CE4 Commander™ System

combined with digishot® plus.4G

THE INDUSTRY'S MOST ADVANCED ELECTRONIC INITIATION SYSTEM

DYNO®
Dyno Nobel

dynonobel.com

Dyno Nobel continues to strive towards excellence in electronic initiation. As a world leader in our field, we aim to deliver world-class safety, the latest technology and consistent quality; resulting in improved loading and fragmentation, to ensure mining becomes more sustainable today and into the future.

Introduction

Electronic blasting systems continue to add major value in overall mining efficiency, environmental protection and safety.

The new DigiShot Plus 4G Initiation System from Dyno Nobel is the market leader in advanced blasting technology ensuring the best blast, on time, every time. The system is now well known for its ease of use resulting in fast deployment and programming, eliminating costly blast delays.

Features

- Fast and simple “tag by plan” deployment method.
- Automatic tagger verification that detonators per channel are within design capacity.
- Detonator energy monitoring right up to the point of blasting.
- Autonomous detection and testing of detonators.
- Programming speed is 7 times faster than existing systems.
- Blasting process wirelessly controlled through the multi-purpose CE4 Tagger.
- On-bench detonator hole position simplified with the GPS location of the detonator stored in the CE4 Tagger.
- Allows for 10 ViewShot plans to be stored on the CE4 Tagger.
- Maximum wire length per channel 16,000 m (400 dets per channel at 40 m).

Tagging Modes

Plan Mode:

- Pre-designed ViewShot 3D blast plan, which contains the location and timing, is downloaded from PC to the CE4 Tagger. The user can define a tagging path that creates a detonator list in the sequence of tagging which is suitable for large scale blasts. The tagger writes the unique ID and timing into the detonator. Tagging path is flexible allowing adjustment of the plan during tagging, for example the insertion of new holes.

Advanced Mode:

- The Advanced mode includes more functionality than the Basic mode, as it allows for multi-primed holes, location assignment and time incremental settings.

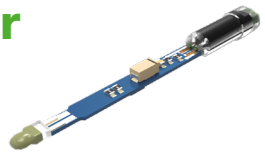
Basic Mode:

- The Basic tagging option is offered to make the tagging simpler where the delay is entered onto the tagger and is assigned directly to the detonator during tagging.
- The timing on all detonators can be assigned or updated in one step should the timing on the plan be changed. When connected to the harness wire, the Commander automatically discovers and tests detonators with increased speed and performance.

“Time assignment” for non-complex blasts:

- The CE4 Tagger simply assigns a time to each detonator – manually or with automatic increments.
- When connected to the harness wire, the Commander automatically discovers and tests detonators with increased speed and performance.

The 4G Detonator



The new generation 4G Detonator is a fully programmable electronic detonator that is suitably tailored to fit all types of blasting operations. The design has evolved from the remarkable safety principles of the 3G detonator.

- Redesigned Application Specific Integrated Circuit (ASIC) with 15 times more memory, which allows the storage and tracking of unique identification numbers.
- Programming of the detonator timing delay can now be done during tagging, alternatively only the hole locations can be logged to then assign timing delays at a later stage.
- Verification of sufficient firing voltage at the furthest detonator, before the user presses the fire keys.
- Down-hole wire length and other critical information is stored in the expanded memory.
- Non-volatile memory during detonator assembly.

The CE4 Commander

This is a multi-purpose device that can be used as a Bench Commander, Repeater or Base Commander, and it controls the entire blast.

- Limits user interface through automatic detonator detection, testing and fast programming.
- Wirelessly controlled by the CE4 Tagger or via the BlastApp on a Tablet device.
- It has four channels that can connect up to 400 detonators, giving a total capacity of 1600 detonators per Commander.
- Up to 10 Commanders can be deployed for a single blast using long distance RF communication, resulting in 16000 detonators per blast.
- Boasts a unique and robust design, with a built-in long-range antenna, that can handle the harshest mining conditions (No need for an external antenna).
- The Arming and Blasting process of the Commanders is controlled with the use of NFC (Near Field Communication) Blastcards.
- Potential to be integrated into the mine's clearance systems to authorise blasting.

CE4 Tagger

The multi-purpose V4 - CE4 Tagger is a leading innovation from Dyno Nobel and the best of its kind in the industry.

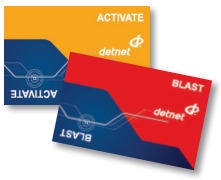
- Up to 10 ViewShot 3D blast plans can now be stored on a tagger.
- Inherently safe multi-purpose device used for on-bench tagging of detonator delay and/or location, functional detonator testing including leakage and troubleshooting before leaving the bench.
- Scratch proof glass screen provides excellent visibility.
- User alerts engage multiple sensory formats: tactile (vibration), audible (speaker) feedback and visual alerts through high-bright LEDs.
- Excellent battery management technology with USB or wireless charging.
- Wireless communication with Commander to confirm system blast readiness and execute Arm & Fire.

Optional - Blast App

The optional BlastApp can be installed on a commercial off the shelf Tablet to run on either Android or Windows based operating system. This enable users to communicate wirelessly with the Commander via a Tablet instead of a Tagger.

- The Tablet becomes the user interface during blast execution with bigger & more readable information.
- The Tablet enables a full color graphic interface.
- Download and view the full detonator list.
- User can design a simple blast design that features helicopter view and blast simulation.
- Consolidate planned versus actual tagged list during fault-finding.

BlastCards



- Uses Near Field Communication (NFC) to wirelessly interact with the Commander.
- Encrypted blast commands and RF settings are stored in the card.
- BlastCards are password protected to ensure safe blasting.

CE4 Commander™ System

DEPLOYMENT

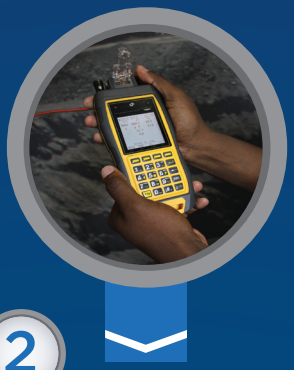
VIEWSHOT® 3D BLAST DESIGN

viewshot 3D

1

VIA USB

DOWNLOAD PLAN TO TAGGER



2

ON-BENCH TAGGING
ASSIGNING TIME DELAY TO DETONATOR

BASE COMMANDER

4

TAP TO BLAST

3000 m LINE OF SIGHT

REPEATER

OPTIONAL ONLY IF LINE OF SIGHT IS NOT POSSIBLE

VIA RF

SCALABLE, BLAST UP TO 10 BENCH COMMANDERS

BENCH COMMANDER 1600 DETS

MAX 16 000 DETS

3

TAP TO ARM

ViewShot 3D®

The ViewShot 3D blast software facilitates the planning, design and simulation of a blast through a flexible and feature-rich user interface. Efficient blasting practices is now further enhanced with ViewShot 3D's ability to optimise blast outcomes with advanced modelling and simulation features. ViewShot 3D seamlessly integrates with third party mine planning and reporting software.

Detonator	
Temperature	-40°C to +80°C -40°F to +176°F *Suitable for hot hole applications
Dynamic Shock Resistance	110 MPa Copper Detonator Shell
Connector	Rugged, water-resistant
Base Charge	PETN
Timing	Fully programmable / 1 ms increments / Max delay 20,000 ms
Accuracy	< 1 ms for blast durations of less than 5 seconds

CE4 Blast Commander	
Temperature	-30 °C to +60 °C -22 °F to +140 °F
Battery	Internal 3.7 V Lithium Polymer
Battery Life	Approximately 8 hours at 25 °C (77 °F)
Weight and Dimensions	2.1 kg / 4.6 lbs
Software Upgrade	Via a PC and a standard USB cable
Water and Dust Resistance	IP57
Display	200 x 96 pixels / 45.80 mm x 21.98 mm / 1.803 in x 0.866 in
External Connectors	4 Sets of terminals to connect 2 wire detonator harnesses

CE4 Tagger	
Temperature	-30°C to +60°C -22°F to +140°F
Battery	Internal 3.7 V Lithium Polymer / External pack 6 x 1.5 V
Battery Life	Approximately 10 hours at 25°C (77°F)
Weight and Dimensions	570 g / 1.25 lbs; 213 mm (L), 88 mm (W), 38 mm (H)
Software Upgrade	Via the USB connector in the CE4 Tagger, and a flash drive
Water and Dust Resistance	IP57
Display	128 pixels x 128 pixels / 44.78 mm x 44.78 mm / 1.76 in x 1.76 in