

# SPEX Smart Electronic Trigger

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The SPEX Smart Electronic Trigger Device (Smart ETD) has been designed to initiate explosive devices conveyed downhole via slickline. Among the downhole tasks, the Smart ETD tool can perform are tubing, drillpipe and casing cutting, tubing punching, perforating, plug setting, and dump bailing. Due to the tool being conveyed on slickline a number of inbuilt safety features are necessary for safe operations.

The Smart ETD incorporates a downhole pressure window, temperature window, time window, motion sensor, and coded shooting module. By incorporating a coded detonator shooting module into the tool running assembly, it is possible to initiate the Dynawell range of coded Electronic detonators and igniters. By running the Smart ETD in combination with the coded detonator or igniter, normal rig activities can continue uninterrupted.

## Principle of Operation

The Smart ETD tool consists of a microprocessor based probe, which consists of five main assemblies:

1. Battery Section
2. Electronic Memory Section
3. Transducer Section
4. Coded Shooting Module
5. Pressure Housing

The battery section is one that is universal in that it can house alkaline batteries, lithium batteries, and silver oxide batteries. This section is designed to supply 12-18 V DC for the tool to operate. The electronic section is the 'brain' and data storage element of the tool. All the downhole tool decisions and fire control is performed in this section. The transducer section is the pressure and temperature measurement section of the tool, utilising rugged proprietary hybrid-quartz technology. The coded shooting module generates a specially sequenced code which is sent to the detonator or igniter which then allows initiation. The pressure housing is an exotic stainless steel housing used to protect the internal electronics from downhole corrosive environments.

To program the Smart ETD the surface system comprises of a laptop computer with a serial port interface to communication with the Smart ETD. The interface assembly is the communication link to program the Smart ETD and download downhole data to the "Smart Blast" program.

The software can provide customer reports onsite which include program control of downhole tool initiation and pressure / temperature graphs.

Other downhole components run in conjunction with the Smart ETD include:

Top shock centraliser, Bottom shear / shock sub-assembly. The top shock centraliser has a combination function of quick disconnection, knuckle jar, no blow, no drop and centraliser.

The bottom shear / shock sub-assembly should always be run at it protects the Smart ETD from explosive detonation shock, and allows the Smart ETD tool to be recovered (by a shear release) should the lower explosive or pyrotechnic tool become stuck.

If It becomes necessary to shear release and recover the Smart ETD, the lower part of the shear / shock sub left in hole presents a standard fishing neck to facilitate the recovery of the explosives left in hole.

## Tool Specifications

Operating Temperature	32 °F to 302 °F (0 °C to 150 °C) Standard 350 °F (177 °C) Extended
Outside Diameter	1.38” (35 mm) Nominal
Tool Length	157”
Maximum Pressure	15,000 psi (103 MPa) Standard 20,000 psi (137 MPa) Extended

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