

Predict critical conditions before they occur
Reduce the cost for last mile deliveries of cooled products
Make passive cooling equally secure as active cooled delivery

An innovative temperature monitoring and last-mile disposition system for passive cooled delivery



The challenge

To track the temperature during transportation, usually data loggers are used. Today's data loggers track and document the temperature conditions in equal time intervals, such as once per minute. At the destination the data loggers need to be collected to read out the data. This adds to the handling costs of the transportation and has the significant disadvantage that invalid temperature conditions can be discovered only at the destination, when it is too late for remedial action.

What is TSENso?

TSENso is not just a wireless sensor to monitor the cargo temperature: It is a complete monitoring solution with smart predictions and early warnings, suited for all kinds of transportation in the range of -25°C to 70°C .

The sensor is small, lightweight ($< 50\text{ g}$), water resistant and has a battery lifetime of one year. It accompanies the cargo during the complete transportation. The sensor is continuously transmitting temperature values to the cloud via a mobile app. Our intelligent algorithm is then calculating the probable evolution of the cargo temperature and predicting the remaining time for the cargo to reach its limit temperature. In the case

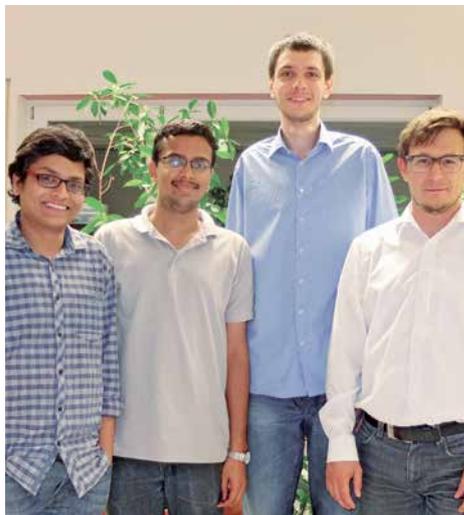
that the remaining time is less than the duration of the transportation, remedial actions are proposed to the driver in real time. In this way, critical conditions such as wrong packaging, leaking sealing or insufficient cooling are cleared before the temperature rises and damages the goods. Therefore with TSENso perishable products reach their target perfectly cooled on time.

Your benefits

- **easy to use:** sensor is immediately ready to use, just download the free app and start!
- **cost-effective:** no additional hardware required, no special vehicle with active cooling needed, cooled parcel can be treated as normal parcel
- **flexible:** measurement intervals, warning limits and documentation can be customized
- **control:** document and manage your data with the secure cloud

TSENso

The core team of TSENso consists of Dr. Matthias Brunner with a Ph.D. in statistical physics developing the prediction algorithms and Veronika Tomasu, heading marketing. Head of the development is Rahul Tomar with several years of experience in the development of geo based applications, supported by Emanuel Puscalau, a long-time INTEL expert for IoT solutions.



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