❑ OPTIONS

TYRE SLIP

Indication of values and limits of tyre slips

P1:	22 mm 02 ↔ 44
P2:	02 mm 01 ↔ 28
P3:	11 mm 04 ↔ 32

Special hardware modules insure the processing of kiln tyre slips and data transfer via RS485 to industrial PC. Diagnostics of measurement and kiln turning regime is included.

ATMOSPHERIC CONDITIONS COMPENSATION

The compensation is carried out with a pyrometer positioned close to the surface of the kiln. In the case of damping of temperature measurement (typically caused by fog) a correction is automatically recalculated and applied on the temperature map of the whole kiln shell.

COOLING FANS

Control of the cooling fans via an OPC server according to temperature monitoring in the area of the kiln shell in place of each fan and selected temperature its switch on/off.
Display of the cooling status in the chosen range of history.

❑ HARDWARE

Infrared sensor, electronic data processing, power supplies and air conditioning components are placed in a steel cabinet designed for industrial environments.
The electronics includes a communication link for data transfer with TEMOS server equipped with an Ethernet/optics converter. Standard optical interface uses ST type of connectors.
To adjust the infrared sensor to the axis of the kiln, the cabinet is equipped with 3-axis positioning bracket.
For orientation of the infrared sensor it is possible to apply a visual IP camera, which can be a part of the infrared sensor (connected via another Ethernet /optics converter).

❑ MAIN SYSTEM DATA

Supported infrared sensors:
- TMC8, TMC7, TMC6, TMC5 (including of integrated IP camera)
- THP7KLN, THP7, THP6, THP5
- Optionally, the system is able to integrate another type of infrared sensor according to customer requirements

Historical data:
- Choice of the storage period in minutes, the range from 1 to 30 minutes
- Total time of the saved data is solely defined by the size of the data storage

Optional modules (Options):
- Measurement of tyre slips
- Control of cooling fans
- Atmospheric condition compensation for measuring kiln surface temperature by pyrometer
- Measurement of shaded positions on the kiln by pyrometers
- Web access to measurement data (web visualization running in a web browser)
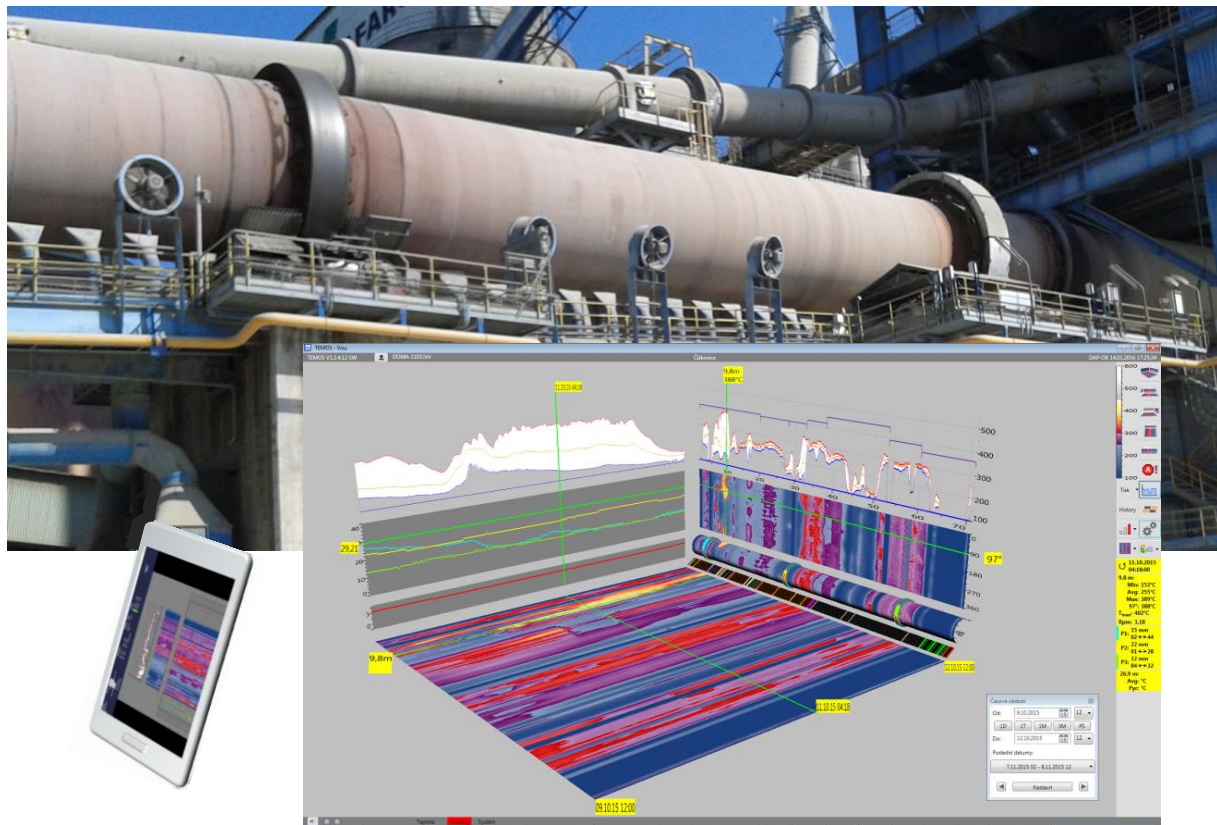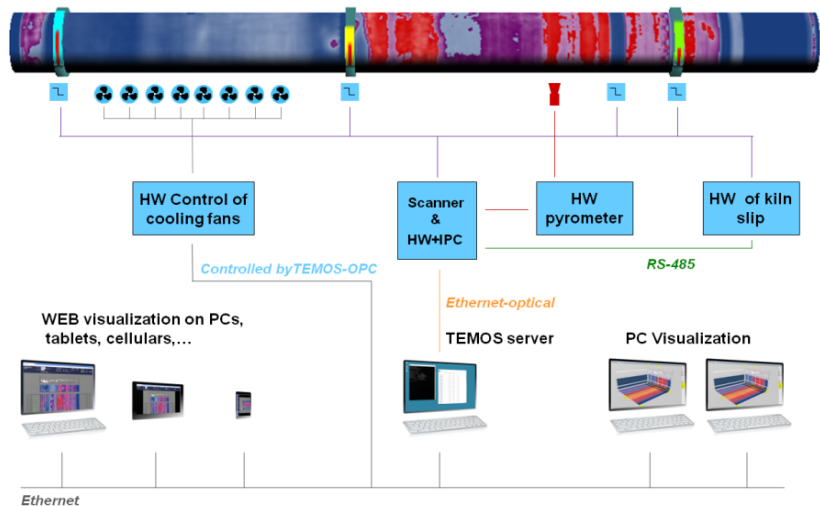
TEMOS

TEMPERATURE MONITORING OF CEMENT KILN SHELL

New system can be integrated into modern networks and mobile configurations using newly applied transparent 3D graphics and enhanced diagnostics of kiln status
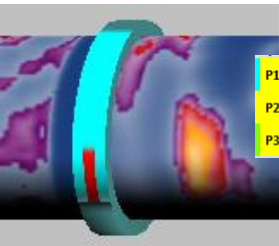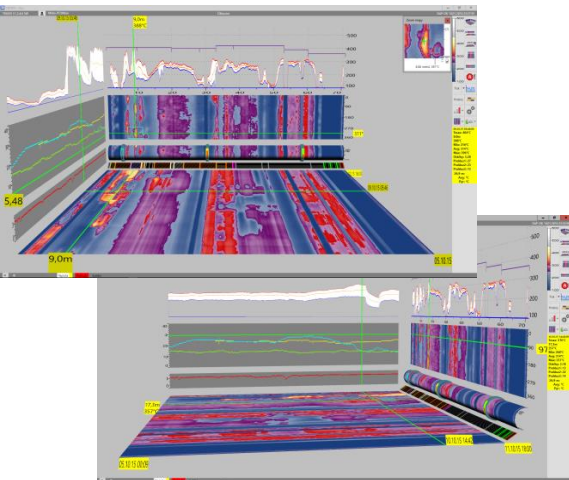
HW Control of cooling fans	Scanner & HW+IPC	HW pyrometer	HW of kiln slip

Controlled by TEMOS-OPC

Ethernet-optical

RS-485

WEB visualization on PCs, tablets, cellulars,…

TEMOS server

PC Visualization

Ethernet

Main features

- ❑ **Clear 3D data display**
- ❑ **OPC technology**
- ❑ **Web access anywhere**
- ❑ **Enhanced diagnostics**
- ❑ **Lining statistics**
- ❑ **Measurement of slip**
- ❑ **Control of cooling fans**
- ❑ **Compensation with pyrometer**

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AUT pro

❑ VISUALIZATION

3D IMAGING

- The original 3D imaging for different selected values and for selected time history
- The profile of max, avg and min temperatures of the whole kiln and display of current temperature limits
- Rotating 3D kiln object with actual kiln speed
- Graphics of linings according to their position
- Temperature map (of max, avg or min) for the entire length of the kiln in the selected time period
- Another optional graphic display of history:
  - Speed of kiln (in rpm)
  - The temperature around the kiln shell for the selected position
  - Slip values
  - The status of cooling fans
  - Data of the temperature compensation
- Zoom from selected objects
- One button orientation optional 3D display for easy viewing of selected graphs and images

TEMPERATURE HISTORY

The original view of temperature history (max, avg or min) for the selected time period and selected longitudinal position in the kiln allows to diagnose radial displacement of the conglomerated meal including the lining and determining the exact position and angle of displacement and time period

ZOOM

Zoom window of temperature maps and history of temperature profiles with the option:
- Changes of point position
- Resizing of windows on either side
- Choosing of the fixation time mode when the zoom is set up to monitor the tracking of its evolution

MENU

- Easy and rapid choice for display of various current and historical process data
- Displaying current and historical data for optional equipment such as tyre slips, temperature compensation or cooling fans
- Entry into the configuration & setup
- Displaying of all available data related to registered types of linings
- Displaying of the list of current and historical alarms and events
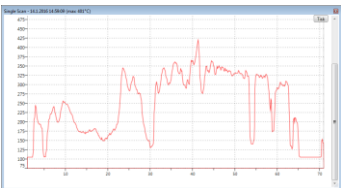- Print of graphic display

INFORMATION FIELD

Well-arranged information field indicates all important data:
- Last time update
- Indications of min, avg and max temperature values for the selected longitudinal position
- The value of the temperature at the cursor position
- Value of the highest temperature measured on the kiln surface
- Speed of kiln (in rpm)
- Values and limit ranges of tyre slips
- The positions and values of installed compensation pyrometer & IR sensor

Information field panel:
07.11.2015 11:51:00
41,8 m:
Min: 259°C
Avg: 270°C
Max: 284°C
°: °C
Tmax: 389°C
Rpm: 3,38
P1: 22 mm 02 ↔ 44
P2: 02 mm 01 ↔ 28
P3: 11 mm 04 ↔ 32
26,9 m:
Avg: °C
Pyr: °C

SINGLE SCAN

Chart of current temperature values for the entire length of the kiln displayed in cases of low or zero kiln speed or during the start-up of the kiln
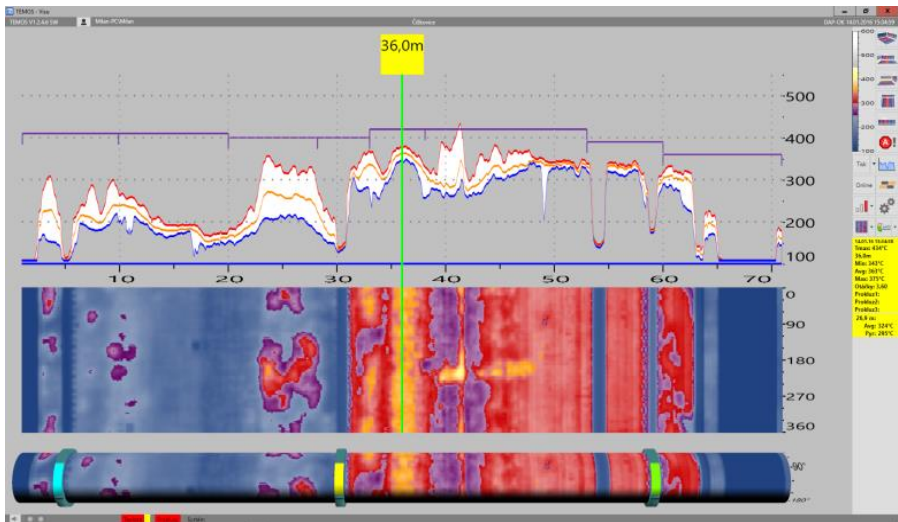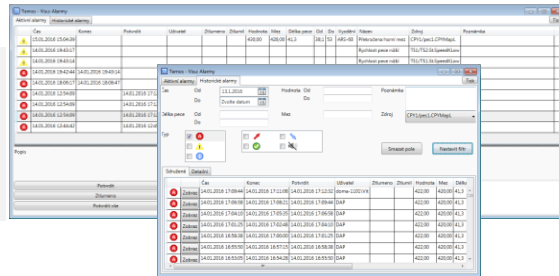
CONFIGURATION & SETUP

User configuration and setup provides many functions e.g.:
- Temperature limits - independent setting of upper and lower adjustable position on the oven, 3 levels of size limits, the ability to use hysteresis
- Slip limits - setting lower and upper limits
- Setting up a separate area or a point on the kiln shell for providing temperature by OPC server
- Setting the parameters of evaluation modules
- Diagnostic information
- Adjustable system of users and set permissions based on predefined groups of rights
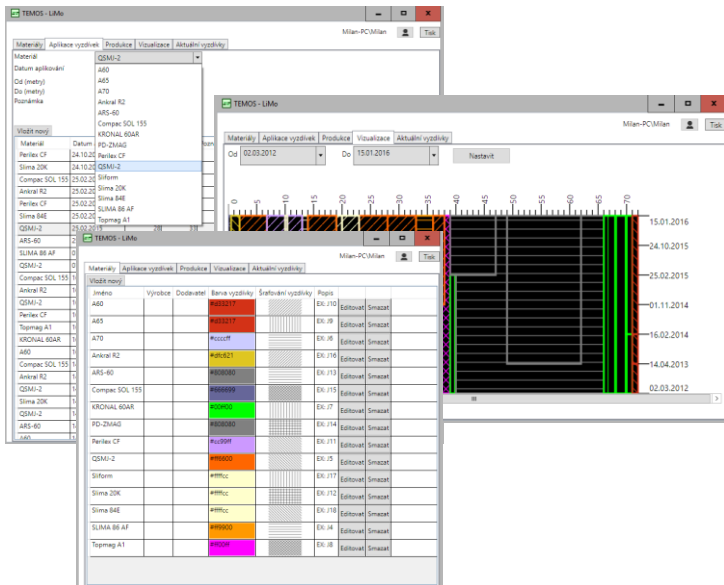
ALARMS & EVENTS

Sophisticated system of alarms and events with the identification of the user who made the confirmation of an alarm or muted warning alarm sound.
Unique ability to display, with a single button, stretch of temperature history based on date and time of selected historical event or alarm.

LARGE 2D SCREEN

The magnified image of the temperature profile including limits temperatures, thermal map of the kiln shells and a rotating 3D model of the actual temperature.

LINING HISTORY & INFORMATION

- Entering and editing various linings in desired areas
- Selection of new materials including graphics
- The possibility of monitoring the state of wear under production
- All linings database with names, time and location on the kiln and specific graphics for each type
- Graphical display of the distribution of individual linings on display throughout history for of max, avg or min temperatures for selected time interval