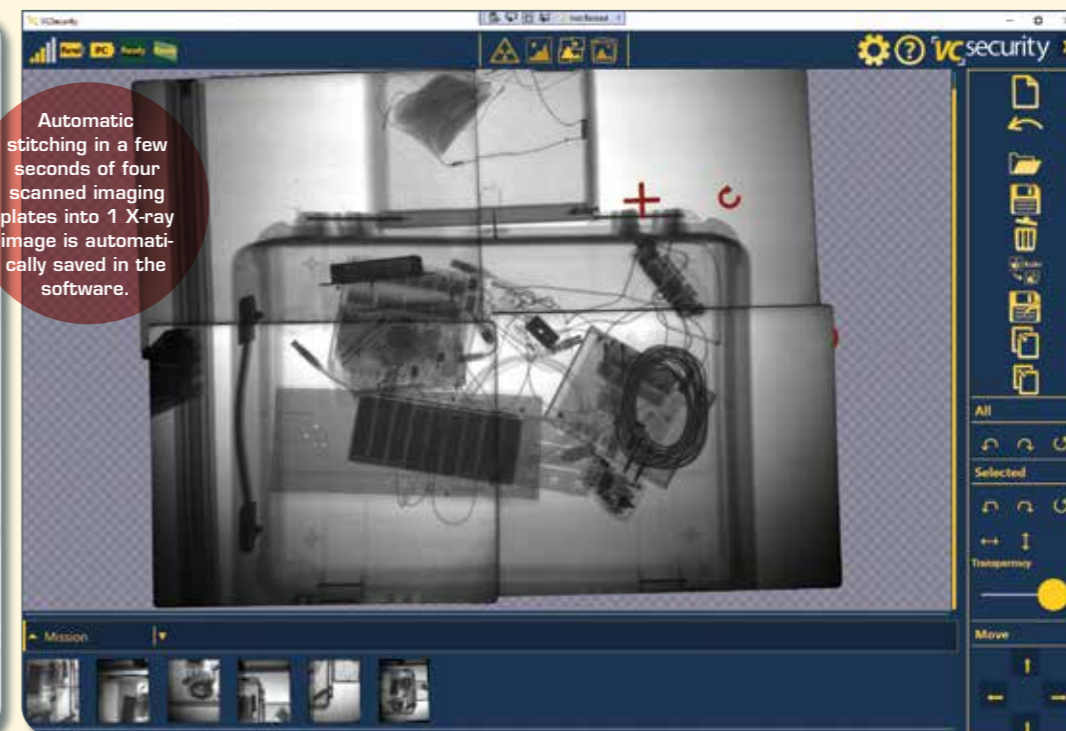


Left: 20-mm steel penetration IED components.
Right: paper and phone behind 20-cm concrete wall.



Automatic stitching in a few seconds of four scanned imaging plates into 1 X-ray image is automatically saved in the software.

VCSECURITY PRESENTS A SOPHISTICATED SOLUTION FOR COUNTER-IED PROFESSIONALS AND EXPLAINS HOW COMBINED RADIOGRAPHY SYSTEMS CAN EFFECTIVELY MEET OPERATIONAL NEEDS

Compact DR systems

In recent years portable X-ray systems have become more compact, sophisticated and rugged. Along with a significant decrease in cost and the growing need for full ROV (remotely operated vehicle) integration without degraded capabilities, they are now the preferred choice for operators.

Designed for durable field operation, the main aspect of such a system is an amorphous silicon (a-Si) flat panel which allows fast high-quality inspection, including organic/inorganic detection.

The panel is available in several dimensions – designed for outdoor operation with low weight. It is a mere 15-17 mm in thickness, it is IP67 rated, and has been drop-tested from 1 m – and can endure a weight of up to 300 kg.

It can be packed with all the requisite accessories in a portable rugged case (up to 25-30 kg) or a light tactical backpack. Usually paired with a lightweight X-ray source (150-370 kV), it offers very high penetration of thick objects, walls or even a car from one side to the other.

The actual operation time the X-ray source is on is very short – from less than one second to seven seconds. The security distance needed for operators is only a few metres from the source’s back and sides, but long cables or wireless modules of up to 1,500-m wireless distance are available.

The third part of the system is a rugged tablet or laptop with advanced user-friendly touch software, which can be easily customised according to operator preferences.

As well as its role in operating the system, the software also offers several advanced functions. It can enhance the image in one click or manually via advanced filters. Automatic stitching of several images and an



Mosaic wall kit combining four imaging plates (36 X 43 cm apiece) for large object inspection in one single rapid X-ray operation.

object, or fit inside a tight spot with space limitations – for example, inside a car or under another object.

In these scenarios, operators are often forced to cancel the inspection or must try to place the DR panel behind the wall or other obstacle if the thickness and distance from the X-ray source are reasonable. Especially when paired with a 270-kV source, it is still possible to get a decent image.

In this scenario, a potential solution could use thin,



CR35+ system ready for operation, paired with the DR panel hardware and software.

advanced gallery to save images and easily retrieve all the required data are also provided.

Due to integration with a dual energy module, the operator’s own interpretation to distinguish between organic and inorganic materials has become much simpler. Like stationary scanners in airports, dual energy unmask the different materials and marks them with different colours. The software also allows the user to ‘peel off’ the external inorganic layer and reveal the organic material beneath it.

Flexible CR35+ system for special missions

Despite the DR panel’s slim and compact design, in some situations it is still not possible to slide it behind a suspect object located close to a wall, or cover a round

New developments in integration capabilities of a portable DR (digital radiography) system – that can be plug and play combined with CR (computed radiography) technology – can now both be installed on a ROV

CBRNE experts worldwide have to face the threat of dealing with not only neutralising an IED threat but also additional decontamination, special handling, and inspection if it includes more than just the ‘standard’ explosive materials.

This is why it is essential to have the most suitable tools for inspecting a potential IED and – no less important – if there is a CBRNE component. This must be carried out remotely from a distance wherever possible to minimise danger to the operators.



Full system packed in a compact rugged case, ready for fast deployment.

light and flexible imaging plates of just 2mm/200g. They vary in shape and dimensions and offer the most superb resolution from all other technologies. They are quite similar to the self-processing films which are still available, but without compromising quality and penetration on dangerous security operations.

Operators can enhance, analyse, and save the images using the same software on the tablet/laptop that is used with the DR system. For high-energy applications, CR plates can also be combined with constant potential (CP) beam tubes in higher kV ranges.

Larger objects

Another challenge an operator might face is the need to inspect a far larger object than the DR panel can expose with just one X-ray shot while keeping minimum operation time and low weight down range near the inspected object.

One option could be a slider to move the panel automatically to acquire several images that get stitched together at the end. Unfortunately, it works mechanically, is heavy, adds dead area from bottom, and more weight carried down range. This is a possible solution for Customs and Border Control applications, but less practical for dangerous counter-IED operations.

The CR35+ system is a more suitable solution for IED operators. Its imaging plates can still keep their low weight and thickness when combined. Large imaging areas are covered by using a mosaic kit, usually consisting of up to four or nine plates that can all be scanned at once.

Once the imaging plates have inspected the object down range using the X-ray source powered by cable or small wireless device, it can be returned up range by the operator or integrated ROV and scanned into the software.

Digital images are retrieved from the imaging plates through a high-definition CR scanner that allows for accuracy of up to 35 microns. With the hybrid CR/DR software the image will be analysed, automatically stitched, and saved.

The CR35+ is an advanced scanner which can be packed safely in a special designed case with a drawer for storing in a van or car. It comes with its own back-up battery and power supply that provides up to six hours of operational run time (more than 100 scans) and continuous operational capability. The scanner is proven to be effective in harsh environments and comes in a customised transport case for easy handling. ✨

BENEFITS OF INTEGRATION

1. Quick operation

Deploying the system and getting the first X-ray image takes less than two minutes from the time the case is unpacked. All system parts are ready for action in any scenario.

2. Long operation

Systems can work for hours on an internal battery or continuously when connected to external power.

3. Dual possibilities

Using both technologies allows back-up in case one requires support or maintenance.

4. Quick change

It is possible to switch quickly between solutions based on operational needs.

5. Cost effective

Bundled discounts and upgrade packages for an existing CR35+ scanner with a DR system are available upon request and evaluation. Using the same main parts and software for both systems saves not only money, but also support handling and time costs.

Combination of these technologies integrated with most leading ROV models can provide the operator with a more complete set of tools for a safer and faster operation.

VCsecurity is a division of VisiConsult X-Ray Systems & Solutions GmbH, a leading manufacturer of digital X-ray systems with over 15 years' experience in supplying portable X-ray systems for security applications.