Model B2
Static Transfer Switch

63 Amperes
3-phase, 4 Pole

Users Manual
March 2014

Contents

1. System Description

1.1 Static Transfer Switch (STS)

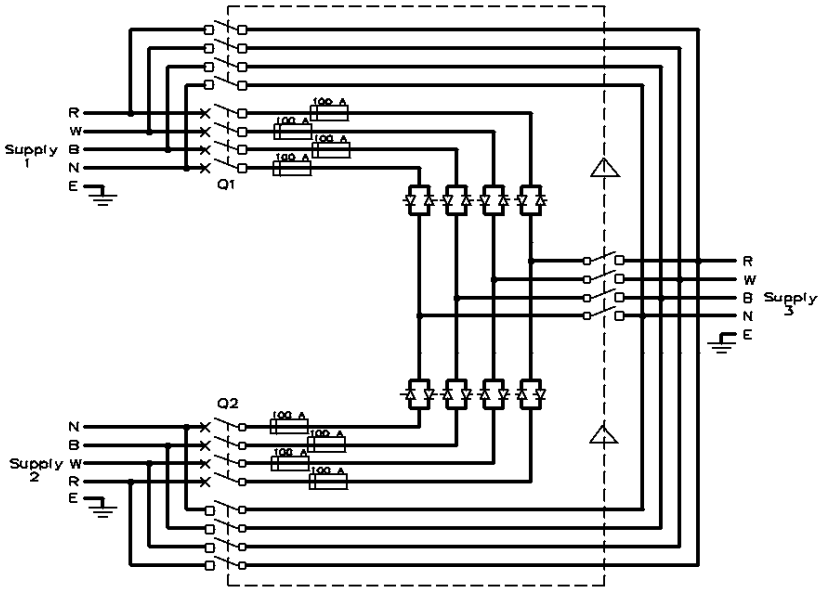
The Static Transfer Switch (STS) provides power and redundancy to items requiring / having only a single AC supply source. The STS selects this supply from one of two input AC supplies. If one of the supply sources becomes unavailable the STS will automatically transfer the critical load to the alternative AC supply source.

Manual selection of supply is also possible.

This Static Transfer Switch has 2 identical and symmetrical switches, one for each phase of the 3-phase AC supply and the neutral to provide the output.

This STS implementation uses Break-Before-Make transfer characteristics to ensure that the two sources are never paralleled so that the failure of one supply source has no impact on the other. The supplies can be truly independent.

The installed STS is a 4 Pole switch where the neutral is also switched.



Upon incoming supply failure or degradation of the selected supply the STS immediately transfers the critical load to the alternative stand-by source.

The installed STS is a 4 Pole switch where the neutral is also switched. In the case for the neutral the transfer is overlapping.

The break time is usually less than one millisecond, however under worst case conditions, can be up to 5 milliseconds.

1. System Description

In the case of downstream load fault conditions, the fault current drawn from the supply may degrade or damage the supply sources; as a consequence should a fault current exist in the load the STS will inhibit a transfer to the alternate source even if this causes source supply degradation or loss. At least the fault will not be transferred to the alternate supply with the possibility of degrading both sources. Alternatively the output of the STS is blocked so that the fault current does not propagate back to the source.

The current threshold for isolation is pre-set to approx. 160 Amperes.

It should be noted that the fuses are for the protection of the semiconductor switches (SCRs/ Thyristors), not the load. The STS does not have any automatic tripping devices, so, load discrimination is undertaken in the primary and secondary supply networks.

The STS is completely self-contained with its own detection, logic, display and controls.

2. System Display Panel

2.1 Overview.

A Colour, back-lit, touch screen LCD provides the user with an easy to navigate hierarchical real time information and control interface.

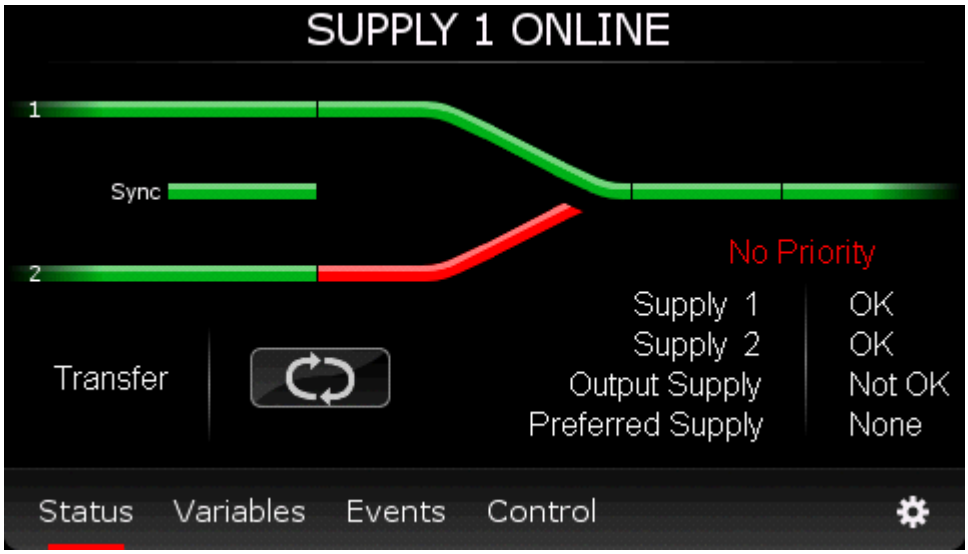


fig. 2. The system display panel.

The LCD provides a full-colour mimic, alarm / status indication and audible to provide instant recognition of the STS state.

Easily identify state changes from the mimic diagram showing system status and / or alarms (Default screen)

Use the touch screen zones along the bottom of the screen to navigate the various information and control options.

The LCD menus are structured in a hierarchy through which the operator navigates by use of the LCD control pushbuttons.

All states are bi-colour where GREEN indicates the normal or on state.

The TRANSFER control function forms part of the LCD control panel and is accessed using the Control touch zone screen pushbutton. **Press and hold for 3 seconds** to affect a transfer. This transfer control pushbutton zone can be removed if desired (to make the install more secure) via the CONTROL menu and selecting the “TRANSFER”, “OFF” condition / option. The unit can still be transferred using the priority switch at the rear of the STS.

2. System Display Panel

2.1 Mimic / Status Screen

This menu item provides details on the equipment operating status and event history.
STS Status

Status summary of the Static Transfer Switch. Provides information on any active alarm or fault conditions.

The availability of supply 1 and 2 is indicated by the respective supply LCD diagram (Green being the ON or OK state).

The synchronization hold-off bar between the two sources on the LCD mimic is located between the two supply bars. Green is in synchronism.

1 and 2 indicate which source is supplying the critical load.

An alarm indication provides indication of an unacceptable, alarm or fault condition. Information as to the cause of the alarm condition is available from the LCD event history or the status indicators located on the LCD. The alarm indicatio and audible alarm (if available) can be cancelled by pressing the Alarms screen.

From normal unattended operation a non normal state Clear Indication of ALARM Visual Prompt and Audible Alarm.

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2. System Display Panel

2.2 Alarm Indication

Alternating visual display of ALARM Condition

When indicated the user touches the LCD screen to acknowledge the condition, silence the audible and show the default Status display.

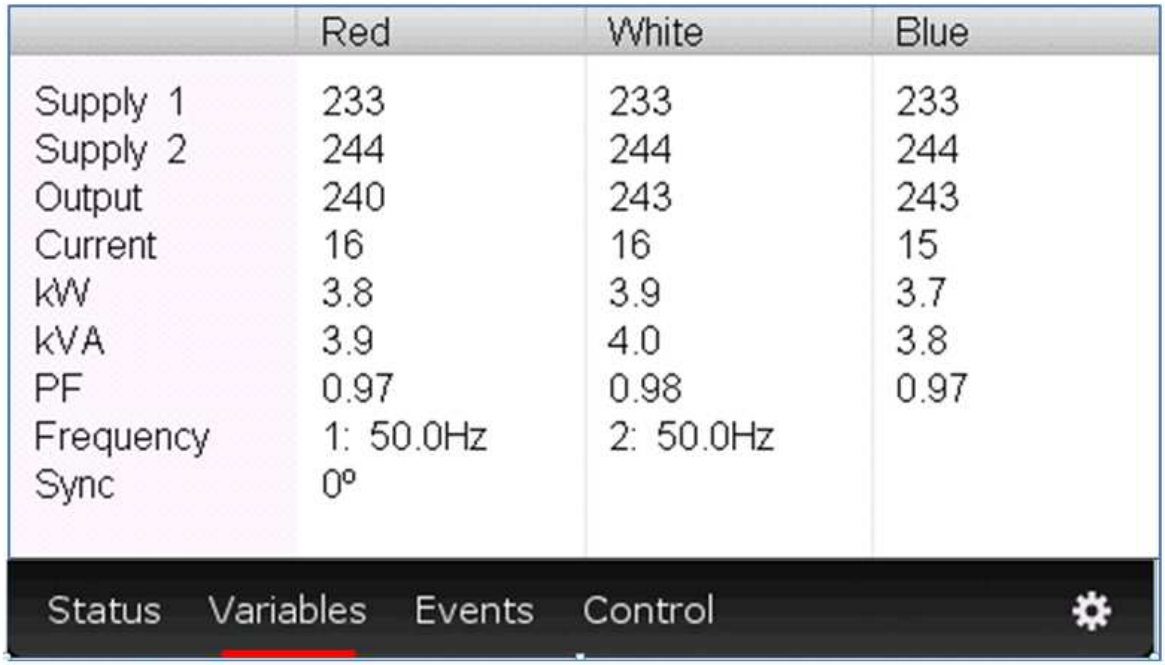
The LCD further provides useful real-time information such as supply variables, power quality, event log via a 200 deep, real time, easily understandable event log to provide the user with operational information displays.

The audible is shipped disabled, however, may be re-enabled using the CONTROL menu option “Audible”, “ON”. Similarly it is able to be disabled if required.

2. System Display Panel

2.3 Variables Display

Actual readings dependent on unit rating /calibration and loading.

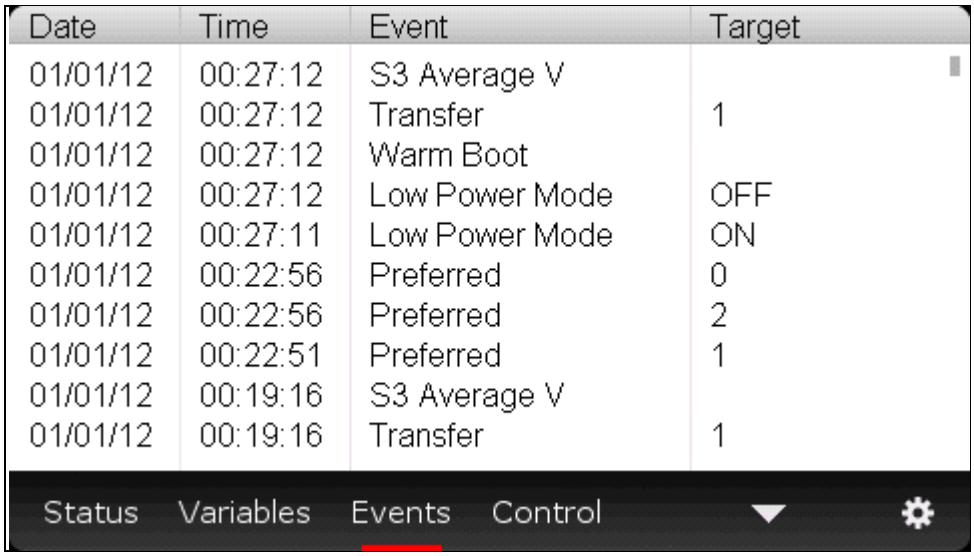


This menu item shows the input & output va

- Output Voltage for each phase.
- Output Current for each phase
- Output Power Factor for each phase.
- Output Power for each phase (kWatts).
- Output Power for each phase (kVA).
- Frequency for each source.
- 1 Source Input Voltage for each phase
- 2 Source Input Voltage. for each phase
- Phase Angle between Sources 1 & 2

2. System Display Panel

2.4 Event History



Access to the event / Alarms list is available via the “Events” screen selection. To scroll through the events buffer the user again presses the “Events” pushbutton. Up to 200 events can be scrolled.

Once the buffer is full the oldest events fall from the buffer and are replaced by any new events.

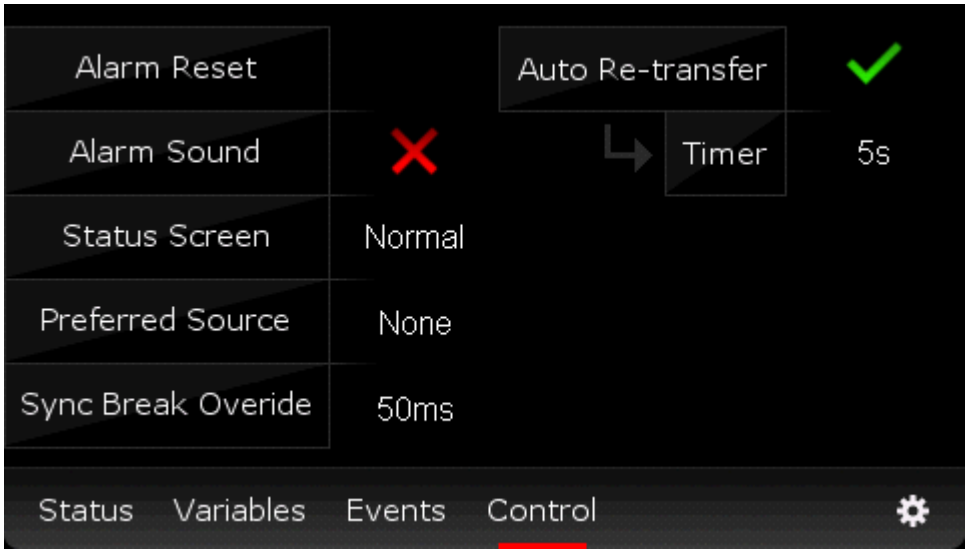
2. System Display Panel

2.5 Controls

The control interface provides access transfer and to all essential parameters and set-up information.

The TRANSFER control function forms part of the LCD control panel and is accessed using the Control touch zone screen pushbutton.

Once pressed the user / operator merely pushes the transfer pushbutton to effect a transfer to the alternate supply.



Control Functions

LCD control functions enable the user to:

- STATUS SCREEN, Enable / Disable the front panel TRANSFER pushbutton
- ALARM SOUND – Set the audible On/Off
- PREFERRED SOURCE, priority 1, 2 or None
- SYNCH BREAK OVERRIDE The break time (50 msec)
- TIMER The time before auto-re-transfer occurs
- AUTO RE-TRANSFER (Enable / Disable)
- ALARM RESET (cancels if alarm has cleared), press & hold 6 sec if transfer is inhibited

Synch Break & Mode Angle Detection Setting

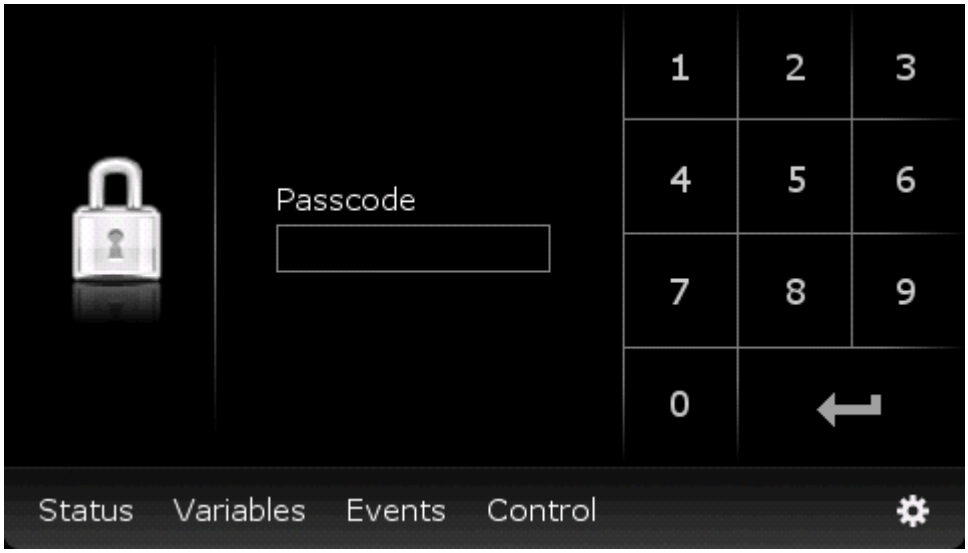
Provides access to adjust the allowable not in synchronism transfer. (Default is 9^{o} and is adjustable between 5^{o} – 30^{o}), Manual transfers are inhibited when supplies are outside this range, however, automatic transfers will experience a 50 msec break, settable (0 – 150 msec). This can be changed from the settings page, however, are the factory default values. Caution should be applied if changes are made so that out of synchronism (asynchronous) transfers do not cause the load to saturate which necessitates large currents to be drawn possibly damaging the device tripping circuit breakers or blowing fuses.

Intentionally left blank

2. System Display Panel

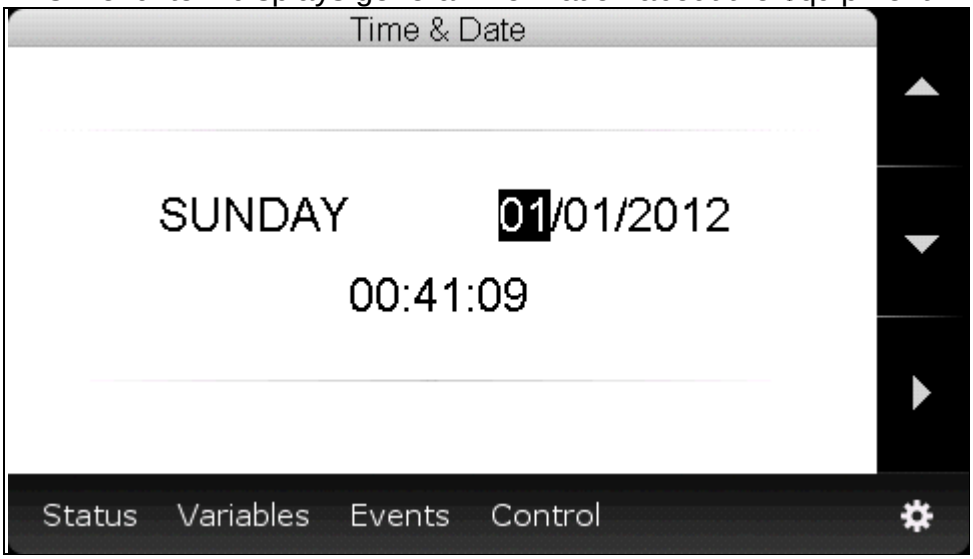
2.6 Settings Menu

This menu item provides a facility for adjusting STS settings and calibrations.



2.6.1 Password
Restricted access to set-up menus (2 levels of access (000) and (1234).

2.6.2 Date / Time
Date and Time adjustment.
This menu item displays general information about the equipment.

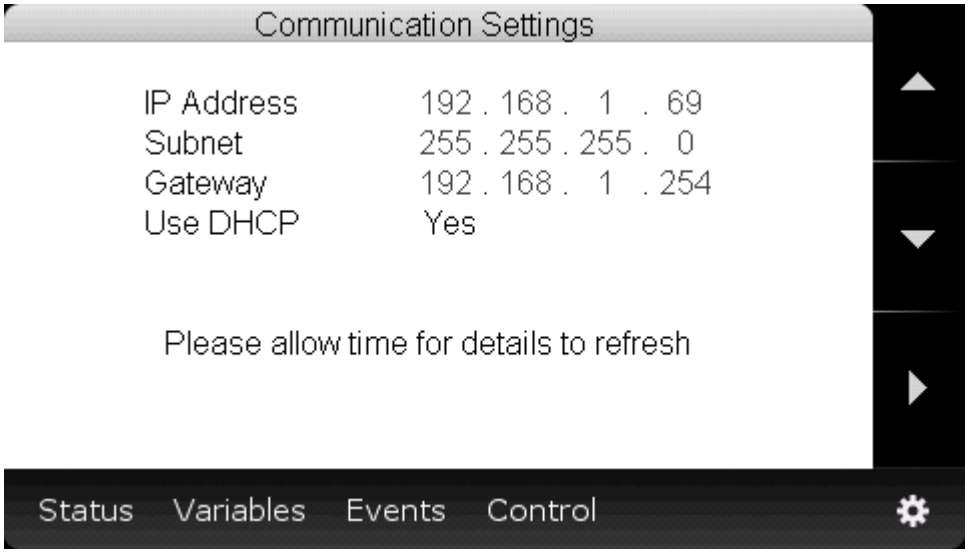


Use the scroll key → to access the parameter then the up & down keys to set the desired parameter value.

2. System Display Panel

2.6.3 Communication Settings

LAN Web Server and SNMP TCP / network address configuration.



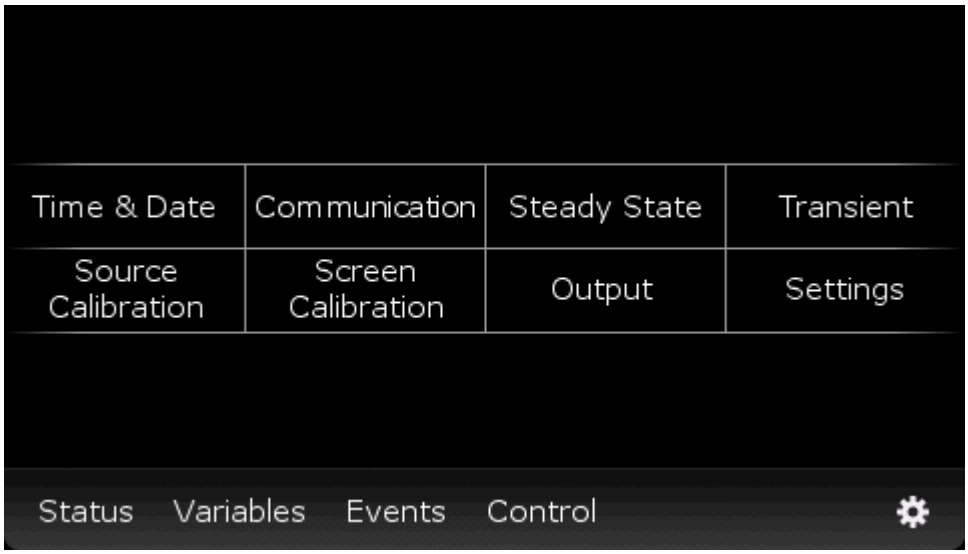
For further help see section 3.4.1 Communication Settings

2. System Display Panel

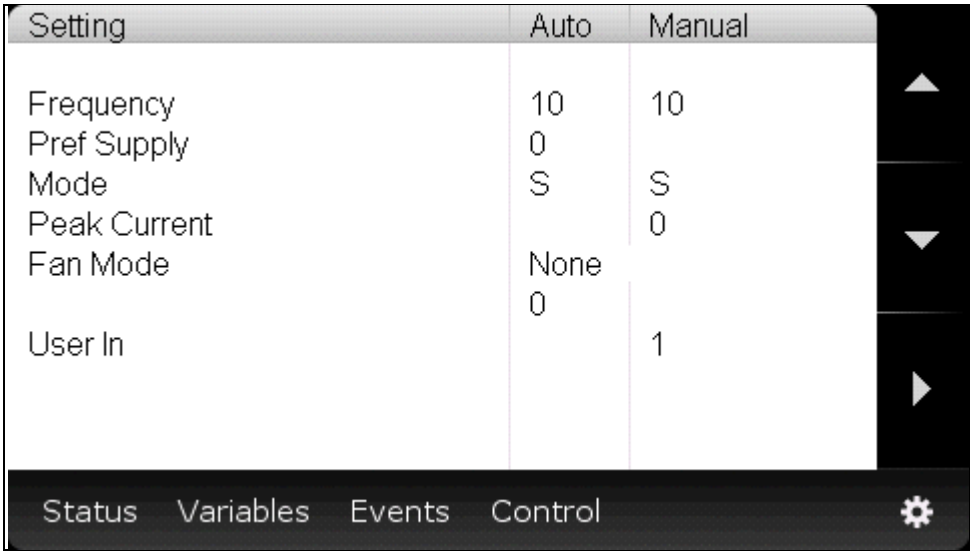
Settings

DANGER, the STS has been shipped with factory defaults. These are the most reliable settings for correct stable operation. The settings should not be changed unless the user has a full understanding of the consequences. Consult Static Power prior to changing any settings.

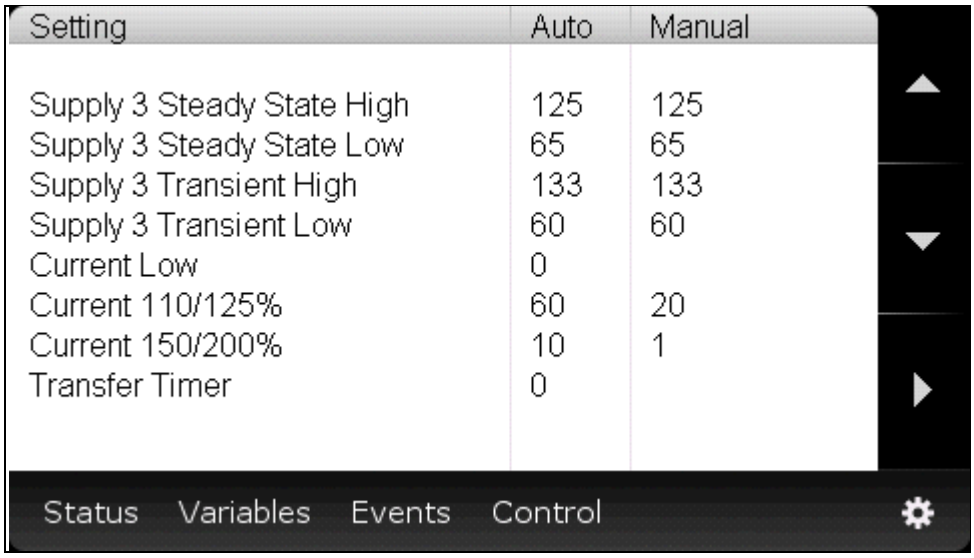
All STS settings always must be wider than the source that is supplying the STS otherwise the STS will become unstable and the load could be compromised.

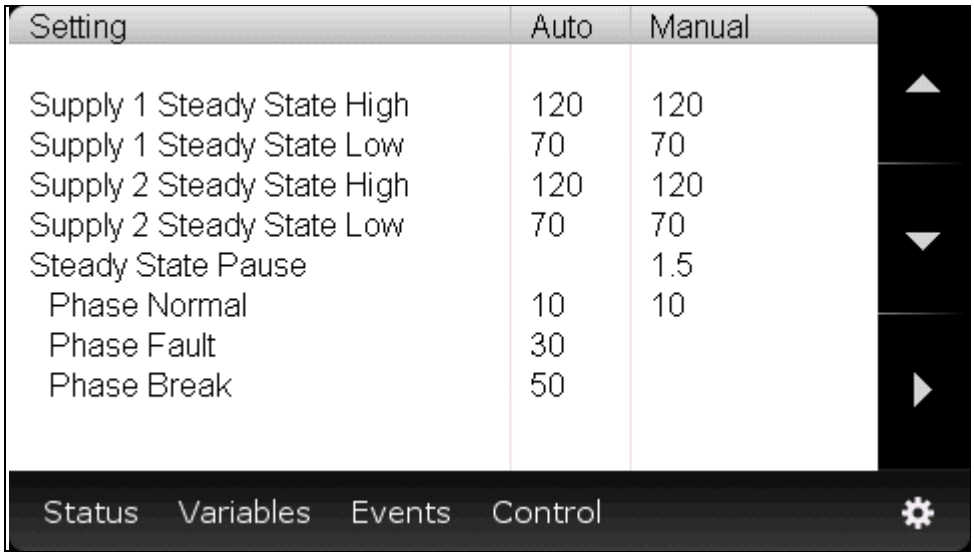


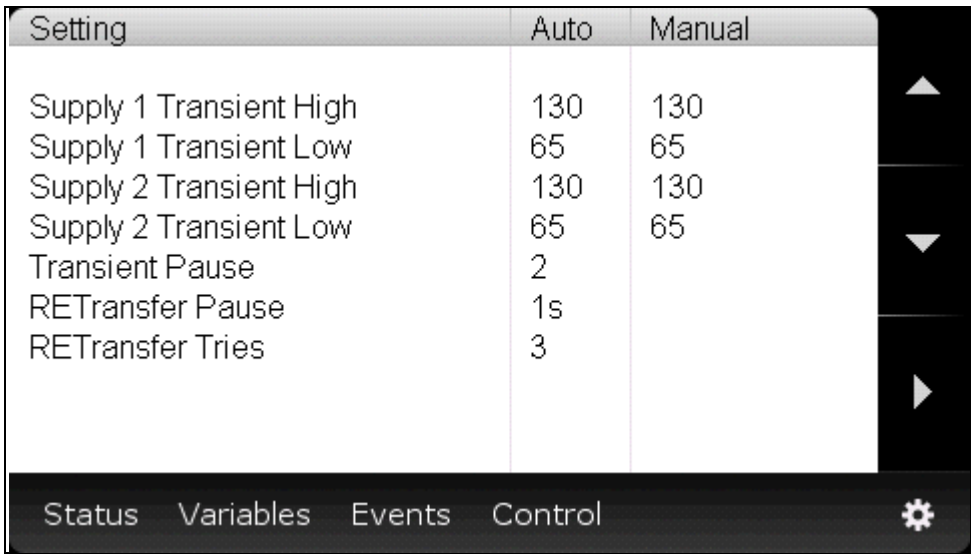
The following screens show the available options. The Auto set of settings apply to normal STS operation (unattended). The Manual setting are referenced when the STS is manually operated (Manual user transfer requests).



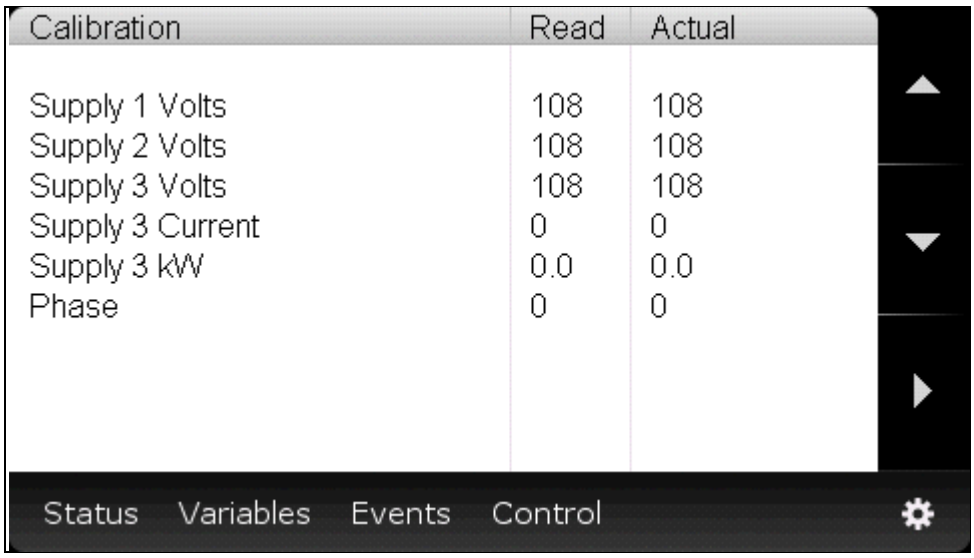
2. System Display Panel







2. System Display Panel



Used to adjust display accuracy of display variables (only or +/- 2 – 3 volts, follow the prompts, read the accurate value and enter into the Actual column.

The user should exercise caution in changing the factory defaults as changing these values or incorrectly setting them could cause unstable or incorrect STS operation. Always ensure that the settings for the STS are wider than the source settings (e.g. mains and UPS).

At reset / start-up whilst the unit is undertaking its initialization / self test the following screen is displayed.

3. STS Operation

3.1 Overview

The Static Transfer Switch control panel consists of a touch screen colour LCD display / control panel accessible via the front of the unit. These inform the user information on the operation and status of the equipment.

Other than the “Control” functions the LCD menu items cannot change the state of the Static Transfer Switch; this can only be done through the ”Control” menu; transfer pushbutton, (except when incorrect settings are made).

Selection of the required source to supply the critical load is made by simply pressing the transfer pushbutton for at least 2 seconds. Provided the supplies are within synchronization limits, the selected supply will be connected to the load. Verification is provided by the LCD and mimic.

If the selected supply should vary outside preset limits and become unusable, the STS will automatically transfer the load to the alternative supply. The preferred source directive (presetable) will ensure that the STS will return to the preferred source if it is available and within acceptable limits, after a settling time.

The preference for the preferred source is selectable. (please see over).

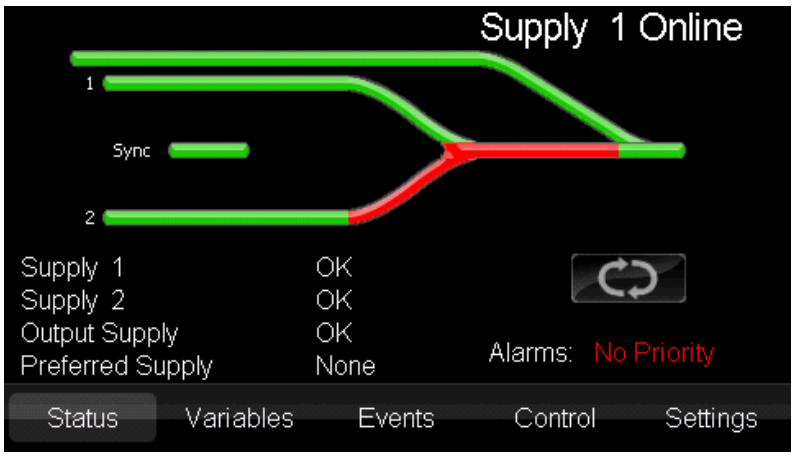
3. STS Operation

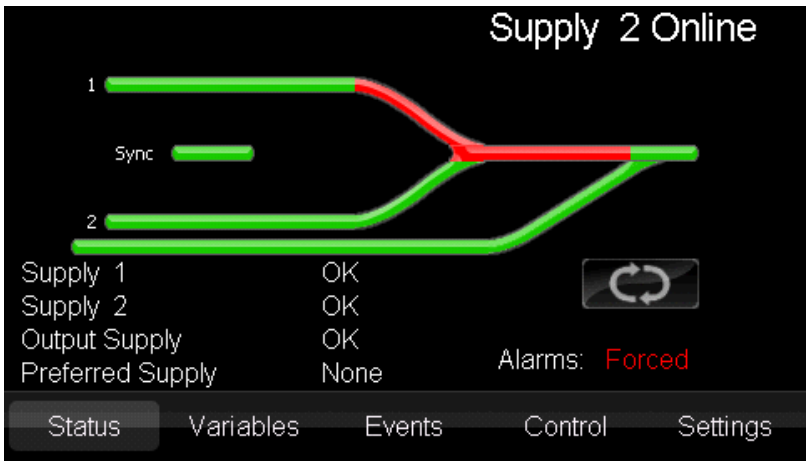
3.2 Maintenance Bypass Switch

This switch situated at the LHS of the unit allows for a maintenance bypass arrangement. The switch is normally in the “N” position and can be used to bypass the internals of the STS to either “Supply Source 1” or “Supply Source 2”. It should be noted however, that operation should only be affected in the direction of the presently operating source. It cannot be used to transfer the critical load from one source to the other.

A padlock can be used to stop inadvertent / unauthorized operation.

Displays indicate the maintenance bypass state.





3. STS Operation

3.2 Source Selection

The preferred source selection does not operate if the STS is manually transferred to the alternative supply from the controls on the front panel.

Preferred source selection is pre-set by a mechanical slide switch inside the unit or via menu selection. Note that at power-up the STS will activate the preferred source, as pre-set by the slide switch, either supply 1 or 2. If no preferred source is set then the unit will not re-transfer to the original source after a fault in that source.

The internal **Preferred source selection** will override any that is set using the LCD controls sub menu. Access to the preferred source selection switches is gained via access to the internals of the STS by removing the front cover via the screws at the side of the unit and should only be undertaken by qualified and authorized personnel.

fig. 4. User control panel.

These are located within the STS cubicle, bottom RHS of the panel, as shown.

Manual transfers override the preferred source selection, (operation of STS to alternate supply say S1 when preferred is S2, where S1 fails will transfer to S2 but not return back to S1). Preferred source selector can also be used to transfer the critical load.

The **OVERRIDE** Selection must not be used to transfer the critical load from one source to the other. Use the preferred source selector to transfer the load if the LCD panel is unavailable. Never operate the Override switch if the supplies are not in synchronism or not available.

The purpose of the override switch is to override the control electronics and lock the STS in the state / direction / source that is presently selected. It used for maintenance purposes.

Communications ports provide remote voltage free contacts for BMS or remote alarm indication and optional control of the STS from remote. The LAN enables remote viewing of the state of the STS using an internet browser or via SNMP via a Network Management System.

3. STS Operation

1. Preferred source selection (pre-set)

0	No preferred source
1	Supply 1 is the preferred source. If STS is forced to automatically transfer the critical load to the alternate (Supply 2) source the STS will automatically transfer back to Supply 1 when again within tolerance and a pre-set settling delay.
2	Supply 2 is the preferred source. If STS is forced to automatically transfer the critical load to the alternate (Supply 1) source the STS will automatically transfer back to Supply 2 when again within tolerance and pre-set settling delay.

2. Control override

(CAUTION: For maintenance only, this should not be used as a transfer control)

0	Normal – Automatic
1	Control Override -> Supply 1 is forced to supply the critical load directly overriding any internal control logic. NEVER attempt to operate the OVERRIDE switch if the supplies are not in synchronism.
2	Control Override -> Supply 2 is forced to supply the critical load directly overriding any internal control logic. NEVER attempt to operate the OVERRIDE switch if the supplies are not in synchronism.

3. STS Operation

3.4 User access

CAUTION

The power cabling <u>should not</u> be run adjacent to user controls. Separate these control cables from power circuits by at least 300 mm. The control signals are distance limited to 30 metres.

All output relays contacts are rated for 50 V DC 1 Ampere (Not 230 V AC rated)

On DB15 Connector

User Remote Inputs (Voltage free contact closure controllers only)

Pin 13 to Pin 7 Remote Transfer to S1
Pin 11 to Pin 7 Remote Transfer to S2

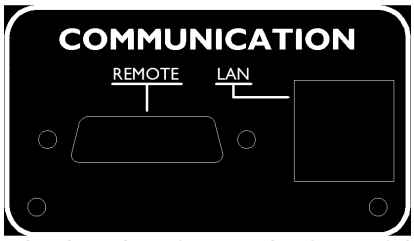
User Relay Outputs

Relays are normally closed and held open in OK state (closed contact represents the alarm state).

Pin 1 to 3 RLY-O/P-ONA
Pin 2 to 4 RLY-O/P- Overloaded
Pin 5 to 14 RLY-O/P-ON B
Pin 6 to 8 RLY-O/P-Not in Synch
Pin 10 to 12 General Alarm

3. STS Operation

3.4.1 - Communications interface



Communications interface at the front of the STS.

The communications interface provides remote voltage free contacts for BMS or remote alarm indication and optional control of the STS from remote. The LAN enables remote viewing of the state of the STS using an internet browser or via SNMP or via Modbus TCP

3.4.1 – LAN Interface

Connecting to the LAN interface can be done two different ways with a RJ45 Cat5 Ethernet cable:

- To a Network hub/switch using a straight-through cable.
- To a PC using a cross-over cable. (Most PCs can now work with a straight-though cable)

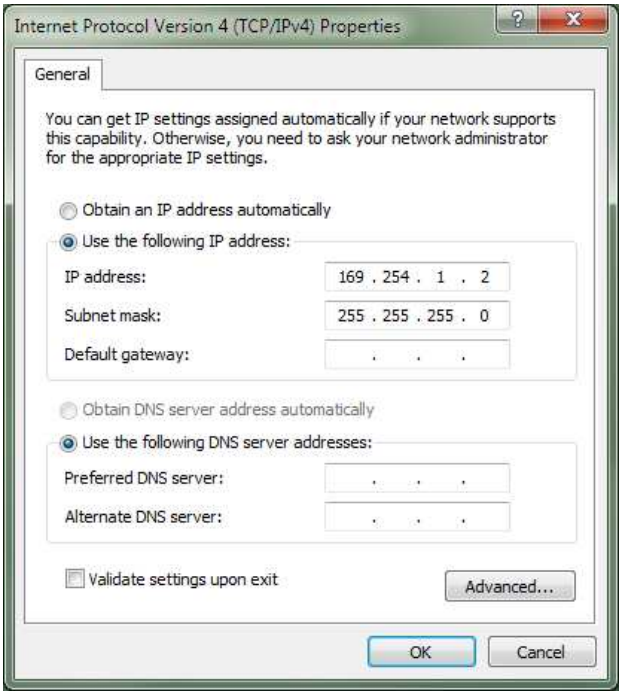
Connection to a Network

By default the STS uses DHCP to get assigned its IP information automatically. If your network does not have a DHCP server or you wish to use a static IP this can be changed in the communications settings screen described above.

Connection to a PC

Both the STS and PC must have statically assigned IP addresses on the same subnet. Set the STS's IP in the communications screen described above. By default this is IP: 169.254.1.1 with Mask: 255.255.255.0
To set your PC's IP address in Windows 7 navigate to: 'Network and Sharing Center' → 'Change adapter settings', right-click the network interface → 'Properties'. Select 'TCP/IPv4' → 'Properties'.

TCP/IPv4 Properties

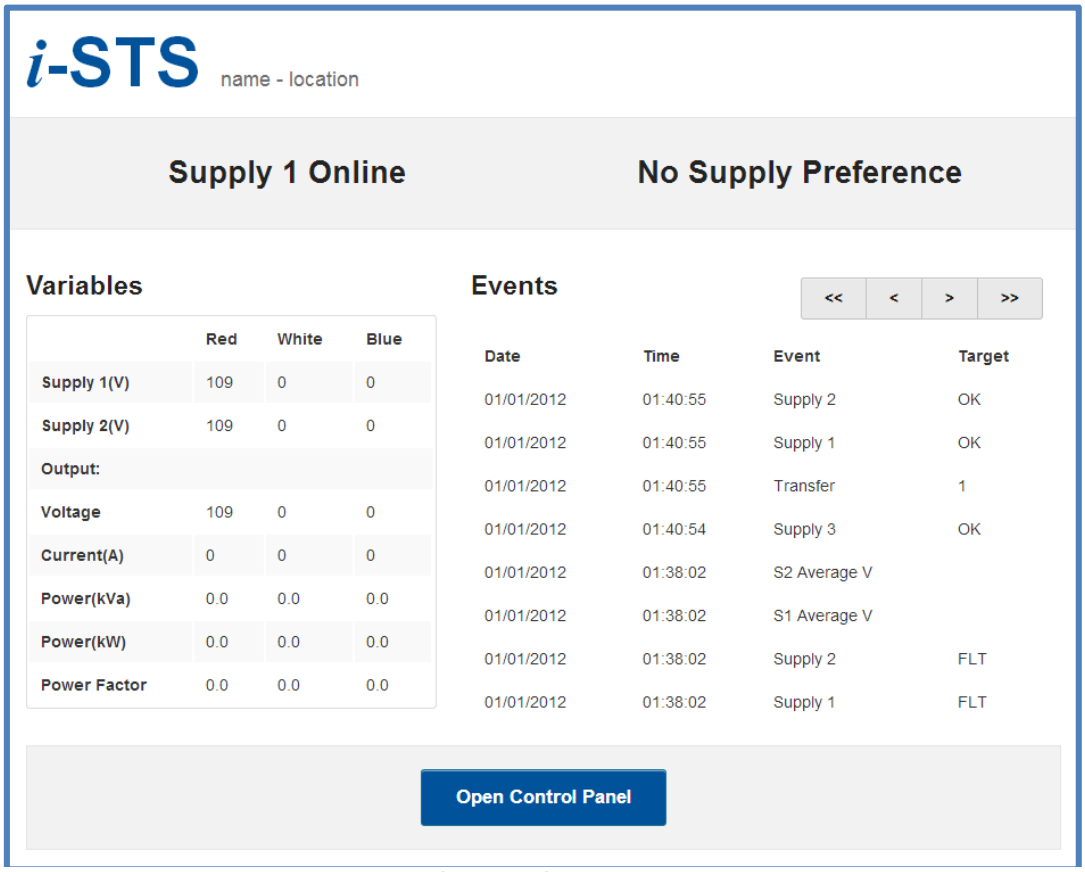


3. STS Operation

Connection to the Web Server

Ping the STS to confirm connection and then enter the address into a web browser. If the DHCP / address have not been registered on your network then you may need to momentarily (a few seconds) remove and re-instate the network cable to re-register on your network.

The home page shows which supply the unit is on, supply preference, variables, and events.



Web server home page.

For safety, authentication is required to enter the control panel:
User Name: **admin**
Password: **1234**

From here you can:

- View utilisation.
- Transfer supplies.
- Set preferred supply.
- Change unit name and location.
- Set the IP address.
- Adjust time and date.
- Adjust settings for:
    - Input steady state.
    - Input transient.
    - Output.

4. Installation and commissioning

4.1 Commissioning

Read this whole document thoroughly. Understand every aspect before proceeding. Request further assistance if you do not understand any aspect of the operation of the STS. Support and contact numbers are at the rear of the manual.

Consider electrical distribution discrimination carefully. The STS has two incoming AC power sources; your upstream protective devices must discriminate with down stream protective devices. The upstream STS supply breaker /fuse should only open if the down stream device protection is unable to trip or there is a fault within the STS.

In case of downstream fault, the STS will not transfer the fault to the alternate supply even if the voltage is adversely affected. Once the fault current has cleared, the STS will resume normal operation protecting the critical loads from voltage disturbances (10 second settling time).

After all of the considerations and precautionary processes in the last section have been understood, then no further special set-up is necessary. Each unit has been fully certified and heat soaked prior to shipment.

Apply power to the STS

After the welcome sign you may be prompted to enter the date and time. This should be required the first time only. We strongly encourage the setting of the date and time so that real time event correlation can be undertaken. The Real Time Clock is thereafter battery backed up.

If the STS has been off for 2-3 months awaiting installation the battery requires replacement. We recommend that the battery be replaced every 3 years as a precautionary matter.

The ALARM should not be active.

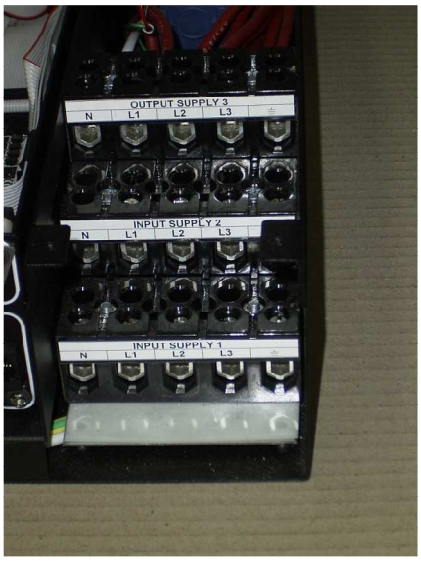
If it is check the following states.

- ON Supply 1 when priority is Supply 2
- On Supply 2 when priority is Supply 1
- Supply 1 or Supply 2 are not in spec.
- Override Switch is in position 1 or 2
- Supply 1 & 2 are not in synchronism
- The unit is too hot (thermal bi-metal switch on H.S. activated)
- There is / was an overcurrent/ overload / load fault condition

CAUTION
REMOVAL OF PANELS EXPOSES DANGEROUS VOLTAGES
ACCESS RESTRICTED TO QUALIFIED PERSONNEL ONLY

4. Installation and commissioning

Connect the supply sources to the terminals as shown below to the terminals associated with the fixed portion / cradle and be sure to support the cables.



Normally the Maintenance bypass switch is in the central Normal “N” position. When operating switch only in the direction of the presently supplied source (e.g. if STS is on S1 (supplying the load) then switch to position 1> This will be a Make Before Break transition. Operation to incorrect source may cause overlap between the sources OR disruption to the load.

Ensure from the supply that you are connected to on the STS is also the supply selected by the Maintenance Bypass Switch supply. If you have a remote maintenance bypass then it too should be in the normal position, prior to this step.

Go to normal mode.

Try using the TRANSFER push button to transfer to the alternate supply. To affect a transfer you need to push and hold the transfer pushbutton for at least 5 seconds.

The LCD should show that it is now powering the load from the other supply, (non preferred).

If unsuccessful or the LCD is not functioning a transfer can be affected using the priority / PREFERRED switch. Simply slide the switch to the desired supply, wait 5 seconds and check the LCD and display to confirm.

Alternatively the user can use the front panel display transfer control pushbutton to affect the transfer (press and hold for 5 seconds).

5. Fault Diagnosis

5.1 Interpretation of LCD event list

Event Descriptor	Append	Description	STS Action Resulting
INITIALIZE		RAM CHKsum failed – Cold Start (RAM Corrupt) – Flash Defaults downloaded	None - Contact Chloride
WARM BOOT		Power-up, Warm Start, re-initialize all but RAM – Keeps Event List	Normal After Black Start
WATCHDOG TIMER	Diagnostic	Signals software / hardware problems	None - Contact Chloride
STACK	Diagnostic	Stack or Heap has overflowed	None - Contact Chloride
EEPROM		FLASH/ EEPROM Checksum error – cal may be damaged	None - Contact Chloride*
ROM		FLASH ROM has been corrupted (Program is in error)	None - Contact Chloride*
BATTERY		Battery has low power (needs replacing)	None - Contact Chloride*
COMMS	1/2/3/4/5/6/7/8	Communications has failed to Dig Proc, Ana1, Ana2.	None - Contact Chloride (can self repair)
CALIBRATION	1/2/3	Calibration of MSP required	Contact Chloride *
LOW POWER MODE	ON/ OFF	LOW POWER MODE (Power Down Modes @ loss of electronics power)	LOW POWER MODES
S 1 / S2 / S3	AVERAGE V (R,W,B	Supply 1 or 2 OR 3 has Steady State High or Low or phase R, W or B	Transfers to supply 2 if on 1
S 1 / S2 / S3	TRANS V (Red, White, Blu)	Supply 1 or 2 OR 3 has Transient High or Low (1 sec)	Transfers to supply 2 if on 1
S 1 / S2 /S3	LOW /OK	Supply 1 or 2 OR 3 has Steady State Low (1 sec)	Transfers to supply 2 if on 1
S 1 /S2 /S3	HI / OK	Supply 1 or 2 OR 3 has Steady State High (1 sec)	Transfers to supply 2 if on 1
SUPPLY 1 or 2 or 3	FAILED / OK	Supply 1 or 2 OR 3 has Steady State High (1 sec)	Transfers to supply 2 if on 1
OVERRIDE	0,1, 2	Controls Override set to S1	User - Manual Switch Only
PREFERRED	0,1, 2	Preferred Source Set (0 or 1)	User - Manual Switch Only
S 1 / S2	FREQ LOW / HI /OK	Frequency of supply 2 is high or low	Alarm No action
LOCAL XFER	1, 2	Local Transfer to Supply 1 or 2 requested	User - Manual Action
REMOTE XFER	1, 2	Remote transfer to Supply 1 or 2 requested	Via User Inputs or BMS
BACK FEED	1 or 2 on (R, W, B)	Back feed voltage too high on S1 or S2	Contact Chloride
REMOTE POWER	OFF/ON	Remote Supply off Requested (EPO)	Via User Inputs or BMS
SYNCRONISATION	LOS / OK	S1 & S2 not in synchronism	Alarm No action

5. Fault Diagnosis

Event Descriptor	Append	Description	STS Action Resulting
CURRENT	WARN / HIGH /FAULT/OK	Output is overloaded (timed shutdown)	Alarm No action starts timer
HEAT SINK TEMP	HI /OK	Fans Failed or Over Stressed Device Temperatures, Heat Sink is Over temperature	No Action – Check & Reduce Loading or Ambient
LOAD FAULT	FLT/ CLR	There was a fault at the load	Does not transfer (Inhibit)
FAN	FAIL / OK	Status Indication Only	No Action - Repair
THDI	HI / OK	Total harmonic Distortion of current is very high	Alarm No Action – Check Load
THDV	HI / OK	Total harmonic Distortion of Voltage is too high	Alarm No action - Check Load
BREAKER OPEN	Q1, Q2, Q3, Q4 or Q5	Status Indication Only	Response to interlocking controls
BREAKER CLOSED	Q1, Q2, Q3, Q4 or Q5	Status Indication Only	Response to interlocking controls
TRIPPED	Q1, Q2, Q3, Q4 or Q5	Status Indication Only	Response to interlocking controls
ALARM CANCEL		Alarm Cancel was pressed	Resets Audible & Latched fault
POWER SUPPLY	1,2 or 3	Status Indication Only	None -Contact Chloride / Repair
SCR SC	S1,S2 R, W, B, N	SCR on S1 or S2 short circuit detected on phase #	Contact Chloride – Locks to safe source
SCR OC	S1,S2 R, W, B, N	SCR on S1 or S2 Open circuit detected on phase #	Contact Chloride – Locks to safe source

5. Fault Diagnosis

5.2 Load Fault

In case of sustained high current output load faults, the STS will inhibit a transfer to the alternate supply even if this means degradation or loss of source supply. It is therefore imperative that you ensure that the discrimination with down stream and upstream protective devices ensures that the downstream protective device always clears the fault first.

In case that all output is lost the faulty equipment should be located and removed from the STS output before re-instatement of power.

At this point it is recommended that the UPS source (1 or 2) be transferred to bypass to allow greater capacity to isolate down stream faults without affecting UPS output voltage integrity. It will be necessary to gain access to the STS internal maintenance bypass switch for 1 or 2. The supply from the UPS system in bypass mode should be selected by manual operation of the corresponding maintenance bypass switch.

Application of this power should clear any downstream faults still present. The alarm pushbutton in the CONTROL menu is then pressed for 10 seconds to reset the alarm conditions, followed by the transfer switch for the desired source to reinstate the STS to normal operation.

When the LCD mimic indicates that the STS is active again (the 1 or 2 LCD bar is Green), the maintenance bypass isolator can be manually opened.

There is an Master control RESET pushbutton on the rear of the STS. Before operating please operate the OVERRIDE switch to the FORCED position corresponding to the STS selected supply (e.g. if STS is supplying the critical load from S1 then operate the OVERRIDE to position 1). Then press the RESET pushbutton. Once the display is normal return the FORCED switch to the “0” centre position.

Do not use the OVERRIDE switch to affect a transfer.
It is for maintenance only. If the front panel controls are inoperative then the load can be safely transferred using the PRIORITY SWITCH to position 1 or 2 as desired.

6. Maintenance

6.1 Overview

The STS has been manufactured to provide a long, reliable and useful life. However, all equipment needs some maintenance.

Recommended Schedule:
Once per month record the operating variables and compare with the units specifications to ensure that you are within its operating capability. Inspect the unit and note down any variations from last observation. Action may need to be taken and or reporting may need to be taken on these variances.

Inspect the Event History and correlate any recorded events since last observation with real occurrences. Report / investigate any suspicious entries.

Once every 6 months, (sooner if the environment is bad), vacuum dust from grills at front of unit. Inspect cable / plug connections for overheating.

Units with fans need their fans changed every 3-5 years. This may need to be sooner if the environment is bad.

NOTE:

Please note that the user should not undertake repair procedures or gains access to the internal of the equipment.
If the unit is faulty then it should be removed from service as per the accompanying procedure and a qualified experienced service agent should affect repair.

7. Specifications

7.1 Operating Parameters

Rating, 3-Phase / phase	63 Amperes RMS
Voltage Rating	208/120 V ± 15%
Permissible Voltage Distortion	15% THDV
Frequency	60 Hz ± 5%
Type	3 Phase + N (4-pole) + Earth
Efficiency	98.5 %
Transfer Type	Thyristor (break-before-make, no source overlap, zero current, neutral overlapping)
Detection	Digital (< 1 msec)
Break time	Normal; (< ½ msec), Max < ¼ cycle (5msec).
MTBF	> 800,000 Hrs
Device Ratings	120 Amperes RMS, 1600 Volts, 2 kA 10msec, 20kA A^2S
Fault rating	20 kA
dV/dt	1000 V/µsec
Minimum Current	0 Amperes
Fault Current Setting	250 Amperes peak (transfer lock-out)
Protection	Internal 100 Ampere
Overload Capacity	Up to 120 % for 30 seconds
	200 % for 0.5 second
	400 Amperes for 100 msec
	2000 Amperes for 10 msec
User Interface	Hierarchical, Colour, backlit, touch screen real-time monitoring (internal manual override controls)
Remote I/O	5 x Voltage free contacts (50 V DC, 1 Ampere N/O) + 2 Transfer Controls
LAN Browser	Standard
Modbus TCP	Standard
SNMP	Standard
Operating Temperature	0 - 45 °C
Cooling	Forced redundant, externally replaceable fan module
Physical Size	19 Inch x 2RU(88mm) X 530mm
Environmental Rating	IP41
Weight	20 kg (typical)
Colour	Black Powder Coat / Black front panel (or as specified)
Compliance	IEC 62310-1,2 & 3 (for STSs), CE Approval
Inlet / Outlet Connections	Fixed feedthrough terminals 35 mm2

8. Main Item Components

Part	Description	Manufacturer	Part Number	Rating
thy1 – 1 to 8	thyristors	ir	sk120kq16	120 Amps/ 1700 v
snb1, snb2	dv/dt limiter	sp	0.22/22	1000 v/usec
q1,q2	isolator	Moeller	R7 Blue 4-pole 63 Ampere Isolator	63 Amps
f1 & f2	fans	sunon	er60/25 12 v dc	12 V dc
F 1 – F8	Power Fuses	SP/Bussmann	RG4/FE100	100 Amperes 690 V
main power board	power control board	i-sts	sp031r2	n/a
main control card	sts control board	i-sts	sp0034r2d	63 a
colour lcd	display board	reach tech	51-0105-02	5 v dc
sp vt card	voltage feedback monitoring board	i-sts	sp035r3	n/a
sp firing card	scr gating board	i-sts	sp033r1	n/a
sp038r0	user i/o board	i-sts	sp038r0	n/a
bypass switch 63	maintenance bypass switch	asn switchgear	WA 83/55E-33 with z32/d2	63 Amperes
prs1-3	power supply +hd	meanwell	pd25a	+5 v / +12 25 w

9. Contact

9.1 Contact Details

For Service and Maintenance
The unit is warranted for 36 months from date of manufacture on a return to manufacturer basis.

We will provide a 24/ 7 telephone support.

Static power will repair or replace faulty items should the unit become defective. Blown fuses are not covered by warranty.
In the event that you wish Static Power Pty. Ltd. to come to site service charges and travelling expenses will result.

i – STS Manufacturing is a subsidiary of STATIC POWER PTY. LTD. ABN 42 101 765 913
Factory @ 5 Candlebark Court, Research, Victoria Australia, 3095
Mail to: , BOX 2003 Research Delivery Centre, Research 3095

for Service: Phone +613 9437 0494 (BH) Mob +61414323 890 Email support@i-sts.com.au or visit www.i-sts.com.au

Warranty is void if not installed as per the instructions and cautions as outlined in this manual or if operated outside of its specification or unauthorised access is gained.

Unit / Parts Return procedure as over

PRODUCT RETURN_REPAIR INSTRUCTIONS - INTERNATIONAL

Please follow these steps... These are in addition to any Export requirements that there may be in your country of goods departure (these are not known by us).

1. Provide a detailed fault report (even if you've discussed it previously, the person attending to your repair will not be the person you spoke to and the passage of time alters the perception if just left verbal).
2. Pack the goods in their original packaging (as long as not extensively damaged prior).
3. Prepare the Invoice for customs:
4. E.g **HS Code 8536.50.92** (So that import duties are not applicable)
   Original Invoice Value of the goods
   Date of original Invoice (only applicable within 24 months of receipt of goods)
   On the Invoice and on the packaging the following (Including shipping docket...)

   420A GST Exemption Code ITEM 20A
   And HS Code 8536.50.92
   Goods Returned to OEM for Repair Under Warranty

   For your explanation

420A	ITEM 20A Customs Tariff Act Goods that have been exported from Australia for repair or renovation.

   HS Code is the duty description of the goods. The information above are required to expedite the goods through customs. Otherwise GST/VAT taxes and duties will be payable

5. Send to:
   Static Power Pty Ltd
   5 Candlebark Court
   Research Victoria 3095
   Attent: Robert Heezeman
   Ph: +61 3 94370494
   (collection from Depot / Freight Forwarder or airport will not be undertaken)

6. Send the goods back using your standard courier or freight forwarder. Use you own account including insurances. Irrespective if the goods are under warranty or not. An assessment and determination will be made after inspection. You will be responsible for the cost of the return of goods.. If the goods are lost or damaged in transit you will be responsible for the costs of repair or replacement so we would recommend insurance. (As per our conditions of sale provided at time of quotation). e.g. **DDP – Delivered Duty Paid (named place of destination)** Shipper is responsible for delivering the goods to the named place in the country of the receiver, and pays all costs in bringing the goods to the destination including import duties and taxes. E.g. "Free In Store (FIS)". Please note that damage in transit or blown fuses and or tampering are not covered by warranty.

6. Please provide the account number and courier information for the return of the goods and a PO for the repair / inspection. This may or may not be used depending on the findings of the initial inspection. We will try to carry out the initial inspection within 2 working days of receipt of the goods. If necessary a report and quotation will be prepared and provided.

7. Upon Receipt of the goods we will acknowledge its arrival

DOMESTIC

Please follow these steps...

1. Provide a detailed fault report (even if you've discussed it previously, the person attending to your repair will not be the person you spoke to and the passage of time alters the perception if just left verbal).

2. Pack the goods in their original packaging (as long as not extensively damaged prior).

3. Prepare the delivery Note, making sure you put your contact details, the PO under which the product was initially purchased, the date it was purchased, your dispatch date and also the initial buyer (if it wasn't you – company).

4. Send to:

   Static Power Pty Ltd
   5 Candlebark Court
   Research Victoria 3095
   Attent: Robert Heezeman
   Ph: +61 3 94370494
   (collection from Depot / Freight Forwarder or airport will not be undertaken)

5. Send the goods back using your standard courier or freight forwarder. Use you own account including insurances. Irrespective if the goods are under warranty or not. An assessment and determination will be made after inspection. You will be responsible for the cost of the return of goods. If the goods are lost or damaged in transit you will be responsible for the costs of repair or replacement so we would recommend insurance. (As per our conditions of sale provided at time of quotation) e.g. "Free In Store (FIS)". Credits and reimbursements will be made as necessary.

   Please note that damage in transit or blown fuses and or tampering are not covered by warranty.

6. Please provide the account number and courier information for the return of the goods and a PO for the repair / inspection. This may or may not be used depending on the findings of the initial inspection. We will try to carry out the initial inspection within 2 working days of receipt of the goods. If necessary a report and quotation will be prepared and provided.

7. Upon Receipt of the goods we will acknowledge its arrival