SOLID STATE EVENT INITIATOR (SSI)

CRITICAL TIMING of PYROTECHNIC EVENTS

INVOCON, INC. **0722**

Invocon's Solid State Initiator (SSI) provides highly reliable and safe initiation capabilities for energetic devices (squibs). It is a solid state replacement for Invocon's historic work horse – the Capacitive Discharge Initiator (CDI). The SSI replaces the mechanical devices of the CDI with solid state electronics while maintaining the same levels of protection for fail-safe activation of engines and pyrotechnic functions required by rockets and spacecraft.

The SSI maximizes flexibility in controlling event initiation by using a combination of timing, external commands, and altitude. Each channel is fully programmable with automated error checking at multiple levels. It also features Invocon's *Squib Sense* ™ fire path analysis capability to ensure that all stages in each fire path are ready for action whether the vehicle is armed or safe.

Key SSI Features:

- Four fully redundant (or eight non-redundant) programmable output channels
- Redundant input triggers for starting the event timers
- 1 millisecond timing resolution per channel on timed functions
- Optional external command triggers for all channels
- Optical isolation between fire paths and control electronics
- Size, weight, and power: 6.25 x 6.25 x 1.78 in, 3.5 lbs
  - 77% reduction in volume from the legacy CDI
  - 75% reduction in mass from the legacy CDI
- Power options include:
  - Single or redundant smart rechargeable batteries
  - Single or redundant smart primary batteries
  - Standard vehicle power: 24 to 36 VDC
- Programmable features:
  - Any combination of channel firing sequences
  - Programmable "safe" altitudes for each channel
  - Logic controlled event start windows
  - Rejects illegal program inputs
  - Selectable sequence start – Lanyard pull, alternate trigger input, or logic command

Solid State Initiator

Key Interface Specifications	
Input Voltage	24 – 36VDC
Input Current	- 60 mA continous at 28V (30 mA per timer) - 5A per squib at initiation
Connectors	- MIL-C-38999 for power - HD DB-15 connector for programming - Standard DB-style connectors for all other functions
Size	6.25 x 6.25 x 1.775 inches (not including connectors)
Weight	3.5 lbs
Case Material	7075 aluminum, Alodine coated (AlMag available if weight critical)
Operating Temperature	-24° to +61°C (Acceptance Levels) -34° to +71°C (Qualification Levels)

System specifications subject to change without notice.

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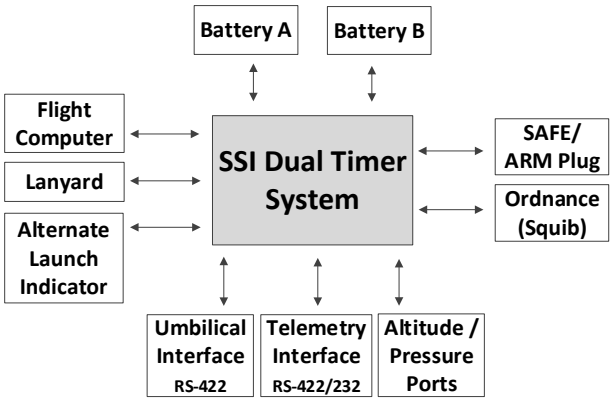
Additional SSI Features include:

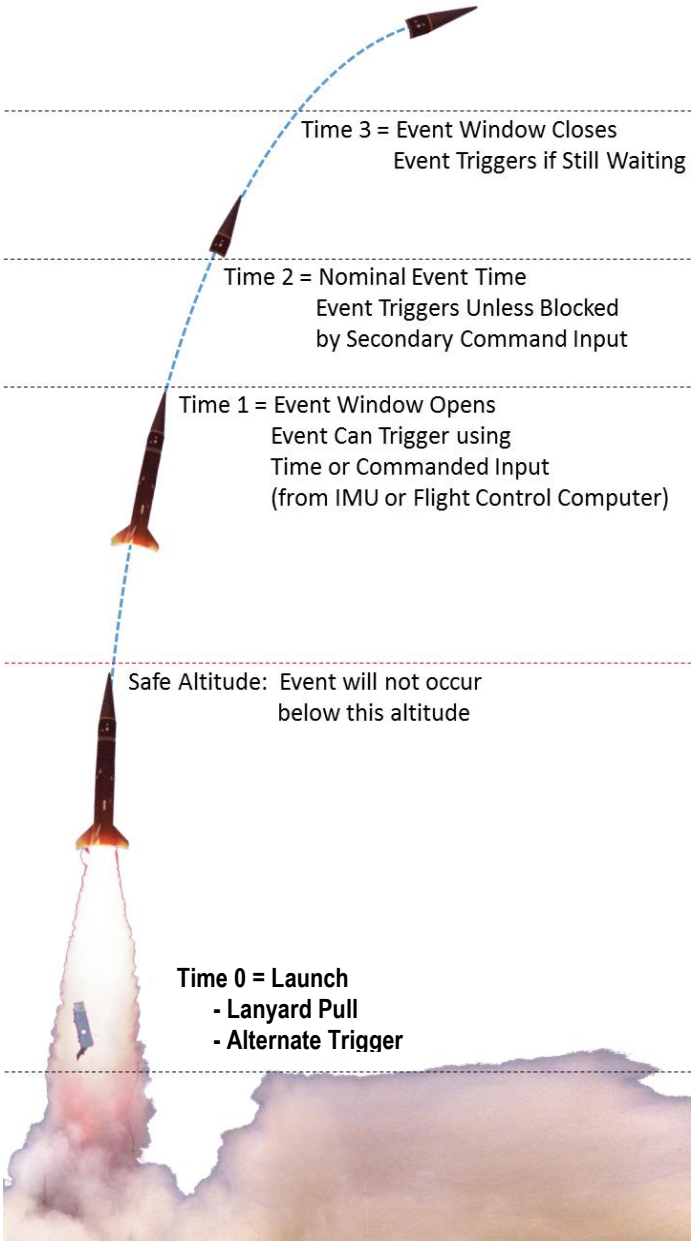
- Triple Modular Redundancy (TMR) implemented in all core logic
- Continuous Health and Status data output via RS422/RS232 to display GUI and/or host vehicle
  - Altitude Sensor Reading
  - Altitude Switch state (open/close)
  - Command fire event status
  - SAFE/ARM plug insertion status
  - Squib Sense™ fire path sensing/analysis
  - Arming status
  - Firing path voltage
  - Input power voltage
  - Firing time and current reporting
- Includes port to simulate altitude for bench testing
- Protected against unsafe umbilical (UMBI) pulls
  - Inhibits timer reset after Lanyard pull
- Capable of simultaneously firing all squibs
- Can be "armed" using two methods:
  - Legacy GSE analog inputs
  - Computer comands via RS422
- Compatible with existing ground support equipment (GSE)
- Graphical User Interface (GUI) for programming, monitoring, and user control



Notional SSI Vehicle Interfaces

Example Event Initiation

Altitude, timing, and command inputs are fully programmable for each channel



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