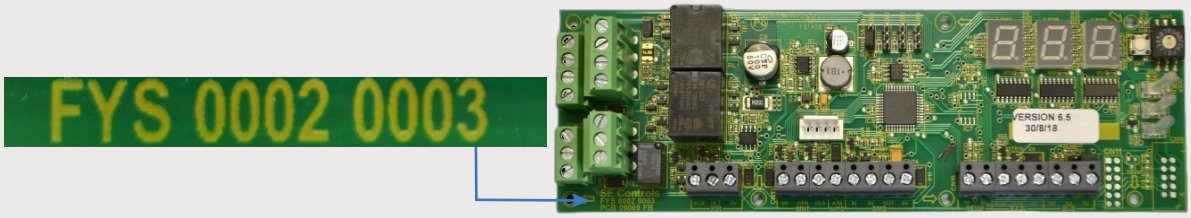
7.1. Connection Schematics

- The following sections are to be used for guidance only and are subject to change.
- All external switch contacts are to be volt-free and capable of carrying 24 V dc at 10mA.
- The maximum cable length for digital control input signals is 500 m.
- 0-10 Volt signals must remain stable and 'spike' free for a period of 2 seconds before the controller will respond to them. The controller only responds to 0-10V signals in steps of whole volts ±250 mV.
- Natural ventilation accessories (e.g. rain sensors) should be powered from the AUX supply.
- Strip the outer sheath of all cables back to the entry point of the enclosure. Ensure enough sheath is left to provide mechanical protection against cable movement over time.
- Inner cable cores should be dressed under the edges of the printed circuit board. This provides a neater and more ordered solution. Only strip inner cores sufficiently to make a good electromechanical contact with the terminal blocks.
- Where multiple actuator leads are to be connected to the controller, it is advisable to use an external junction box to reduce the number of cable glands required.
- If using screw-terminal joints, ensure they are of the enclosed type.
- The default controller settings have been chosen to cater for the majority of applications.

Note:

External diodes are required on PCB 09069 Issue **FA.**

External diodes are not required on PCB 09069 Issue **FB and above**



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