

# Stocked Electro-Mechanical Switches (SEM Series)

Stocked EM   Standard EM   Custom EM   Standard PIN   Multi-Throw PIN   High Power PIN   Switched Attenuators   Switched Filter Banks   Limiters

## Quick Reference Guide

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## Glossary

**SP2T** – A single-pole, double-throw switch has one input port and two selectable output ports.

**Multiposition Switch** – A multiposition switch has one input port and more than two selectable output ports. Unlike some switches, Narda models can be switched directly to any one of the available output positions without sequencing through intervening positions.

**Transfer Switch** – A transfer switch has two independent paths that operate simultaneously in one of two selected positions.

**Failsafe** – The switch moves to the closed position when the actuating voltage is applied and always returns to a predetermined position when the voltage is removed.

**Latching** – Also called Pulse Latching, the switch remains in a preselected position whenever the actuating voltage is removed or interrupted and holds that preselected position until a voltage is applied to another position. This configuration must be pulse-controlled with a pulse width of 20 ms to 100 ms duration. Standard polarity is common positive.

**Normally Open** – All output ports of the switch are disconnected from the input port until a voltage is applied to a selected position.

**Terminated Units** – Each unused or open output RF port is internally terminated in a 50-ohm resistive load (1W CW max.).

**TTL** – Selected position of the switch is controlled by a TTL Logic High. The switch requires only nominal +28 Vdc (additional 5 Vdc is not required).

**TTL Logic Voltage Level:**

Low 0 to 0.8 Vdc High 2.5 to 5.0 Vdc

**TTL Logic Input Current:**

Low 0 mA High 1.6 mA max. @ 3.85 Vdc

**TTL Units** – Transistor-Transistor-Logic circuitry enables the status of the switch to be controlled by the level of TTL logic input.

**Suppression Diodes** – Fast-recovery silicon rectifiers (diodes) connected in parallel with the coils of the switch to suppress any transient voltage that may be generated by the coils.

**Indicator Circuitry** – A set of internally mounted contacts that allows external monitoring of switch RF status. Some switch series include a steering diode drive due to the electronic indicator.

**Solder Terminal** – A turret terminal is standard on all switches.

**Self De-energizing Circuitry** – With this option, a set of internally mounted contacts or electronically generated pulses disconnects the driver voltage as soon as RF contact has been made. This option is only available with latching type switches. Suppression diodes must be specified with this option.

## Common Specifications:

- **RF Impedance: 50 ohms nominal**
- **Actuating Voltage: 28 Vdc**
- **Switching Time: 15 ms (max.)**
- **Switching Sequence: Break Before Make**
- **Operating Ambient Temp.: -35°C to +70°C**
- **Operating Life: 1 million cycles/position**
- **Designed to meet MIL-S-3928**

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## SEM Series Index

| SEM No.      | TYPE     | FREQUENCY RANGE GHZ | CONNECTOR | ACTUATION          | TERMINATION 50 OHMS | INDICATOR CIRCUITRY | SUPPRESSION DIODES | TTL LOGIC | SELF DE-ENERGIZING CIRCUIT |
|--------------|----------|---------------------|-----------|--------------------|---------------------|---------------------|--------------------|-----------|----------------------------|
| 020          | SPDT     | DC TO 18            | SMA       | FAILSAFE, 28V      |                     |                     |                    |           |                            |
| 020-12       | SPDT     | DC TO 18            | SMA       | FAILSAFE, 12V      |                     |                     |                    |           |                            |
| 020-24       | SPDT     | DC TO 18            | SMA       | FAILSAFE, 24V      |                     |                     |                    |           |                            |
| 020L         | SPDT     | DC TO 18            | SMA       | LATCHING, 28V      |                     |                     |                    |           |                            |
| 123          | SPDT     | DC TO 18            | SMA       | FAILSAFE, 28V      |                     | ✓                   |                    |           |                            |
| 123D         | SPDT     | DC TO 18            | SMA       | FAILSAFE, 28V      |                     | ✓                   | ✓                  | ✓         |                            |
| 123T         | SPDT     | DC TO 18            | SMA       | FAILSAFE, 28V      | ✓                   | ✓                   |                    |           |                            |
| 123L         | SPDT     | DC TO 18            | SMA       | LATCHING, 28V      |                     | ✓                   | ✓                  |           |                            |
| 123LT        | SPDT     | DC TO 18            | SMA       | LATCHING, 28V      | ✓                   | ✓                   | ✓                  |           |                            |
| 123LD        | SPDT     | DC TO 18            | SMA       | LATCHING, 28V      |                     | ✓                   | ✓                  | ✓         |                            |
| 123DT        | SPDT     | DC TO 18            | SMA       | FAILSAFE, 28V      | ✓                   | ✓                   | ✓                  | ✓         |                            |
| 123LDT       | SPDT     | DC TO 18            | SMA       | LATCHING, 28V      | ✓                   | ✓                   | ✓                  | ✓         | ✓                          |
| 123LDT-24    | SP2T     | DC TO 18            | SMA       | LATCHING, 24V      | ✓                   | ✓                   | ✓                  | ✓         | ✓                          |
| 123N         | SPDT     | DC TO 12.4          | N         | FAILSAFE, 28V      |                     | ✓                   |                    |           |                            |
| 123DN        | SPDT     | DC TO 12.4          | N         | FAILSAFE, 28V      |                     | ✓                   | ✓                  | ✓         |                            |
| 124          | SPDT     | DC TO 26.5          | SMA       | FAILSAFE, 28V      |                     | ✓                   |                    |           |                            |
| 133          | SP3T     | DC TO 18            | SMA       | NORMALLY OPEN, 28V |                     | ✓                   |                    |           |                            |
| 133D         | SP3T     | DC TO 18            | SMA       | NORMALLY OPEN, 28V |                     | ✓                   | ✓                  | ✓         |                            |
| 133DT        | SP3T     | DC TO 18            | SMA       | NORMALLY OPEN, 28V | ✓                   | ✓                   | ✓                  | ✓         |                            |
| 133LT        | SP3T     | DC TO 18            | SMA       | LATCHING, 28V      | ✓                   | ✓                   |                    |           |                            |
| 133T         | SP3T     | DC TO 18            | SMA       | NORMALLY OPEN, 28V | ✓                   | ✓                   |                    |           |                            |
| 143          | SP4T     | DC TO 18            | SMA       | NORMALLY OPEN, 28V |                     | ✓                   |                    |           |                            |
| 143D         | SP4T     | DC TO 18            | SMA       | NORMALLY OPEN, 28V |                     | ✓                   | ✓                  | ✓         |                            |
| 143DT        | SP4T     | DC TO 18            | SMA       | NORMALLY OPEN, 28V | ✓                   | ✓                   | ✓                  | ✓         |                            |
| 143DT-24     | SP4T     | DC TO 18            | SMA       | NORMALLY OPEN, 24V | ✓                   | ✓                   | ✓                  | ✓         |                            |
| 143T         | SP4T     | DC TO 18            | SMA       | NORMALLY OPEN, 28V | ✓                   | ✓                   |                    |           |                            |
| 153          | SP5T     | DC TO 18            | SMA       | NORMALLY OPEN, 28V |                     | ✓                   |                    |           |                            |
| 066          | SP6T     | DC TO 18            | SMA       | NORMALLY OPEN, 28V |                     |                     |                    |           |                            |
| 163          | SP6T     | DC TO 18            | SMA       | NORMALLY OPEN, 28V |                     | ✓                   |                    |           |                            |
| 163D         | SP6T     | DC TO 18            | SMA       | NORMALLY OPEN, 28V |                     | ✓                   | ✓                  | ✓         |                            |
| 163DT        | SP6T     | DC TO 18            | SMA       | NORMALLY OPEN, 28V | ✓                   | ✓                   | ✓                  | ✓         |                            |
| 163LD        | SP6T     | DC TO 18            | SMA       | LATCHING, 28V      |                     | ✓                   | ✓                  | ✓         | ✓                          |
| 163LDT-24    | SP6T     | DC TO 18            | SMA       | LATCHING, 24V      | ✓                   | ✓                   | ✓                  | ✓         | ✓                          |
| 163T         | SP6T     | DC TO 18            | SMA       | NORMALLY OPEN, 28V | ✓                   | ✓                   |                    |           |                            |
| XSEM323      | TRANSFER | DC TO 18            | SMA       | NORMALLY OPEN, 28V |                     | ✓                   |                    |           |                            |
| XSEM323D     | TRANSFER | DC TO 18            | SMA       | NORMALLY OPEN, 28V |                     | ✓                   | ✓                  | ✓         |                            |
| XSEM323L     | TRANSFER | DC TO 18            | SMA       | LATCHING, 28V      |                     | ✓                   |                    |           |                            |
| XSEM323LD    | TRANSFER | DC TO 18            | SMA       | LATCHING, 28V      |                     | ✓                   | ✓                  | ✓         |                            |
| XSEM323LD-24 | TRANSFER | DC TO 12.4          | SMA       | LATCHING, 24V      |                     | ✓                   | ✓                  | ✓         |                            |