Mitsubishi Electric's SCADA Software "GENESIS64"

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Abstract

Amid the promotion in recent years of Digital Transformation (DX) in the manufacturing industry, Supervisory Control And Data Acquisition (SCADA) software, which can centrally collect, store, and utilize data, has become increasingly prominent.

Mitsubishi Electric has made Mitsubishi Electric Iconics Digital Solutions, Inc. (MEIDS), the company developing the SCADA system "GENESIS64," a wholly-owned subsidiary and has been strengthening the product through joint development. GENESIS64 features high connectivity with external systems and devices, and offers rich data visualization methods and multifaceted analysis functions. Added value for the user has also been improved by enhancing compatibility with our FA-related products.

Use of GENESIS64 enables utilization of comprehensive data, and contributes to improved productivity and quality in the manufacturing industry.

1. Introduction

As DX rapidly advances in various industries, it is also being actively promoted in the manufacturing industry, with the aim of improving productivity and quality. Collection and utilization of data, which are the foundation of DX, have been emphasized as important themes in DX promotion activities. Under these conditions, SCADA systems, which feature the ability to efficiently collect and store massive amounts of data across the entire manufacturing process, and then effectively visualize and analyze it, are becoming increasingly widespread all over the world.

GENESIS64 is a SCADA software product that has been strengthened through joint development with MEIDS which became our wholly-owned subsidiary in 2019 (Fig. 1). This paper describes the features of GENESIS64.

Fig. 1 GENESIS64

2. Features of GENESIS64

2.1 Rich data visualization methods

GENESIS64 is equipped with various functions enabling effective visualization of data collected from monitored targets at facilities such as manufacturing sites, according to the desired purpose (Fig. 2).

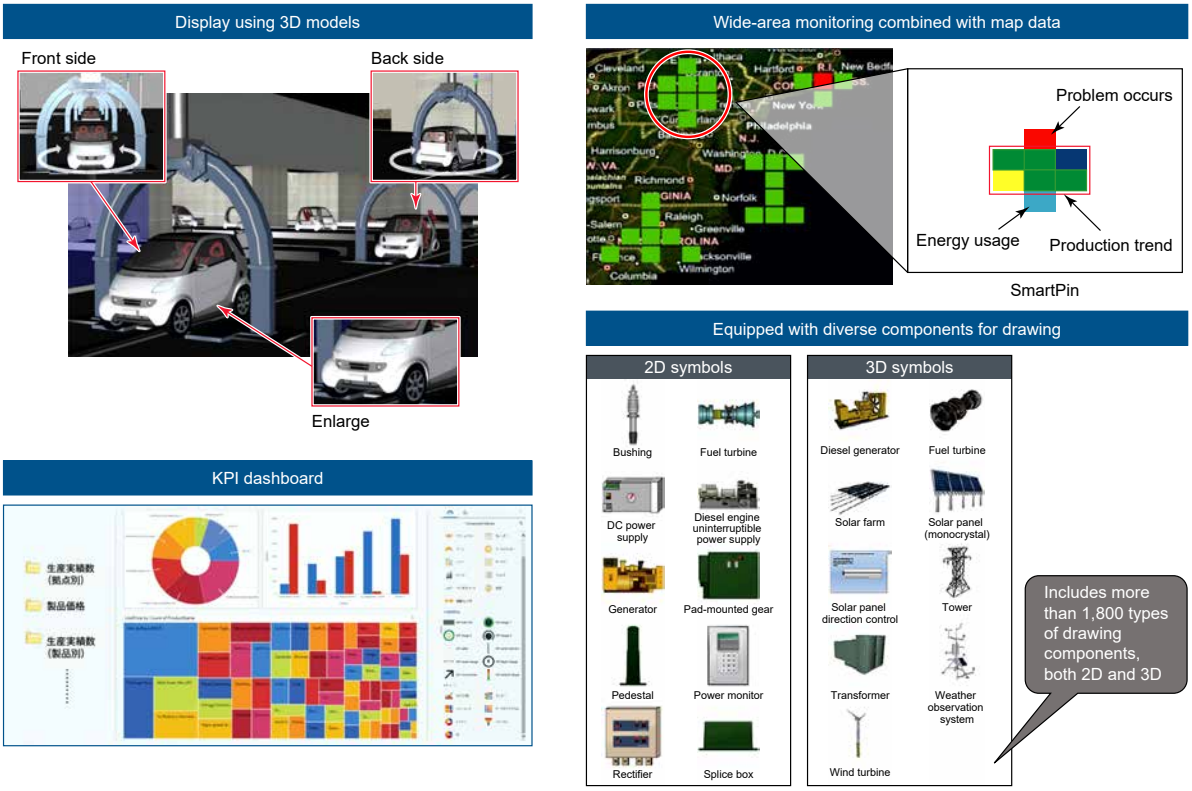

Fig. 2 Example of visualization using GENESIS64

This system naturally displays ordinary real-time data, but it also provides various visualization methods suited to applications, such as building models close to real environments using 3D functions, wide-area monitoring of multiple sites combined with map data, and displaying statistical information on the Key Performance Indicator (KPI) dashboard screen. An extensive range of templates are provided to create these screens, and screens with excellent design values can be built without creating components from scratch. Also, remote monitoring from various browsers and mobile devices is possible by putting screens on the web.

2.2 Utilization of data

GENESIS64 can collect and store massive amounts of data at a high speed of 100,000 items per second. It supports redundancy and distributed configurations for users who cannot afford data loss due to server failures or other problems, to enable construction of highly reliable monitoring systems. Also, collected data is not only stored as is, but can also be flexibly processed according to its intended application. The system also provides numerous functions for data analysis, contributing to on-site improvement from various perspectives and management decision-making (Fig. 3).

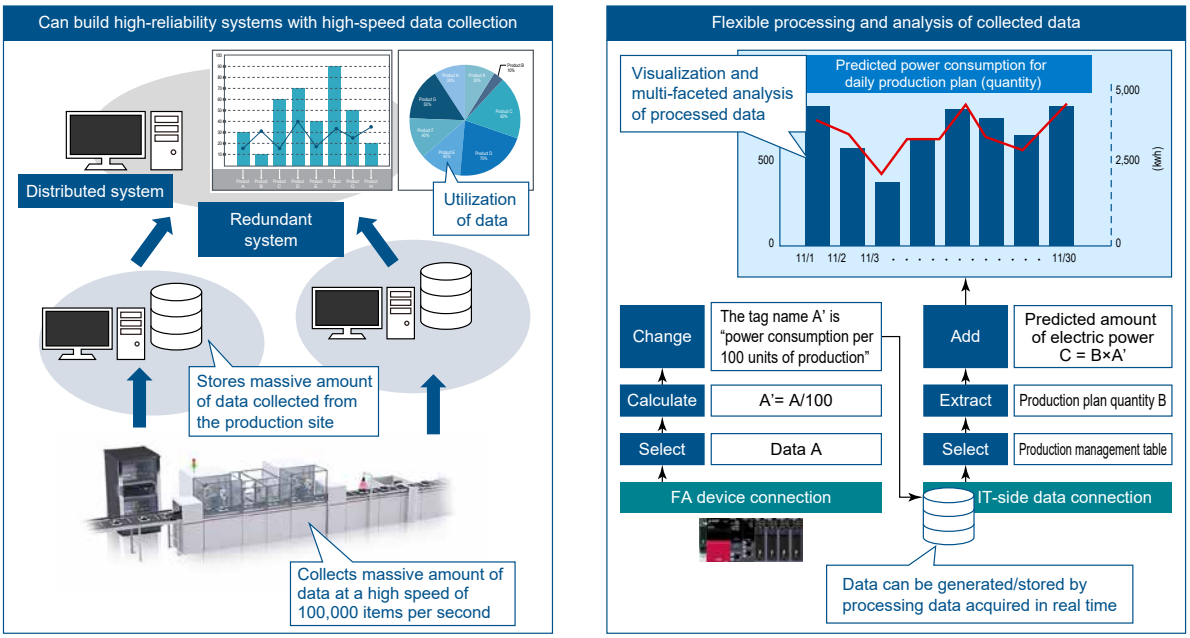

Fig. 3 Utilization of data with GENESIS64

2.3 Open connectivity

GENESIS64 has outstanding connectivity with various systems and devices, enabling flexible system construction (Fig. 4).

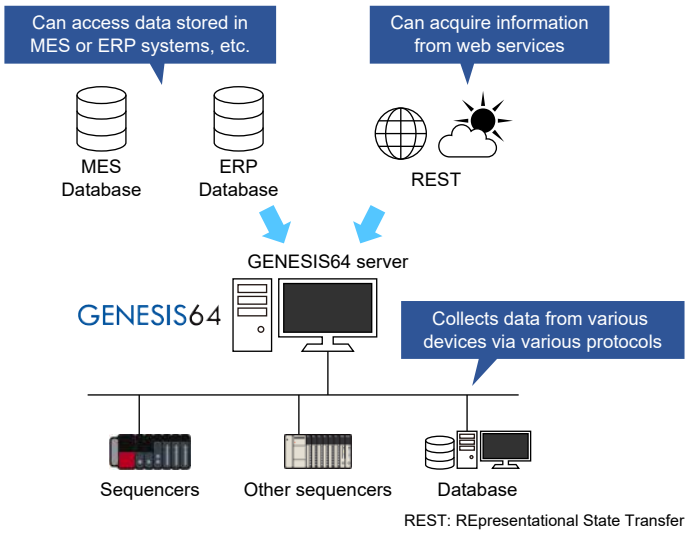

Fig. 4 GENESIS64 connectivity

(1) Support for industry standard protocols

The system supports industry standard protocols such as OPC*1, BACnet*2, and MODBUS*3, enabling connection with devices across a wide range of fields.

(2) Connectivity with host systems

Optimization across the entire manufacturing process is achieved by connecting with IT systems such as Manufacturing Execution Systems (MES) and Enterprise Resource Planning (ERP) systems, and performing integration and management with data from on-site Operational Technology (OT) systems.

*1 OPC is a registered trademark of the OPC Foundation.
*2 BACnet is a registered trademark of ASHRAE.
*3 MODBUS is a registered trademark of Schneider Electric USA, Inc.

(3) Interconnection with external web services

The system can connect with external web services through a REST Application Programming Interface (API) to display the acquired data on monitoring screens.

2.4 High compatibility with Mitsubishi Electric FA devices

GENESIS64 strengthens interoperability with our FA devices and related products to help improve added value for our customers (Fig. 5).

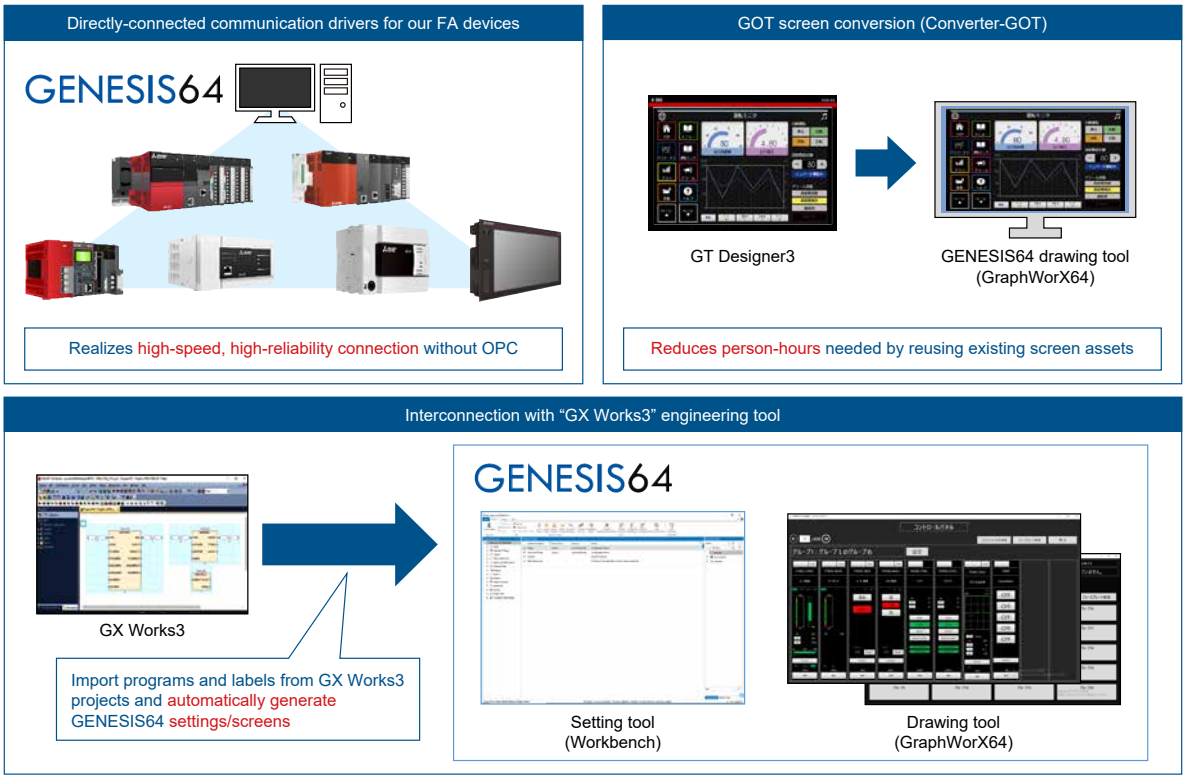

Fig. 5 Compatibility between GENESIS64 and our FA devices

(1) Directly-connected communication drivers for our FA devices

The system is equipped with a dedicated driver (Mitsubishi Electric FA Connector) for connecting with our FA devices, and this enables high-speed, high-reliability data collection without introducing an OPC server. Setting has also been simplified, and connection can be done by automatically detecting devices installed on the network.

(2) GOT screen conversion function (Converter-GOT)

A function is provided for converting screen data created for the Graphic Operation Terminal (GOT) of our Human Machine Interface (HMI) devices for use with GENESIS64. By utilizing screen assets designed for GOT, it is possible to reduce engineering person-hours required for system expansion.

(3) Interoperation with GX Works3

A function is provided that reads instrumentation programs created with our engineering tool "GX Works3" and automatically generates communication settings and monitoring screens for the monitored system. Also, label information defined in GX Works3 projects can be directly imported to automatically generate communication tags for GENESIS64.

3. Conclusion

This paper has described the features of GENESIS64 SCADA software. The trend of promoting DX in manufacturing is expected to accelerate, and as part of that, the importance of SCADA will continue to grow. Moving forward, we will continue to improve the added value of GENESIS64 by enhancing its functions and strengthening compatibility with our FA products.