

# Simba Automation

Combines onboard and teleremote functionalities for monitoring, drill planning and autonomous operation



# Give your operation an extra sense

The Simba production drill rig is globally recognized as the best in its class, but there is more Epiroc can do. Through automation, access to better information, as well as better ways of working, Epiroc seeks to optimize the full production cycle.

6<sup>th</sup> Sense is the Epiroc way to optimize our customers' value chain through automation, system integration and information management.

**6<sup>th</sup> Sense**  
Smart. Safe. Seamless.



## Automation enabled by RCS

The well proven Epiroc Rig Control System (RCS) was introduced to the market in 1998. All hardware and software is designed, maintained and supported by Epiroc. RCS simplifies the operation and achieves more productive results. The RCS platform enables mining equipment to assist the operator and to make the functions semi or fully automated. Epiroc has delivered thousands of RCS rigs operating all over the world.



# Make the most out of your operation

Make the most out of your operation with Simba Automation. With added automation functions the safety as well as productivity improves.

Simba Automation from Epiroc is a series of features for production drill rigs. To be installed separately or as a total solution, always depending on what is suitable for your operation and specific challenges. Simba Automation combines onboard and teleremote functionalities for monitoring, drill planning and autonomous operation.

## + Main benefits

**Safety increase and operational awareness** by removing the operator from harm's way, to safe and comfortable control rooms

**Higher machine utilization** when operating during breaks and shift changes

**Faster and simplified process** when less travels to the machine is required thanks to teleremote operations



### Automatic fire suppression system

Improves safety. Automatic fire detection and actuation system with different configurations for each application.

### Drill stop protection system

Improves safety. The system uses motion sensors to detect if someone enters the drilling area in front of the cabin. When the sensors are activated the machine stops to prevent injuries.

### Void detection

Protects the rock drill from drilling with full impact in case of a void or soft rock condition. Straighter holes and better consumables economy is a fact when using this option. Less downtime, less damage and less repairs.

### Breakthrough automatic stop

The rig will automatically stop in case of a breakthrough to another drift. Protection against loss of consumables and prevention of empty stroke that can damage the rock drill. Less downtime, less damage and minimized cost.

### Automatic parallel holding

Significantly increases accuracy and precision. With a simple press of a button the drill unit will work according to preset angles, boom positioning will be made manually by the operator. It will be automatic activated via drill plan when drilling with ABC-total.

### Total Station Navigation

Fast and accurate navigation method, fully integrated with RCS system, using a total station that communicates with the machine via Bluetooth. It can be performed by the operator with no surveyor needed at the drill rig setup.

### Rod handling system

Automatic system that adds and retrieves rods and tubes for long-hole drilling. Different configurations are possible for each application. This item is included as standard for all Simbas.

### Drill plan adaptation

This function re-calculates the position of collaring and keep the same end position according to the digital drill plan. Effective when hole positioning coincides with an irregularity in the rock, with a bolt or when drilling under the i-frame with Simba M6.

### ABC-total

ABC-total enables fully-automated execution of a drill ring according to a digital drill plan. Optimized programmed hole sequences add precision and minimize wear of

components and drill bits. This enables consistency, controlled production and reduced maintenance.

### Bit changer

Automatic changing of drill bits. Perfect combination with ABC-total and teleremote drilling operations. Preset values for total meters or penetration rate define the change intervals. High machine utilization during shift breaks, even in case of abrasive rock.

### CertiQ

A telematics system that monitors vital machine data. It operates with standard LAN and W-LAN communication network or with an ad hoc network with a handheld unit. CertiQ interfaces (APIs) offer access to databases and integration possibilities for analytics and optimized decision-making processes.

### Rig Remote Access

PC software that allows remote supervision of drill rigs and reliable transfers of drill plans and log files to and from the rig, through wireless network. No need to drive around underground with USB anymore.

### Underground Manager

Software for efficient planning, administration and evaluation of the drilling operations in mining and tunneling projects. Easy to use and create drill plans in IREDES format that can be transferred to the rig through wireless network or a USB memory stick.

### Measure While Drilling

Visual and numerical lithology analysis based on accurate data registering of the drilling process for each hole. Used together with Underground Manager software to optimize drill and charging plans.

### Multi-machine remote control room

Higher machine utilization is achieved with operation through shift changes. Removing operators from risky zones and working more like a supervisor due to several intelligence and monitoring functions. Everything from a safe and comfortable control room located underground or at the surface.

### Teleremote e-tramming

This function enables the machine to tram to the next drill ring without starting the diesel engine, navigate and drill the next ring according to drill plan. Everything from the remote control room, using the same joysticks as in the cabin, with improved visibility due to 4 cameras.

## Network

Simba rig software with minimum RCS 4.0.	
Network requirements infrastructure should support the following standards	
IEEE 803.2 for Ethernet	●
IEEE 802.1Q & 802.1p for VLANs and Layer-2 QoS	●
IEEE 802.11g (minimum) for Wireless LAN	●
Required net capacity per Rig: 5 Mbps (video & control)	●
Maximum tolerated delay: 100 ms (video & control)	●
Required net capacity RRA: 5 Mbps (file transfer)	●
IPSec / VPN connection is required to be allowed throughout the infrastructure between Rig and OP-Station	●

Note: prior to deployment a proper site survey must be performed when additional recommendations and requirements can be found necessary.

## Simba recommended options

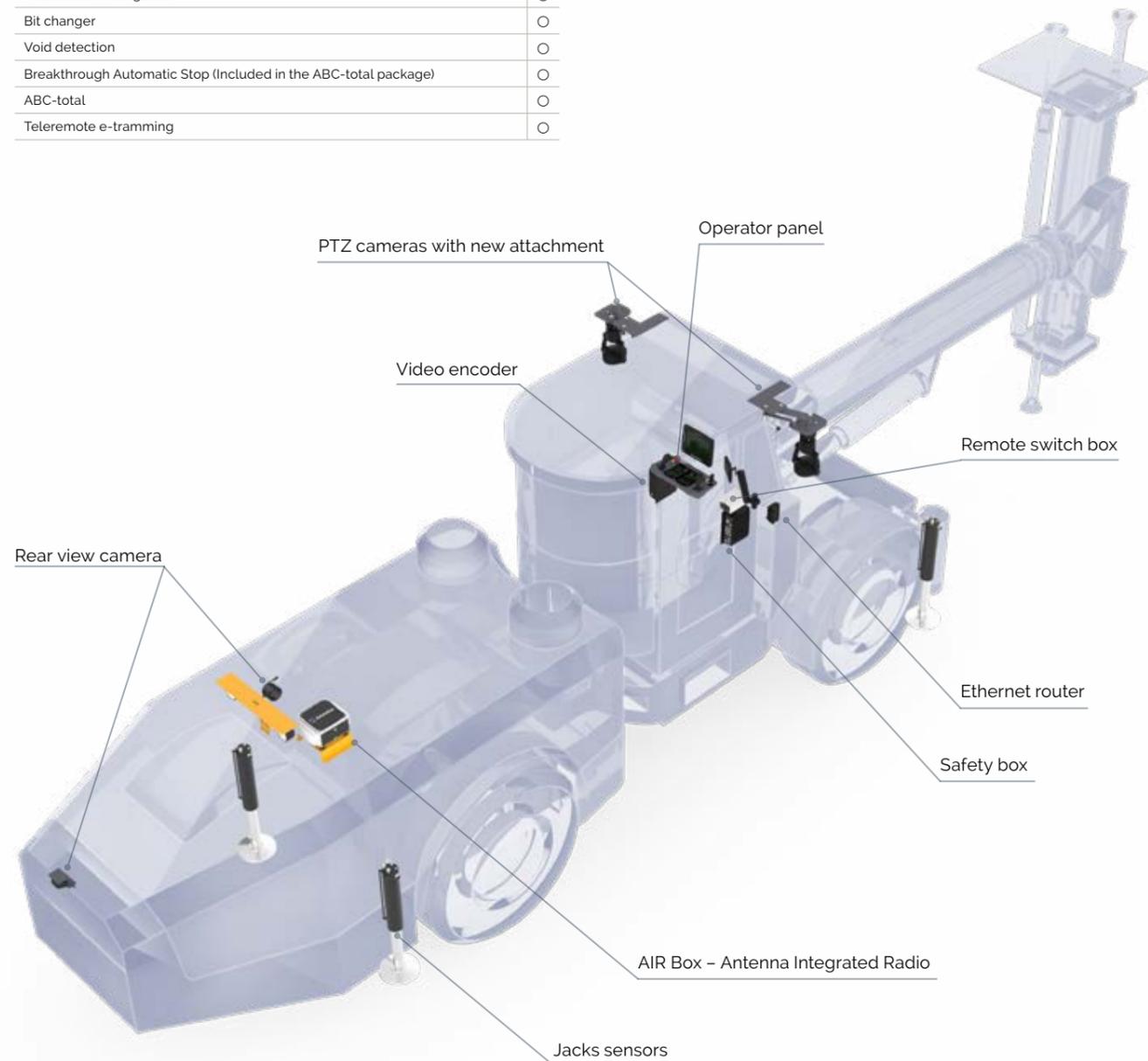
Certiq	○
Underground Manager software (Included in the ABC-total package)	○
Rig Remote Access	○
Drill stop protection system (Standard for CE countries)	●
Total Station Navigation	○
Bit changer	○
Void detection	○
Breakthrough Automatic Stop (Included in the ABC-total package)	○
ABC-total	○
Teleremote e-tramming	○

## Complies with following standards

CE	●
FCC: TK4-05-WLM54AG	●
IC: 7849A-WLM54AG	●
Safety system: PLe	●

## Power

110-230 AC 50-60Hz	●
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## Rig kit teleremote

	IP	Features	
Pan Tilt Zoom cameras	68	Zoom- optical + digital = 30x, 12x. Horizontal view angles = 2,3 - 63,7 deg. Wiper. Adjustable attachment for wider coverage	●
Video encoder	65	Encoder for 4 video sources, IP data protocol, up to 704 x 576 pixel resolution, MPEG-4 video coding, audio channel	●
AIR Box - Antenna Integrated Radio	67	WLAN module - IEEE 802.11 b/g, 54 Mbit/s, 2.4 GHz, 13 channels, WPA encryption 12 dBi, 2 400 - 2 485 MHz, flat panel antenna	●
Local/remote switch box	65	Enables the selection of type of machine control, either inside the cabin or from a remote operator station	●
Safety module	67	PLe Classed safety system	●
Ethernet switch	65	Unmanaged 8 port Ethernet switch	●
Ethernet router	67	Ethernet IEEE 802.3 10/100 Base TX	●

## Mobile operator's station

	Features	
Mobile teleremote station	L 1205 mm x W 1120 mm x H 1370 mm, 250 kg, 10 - 36 V DC max 15A	●
Remote operator panel	Extra joystick for camera control, standard buttons and controls like inside cab	●
Display module	Standard display module just like in the cab	●
Epiroc Machine Server	Touch screen control, rig and system monitoring status	●
Video decoder	Decoder for 4 video sources, IP data protocol, up to 704 x 576 resolution, MPEG-4 video coding, audio channel	●
Safety system module	PLe classified safety system	●
Wireless LAN module	IEEE 802.11 b/g, 54 Mbit/s, 2.4 GHz, 13 channels, WPA encryption	●

## Fixed office operator's station

	Features	
Remote operator panel	Panel and joysticks like inside cab*	●
Server rack	L 800 mm x W 600 mm x H 800 mm	●
Display module	Standard display module just like in the cab	●
Epiroc machine server	Touch screen control, rig and system monitoring status	●
PC	Standard office computer	●
2 x video decoder	Decoder for 4 video sources, IP data protocol, up to 704 x 576 resolution, MPEG-4 video coding, audio channel	●
Safety system module	PLe classified safety system	●

\*Additional units possible



Fixed operator station.



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