



A STEP TOWARD THE FUTURE

THANKS TO DIGGER DTR'S TECHNOLOGIES



**UNIVERSAL REMOTE
CONTROL SYSTEM FOR
ALL TYPES OF VEHICLE**





*For more details scan
this QR code*

KEEPING YOU AWAY FROM DANGER

THAT IS THE RAISON D'ETRE OF THE SCRAPER SYSTEM.
WHERE HAZARDOUS MATERIALS ARE PRESENT AND
IN AREAS OF HIGH RISK, SCRAPER ALLOWS YOU TO REMOTELY
CONTROL YOUR SITE MACHINERY.

GUARANTEED SAFETY

Remote control guarantees the security and physical safety
of your operators on site.

IMMERSIVE VIRTUAL REALITY

The operator is immersed in a virtual reality environment which
reproduces the interior of the cabin and allows him to control the
machine while keeping all his usual habits.

BROAD COMPATIBILITY

Quick to install, SCRAPER is compatible with the majority of
construction vehicles. At any time the operator can take back
physical control of the machine from the cabin where the work does
not require remote control.

REDUCED COSTS

Installation of the system is a relatively small investment compared
to the cost of the vehicle.

IN RISKY SITUATIONS AND THE PRESENCE OF HAZARDOUS MATERIALS



DEMOLITION

RISK OF COLLAPSE IN QUARRIES, TUNNELS AND MINES

DECONTAMINATION OF TOXIC, EXPLOSIVE AND RADIOACTIVE SUBSTANCES...

At certain sites, tough working conditions or the existence of hazardous materials can represent a danger to the life or health of the operators.

So that work can continue under good conditions, ensuring the greatest possible safety, SCRAPER permits operation of your construction equipment by remote control.

Equipped with SCRAPER, your site machinery can be operated directly or by remote control.



SEVERAL HUNDRED METRES AWAY FROM DANGER

Thanks to SCRAPER, the operator can control his machine effectively while remaining several hundred metres away from danger.

As soon as he puts on the virtual reality (VR) headset, he finds himself immersed in the familiar surroundings of his cab and takes charge naturally using the professional controls identical to those fitted to his vehicle.

Whether for intermittent or permanent use, the SCRAPER system is easy to operate and deploy.

**COMPATIBLE WITH HYDRAULIC OR
ELECTROHYDRAULIC CONTROLS**





The stereoscopic camera can be installed in just a few seconds in the space usually occupied by the operator's head.



Via a high speed radio link with no perceptible latency, the operator finds himself immersed in the control of his vehicle thanks to a Virtual Reality (VR) headset.



The remote control station can be adapted to suit different surroundings such as the back seat of a car or a permanent container for longer working periods. A quiet generator permits independent use.



With professional controls, the operator can control all the movements of the machine.



A vehicle equipped with SCRAPER can always be controlled directly from the cab when there is no risk of danger. The SCRAPER system contained in two suitcases can be deployed rapidly at any time, as required.



SCRAPER meets the strictest safety standards such as those in force in Europe.



PRACTICAL INFORMATION

- **Universal:** SCRAPER can be adapted to suit almost any type of construction equipment of whatever brand.
- The equipment is modified in such a way as to ensure that the **warranty offered by the manufacturer to the owner is not infringed**. Part of the SCRAPER system (on-board electronics and hydraulics) is permanently installed on the machine by DIGGER DTR customer service. This can be done at our premises or in a workshop made available by the customer.
- The radio connection between the control station and the machine is made via several **secure and encrypted WiFi links**. The communication protocols use control algorithms which ensure absolute integrity of the data exchanged.

The flow of video data and commands occurs without any perceptible delay, a prerequisite for ensuring total immersion of the operator and effective working.

All transmissions make use of free frequency bands which do not require licenses.

One part of the high-speed system is installed on the roof of the construction equipment, the other at the remote control station, either on the roof of a vehicle or of a container, where the operator is located.

- **Immersion via a virtual reality headset** offers a driving experience very similar to that in the cab of the vehicle, allowing almost instant handling. The output of the equipment controlled in this way is very close to that obtained under normal operating conditions (60 to 80%, depending on the type of work).

TECHNICAL SPECIFICATIONS

Operating range	250 metres in the line of sight. An optional repeater system can extend the range to several kilometres and also bypass obstacles, where required.
Frequencies	Video and informations machine transmission: 2.4 GHz or 5 GHz Machine controls: 433 MHz Frequencies can vary depending on the country of use
Safety	Performance level according to ISO 13849: Up to PL-d depending on the specific conditions of use
Hydraulic functions	8 bi-directional functions (16 solenoid valves)
Pressure of the hydraulic control circuit	30 to 50 bar
Direct control of the main hydraulic circuit	up to 450 bar if required
Electrohydraulic control graphs	Factory set and then fully configurable individually for each operator using the smartphone app provided

OPERATOR INTERFACE

Head-up display (OSD)	Engine speed Engine temperature Hydraulic oil temperature Fuel level Artificial horizon
Type of camera	Stereoscopic
Camera resolution	720 pixel
Camera opening angle	110°
Controls (Depending on the type of vehicle)	Joysticks Steering wheel Foot pedals

OPTIONS

Geolocation	GPS GPS-RTK (precise to within 2 cm)
Additional cameras	Up to 5 additional cameras, e.g. for 360° viewing, video stream integrated in the VR headset display, resolution and focal length can be chosen to suit your needs



WHO ARE WE?

Founded in 1998, DIGGER DTR is a subsidiary of the Swiss DIGGER Foundation. Initially it was involved in the construction of radio-controlled, semi-autonomous, demining equipment. These machines have already been used for demining projects in over fifteen countries on four continents – recognised worldwide for their humanitarian impact and effectiveness.

While continuing its conventional demining activities, in recent years DIGGER DTR has closely followed the massive destruction of cities in the Middle East and North Africa. It thus wanted to offer a practical solution to ensure the safety of vehicle operators on site, in surroundings heavily contaminated by high-powered explosive devices.

It was to meet this new challenge that the SCRAPER system came into being.

The growing attention paid to the safety of construction equipment operators in the broadest sense has led to its rapid spread beyond the field of humanitarian demining to civil engineering activities in general.

Our equipment is produced entirely in our workshops in Switzerland. Our design office ensures both the electronic and hydraulic integration for each new model of machine offered. Building on the experience of two decades of demining equipment, our engineers and technicians are able to come up with new solutions to respond to the many different situations and individual requirements in the field of civil engineering.

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