

Emerson Emerson Series Service Manual

SS4303T01

1. Description

Emerson SS4303T01 LS AI 4-20 mA HART CHARM

3. Product Information

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DeltaV SIS™ Electronic Marshalling

Hardware Includes:

- CHARM Smart Logic Solver Carrier (DIN rail mounted and supports a redundant pair of CHARM Smart Logic Solvers, redundant 24V DC power connectivity, and redundant Ethernet Safety Network communication Ports).

- CHARM Smart Logic Solver (provides redundant safety logic processing and communication to up to 96 LS-CHARMs).

- CHARM Base plate (DIN rail mounted with interleaving power and bus connectors. Supports 12 LS CHARMS and their terminal blocks, as well as connection for injected field power).

LS CHARM Terminal Block (removable terminal block providing terminal connections to field wiring and physical latch for LS-CHARM).

- LS CHARMs (Logic Solver Characterization Module for each field signal. Provides basic characterization and isolation to the redundant communication bus).

- Cable Extenders that provide flexibility in carrier mounting.

- I/O bus termination (provides bus terminations for redundant I/O bus).

- Labeling features for base plate and channel identification.

The CHARM Smart Logic Solver carrier is mounted to the top of a vertical DIN rail and up to eight CHARM Base plates are mounted below it, snapping easily to the DIN rail as they are connected to each other. The bus termination assembly is attached at the bottom. A standard DIN-rail lock is used to keep the entire assembly in place.

A pair of CHARM Smart Logic solvers install on the carrier and communicate over a redundant Ethernet safety network with up to 15 other CSLs and 1 SZ controller, allowing great flexibility and ease of system expansion.

SNPs are available for copper only.

SZ controllers connect to both the area control network and the LSN to isolate the CSLs from the process control system. The SZ controllers has replaceable Ethernet Isolation Ports for connection to both LSN and the DeltaV Area Control network. Starting in DeltaV v14.3 a new Keylock Ethernet Isolation Port, in yellow color plastic, which enable the key inhibit unlock switch on the carrier to allow the key to inhibit the unlock command to all CSLs on the LSN.

Only DeltaV SIS Smart Switches are supported on the Local Safety Network (LAN).

Each baseplate is ordered with 12 terminal blocks: standard terminal blocks or fused, injected power terminal blocks.

Electronic Marshalling eliminates the need to partition the I/O wiring to specific channels based on signal type. Simply connect field signal multi-cores in an orderly fashion as desired. Install the appropriate LS CHARM to complete the field circuit and the signal is ready to be used by the CSLs. No cross-wiring required.

Each LS CHARM acts as a circuit protection device and field wiring disconnect. Signals are inherently current limited to protect against wiring faults to ground. Each LS CHARM

provides surge protection to meet industry standards in the area of EMC. Under extreme overvoltage conditions due to incorrect field wiring, the LS CHARM will act as a fuse to protect adjacent channels. Signal faults are thus isolated to the single LS CHARM.

LS CHARMS can be partially ejected to a locked position that disconnects the field wiring from the system to perform field maintenance actions or to remove power to a field device. Activating the LS CHARM latch ejects the LS CHARM to the detent position. Closing the latch locks the LS CHARM in place and isolates the field wiring for field work.

Baseplate extenders and cables provide great flexibility to the LS CHARM installation in existing cabinets or in custom enclosures. Cables are redundant, each carrying 24V DC field power, 6.3V DC LS-CHARM power, and one of the communication busses.

Bus termination provides added robustness for the communication bus and is installed at the end of the physical bus.

Label features are available to identify channel usage and Baseplate identification to help with maintenance.

LS CHARMS can be added to any existing base plate position and autosensed online. Additional CSLS can be added online.

Sensor Types Voltage device

Full Scale Signal Range See Table below

Accuracy See Table below

Input Impedance 10 MΩ

Repeatability 0.05% of span

Resolution 24 bit A/D converter / Refer to the following table

Calibration None required

Common Mode Rejection 90dB at 50/60 Hz

Isolation Input channel galvanically isolated and factory tested to 1000V DC

CHARM Power Req. 18 mA max @ 24V DC

CHARM Heat Dissipation 0.40 Watts

Sensor Type: 0 to 5 VSensor Range: 0 to 5 V25° Reference Accuracy: ± 0.005 VTemperature Drift: ± 0.0005 V/°CNominal Resolution: 0.00008 VSensor Type: 0 to 10 VSensor Range: 0 to 10 V25° Reference Accuracy: ± 0.010 VTemperature Drift: ± 0.001 V/°CNominal Resolution: 0.00015 VSensor Type: 1 to 5 VSensor Range: 1 to 5 V25° Reference Accuracy:± 0.005 VTemperature Drift: ± 0.0005 V/°CNominal Resolution: 0.00006 VSensor Type: 1 VSensor Range: -1 to +1 V25° Reference Accuracy: ± 0.0025 VTemperature Drift: ± 0.0002 V/°CNominal Resolution: 0.00003 VSensor Type: 5 VSensor Range: -5 to +5 V25° Reference Accuracy: ± 0.005 VTemperature Drift: ± 0.0005 V/°CNominal Resolution: 0.00015 VSensor Type: 10 VSensor Range: -10 to +10 V25° Reference Accuracy:± 0.010 VTemperature Drift: ± 0.001 V/°CNominal Resolution: 0.00030 V