WirelessHART: Communication Stack Opens New Possibilities

The Wireless Industrial Technology Konsortium (WiTECK) was founded in 2008. Among its members are ABB, Emerson, Endress+Hauser, Pepperl+Fuchs, Siemens and Softing. A key goal of the consortium has been to develop a WirelessHART compliant communication stack that member companies can implement free-of-charge into their field devices. Softing has now completed the development process and has made the stack available. Product Manager Thomas Hilz provides the details.

etz: Mr Hilz, Softing presented the newly developed WirelessHART stack at the beginning of April. Could you please briefly outline the reasons behind the development?

T. Hilz: Softing's [1] formula for success has always been the early identification and adoption of relevant market trends and technologies in industrial communication. We see wireless communication as a technology of the future in process automation, and we are confident that WirelessHART will prevail over the various wireless ideas and concepts. Against this background we started developing our own WirelessHART stack and wireless hardware already five years ago. Our next step then was to join WiTECK [2]. Softing has a special position within this consortium. On the one hand, we have developed the WirelessHART stack and now provide WiTECK with ongoing maintenance services to enhance and further develop the stack. On the other hand, Softing acts as a licensing agent, which gives us the exclusive right to commercially market the WiTECK Stack.

etz: What benefits do customers get from the stack and what is the main target group?

T. Hilz: Because of their functionality, the stacks designed for industrial use – and thus also for WirelessHART – are very complex and require extensive in-depth knowledge. At the same time, a standardized communication protocol provides little opportunity for creating unique selling points through its development. Therefore, it makes no sense for individual device manufacturers to gather this detailed know-how and develop their own custom protocol stacks. They are more interested in using a field-proven stack, which also saves them the effort to continually maintain the stack. Softing's stack meets these requirements. According to the application possibilities of the WirelessHART stack, Softing's solution is designed for manufacturers planning to implement WirelessHART field devices.

etz: Is the stack compatible with existing applications?

T. Hilz: Continued full interoperability with the installed base of existing WirelessHART platforms is of course ensured. The stack also allows the implementation of WirelessHART on a wide variety of hardware platforms. We have tested the stack with a multitude of different system components and field devices, and have thus fully achieved WiTECK's development goals – robustness, stability and interoperability.

etz: By the way, what about the ETSI EN 300328 V.1.8.1, which has recently caused a stir? Already in the terms of use, it defines the technical coexistence measures that are to be met by wireless technologies in the 2.4 GHz band. This means automatic functions that can discover other transmitters and must adapt the subsequent behavior of the radio transmission accordingly. That includes extensive Listen Before Talk, automatic channel
hopping and a minimum number of usable channels. Is your solution affected by these aspects and to what extent does it take them into account?

T. Hilz: This proposal basically concerns not only Softing’s products, but WirelessHART in general as well as others like ZigBee, for example. HCF members from Germany have formed an interest group under the umbrella of the ZVEI [4] in order to assess potential problems of the standard in connection with WirelessHART and to represent their interests. The way things stand at the moment, the interest group came to the conclusion that WirelessHART has no problems with the change of the standard because the protocol provides for sufficient measures – or that requirements are not relevant due to the classification of WirelessHART within the framework of ETSI EN 300328. In addition, the ZVEI interest group is considering an exception to the regulations for plants.

Thomas Hilz works as a product manager for Softing Industrial Automation GmbH in Haar, Germany. He is responsible for the development and international launch of WirelessHART and HART products. In addition, Thomas Hilz is an active member of various working groups of the fieldbus organizations

More Information
[3] ETSI EN 300328 Version1.8.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques
Statement by Pepperl+Fuchs: Geared up for future developments

We definitely approve of Softing's development of the new stack for the WiTECK members. After all, we at Pepperl+Fuchs (www.pepperl-fuchs.de) plan to make use of the stack in new WirelessHART products. As the stack is designed for easy portability, it will offer us advantages regarding the substitutability of hardware components, which resolves a single source situation. At the same time we, as a WiTECK member, have the core competence for WirelessHART in our own hands. This provides better possibilities for designing and advancing the technology. For it has always been a key objective of our company to be a technology leader and knowledge carrier. We are committed to innovation and we are – and have always been – at the leading edge in terms of infrastructure measures in process automation. We have proved this once again with DART, and we don't stop at WirelessHART.

![The WirelessHART gateway](image)

At the Achema, we will present a 3D simulation tool (Wireless Network Checker) for the simulation of WirelessHART networks and a new software application with extended diagnostic functions for the WirelessHART gateway. It is the nature of a WirelessHART connection to be invisible. Therefore, the network obviously cannot be simply planned and maintained just like fieldbus, interface or remote I/O installations. So we now make the WirelessHART network virtually visible for users. Before the installation, this is done by the 3D simulation. During commissioning and operation, a graphical network analysis is used. The connections are shown in different colors according to quality and quantity. This way, users can see at a glance what WirelessHART connections exist and what quality they have. That is new and unique.

Dipl.-Wirt.-Ing. Irene Ruf is Product Marketing Manager Remote Systems at Pepperl+Fuchs GmbH
Statement by Siemens: A second source is important

In September 2007, WirelessHART was released with HART V7 and has been internationally standardized as IEC 62591 since April 2010. Thanks to support from almost all manufacturers it has gained widespread acceptance and use in the process industry. Our experiences are confirmed by surveys according to which WirelessHART is assumed to account for 80% of wireless communication at the field level in the process industry. In addition to WirelessHART, two other comparable wireless communication technologies are currently being introduced to the market. Our customers explicitly demand a single standard. Siemens supports this request.

In terms of technology and market demands, Siemens (www.siemens.com/automation) has actively contributed its know-how to the HART Communication Foundation from the very beginning, and since 2009 has expanded its portfolio to offer a variety of WirelessHART devices and components:

The different solutions available include the Sitrans P280 pressure transmitter and the Sitrans TF280 (photo) temperature transmitter as well as the Sitrans AW200 WirelessHART adapter and the IE/WSN-PA Link WirelessHART gateway. The two Sitrans transmitters and the adapter are battery-powered and have an integrated radio module. The transmitters can be operated via three push buttons and a graphic display, and can be integrated into the network. Though running on battery, the devices feature a backlit display to facilitate operating the devices and reading the measured values even in poor light conditions. This allows flexible use.

![WirelessHART Temperature Transmitter Sitrans TF280](image)

The WirelessHART temperature transmitter Sitrans TF280 provides all measured process values as well as diagnostic information, parameters and functions via radio. The device is designed for low power consumption.

Different function block libraries and faceplates are available for easy integration into the automation solution with Simatic PCS 7 and Simatic S7.

A key factor in the success of WirelessHART is that the base technology is offered by more than one manufacturer. In the case of WirelessHART this applies, in particular, to the radio module and the communication stack. In order to provide for a second source in this respect, the WiTECK consortium has been founded in which Siemens is also active. We greatly welcome the fact that the communication stack developed in the consortium is now available.
for the first time as a component from Softing, and we will take the stack into account in future product developments.

Dr. Jürgen Spitzer is Head of Process Instrumentation at the Siemens Industry Automation Division