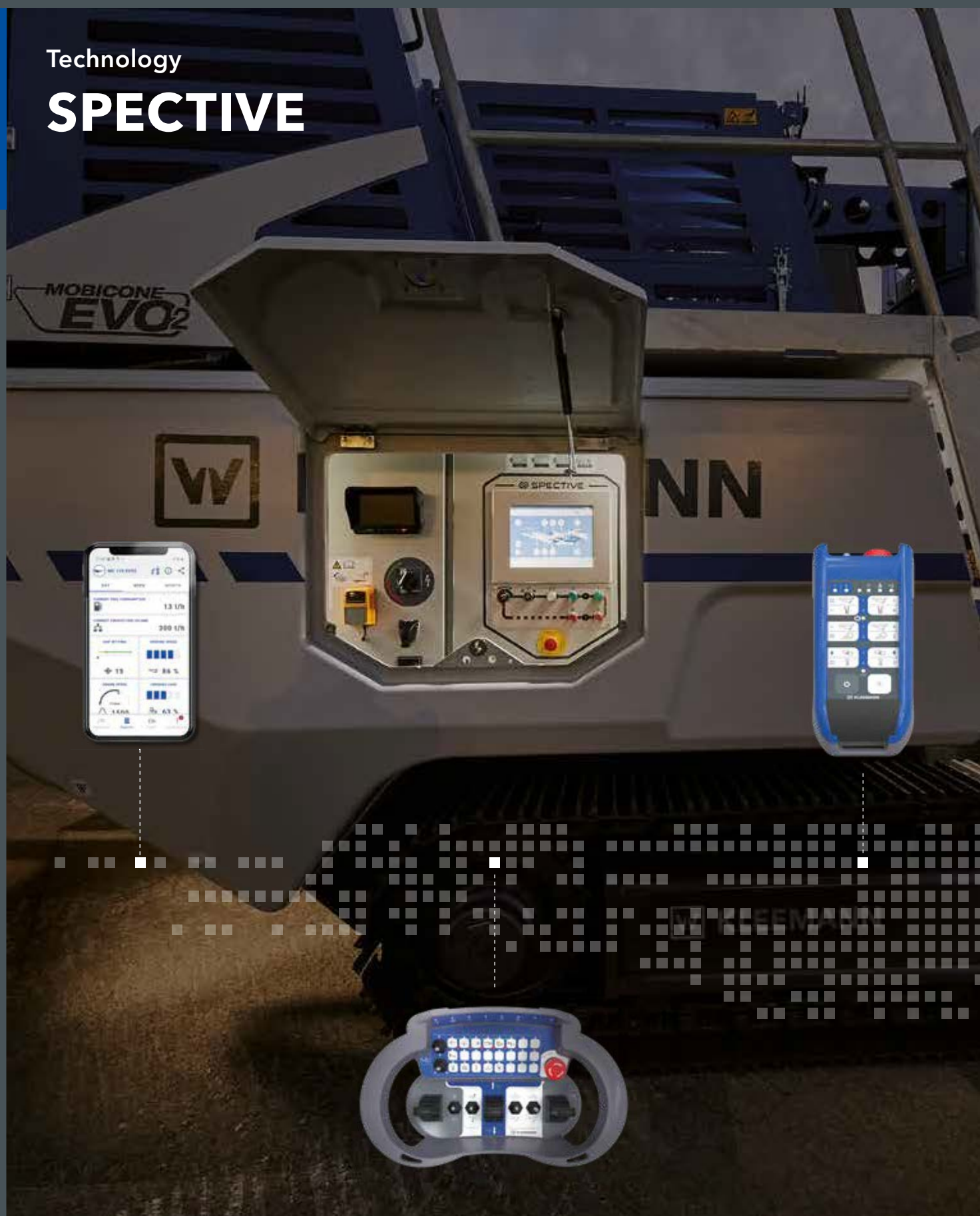




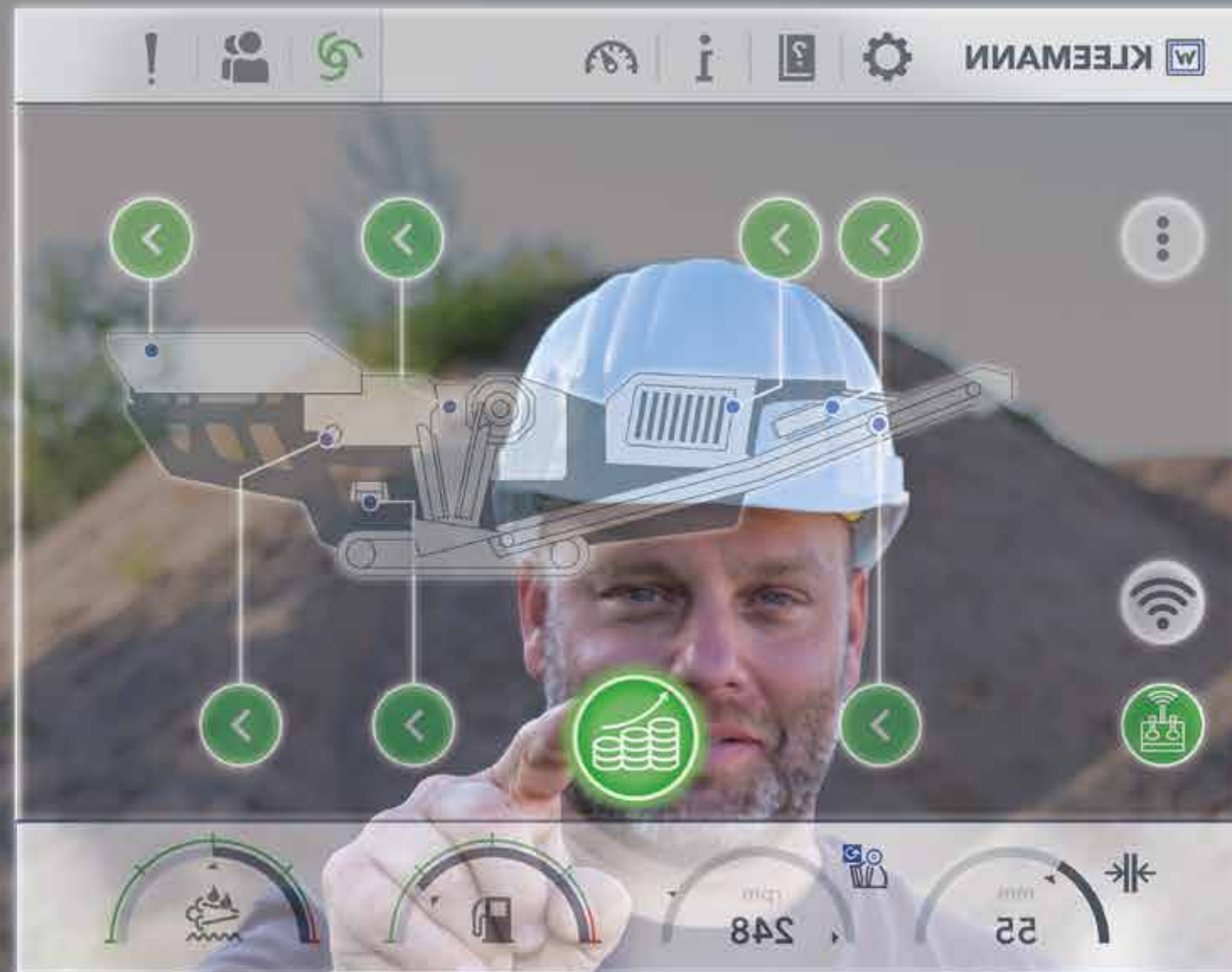
Technology

SPECTIVE



THE SPECTIVE INTUITIVE OPERATING CONCEPT

For exceptionally simple operation.



As the demands placed on modern crushing plants increase, so does their complexity. At the same time, the technology has to be reliable and as easy to control as possible - without the need for long training sessions.

Together with machine operators and experts in usability and interface design, it was possible for us to determine the requirements for operating the machine - thoroughly and comprehensively - in user tests with our operators. The result is: SPECTIVE - the intuitive operating concept from KLEEMANN.

SPECTIVE - THE COMPONENTS

My working day with SPECTIVE.



The components of the SPECTIVE world are perfectly tuned to each and specially geared to the requirements of the operator. At the same time, the components "accompany" the operator during the whole working day.

- 01 Interface**
> The SPECTIVE interface is the central reference point of the machine. The basic settings of the plants can be made here.
- 02 Radio remote control**
> Using the radio remote control, the plants are moved and the complete set-up procedure can be carried out conveniently and at a safe distance from the ground.
- 03 Radio remote control, small**
> The small, space-saving radio remote control can be used to execute all relevant functions comfortably from the excavator.
- 04 SPECTIVE CONNECT**
> SPECTIVE CONNECT transfers all important plant information to the smartphone and supports with reporting.

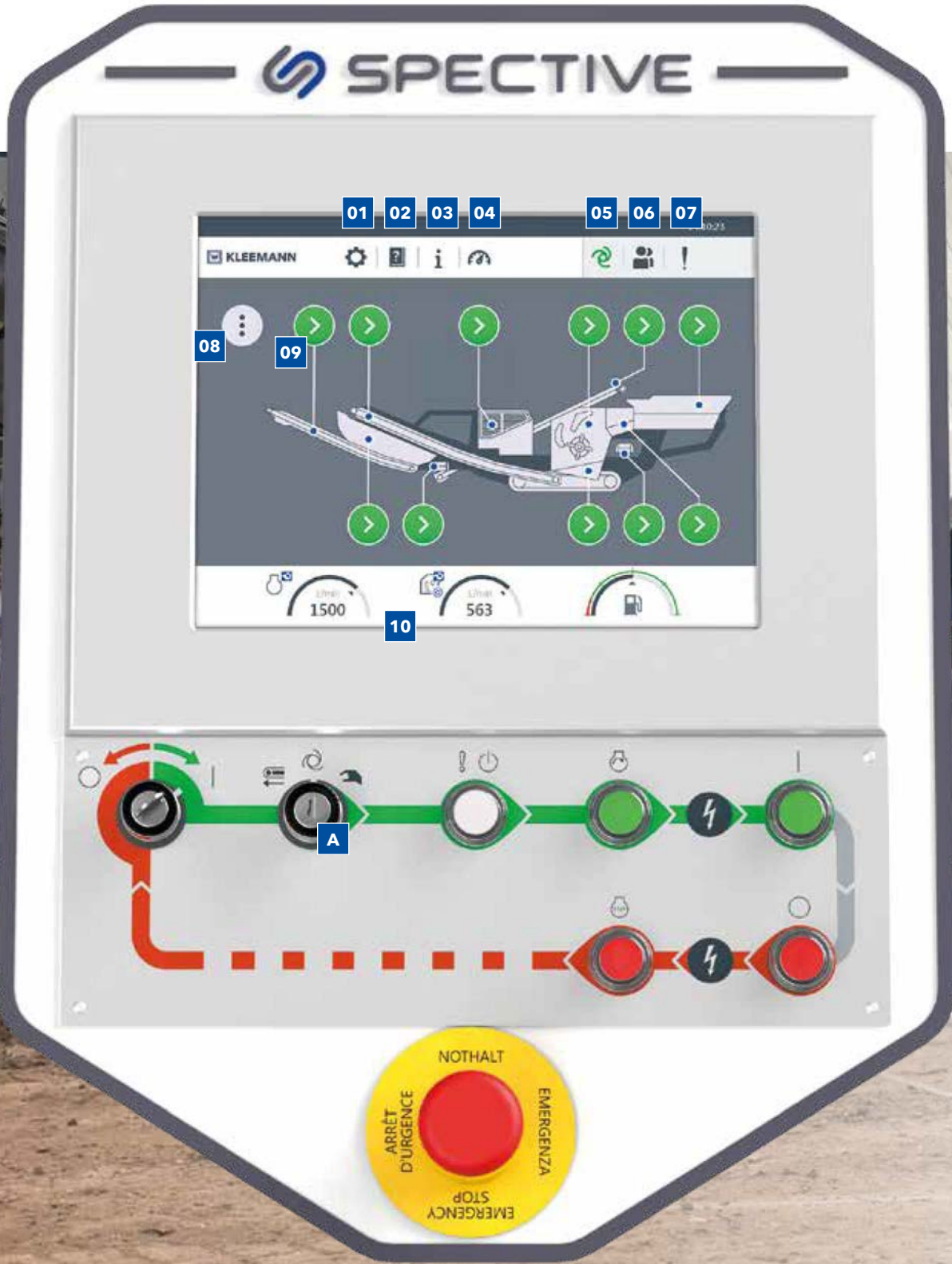
i Functions and components can vary depending on the machine model, or may be available at a later date.

THE SPECTIVE INTERFACE

The central reference point of the machine.

From the start-up process to troubleshooting and maintenance - SPECTIVE provides users with all important system information on a 12" touch panel in a way that is clear and structured, and enables all system settings to be made in one place.

The optimised layout of the keys below the display makes operation even more convenient. The lockable operating mode selector switch also protects against operating errors - making it impossible to accidentally switch to a different operating mode. The user guidance and visualisation of the operating process are simple and clearly presented. Trouble-shooting assistance has also been improved, which helps minimise downtimes. The operator is guided step-by-step through all processes.



i A special SPECTIVE interface adapted to the functions is available for the NEO-Line machines and the MOBIBELT stockpile conveyors. For simple, safe and reliable operation.

- | | |
|---|--|
| 01 Settings | 07 Information, warnings and fault elimination aids |
| 02 Help and documentation | 08 Call up side menu bar |
| 03 Information, software version, operating hours | 09 Submenu and component status |
| 04 For an overview of machine operation (utilisation of diesel generator, speed display,...) | 10 Key data at a glance |
| 05 Selected operating mode | A Lockable operating mode selector switch |
| 06 User log-on | |

KLEEMANN > GOOD TO KNOW

The lockable operating mode selector switch **A** increases safety:

- >> In combination with the different user levels in the SPECTIVE panel
 - Advanced Level: the supervisor sets the plant parameters
 - Operator Level: plant operation is possible without extensive previous knowledge
- > preventing unintentional manual mode operation

>> The operating mode selector switch can be locked for transport

- > preventing unintentional plant operation by the carrier during unloading

SPECTIVE RADIO REMOTE CONTROL

For efficient set-up and driving processes.



With the large, standard-series radio remote control, all system functions, including the entire set-up and driving process, can be controlled from a safe distance. The operator can move around freely and have an unobstructed view of everything. The layout of the operating functions reflects the logical sequence of operations.

On the worksite, the large radio range of up to 180 m and the long battery life of more than 10 hours offer additional convenience. An LED display continuously shows the charge status and, should the radio contact be briefly interrupted or the battery need to be changed, it can be done without tripping the emergency stop.

After set-up and adjustment, the plant is operated in automatic mode. The large radio remote control can be stored safely in the control cabinet and the operator can now operate the plant conveniently from the excavator or wheel loader using the small radio remote control.



KLEEMANN > GOOD TO KNOW

In some applications – for example in road construction – relocation of the crushing plant several times a day is necessary. When this is done, the plant should remain in operating mode so that it is quickly ready for operation once it has been moved. The **"Quick Track"** option allows this to be controlled conveniently via the remote control – without leaving the operating mode.

SMALL REMOTE CONTROL

For convenient operation in the loader.



Thanks to its compact size, the small radio remote control is suitable for taking along in a loader. As a rule, far fewer functions are needed there than during machine set-up.

- All relevant functions can be executed in automatic mode from the excavator:
- > Switching feed on/off, regulating the feed speed
 - > Raising/lowering magnet
 - > Setting the crushing gap
 - > Switching lighting on/off
 - > Switching spray system on/off



KLEEMANN > GOOD TO KNOW

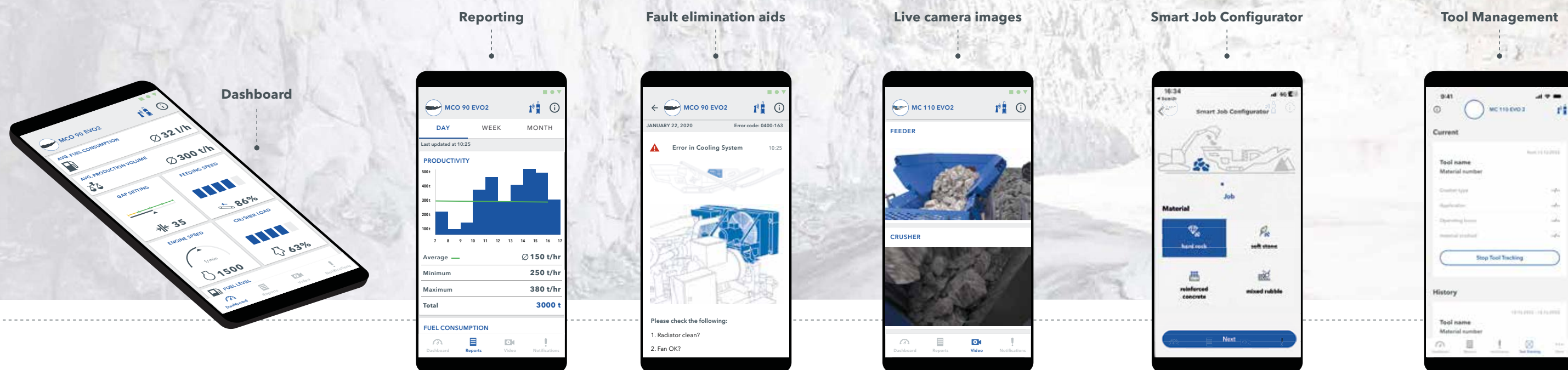
Convenient crusher gap adjustment using the cone crusher as an example

If the share of oversize grain increases as a result of wear in the closed circuit of a cone crusher, the share of utilisable final product is reduced. With the small radio remote control, the operator can correct the gap accordingly and conveniently from a distance – for a constant output and quality.



SPECTIVE CONNECT

Plant data on your smartphone.



SPECTIVE CONNECT is the logical extension of the SPECTIVE operating concept. All important information on the crushing plant is transmitted to the operator's smartphone. Irrespective of whether operators are in an excavator or wheel loader or somewhere else nearby, they always have all relevant information on the status of the machine at their disposal.

Apart from relevant data such as fuel consumption, current production output, diesel and urea filling levels, fault messages are also displayed. If the optional camera is installed, live images, e.g. of the crusher inlet or feeding unit, can be transferred to the smartphone. Work, therefore, does not need to be interrupted to view the status of the crushing plant. The option for preparing a clearly laid out report creates additional transparency for the operating company.

The benefits in brief:

- > All relevant data at a glance
- > Overview of all plants in the train
- > The operator can remain in the excavator/wheel loader
- > No interruption to the work process
- > Increased operational and work safety
- > Increased working comfort

Prior to initial start

During the initial connection, a QR code appears in the SPECTIVE plant display at the push of a button. Scan this code with the smartphone and the plant is already connected with the SPECTIVE CONNECT app. The connection is always set up automatically if you are in the vicinity of the machine. Even plants without a touch display can be connected easily with SPECTIVE CONNECT.



KLEEMANN > GOOD TO KNOW

Is your plant ready for SPECTIVE CONNECT?

If your plant is equipped with the SPECTIVE CONNECT option, then simply download the app for your smartphone and get started!

1. Select the WiFi symbol on the SPECTIVE start screen.
 2. Scan the QR code and you'll be immediately connected with the plant.
- Following this, the connection is always established when you are in the vicinity of the machine.**

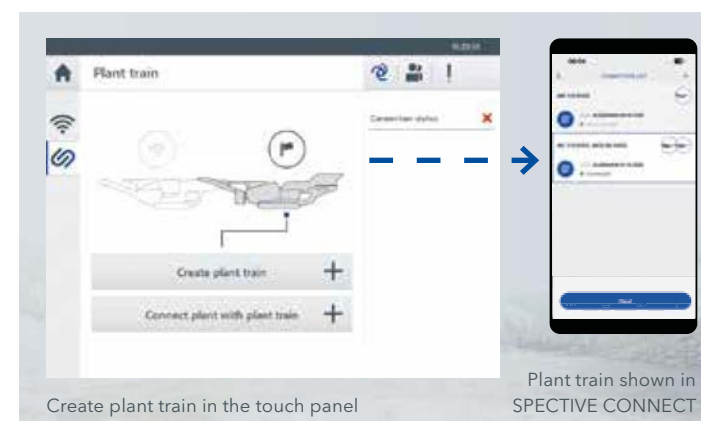


Scan the code for further
information on SPECTIVE CONNECT

Displaying several machines in SPECTIVE CONNECT

On the touch panel, a plant train can be created in the SPECTIVE CONNECT menu. The operator can then connect with a (master) plant in SPECTIVE CONNECT and view several machines at the same time, or switch between them. Up-to-date data can therefore be displayed for every plant.

Irrespective of which plant is currently shown in the dashboard, notifications and messages from all plants are actively signalled.



SPECTIVE CONNECT

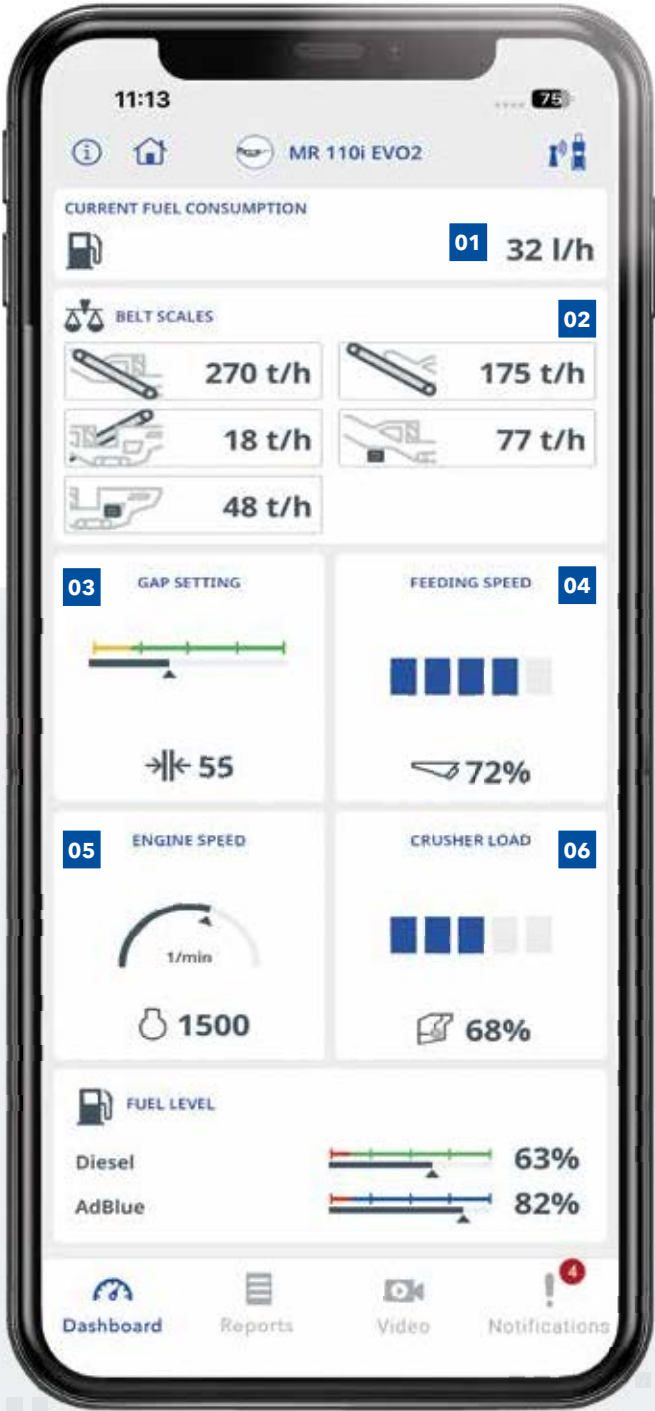
Dashboard, live camera images, fault elimination aids.



Dashboard - all current data at your fingertips

A non-verbal display provides a clearly arranged presentation of all current information on the crushing plant relevant to the operator, who always has a view of the current status of the machine.

- 01 Fuel consumption
- 02 Production output of all installed belt scales
- 03 Gap setting
- 04 Conveying speed
- 05 Speed and utilisation
- 06 Crusher level



Fault elimination aids - always best supported

All active faults displayed on the SPECTIVE touch panel on the machine are displayed at the same time via SPECTIVE CONNECT on the smartphone. The operator finds out what has to be done and is also supported in a targeted manner with fault elimination aids. Depending on the type of fault, they can decide whether it is necessary to leave the excavator or wheel loader. In each case, they can use the fault elimination aids to intervene directly at the point of occurrence and eliminate the fault. This effectively reduces downtimes and increases productivity!

If the fault cannot be eliminated, SPECTIVE CONNECT generates a Service report which can be sent to the person in charge of technology or a WIRTGEN GROUP Service centre. All operating hours, fault messages, etc. are available in a clearly arranged manner at a glance. With the offline troubleshooting help, additional support can be provided remotely.



Stockpile monitoring - for even higher productivity


Stockpile monitoring allows SPECTIVE CONNECT to display the current status of material stockpiles. When a certain value is reached (e.g. 90%), the app informs you that the stockpile soon has to be cleared. In the case of plant trains, in particular, where the excavator driver does not have a view of all stockpiles and the wheel loader driver has other tasks to complete, this can considerably facilitate work - preventing shutdowns and increasing productivity.



Camera live images - everything at a glance

If the machine is equipped with the optionally available camera system, live video images from the camera can display the crusher inlet and the feeding area in SPECTIVE CONNECT (with the MR 130(i) PRO, in addition, the transfer point of the material return to the secondary screening unit). For a view of what is happening while comfortably seated at the wheel loader or excavator.

- > Presentation of several cameras in the split-screen
- > Switch to the vertical display (landscape) possible

 The availability of SPECTIVE CONNECT depends on country-specific conditions. Moreover, individual features may not yet be fully activated. For further information, please contact your local representative or visit www.wirtgen-group.com/spective-connect-kleemann

REPORTING

Meaningful and informative.

The reporting system provides operators of screening and crushing plants with meaningful findings about their plants. The status of the machines can be viewed and optimisation potential can also be deduced.

Unclear reports on paper are a thing of the past. The report generated by SPECTIVE CONNECT can be sent conveniently by e-mail or messenger to other people in the company.

Innovative worksite management

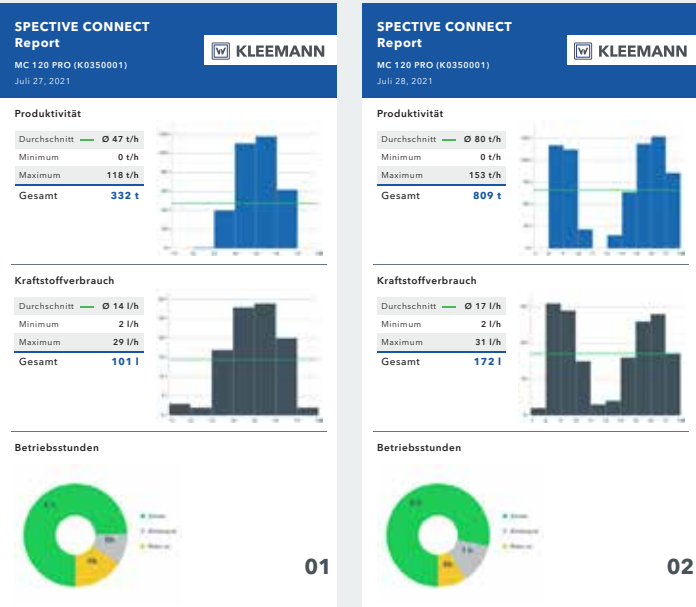
SPECTIVE CONNECT receives data from the plant per WLAN. The App user has an option for preparing reports and then sending them via the mobile radio network. In addition to several machine data, the focus is on process and performance data.

- > Operators have a view of the data at all times in their work area near the machine
- > As a manual tool for the operator, SPECTIVE CONNECT contributes directly to an increase in efficiency
- > Live data, e.g. fault messages, available per push notification
- > Report function at daily, weekly, monthly intervals
- > Reports in two formats: PDF for convenient distribution and CSV for simple further processing of the data



In SPECTIVE CONNECT, daily, weekly and monthly reports can be prepared and sent. They provide information, for example, on productivity and fuel consumption. A detailed analysis allows further interesting conclusions to be drawn:

- > Why is the output in the morning clearly below average?
- > Are the output fluctuations the result of non-optimised processes?
- > What conclusions can be drawn based on fuel consumption for further orders?



- 01** 27.07.2021: Machine was not operated until the afternoon – high discrepancy between max. output and average output – from 11 a.m. onwards, fuel was already consumed
> check: was repair/maintenance work carried out in the morning? Is the process correctly set, or why are the output fluctuations so high?
- 02** 28.07.2021: Higher production than on the day before – gap between 11 a.m. and 1 p.m. – otherwise the performance is constantly good

KLEEMANN > GOOD TO KNOW

A crushing plant's crushing capacity can be determined conveniently via integrated belt scales (optional) on the discharge conveyors and displayed via SPECTIVE CONNECT.

Reports become even more meaningful and enable conclusions to be drawn about the interaction between production output and fuel consumption.



SMART JOB CONFIGURATOR

The Smart Job Configurator tool helps the operator select and enter the correct machine settings - irrespective of the application. This saves time, provides safety and guarantees a high-quality final product with the lowest possible wear and fuel consumption.

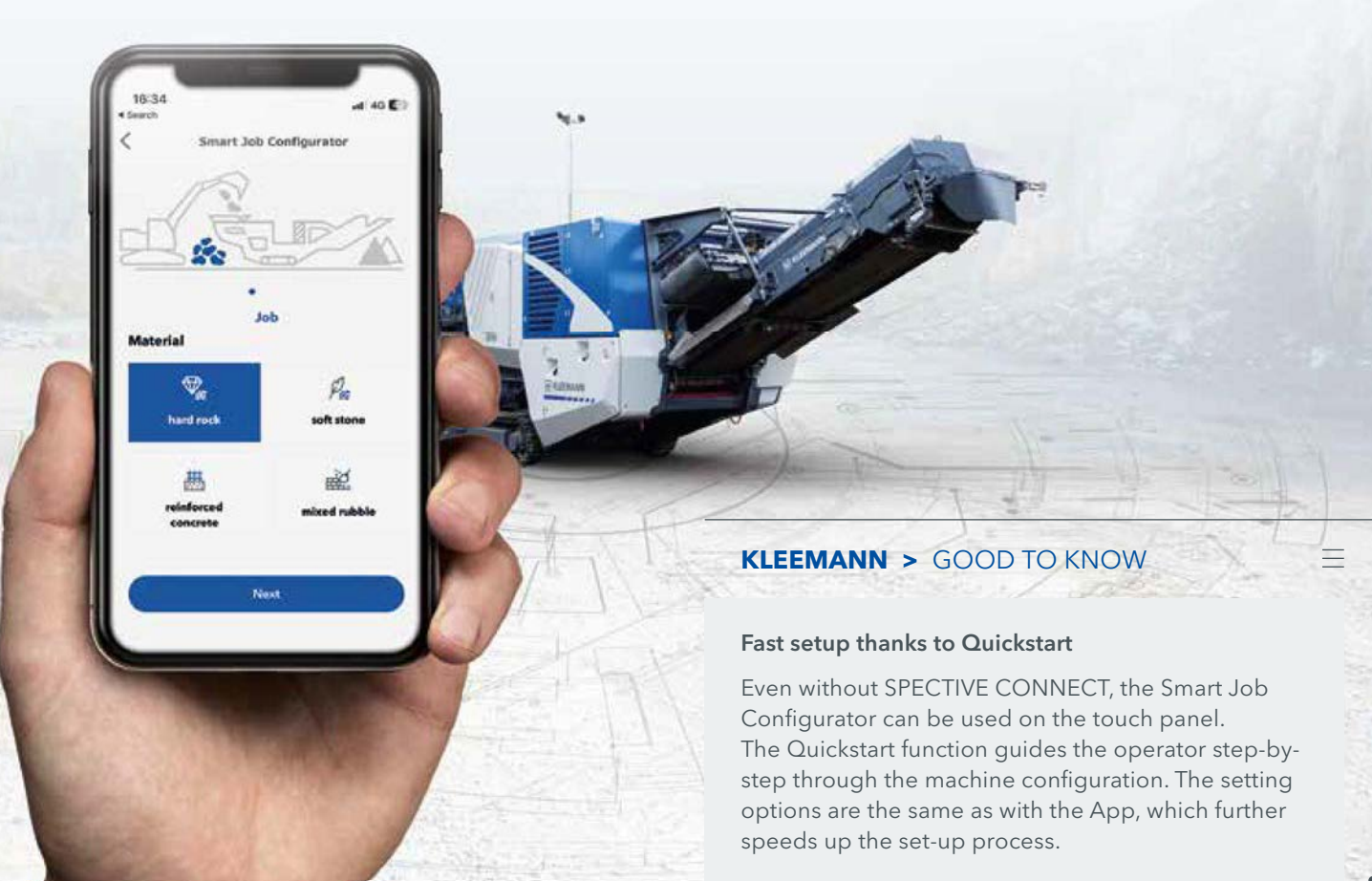
Intuitive user guidance

The operator is guided successively and clearly through the Smart Job Configurator menu on the SPECTIVE CONNECT app. First, they enter the necessary information about the machine, the material and its processing step by step. A suitable final product and the required tools are suggested. Once all parameters have been entered, the tool creates an overview of the ideal machine configurations. The result of the calculations can be exported as a PDF and sent to other people, for instance.

The suggested settings can now be entered conveniently at the SPECTIVE touch panel. The machine now works with the applied setting and delivers the planned end result.

Different sample applications inside

The configuration tool is fed with various application scenarios created by KLEEMANN Application Technology. Further 'recipes' will gradually be added so that operators can find an ever broader range of different applications. And, should there be a need for special application fields, customers can also contact KLEEMANN directly at any time.



PERFORMANCE ASSISTANT

The Performance Assistant supports operators even more with their daily work. The system monitors different values in the crushing process and can use them to make improvement suggestions.

The operator therefore receives a push notification if the current production output no longer corresponds to the output calculated in the Smart Job Configurator - including simple tips as to the possible cause of the deviation.

Practical examples

- > Tool wear due to a lower production output or excessive share of oversize grain
- > Worn, defective or incorrect screen surfaces
- > Imperfect material flow through the plant
- > Determination of the material flow on the return conveyor with a secondary screening unit possible. In the event of a change, the cause will probably be wear on the crushing tool or damage to the screen surface.

A prerequisite for the Performance Assistant is the use of SPECTIVE CONNECT and belt scales.

The Performance Assistant will be available over the course of 2024



TOOL MANAGEMENT

In Tool Management, the plant's crushing tools and their wear can be documented in SPECTIVE CONNECT. The tool determination and Tool logbook functions are used for this purpose.

Tool determination


The tool can be selected manually via SPECTIVE CONNECT. The current tool, the operating hours and the crushed tons during the current usage period are displayed in the dashboard. All other possible tools for the machine can be displayed and assigned to the project. The operator therefore always knows which tool is installed.

Tool logbook

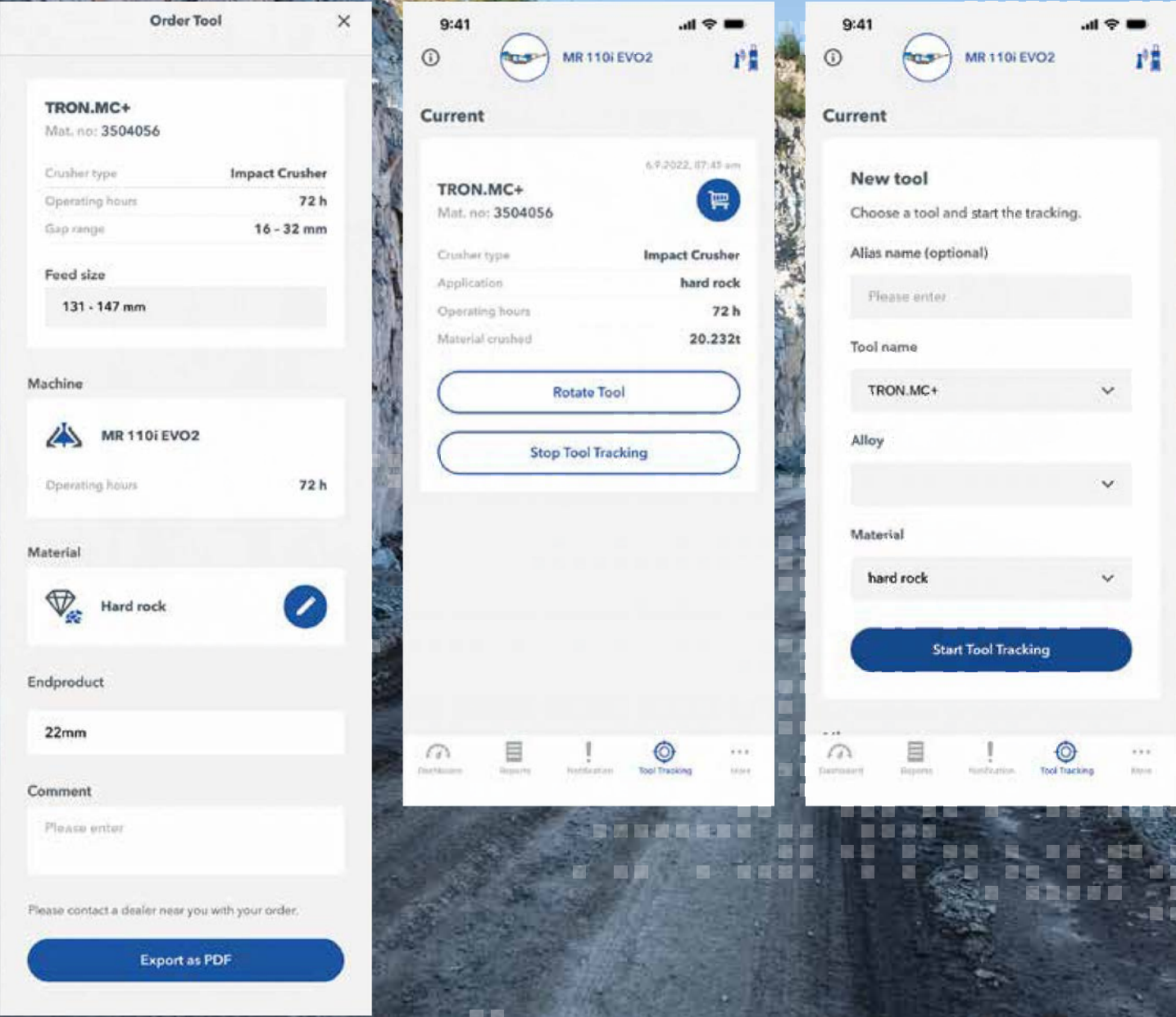
When a tool is assigned, the current date, the current operating hours and – with the use of a belt scale – the production output are documented. Should another tool be required, it can be assigned in SPECTIVE CONNECT or the time of turning can be documented.

The previous tools remain in a history. After a certain period of time, an average tool life can be derived or read out and upcoming tool changes can be planned in advance. The operator benefits from good planning for less downtime.

The Tool Management information is available to all connected SPECTIVE CONNECT users – synchronisation takes place automatically.

 An order form is available in Tool Management for easy tool re-ordering through your WIRTGEN GROUP contact person.

Rotor ledge / crusher jaw / mantle and bowl liner



SPECTIVE PACKAGES

Because it all fits together perfectly.

The less often work processes have to be interrupted, the higher the yield generated at the end of the day. The sensible combination of various SPECTIVE elements with other machine features makes day-to-day work easier, and the operator can do his work comfortably and effectively from his cab in all weather conditions.

Full Control Duo:
SPECTIVE CONNECT + small radio remote control

01 + 02

- With the combination of SPECTIVE CONNECT and the small radio remote control, you increase your efficiency and safety during crushing:
- > All relevant data at a glance on the smartphone incl. support with reporting.

> Convenient operation of all relevant functions in automatic mode from the driver's cab.

Productivity Pair:
SPECTIVE CONNECT + belt scale

01 + 03

- The combination of SPECTIVE CONNECT and belt scale for the crusher discharge conveyor increases transparency.
- > In SPECTIVE CONNECT, the current production output is displayed and prepared in a report.

Performance Trio:
SPECTIVE CONNECT + small radio remote control + belt scale

01 + 02 + 03

- With the combination of SPECTIVE CONNECT, the small radio remote control and the belt scale at the crusher discharge conveyor, operators always have a direct view of their plants' performance data.
- > The production output is determined by an optional belt scale and transferred to SPECTIVE CONNECT.

> If intervention in the process is necessary, this is carried out conveniently in the excavator with the small radio remote control.

> With an installed belt scale, reports are even more meaningful and allow conclusions to be drawn about the interaction between production output and fuel consumption.

Productivity View+:
SPECTIVE CONNECT + belt scale + camera system

01 + 03 + 04

- With the combination of SPECTIVE CONNECT, the camera system and the belt scale at the crusher discharge conveyor, operators always have a "live" view of the machine and performance data directly at their fingertips.
- > The production output is determined by an optional belt scale and transferred to SPECTIVE CONNECT.

> The live camera image can be transferred to SPECTIVE CONNECT – and everything can be viewed conveniently from the driver's cab.

Performance View + Package:
SPECTIVE CONNECT + small radio remote control + belt scale + camera system

01 + 02 + 03 + 04

- With the combination of SPECTIVE CONNECT, the small radio remote control, the camera system and the belt scale at the crusher discharge conveyor, operators always have a "live" view of the machine and performance data directly at their fingertips.
- > The production output is determined by an optional belt scale and transferred to SPECTIVE CONNECT.

> If intervention in the process is necessary, this is carried out conveniently in the excavator with the small radio remote control.

> The live camera image can be transferred to SPECTIVE CONNECT – and everything can be viewed conveniently from the driver's cab.



01



02



03



04

01 SPECTIVE CONNECT 02 Small radio remote control 03 Belt scale 04 Camera system

SPECTIVE - SAFE, RELIABLE AND COST-EFFECTIVE

SPECTIVE and, in particular, SPECTIVE CONNECT, with its digital tool box, ensures more safety for the operator, higher plant availability, better utilisation increased cost-effectiveness.

Many factors increase operator safety

1. Thanks to the display of important process data via the SPECTIVE CONNECT dashboard, in most cases operators no longer have to leave the cab or interrupt production. They can detect, for example at the smartphone, that the diesel fill level is low and order fresh supplies directly from the driver's cab.

2. Moving the plant and completion of the set-up procedure can be carried out conveniently thanks to the large SPECTIVE radio remote control and at a safe distance from the machine.
3. The small SPECTIVE radio remote control can be used to conveniently execute all relevant functions in automatic mode from the excavator - without having to leave the cab.

This all results in considerably more safety for the operator.



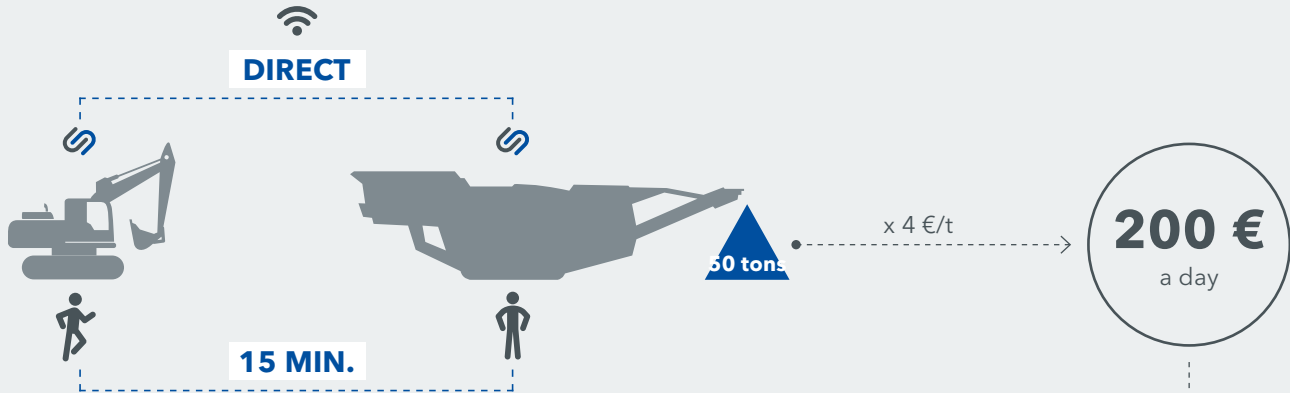
**High plant availability + optimum utilisation
+ less errors = higher cost-effectiveness**
With meaningful reports, convenient troubleshooting through the various aids or support in selecting the correct machine settings - the SPECTIVE components contribute to improved cost-effectiveness.



KLEEMANN > GOOD TO KNOW

The advantages of SPECTIVE CONNECT can be demonstrated very easily:

- With SPECTIVE CONNECT**
- > For starting and switching, go to the panel, make the basic settings
 - > Everything else with SPECTIVE CONNECT and the small radio remote control in the excavator/wheel loader
- = **Production is running.**



- Without SPECTIVE CONNECT**
- > For starting and switching, go to the panel, make the basic settings
 - > For adaptation of the process, fault messages, etc:
leave the excavator, read off info at the panel, interrupt production and make settings
- = **approx. 15 mins. interruption** in which the machine would have produced around 50 t (at an assumed 200 t/h)

With only one interruption a day, this means:
50 t/day x 4 €/t = 200 € per day x 220 working days = **44,000 € per year difference in turnover**

44,000 €
per year

SPECTIVE EQUIPMENT

| PLANT OVERVIEW - SPECTIVE EQUIPMENT | | | | | | | |
|--|----------------------------------|---|---|---|---|---|---|
| | |  |  |  |  |  |  |
| | | SPECTIVE Touch panel, Generation 1 | SPECTIVE Touch panel, Generation 2 ¹⁾ | SPECTIVE Operating position | SPECTIVE Radio remote control, large | SPECTIVE Radio remote control, small | SPECTIVE CONNECT |
|  | MC 110(i) EVO2 | | ✓ | | ✓ | ✓ | ✓ |
|  | MC 120(i) PRO | ✓ | | | ✓ ²⁾ | | ✓ |
|  | MR 100(i) NEO | | | ✓ | ✓ | ✓ ³⁾ | ✓ |
|  | MR 110(i) EVO2 / MR 130(i) EVO2 | ✓ | | | ✓ ²⁾ | | ✓ |
|  | MR 130(i) PRO | | ✓ | | ✓ | ✓ | ✓ |
|  | MCO 90(i) EVO2 | | ✓ | | ✓ | ✓ | ✓ |
|  | MCO 110(i) PRO | ✓ | | | ✓ ²⁾ | | ✓ |
|  | MSC 702 / 703 / 952 / 953(i) EVO | | | | | | ✓ ⁴⁾ |
|  | MSS 802(i) EVO | | | | | | ✓ ⁴⁾ |
|  | MBT 20/24(i) | | | ✓ | | | |

1) Generation 2: optimised buttons under touch panel and lockable operating mode selector switch
2) Radio remote control, large, Generation 1, with smaller range of functions

3) Expected to be available as of Q3/2024
4) Expected to be available as of Q4/2024

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