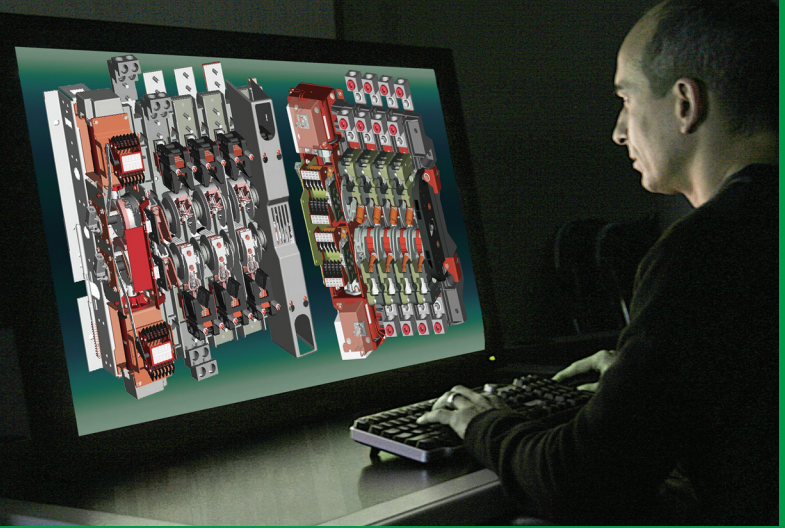
ASCO Series 4000 Power Transfer Switches

ASCO®



The Recognized Leader in Power Transfer Switch Technology Offers the Most Advanced Transfer Switches in the World.

Fig. 1: Three Pole 4000 Series Automatic Transfer Switch rated 800 amperes

4000 Series Power Transfer Switches Product Features

- Conventional two-position transfer configuration, plus closed and delayed transition modes of operation. All configurations available with either automatic or non-automatic control.
- UL listed to 1008 Transfer Switch Equipment & CSA certified to CSA 22.2 No.178-1978 Automatic Transfer Switches.
- Qualified to IEC 60947-6-1, CE marked (optional). (Limited to certain accessories.)
- Rated up to 600 VAC, 30 through 4000 amperes. Reliable and field proven solenoid operating mechanism.
- High withstand and close-on ratings including short time withstand current rating for optimum flexibility in circuit breaker coordination (800-4000 amperes).
- Solid, switched neutral configurations available.

4000 Series

ASCO Power Transfer Switches are the standard of the industry. High speed transfer of loads between alternate sources of power, regardless of ampacity size, is achieved by a reliable, field proven solenoid operating mechanism. When combined with a programmable microprocessor controller with keypad and LCD display, they offer the most advanced method of transferring all types of loads, such as motors, electronic drives, UPS's and microprocessor based systems. 4000 Series Power Transfer Switches are available open or enclosed, in ampacity sizes from 30 through 4000 amperes with a limited selection of optional accessories.

Fig. 2: Four pole, Closed-Transition Transfer Switch rated 1000 amperes in Type 1 enclosure.

Fig. 3: Four pole, Delayed-Transition Transfer Switch rated 400 amperes in Type 1 enclosure.

CLOSED-TRANSITION TRANSFER SWITCHING

ASCO Automatic Closed-Transition Transfer Switches feature main contacts that overlap, permitting the transfer of electrical loads without power interruption. The switch transfers in a make-before-break mode if both sources are within acceptable parameters. Control logic continuously monitors source conditions and automatically determines whether the load transfer should be open (conventional non-overlap mode) or Closed-Transition. Available 150 through 4000 amperes.

Closed-Transition Transfer within 5 electrical degrees is achieved passively, without control of engine generator set. Therefore, no additional control wire runs are required between the ATS and engine generator set governor. Plus, protective relaying may not be required under normal operation since the contact overlap time is less than 100 milliseconds (consult your local utility on protective relay requirements).

Failure to synchronize indication, extended parallel time protection, and transfer switch lock out are standard features.

DELAYED-TRANSITION TRANSFER SWITCHING

ASCO Delayed-Transition Transfer Switches are designed to provide transfer of loads between power sources with a timed load disconnect position for an adjustable time period. Applications include older style variable frequency drives, rectifier banks, and load management applications.

- Available 150 through 4000 amperes.
- Utilizes reliable, field proven solenoid operating mechanisms.
- Mechanical interlocks to prevent direct connection of both sources.
- Indicator light (LED Type) for load disconnect position.
- Adjustable time delay for load disconnect position.

NON-AUTOMATIC TRANSFER SWITCHING

ASCO Non-Automatic Transfer Switches are electrically operated units which are operated with manual control switches mounted locally or at remote locations.

- Sizes from 30 through 4000 amperes.
- Microprocessor based controller provides for addition of optional accessories.
- Controller prevents inadvertent operation under low voltage conditions.
- Low control circuit operating currents allow for long line runs between remotely mounted manual control switches and the transfer switch.
- Source acceptability lights inform operator if sources a

Fig. 4: Three pole Non-Automatic, electrically operated 200 ampere switch shown in Type 1 enclosure.

WITHSTAND AND CLOSING RATINGS FOR ALL 4000 SERIES PRODUCTS

SWITCH RATING (AMPS)	UL 1008 WITHSTAND AND CLOSE-ON RATINGS[1]									
TRANSFER SWITCHES	RATINGS (RMS SYMMETRICAL)						RECOMMENDED FUSES		SHORT TIME RATINGS 480V[4]	
	SPECIFIC BREAKER[2]	VOLTS MAXIMUM	"ANY" BREAKER[3]	VOLTS MAXIMUM	CURRENT LIMITING FUSE RATING	VOLTS MAXIMUM	MAX SIZE, A	CLASS	RATING (RMS SYM), A	DURATION (CYCLES)
30			10KA	600V	100KA	480V	60	J	N/A	-
70, 100, 125, 150	22KA	480V	10KA	600V	200KA	480V	200	J	N/A	-
200	22KA	480V	10KA	480V	200KA	480V	200	J	N/A	-
230	22KA	480V	10KA	480V	100KA	480V	300	J	N/A	-
260, 400, 600	50KA	480V	65KA	240V	200KA	600V	800	J	N/A	-
	42K	600V	42KA	480V			800	L		
			35KA	800V						
800-1200	65KA	600V	50KA	600V	200KA	600V	1600	L	36KA	18
1600-2000	125KA	480V	100KA	600V	200KA	600V	3000	L	42KA	18
2600-3000	-	600V	100KA	600V	200KA	600V	4000	L	42KA	18
4000	-	600V	100KA	600V	200KA	600V	5000	L	85KA	8
									65KA	30

1) All WCR values indicated are tested in accordance with the requirments of UL 1008. See ASCO Pub. 1128 for more WCR information.
2) Application requirments may permit higher WCR for certain sizes of switch. Contact ASCO for guidance if application requires higher WCR.
3) Based on 3 cycles for 260-4000 A and 1.5 cylcles for 30-230A switches. Applicable to circuit breakers with instantaneous trip elements.
5) Optional front connectes service (Accy 40MY and 40NY) limits 1600 and 2000 AG Frame switches to 85 kA Any breaker rating.
6) J Frame switches utilizing overlapping neutral (code "C") are limited to 35 kA Any Breaker rating at 480V.

4000 Series MICROPROCESSOR CONTROLLER

Fig. 5: 4000 Series Microprocessor Controller.

The 4000 Series microprocessor controller is used with all sizes of Power Transfer Switches from 30 through 4000 amperes. It represents the most advanced digital controller in the industry and includes, as standard, all of the voltage, frequency, control, timing and diagnostic functions required for most emergency and standby power applications.

Because of severe voltage transients frequently encountered with industrial distribution systems, the microprocessor logic board is separated and isolated from the power board as shown below. This improves electrical noise immunity performance and helps assure compliance with the rigorous transient suppression standards highlighted below.

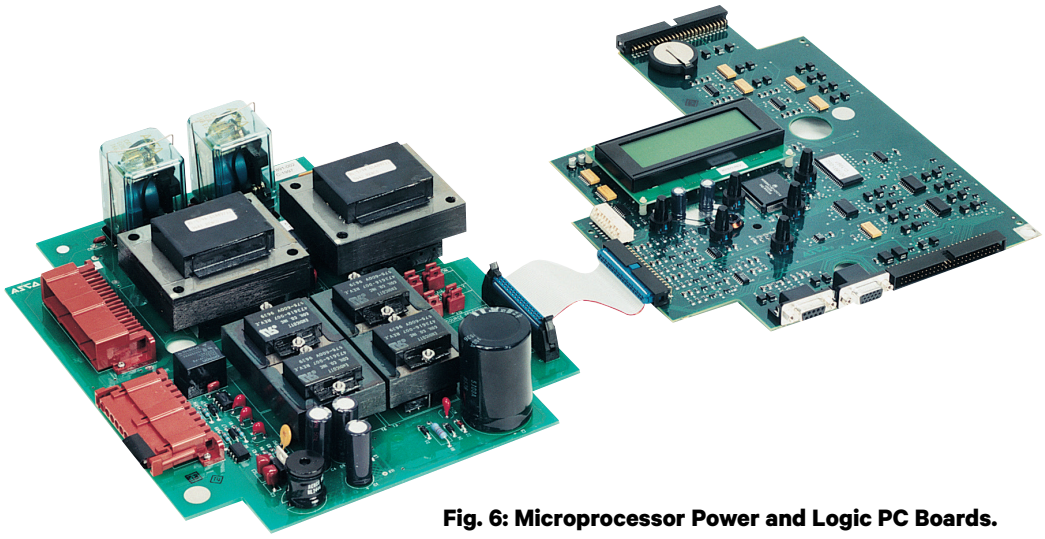


Fig. 6: Microprocessor Power and Logic PC Boards.

4000 Series Microprocessor Controller	
Emission Standard - Group 1, Class A	EN 55011:1991
Generic Immunity Standard, from which:	EN 50082-2:1995
• Electrostatic Discharge (ESD) Immunity	EN 61000-4-2:1995
• Radiated Electromagnetic Field Immunity	ENV 50140:1993
• Electrical Fast Transient (EFT) Immunity	EN 61000-4-4:1995
• Surge Transient Immunity	EN 61000-4-5:1995
• Conducted Radio-Frequency Field Immunity	EN 61000-4-6:1996
• Voltage Dips, Interruptions and Variations Immunity	EN 61000-4-11:1994

4000 Series MICROPROCESSOR CONTROLLER

FEATURES

- Digital microprocessor.
- Touch pad programming of features and settings without the need for meters, or variable power supplies.
- Sixteen (16) selectable operating voltages available in a single controller.
- On-board diagnostics provide control panel and ATS status information to analyze system performance.
- Displays and counts down active timing functions.
- Selectable multi-language display (English, German, Portuguese, Spanish, or French. For others contact ASCO)
- Password protection to prevent unauthorized tampering of settings.
- Remote monitoring and control with ASCO PowerQuest® communications products. Specify optional accessory 72A or 72E.
- Load shed option for bus optimization applications. Specify optional accessory 30B.
- Lamp Test - Provides a convenient way to verify functionality of all LED's on the user interface.

VOLTAGE AND FREQUENCY SENSING

- 3-Phase under and over voltage settings on normal and emergency sources.
- Under and over frequency settings on normal and emergency.
- True RMS Voltage Sensing with +/- 1% accuracy; Frequency Sensing Accuracy is +/- 0.2%.
- Selectable settings: single or three phase voltage sensing on normal and emergency; 50 or 60Hz.
- Phase sequence sensing for phase sensitive loads.
- Voltage unbalance detection between phases.

STATUS AND CONTROL FEATURES

- Output contact (N/O or N/C) for engine-start signals.
- Selection between "commit/no-commit" on transfer to emergency after engine start and normal restores before transfer.
- Terminals for remote test or customer contact for peak shaving applications
- Advanced inphase algorithm which automatically measures the frequency difference between the two sources and initiates transfer at appropriate phase angles to minimize disturbances when transferring motor loads.
- Output signals for remote indication of normal and emergency source acceptability.
- Statistical ATS/System monitoring data screens which provide:
- Total number of ATS transfers.
- Total number of days ATS has been in operation.
- Total number of hours that the normal and emergency sources have been available.

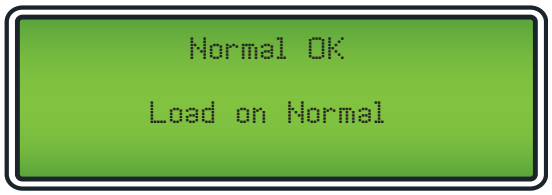
TIME DELAYS

- Engine start time delay - delays engine starting signal to override momentary normal source outages - adjustable 0 to 6 seconds.
- Transfer to emergency time delay - adjustable 0 to 60 minutes.
- Emergency source stabilization time delay to ignore momentary transients during initial generator set loading - adjustable 0 to 6 seconds.
- Retransfer to normal time delay with two settings:
- Power failure mode - 0 to 60 minutes.
- Test mode - 0 to 10 hours.
- Unloaded running time delay for engine cooldown - adjustable 0 to 60 minutes.
- Fully programmable engine exerciser with seven independent routines to exercise the engine generator, with or without loads, on a daily, weekly, bi-weekly or monthly basis.
- Contains all alarm signals, logic and time delays for use with closed transition switches.
- Insynch time delay - 0 to 3 seconds.
- Failure to synchronize - 1 to 5 minutes.
- Extended parallel time - 0.1 to 1.0 seconds.
- Transfer switch locked out.
- Delayed transition load disconnect time delay - adjustable 0 to 5 minutes. (Delayed Transition Switches only.)

4000 Series Power Control Center Screens

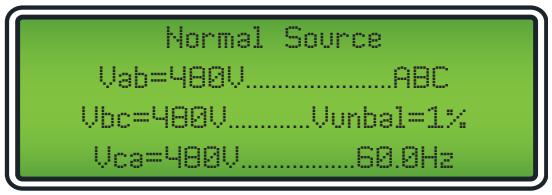
STATUS

SYSTEM STATUS



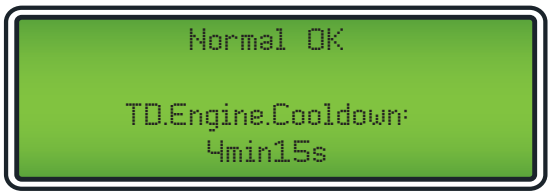
Displays system status in clear, concise language. Message shown indicates normal source is acceptable and the load is connected to the normal source.

SOURCE STATUS



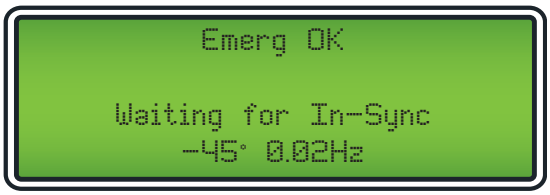
Displays voltage for each phase, frequency, phase rotation and vol age unbalance for both normal and emergency sources.

TIME DELAY STATUS



Active time delay status displays time remaining until next control event.

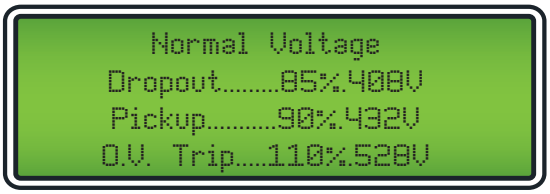
INPHASE TRANSFER MODE



Displays the relative phase angle between sources and frequency differential to indicate the controller is awaiting an inphase condition.

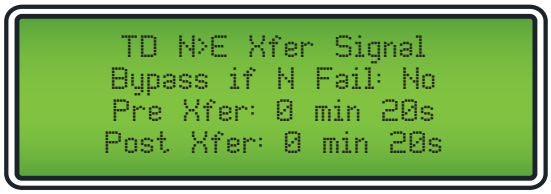
SETTINGS

VOLTAGE AND FREQUENCY SETTINGS



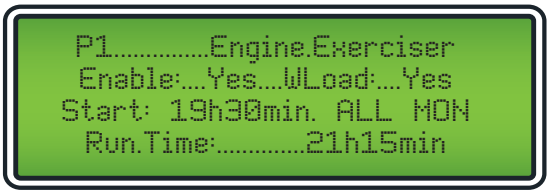
Provides voltage and frequency setting values for normal and emergency sources. Voltage pick-up, dropout and trip settings are set in percentage of nominal voltage and are also displayed in rms voltage values.

TIME DELAY SETTINGS



Provides direct reading display for setting time delays.

ENGINE EXERCISER



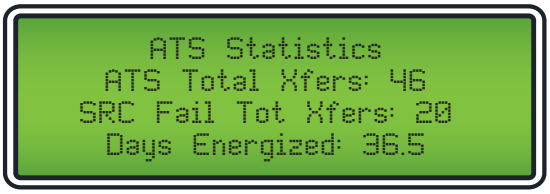
Seven independent programs, load/no load selection, flexible run times and daily, weekly, bi-weekly and monthly exercise routines.

FEATURE SETTINGS

Standard features can be activated with the keypad. As an example, when enabled, the “shed load” option causes the transfer switch to transfer the load off of the specified source. If desired, the load shed transfer can be made inphase.

DATA LOGGING

ATS STATISTICS



Instant availability of statistical information on tota number of ATS transfers, number of transfers caused by power failures and total days controller has been energized, plus more.

4000 Series OPTIONAL ACCESSORIES

TIME DELAYS

2C Provides an extended time delay on engine starting. The standard feature one time delay is adjustable from zero to six seconds. Accessory 2C allows this time delay to be adjustable from zero to sixty minutes in one second intervals factory set at five minutes.

1G Similar to accessory 2C except using an external 24 volt DC power input. Available only as a feature of accessory 18Z.

INDICATORS & CONTROLS

14A/14B Additional auxiliary contact sets to indicate switch position. Two sets are typically standard. Maximum number of two additional sets. (Varies by configuration)

6C Reset Switch for manual retransfer to normal wit automatic override upon emergency source failure.

NEUTRAL CONDUCTOR OPTIONS

- Solid neutral, with fully-rated terminals. (AL-CU) UL Listed.
- Conventional neutral switching pole.

Note: Specify neutral option in catalog number, see page 18 for instructions.

COMMUNICATIONS OPTIONS

72EE2 Ethernet connectivity module for remote communications to ASCO POWERQUEST* products. Contains embedded web pages for the remote monitoring of ASCO products as well as some 3rd party devices. Also provides Serial-to-Ethernet link with ability to communicate using Modbus/TCP.

CUSTOMER CONTROL CIRCUITS

30A Load-shedding circuit initiated by opening of acustomer-supplie contact.

30B Load-shedding circuit initiated by removal of customer-supplied control voltage. (Specify voltage).

44G Strip Heater with thermostat recommended for outdoor applications on temperatures below 32° F (0°C) to prevent condensation and freezing.

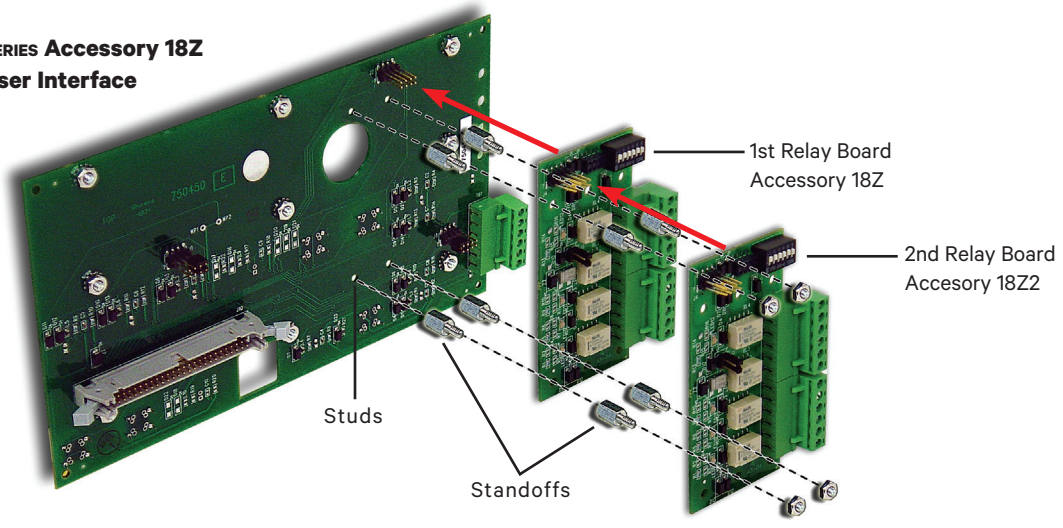
ADD-ON BOARDS

18Z Includes one Form C contact (Rated 2A @ 30VDC or .5A @ 125VAC) for each of the following:

- Normal Source Acceptability.
- Emergency Source Acceptability.
- Selective Load Disconnect. - Pre and post transfer signal time delay for selective load disconnect with a programmable bypass on source failures - adjustable 0 to 5 minutes.
- Fourth contact can be set to mimic the accepta- bility contacts or annunciate any combination of the acceptability contacts and/or any switch alarm conditions available:
- Extended Parallel Time (Closed transition),
- Failure to Synchronize (Closed transition),
- Transfer Switch Locked Out (Closed transition),
- Load Disconnected (Delayed transition).
- Accessory 18Z includes an extension of the engine start time delay (feature) to 60 seconds if an ex- ternal 24VDC supply is connected to a 4000 Series controller. This external power source will also allow the LCD display to be active when both normal and emergency sources are unavailable.

18Z2 Includes two 18Z accessory boards. (Maximum of two 18Z accessory boards allowed.)

Fig. 9: 4000 Series Accessory 18Z mounting on User Interface



4000 Series OPTIONAL ACCESSORIES

ASCO 5200 Series POWER METER

The ASCO 5200 Series Power Meter is a microprocessor based metering device that provides real-time measurements of single and three phase power systems. The Power Meter uses digital signal processing technology to measure voltage and current per phase; real, reactive and apparent power, and bi-directional energy. All measurements can be viewed locally with a backlit liquid crystal display and/or displayed remotely with ASCO PowerQuest® products.

Direct voltage input for systems up to 600 Volts AC can be monitored without the use of external potential transformers (PTs). Measures three phase currents and a fourth current input is available for measuring current in the neutral conductor. The Power Meter includes one discrete input for transfer switch position, eight general purpose discrete inputs, and four relay outputs for monitoring and controlling external devices.

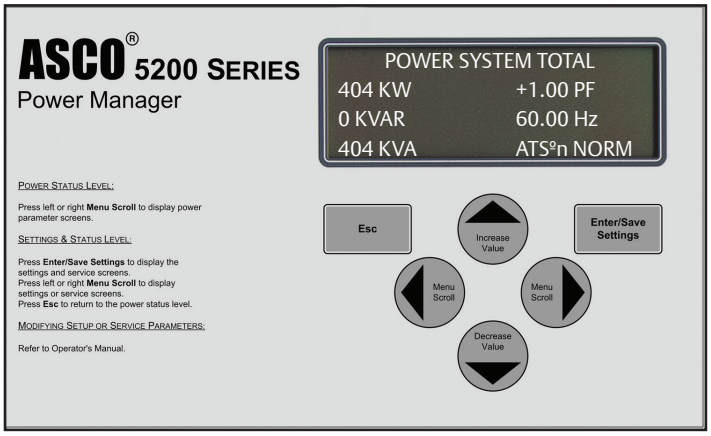


Fig. 10: ASCO 5200 Series Power Meter

POWER METERING

- Voltage:
  Line - Line: VAB, VBC, VCA, VAVERAGE
  Line - Neutral: VAN, VBN, VCN, VAVERAGE
- Frequency: 45.0 to 66.0 Hertz
- Current: IA, IB, IC, IAVERAGE
- Unbalance %: Voltage, Amps
- Real Power: KWA, KWB, KWC, KWNET
- Reactive Power: KVARA, KVARB, KVARC, KVARNET
- Apparent Power: KVAA, KVAB, KVAC, KVANET
- Real Energy: KWHIMPORT, KWHEXPORT, KWHNET
- Reactive Energy: KVARHIMPORT, KVARHEXPORT, KVARHNET
- Power Factor: PFA, PFB, PFC, PFNET

DATA ACCESS

- Eight digital inputs, four relay outputs.
- Input/Output 15-character, user definable screen display for identification of input/output signals.

CONFIGURABLE DESIGNATIONS

- Local - A four line, 20 character LCD backlit display.
- Remote - With optional Acc. 72A or 72E and Power Meter monitoring systems.
- Provides user programmable setpoints based on twelve metering and I/O parameters. Each setpoint allows the user to select the parameter, the trip & reset levels, the trip & reset time delays and the alarm type or relay output to trigger. This can be used for protective relaying and peak shaving applications.

INTEGRATED ATS FEATURES

When configured on load of ATS:

- Displays ATS position.
- Displays power data as a function of ATS position (normal/emergency).
- Accumulates energy data separately for normal and emergency sources.

Optional Configurations and Connection Arrangements

Connected To:	With Display	Without Display
Load	Acc. 85L	Acc. 75L
Normal	Acc. 85N	Acc. 75N
Emergency	Acc. 85M	Acc. 75M

Add suffix "A" to above designations if neutral conductor monitoring is required.

Note: Accessory 75 and 85 includes component mounting, CTs, shorting blocks and all necessary interwiring.

Note: The ASCO Power Manager is also available as a separate unit for monitoring electrical parameters anywhere in the power distribution system.

4000 Series Power Monitoring & Control

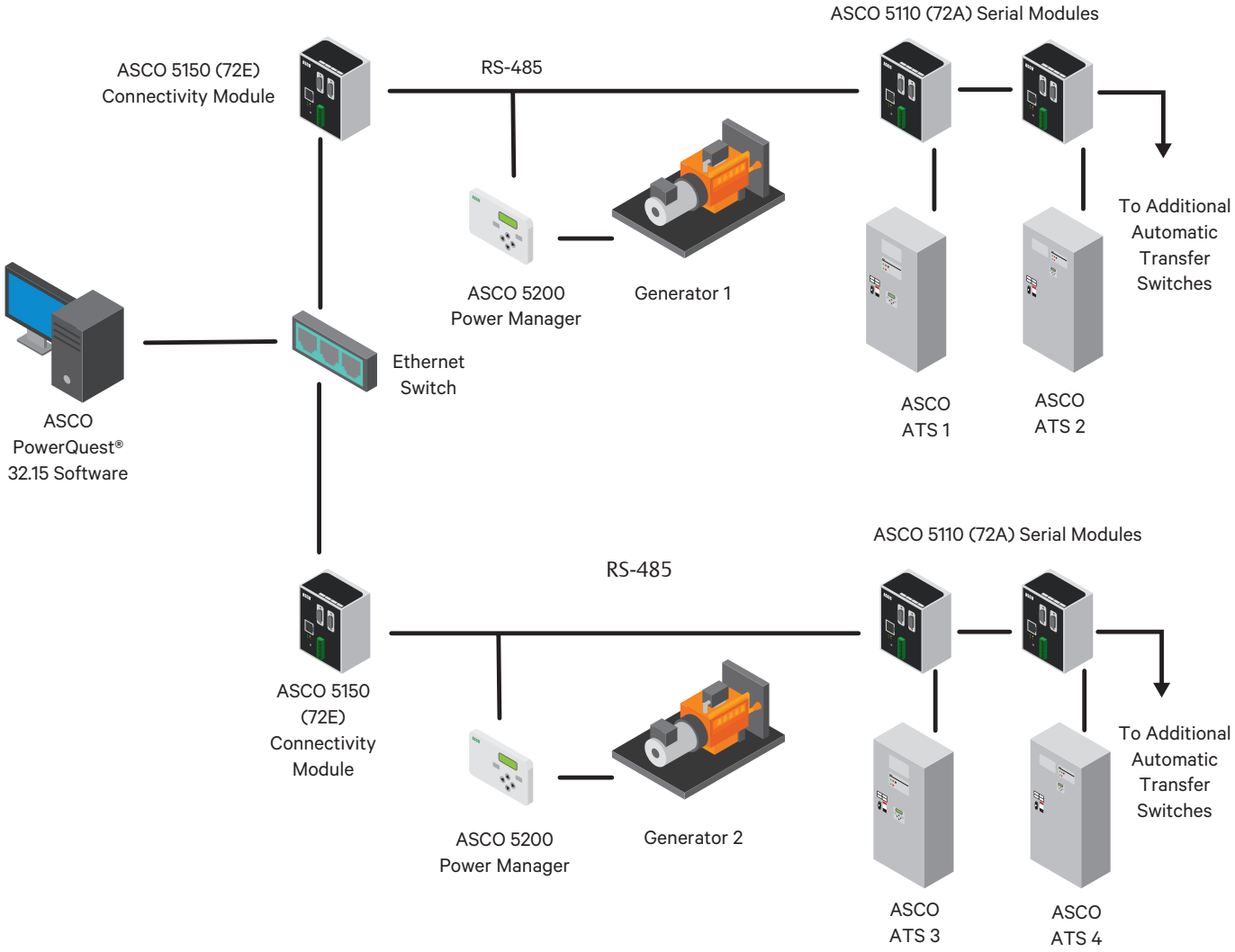
ASCO POWERQUEST Solutions

ASCO POWERQUEST® communications products allow for the monitoring and control of power transfer switches in your Emergency or Standby Power Distribution System. Local Area networks and Remote networks are supported with either single or multiple points of access, and web-enabled communications allow access to your power system from anywhere around the world.

Features

- Monitors and controls Power Transfer Switches and Engine Generators
- Monitors normal and emergency voltages and frequency
- Indicates transfer switch position and source availability
- Provides transfer and re-transfer of loads for system testing
- View normal and emergency voltage and frequency settings
- View transfer switch time-delay settings
- Provides transfer switch rating and identification
- Automatic paging notifies personnel, by e-mail or text message, of selected system alarms
- View current, power and power factor with ASCO Power Managers Connected to the System
- View transfer switch event log
- Provides transfer switch test schedule

Typical Network Architecture



4000 SERIES POWER MONITORING & CONTROL

Connectivity Module 72E

5150 CONNECTIVITY MODULE

The 5150 Connectivity Module is used to bring several different serial devices that communicate at different baud rates and with different protocols to a common Ethernet media. The module is used to connect 4000 SERIES transfer switches, and ASCO Remote Annuciators to a standard Ethernet TCP/IP network with standard 10base T(RJ-45) connectors. The module has customized embedded JAVA™ applets (program applications for an internet browser) for each monitored device that loads automatically to a standard Web Browser. The module is designed to communicate with up to 8 clients such as Web applications (web pages), POWERQUEST®, or third party Modbus® devices simultaneously over an Ethernet connection.

ASCO Remote Annuciator

5350 REMOTE ANNUNCIATOR

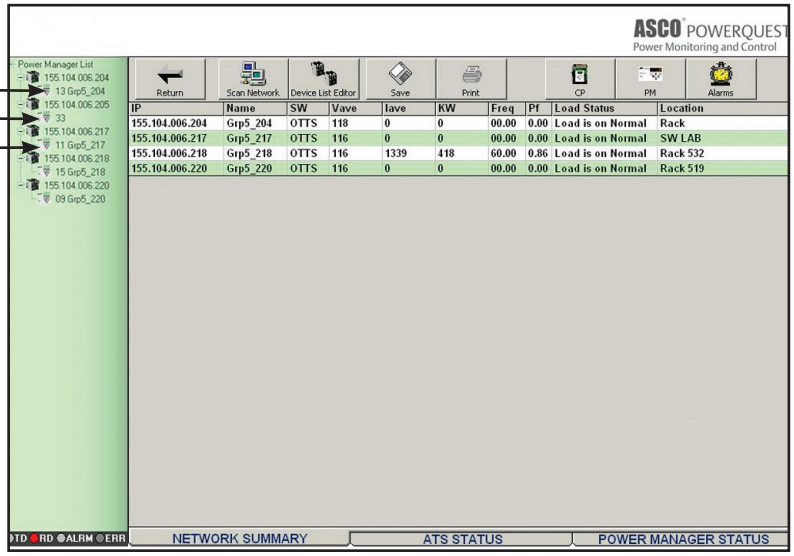
The ASCO Power Transfer Switch Remote Annunciator is a stand-alone, industrial grade interface device providing you with the most critical transfer switch status indication and transfer/retransfer control for up to eight switches. Ethernet technology is built in for faster and more reliable communications. LEDs indicate switch status and position, while separate push buttons individually initiate transfer switch operation and testing. Transfer switch annunciators can be set up in multiple locations to monitor various transfer switches, allowing redundant and distributed annunciation.

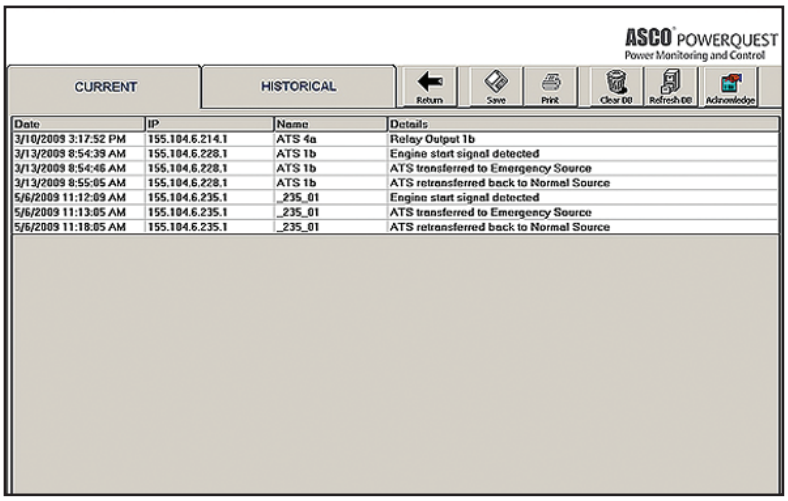
POWERQUEST 32.15

ASCO 32.15 POWER INTERFACE SOFTWARE

The ASCO 32.15 Power Interface is a computer-based monitoring and control software package. When combined with ASCO 72E/72A Communications Interface modules and the ASCO 5200 Series Power Manager, it provides a centralized and comprehensive monitoring and control interface of power transfer switches and engine generators. A one-line diagram, power metering information, transfer switch controls and event-log data, and engine-generator screens are available to users with password protected controls.

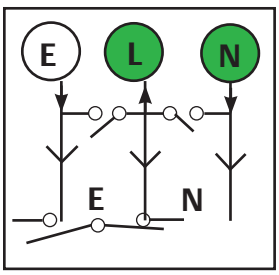
SUMMARY SCREEN





CURRENT AND HISTORICAL ALARMS

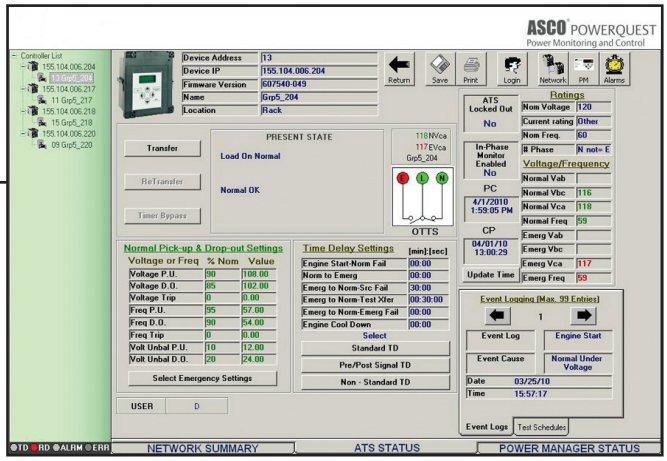
The Current Alarm screen displays all currently active alarms. It provides the date of the alarm, along with IP and Name of the device with the issue. In addition, a detailed description of the alarm is provided to help the operator in pinpointing the issue. All historical alarms can be viewed as well by selecting the “Historical” tab.



CONVENIENT ONE-LINE DIAGRAM

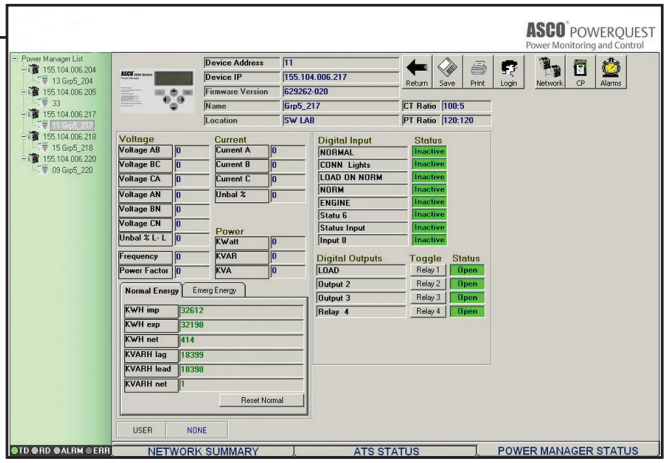
- Colored icons highlighted to show source availability and which source is connected to load.

POWERQUEST 32.15



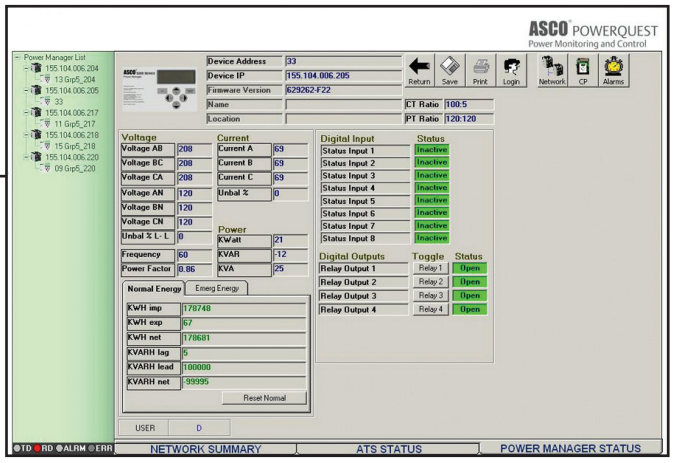
TRANSFER SWITCH DETAIL SCREEN

- ATS rating and identification data is displayed.
- Allows remote testing and time delay bypass.
- Voltage, frequency, phase sequence, voltage unbalance and time delay settings can be checked.
- Viewing of engine exercise schedules.
- Displays phase to phase voltage on normal and emergency.
- Provides complete system status message from 4000 microprocessor controller.
- View event log on the last 99 events for each ATS.
- Arrange test schedules for transfer switches.
- Provides for monitoring of local site or remote sites.



POWER MANAGER DETAIL SCREEN

- Voltage: phase to phase; phase to neutral and voltage unbalance.
- 3 phase currents and neutral (optional).
- Frequency.
- Kilowatt hours - normal and emergency.
- Status and control of four relay outputs.
- Status of eight digital inputs.
- Device ratings: CT and PT ratio.



ENGINE-GENERATOR DETAILS

- Voltage: Phase to phase; Phase to neutral
- Current for each phase.
- Kilowatts and kilowatt hours total.
- Frequency and power factor.
- Status and control of four digital outputs which can be customized by the user.
- • Status of eight digital inputs.
- “Alarm Enabled” selection. These alarms flash the “engine-generator” icon on the summary screen.
- Digital inputs for engine malfunctions are derived from engine mounted sensors (supplied by others).

POWERQUEST SOLUTIONS

5500 Series THIN WEB SERVER

The ASCO Thin Web Server is an internet-based thin client application, which provides monitoring and control of transfer switches and engine generators from anywhere in the world. With ASCO 72E/72A Communications Interface modules and ASCO 5200 Series Power Managers, it brings the power interface to your browser with your user name and password. Alarms and event logs are provided through the browser, while simultaneously transmitting an email indicating that an alarm has occurred with one or more transfer switches.

Fig. 24: Thin Web Server

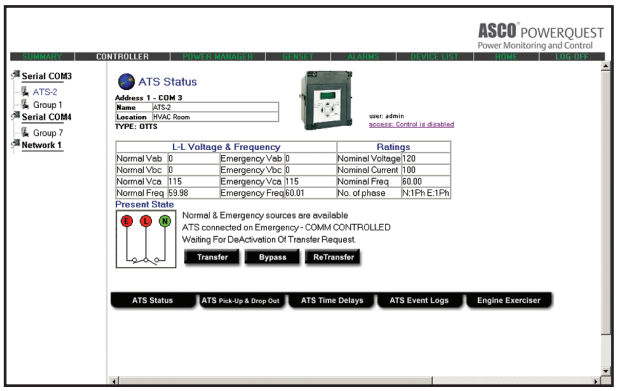


Fig. 25: Thin Web's html interface screen shot

COMMUNICATIONS PRODUCTS FOR 4000 Series TRANSFER SWITCHES

DESCRIPTION	ACC. OPTION	CATALOG NO.
Serial Module	72A	5110
Connectivity Module	72E	5150
Power Manager with Display*	85L	5220D
Thin Web Server*	-	5510E
Software Package*	-	32.15

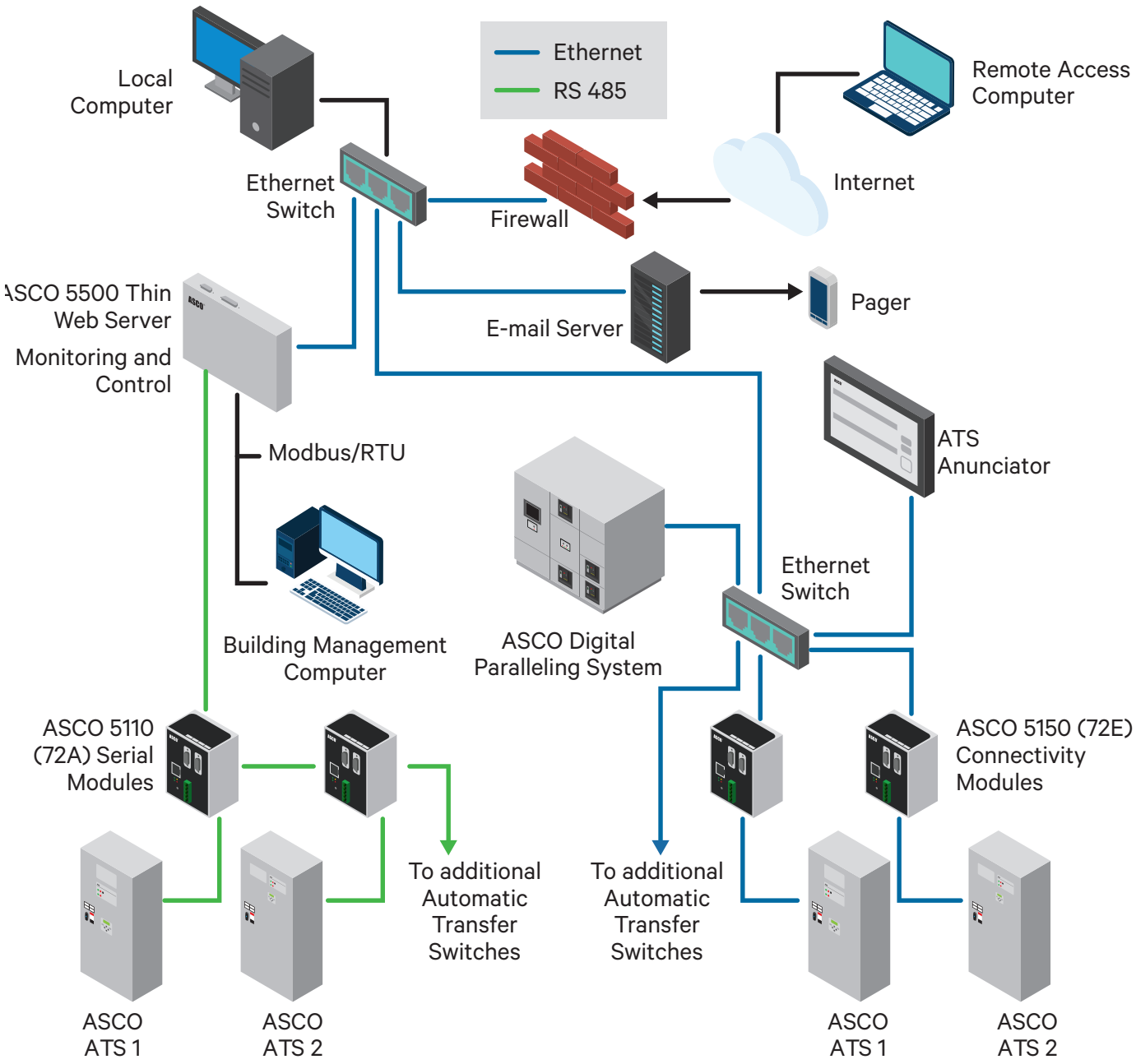
* These products are available as separate items only. They can be ordered by catalog numbers shown in above chart.

SOLUTIONS COMPARISON

ASCO CONNECTIVITY SOLUTION GUIDE FEATURE	POWERQUEST® 32.15	5500 THIN WEB SERVER	5150 CONNECTIVITY MODULE	5350 REMOTE ANNUNCIATOR
Quantity of Monitored / Controlled Power Transfer Switches per LAN	32	64	1024+	8
Number of Monitored / Controlled Gensets	4	8	1024+	0
Control & Monitoring Capability	YES	YES	NO	YES
Embedded Web Pages	NO	YES	YES	YES
Ethernet Network Compatible	YES	YES	YES	YES
Monitor Multiple Protocols & Baud Rates (ASCO I, ASCO II, Modbus)	NO	NO	YES	YES
Monitor Multiple Sites	INTRANET	INTERNET	INTRANET	INTRANET
Multiple Client Access	NO	UP TO 8	UP TO 8	UP TO 8
Client Software Required	YES	INTERNET EXPLORER	INTERNET EXPLORER	INTERNET EXPLORER*
Monitors Dissimilar ASCO Controllers on Common LAN	NO	NO	YES	YES
Communicates with ASCO Remote Annuciators	NO	NO	YES	YES
Email / Paging Alarms	NO	YES	NO	NO
Historical Trending Option Alarms	NO	YES	NO	YES**

* Internet Explorer only required for initial communications setup.

** Historical trending not available on Remote Annuciator.


Local Computer
Ethernet
RS 485
Remote Access Computer
Ethernet Switch
Firewall
Internet
ASCO 5500 Thin Web Server
Monitoring and Control
E-mail Server
Pager
Modbus/RTU
ATS Anunciator
Building Management Computer
ASCO Digital Paralleling System
Ethernet Switch
ASCO 5110 (72A) Serial Modules
ASCO 5150 (72E) Connectivity Modules
To additional Automatic Transfer Switches
To additional Automatic Transfer Switches
ASCO ATS 1
ASCO ATS 2
ASCO ATS 1
ASCO ATS 2

4000 Series USER INTERFACE

USER INTERFACE FEATURES

- **Convenient One Line Diagram** - Provides a clear view of the position of the transfer switch, as well as the acceptability of the Normal and Emergency sources.
- **Source Acceptability LEDs** - Provide true indication of the acceptability of each source, as determined by the voltage, frequency, voltage unbalance, and phase sequence settings of the control panel.
- Transfer Switch Position LEDs - Provide an indication of which source the transfer switch is connected to.
- **Transfer Test** - Allows the user to test the operation of the transfer switch under a simulated failure of the normal source. Holding for 15 seconds allows time for the engine generator to come online and the transfer switch to transfer the load.
- **Retransfer to Normal** - Allows the user to bypass the programmed Retransfer to Normal time delay upon the return of the normal source when the switch has transfered to emergency either during normal operation or a transfer test.
- **Lamp Test** - Provides a convenient way to verify the functionality of all LEDs on the User Interface.
- **User Controls Locked** - Visually displays the sttus of the keypad lock feature of the control panel. When illuminated, the buttons of the User Interface are disabled and the user must enter a password into the control panel to unlock the switch. When LED is blinking, the controls are temporarily unlocked for five minutes from the last button pressed.tus of the keypad lock feature of the control panel. When illuminated, the buttons of the User Interface are disabled and the user must enter a password into the control panel to unlock the switch. When LED is blinking, the controls are temporarily unlocked for five minutes from the last button pressed.

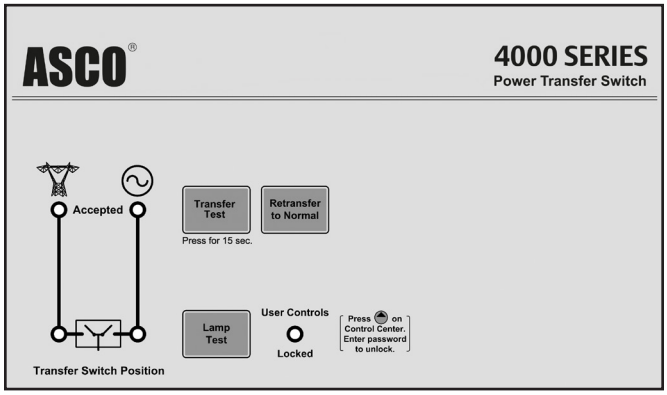


Fig. 7: 4000 Series Open Transition User Interface

ADDITIONAL CLOSED TRANSITION USER INTERFACE FEATURES

- **Extended Parallel Time** - Provides visual indication when the preset extended parallel time has been exceeded. The controls automatically open the emergency or normal main contacts. Separate contact also available to shunt trip to an external breaker.
- **Failure To Synchronize** - Visually displays a failure to synchronize alarm if the time delay settings is exceeded, during closed transition transfer operation.
- **Transfer Switch Locked Out** - Prevents transfer in either direction if the extended parallel time is exceeded.
- **Alarm Reset** - Resets extended parallel and failure to synchronize alarms.
- **Closed Transition Bypass** - Pushbutton allows transfer between sources in an open transition mode.

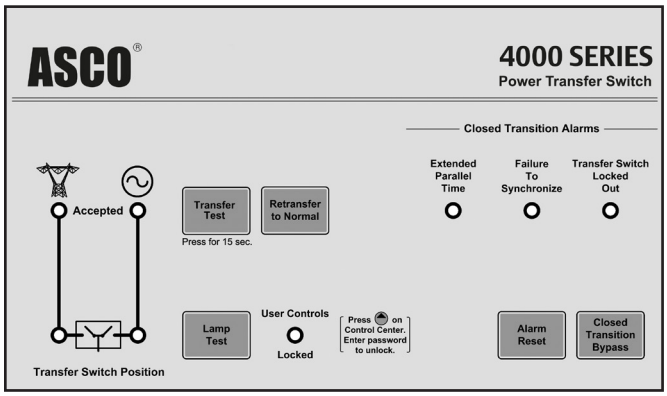


Fig. 8: 4000 Series Closed Transition User Interface

4000 Series ORDERING INFORMATION

To order an ASCO 4000 Series Power Transfer Switch, complete the following catalog number:

4	A	TS		A		3	400		N		5X	C	
		PRODUCT		NEUTRAL CODE*		PHASE POLES	AMPERES		VOLTAGE CODE		GRP CODE	ENCLOSURE	
A	Automatic	TS	Conventional 2-Position	---	No Neutral	2	30	1000	A	115	5	---	No enclosure
						3	70	1200	B	120	5X- optional	C	Type 1 enclosure
							100	1600	C	208			
							125	2000	D	220		F	Type 3R enclosure
		CTS	Closed Transition	A	Solid Neutral		150	2600	E	230			
							200	3000	F	240		G	Type 4 enclosure
							230[1]	4000	H	380			
							260		J	400		H	Type 4X enclosure[2]
N	Non-Automatic	DTS	Delayed Transition	B	Switched Neutral		400		K	415			
							600		L	440		L	Type 12 enclosure
							800		M	460			
									N	480		M	Type 3R secure double door
									P	550			
									Q	575		N	Type 4 secure double door
									R	600			
												P	Type 4X secure[2] double door (304 Stainless Steel)
												Q	Type 12 secure double door
												R	Type 3RX[2] secure double door (304 Stainless Steel)

*Note:

1. 200 and 230 amp switch limited to 480 volts maximum.

2. Type 304 Stainless steel is standard. To provide an improved reduction in corrosion in salt or marine environments, specify optional type 316 stainless steel.

The Example Catalog Number above is 4ATSA3400N5XC
(X is used to specify optional accessories).

TRANSFER SWITCH CONFIGURATIONS

4ATS, 4NTS, 4ADTS, 4NDTS, 4ACTS, 4NCTS

Sizes of UL-Listed Solderless Screw-Type Terminals for External Power Connections

SWITCH RATING AMPS	MAX # OF CONDUCTORS PER TERMINAL	RANGE OF AL-CU CONDUCTOR SIZES
30 -230[1] ATS,NTS	One	#14 to 4/0 AWG
150 DTS, CTS	One	#4 AWG to 600 MCM
	Two	#1/0 AWG to 250 MCM
260-400	One	#4 AWG to 600 MCM
	Two	#1/0 AWG to 250 MCM
600	Two	#2 AWG to 600 MCM
800-1200	Four	#1/0 AWG to 600 MCM
1600-2000[2]	Six	#1/0 AWG to 600 MCM
2600, 3000[2]	Twelve	#1/0 AWG to 600 MCM
4000[2]	Twelve	#2/0 AWG to 600 MCM

Notes:

1. 200 and 230 amp rating for copper conductors only.

2. All main terminals are rear connected. 1600 & 2000 amp switches are available in optional front connected arrangement. Specify optional accessory 40MY for 1600 amp and 40NY for 2000 amp. WCR rating limited to 85,000 amp rms symmetrical. see pages 20, 21 for enclosure dimensions.

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