

# Can you Hear? Can you See? Can you Imagine?

YOUR PLANT IS TALKING, AND TALKING INCESSANTLY ABOUT EVERYTHING.  
DO YOU HEAR WHAT IT IS SAYING?



zenon continues to develop, engulfing new technologies and embracing each new industrial era without hesitation. However, future success is built upon the strong pillars of history. One of those fundamental pillars is the zenon Historian. In the Life Science industries, recording process information is fundamental to any production activity; data acquisition and a historian are therefore a primary focus. In this article, I would like to turn the tables on the traditional automation hierarchy and give the zenon Historian prime importance (see *figure 1*), and position the other zenon features as its supporting modules.

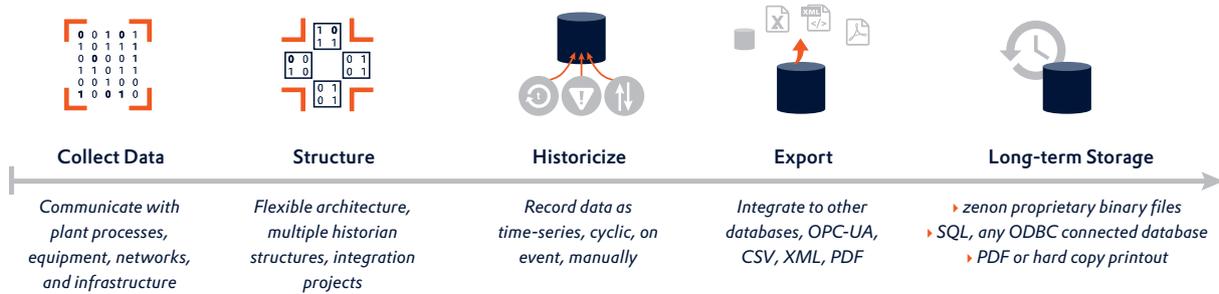


Figure 1: Consistent integration from data collection to storage.

## ZENON HISTORIAN FRONT AND CENTER

The zenon Historian is a process data highway. Data can enter the system at any point within the infrastructure from its connected PLC processes, IT-layer systems such as MES or ERP, or mid-level HMI & SCADA systems. Data can also leave the highway at any point, at the equipment level, production process level, or globally across plants.

Starting at the zenon Historian itself, flexibility and the ability to adapt to individual processes are key qualities. Historians can be placed at the top of the IT structure, capturing the entire plant's activity. Or historians can be placed at the equipment or production line level, to have stand-alone functionality. If desired, these smaller historians can then be tied into larger process historians and multi-site global historian systems.

With native communication drivers, including standard industry protocols, zenon Historian can connect with any industrial system. This powerful connectivity brings together different systems from different process equipment, including systems such as MES, ERP, and other databases. Data can enter and exit the zenon Historian freely from the different layers and systems in a bi-directional sense. No existing infrastructure needs to be changed to connect with it – native drivers connect without modification to the third party system. The big plus here is that validated processes remain unaffected.

The diagram above displays how the zenon platform connects to the different processes that collate data. The raw data entering the system is then structured with meta-data so archives can be defined with independent processes of variable scope and independent data logging.

Finally, data can be stored long-term, with the possibility of exporting it in different forms to suit the desired outcome.

## FLEXIBLY COLLECT DATA

zenon is independent and flexible; connecting natively with different industrial systems, PLCs, devices, industrial networks, databases, and other IT systems. This is a powerful advantage in any industry, but its benefit is magnified in the pharmaceutical sector because connecting natively minimizes additions or changes to validated systems – leaving qualified processes untouched. This environment brings multiple systems together while reducing engineering design effort and risk to the process, and resulting in significant positive effects on quality and the level of validation a historian system needs.

The ergonomics of zenon benefit the final historian solution, allowing manual data to be entered easily alongside automated data. Using a desktop PC or workstation, mobile tablet, or smartphone, manual tasks can be requested. User events, results, and comments are then recorded in the same historian. This data has a time stamp and meta-data, which is archived like any other element of process data. Wider systems such as building management and energy systems can also be included in the scope of an application. Any data from a sensor, device, industrial network, or manual entry can be archived in a site-wide, global, or cloud-based zenon Historian.

## VISUALIZE EVEN COMPLEX INFORMATION INTUITIVELY

Now the data is in the system, there is no need to keep it hidden away. We can now touch on powerful knowledge

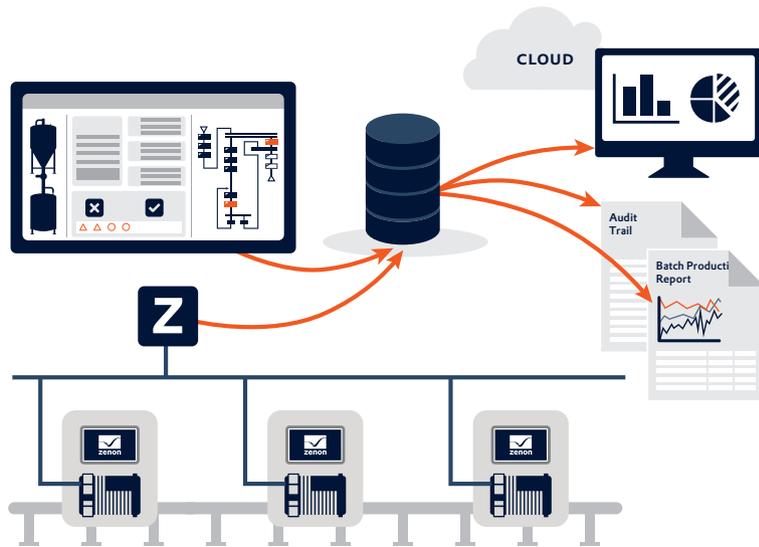


Figure 2: Flexible and intuitive visualization enables accurate and quick decision making.

generated from within the production environment; visualizing this knowledge with plant overview dashboards and detailed process screens with, for example, alarm and event information. Process variables can be displayed in trends, KPIs are generated from live or historical production runs, and equipment GANTT charts provide a detailed view of active processes and production losses. Valuable production information is close at hand. You are able to deal with complexity and abnormality, and make the right decision quickly.

### AGILE STRUCTURES ENHANCE EFFICIENCY

Reading your process data and storing it requires structure. This structure needs to be agile in order to be matched to the process, then the outcome of the data is focused and a true representation of real-world events.

“Time-series data” creates a very accurate and storage-efficient way to archive processes. Reading data and only storing this data “On change” records events spontaneously – therefore you can be certain no event is missed. “Cyclic” data records processes at a certain frequency, e.g. every minute the variables will be recorded, thus recording a predictable snapshot of the process. “Event triggered” allows zenon Historian to synchronize with external systems or process events.

All data coming into zenon is structured before reaching the historian; adding richer knowledge and grouping to reflect the actual processes being recorded. Variables can be defined in an ISA 95 Equipment Modelling structure, and alarms can be defined by group, class, or area. The historian archives can be placed where the data is most relevant for the processes. For example, a traditional top-heavy structure can be applied, with a central historian system at the top of the IT tree. Alternatively, the archives can be generated and reside where the data is generated, directly at the individual piece of equipment or production line.

Historians and archives can overlap each other. For example, when process data is being logged as time-series, certain critical process values within this data can additionally be being logged cyclically at a defined frequency. Therefore, no data is lost and all representations of the data can be displayed. In a distributed

### QUICK FACTS:

#### COLLECT DATA

- Native communication drivers
- Standard interfaces
- OPC-DA, OPC-UA, Modbus, CAN, BACnet, IEC 60870, IEC 61850, IEC 61400, IEC 61499, IEC 62056, SQL, DNP3, VDMA, M-Bus, Profibus, Profinet
- cloud, Azure driver
- Manual data input, tablet, workstation
- Process controllers, industrial networks
- Building management, energy and infrastructure

#### VISUALIZE

- Process screens, dashboards
- Predictive maintenance
- Alarm & event notification
- KPI, trends, GANTT
- Workstation, tablet, mobile, HTML5

#### HISTORICIZE

- Time-series data; store data on change
- Event trigger; synchronize data write with process event(s)
- Cyclical data; fixed-frequency data acquisition

#### STRUCTURE

- Flexible archive scope and location, HMI, SCADA, top-layer production IT.
- Equipment modelling: ISA 95, ISA 88

#### EXPORT

- SQL, any ODBC-connected database
- OPC-UA, standard industrial interface
- CSV, human readable files, Excel compatible
- XML, structured common file format

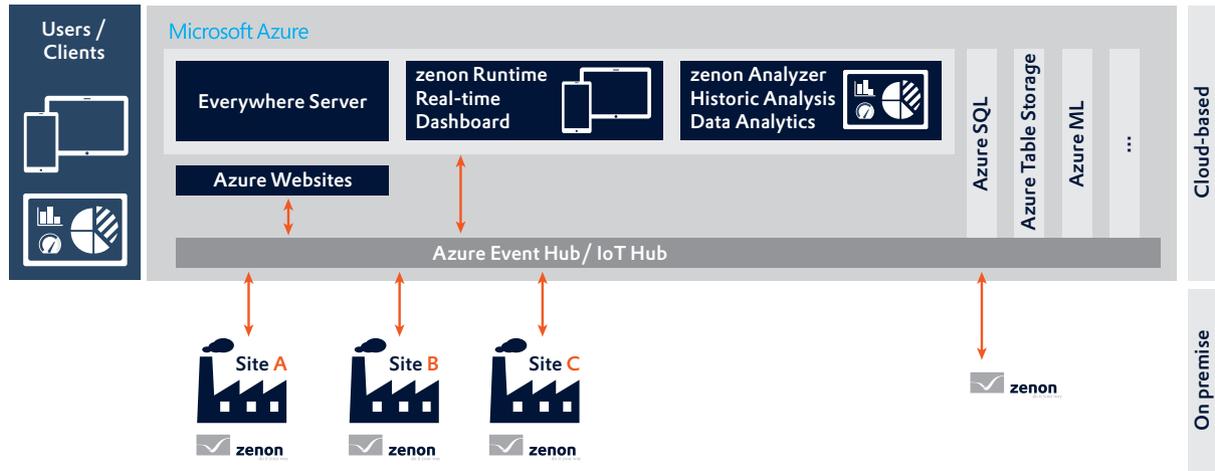


Figure 3: Multi-site analysis and efficient long-term storage with cloud technology.

system, local archives at the equipment or production line level can also be included with archives at the top-level IT layer.

### EFFICIENT LONG-TERM DATA STORAGE

zenon's proprietary storage files have the distinct benefit of acquisition speed, especially for large volumes of data. Using proprietary binary files increases security for long-term storage. Open to have the choice of integration possibilities, you are also able to use an external SQL or any ODBC-connected database. Keeping your data over the long term may also include exporting data to other databases, or printing it to PDF or as a hard copy.

### DELIVER ENHANCED ANALYSIS

Now we start to accelerate the possibilities: with strong reporting and analytical tools releasing the potential of your production data. Production reporting, such as batch reports, are a common reason for implementing a historian, proving quality and regulation compliance. Once you have this installed, we can start to release additional potential with zenon. On the same platform, it is a simple matter to provide deep analysis. Practical examples of this include: alarm analysis highlighting where losses are holding you back; KPIs such as OEE to increase efficiency; including energy consumption in your analysis; or using RBE (Review by Exception) reports to increase quality.

### EXPAND SCOPE IN THE CLOUD

Adding the Microsoft Azure platform effectively places the zenon Historian into the cloud. On premise zenon systems transfer local process information with high security and fast data acquisition to the cloud. In so doing, zenon Historian becomes an ergonomic Big Data solution, using its conventional native archiving technology in a highly accessible global historian system.

The Azure cloud platform adds a different dimension to what data is available and where. The use of a global cloud solution is becoming very popular with equipment suppliers where their equipment is deployed at end-customer sites throughout the world. The cloud is used to obtain and store equipment performance, where no record is made of actual production results – only equipment performance. This helps the equipment supplier become closer to the customer – enabling it to suggest preventative maintenance based on real data and facilitating the possibility of providing different services, such as pay-per-use machines.

For end customers, the cloud offers global connectivity. Data security is a major question in this choice. Which is answered using a combination of Azure encryption, Azure security certificates, and zenon network security. From the on-premise system to the cloud, the Azure mechanism only transfers raw data. This raw data has no context until the zenon Historian operating in the cloud receives it – at which point it becomes information and knowledge.



Figure 4: Analytics and reporting.

## PERFORM AT YOUR BEST WITH ZENON

zenon has the ability to connect with any industrial system, wherever it is located, and is easily scalable – from a single equipment unit to multi-site global operations.

This means you can hear what your plant is saying, wherever your plant is. zenon helps you to futureproof your processes, release your imagination, and continue to perform at your best.

ROBERT HARRISON

## LONG-TERM STORAGE

- zenon proprietary binary files
- SQL, any ODBC-connected database
- pdf or hardcopy printout

## ANALYSIS

- Batch report, RBE
- OEE, KPI, GANTT, production efficiency
- Alarm analysis, stoppages, breakdown
- Energy efficiency, ISO 50001
- Process analysis, trends, SPC
- Custom formula

## DELIVER

- PDF, HTML, Excel, Word, Power Point, TIFF
- Process event trigger, e.g. end of batch, alarm event
- Time-scheduled event
- Manual request

## CLOUD

- Azure native communication driver
- Multi-site analysis
- Industry, process and hardware independent
- Energy efficiency, ISO 50001
- Archive, visualization, reporting