

# PUBLICLY AVAILABLE SPECIFICATION

## PRE-STANDARD

**Industrial communication networks – Fieldbus specifications –  
WIA-PA communication network and communication profile**

IEC/PAS 62601:2009

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INDUSTRIAL COMMUNICATION NETWORKS –  
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# INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS – WIA-PA COMMUNICATION NETWORK AND COMMUNICATION PROFILE

## 1 Scope

This PAS specifies WIA-PA system architecture and communication protocol for process automation based on IEEE 802.15.4.

WIA-PA network is used for industrial monitoring, measurement and control applications.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61499 (all parts), *Function blocks*

IEC 61804 (all parts), *Function blocks (FB) for process control*

IEEE 802.15.4:2006, *IEEE Standard for Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 15.4: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Low Rate Wireless Personal Area Networks (LR-WPANs)*

## 3 Terms, definitions, abbreviated terms, acronyms, and conventions

### 3.1 Terms and definitions

For the purposes of this document the following terms and definitions apply.

#### 3.1.1

##### **active leaving**

process by which an online field device is allowed to leave network through applying to its routing device, or by which an online routing device is allowed to leave network through applying to the gateway

#### 3.1.2

##### **adaptive frequency diversity**

irregular change of transmit/receive frequency according to actual condition of channels for combating interference and fading

#### 3.1.3

##### **Aggregation**

merging several packets into one

#### 3.1.4

##### **Application Sub-layer**

a protocol sub layer which provides communication and management services for application layer



**3.1.5****Beacon**

a special frame broadcast by the routing device and gateway in the WIA-PA network. New routing device or end device join the WIA-PA network by listening to beacons first

**3.1.6****Cluster**

a logical group of devices which comprises a manager and many data sources

**3.1.7****Cluster Head**

a manager in a cluster

**3.1.8****Cluster Member**

a data source in a cluster

**3.1.9****communication resource**

channels and timeslots used to transport frame

**3.1.10****Configuration software**

software tools for configuring the network

**3.1.11****data link sub-layer**

upper layer of IEEE 802.15.4 MAC layer used to handle the aspects of network topology, link and communication resource in WIA-PA

**3.1.12****Disaggregation**

split-up the merged packet into original ones

**3.1.13****Field device**

the device which is connected to or controls the process and installed in the industrial field with sensor, actuators, etc

**3.1.14****frequency hopping**

change of transmit/receive frequency to combat interference and fading

**3.1.15****Gateway Device**

device connecting a WIA-PA network and other plant networks

**3.1.16****Handheld device**

a portable device with host application

**3.1.17****Host Computer**

users, maintenance/management person interact with a WIA-PA network through a host computer