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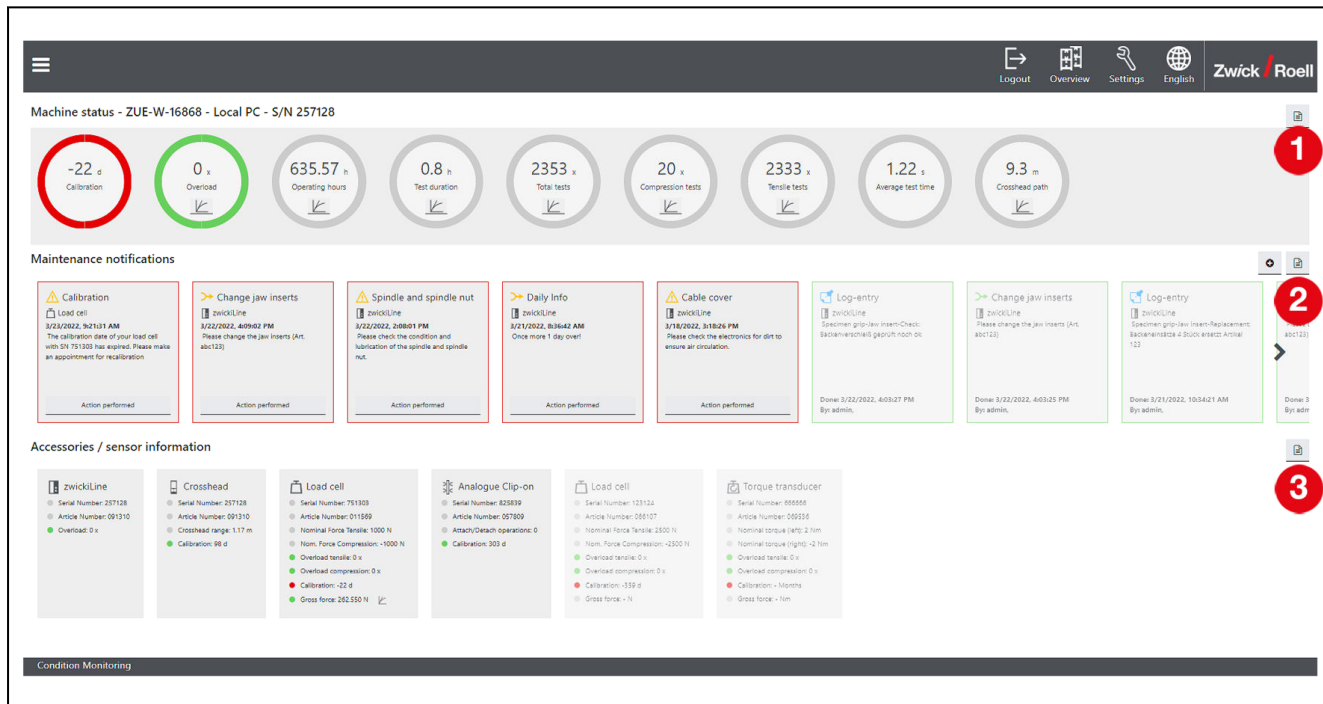# Product Information
Machine Status and Condition Monitoring

Always keep your testing machine in view with Machine Status and Condition Monitoring[1] [2]

1   Machine status information

2   Digital maintenance notifications
3   Accessory and sensor information

The testing machine at a glance
Machine Status: The requirements for machine data are constantly increasing within the context of Industry 4.0. Machine Status saves all machine-specific data in a local database on the machine PC. This feature is included as standard in the testXpert III basic package, and is accessible via web browser.

The dashboard displays important messages and information about
- Current machine status
- Current maintenance notifications
- Currently connected sensors and accessories, such as load cells, extensometers, etc.

Condition Monitoring: The advanced functions of Condition Monitoring provide an even higher level of convenience and security. Here you can customize these messages and information to your specific needs, document them, and receive digital notifications about them.

Advantages and features of Machine Status
- Easy access to machine-specific data via web browser
- Transparency about the status of the testing machine, sensors, and accessories
- Reliable test results due to perfect machine condition
- Configurable electronic maintenance guide
- Proactive planning of necessary maintenance

Advantages and features of Conditioning Monitoring
- Customizable maintenance tasks
- Trends provide an overview of the usage behavior and stresses and show irregularities
- Proactive information about the machine condition via email
- Documentation and traceability of machine activity as well as maintenance checklists via the export function

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Information regarding the machine status
The Machine status field displays a range of information regarding the machine and events.

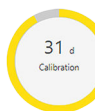### General status information

Grey:
- Total running time
- Test time
- Number of tests: in total and according to type of test such as tensile or compression tests
- Average test time
- Crosshead travel distance

Information regarding non-critical or upcoming events

Green:
- Time frame until the next calibration (over 51 days)
- No overloads detected for the sensors

Yellow:
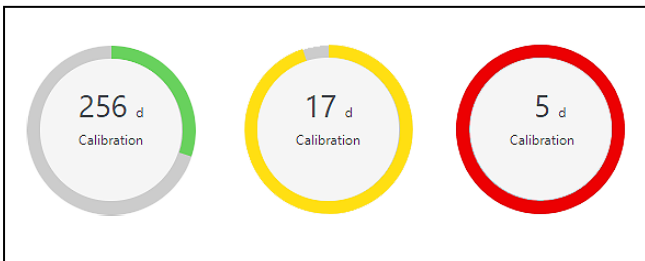- Time frame until the next calibration (50 to 11 days)

Information regarding critical or overdue events

Red:
- Number of overloads detected for the sensors
- Overdue calibration

Visualization of upcoming calibrations and their urgency

Upcoming calibrations are displayed in different colors depending on their level of urgency. This feature assists you with planning machine calibrations and, if applicable, with receiving laboratory certifications. Prevents tests from being performed with a defective testing system.

Electronic maintenance guide
The electronic maintenance guide advises regularly scheduled service and maintenance activities. This makes it easier to plan maintenance tasks and increases the utilization time (uptime) of the testing machine. The interval details are based on the requirements in the machine user guide.

For example, the following notices are possible:
- Inspection of load frame elements such as emergency stop buttons, air circulation at the electronics, lubricating the lead screw, etc.
- Upcoming calibration and number of load cell overloads
- Regular inspection of the condition and the functions of the safety shield and, if applicable, replacement of the polycarbonate shield
- Inspection of the extensometer condition and its knife edges for contact extensometers
- Overdue calibration of the sensors
- Gross force deviation

Traceable maintenance activities

Maintenance tasks can be easily acknowledged after being performed. The date and time of the acknowledgment are documented. All performed service and maintenance tasks can be easily recognized by the green border and differentiated from pending notices with yellow border and due notices with red border. This enables maintenance tasks that have already been performed to also remain saved and traceable.

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Accessories / sensor information

Overview of the most important information regarding the accessories used; 1 = active, 2 = inactive

Overview of accessory information
All relevant information regarding the accessories and sensors that are currently connected to the testing machine is visualized.

Pictograms make it easy to identify what type of accessory you are dealing with.

- Testing machine

- Moving crosshead

- Safety device

- Load cell

- Extensometer

- Specimen grips

Important information can be viewed according to accessory type at a glance, for example:
- Serial number
- Item number
- Measurement range
- Nominal forces
- Number of overload
- Upcoming or overdue calibrations
- Number of closing procedures for safety doors
- Number of attachment and removal procedures for contact extensometers
- Number of closing procedures for hydraulic and pneumatic grips

This feature assists you with monitoring and planning for accessory calibrations. It can prevent tests from being performed with a defective accessory in the testing system.

Condition Monitoring

Advanced functionality
In addition to the currently connected sensors, all inactive sensors that were previously connected to the machine are also shown in the accessories / sensor information. The sensors currently not in use are displayed in grayed out tiles, and all actively connected sensors are displayed in bold font as usual. The status of these sensors is recorded based on the time of removal from the machine; the status information is not updated again until the next time it is used on a machine. We are thereby providing transparency and traceability of machine configurations. Currently unused sensors are also not forgotten during calibration. You can fully focus on your test task, while Condition Monitoring ensures safe general conditions.

Settings – Adjust intervals
Configuration of maintenance notifications for the machine and connected sensors. The user can do the following according to individual needs:
- Deactivate maintenance notifications
- Create customized maintenance notifications
- Combine maintenance notifications (e.g. time and/or travel)
- Adjust respective maintenance interval cycles
- Edit notification text
- Activate automated email alerts

All data at ambient temperature.

Subject to change in the course of further development.

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Machine Status and Condition Monitoring

Individually customizable maintenance notifications

These customized maintenance notifications and intervals are shown on the dashboard display of the electronic maintenance guide and help the user optimize their maintenance service. This allows you to tailor your maintenance activities to your needs:

• Shift model
• Test task
• Level of utilization
• Environmental influences
• Test material

Safety-related service intervals are grayed out and cannot be edited.

Log entry
The electronic maintenance guide provides the option to note events and record the following activities:

• Maintenance measures performed
• Parts replacement or exchange

Enter description of events with the log entry and store it

Settings – Back up and restore configuration – Configuration manager
This function allows you to transfer customized maintenance notifications settings to other machines.

Export configuration – all customized settings are acquired via a json file.

Import configuration – these are transferred to another machine with the data relevant to the machine type and accessories.

Reset Condition Monitoring – the factory settings are restored. All customized settings are reset.

Settings – General settings – Maintenance notifications
The date filter is used to determine from what point in time the acknowledged maintenance notifications are displayed on the dashboard.

The predictive maintenance notifications can be

• Activated / deactivated
• Set between 0 and 365 days

This allows for advance planning and combining of upcoming maintenance tasks on the testing machine, which can in turn significantly reduce maintenance downtime.

All data at ambient temperature.

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Trends provide an overview of the usage behavior of a machine

Condition Monitoring provides the following trend analyses:

- Number of performed tests
- Number of performed compression tests with load range analysis
- Number of performed tensile tests with load range analysis
- Gross force progression of load cell sensor
- Number of overloads
- Test duration
- Crosshead travel

These longterm trends provide indications of stress and wear imposed on the machine and accessories, from which corresponding necessary service measures can be derived. We provide an overview of the timeframe in which events such as overload conditions occurred. Furthermore, they help in the determination of individual maintenance intervals and provide information to optimize machine utilization.

Gross force progression trend / load cell sensor

This trend analysis allows the user to predictively detect anomalies in the force measurement range. Each new recording of the gross force and comparison with stored reference values provides information about possible system changes caused by defective or damaged hardware, for example after a machine overload condition. This function therefore significantly contributes to reliable test results. [1]
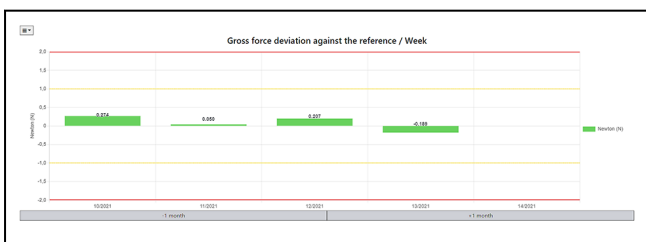
The gross force progression trend enables the detection of anomalies or system changes via yellow warning limits and red alarm limits

CSV file export function

The following information can be exported into a CSV file and documented:

- Machine status
- Maintenance notifications
- Sensor and accessories information

The current machine, maintenance and sensor status provide a comprehensive overview. With the export function, this status information is made available in editable CSV format. Contents can therefore be easily transferred to customer documents such as maintenance checklists.

Settings – General settings – Email settings

Alert system via email message informs the user in case of critical machine conditions such as:

- Exceeded limit values
- Expiration of the calibration deadline
- Overload condition

This function allows laboratory supervisors and/or ZwickRoell to be proactively and digitally informed about critical system discrepancies. Possible manipulation by the operator is therefore minimized. Machine downtimes are reduced through quick response times and on-call services/shifts are supported.

Monthly provision of CSV files via email can be automated, enabling your testing machine to proactively keep you informed about its current condition.

Setting up email alerts

Minimum system requirements

- testControl II measurement and control electronics including firmware for static testing machines
- testXpert III V1.6 including testXpert Storage installation
- Intel I5 personal computer (or comparable) with at least 8 GB RAM
- Windows 10 operating system, 64 bit

CTA: 249015

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[1] (Available as of testXpert III V1.6)

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- Largest possible hard drive (recommended: 2 TB) for testXpert Storage installation
- Google Chrome or Microsoft Edge web browser

Exporting the ZwickRoell HMD (hour meter data) service function

After replacing the testControl II electronics, ZwickRoell Service transfers the Condition Monitoring data to the new electronics. All stored machine usage data continues to be seamlessly available after a necessary replacement of the electronics. This function can only be performed by trained ZwickRoell Service personnel.

Machine overview
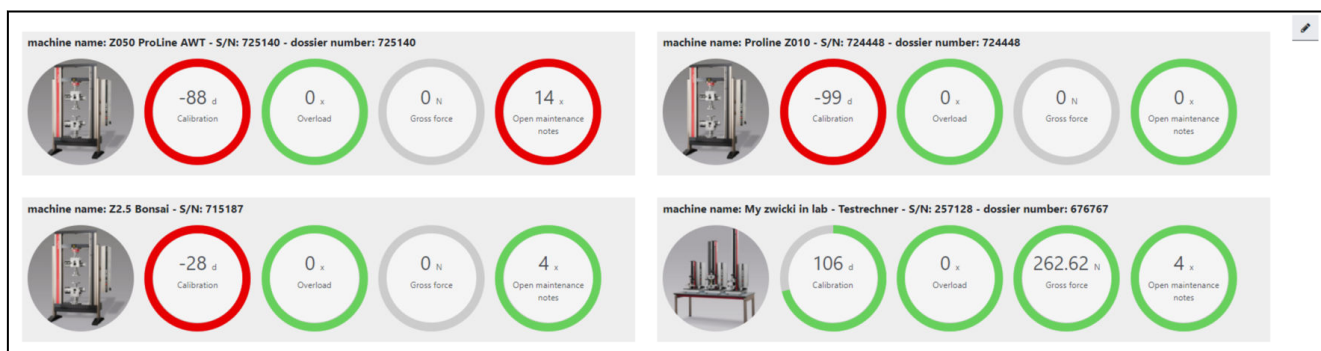
Display of multiple machines

The machine overview provides you with an overview of all available machines. Critical or upcoming events are signaled.

Machine Status or Condition Monitoring – the right license option to fit your needs

With testXpert III, you have access to the basic version of Condition Monitoring, the Machine Status, free of charge and indefinitely.

With every new machine, every modernization and every testXpert III software upgrade, you receive a 12-month Condition Monitoring license. Get to know the innovative functions provided by our Condition Monitoring feature, and use them without obligation and free of charge. This will allow you to familiarize yourself with the system.

If you would like to continue using Condition Monitoring after the trial phase, you can choose our low-priced unlimited license or a 12-month license with maximum flexibility.

Condition Monitoring licenses

Description	ArticleNumber
Machine Status, included in the testXpert III basic package, free of charge	**See testXpert III basic package**
Condition Monitoring 12-month trial license, included free of charge in machine warranties for new machines, and in modernizations and testXpert III software upgrades	**1105876**

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Product Information
Machine Status and Condition Monitoring

Machine Status: machine status display, maintenance notifications, as well as accessories and sensor information

Condition Monitoring: individualized adaptation of information and messages to the need of the customer, including email alerts

User management: in the standard configuration, the following users are set up within user management:
- Lab manager and admin (level 2)
- Tester (level 1)

The user management feature also allows you to define additional users.

Available features as of 4/1/2022

General settings	Machine Status	Condition Monitoring	User management
Editable machine name and dossier number	x	x	Level 2
E-mail messaging / alert function	-	x	Level 2
Service interval configuration manager (import / export)	-	x	Level 2
Machine overview - display	-	x	Level 1
Machine overview - edit	-	x	Level 2
User management	-	x	Level 2

Machine Status	Machine Status	Condition Monitoring	User management
Calibration	x	x	Level 1
Overload	x	x	Level 1
Overload trend	-	x	Level 1
Hours of operation	x	x	Level 1
Test duration	x	x	Level 1
Test duration trend	-	x	Level 1
Tests	x	x	Level 1
Number of tests	-	x	Level 1
Compression tests	x	x	Level 1
Compression test trend with load range analysis	-	x	Level 1
Tensile tests	x	x	Level 1
Tensile test trend with load range analysis	-	x	Level 1
Average test time	x	x	Level 1
Crosshead travel	x	x	Level 1
Crosshead travel trend	-	x	Level 1
Machine status CSV export	-	x	Level 1

Maintenance notifications	Machine Status	Condition Monitoring	User management
Maintenance notifications per machine type and accessory	x	x	Level 1
Maintenance notification acknowledgment	x	x	Level 1
Editable maintenance notification time intervals	x	x	Level 2
Maintenance notifications can be deactivated / text can be edited	-	x	Level 2
Upcoming maintenance notifications, 365 days	-	x	Level 2
Maintenance notification date filter	-	x	Level 2
Maintenance notification CSV export	-	x	Level 1

All data at ambient temperature.

Subject to change in the course of further development.

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Maintenance notifications	Machine Status	Condition Monitoring	User management
Log entry	-	x	Level 2
Customer-specific maintenance notifications	-	x	Level 2
Combinable maintenance notifications (e.g. travel and/or time)	-	x	Level 2

Information on accessories / sensors	Machine Status	Condition Monitoring	User management
Display of active accessories / sensors	x	x	Level 1
Accessory-specific condition information	x	x	Level 1
Load cell gross force trend	-	x	Level 1
Accessories information on inactive accessories / sensors	-	x	Level 1
Accessories / sensors CSV export	-	x	Level 1