

ATS Control System

RPTCS

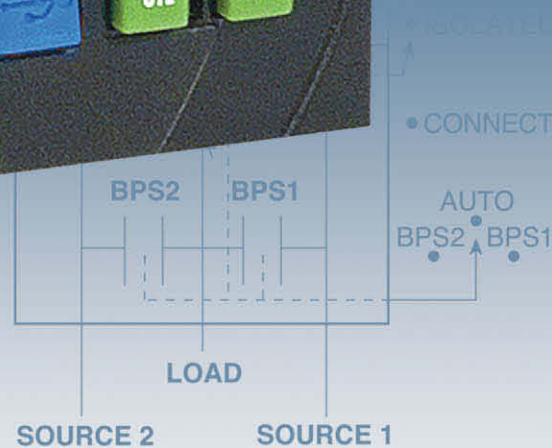


The RPTCS control panel features a color LCD screen displaying the following information:

- Top bar: 28 Jan 12 14:36
- Header: Load Connected to S1
- Table:

Type		Configuration	
Name	ATS	Trans Type	Delayed
Type	Closed Trans	Mode	Auto
Amps	400	BypRxfrTmr	Disabled
Volts	480	BTR	Enabled
Job#	ATS	Load Shed	Enabled
Mod#	ATS	Exerciser	Enabled
S1	Utility	Commit	Disabled
S2	Generator	Test Mode	Not Active

Below the table are buttons for 'Values', 'Status', 'Setpoints', 'Diag', and 'Exerciser'. To the right of the screen is a vertical stack of blue buttons: Home, Up, Down, ESC, ENTER, HELP, and a card icon. Further right are three status indicators: ALARM (off), TD ACTIVE (off), and XFER INHIBIT (off). Below these are two indicator lights for S1 (on) and S2 (off), with a schematic diagram showing a load connected to S1. At the bottom right are four green buttons: ALARM RESET, TEST, CTL, and INFO. At the bottom left, the 'Russelectric RPTCS' logo is visible above five RJ45 ports.



RPTCS: Transfer Switch Control System

- 1) Color LCD screen
- 2) Context-sensitive soft keys
- 3) Navigation keys
- 4) LED status indicator lights
- 5) Direct-acting function keys
- 6) USB port



Control of All Operational Functions

Used exclusively on Russelectric RTS Series transfer and bypass/isolation switches, the Russelectric RPTCS microprocessor automatic transfer control system controls all operational functions of the ATS. Each RPTCS is programmed at the factory to control standard switch features as well as customer-specified options.

Controller design accommodates the addition of accessories.

Intuitive Graphical User Interface

The RPTCS's graphical control panel provides an operator with rapid access to relevant information and controls through intuitive sequences. It also allows access to control settings and other available information.

Setup, alarm acknowledgement, and review of actual data are easily accomplished using the controller's soft keys and color display. The intuitive menu guides the user through controller setup and the entering of configuration data, including communications and timing set points, adjustable control parameters (interlocks, alarms, and security), and event logging.

The panel contains a 3.5" (320 x 240 pixel) backlit color LCD screen, and pushbutton keys for display and command functions. Pushbuttons for ALARM RESET, TEST, CONTROL, and INFO provide direct-acting control. Several LED indicators show switch status. Details are displayed on screen when the user navigates to the appropriate screen.

Located directly below the display screen, five soft keys are used to perform navigation and screen-specific functions, and to acknowledge pop-up windows. Labels for these keys are context-sensitive and appear in grey boxes along the bottom of the LCD screen.

Fully Programmed at the Factory

All RPTCS Controls are fully programmed at the factory with default setpoints.

Changing Setpoints

Operators can easily review and alter these default setpoints (except for factory setpoints, which can only be modified by Russelectric personnel) within established limits through the controller graphical interface.

Configuration setpoints are categorized as follows:

- ATS Configuration
- CT-VT Configuration
- Inputs
- Outputs
- Communications
- RPTCS System (including Security)
- Events
- Event Counters

Communication

The RPTCS Controller supports the following communications protocols:

- Modbus RTU via RS485 (standard)
- Modbus TCP/IP via 10/100Base-T Ethernet (available)

With the Russelectric DTWG Web Server Communications Gateway accessory, the RPTCS can also accommodate web-based digital and analog I/O serial communications over industrial fieldbus networks using other protocols.

An external USB communication port on the control's faceplate allows fast, easy connection to electronic devices.

Actual Values

Actual values — measured values and control, maintenance, and fault analysis information — can be easily displayed on the RPTCS's screen through the menu.

Real-time metering of voltage (phase-to-phase and phase-to-neutral) and frequency of both normal and emergency power sources is standard. Available options include metering of phase and neutral current; percent of unbalanced current; percent of unbalanced voltage; accumulated energy (KWH, KVAH, and KVARH); and per-phase and 3-phase totals for real power (KW), apparent power (KVA), reactive power (KVAR), and power factor. All metering can be accessed through the menu.

Operational Status

The RPTCS provides information on a switch's operational status in the form of alarms, status messages, or general messages. Alarm messages are preceded by a red triangle and status messages by an orange square. General information messages are displayed in black text.

When the controller is first powered up, the status screen will display any parameters that must be entered for proper operation of the ATS. Trips, inhibits, faults/alarms, and control messages are displayed as status messages. The operator can easily scroll through these messages using the up and down keys.

Information messages are provided in two forms: information only and information with navigation. The latter are marked with an "Enter" key on the right, which when depressed takes the operator directly to the respective screen.

Status Inputs and Status Outputs screens display lists of the current state of each input or output respectively. A Status System screen shows the status of communication interfaces (serial and Ethernet).

Optional upgrades allow for up to 512 lines of custom control logic programming.

System Exerciser

The RPTCS has a built-in exerciser that is set up and enabled from the Exerciser Info Screen. This feature allows the user to test the system periodically or to schedule exercises for the operating system periodically in order to minimize utility costs.

The Exerciser Info screen provides access to all parameters for scheduling exercises, as well as dates for the last exercise and next scheduled one.

An Exerciser Setup screen allows selection of the type of exercise and date for up to 7 events, daily, weekly, semi-monthly, or 24 events yearly. Types of exercises include Transfer of Load with Time Delay and No Transfer — Test Without Load/Generator Start Only. Unscheduled manual testing can also be performed. A "Test Cancel" button allows an operator to abort a test in progress.

Diagnostics

Diagnostics screens display information such as an event record, learned data, power summary, system counters, and system information. These screens are very helpful in diagnosing the cause of a fault or alarm.

An Event Log screen lists the ten most recent events (from the event recorder) with the most recent at the top.

An Event Log/Statistics screen displays date and time information as well as the reason for the last failure of the preferred source. It also provides statistics on how long the load has been in either source, how many transfers have occurred, and total time the load has been without power.

A Power Summary screen displays phase rotation, voltages and angles, frequency, and phase difference for both sources.

Fixed system information is displayed on the System Parameters screen. Information includes the order code, serial number, and hardware and software revision.

Information on the last transfer event and load conditions at the time are presented on the Event Log screen.

Optional Wave Form Capture

The RPTCS can also monitor power quality with available waveform capture and historical trending.



Sample RPTCS ATS Control System Screens

Operational Status

Operational Status screen showing 'Load Connected to S1'. Status indicators: S2 Disconnected, S1 Connected, S1 Available.

System Parameters

System Parameters screen titled 'Test in Progress' showing configuration details:

Type	Configuration
Name ATS #4	Trans Type Closed
Type Closed Trans Bypass	Mode Auto Xfer
Amps 400	BypRstrTmr Disabled
Volts 480	BTR Enabled
Job# 90019-5	Load Shed Enabled
Mod# RTS30-ABOC4004CM	Exerciser Enabled
S1 Utility	Commit Disabled
S2 Generator	Test Mode Active

Help Screen

Help Screen for Timers showing a list of settings:

- Delay for Generator Start (s) 3 Sec
- Delay - Xfer to Nonpreferred Src Not Set
- Delay - Xfer to Preferred Src (s) 12 Sec
- Delay - Cntr Off Pos. to Non-Pref 1 Sec
- Delay - Cntr Off Pos. to Pref.Src 1 Sec
- Delay for Engine Cooldown (s) 7 Sec
- Time Delay for Gen Sag 1 Sec
- Preferred Sag Timer (10ms) 20
- Pre Load Control 1 Timer (s) Not Set
- Post Load Control 1 Timer (s) Not Set
- Bypass Non-Pref Timers Disabled
- Fail to Sync Timer (s) 180

Power Summary

Power Summary screen showing power measurements:

S1	S2	Power
208 Vab	202 Vab	262.9 kW
208 Vbc	202 Vbc	264.4 kVA
210 Vca	203 Vca	-28.1 kvar
60.10 Hz	60.14 Hz	0.99 lead

System Configuration

System Configuration screen for CT-VT showing parameters:

- Phase CT Type 5 A Secondary
- CT Primary (A) 4000
- VT Ratio (VT:1) 1.00
- Nominal ATS Amps (A) 400
- ATS Secondary Voltage (V) 480
- Supply Frequency (Hz) 60
- ATS Number of Poles Four Poles
- S1 Number of Phases Three Phase
- 3 Phase Voltage Connection Wye
- S1 Type Utility
- S2 Number of Phases Three Phase
- 3 Phase Voltage Connection S2 Wye

Control Settings

Control Settings screen for General showing parameters:

- Preferred Source S1
- Commit Xfer to S2 Disabled
- Transition Mode Select Delayed
- Local Load Shed Mode Remote Load Shed
- Local Load Shed KW Bypass Disabled
- Sync Phase Angle Limit (°) 5
- Slip Rate (Hz) 0.20
- Load Phase Rotation Check Disabled
- Load Phase Rotation ABC

Timer Configuration

Timer Configuration screen showing timer settings:

- Delay for Generator Start (s) 3 Sec
- Delay - Xfer to Nonpreferred Src Not Set
- Delay - Xfer to Preferred Src (s) 12 Sec
- Delay - Cntr Off Pos. to Non-Pref 1 Sec
- Delay - Cntr Off Pos. to Pref.Src 1 Sec
- Delay for Engine Cooldown (s) 7 Sec
- Time Delay for Gen Sag 1 Sec
- Preferred Sag Timer (10ms) 20
- Pre Load Control 1 Timer (s) Not Set
- Post Load Control 1 Timer (s) Not Set
- Bypass Non-Pref Timers Disabled
- Fail to Sync Timer (s) 180

Event Log

Event Log screen showing event details:

#	Date/Time	Cause
2867	8 Feb/10:00:17.700	Xfer to Alternate Source
Event Record Details #: 2858		
2858	8 Feb/10:00:00.020	SWITCH EXERCISING