Industrial Research Institute for Automation and Measurements PIAP

IQRF in distributed measurement systems

IQRF Alliance Conference

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About us

Automatization of industrial processes

Mobile robotics

Measurement systems

3D printing

IQRF in PIAP

We needed solutions that are:

- low-cost,
- energy efficient,
- stable in terms of data transmission,
- easy to prototype,

for:

- control systems,
- laboratory devices monitoring.

IQRF in PIAP

That led as to the IQRF transceivers.

IQRF TR-52D

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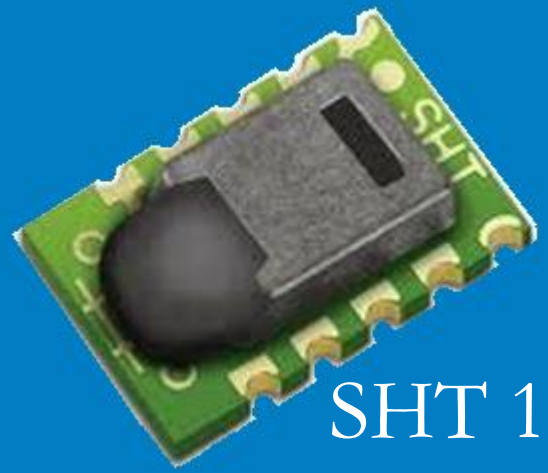
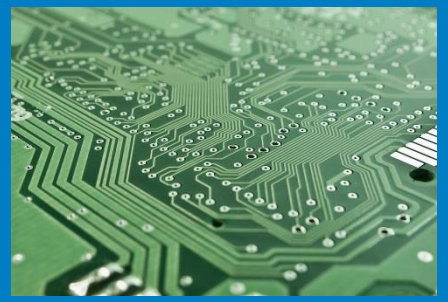


SHT 15

+

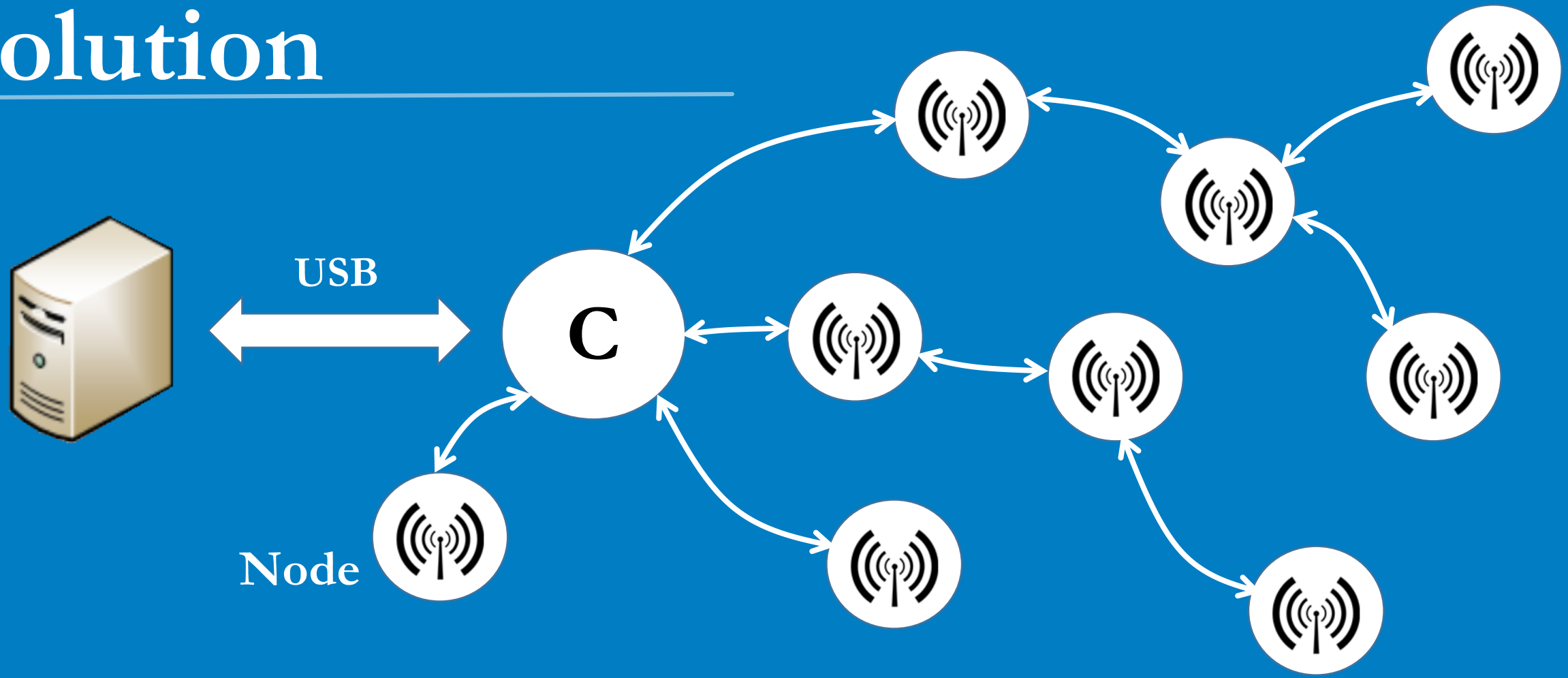


ELECTRONICS

=

Universal distributed temperature and humidity measurement system

Solution



C – coordinator

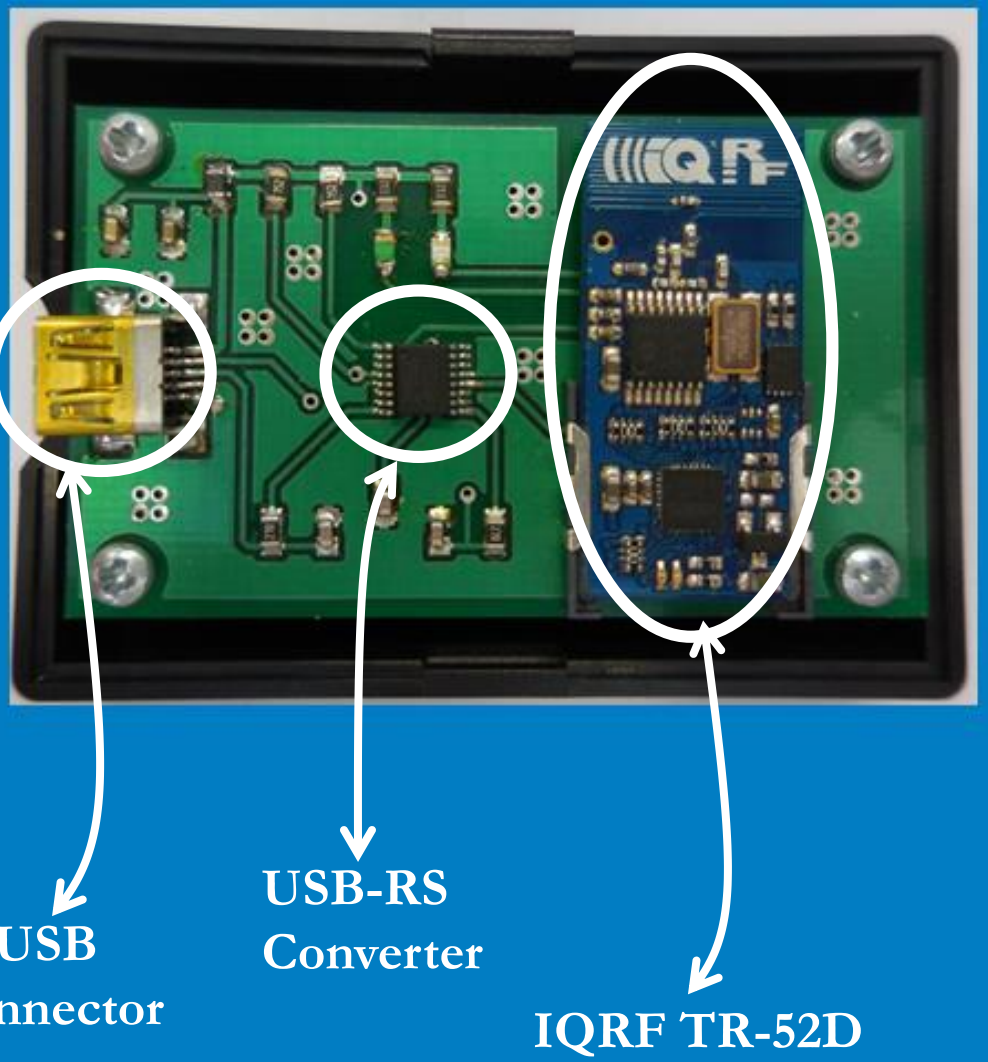
Nodes consists of IQRF transceiver and sensors

Solution

General information about solution:

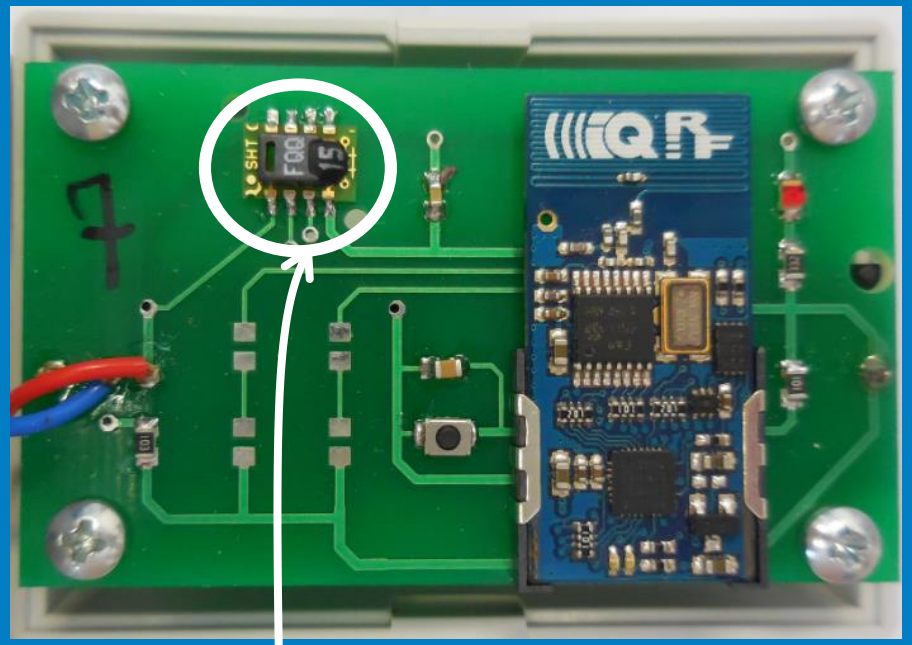
- Coordinator collects measurement data from distributed sensors.
- Coordinator forwards data to the PC, where data is stored.
- Coordinator is responsible for network management, e.g. bonding of new nodes, disconnection of selected nodes, identification of nodes, DISCOVERY initiation and others.
- SHT15 temperature and humidity sensors are supported, by PIC controllers mounted on IQRF transceivers.

Coordinator



- Responsible for network management,
- transmits requests,
- collects data,
- bonds nodes,
- identifies nodes.

Node



- Responsible for data collection,
- transmits data,
- responses to coordinator requests,
- sends status messages.

Application I

Monitoring of temperature and humidity in PIAP Measurement Devices Laboratory.

Main purpose was to enable remote monitoring of environmental conditions in specialized climatic chambers. This chambers are responsible, for example, for tests of mobile robots resistance to harsh conditions.

Application II

Data collection in C2-SENSE European project (The Emergency Interoperability Framework). This project concerns effective management of emergencies, crises and disasters.

Presented IQRF based system is one of the communication mediums (alongside e.g. GPRS, GSM), which forwards measurement data to the C2-SENSE IP-Gateway. This data is then stored in the system Enterprise Service Bus in O&M XML and is used in crisis management and monitoring.

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Application III

Electro-heating system for concrete.
New prototype of already existing system is planned, which will be based on IQRF solution.

Main objectives:

- remote control of heating devices,
- algorithm for optimal distribution of transceivers and heating devices,
- optimization of heating process.

Summary

IQRF transceiver modules were used to prototype highly functional distributed temperature and humidity measurement system, which:

- is low-cost,
- is energy-efficient,
- ensures stable data transmission,
- is easy to support/handle,
- ensures modular structure of system.

Thank you for your attention