REMA MCUBE

MONITOR // MAINTAIN // MANAGE

State of the art technologies maximizing the profitability and sustainability of your conveying systems

REMA MCUBE
## Monitor, Maintain and Manage your belting systems

REMA TIP TOP MCUBE focus on optimizing the use of our products and services to remain market leaders. We offer unique solutions for specific operations that focus on profitability and sustainability.

REMA TIP TOP MCUBE constantly develop new systems that will significantly prolong the lifetime of our clients conveyor belts. As conveyor belts are the backbone of any mine and their greatest expense, MCube can be utilized on all types of conveyor belts whilst in full operation.

MCube has been designed to provide our clients with greater insight into the current status of their conveyor belts by providing real time data showing any form of damage, allowing planned maintenance and shortening production downtime.

Steel Cord Scan

BTM Belt Thickness Monitoring
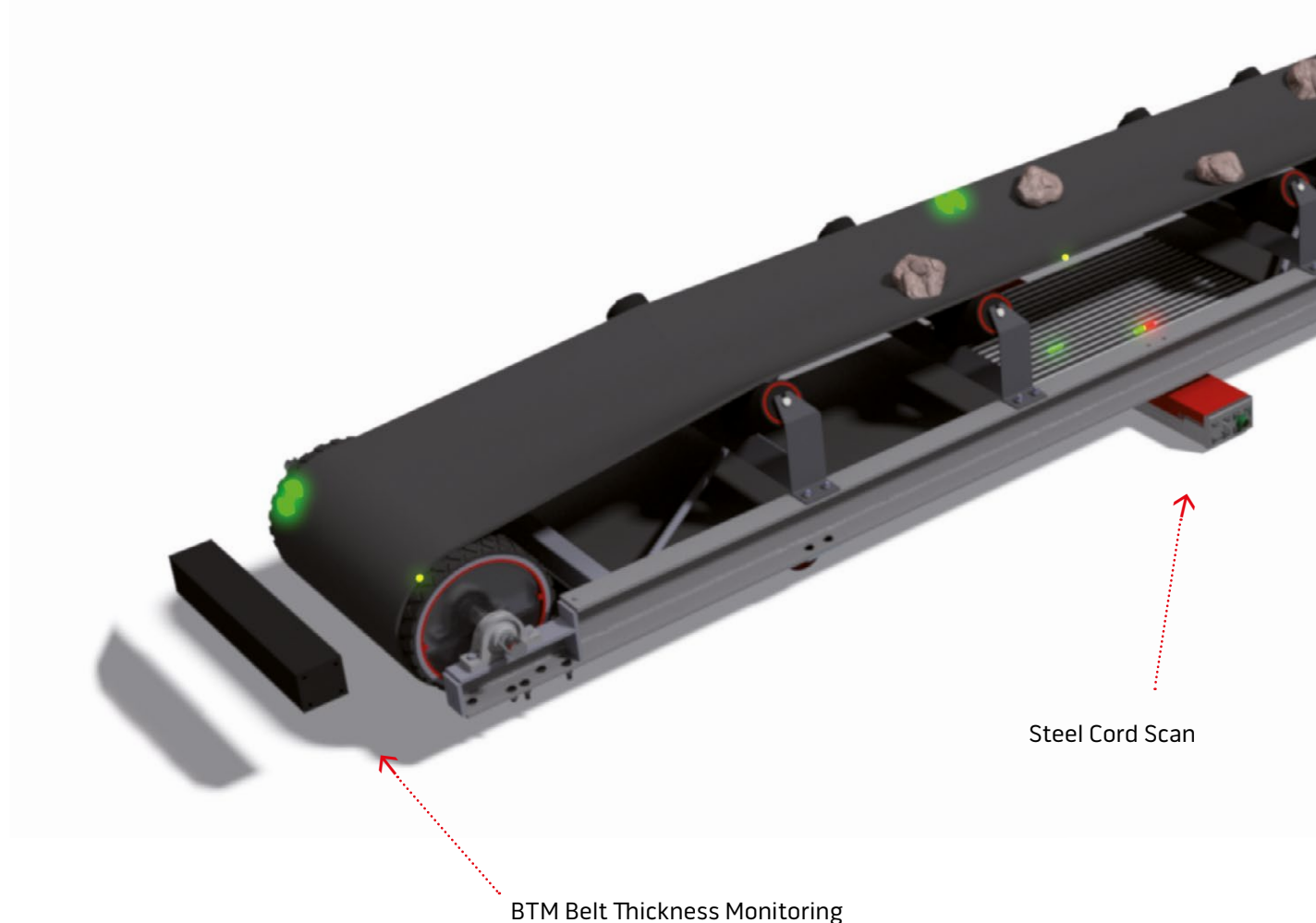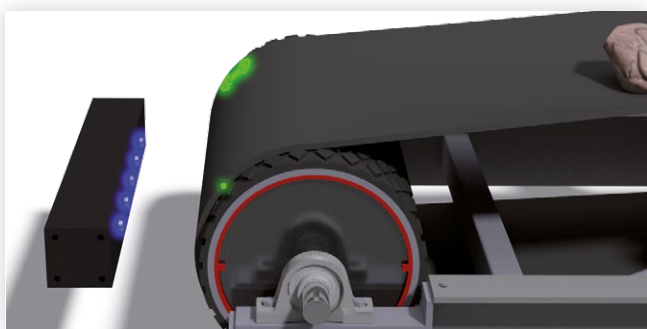
Radar Based Sensor Systems
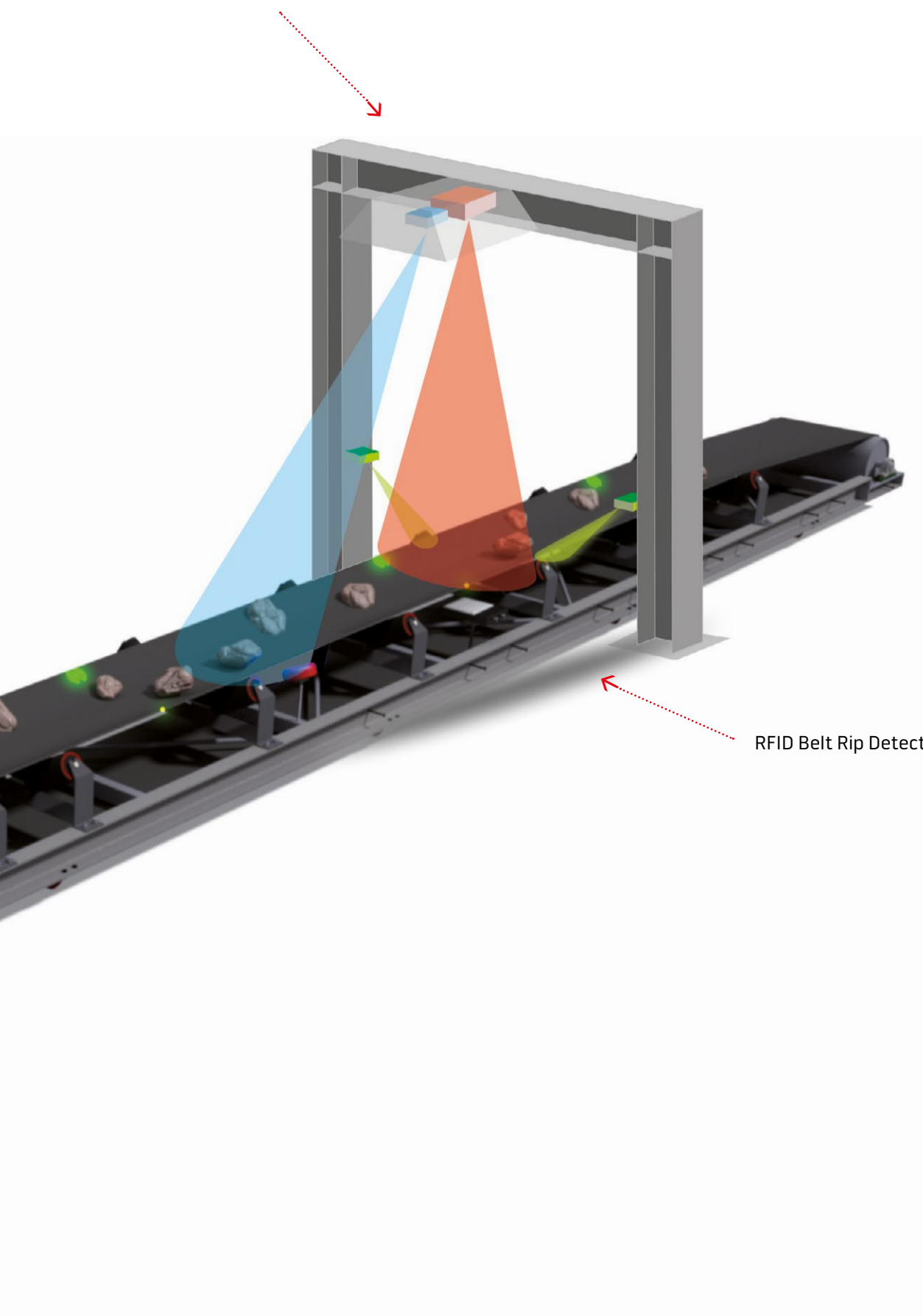
RFID Belt Rip Detection

REMA MONITOR
Our Monitoring Services for your Conveying System

RFID Belt Rip Detection

→ Unique RFID Antenna ID Code
→ Stops the belt when longitudinal rips are detected
→ Antennas can be detected at 15m/s
→ Antennas installed at shorter intervals to offer greater protection

BTM Belt Thickness Monitoring

→ Shows all wear and damage to the conveyor belt
→ Accurate reporting of belt wear or damage
→ Predicts the remaining lifetime of the belt
→ Generates a belt image after the first revolution

Steel Cord Scan

→ Available as a modular or fixed installation
→ Shows all cord damage to the conveyor belt
→ Indicates the health of all splices
→ Operates continuously while the belt is in full operation
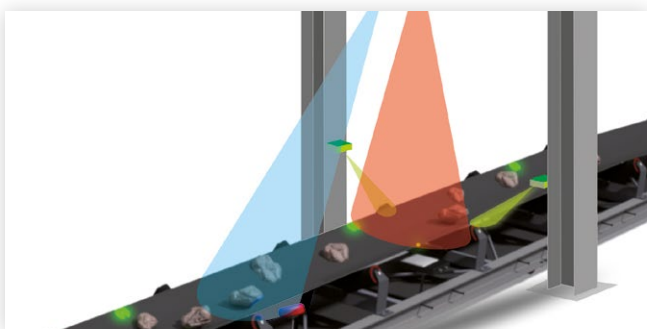
Radar Based Sensor Systems

→ REMA MCube rBVS - „RADAR Belt Volume Scanning System"
→ REMA MCube rBSM - "RADAR Belt Speed Measuring System"
→ REMA MCube rBAM - "RADAR Belt Alignment Measuring System"

REMA MCUBE – MONITOR
RFID Belt Rip Detection System

The Belt Rip Detection System uses the latest RFID technology. By using our new RFID antennas we are able to offer protection to all types of conveyor belts ie. steel-cord, plied belting and PVC belts.

With the RFID antenna costing a fraction of conventional antenna sensor loops we are able to offer our clients significant savings.

Due to the lower price of the single RFID antenna we are able to install the antennas at shorter intervals offering greater protection to the conveyor belts by minimizing longitudinal rips within the belt. The Belt Rip Detection System does not only detects our unique RFID antennas, it also detects inductive sensor loops making the system incredibly versatile by monitoring belts with any existing sensor loops installed.

The RFID Belt Rip Detection system consists of 3 components illustrated below

RFID reader

Control unit

Unique RFID antenna being installed into a plied belt

SYSTEM KEY FEATURES

→ The specialised RFID chip can withstand temperatures up to 230 degrees Celsius, therefore having zero effect on the tag during the vulcanization process

→ The system can be operated by the control room operator directly from the control room

→ Multiple network connectivity like TCP/IP, WIFI and Serial are available

→ The RFID reader can detect the unique RFID antenna at a speed of 15 m/s

→ Each RFID antenna has a unique identification code

→ The software generates a map of the entire belt after only one full revolution

REMA MONITOR
RFID Belt Rip Detection System

Each of the RFID antennas is installed during the manufacturing process at 25 m intervals. Every antenna has a unique identification number programmed into the RFID tag, these robust tags can withstand temperatures of up to 230°C so the vulcanization process has zero effect on the tags. Alternatively, the RFID tags can also be retro fitted to existing conveyor belts in the field. This process takes less that 30 minutes as apposed to the retro fitting of inductive sensor loops which can take up to eight hours to retro fit.

Once the conveyor belt has been fitted and the system installed, it takes the RFID Rip detection system just one revolution of the belt for the system to be active and in protective mode. The system not only maps each and every unique identification number of the RFID tag in sequence but it also monitors the number of pulses in between the RFID tags. This offers additional protection to our clients belts, by ensuring that should the controller unit not detect the unique tag number in sequence or the correct amount of pulses between the RFID tags, then the controller unit will automatically shut down the conveyor belt.

With the use of the system network capability, multiple system can be linked to the mines central control room where several systems can be monitored simultaneously by the control room operator. This process also allows for selected mine personnel to be notified in case of a system trip. The system can also be reset, activated or bypassed from the control room.

The RFID Belt Rip Detection System can operate in one of the three modes:

Mode 1 - Learning Mode: This mode is set up for the system to generate its own RFID and Pulse map of the conveyor belt, whereby only one revolution of the conveyor belt is required.

Mode 2 - Distance Mode: This mode validates the pulses and exact distance between RFID Transponders.

Mode 3 - RFID Sequence Mode: This mode compares the unique RFID signature to the stored map.

Several systems can be monitored at once, by the control room operator.

REMA MONITOR
RFID Belt Rip Detection System

Technical Specification

Supply Voltage	110 / 240VAC 50/60Hz, 15 Amp stable power source
Ambient Temperature Range	-40 - +70° C
Working Humidity	20 - 90% RH NON Condensing
Ethernet Connectivity	Cat 5 Copper - (RG-45) Socket (10 100 MHz) Wireless Wi-Fi Connection – 802.11 a/b/g/n
OS and Processing Power	OS – Microsoft Windows 8.1 c/w all critical security updates CAPE-7 Mini PC Processor – Intel Celeron, CPU 1037U, 1.80 GHz, (2 cpu'S) Ram – 4096 MB Hard drive – 500 GB Disk capacity
Monitor	17 Inch touch screen monitor
Operating temperature of RFID tag	- 40 to 230 C
System Enclosure and Sensor Enclosure rating	IP 65 Rating – No ingress of dust, complete protection against contact. Water projected by a nozzle (6.3mm) against enclosure from any direction shall have no harmful effects.
System Enclosure mounting brackets	4 x Mounting brackets on back side of enclosure (13 mm)
RFID Tag reader	UHF Alien RFID Reader, POE, TCP/IP and RS-232 c/w enclosure and cable glands.
RFID Tag	UHF RFID tag c/w unique address.

REMA MONITOR
## BTM Belt Thickness Monitoring System

One of the most important factors is an increased life expectancy of conveyor belts. The Belt Thickness Monitoring System (BTM) continuously measures wear and wear characteristics on conveyor belts by use of ultrasonic soundwaves, these sensors generate over 1.000 readings per second in order to present an accurate graphical representation on the clients belts.

The system makes use of a RFID tag which allows our software to pinpoint any damage on the belt, then it compares the damaged area to historical data and calculates when this damaged area will become critical. In doing so, our clients are able to:

→ plan for replacement belts efficiently, as the system can predict the belt life accurately.

→ plan for maintenance shutdowns, therefore controlling the downtime.

SCAN IMAGES GENERATED BY THE BELT THICKNESS MONITORING SYSTEM
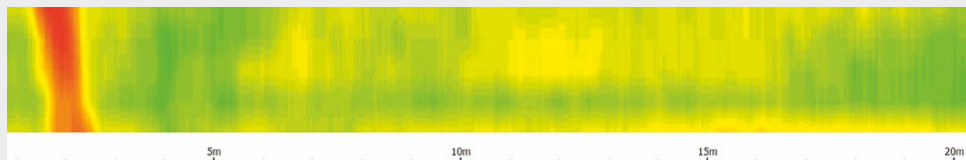
Image 1: Shows a splice at 2 meters with normal wear to the belt, however slight impact damage can be seen at 12 meters, and damage to the side of the belt occurring between 15 to 19 meters.
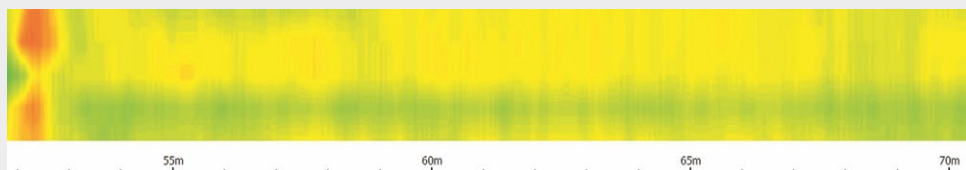
Image 2: Shows a splice at 52 meters with impact damage clearly being displayed between 55 to 70 meters, this image also shows that the wear on the belt is one sided, this is caused by the belt being misaligned at the loading point.
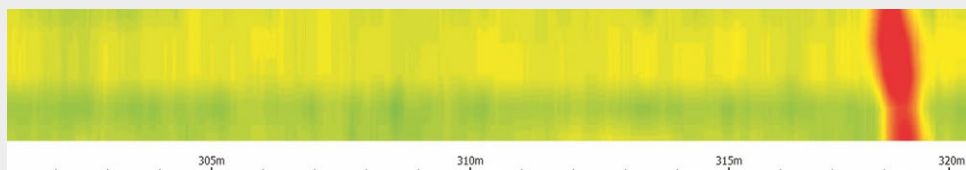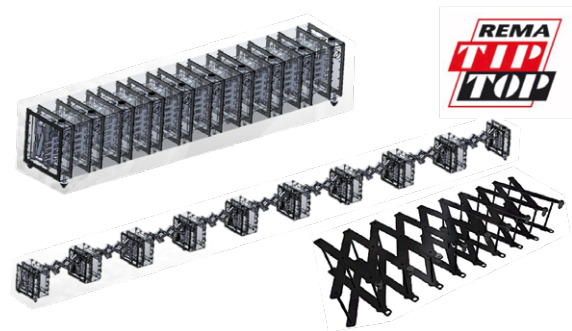

Image 3: Shows normal wear to the belt between 301 and 320 meters, with a splice at 319 meters.

REMA MONITOR
BTM Belt Thickness Monitoring System

The BTM Belt Thickness Monitoring system consists of the 3 components illustrated below:

RFID reader

Ultrasonic sensor array complete with calming idler

Control unit

BTM mobile

SYSTEM KEY FEATURES

→ The conveyor belt does not have to be stopped in order for the scan to take place
→ The system has zero contact with the belt
→ Can be installed on new and used belts
→ Unlimited belt image history is stored in the system database to compare historical and latest scanned images

→ Any damage to the conveyor belt can be identified accurately using the RFID tag and belt length scale provided
→ The system instantly generates a belt image after the first revolution

REMA MONITOR
BTM Belt Thickness Monitoring System

Technical Specification

|	
Supply Voltage	110 / 240VAC 50/60Hz, 15 Amp stable power source
Ambient Temperature Range	-40 - +70° C
Working Humidity	20 - 90% RH NON Condensing
Ethernet Connectivity	Cat 5 Copper - (RG-45) Socket (10 100 MHz) Wireless Wi-Fi Connection – 802.11 a/b/g/n
OS and Processing Power	OS – Microsoft Windows 8.1 c/w all critical security updates CAPE-7 Mini PC Processor – Intel Celeron, CPU 1037U, 1.80 GHz, (2 cpu'S) Ram – 4096 MB Hard drive – 500 GB Disk capacity
Monitor	17 Inch touch screen monitor
Ultrsonic Sensitivity	0.34 mm Accuracy
System Enclosure and Sensor Enclosure rating	IP 65 Rating – No ingress of dust, complete protection against contact. Water projected by a nozzle (6.3mm) against enclosure from any direction shall have no harmful efects.
System enclosure mounting brackets	4 x Mounting brackets on back side of enclosure (13 mm)
Ultrasonic Sensor enclosure mounting brackets	2 x Universal ball joint brackets for easy setup and sensor adjustments
RFID Tag reader	UHF Alien RFID Reader, POE, TCP/IP and RS-232 c/w enclosure and cable glands.
RFID Tag	UHF RFID tag c/w unique address.

REMA MONITOR
Steel Cord Scanning System

The Steel Cord Scanning System provides the world's most accurate and reliable detection of broken cables, tension breaks and conveyor belt splices in realtime. The system is modular and can scan conveyor belts of any width.
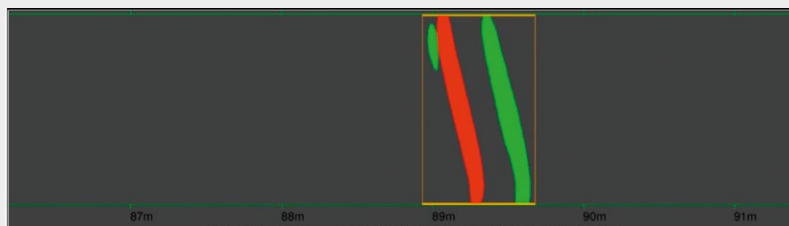

Steel Cord Scan -
Full System (Four Module)
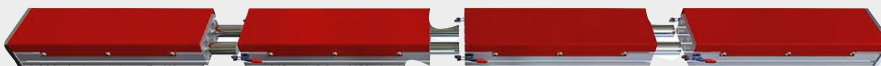
Steel Cord Scan -
Modular System

The system does not present raw data to the user, it processes the raw data via specially developed software and then displays the results graphically.

Image 1: Shows a steel cable broken on the left side of the conveyor belt at 24.4 meters from the starting point of the scan.

**Image 2:** Shows a splice at 89,5 meters.

REMA MONITOR
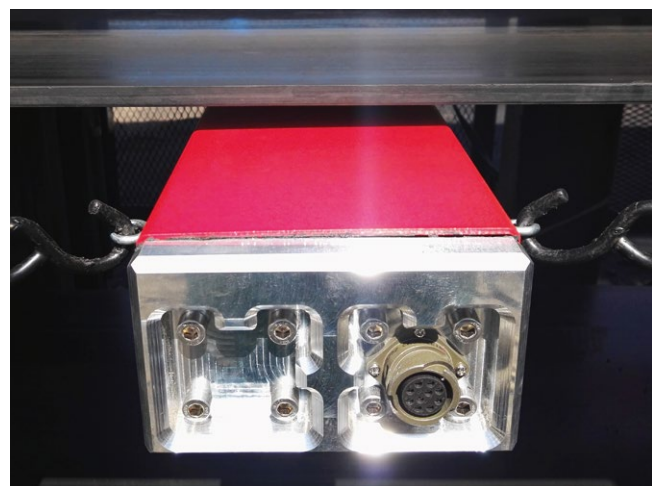## Steel Cord Scanning System

SYSTEM KEY FEATURES

→ Runs continuously while the belt is in operational mode, the belt does not have to be stopped

→ System is suited for all widths of conveyor belts

→ Can be installed on new and used conveyor belts

→ Any damage to the conveyor belt can be identified accurately using the belt length scale provided

→ Easy to install, little maintenance necessary

→ Shows all cord damage on the conveyor belt, offering cost saving to the client

2x module scanning assembly
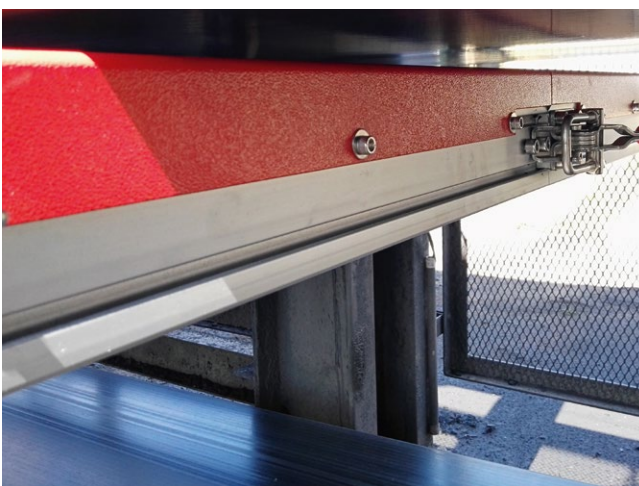
Capturing scan data

Mil-spec connector

REMA MONITOR
## Steel Cord Scanning System

Technical Specification

|	
Supply Voltage	100 - 277VAC 50/60 Hz, 15 Amp
Ambient Temperature Range	-40 - +70°C
Working Humidity	20 - 90% RH NON Condensing
Ethernet Connectivity	Cat 5 Copper - (RG-45) Socket (10 100 MHz)
OS and Processing Power	OS – Ubuntu 14.04 c/w all critical security updates Compatible laptop computer Processor – Intel Celeron, CPU 1037U, 1.80 GHz, (2 cpu'S) Ram – 4096 MB Hard drive – 500 GB Disk capacity
Sensor Enclosure rating	IP 65 Rating – No ingress of dust, complete protection against contact. Water projected by a nozzle (6.3mm) against enclosure from any direction shall have no harmful efects.
Sensor Enclosure mounting brackets	4x Mounting eye bolts on each sensor array module.
Number of Sensor Array Modules	4
Single module size	600mm x 170mm x 100mm
Complete four module assembly size	2400mm x 170mm x 100mm

REMA MONITOR
Radar Based Sensor Systems

REMA MCube rBVS - „RADAR Belt Volume Scanning System"

→ Industrial grade, 77 GHz volume detection radar sensor
→ High-resolution measurements results between 0 to 150 m
→ Detects volume not mass, as storage and transport facilities like belts are limited by volume, not by mass
→ Integrates easily in any hard- and software infrastructure
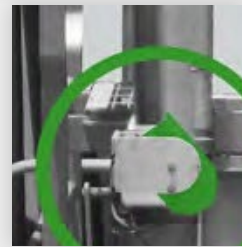
REMA MCube rBSM - "RADAR Belt Speed Measuring System"

→ Slippage-free, safe and stable contact-less measurements
→ Real material speed as data output – not pulley speed
→ Replaces maintenance-intensive measurement wheels
→ Detects slow-moving objects < 0.1 m/s
→ Guaranteed one-time calibration, no further maintenance
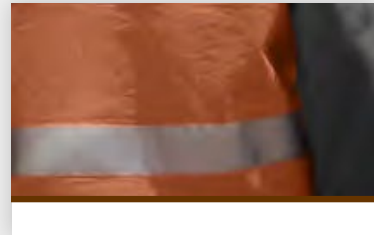
REMA MCube rBAM - "RADAR Belt Alignment Measuring System"

→ Detect belt slippage long before switches will react
→ Contact-free 400 Hz measurements
→ Measures freeboard for optimizing material flow rates
→ Supreme accuracy level in mm area
→ Guaranteed one-time calibration, no further maintenance

Contact-free an

Worry-free techr

real-time volu

ology for all e

CUSTOMER BENEFITS

Reliable data	Tough environments
	Inclined belts
	Short belts
	Apron feeders
Process control	Maximize troughput, avoid overloading
	Fair intra-division accounting
	0.34 mm Accuracy
Easy installation	No software installation
	One-time calibration
	No maintenance
	No cleaning
High accuracy	Typical accuracy 99%
	Contact free measurement
	Remote calibration audit service

Independent of external influences

vibrations	steam	dust	rain

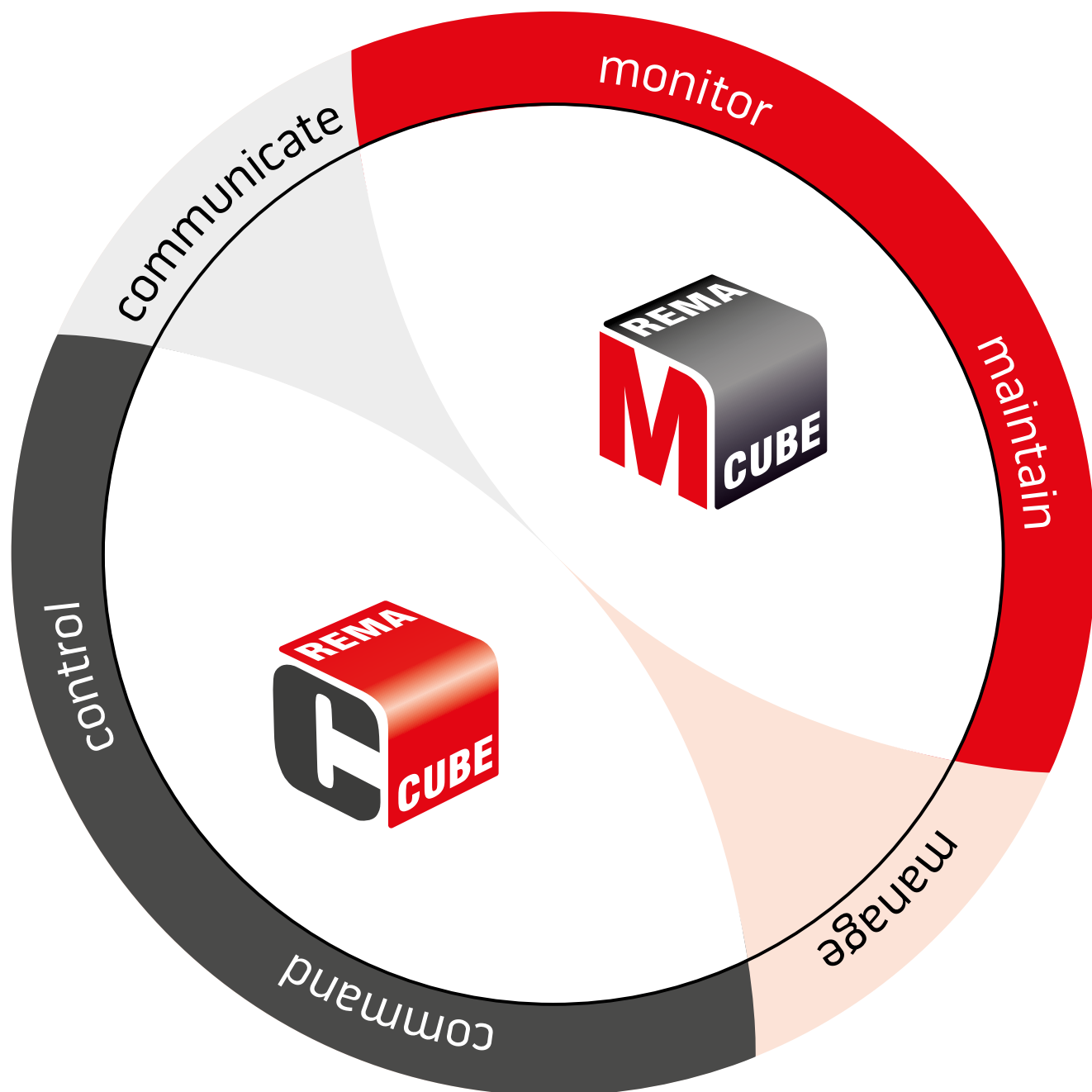| snow	fog	wind	temperature

REMA MAINTAIN
There for you across the globe

Our customers have for decades relied on individual all-in-one care and support by our highly-qualified specialists. REMA TIP TOP teams manage projects internationally as well as locally. This dissemination of product and service know-how across the globe ensures maintenance of high REMA TIP TOP quality – in over 170 countries.

REMA TIP TOP helps you to utilize new maintenance and upkeep methods that focus on plant availability. The goal of this approach is a change from passive to active downtime management, i.e. ensuring successful long-term planning while utilizing resources in an optimal manner. In this respect, upkeep must be regarded as an investment, not as a cost factor.
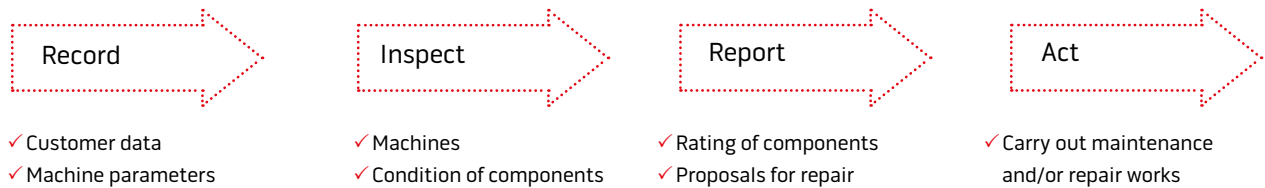
REMA SERVICE MANAGEMENT
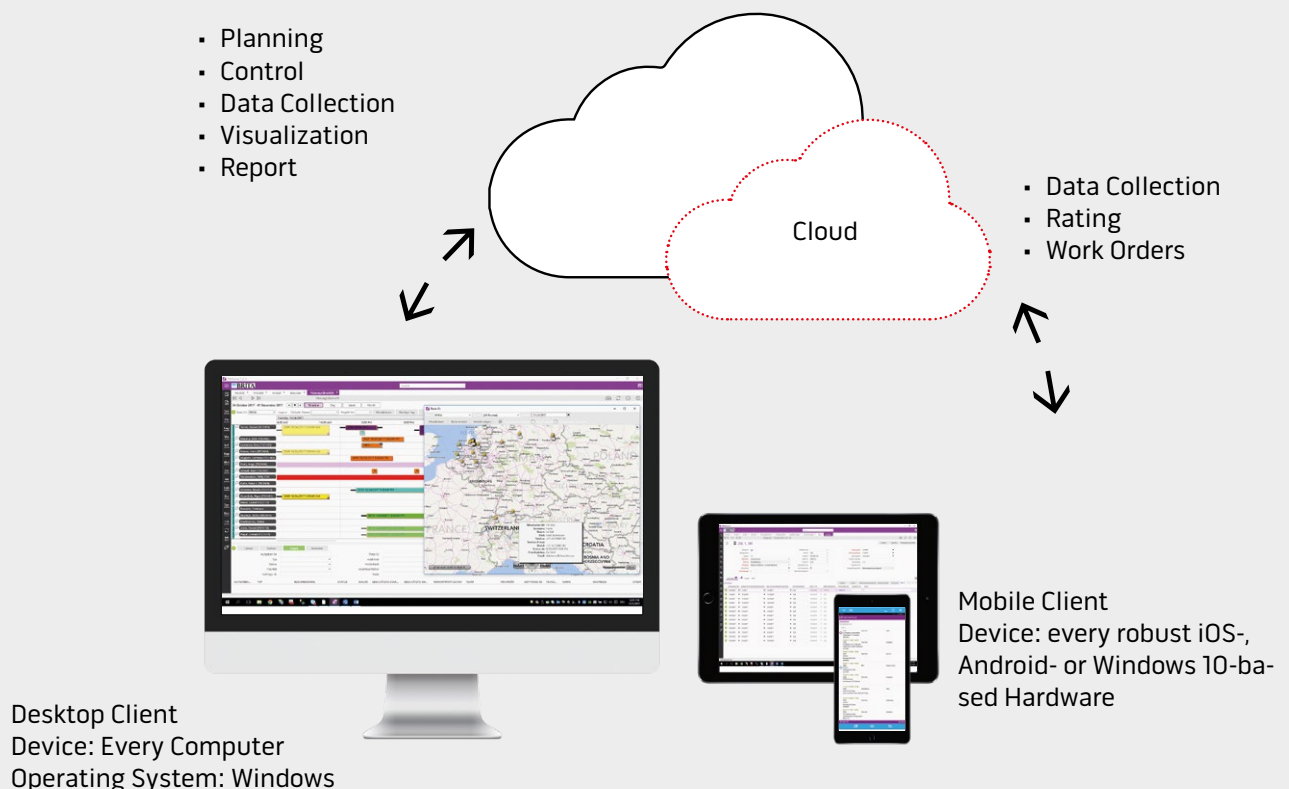## Computerized Maintenance with REMA CCube

CCube is a service management system specialized for computer added inspections undertaken by qualified REMA TIP TOP personnel. CCube enable REMA TIP TOP to provide value added services to all customers who want to continuously improve their plant maintenance systems and reduce maintenance costs. It is a secure, cloud-based system that provides an efficient workflow for the maintenance of material processing systems and many others. CCube enables realtime reporting and maintenance actions, minimizing the risk of unplanned breakdowns.

Record	Inspect	Report	Act
✓ Customer data ✓ Machine parameters	✓ Machines ✓ Condition of components	✓ Rating of components ✓ Proposals for repair	✓ Carry out maintenance and/or repair works

SYSTEM KEY FEATURES

→ Better planning and problem identification
→ Maintenance costs can be reduced
→ Fast and comprehensive reporting

→ Only system that works with a local offline client
→ Efficient digital data management
→ Worldwide 24/7 availability
→ Complementary value-add for our customers

SYSTEM STRUCTURE

- Planning
- Control
- Data Collection
- Visualization
- Report

Cloud

- Data Collection
- Rating
- Work Orders

Desktop Client
Device: Every Computer
Operating System: Windows

Mobile Client
Device: every robust iOS-, Android- or Windows 10-based Hardware

Notes

Your local contact

//ONE BRAND //ONE SOURCE //ONE SYSTEM