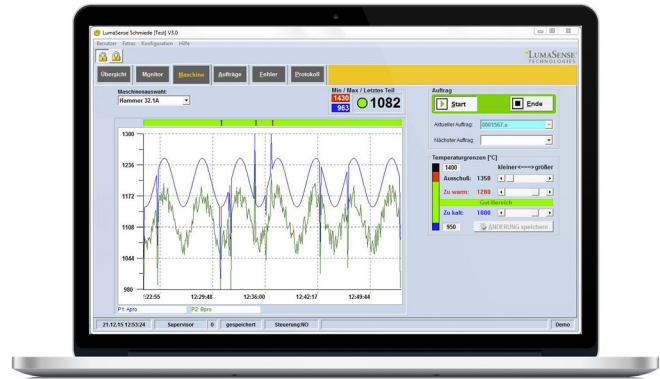


Complete recording and archiving of process temperatures, e.g. at forging, pouring or induction heating applications.

## TQCS - Temperature Quality Control System

- Central, order related and manipulation-safe temperature recording for every single work piece and simultaneously measure up to 30 machines
- Connects easily to existing machine controllers – manufacturer independent
- Modular system for easy upgrade or retrofit
- Enables reliable identification and discharge of scrap
- Archival data storage for 30 years or more
- Applicable on any Windows PC (Windows 7 or higher)
- Optional data exchange with existing ERP system
- Optional control of the pyrometer with online calibration check



The TQCS software is used in combination with digital or analog pyrometers for recording and documentation of temperatures for every single processed piece on up to 30 machines simultaneously.

Connect orders to temperature readings to ensure quality product. This easy-to-upgrade software uses central data processing (detached from the machine) and reduces possible manipulation.

The transparent display, documentation, and archiving of all relevant process temperatures guarantees a consistent product with proof of adherence to quality specifications. Meet both

demanding customer requirements as well as constantly growing norm standards.

The measured temperature data can also be used for process optimization. The automatic and reliable identification and discharging of scrap is only one example of possible options.

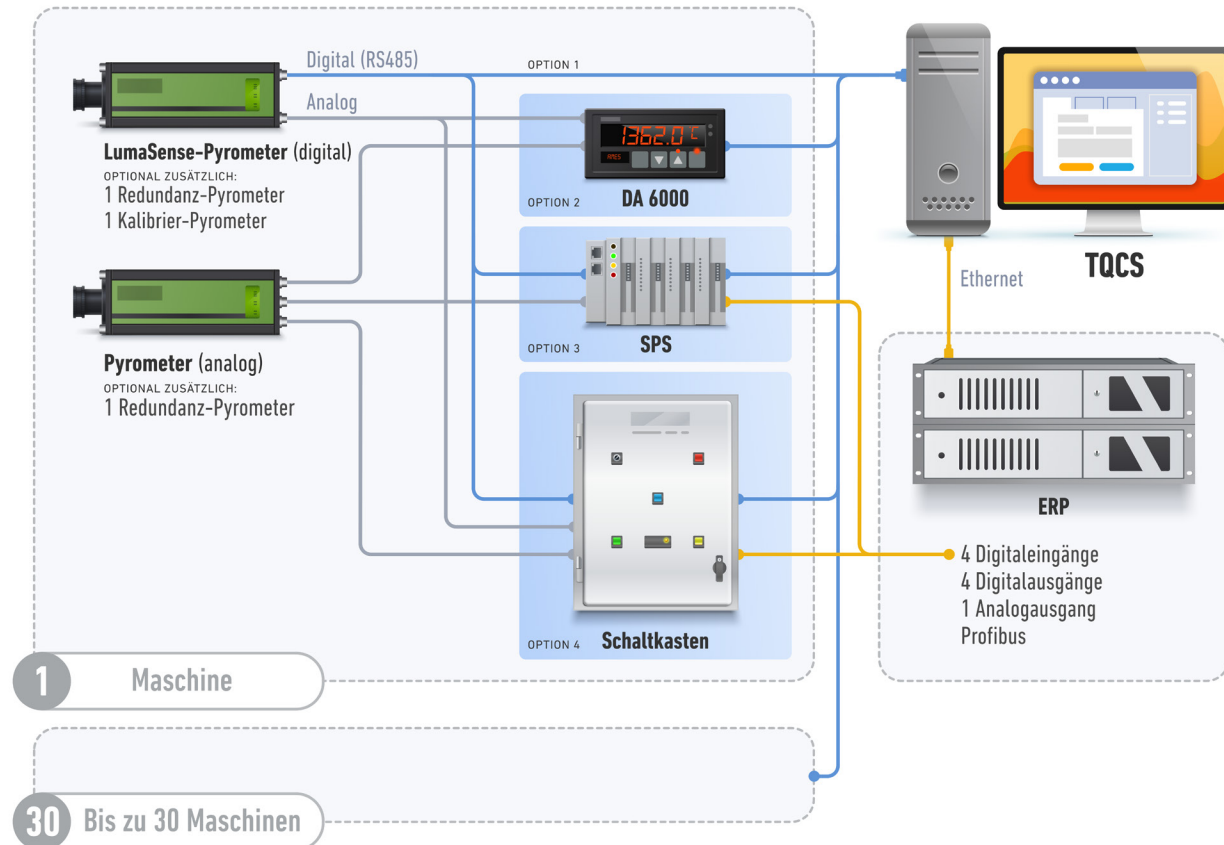
Connect the TQCS software easily to existing machine controls, e.g. via RS485 or Profibus. Optionally, a fully automatic data exchange via TCP/IP-LAN between the user's ERP software and their customers is possible.

The modular system makes possible an easy upgrade and retrofitting - even for the

majority of existing installations and independent of the machine manufacturer.

Further safety and reliability is e.g. given by the optional and regular control and documentation of the used pyrometers by making online calibration checks.

# Configuration Options



## OPTION 1 Measuring Data Transmission Only

For the transmission of temperature measuring data LumaSense pyrometers with digital interface (RS485) can be connected to a PC using an RS485 cable.

## OPTION 3 Measuring Data Transmission and Active Control of the Measured Work Pieces

Using the 0...20 mA or 4...20 mA output any pyrometer (including pyrometers from other manufacturers) can be connected to a special PLC that is integrated into the control cabinet of the machine. In doing so, not only the transmission of measuring data but also an active intervention into the system and switch control (gate) is feasible. This makes possible the selection / classification of every single workpiece based on its temperature (too cold – ideal – too warm).

## OPTION 2 Measuring Data Transmission Only

For the transmission of temperature measuring data any pyrometer (including pyrometers from other manufacturers) can be combined with a DA 6000 (RS485 version) via the 0...20 mA or 4...20 mA output and then connected to a PC using an RS485 cable.

## OPTION 4 Measuring Data Transmission and Active Control of the Measured Work Pieces

This option is identical to option 3 but in this case the PLC is mounted in a special control box. This box features 4 digital inputs, 4 digital outputs, 1 analog output and a Profibus interface. Moreover it provides additional operation and display options such as:

- Order Start / Stop
- Display of order status
- Fault indication
- Pilot light on/off
- Part counting function

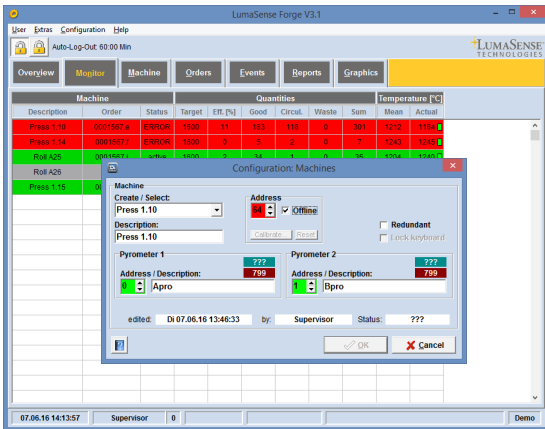
# Select Feature Overview

The documentation software is designed for temperature control and documentation of work pieces. In connection with an intelligent control module, the program can be used to monitor up to 30 machines.

## Machine Management

Define up to 30 machines with up to 2 pyrometers each. Assign orders and follow-up orders to each machine. Display of temperature progression as well as the maximum and minimum temperature per order.

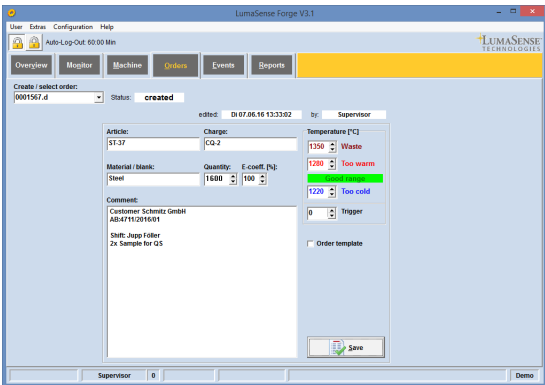
- Configuration of machine
- Display of the current machine configuration
- Display of configuration changes including user name and time stamp



## Order Management

Entry of up to 250 orders with order number, article, charge, material, quantity, emissivity or ratio coefficient, 3 temperature limits and comments. The maximum quantity per order is 65000. Possible creation of sample orders.

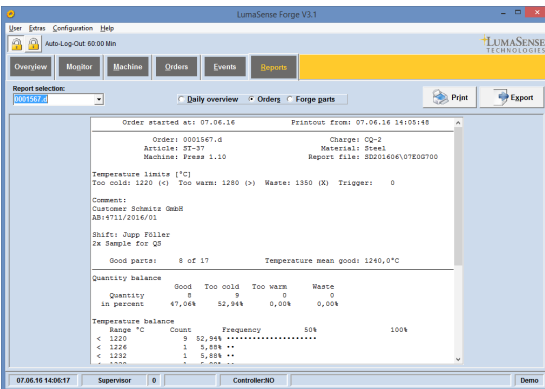
- Entry of individual material information
- Entry of order related thresholds (too cold, good, too warm, scrap), e.g. for a gate / switch control
- Optional entry of additional information, e.g. regarding customers or orders (will be shown in the reporting)



## Reporting

Print out or export of 3 different error reports as ASCII-file.

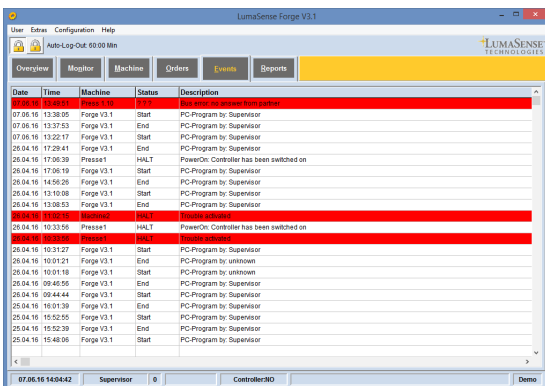
- **Daily overview:** All orders sorted by machine, quantities of "Good", "Cold" and "Scrap" parts per order as well as the day's total amount, optionally listed per shift
- **Order report:** Order data, error messages, pyrometer settings (only for digital pyrometers), histogram (10 ranges), temperature limits, subtotal and total quantities, average work piece temperature, maximum and minimum temperature, and waste part list.
- **Work pieces:** List of all work pieces with date, time, temperature and gate (switch control) position.



## Error Handling

Display of the last 100 error messages. Additionally storage of all relevant errors (damage, disturbance, sensor break, bus error) in order protocol.

- Fast malfunction diagnosis in case of cable breaks
- Transparency regarding potential error / malfunction sources



## Select Feature Overview (Continued)



### Archiving

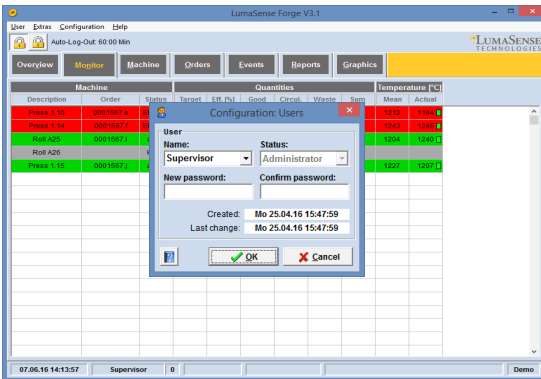
Monthly storage of all data in separate directories.  
Automatic generation of file names. Possible archiving of approximately 24 Million work pieces on a single CD-ROM

### User Management

Administration of up to 250 users with passwords and various levels of access: Administrator, Foreman, and Operator

### Optional ERP Integration

Optional automated data exchange with ERP software via TCP/IP network



## Reference Numbers

- 3 826 100 Software TQCS "Forge"
- 3 826 110 Control box TQCS (programmed)
- 3 826 090 PLC for TQCS, with analog extension module, programmed

**NOTE:** The TQCS Software is provided on a DVD and can be installed either in English or in German.



For international contact information, visit [advancedenergy.com](http://advancedenergy.com).

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