F.EE

fe.screen
screw data management
SDM

SCREW DATA MANAGEMENT
AND **PROCESS CONTROL**

**fe.screen-sdm© –
a product of the F.EE Company Group**
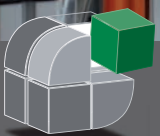
OUR EXPERIENCE
IS YOUR SECURITY

**fe.screen-sdm is a high-quality product from the
F.EE Company Group.**

With currently 900 employees, F.EE is one of the leading German
companies on the market for production and automation
technology.

The company operates on global growth markets such as the
capital goods industry, the energy sector and the engineering and
service branch and very successfully offers customised solutions
as well as products and services tailored to meet the requirements
of its customers.

Working competently and professionally for:

- Machinery and plant engineering.
- Automotive and supplier industry.
- SME's from the most diverse branches.
- Energy providers, municipal authorities and
  power plant operators.

CONTENT

fe.screen-sdm
AN OVERVIEW

SDM

fe.screen-sdm

fe.screen-sdm is a configurable, standard software for screw data management with an HMI. The software, which is modular in design and can be expanded, controls the devices connected in the production cycle, collects and evaluates screw connection results while at the same time providing the worker with clear graphical operator guidance and a reworking module.

There are a multitude of manufacturing steps in the final assembly of automobile production. The incomplete vehicle passes through numerous stations at which a few final work steps are carried out, either automatically or by the worker. Countless screw connections are made on the various components in these work cycles, either with hand-held or automatic screw-tightening systems. Working aids for the respective work cycles include among other things camera systems, pick-to-light systems, worker guidance with attractive graphics, etc. In order to master the diversity of the control tasks, the company F.EE provides the product **fe.screen-sdm** as a human-machine interface. This modularly designed software consists primarily of a logic part, an HMI for the worker guidance and a configurator with which the individual work cycles can be configured. The individual modules of the software can be exchanged wherever necessary, thus ensuring maximum flexibility.

The typical sequence of a work cycle equipped with the **fe.screen-sdm** is as follows: First, the information on the body type is identified via the database once a body or a component has been fed into a work cycle. The employee is guided through the various work steps to be carried out via the screen with the aid of the integrated worker guidance and the support of signal generators and label printers. Screw connection jobs are triggered by the **fe.screen-sdm** via a standard XML protocol, screw connection results are evaluated, visualised and where necessary transmitted to a reworking station. The result telegrams collected during this process are transmitted with triple security to a quality server at the end of the cycle to ensure seamless documentation. The **fe.screen-sdm** then waits for the next body to be fed in …

Fig. 1: User interface

MODULAR DESIGN AND EXPANDABILITY

The modular design of the **fe.screen-sdm** with its state-of-the-art technology based on .NET Framework technologies means that

- devices and complete plant parts can be exchanged or expanded at any time.
- tested and proven plant parts are not affected by the exchange or expansion and complete the entire system.
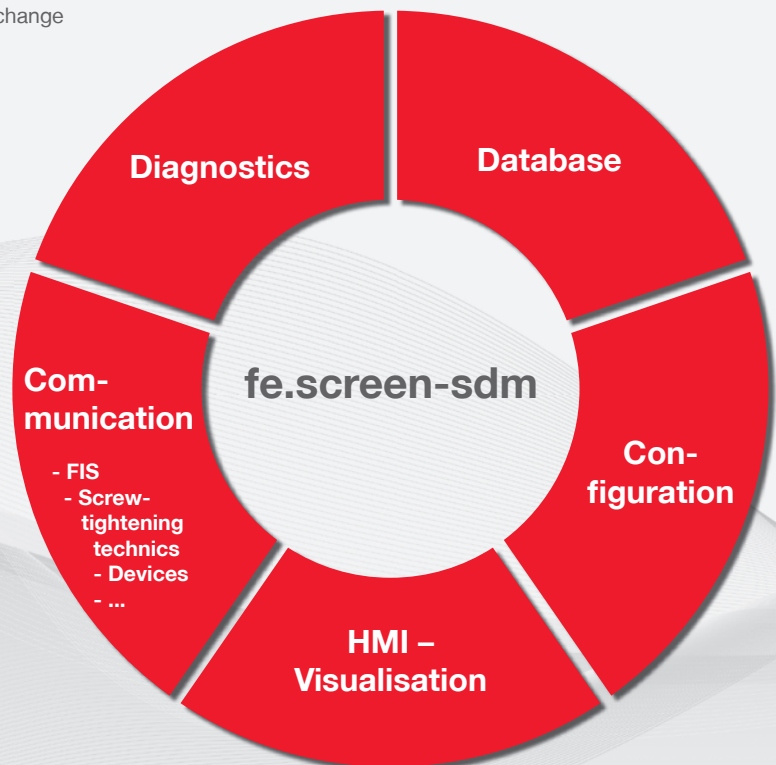- work step types can be expanded without limit.

Diagnostics

Database

Communication
- FIS
- Screw-tightening technics
- Devices
- ...

fe.screen-sdm

Configuration

HMI – Visualisation

Fig. 2: The fe.screen-sdm modules

FUNCTIONAL OVERVIEW

- Complete process and screw-tightening system control in the cycle with **fe.screen-sdm.**
- Conveyor control via (line)PLC or IO modules.
- Filtering of the screw-tightening programs for the screw-tightening systems defined in the cycle, external systems (IdentServer) or local pre-filtering possible.
- Connection of quality data server and **fe.screen-sdm** reworking stations.
- Visualisation and operator guidance via **fe.screen-sdm** HMI.
- Centralised and local configuration.
- Control of several cycles via one PC possible.
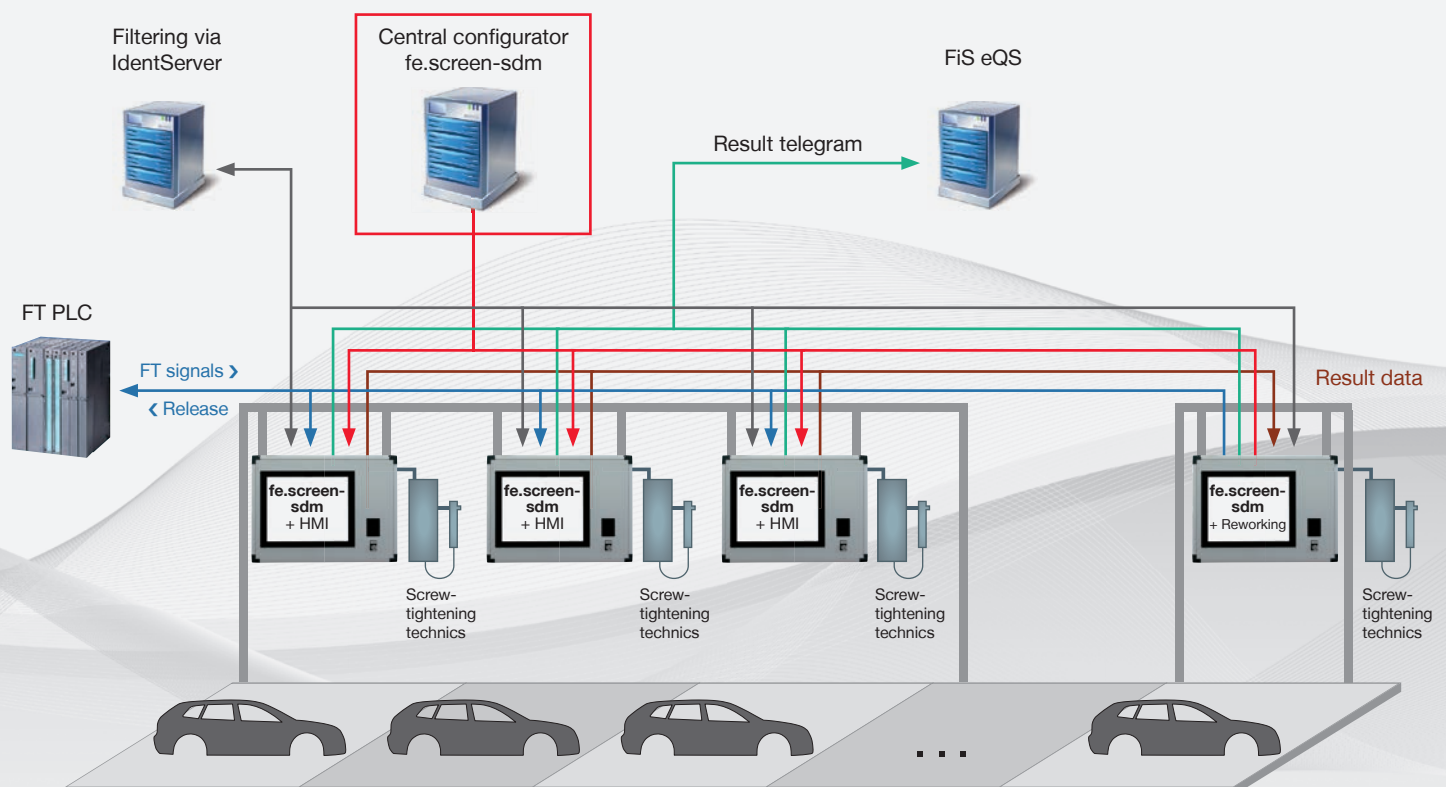- Extensive visualisation of process events via IO modules.

Filtering via IdentServer

Central configurator fe.screen-sdm

FiS eQS

Result telegram

FT PLC

FT signals ›

‹ Release

Result data

fe.screen-sdm + HMI

fe.screen-sdm + HMI

fe.screen-sdm + HMI

fe.screen-sdm + Reworking

Screw-tightening technics

Screw-tightening technics

Screw-tightening technics

Screw-tightening technics

Fig. 3: Communication scheme

CONTROL OF SCREW-TIGHTENING SYSTEMS

- Hand-held, hand-guided and automatic screw-tightening systems.
- Communication with screw-tightening systems via standard XML protocol.
- Connection of any number of devices via IO module interface.
- Release control via nut changer system possible.
- Feedback message of screw-tightening results and process-secure message to the quality data server.
- Local fallback strategies for quality data.
- Printing of screw-tightening results at the end of the cycle.

Fig. 4: Hand-held screw-tightening device
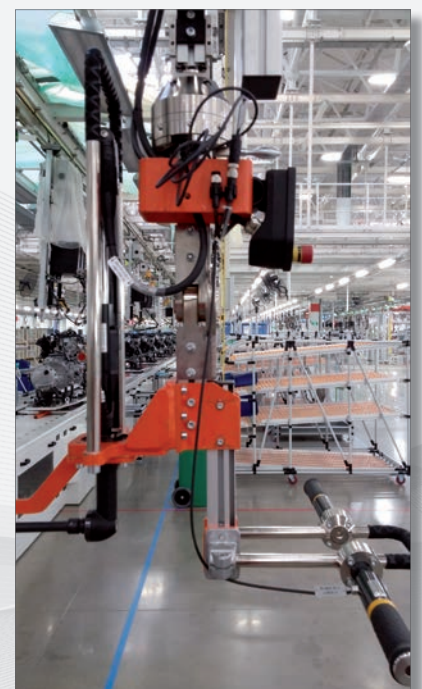
Fig. 5 and 6: Hand-guided screw-tightening device

HMI – VISUALISATION

- Visualisation and graphical user guidance for type-dependent work at the stations.
- Display in table form with current screw-tightening values and results.
- Splitting of the display at the connection sides of the screw-tightening system is possible, both as a split screen or on a second monitor.
- Visualisation and user guidance of the parameterised nut changers.
- Extensive diagnostic possibilities.
- Simple device deselection and service options.
- Integral user and user role management.
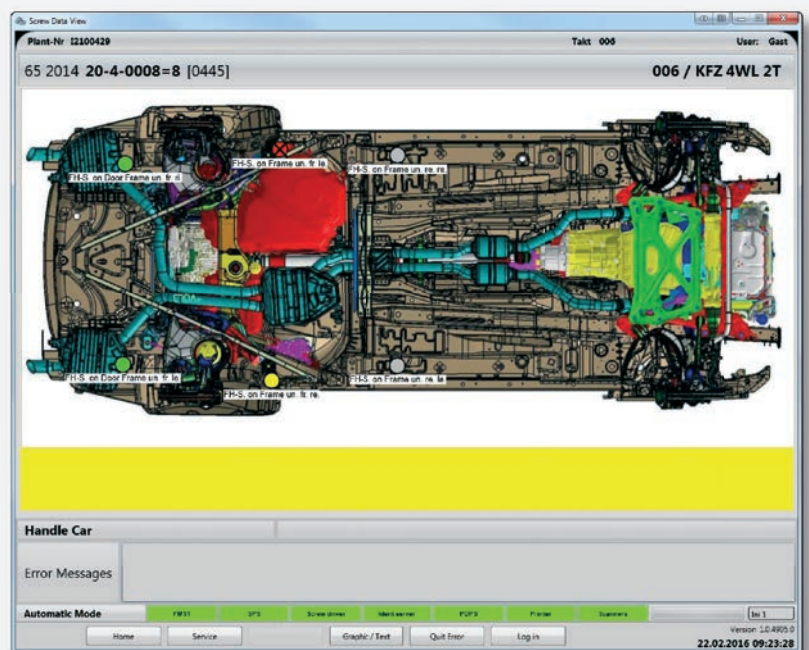
Fig. 7: Active graphical user guidance with screw point visualisation

Fig. 8 and 9: Graphical user guidance with complete status visualisation after end of cycle
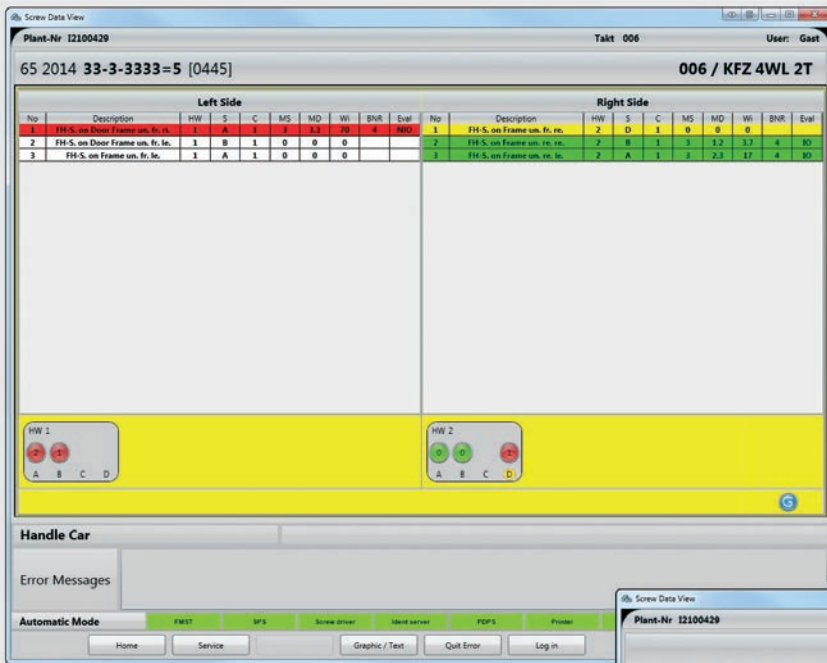
*Fig. 10: Table display of screw points
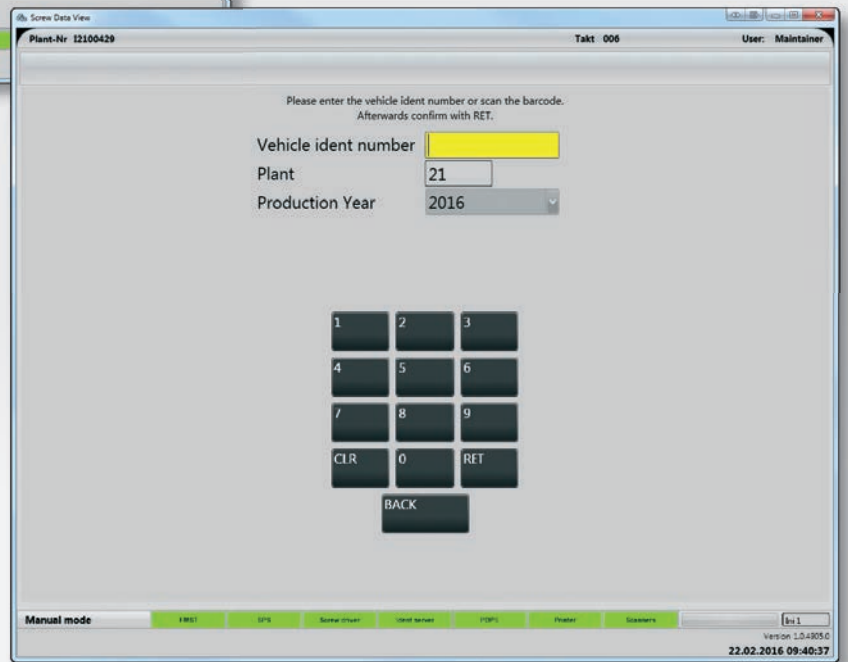in a split screen for different connection sides*

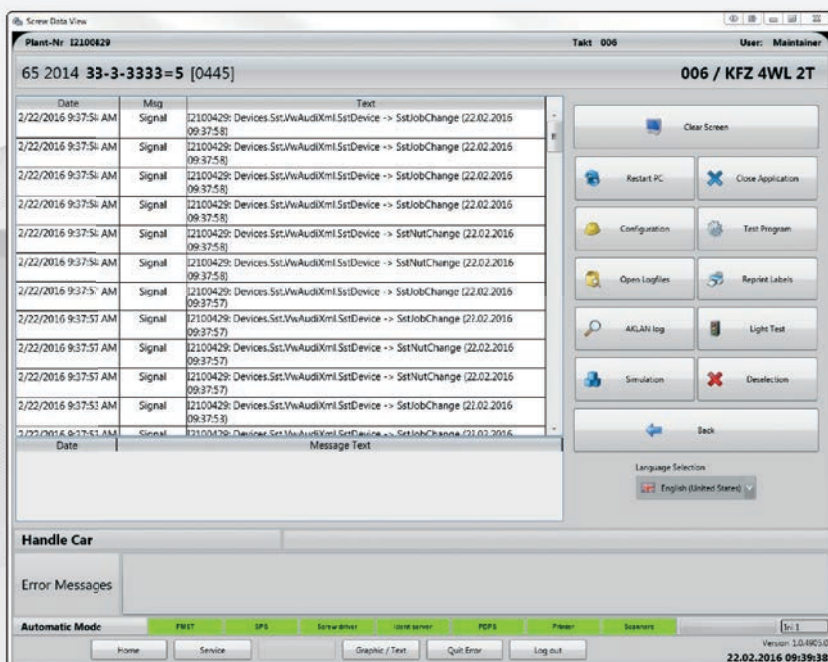*Fig. 11: Manual ID number and type post selection*

Fig. 12: Service menu with worklog and message archive

- **fe.screen-sdm** has a system configurator for easy configuration of a cycle.

- Divided into device, vehicle data and maintenance configuration.

- Integral user and user role management.

- Language switching.

- Clear tree view display.

- Flexible data management tool for directory and database cleaning.

- Optional central plant configurator available for easy configuration of all cycles on one computer.

- Versioning system with rollback option.

- Download of the cycle configurations to the individual cycle PCs.

- Activation of new configurations per execution criterion or manually „on site".

- Import/export function.

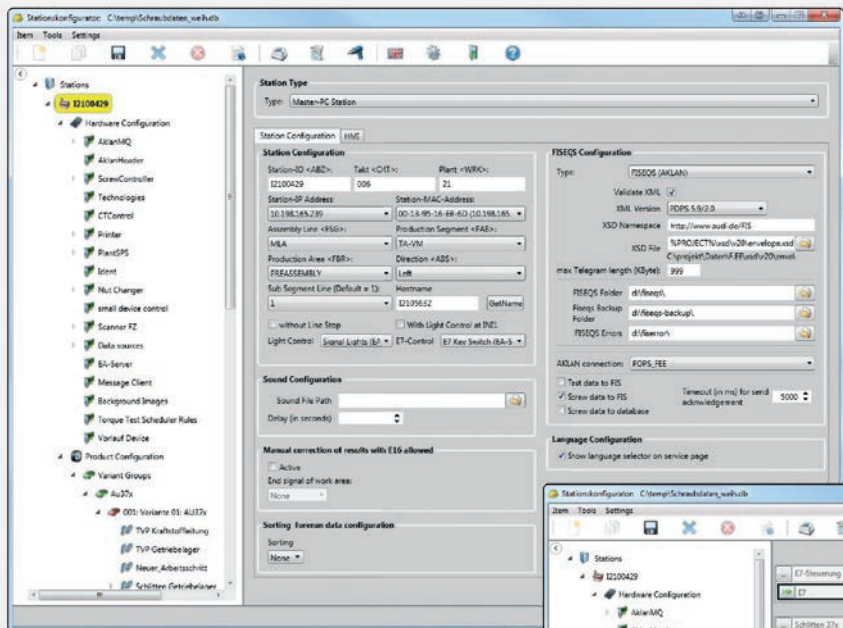- Free choice of background images.

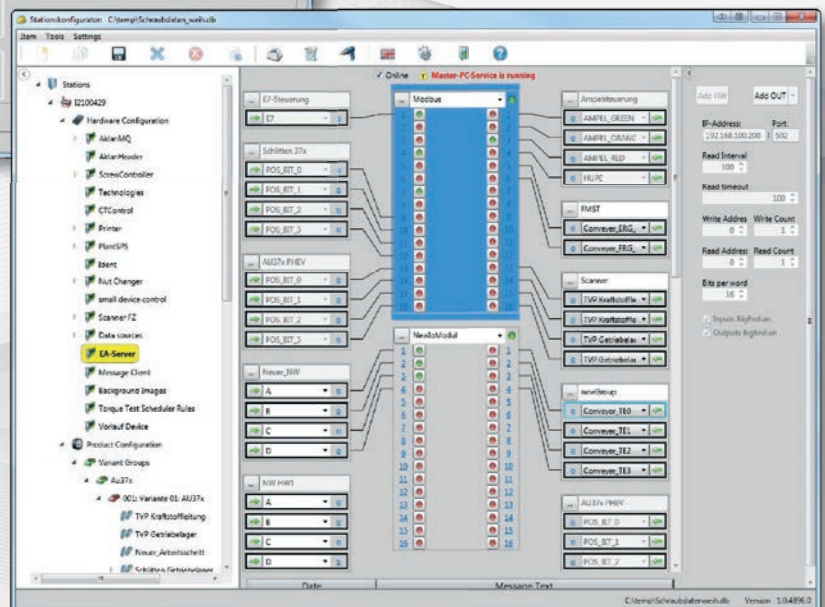Fig. 13: Station configurator with tree view display

Fig. 14: Graphical I/O module parameterisation with online function
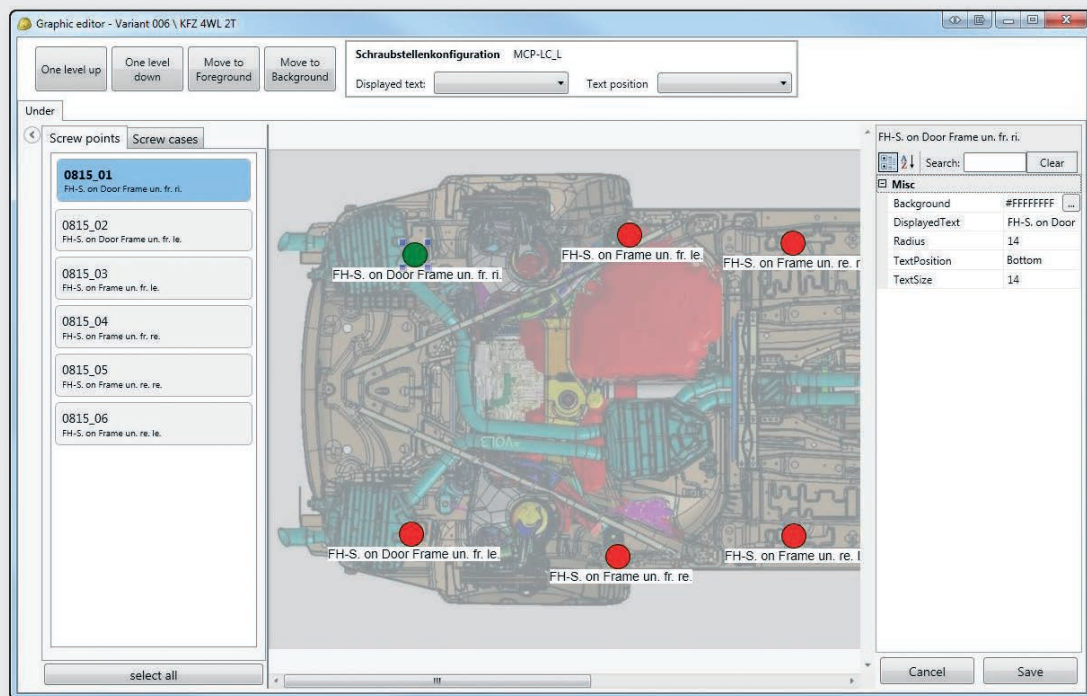
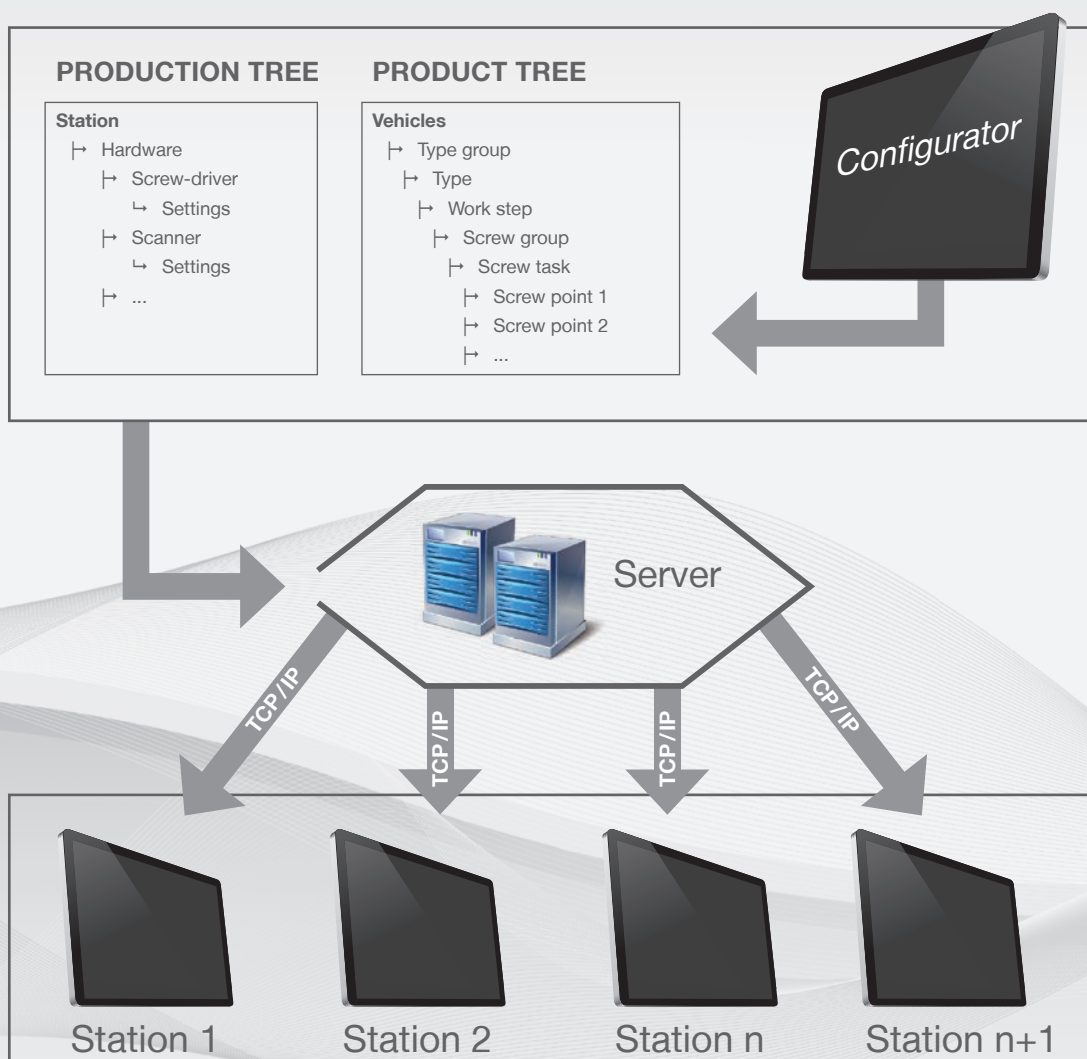Fig. 15: Graphical screw point configurator with flexible Drag & Drop positioning

Fig. 16: Central plant configuration

REWORKING
(data logger)

- **fe.screen-sdm** as a reworking station at the end of the line for complete vehicle quality.

- Identical look & feel as in the individual cycles.

- Automatic visualisation of all NOK screw points with assignment of the existing screw-tightening systems for reworking.

- Manual setting of screw point results possible.

- Direct communication with cycle PC without any interim systems.

- Stand-alone connection to lines with PLC systems via data logger possible.

DEVICE AND PROTOCOL DIVERSITY

fe.screen-sdm enables the connection of numerous devices from different manufacturers and different types by means of a simple and intuitive configuration, which can be carried out both locally and centrally.

Individual expansion and the integration of existing plant parts are both possible thanks to its modular design and use of standard interfaces and standard protocols (Aklan/AklanS, Modbus TCP, RFC1006, ISO 8073, printer, TCP/IP, XML protocol).

Printer systems
with parameterisable labels

Signal generator

Key switch

Card reader

I/O-modules

Screw-tightening system

Nut changer

PLCn

Scanner

Camera systems

AND IF IT IS STILL NOT QUITE RIGHT?

On request our employees work together with you to develop a concept for the ideal use of **fe.screen-sdm** in your production within the framework of an organisation workshop. We would be glad to pass on our experience and some tips to you during the workshop. The organisation workshop ensures you get exactly the services you need.

fe.screen-sdm offers numerous options and levels that allow the software to be adapted to meet your needs or for you yourself to adapt it to your needs:

SYSTEM:

- Extensive possibilities for parameterisation on the system and user level.
- Detailed rights management for releasing critical areas.

PRINTOUTS:

- The standard reports for labels supplied can be adapted simply and freely. A report generator is included in the scope of the delivery.

FURTHER DEVELOPMENT:

- Our development team is continuously expanding the range of functions and makes new features available at short notice.
- In addition to general further development, a certain amount of development capacity is always reserved for projects.

www.**fee**.de

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„**fe.screen-sdm** – YOUR SOLUTION
FOR FLEXIBLE, CONVENIENT AND
QUALITY-ASSURED PRODUCTION."

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