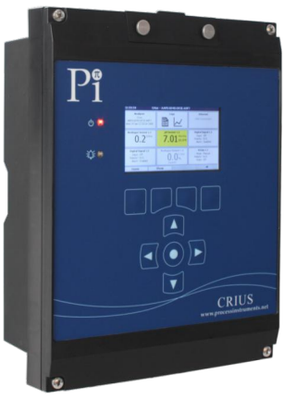
Technical Note 45

Water 4.0, Industry 4.0, IoT, SMART and DIGITAL

Introduction

The phrases 'Water 4.0', 'Industry 4.0', 'Internet of Things' and 'SMART and DIGITAL' are now commonly heard but what do they mean and where does Pi fit in?

Pi's CRIUS® controller is set up for all of these things. Pi already has SMART and DIGITAL installations all over the world and works as partners to many multinational organizations to provide remote access, remote comms and SMART technology.



CRIUS® Controller

What is Industry 4.0 (and Water 4.0 and the Internet of Things and SMART and DIGITAL technology)?

Simply put the concept is that we are currently living through the 4th Industrial Revolution.

The first was mechanization, (what we currently think of as the Industrial Revolution), so steam engines, spinning jennies, railways, canals, and factories in the 1800's.

The second was the age of mass productions so; electricity, the production line, etc., largely in the first half of the 20th century.

The third was computers and automation, in the latter part of the 20th century, and the fourth?

The fourth (Industry 4.0) is about 'SMART' factories. (The original use of the expression Industry 4.0 was by a group of advisors to the German government who presented their advice in 2012). Industry 4.0 is about making factories as SMART as they can be. That is having assets (machines, people, robots, AI, cyber technology etc.) all communicating with each other.

The main principles put forward were based on;

- **Interoperability -** everythng should be able to talk to everything else.
- **Information Transparency -** the physical world should be able to be recreated virtually to allow for testing and modelling.
- **Technical Assistance -** information should be presented in a way that supports people to make good and fast decisions.
- **Decentralization -** after decades of centralization to things like DCS systems and SCADA systems, the future is to enable as many decisions as possible to be made locally by whatever intelligence (human or machine) is available.

What is Water 4.0 and SMART and DIGITAL?

Water 4.0 is simply how this technology and philosophy will be implemented/will affect the water industry. There are some clear outcomes from the above... more sensors... more modelling... 'SMARTER' instruments, controllers, pumps etc..

SMART and DIGITAL.

The terms aren't quite as well defined as others. Generally it is accepted that SMART is the increasing sophistication of equipment to make decentralized decisions. For example, in 1990 a chlorine analyzer measured chlorine in water, gave out a

4-20mA output proportional to the chlorine and had a couple of relays for alarms.

Now the CRIUS® HaloSense (fully Water 4.0 developed) can provide the 4-20mA output and the relays, but also has multiple digital comms options (INTEROPERABILITY), has space for up to 16 sensors (INFORMATION TRANSPARENCY), has wireless and wired internet access (TECHNICAL ASSISTANCE) and full PID capability with remote setpoint, i.e. another deivce can set the setpoint (DECENTRALIZATION). So SMART technology is the technology that allows for the implementation of Industry 4.0 or Water 4.0. DIGITAL tends to refer to the comms capability.

HaloSense Chlorine Sensor

What is the Internet of Things or IoT?

When the previous Industrial Revolutions happened, the technology and concepts spilled over into the consumer world from the business/manufacturing world. With Industry 4.0 it is beginning to be the other way around with consumer demand for the internet, and mobile phone technology, driving the technology. If we assume that in this Industrial Revolution the same thing will happen, then the Internet of Things refers to all devices we use all the time talking to each other and making their own decisions.

Imagine your mobile phone waking you at 6am and telling your kettle that turns itself on at 6.20am, which tells your car that starts itself and defrosts the windscreen at 6.30am etc., etc..

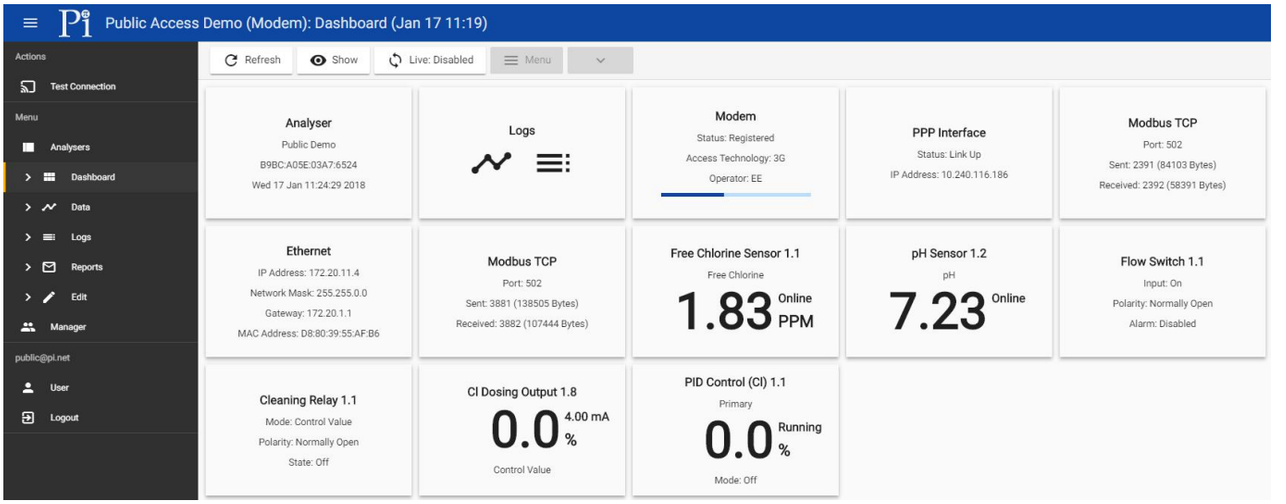
Not convinced that we are in a new Industrial Revolution?

Consider this..... perhaps Industrial Revolutions are only identifiable in hindsight?

And what does it matter? Well from Process Instruments' point of view, it doesn't. As long as our products are leading the way in providing our customers with what they need to enable their own Industry 4.0.

Internet of Things

If you would like to discuss how the CRIUS® can help you with your increasing automation, measurement and information then please don't hesitate to get in touch.



Remote Access Demo - available at www.processinstruments.net/products/remote-access-demonstration/