



Adding apps into the field (Part 2)

Application software for process instrumentation

What comes to mind when you hear the word “app”? WhatsApp? TikTok? Linked-in? Broadening our scope from these examples that deliver entertainment and connection, what can apps do for users in the process industries? Quite simply, an app is an application software that generates benefits for the user on different platforms - on your mobile device, in the cloud or on a server, under the desk! Let's take a look at three apps for process instrumentation, exploring their different approaches as well as their specific advantages.

With the popularity of smartphones, the word “app” has become firmly established in the German-speaking world to mean specific user programs. With the help of apps, we can conduct banking transactions, communicate with each other in a variety of ways, navigate or play games – all while on the move. But did you know that “app” is the abbreviation for application software? Every day, millions of people access the app stores for the major mobile operating systems Android and iOS, where the latest little helpers are available for download. What's more, mobile devices are not only used in the private sphere, but increasingly also in workplaces like yours. Process industries are taking advantage of the at-your-fingertips data that apps deliver safely and conveniently - and even include features like ATEX certification.

Convenient parameterization of field devices via smartphone

In a process facility, sensors are ideally located for a measurement task - but this often results in their placement in hard-to-reach places: in deep shafts, hidden in a tangle

of pipelines or exposed on high tanks. Apps to the rescue: commissioning and parameterization of such field devices, such as those from the Sitrans LR100 device family, become exceptionally convenient with the Sitrans mobile IQ app.

To commission and set up such a compact 80 GHz radar transmitter, the user downloads the free app from one of the major stores to their mobile device and accesses the transmitter via secure Bluetooth connection. When the app is opened, all supported field devices in the environment are automatically detected and displayed. Once the user enters the device PIN, they are granted access to individual transmitters. As soon as the device is connected, identification information is displayed, and users can now perform both a guided quick commissioning and a detailed setup.

Via the display of the tablet or smartphone, the technician can safely commission a Sitrans LR100 within a few minutes by entering several parameters such as operating mode,

material, and application type. The app allows convenient viewing of measured values as well as echo profiles.

Even devices that are equipped with a service interface but no Bluetooth interface can be retrofitted with a Bluetooth adapter; examples are the current Sitrans Probe LU240 ultrasonic level transmitter or the Sipart PS100 positioner. With mobile IQ and compatible Siemens field devices, commissioning and ongoing maintenance become much more efficient and convenient.

Data connectivity to the most distant corners

Process plants are never-ending sources of data. The comprehensive Siemens portfolio for flow, level, pressure, temperature or weighing technology - which has long served countless plants across various industries - makes a significant contribution to the availability of data.

In the following, however, we want to leave the completed, automated plants and instead look at measurement tasks that today are either not recorded at all or only with a great deal of manual effort. In the context of digitalization, data connectivity is now coming to the fore, and here Sitrans IQ covers two levels above the pure field device offering: on the one hand, the connectivity layer, or the extended communi-

cation options of the field devices themselves; and, on the other hand, the level of field device-specific apps, whether as an on-premises variant or in the cloud.

Inventory management in the cloud

At least certain parts of most apps installed on mobile devices or PC screens actually run in the cloud. This has enormous advantages: cost-efficient and secure operation, fast response times, and availability of measured values - around the clock and around the globe.

Sitrans store IQ follows this approach: this tool for intelligent inventory monitoring and management uses the Siemens IoT platform MindSphere. The cloud-based app is open for almost any measurement technology and allows for timely mapping of fill levels of tank farms or silos as well as stock levels in shelves - wherever there is no integration into an automation system, but measured values are still important. Because with the help of the values and Sitrans store IQ, users can optimize inventories and logistics processes. And production losses due to material shortages, costly storage of excess capacity or unnecessary logistics services are now a thing of the past!

The application is based on what are called MindConnect elements, i.e., edge hardware that securely transfers measured

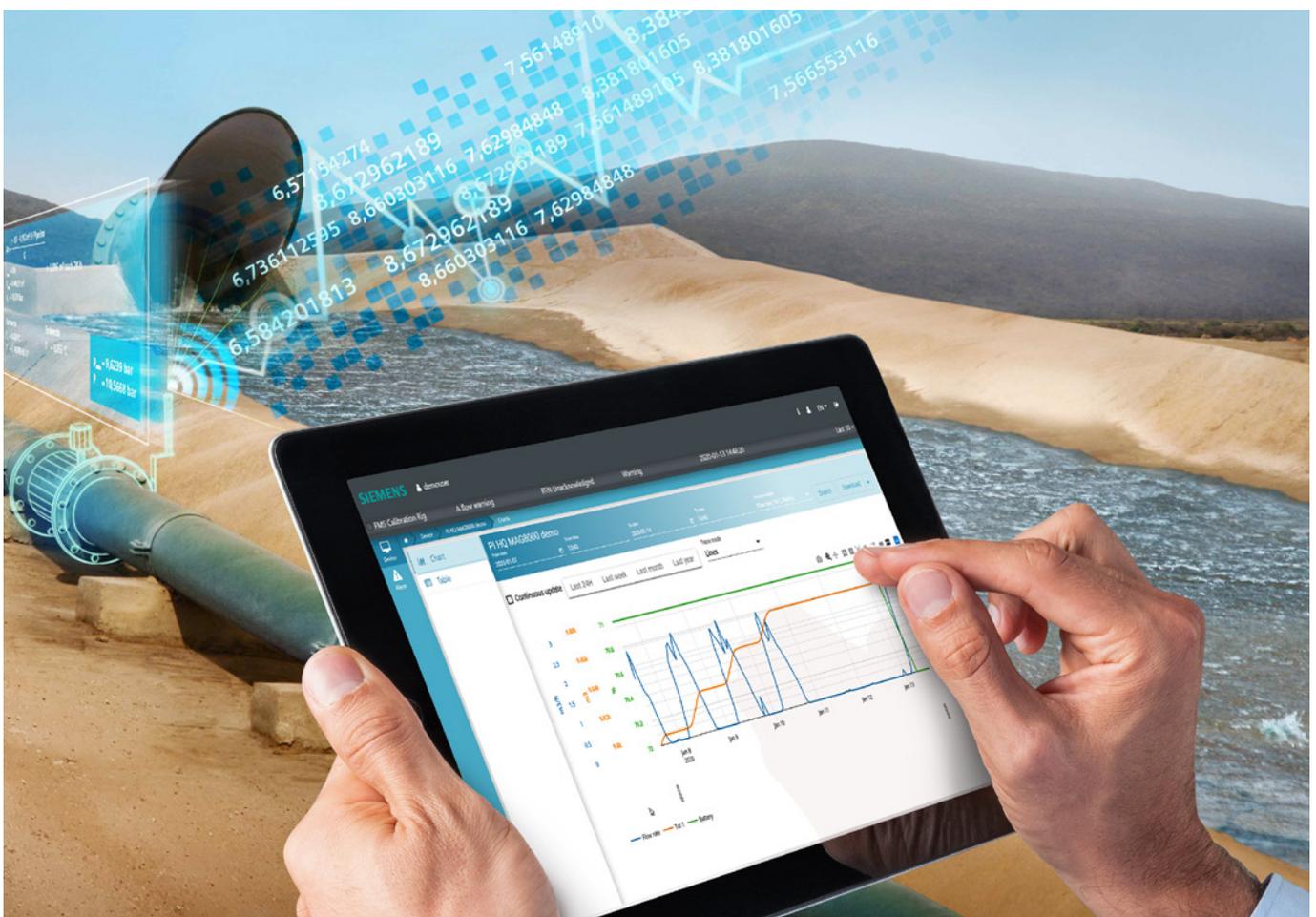


Figure 1: Intelligent apps visualize events or measurement data in near real time.



Figure 2: With so-called cloud connectors, measurement data comes securely from the field to the app, where it can be used for analysis.

values from the field to MindSphere, the leading industrial IoT-as-a-Service solution from Siemens. Well known connectivity hardware includes the Sitrans CC240 cloud connector or tele-control units from the Simatic RTU3000C family.

Once the data is stored in the cloud, Sitrans store IQ enables visualization. Users can calculate daily or summed values, display trends, and set up limit values - all based on values that are permanently updated. The user-configurable threshold values can then be used to issue alerts via email or SMS. Different basic subscriptions are based on the number of users or the number of assets monitored, allowing very cost-effective use and perfect scalability by the user.

On-premises process data collection from remote sensors

But apps are not limited to mobile devices or the cloud, of course - they can also be run on locally operated industrial PCs or servers, even on virtual machines. One example of such an on-premises solution is Sitrans serve IQ. Widely distributed measuring points can be found in numerous applications, such as battery-powered flow measurements in water management. Typical users are public utilities, infrastructure operators (e.g. ports and airports), but also manufacturing industries that report water withdrawals or intakes to environmental authorities.

Process data from these widely distributed or remote sensors are sent via cellular standards like 3G and 4G. Examples include the Sitrans FM MAG 8000 flow meter with a communication module already integrated, or the Simatic RTU3000C family of remote terminal units (RTUs). They send the data of any connected transmitters in the form of e-mails with file attachments.

Sitrans serve IQ receives this data, saves it locally and visualizes it. The app also supports the download of data series and it displays all sensors in a clear and geographically exact position. Other functionalities of Sitrans serve IQ include continuous monitoring of measured values within configurable upper and lower limits. User management allows the recorded remote sensors to be grouped and assigned to users according to their responsibilities. In this way, for example, an operator can transmit specific data to different customers in a targeted manner. Particularly convenient is the possible integration into existing SCADA systems via the IEC 60870-5-104 telecontrol protocol - this makes formerly isolated measured values available reliably and automatically.

Innovative apps combine with process instrumentation to form a powerful tool generating added value in industries across the globe. As a total system provider, Siemens delivers comprehensive solutions for its customers as a reliable partner for measurement tasks and for intelligent digitalization strategies.

 **Dipl.-Ing. Dipl.-Wirtsch.-Ing.
Jan Kiehne**
Siemens AG
76187 Karlsruhe, Germany
Jan.kiehne@siemens.com

 **Dipl.-Ing. Konstantin Selnack**
Siemens AG
76187 Karlsruhe, Germany
konstantin.selnack@siemens.com