TAKEBISHI

OPC FOUNDATION MEMBER

Data Access Unit for IoT
DeviceGateway®

Device Gateway

DeviceGateway DGW-C10
TAKEBISHI CORPORATION

USB
ETHER1
ETHER0
DC12V

HULFT IoT Ready
Device Gateway
TAKEBISHI CORPORATION

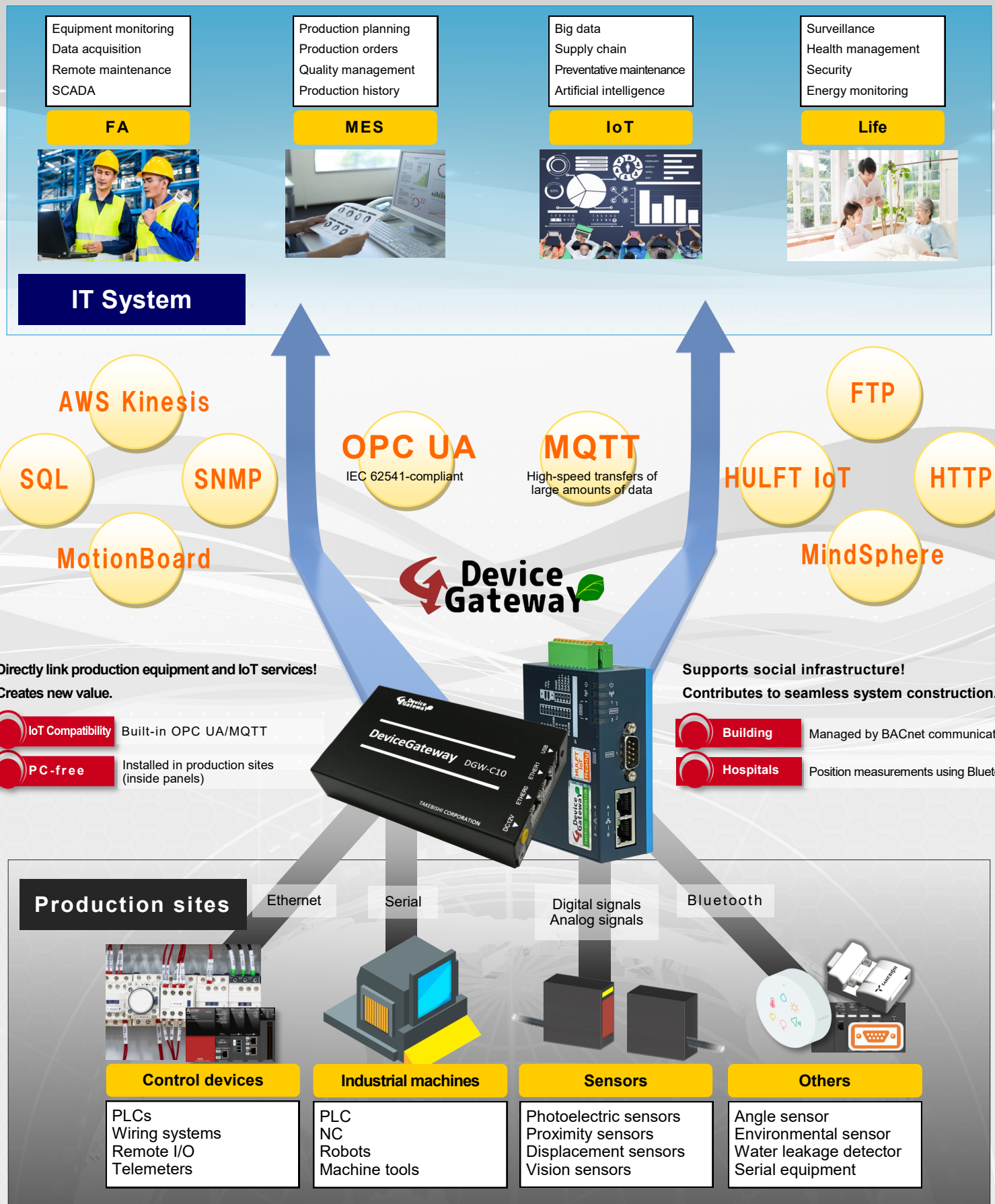TAKEBISHI PRODUCTS CHECK!

Supports 320 series of devices

Compatible with Industry 4.0

Compatible with Various Cloud Services

Easy Setup with a Web Browser

Directly Link Production Equipment and IT Systems

Accesses sensor information and improves production efficiency!

FA	MES	IoT	Life
Equipment monitoring	Production planning	Big data	Surveillance
Data acquisition	Production orders	Supply chain	Health management
Remote maintenance	Quality management	Preventative maintenance	Security
SCADA	Production history	Artificial intelligence	Energy monitoring

IT System

AWS Kinesis

SQL

SNMP

MotionBoard

OPC UA
IEC 62541-compliant

MQTT
High-speed transfers of large amounts of data

FTP

HULFT IoT

HTTP

MindSphere

Device Gateway

Directly link production equipment and IoT services!
Creates new value.

IoT Compatibility   Built-in OPC UA/MQTT

PC-free   Installed in production sites (inside panels)

Supports social infrastructure!
Contributes to seamless system construction.

Building   Managed by BACnet communication

Hospitals   Position measurements using Bluetooth

DeviceGateway DGW-C10
TAKEBISHI CORPORATION

Production sites

Ethernet   Serial   Digital signals / Analog signals   Bluetooth

Control devices	Industrial machines	Sensors	Others
PLCs	PLC	Photoelectric sensors	Angle sensor
Wiring systems	NC	Proximity sensors	Environmental sensor
Remote I/O	Robots	Displacement sensors	Water leakage detector
Telemeters	Machine tools	Vision sensors	Serial equipment

Line up

MITSUBISHI	JTEKT	OMRON	YOKOGAWA	HITACHI	SHARP	FUJI

KEYENCE	YASKAWA	PANASONIC	Rockwell	SIEMENS	GE	TOSHIBA

MachineTools
- MITSUBISHI
- YAMAZAKI
- FANUC
- SHIBAURA

Robot
- YAMAHA
- IAI
- SANYO

Networks
- ANYWIRE
- HIOKI
- MG
  (Formerly M-System)
- HAKKO
- IDEC
- KOYO
- DELTA
- MOXA

- AZBIL
- RKC
- CHINO
- Eurotherm
- PANASONIC
- MITSUBISHI
- YOKOGAWA
- Silex Technology

- WAGO
- MTT
- OMRON
- Ablic
- SIRC
- CODESYS
- COMTROL
- PHOENIX CONTACT

EtherNet/IP	Modbus	SLMP
MTConnect	BACnet/IP	DNP3

その他

Serial interface

DIO/AI

Bluetooth Beacon

Find out further Connectivity!

Line up

Compliant with safety standards, High spec model
DGW-W710
- Safety standards (CE / FCC / UL / CCC (Exemption applied))
- Equipped with DIO terminal
- Wide temperature range (-20 to 55)
- 3 serial ports(RS232C x 1, RS485 x 2)

Compact model
DGW-C10
- Space saving
- Wide temperature range(-20to60)
- 1 serial port (RS232C)

I/O equipped, Factory model
DGW-F20
- 8 digital inputs / 8 outputs
- 4 analog inputs
- Pin terminal power input
- 2 serial ports (RS232C x 1, RS485 x 1)

LTE equipped model
DGW-L30
- Japanese multi-carriers support. LTE compatible(3G not possible)
- Dual antenna
- 1 serial port (RS232C)
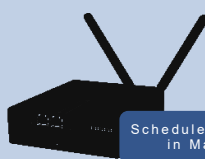
Scheduled for release in March 2024

I/O and LTE equipped model
DGW-R40
- Japanese multi-carriers support LTE compatible(3G not possible)
- 24 digital inputs / 8 outputs
- 8 analog inputs
- 2 serial ports (RS232C x 1, RS485 x 1)

Software version, Docker model
DGW-D20（H/B）
- Works in Linux environment
- Docker virtual image included
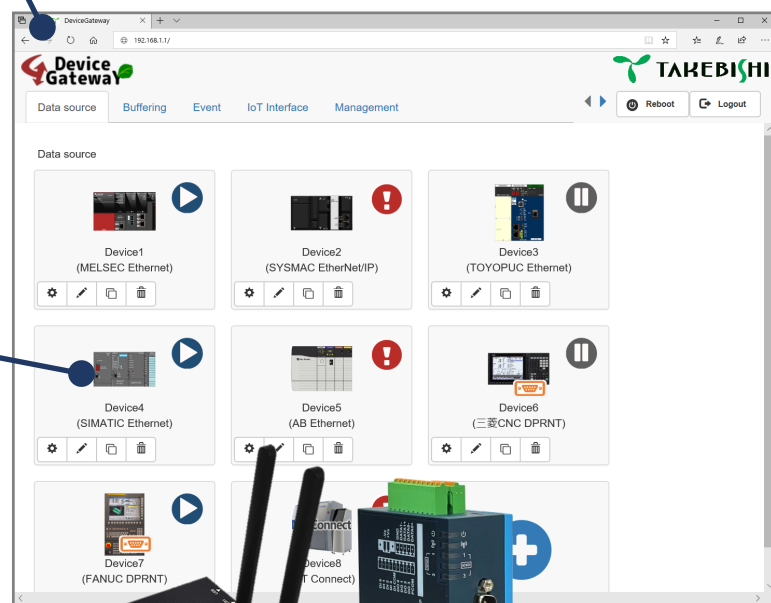- Other application linkage

Features

All the functions needed to construct an IoT system.

Easy setup with browser

Specific application is not required to set up this product.
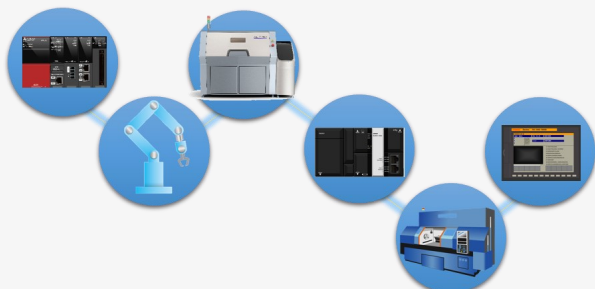Simply enter the IP address from your browser to configure.

Supports 320 series devices

Supports many kinds of devices such as PLCs, measuring instruments, processing machines and robot controllers.
You can register multiple connection settings as data sources.

Data Management with tags

Data from devices are managed as tags with specified names.
Tags can be managed in a hierarchical structure (Address Space) using folders.
You can create tags with various data types, and easily set scale/BCD conversion.

Data Access Unit for IoT
DeviceGateway®
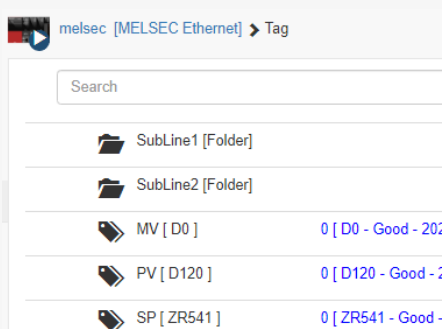
Partners / Device certification
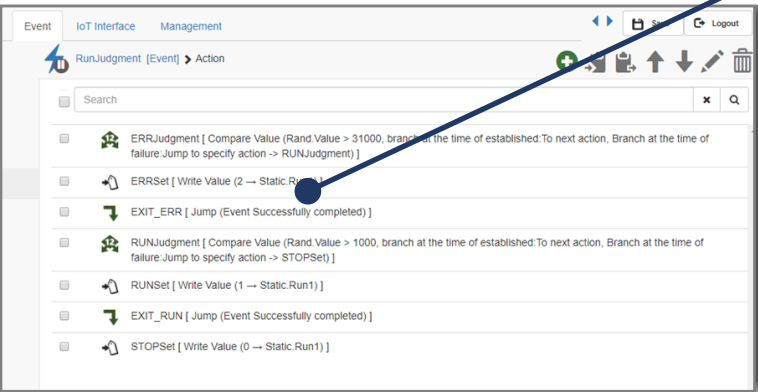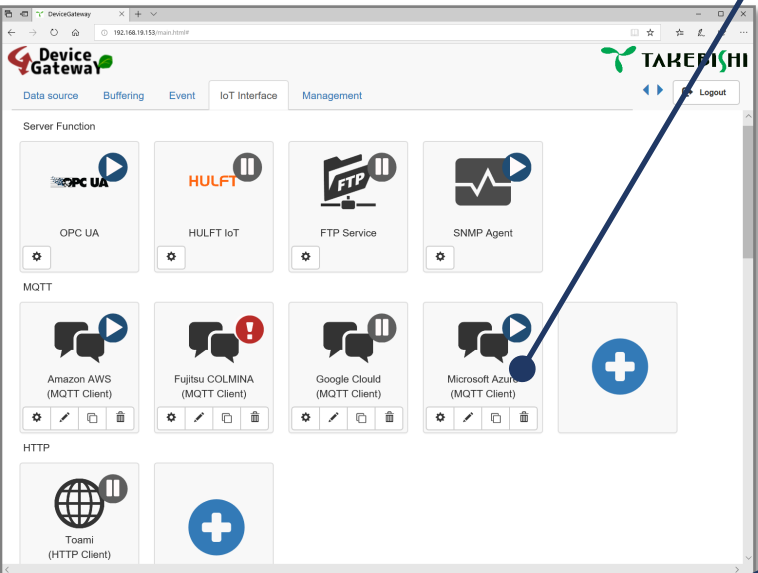
Here are some of our DeviceGateway alliance and Certified device partners who we have joined.

Flexible cooperation with many IoT services.

Compatible with various services

Industry 4.0
Built-in OPC UA server function

Supported on various applications
MQTT connections to AWS/Azure/GCP/Alibaba

HULFT IoT
Secure communication with mission-critical systems

MotionBoard
Visualization / Analyzation by BI tools

SNMP Agent
Monitors status by upper layer system. (e.g. Zabbix)

etc...

Event driven sequence logic

Cycle, Time execution
Specify event execution interval

Alarm detection
Monitors the rate of change and deviation of tag data

Conditional branch
Implements complex processing without programming

Message creation
Makes JSON automatically with tag definition

Feedback to production equipment
Writing to tag

etc...

Convenient management tools

Switching Language
English and Japanese are available

Time Synchronization
Synchronizes with NTP Server

Updatable firmware
New functions are available

etc...

(As of April 2022)

Partner Name	Device certification or alliance name
Amazon Web Services	AWS Partner Device Catalog
WingArc1st	Dr.Sum E model
SB Cloud	Alibaba Cloud IoT Platform Certified Device
OGIS-RI	IoT Partner
OKI	AI Edge Partner
OPC Foundation	OPC UA Certified
SAISON INFORMATION SYSTEMS	HULFT Collaboration Partner
SORACOM	SPS Certified Device Partner
NSW	Toami Ready
Fujitsu	COLMINA Ready
Microsoft	Azure Certified for IoT Device（Legacy）
Mitsubishi Electric	e-F@ctory Alliance Partner
YE DIGITAL	MMCloud Ready

Use Cases

KPI dashboard and Cross-section analysis by BI tool

**Implements equipment monitoring remotely or KPI management by using dashboard products.
In addition, by BI tool, you can combine collected data as various perspectives and analyze cross-cutting.**
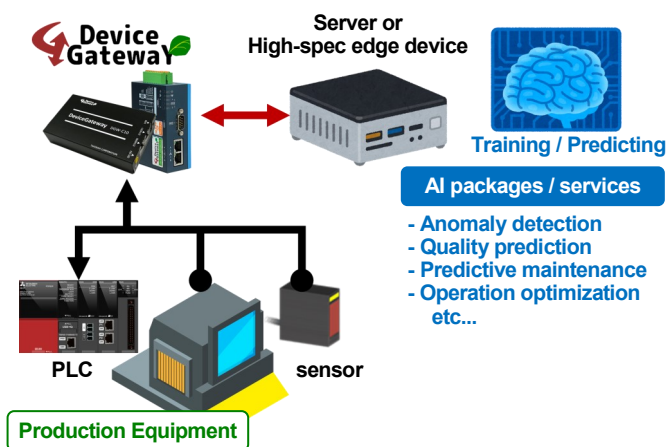
Cloud

KPI management

Cross-section analysis

Production System

Device Gateway

Equipment monitoring
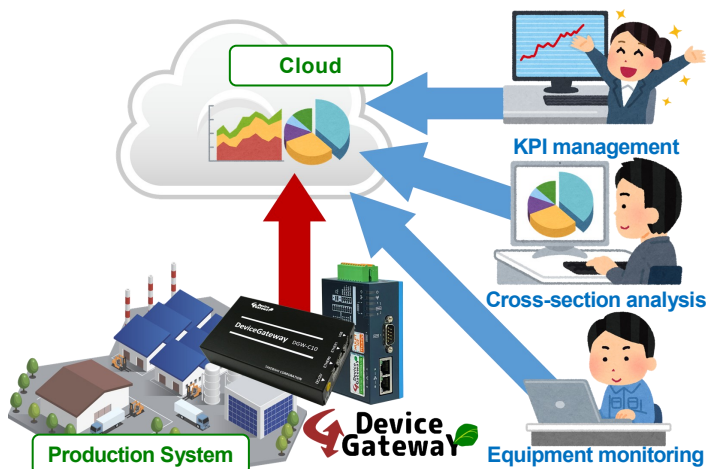
Dashboard / BI product examples

Makers	Products
Amazon Web Services	Amazon QuickSight AWS IoT SiteWise Amazon Elasticsearch
Alibaba Cloud	Alibaba Cloud DataV
SB Technology	IoT Core Connect
WingArc1st	MotionBoard
SORACOM	SORACOM Lagoon
Hitachi	Lumada MfI
Fujitsu	COLMINA
Microsoft	Azure Stream Analytics Power BI
YDC	YDC SONAR

Strengthening of competitiveness by cooperating with AI

By cooperating with AI packages/services, you can add new value into your production line or products and strengthen competitiveness. Realizes gathering data, indicating to predict, sending feedback into controller.
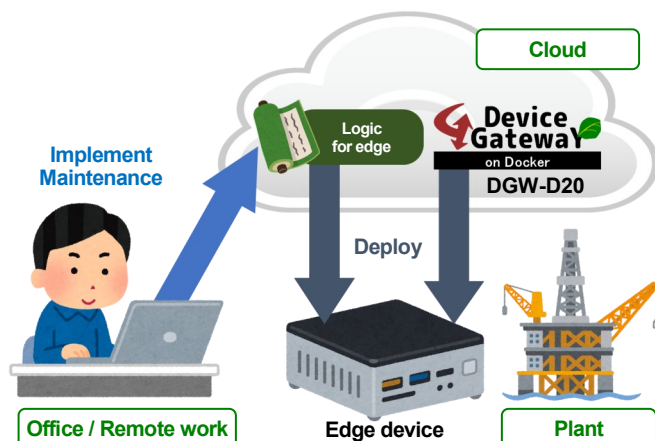
Device Gateway

Server or High-spec edge device

Training / Predicting

AI packages / services

- Anomaly detection
- Quality prediction
- Predictive maintenance
- Operation optimization
  etc...

PLC   **sensor**

Production Equipment

AI product examples

Makers	Products
Amazon Web Services	Amazon SageMaker
Cross Compass	MANUFACIA
SKYDISC	SkyAI
Brains Technology	Impulse
Microsoft	Azure Machine Learning
RapidMiner	RapidMiner

Edge development with centralized cloud management

**Software version (DGW-D20) runs on the device you chose.
Centralized cloud management can be deployed by DeviceGateway and your business logic for the edge device.**

Implement Maintenance

Cloud

Logic for edge

**Device Gateway on Docker
DGW-D20**

Deploy

Office / Remote work

Edge device

Plant

Cloud service examples

Maker	Products
Amazon Web Services	AWS IoT Greengrass
Microsoft	Azure IoT Edge

Get via Azure Marketplace

Edge device examples

Makers	Products
OKI	AI Edge Computer "AE2100"

Monitoring / Production control / DX by OPC UA

Realizes monitoring / production control with low cost by using SCADA / MES packages. The ETL tool "OPC Spider®" integrates FA and OA systems without programming by using OPC UA, DB, and various interfaces, and promotes DX.
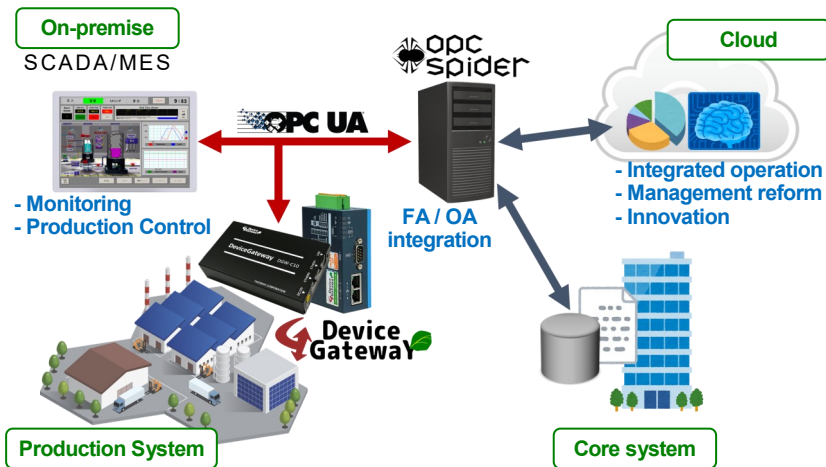

OPC Client product examples

Makers	Products
Mitsubishi Electric (ICONICS)	GENESIS64
Siemens	WinCC
Rockwell	RSView
AVEVA (Wonderware)	InTouch/Historian
Takebishi	DxpLOGGER
Takebishi	OPC Spider

In addition, it has been tested by various OPC Clients at the annual Inter Operability Workshop Testing.

Detecting invasion and managing the movement by Bluetooth positioning

Captures radio waves from Bluetooth tags and calculates position information based on its strength.
Improves safety by detecting entry into unsafe areas and managing the movement of staff.
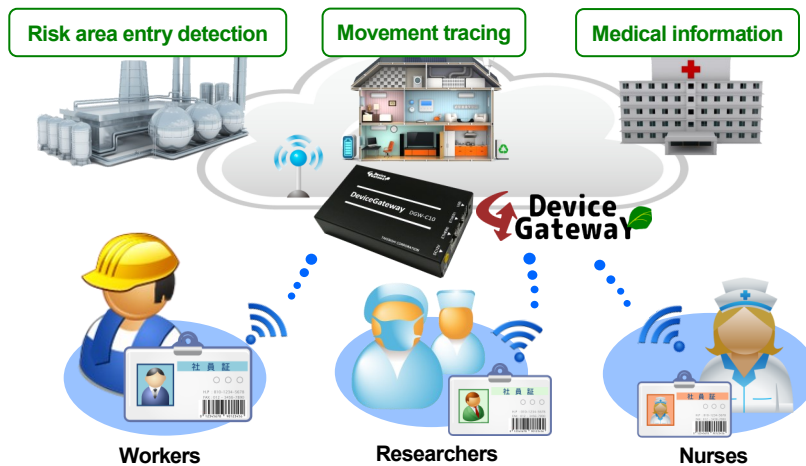
Monitors building equipment by BACnet communications

Supports the open protocol "BACnet/IP" for building-automation.
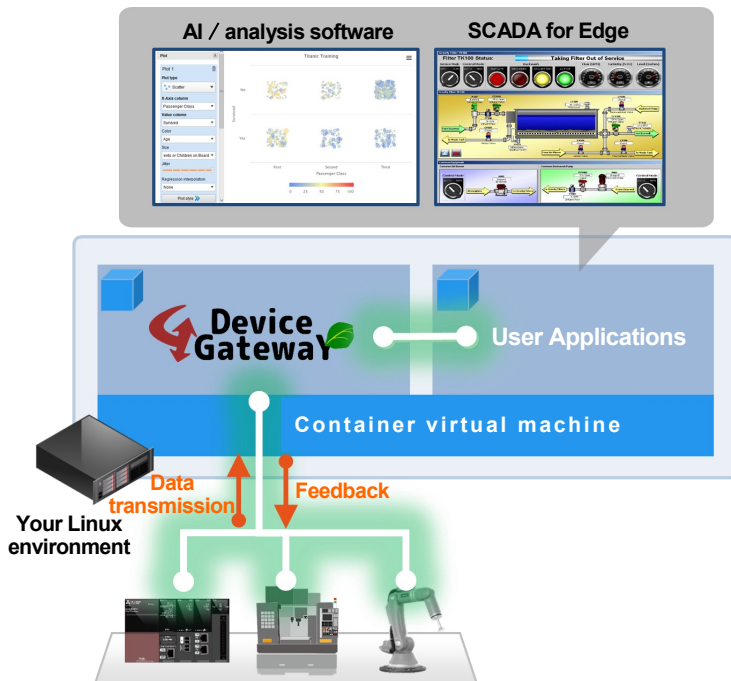Contributes to efficient building management by gathering data from air-conditioner, lighting, and others.

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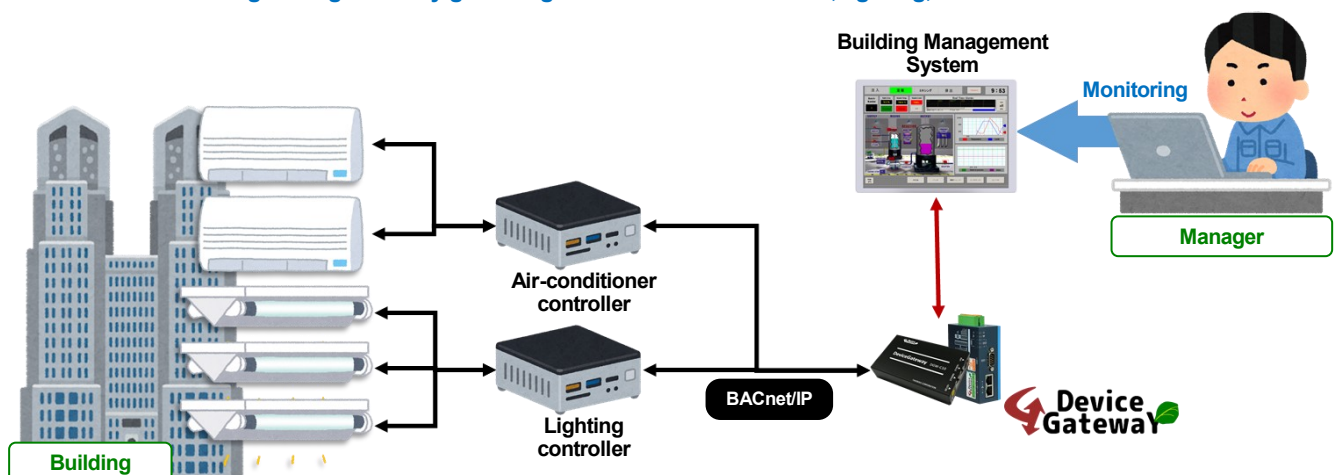
Use Cases

DeviceGateway® on Docker

Provided as software and coexists with user application

"DeviceGateway on Docker" (DGW-D20) is a software product as an image for virtualization container .
It can coexist with other software packages or applications in Linux environment and link data.

AI / analysis software   SCADA for Edge

Device GatewaY   User Applications

Container virtual machine

Your Linux environment

Data transmission   Feedback

Operates in a virtual environment
The software is provided as a Docker image. You can use it for edge computing.

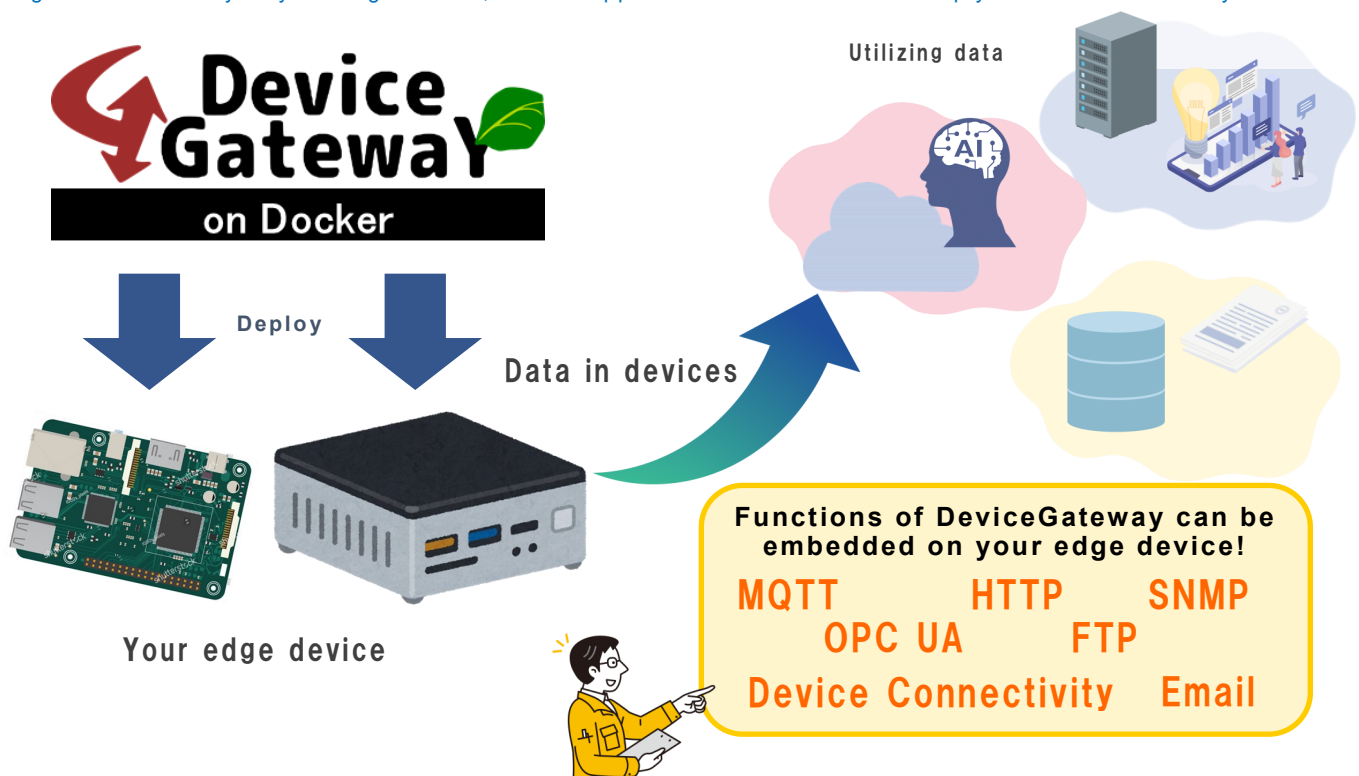**Porting not required**
Simply start be loading a Docker image.

Recommended operating environ-

DeviceGateway on Docker	CPU: Intel Core i Series or higher 　　　Cortex-A15 1GHz or higher RAM: 512MByte or higher ROM:(x86_64) 100MByte or higher 　　　(ARMv7)100MByte or higher ＊A storage area for Volume Mount 　　and Storage Mount is required separately.
License management server ＊	Windows 8.1 or later 32bit/64bit Mac OS X 10.11 or later Debian x86 /x64/ armhf/ aarch64 (DEB package) RedHat x86 / x64 (RPM package)

＊ When selecting the software license key or in the execution environment
　　where the hardware license key (USB) cannot be accessed from the

Simple and Cost-effective connection to IT system!

We also provide reasonable DeviceGateway software models with a limited number of connections.
Embedding DeviceGateway to your edge device, it can support OPC UA and MQTT simply and cost-effectively.

Device GatewaY
on Docker

Deploy

Data in devices

Utilizing data

AI

Your edge device

Functions of DeviceGateway can be embedded on your edge device!

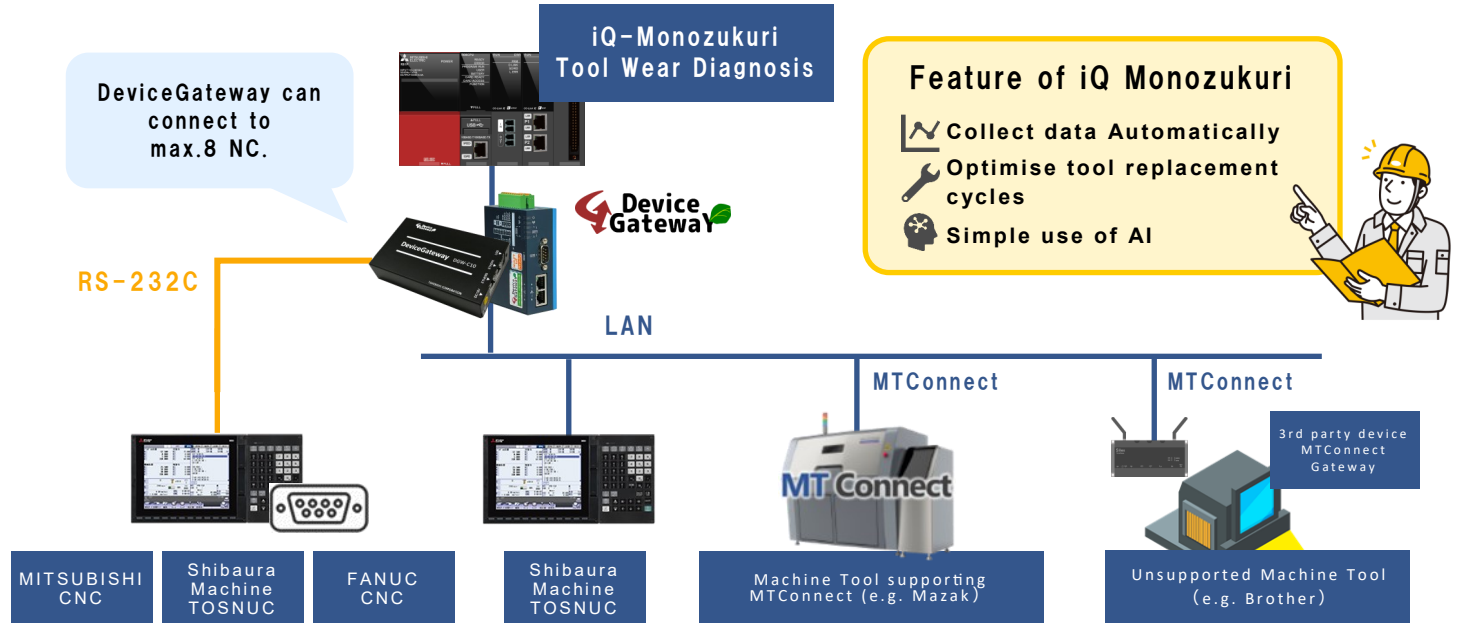MQTT　　　HTTP　　SNMP
OPC UA　　　FTP
Device Connectivity　Email

iQ Monozukuri Tool Wear Diagnosis

Cost saving through prediction of tool deterioration and detection of irregular machinery.

"iQ Monozukuri," a Mitsubishi Electric FA application that informs the user when to replace tools at the proper timing, can link to the machine.
It automates the task of when to replace tools and can help to reduce costs.

iQ-Monozukuri Tool Wear Diagnosis

DeviceGateway can connect to max.8 NC.

Feature of iQ Monozukuri
- Collect data Automatically
- Optimise tool replacement cycles
- Simple use of AI

RS-232C

Device Gateway

LAN

MTConnect   MTConnect

3rd party device MTConnect Gateway

| MITSUBISHI CNC | Shibaura Machine TOSNUC | FANUC CNC | Shibaura Machine TOSNUC | Machine Tool supporting MTConnect (e.g. Mazak) | Unsupported Machine Tool (e.g. Brother) |

DeviceGateway® LTE model

Mounted Multiple carrier LTE module

LTE model（DGW-L30 / DGW-R40) has a multiple carrier LTE module, so it is able to connect to the cloud via mobile network.
It is useful for embedding into the equipment shipped to the end-user, or in difficult environments for wired network.

Cloud

IoT Service

Remote Maintenance *

Device Gateway

DGW-L30/R40

Plant
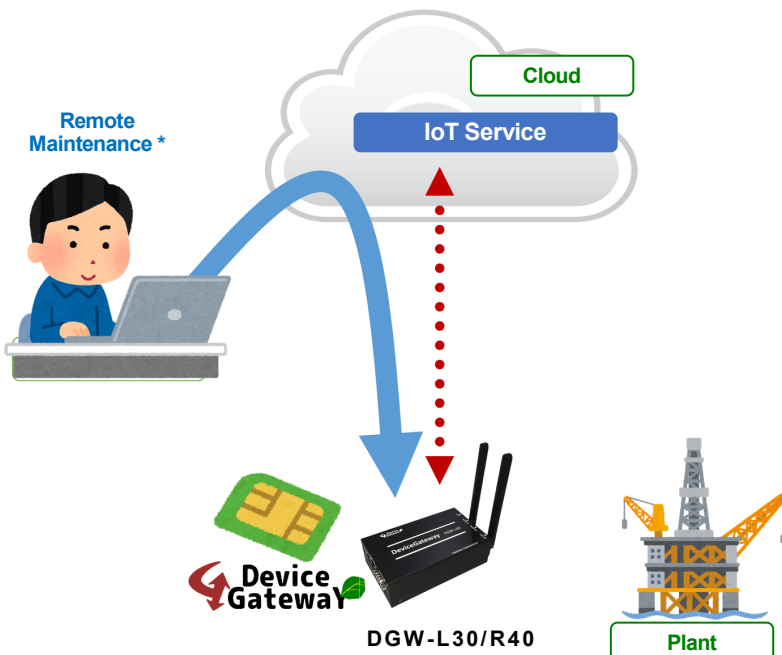
Carrier/MVNO examples

Carrier/MVNO	DGW-L30
Docomo	✓
au	✓
Softbank	✓
SORACOM	✓
NTTPC	✓

SORACOM service examples

Services	Description
SORACOM Napter	On demand remote accessing
SORACOM Harvest	Data gathering / storing
SORACOM Lagoon	Dashboard
SORACOM Funnel	Cloud resource adapter

＊ Remote accessing on demand via SORACOM Napter is available.

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Functional Specifications

Hardware Functional Specifications

Model	DGW-W710	DGW-C10	DGW-F20	DGW-L30	DGW-R40
Exterior					Scheduled for release in March 2024
Ethernet Interfaces	2Ports (10/100/1000BASE-T)	2Ports (10BASE-T/100BASE-TX/1000BASE-T)			
Serial Interfaces	RS-232C/485×1Port (DSUB9) RS-485×2Port (Terminal block)	RS-232C×1Port(DSUB9)	RS-232C×1Port(DSUB9) RS-485×1Port(DSUB9)	RS-232C×1Port(DSUB9)	RS-232C×1Port(DSUB9) RS-485×1Port (Screwless terminal block)
Bluetooth Interfaces [1]	-	Bluetooth Beacon, DeviceAdapter (Up to 3 units can be connected)			
Digital Inputs	4ch(voltage/non-voltage input, photo coupler isolated)	-	8ch(voltage/non-voltage input, photo coupler isolated)	-	2ch(voltage input, photo coupler isolated) 24ch (voltage input, photo coupler isolated)
Digital Outputs	4ch(open collector, photo coupler isolated)	-	4ch(open collector, photo coupler isolated) 4ch(photoMOS relay, photo coupler isolated)	-	1ch(open collector, photo coupler isolated) 8ch(open collector, photo coupler isolated)
Analog Inputs	-	-	4ch(voltage/current mode, 16-bit resolution)	-	8ch (voltage/current mode, 16-bit resolution)
SD Card Slot	microSD 1 Slot	1 Slot (SD/SDHC compatible)			
USB [1]	-	USB 2.0 (Type-A) × 1 port			
Power Supply — Power Supply Input	24VDC 2-pin screw-fastened connector	12VDC DC jack (AC adapter)	12VDC DC jack (AC adapter) or 3-pin screw-fastened connector	12VDC DC jack (AC adapter)	9 to 36VDC 2-pin screw-fastened connector
Power Supply — Included AC Adapter	-	100 to 240VAC input (50 to 60Hz)/12VDC output			-
Power Supply — Included AC Cable[2]	-	Plug A (for Japan) 7A/125V			-
SIM Card Slot[3]	-	-	-	1slot (Japanese Multi-carrier LTE)	
Antenna Connecter	-	-	-	MAIN:SMA/SUB:SMA	
Included Antenna[4]	-	-	-	Slave Antenna×2	
Maximum Power Consumption	5W	4.5W (max usage 100VAC)	10.5W (max usage 100VAC)	7.2W (max usage 100VAC)	8.3W (max usage 24VDC)
Operating Temperature (in Celsius)	-20to+55 *Without condensation	-20to+60 *Without condensation	-20to+50 (100BASE-TX) -20to+40 (1000BASE-T) *Without condensation	-20to+40 *Without condensation	-20to+60 *Without condensation
External Dimensions (mm) (Excluding protrusions)	W115.58 x D73 x H36	W81 × D137 × H29	W137 × D137 × H40	W81 × D137 × H40.2	W137 x D157 x H42
Weight	170g	380g	700g	480g	920g
Standards and Compliance	CE、FCC、UL CCC (Exemption applied)	cCSAus	-	-	-
Warranty Period[5]	1 year from the date of purchase				

∗1 When using Bluetooth Beacon or Bluetooth Serial Communication, Bluetooth conversion adapter (recommended product: BLED112 by Silicon Labs) is required. DGW-W710 is not supported.
∗2 Please change to products that comply with local standards.
∗3 When using "nanoSIM", please use the included conversion adapter.
∗4 Please contact us for use of waterproof or outdoor antenna.
∗5 Please check the Provision matters (https://www.faweb.net/en/support/document/) for the warranty details.

Software Functional Specifications (model)

Model	DGW-W710	DGW-C10	DGW-F20	DGW-L30	DGW-R40	DGW-D20H	DGW-D20	DGW-D20B
Max Connections	8 connections					64 connections	16 connections	1 connection
Max Tags & Points	8,192 points					65,536 points	16,384 points	1,024 points
Max Events	64 events					128 events	64 events	

Software Functional Specifications (shared)

Item		Description
Data sources	External Interfaces	Ethernet, Serial, Digital I/O, Analog Input etc.
	Device Protocols	SLMP, MODBUS, MTConnect(1.3), BACnet etc.
	Max Connections	8 connections (DGW-D20 has 16 connections)
Tag Management	Max Tags & Points	8,192 points (DGW-D20 is 16,384 points)
	Data Types	(U)Int8/16/32/64, Float, Double, Boolean, String * Arrays are supported for all types except String
	Extended Settings	Specify bit position of registers Byte swapping, Read/Write only attributes Specify byte position of word registers
	Simulation	Random, Increment, Sign, Static
	System Calculation	BCD conversion
	Scale Conversion	Linear, Square Root, Power factor
	Alarms	Rate of change, Deviation, Level, Discrete
	Monitor Values	Current values can be monitored from the web browser
Configuration	Operation	Web browser setup page (HTTP/HTTPS) is provided * Microsoft Internet Explorer 10 or higher
	External	Import/Export (CSV/JSON format)
Events	Max Events	64 events
	Triggers	Cycle, Time, Changed value, Changed value(Multiple tags), Area changed value, Received MQTT, Tag alarm changed, Area alarm changed, Disk size, Beacon detection, Update beacon data, Pre Recorder,
	Actions	Loop start/end, Jump, Sleep, Compare value, Compare text, Calculate, Edit text, Get text, Get CSV element, Get JSON element, Write value, Refresh, Make message Send MQTT, Send HTTP, Send SQL, FTP upload, Send Kinesis, Send E-mail, Send MindSphere Send MotionBoard, Send kintone Buffer historical values, Extract buffered records, Reshape array elements, Write file, Read file, Rename file, Copy file, Move file, Delete file(s), List files, Get file count, Output log message, Restart, Shutdown, Make beacon list
Buffering	Max Tags	32 tags (4 point per 1 setting, max 8 settings)
	Max Data	8,192 records each (converted data accumulated as 1 record)
Offline Buffering	Applicable Interfaces	MQTT, HTTP(S), SQL, FTP, AWS Kinesis SIEMENS MindSphere, WingArc1st MotionBoard
	Max Queue Size	8,192 queries
	Operation Mode	Enabled (constantly) Enabled (when there is an communications error) Disabled
Diagnostics	Network Diagnostics	Ping, Traceroute
	Diagnostics Log	Data Source, Event, IoT Interface etc.
User Accounts	Applicable Target	WebUI, FTP server, OPC UA server
	Max Users	64 users
General Functions	Language switching	English, Japanese
	File Management	Diagnostics log, Certificates, Backup/restore
	Time Management	Correction of internal clock data (NTP server synchronization) (DGW-D20 is out of scope)
	Update	Firmware Update (DGW-D20 is out of scope)
	Firewall	Access restricted from external functions (DGW-D20 is out of scope)
Option	DAP Communication	Virtual serial mode / Manual connection mode, Max 3 DAPs

Item		Description
OPC UA Server (Ver. 1.04)	Endpoint URL	opc.tcp://[IP address]:[port number]/
	Profile	Embedded UA Server Profile
	Security Policy	None, Basic128Rsa15, Basic256, Basic256Sha256 Aes128Sha256RsaOaep、Aes256Sha256RsaPss
	Security Mode	None, Sign, SignAndEncrypt
	User Authentication	Anonymous, User name/password X.509 user certification
SNMP Agent (Ver2c)	Supported Command	Get, GetNext, GetBulk, Notification(Trap)
	MIB	Supplies original objects of this product
	Max Trap Targets	2 SNMP Managers
MQTT(S) Client (Ver3.11)	Sending and receiving	Subscribe, Publish
	Protocol	TCP (WebSocket not supported)
	Authentication	User name/password, TLS authentication
	Supported functions	QoS0/1/2, Retain/Will, TLS/SLL
HTTP(S) Client (Ver1.1)	HTTP Authentication	None, Basic authentication, Digest authentication OAuth2.0 ahthorization(only ROPC)
	HTTP Method	GET, PUT, POST, DELETE, OPTIONS, HEAD, TRACE
	Proxy Server	Supported (User name/password authentication also supported)
SQL Client	Interface	JDBC 4.2
	Database	Microsoft SQL Server2014 Oracle Database 11g MySQL5.6, PostgreSQL 9
	Query	SELECT, UPDATE, INSERT, DELETE
	Max Columns	512 columns per query
FTP Server	User Authentication	User name/password
	Transfer Mode	Active/Passive
FTP(S) Client	User Authentication	Anonymous, User name/password
	Transfer Mode	Active/Passive
AWS Kinesis Client	Command	PutRecord
	Partition Key	Arbitrary fixed value
	Proxy Server	Supported (User name/password authentication also supported)
SIEMENS MindSphere Client	Command	api/agentmanagement/v3/register api/agentmanagement/v3/oauth/token api/mindconnect/v3/exchange
	Security Policy	SHARED_SECRET
	Proxy Server	Supported (User name/password authentication also supported)
WingArc1st MotionBoard Client (MBCloud compatible)	Authentication	Login ID, Authentication key
	Command	POST, Realtime data connection WebAPI(JSON)
	Supported Data	Status (Text, Number, Boolean)
	Max Columns	50 Status per query
kintone (HTTP Client)	Method	GET, PUT, POST
	Authentication	API token
	Proxy Server	Supported (User name/password authentication also supported)
HULFT IoT Agent (Ver. 2.2) *	File Transfer	Encryption, Data compression
	Proxy Server	Supported (User name/password authentication also supported)
Water Standard Platform [Japan] (only available on DGW-W710/D20)	Standard Interface	Communication Method: MQTT(receive), HTTP(send) Contents Type: JSON
	General Standard Interface	OPC UA
iQ-Monozukuri Tool Wear Diagnosis for Machine Tools Protocol Convertor	Machine Tool	8 Machine Tools - Operates as up to 2 convertors per one this product. - Supports 4 machines per one convertor.

*   An SD card is required to use the event function, buffering, offline buffering, HULFT IoT, diagnostic log function, and other functions.
*   To use the SQL connection function, a relay service (for Windows or Linux) dedicated to this product must be set up.
*   To use the DAP Communication, DeviceAdapter is required.
     (DAP Communication makes serial communication wireless by Bluetooth.)
*   To use HULFT encryption, please apply HULFT encryption implemented firmware.
     (HULFT encryption implemented firmware is available on faweb.)

Supported Devices

Refer to the list of supported devices on following website.
https://www.faweb.net/en/product/devicegateway/supportlist

Hardware Products

Product Name	Model	List Price
DeviceGateway Compliant with safety standards, High spec model	DGW-W710	discretionary price
DeviceGateway Compact model	DGW-C10	discretionary price
DeviceGateway I/O equipped, Factory model	DGW-F20	-
DeviceGateway LTE equipped model	DGW-L30	-
DeviceGateway I/O and LTE equipped model	DGW-R40 (Scheduled for release in March 2024)	-

Software Products

Product Name	Protect Type	Model	List Price
DeviceGateway on Docker High spec model	Hardware Key	DGW-D20H-HW-E	discretionary price
	Software Key	DGW-D20H-SW-E	
DeviceGateway on Docker	Hardware Key	DGW-D20-HW-E	discretionary price
	Software Key	DGW-D20-SW-E	
DeviceGateway on Docker Basic model	Hardware Key	DGW-D20B-HW-E	discretionary price
	Software Key	DGW-D20B-SW-E	

関連製品

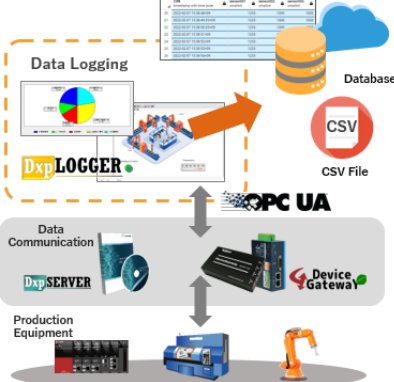**DeviceXPlorer® DataLogger** −OPC UA support data logging software−

High performance
Collect up to 65,536 data at any timing.
(512 x 128 group)

Connectivity
Using with OPC Server product, all data in production equipment can be collected.

Multifunction
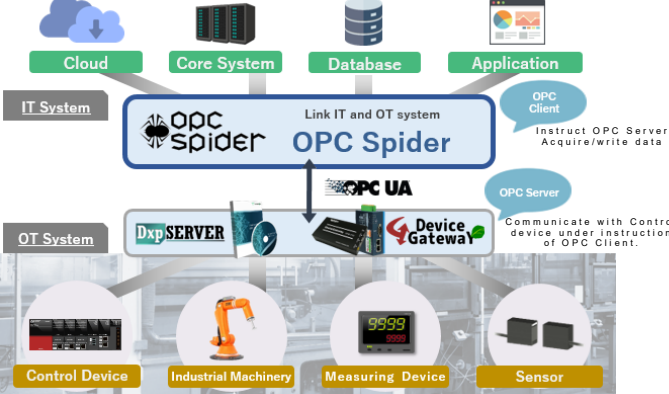Provides a range of functions such as data logging, alarm monitoring, graph and monitoring display.

OPC Spider® Data Linkage Platform

Link IT and OT system
OPC Spider

Instruct OPC Server Acquire/write data

Communicate with Control device under instruction of OPC Client.

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Videos : On YouTube at "Takebishi FAWEB" channel

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