

A UNIQUE testing capability

The CCMAT WORM system provides demining equipment testing agencies and machine manufacturers with a unique easily transportable and inert testing system.

The provision of a serial number on each target allows specific targets to be traced. This traceability along with the real-time triggering indication provided by the WORM system provides more data about machine performance than traditional non-interactive or explosive targets.



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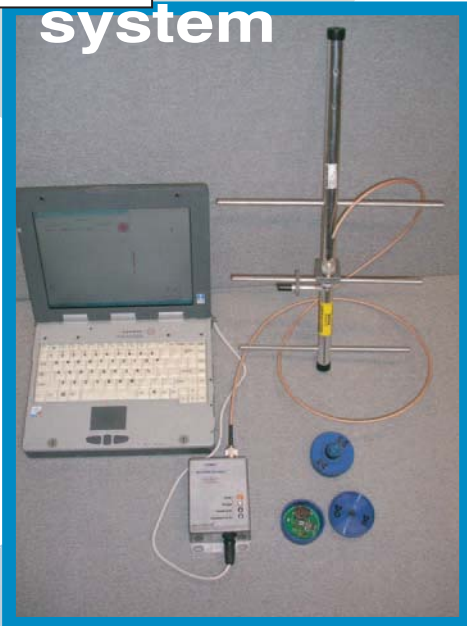
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CCMAT

WORM system



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The Canadian Centre
for Mine Action
Technologies

Le Centre canadien
des technologies
de déminage

Wirelessly Operated Reproduction Mine (WORM)



WORM

the CCMAT WORM system

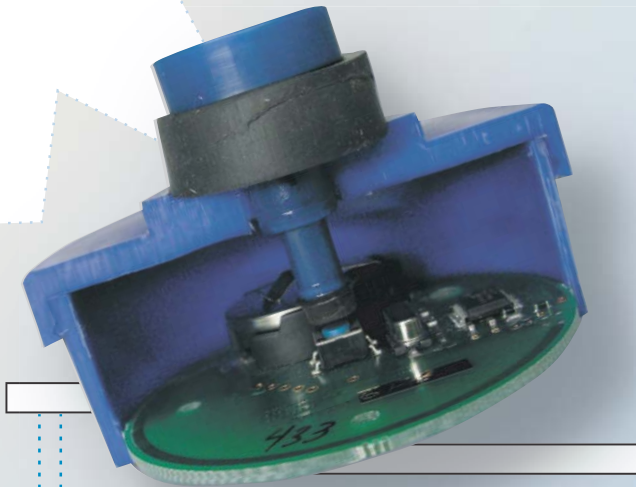
In the test and evaluation of machines for demining applications, it is not always possible or desirable to use real mines, especially when collecting statistically significant amounts of data.

The CCMAT Wirelessly Operated Reproduction Mine (WORM) system is the latest development in a series of inert anti-personnel simulator targets for this type of testing. This system has been developed specifically to be compatible with the Performance Tests described in CEN Workshop Agreement CWA 15044 (available at www.itep.ws); the WORM system may be useful beyond the scope of the agreement. The CCMAT WORM has also been used to form the functional part (fuze) of an anti-tank mine simulator and could be used as part of a training system.

The CCMAT WORM system includes the following main components

- Target body components
- Target transmitter
- Receiver
- Antenna & cables
- User interface software
- Computer (supplied by user)

The CCMAT WORM target requires a force between 10kg and 15kg on the plunger to activate as specified in CWA 15044. Each target transmits a unique identification number 200 times for a total of 0.5 seconds when triggered. If no message is received from a target in a particular trial, it must be excavated as it will either have been completely destroyed or left completely untouched. This is similar to testing using real landmines. Unless a target is mechanically damaged, it is completely reusable.



limitations

The CCMAT WORM system is not intended for use by the general public. It is not a consumer-ready product, nor is it completely user friendly. It is expected that persons using the system will have a background in test and evaluation of mechanical equipment, especially relating to demining equipment.

When properly used by personnel familiar with testing mechanical equipment, the CCMAT WORM system provides useful performance data. It may not work in all circumstances.

how it works

The CCMAT WORM system uses low-cost, low power radio transmitters to transmit a serial number associated with an individual target to indicate triggering. The system is available in two frequencies; a 433.92MHz version and a 315 MHz version. As the 433.92MHz version is more robust, it is recommended for use except where a different frequency is required due to interference with other equipment. The typical range from a buried target to the receiver is in excess of 25 meters.

materials & sources

Note: The sources listed below were used for a CCMAT purchase in the Fall of 2005. Some components may be available from other suppliers. CCMAT does not necessarily endorse these suppliers.

Individual WORM Targets

SER	Part	Supplier	Description
1	plastic bodies	Triplan AB Box 30 28070 Lönsboda SWEDEN Contact: Jonas Malm	Truppmina plastic parts to CCMAT specifications Part numbers 14391500 and 14401500
2	circuit boards	Automation Artisans 2335 Tanner Road Victoria, BC V8Z 5P8 CANADA Contact: John Dammeyer www.autoartisans.com	WORM transmitters 433.92 MHz or 315 MHz
3	plunger	emachineshop.com 666 Godwin Ave Midland Park, NJ United States	Injection molded plastic part Use same mold as job #: 160892 Machines: 686. Injection Mold Tool, 685. Injection Mold Run Material: Polycarbonate Color: RAL 5015 - Blue
4	sorbothane washer	McMaster-Carr PO Box 4355 Chicago, IL 60680-4355 United States	3/8" Sorbothane 12"x12" Durometer 50
5	sorbothane tip	McMaster-Carr	1/8" Sorbothane, 12"x12" Durometer 50
6	battery	www.digikey.com	CR2032 battery N189-ND
7	screws		self threading #6 x 3/8"

Receiver (quantity 1 required)

SER	Part	Supplier	Description
1	receiver	Automation Artisans	receiver module For 433.92 MHz: WORM-433RX-A (USB) For 315 MHz: WORM-315RX-A (serial)
2	antenna	Hutton Communications www.huttononline.com	Maxrad Yagi antenna For 433.92 MHz: Maxrad MYA4303N For 315 MHz: Maxrad MYA3003N
3	antenna cable	Hutton Communications	6' antenna cable SP42-72NMM
4	notebook computer		433 MHz: requires a USB port 315 MHz: requires a serial port