PowerCommand® 40-02/12 Transfer Switch Control

GTEC Transfer Switches

DESCRIPTION



The PowerCommand® 40-02/12 Transfer Switch Control is a sophisticated microprocessor-based control with the basic features you need for primary source and generator set monitoring, generator set starting and load transfer functions for emergency standby power applications. The control features a highly customizable customer inputs/outputs which can be tailored to suit a wide range of application requirements.

The control human machine interface (HMI) includes a LCD display with tactile-feel soft-switches for easy operation and screen navigation. All data on the control can be viewed by scrolling through screens with the display scroll button. The control displays the current active fault, fault occurrences and time-ordered history of the 10 previous faults with respect to Real Time Clock Stamp and Engine Running Time.

FEATURES

Digital display – The PowerCommand® 40-02/12 offers a clear back-lit LCD 4-line text display, showing system status, contextual icons and warnings. The display is also equipped with 9 red and green LEDs indicating operational status.

Modbus network communication – Modbus network communications capable. Optional Modbus RTU RS485 connection (1 serial port).

Diagnostics and reporting – Detailed event logging with enhanced fault codes, alert lists, power event history, and source statistics enhances diagnostic capability during service events and provides the ability to meet any reporting requirements.

Dry Contact (Volt Free) Relays – Configurable volt-free digital inputs and outputs make the PowerCommand® 40-02/12 fully flexible to suit a wide variety of applications.

PC & Front Panel Configurations – The modules can be easily configured using the PC software. Selected front panel editing is also available.

Ease of service and access – Built-in plug-and-play control with minimized point-to-point connections and compatible terminal markings simplify servicing.

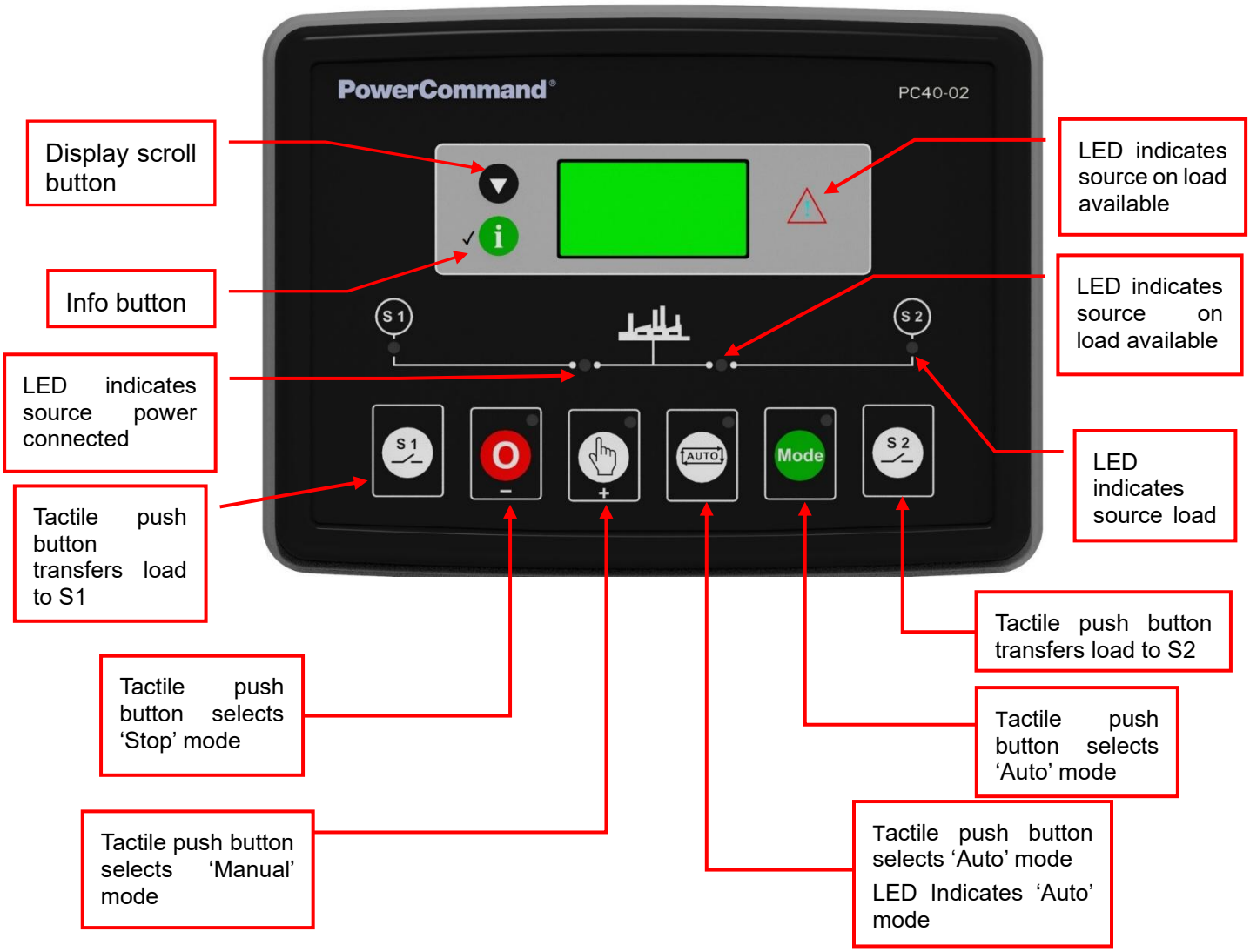
Complete product line – Cummins is a single source supplier with full scope of power system solutions, integration and service capability, from paralleling to system level controls, switchgear and remote connectivity.

Warranty and service – Products are backed by a comprehensive warranty and a worldwide network of distributors with factory-trained service technicians.



Isometric (ISO) projection: front views

HUMAN MACHINE INTERFACE (HMI) CAPABILITIES



CONTROL FUNCTIONS

Transfer Inhibit

When transfer inhibit external input is active, the control does not automatically transfer the transfer switch to a standby source even when the preferred source fails.

Retransfer Inhibit

When retransfer inhibit external input is active, the control does not automatically retransfer the transfer switch to a preferred source even when the preferred source returns.

Real Time Clock

This feature is used by the control for fault and event time stamping and as a reference for exerciser schedules and exception schedules.

Test - Remote

Test feature allows the user to automatically test the standby source and the transfer switch. The test command can be issued from the remote source.

The test has following types available:

- Remote Start On Load
- Remote Start Off Load

Preferred Source Selection

Using this feature the user can swap the priority of the sources which are preferred and standby.

Exerciser Scheduler

The Scheduler allows the user to configure pre-set automatic starting and stopping of the Generator as well as stopping the ATS carrying out a transfer (when in Auto mode).

BANK 1 / BANK 2

Each Bank of the Exercise Scheduler is used to give up to 8 scheduled runs per bank, 16 in total. This run schedule is configurable to repeat every 7 days (weekly) or every 28 days (monthly). Do Not Transfer, Off Load and On Load. Each scheduler bank configured differently either to weekly or monthly based exercises.

Source Availability

This feature monitors the frequency and voltage sensors on the preferred and standby sources to determine and declare the availability status of the two sources, irrespective of which source is connected to the load. It declares the states as event codes. Preferred/Standby Available - active inactive.

Configurable Input/Output

This feature allows the configurable inputs to be configured to perform any of the below assignable input functions and configurable output pins to perform any of the below assignable output functions:

Assignable input functions:

- Alarm Mute
- Alarm Reset
- Auto Restore Inhibit
- Auto Start Inhibit
- Auxiliary S1 Fail
- Auxiliary S2 Ready
- Charger AC Failure
- External Panel Lock
- Inhibit Scheduled Run
- Lamp Test
- Load Shedding
- Open / Close S1 and S2
- Remote Start Off Load
- Remote Start On Load
- S1 / S2 Closed Auxiliary
- S1 / S2 Load Inhibit
- S2 Transfer inhibit
- Simulate S1 / S2 Available

Assignable output functions:

- Close S1 Or S2
- Close S1 / S2 / N Output
- Common Warning
- Cooling Down
- Digital Input A – K
- Elevator Control
- Fail to Start / Stop
- Loading Frequency Not Reached
- Loading Voltage Not Reached
- Open S1 / S2 Output
- Return Delay in Progress
- Start Delay in Progress
- System in Auto Mode
- System in Manual Mode
- System In Start Inhibit Mode
- System in Test Off-Load Mode
- System in Test On-Load Mode

Voltage sensing

3-phase sensing on Source 1 and Source 2 (up to 600 Vac with no need for additional PTs). Plant battery voltage monitoring.

Time Delays

The following adjustable time delays are built into the transfer switch control. External modules to accomplish these delays are not required.

- **Start Delay** (Also known as Time Delay Engine Start, TDES adjustable from 0 to 10 hours)
- **Warming** (Also known as Time Delay Normal to Emergency, TDNE adjustable from 0 to 1 hour)
- **Elevator Delay** (Also known as Time Delay Elevator, TDEL adjustable from 0 to 5 minutes)
- **Non-sync Transfer Time** (Also known as Time Delay Programmed Transition, TDPT adjustable from 0.5 s to 10 minutes)
- **Return Delay** (Also known as Time Delay Emergency to Normal, TDEN adjustable from 0 to 5 hours)
- **Cooling** (Also known as Time Delay Engine Cool-down, TDEC adjustable from 0 to 1 hour)

Source Statistics

The control displays the following source statistics:

- S1 Connected
- S1 Available
- S2 Connected
- S2 Available
- S1 Voltage L1-N
- S1 Voltage L-L
- S1 Frequency
- S2 Voltage L1-N
- S2 Voltage L-L
- S2 Frequency
- Auto / Manual Mode
- Warning Alarms
- Event Log
- Current operational status
- Load current (A)
- Plant Battery Voltage

Events

The control displays information on up to 10 events displayed in chronological order, beginning with the most recent event, about either source. The event information shall include the following:

- Failure modes
- Warning
- Tests and exercises
- User-driven inputs (e.g., override, transfer inhibit)

SUPPORTED APPLICATIONS

Application Types

- Utility - Generator Set

COMMUNICATIONS

The PowerCommand® 40-02/12 Transfer Switch Control features an optional network communication module.

Features include:

- Optional Modbus® RTU RS485 communication module (1 isolated serial port)
- USB port for service tool interface

PROTECTION

Phase rotation sensing

- Source 1 and Source 2

Under-Voltage sensing

- 3-phase normal, 3-phase emergency
- Accuracy: ±2 % of full-scale phase to phase
- Phase to neutral voltage range 50Vac to 414Vac.
- Phase to phase voltage range 86Vac to 717Vac.

Overvoltage sensing

- 3-phase normal, 3-phase emergency
- Accuracy: ±2 % of full-scale phase to phase
- Phase to neutral voltage range 52Vac to 416Vac.
- Phase to phase voltage range 90Vac to 720Vac.

Over/under frequency sensing

- Normal and emergency
- Accuracy: ±0.2 Hz
- Frequency range 3.5 – 75 Hz

CONTROL OPERATING VOLTAGE

- Range: 8-35 Vdc.

ENVIRONMENT

Operating Temperature Range	Control operates over an ambient temperature range: -30 ºC to 70 ºC.
Storage Temperature Range	The control operates after being exposed to Storage Temperatures in the range of -40 ºC to 85 ºC. The LCD display functions after being exposed to storage temperatures of -30 ºC to 80 ºC.
Ingress Protection	The front panel is to be IP65.

CODES AND STANDARDS

c UL us	The PC40-02/12 control is a UL Recognized Component Marked for United States and Canada.	NFPA	Capable of being used on systems compliant with **NFPA 70**, **99** and **110 (Level 1)**.
IEEE	The control is **IEEE C37.90.2** certified. Capable of being used on **IEEE 446** compliant systems; Recommended Practice for Emergency and Standby Power Systems.	NEMA National Electrical Manufacturers Association	Control and display as installed in a transfer switch enclosure comply1 with **NEMA 4X** and **IP65** at the transfer switch level - if the transfer switch enclosure is also **NEMA 4X** & **IP65** compliant.
RoHS	The control is **RoHS** compliant.	NEC®	Capable of being used on systems suitable for use in emergency, legally required and Standby and Critical Operations Power Systems (COPS) applications per **NEC 700**, **701**, **702** and **708**.
CE	Fulfills the requirements of relevant European product directives.	LVD	The unit is designed to comply with European directive 72/23/EEC by complying with harmonized European safety standard BS EN 60950
EMC	The control is tested to meet the following **CE** Electromagnetic Compatibility (**EMC**) standards for **EN 61000** series (electromagnetic compatibility): **EN 61000-6-2** Generic Immunity Standard **EN 61000-6-4** Generic Emissions		

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S-6561 PD00000757 (11/2025)