SmartShot™
Technical Data Sheet

Product Description

SmartShot™ is part of the DetNet suite of precise electronic initiation systems. The SmartShot™ system offers innovative features including wireless remote blasting and complete timing flexibility. Specialised splashproof and dirt displacing connectors ensure quick easy and reliable connections and prevent leakage.

Technical Data

SmartShot™ V8 Tagger

The SmartShot™ Tagger is used for on-bench operations such as assigning detonator locations, testing for leakage and testing detonator integrity. The tagger is intrinsically safe – maximum battery voltage is below blasting voltage and the tagger cannot issue the encrypted blasting command.

Applicable standards	SANS 1717-1: The South African National Standard for: The design and specifications approval of EDD initiation systems for use in mining and civil blasting applications. CEN TS13763-27: European CEN-Testing specification for Explosives for civil uses – Detonators and relays.
Temperature Limits	-20°C to +70°C -4°F to +158°F (Tagger LCD when exposed for 1 hour)
Battery	User replaceable 9V Alkaline Recommend Energiser or Duracell for normal operating temperatures or Lithium Thionyl Chloride for low temperature operation
Weight	Approximately 600 g / 1.32 lbs.
Display	128x64 mm / 5.04x2.52 in LCD with backlight
Keypad	Tactile touch pad with numeric and soft-keys
External Connectors	2 Terminals to connect to 2 wire string starter Custom USB connector 4 wire Harwin connector
Operating time from a fresh battery	Approximately 6 hours at 25°C (77°F). Operating time is influenced by detonator load, backlight settings and operation temperature. At low temperatures battery life may be reduced significantly
Software upgrade	Via a PC and a custom USB cable
Water resistance	Splash proof (IP 55)

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CE4 Tagger

The CE4 Tagger is used for on bench operations such as assigning detonator locations testing communication, leakage of detonator installation and verification of desired blast layout. The tagger is inherently safe maximum – battery voltage is below minimum required blasting voltage (culling voltage) and the tagger cannot issue the encrypted blasting command (i.e. ARM and FIRE commands).

Applicable standards	SANS 55: The South African Standard for design and specifications approval of EDD initiation systems for use in mining and civil blasting applications. CEN 13763-27: European CEN- Testing specification for Explosives for civil uses – Detonators and relays.
Temperature limits (Operational) (Tagger LCD when exposed for 1 hour)	-30°C to +60°C -22°F to +140°F
Battery - Internal, not field replaceable	3.7V Lithium Polymer (MSD-91)
Battery – External battery pack, not included	6 x 1.5V AA Alkaline or 6 x 1.2V Ni-MH / Ni-Cd
Weight of tagger and head	213mm (L) 88 mm (W) 38mm (H)
Weight of external battery	180mm (L) 85mm (W) 27mm (H)
Display (Active LCD area with backlight)	128 pixels x 128 pixels / 44.78 x 44.78mm
Keypad	Backlit tactile silicone keypad with alphanumeric keys.
External Connectors	A series of detonator connections exist for different application purposes. Replaceable Tagger to detonator connector head. USB Connector for data extraction and charging.
Operating time from a fully charged battery	Approximately 10 hours at 25°C (77°F). Operating time is influenced by detonator load, backlight settings and operation temperature. At temperatures below -15°C (5° F) battery life may be reduced significantly.
Software upgrade	Software upgrade is via the USB connector on the Tagger, and a flash drive.
Water resistance	IP 57

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DetNet South Africa (Pty) Ltd
Tel: +27 11 657 7619 I Fax: +27 657 7601 I
Block 1B, Founders Hill Office Park,
Centenary Road, Modderfontein
P O Box 10, Modderfontein, 1645, South Africa
www.detnet.com

SmartShot™ Bench Box

The SmartShot™ Bench Box is used to initiate the blast from a point of safety. It stores the detonator timing plan and utilizes a Smart Key during the blasting process. The Bench Box can be used as a stand-alone blaster and initiate a blast from a point of safety. This device has 12 independent detonator channels for detonator connection via the connector block.

Applicable standards	SANS 1717-1: The South African National Standard for: The design and approval of EDD initiation systems for use in mining and civil blasting applications. CEN TS13763-27: European CEN-Testing specification for Explosives for civil uses - Detonators and relays.
Temperature Limits	-20°C to +70°C -4°F to +158°F
Battery	Non-user replaceable rechargeable 12V 2.3Ah lead acid battery
Weight	Approximately 10.5 kg / 23.15 lbs.
Keypad	Display 128 x 64 mm / 5.04 x 2.52 in LCD with backlight Tactile touch pad with numeric and soft-keys
External Connectors	RF Antenna Connector Connector Block 2 Terminals to connect to 2 wire detonator harness Smart Key connector Custom USB, sync-link and charging connector
Operating time from a fresh battery	Approximately 6 hours at 25°C (77°F). Operating time is influenced by detonator load, backlight settings and operation temperature.
Software upgrade	Via a PC and a custom USB cable
Water resistance	Splash proof (IP 54)

SmartShot Base Station

The SmartShot™ Base Station is used to control and monitor the bench box (up to 4 bench boxes), connected to the entire blast from a safe location. Remote control is achieved through the use of RF or wire link between the base station and bench box. It utilizes Smart Key during the blasting process.

Applicable standards	SANS 1717-1: The South African National Standard for: The design and approval of EDD initiation systems for use in mining and civil blasting applications. CEN TS13763-27: European CEN-Testing specification for Explosives for civil uses - Detonators and relays.
Temperature Limits	-20°C to +70°C -4°F to +158°F
Battery	Non-user replaceable rechargeable 12V 2.3Ah lead acid battery
Weight	Approximately 10.5 kg / 23.15 lbs.
Keypad	Display 128 x 64 mm / 5.04 x 2.52 in LCD with backlight Tactile touch pad with numeric and soft-keys
External Connectors	RF Antenna Connector Smart Key connector Custom USB, sync-link and charging connector
Operating time from a fresh battery	Approximately 6 hours at 25°C (77°F). Operating time is influenced by detonator load, backlight settings and operation temperature.
Software upgrade	Via a PC and a custom USB cable
Water resistance	Splash proof (IP 54)

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DetNet South Africa (Pty) Ltd
Tel: +27 11 657 7619 I Fax: +27 657 7601
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P O Box 10, Modderfontein, 1645, South Africa
www.detnet.com

SmartShot™ Repeater
Filters, refreshes and repeats signal over RF connection. Solar panels that charge the battery.

Temperature Limits	-20°C to +70°C -4°F to +158°F
Weight	± 50Kg
Dimensions	L: 539 - 541mm; W: 480 - 482mm; H: 731 - 733mm L: 21.22 - 21.3in; W: 18.90 - 18.98in; H: 28.78 - 28.89in.
External Connectors	USB; (RS-232 & RS-485 for expansion – rear of unit)
Water Resistance	Splash proof (IP54)

Detonator

Dynamic Shock Resistance	<=15954.15 Psi / 110 MPa
ESD Resistance	>1 Joule Energy @ 30kV
RF Immunity	Passes CEN TS 13763-27
Detonator Shell: South Africa North American	 Copper: L - 93.5mm - 94.5mm, OD: 7.49mm - 7.54mm Copper: L – 93.5mm – 94.5.15mm, OD: 7.49mm - 7.54mm
Detonator Strength	8D (South African Strength Definition) #12 (North American Strength Definition)
Base Charge	PETN
Net Explosives Quantity (NEQ)	1 gram per detonator
Timing	Fully programmable & Auto-programmable
Wire: Polyvinylchloride (PVC) Polyethylene (PE) - arctic Thermal Polyurethane (TPU) - HD	 Rugged, green with black stripe, over extruded Rugged, green with white stripe, over extruded Rugged, green with orange stripe, over extruded
Connector	Rugged, water resistant
Elongation	Maximum 20%
Tensile Strength	>200 N / 45 lbs.
Abrasion Strength	Passes CEN TS 13763-27
Detonator Shell Marking	Dangerous - Blasting Cap - Explosive Danger - Detonateur - Explosif
In-Hole Sleep Time: PVC PE TPU	 Max 21 days A maximum of 7 days (when tested in 100% diesel, 500Kpa pressure and starting temperature of 60°C/140°F - end temperature of (25°C / 177°F) Max 7 days
Accuracy	±1ms for blast durations of less than 5 seconds

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Detonator Temperature Limits * Detonator is suitable for hot emulsion application.	-40° C to +80° C -40° F to +176° F

Transportation, Storage and Handling

SmartShot™ must be transported, stored, handled and used in conformity with all federal, state, provincial and local laws and regulations. Control equipment and accessories should be handled with due care and not dropped, mishandled, subjected to excessive vibration or exposed to any chemical agents. Connectors should be kept clean and the equipment must be kept in a safe environment to avoid misappropriation or misuse.

Packaging

UN Shipping Classification	1.1B (manufactured in South Africa) 1.4S (manufactured in South Africa) 1.4B (manufactured in North America)
Detonator Configurations	Shrink wrapped coil
Cable Colour	Green with a coloured stripe

Wireless Link Specifications

Remote Frequency Bands South Africa	902 – 928 MHz
USA/Canada	902 – 928 MHz
Australia	915 – 928 MHz
Europe	2400-2483.5 MHz
RF Technology	Frequency Hopping Spread Spectrum (FHSS)
Transmitter Output Power	Variable up to 1 000 mW
Antenna Gain	2 dBi
Regulatory	FCC - 15.247

System Limits

Maximum Total Delay Time	20 000 milliseconds
Maximum Number of Detonators with expander module	2400*
Multiple Bench Boxes initiated from one base station	9600*
Lead-in Length (wireless)	3000m*
Lead-in Length (wire)	2000m*

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Maximum In-hole Lead Length	45m / 148ft

* Dependant on shot layout, please refer to training manual before use.

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SmartShot™ Accessories

Connector Block: Number of channels: Temperature Limits: Weight Dimensions: Water resistance:	 12 -20°C to +70°C -4°F to +158°F Approximately 780g / 1.72 lbs. ± L: 180mm; W: 80mm; H: 45mm Splash proof (IP 55)
String Starter: Temperature Limits: Weight Dimensions: Water resistance:	 -20°C to +70°C -4°F to +158°F Approximately 89g / 0.20 lbs. ± L: 92mm; W: 55mm; H: 35mm Splash proof (IP 55)
Connector block cable	Grey cable with military connectors to connect Bench Box to connector block.
Active End Plug	4 wire male connector with yellow plastic cover and harness for replacing damaged cable.
Harness Wire	0.63mm (or 22 gauge in North America) twisted pair copper wire with PVC or Polyethylene insulation available in 200 m / 219 yds. and 500 m / 547 yds. reels. (Country dependant)
Harwin connector replacement kit: Connector: Replacement kit Tool	 4 wire male connector with yellow plastic cover and harness for replacing damaged cable. Tool for single connector replacement options
Signal Booster	Boosts D-Line return signal
Smart Key	The Red Smart Key provides a coded blast command for the detonators and has a user-specific password. In RF synchronised blasting mode a Red and Yellow Smart Key set is provided enabling remote blasting from the Base Station.
Charger	The charger is used to recharge the Bench Box/Base Station. It accepts 110 or 220V AC input at 50/60Hz. It must only be used indoors at room temperature. Charging time will vary depending on the state of the battery.
Car Charger	12V to 19V @1Amp charger with DIN plug
Omni-Directional Antennae	Antennae are provided in 2 different colours: Grey antennae for the frequency range 902 - 928 MHz Blue antennae for the frequency range 2400 - 2483.5 MHz

Special Instructions

SmartShot™ should only be used by appointed users who have completed both product specific training successfully and who comply with the applicable local regulatory requirements. SmartShot™ control equipment and detonators are ONLY suitable for use within the SmartShot™ system – no other equipment should be connected to SmartShot™ detonators and no SmartShot™ equipment should be connected to a

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non SmartShot™ detonator of any type. The SmartKey should always be under the direct control of the blast supervisor.

Other

SmartShot™ control equipment batteries should be kept in a charged state. If the equipment is to be stored for long periods the batteries may require charging at 3 monthly intervals or need to be removed or replaced. All equipment in the field must be returned to DetNet or its approved repair centres for service in the following intervals:

Handheld equipment (Taggers, etc.):	18 months
Other equipment (excl. accessories):	24 months

Product Disclaimer

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