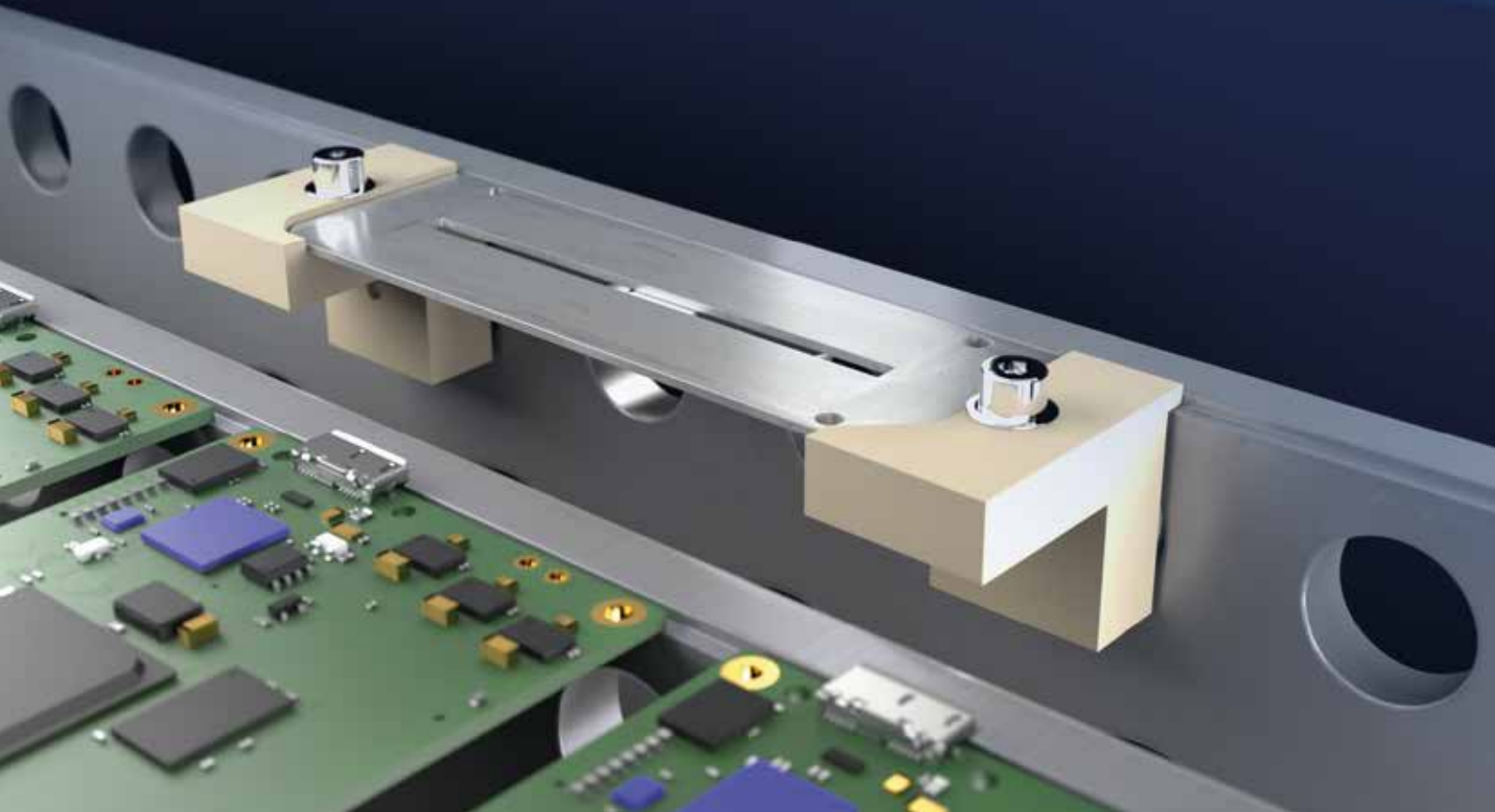


THERMAL SYSTEMS

WPS 2.4: Wireless Profiling System

A new level of quality for temperature recording



Wireless Profiling System
Condensation Soldering

WPS 2.4

Temperature monitoring at the highest level



With the Wireless Profiling System a further step towards Industry 4.0

Rules and standards determine our daily lives in many different fields. Speed limits ensure our safety, traffic lights direct traffic, and state-of-the-art light barriers in tunnels monitor vehicle heights and sound an alarm if the permitted value is exceeded. But how is it possible to quality check the flawless production of safety-related electronics?

Every electronic manufacturer aims to have a stable production process and precise monitoring of the manufacturing parameters, be they preset temperature and time windows, load or pressure control. Reliable temperature measurements are important for thermal processes such as soldering of electronic components to ensure high-quality, traceable results. Traceability is not just a requirement by OEMs in the automotive industry – medical technology producers and manufacturers in the aviation and space technology fields also place great demands on their suppliers when it comes to documenting their production processes.

For Rehm's reflow condensation soldering unit, the answer to this challenge is the Wireless Profiling System – WPS 2.4. The wireless temperature sensors, developed by pro-micron and tailored to the condensation soldering using the Condensox series from Rehm, enable a completely new level of reliable temperature monitoring quality.

Wireless temperature monitoring for the best reflow condensation soldering processes

The WPS 2.4 is a novel measurement systems for condensation soldering and can be used for continuous monitoring of the temperature profile. The measurement system is based on SAW (surface acoustic waves) technology. The connection between the sensor and the analysis unit is wireless. The WPS 2.4 consists of a sensor with antennas, a radio and analysis unit. The temperature sensor is fitted directly to the workpiece carrier of Rehm Condensox soldering systems. It works passively and needs no external power supply for its

measurements. A complete soldering profile can be determined, without annoying cables or batteries, and transmitted live to the unit's software without having to stop or affect the production run. The tool was specially adapted to the Condensox series with optimised antennas for the process chamber and cooling zone. Software-based documentation and analysis features by Rehm (Rehm Recorder) provide a new level of traceability.



The various WPS 2.4 components are internal and external antennas, a sensor with mount, and a radio and analysis units



- 100 % process monitoring thanks to complete data recording
- Simple, continuous quality assurance
- Permanent sensor functionality without batteries
- Transparent documentation of machine and process capabilities
- No annoying cables
- Simple to retrofit

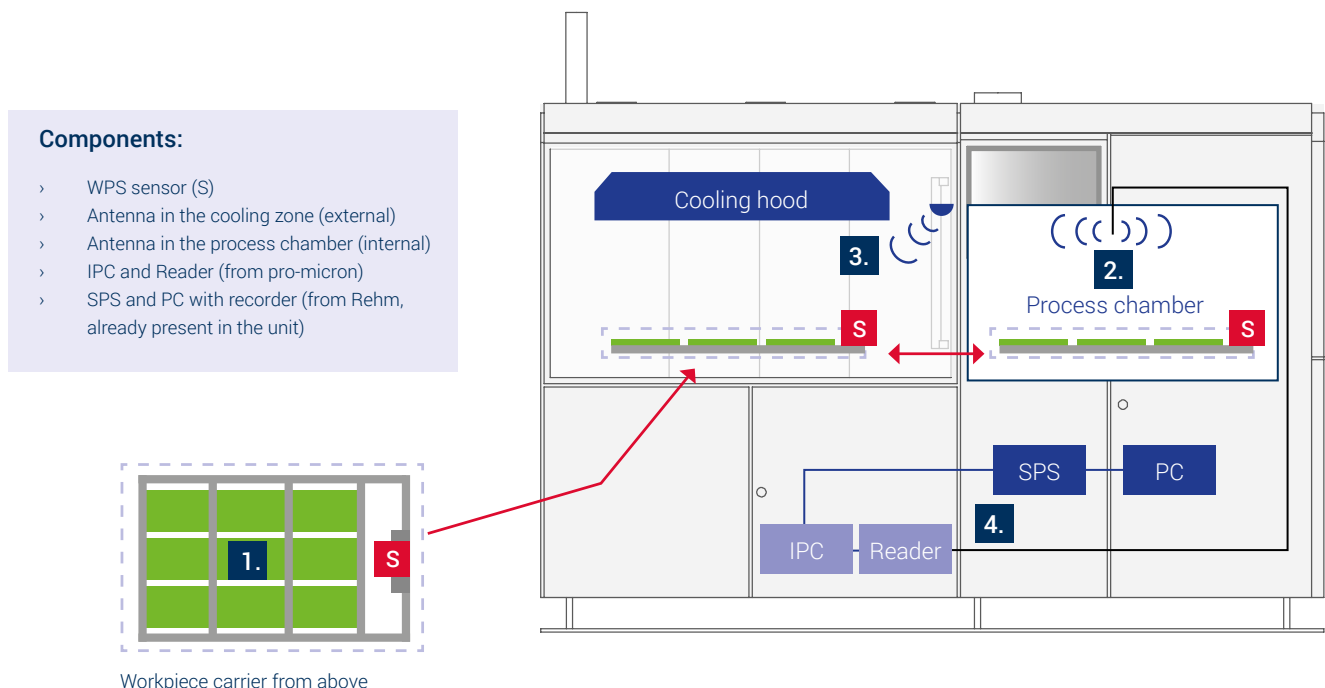
Complete process traceability

Application example for CondensoXS

A comprehensive soldering profile has to be created prior to the actual soldering process for each new product, where all process-relevant parameters such as temperature, time or pressure are determined. Thanks to the WPS 2.4, the temperature curve created through the profiling can be monitored and documented during the production in a complete, precise manner. The tool follows the entire soldering process, from the preheating and peak zone to the end of the cooling phase. The WPS 2.4 sensor is fitted directly to the workpiece carrier at the height of the components that require soldering. One WPS 2.4 antenna is fitted inside the CondensoXS unit process chamber, another is external in the cooling zone. The sensor continually measures the temperature during soldering and generates traceable data.



Workpiece carrier with temperature sensor in the loading position



1. Load

Fitting of the WPS sensor to the workpiece carrier and assembling with PCBs

2. Soldering process

Workpiece carrier moves into the process chamber; WPS sensor measures the temperature continuously during the entire soldering process

3. Cooling

WPS sensor continues to records the temperature until the cooling process is completely finished, even after the workpiece carrier has already left the process chamber

4. Documentation

Analysis of the temperature using pro-micron analysis unit; real-time display of the temperature curve on the unit monitor and saving/documenting of the values using Rehm Recorder

Technical Data

Overview of WPS 2.4



Measurement

Measurement rate:	5 Hz
Measurement accuracy:	± 1 K (at 150 – 250 °C) ± 2 K (at 20 – 300 °C)
Operating frequency:	2,4 GHz
Radio output:	< 10 mW
Temperature gradient:	up to 20 K/s
Calibration validity:	3000 cycles or one year

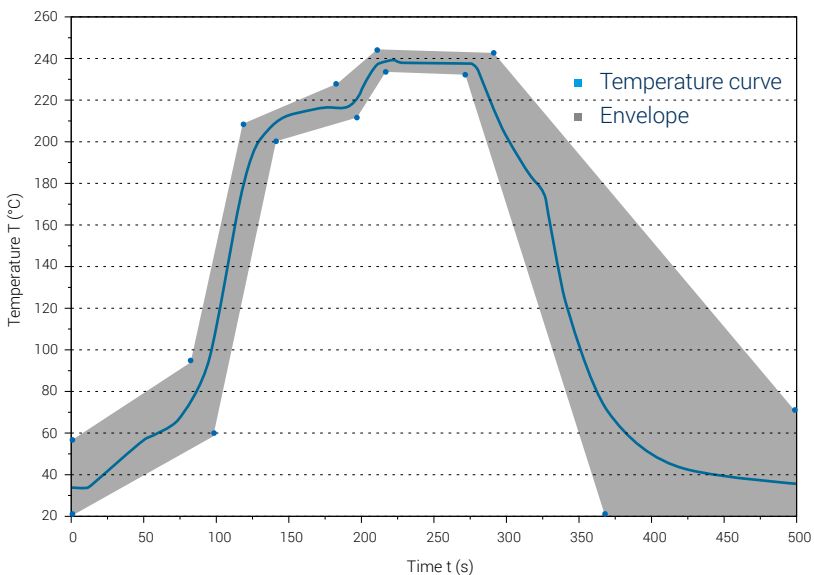
Sensor

Sensor measurements	
incl. antenna:	90 x 29 x 5 mm
Sensor weight:	< 20 g
Temperature measurement:	up to 300 °C
Pressure range:	1 – 1000 mbar

Error detection

The WPS 2.4 measurement signal is transmitted in real-time wirelessly and the temperature is displayed as a temperature curve on the unit's monitor. The unit operator can set an envelope as a permitted process window around this reference curve. The system issues a warning or immediately blocks the unit if the measurement result deviates. The temperature

profile is then saved with the date and timestamp using **Rehm Recorder** and is available for analysis or comparison measurements at a later date. The WPS 2.4 therefore enables the recognition and avoidance of production errors that may occur owing to possible deviations in temperature.



The unit operator can set an envelope as a tolerance range for the temperature recording using pre-defined points.



THERMAL SYSTEMS



Rehm Worldwide

As a leading manufacturer of innovative thermal system solutions we have customers on every continent. With our own locations in Europe, America and Asia as well as 26 agencies in 24 countries we are able to serve the international markets quickly and to offer outstanding on-site service – worldwide and round the clock!



Rehm Thermal Systems GmbH

Leinenstrasse 7
89143 Blaubeuren, Germany

T +49 73 44 - 96 06 0 | F +49 73 44 - 96 06 525
info@rehm-group.com | www.rehm-group.com