

Panasonic PAN802154HAR00 Communications Module solves Electronic Factory Problems

A brief explanation of a temperature monitoring system implemented in a production facility.

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Abstract

For high quality electronic manufacturing, one of the most important solder print variables which need to be considered before any print cycle is the solder paste viscosity. To minimize temperature induced viscosity changes, the paste should be stored and printed in a temperature controlled area. High temperature will speed up the evaporation of the solvents and thereby make the solder paste too dry. Smearing will occur if it is too low, and there will be skips if it is too high. A wireless system to monitor the temperature 24 hours a day in the solder paste storage area and printing process was needed. The monitoring system should be capable of covering the whole production line area, be robust, maintenance free, easy to install, provide real time alarms and store the data to make it available for future analysis. To meet those requirements the **PAN802154HAR00 module** was successfully deployed.

Solution

The **PAN802154HAR00** provides a reliable and cost effective hardware platform which makes implementation easy. The module is ready to be used with only a three terminal temperature sensor and two AA batteries enclosed in a plastic box. The **PAN802154HAR00** module also has an RS232 ready interface which facilitates communication to the computer.



1. One of the printing machines and the user interface for coordinator.

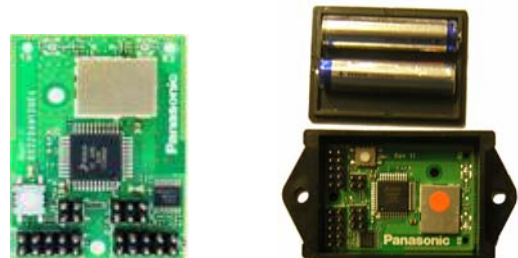
An IEEE 802.15.4 star network topology was created with focus on robustness and long battery life. The network consists of one coordinator and 20 end devices or nodes. The coordinator receives the sensor temperature data from all the nodes, and sends the message through RS232 to the computer. Each end device listens to the

coordinator, transmits the temperature sensor data and goes to sleep for 600 seconds, then the cycle is repeated.



2. Temperature sensor nodes in star network topology

The PAN802154HAR00 is a 2.4GHz, WPAN module that fully supports ZigBee, IEEE 802.15.4, or simple MAC. Some of the features that make it ideal for this kind of application are that it is designed to operate with two battery cells, It consumes 35mA in active mode and less than 4uA in sleep mode. It also includes a switch, LED, RS232 interface, standard connectors and is FCC and IC approved.



3. PAN802154 module and the module in the plastic box

Conclusion

After months of failure-free operation, the wireless temperature monitoring system using the **PAN802154HAR00** proved that it can work maintenance free in a tough industrial environment for long periods. It has contributed significantly in terms of labor savings; and improved Panasonic Electronic Devices product overall quality.

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