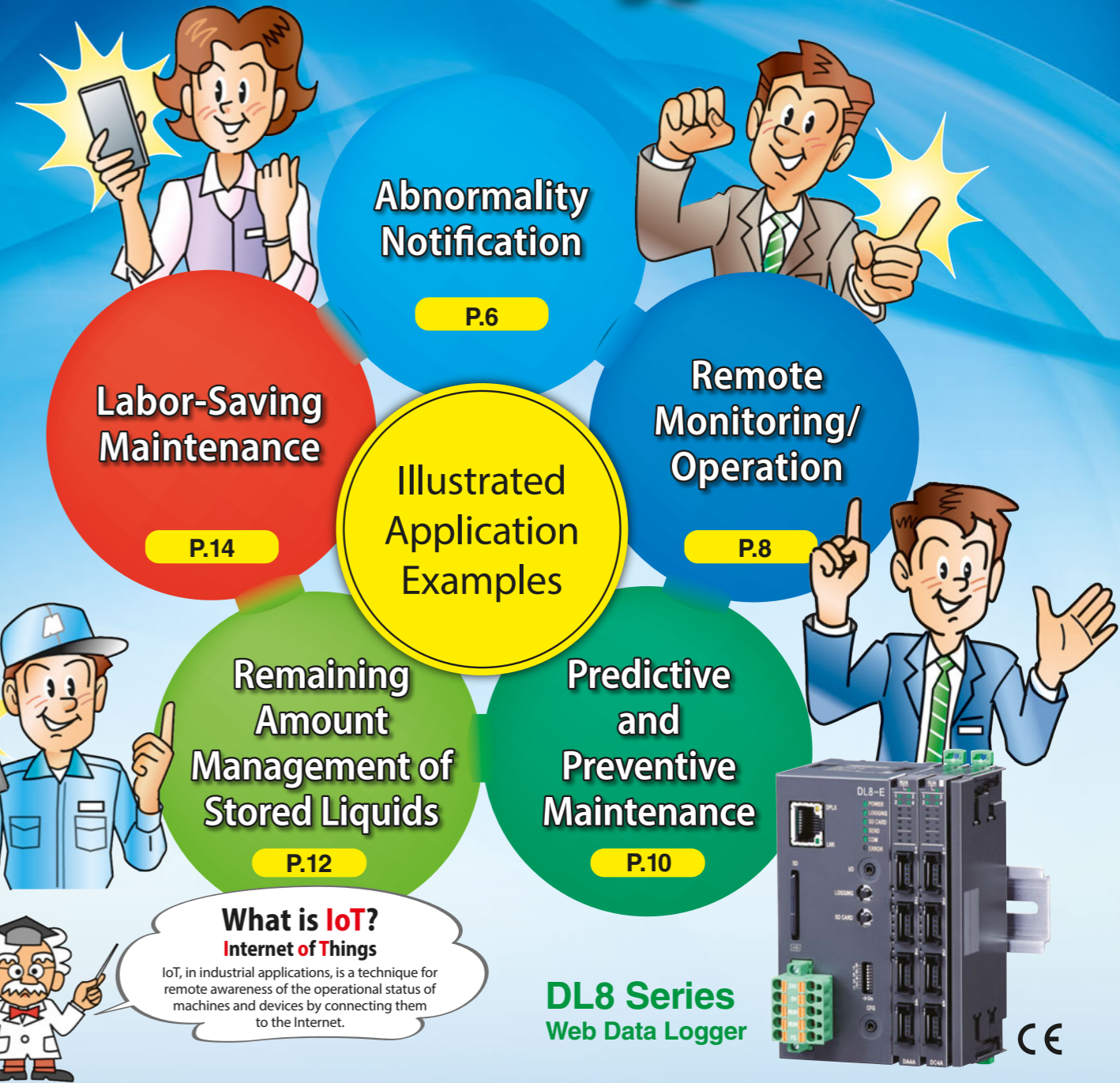


DL8 Web Data Logger for IoT



Website



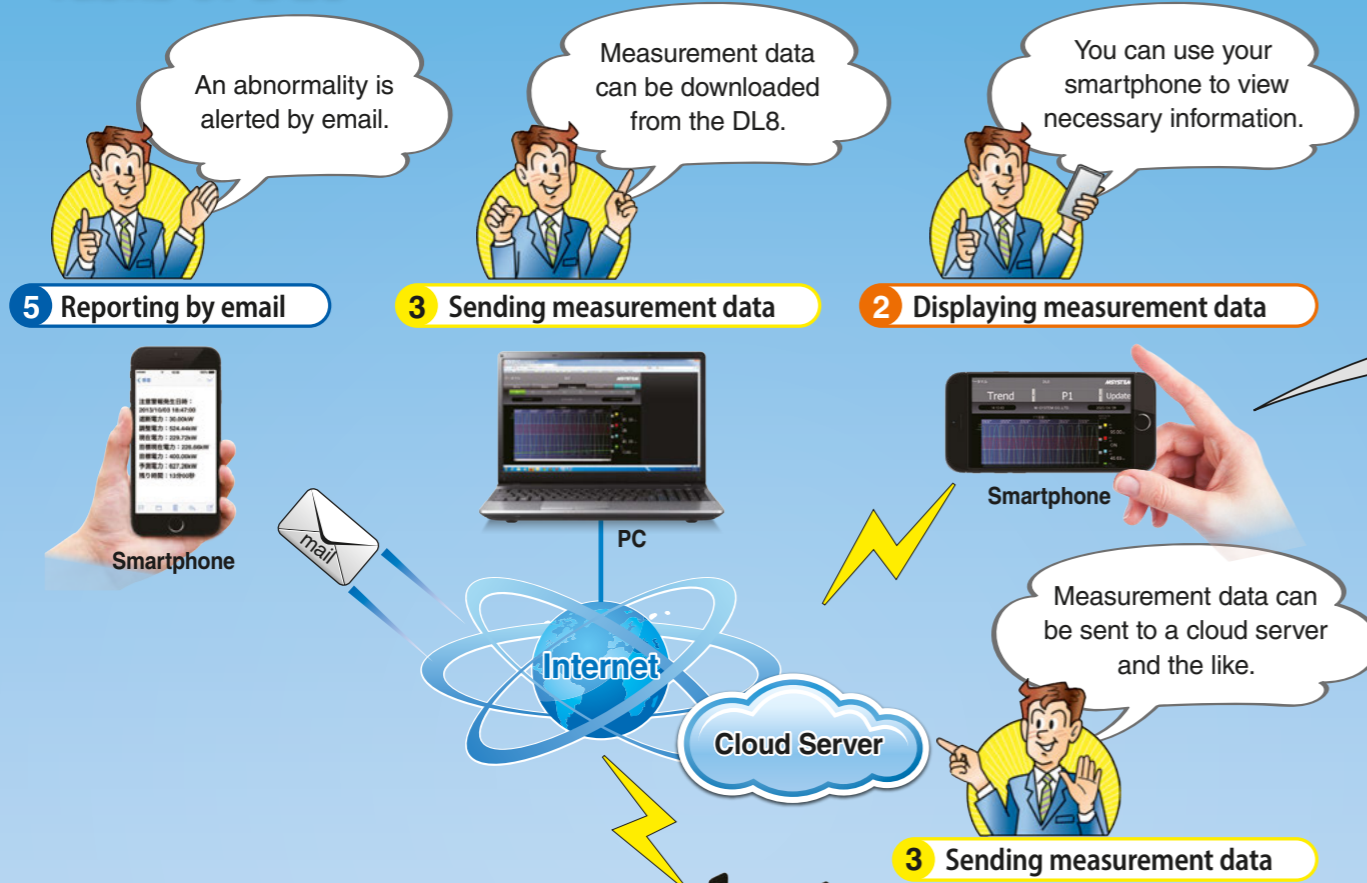
Request Info

MG CO., LTD.
(formerly M-System Co., Ltd.)
www.mgco.jp

Your local representative:



Tasks of DL8



Display Examples of PC/Smartphone

Trend view

Graphic view can be also created.

Remote operation from a PC/smartphone

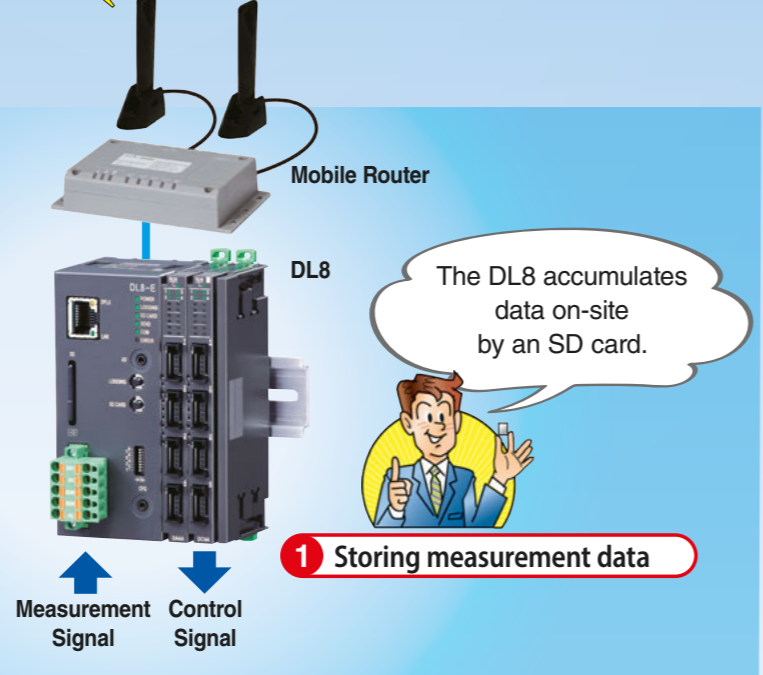
Remote output can be controlled from your smartphone.

Convenient event history screen

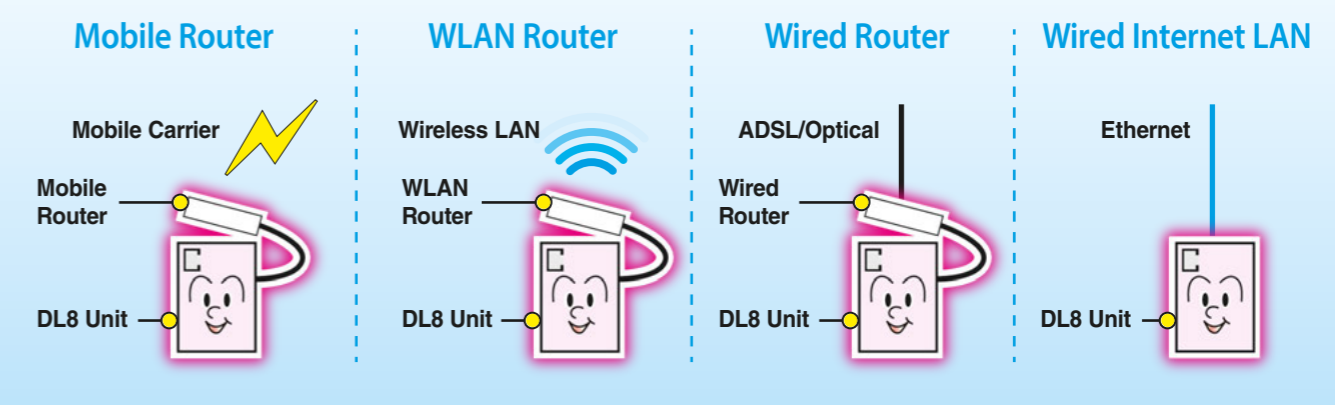
Time	Ch	Name	Comment	Event/Status	Signal
2015/03/31 13:36:01	AR3	Tank water level	LIC-03	Tank empty	HH
2015/03/31 13:35:57	AR1	Feedwater flow	PIQ-01	Demand Alarm	LO
2015/03/31 13:34:56	PRM	Energy consumption	WQ-06	9999 counts	HH
2015/03/31 13:34:42	AR2	Feedwater pressure	PIQ-02	Tank empty	LO
2015/03/31 13:34:40	PRM	Feedwater flow Q	PIQ-01	9999 counts	HH
2015/03/31 13:34:21	AR3	Tank water level	LIC-03	Tank empty	HH
2015/03/31 13:34:17	AR1	Feedwater flow	PIQ-01	Demand Alarm	LO
2015/03/31 13:33:25	PRM	Energy consumption	WQ-04	9999 counts	HH
2015/03/31 13:33:02	AR2	Feedwater pressure	PIQ-02	Tank empty	LO
2015/03/31 13:31:00	PR1	Feedwater flow Q	PIQ-01	9999 counts	HH
2015/03/31 13:32:41	AR3	Tank water level	LIC-03	Tank empty	LO
2015/03/31 13:32:37	AR1	Feedwater flow	PIQ-01	Demand Alarm	LO
2015/03/31 13:31:54	PRM	Energy consumption	WQ-04	9999 counts	HH
2015/03/31 13:31:22	AR2	Feedwater pressure	PIQ-02	Tank empty	LO
2015/03/31 13:31:30	PR1	Feedwater flow Q	PIQ-01	9999 counts	HH
2015/03/31 13:31:01	AR3	Tank water level	LIC-03	Tank empty	LO

5 Tasks of DL8

- 1 Storing measurement data
- 2 Displaying measurement data
- 3 Sending measurement data
- 4 Enabling remote operation
- 5 Reporting by email



In this brochure, variations of the DL8 character are introduced in combination with different types of routers.





Internet of Things

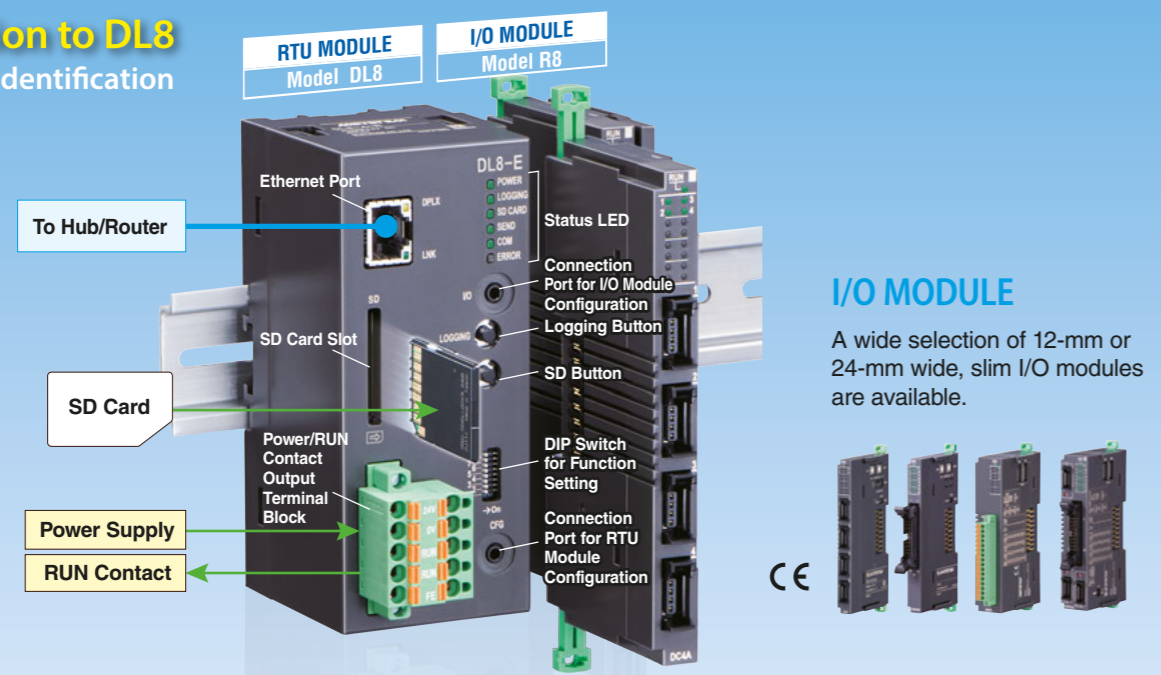
IOT

That Can Be Implemented Right Now



On-site measurement data can be viewed on a smartphone anywhere, anytime.

Introduction to DL8 Component Identification



I/O MODULE

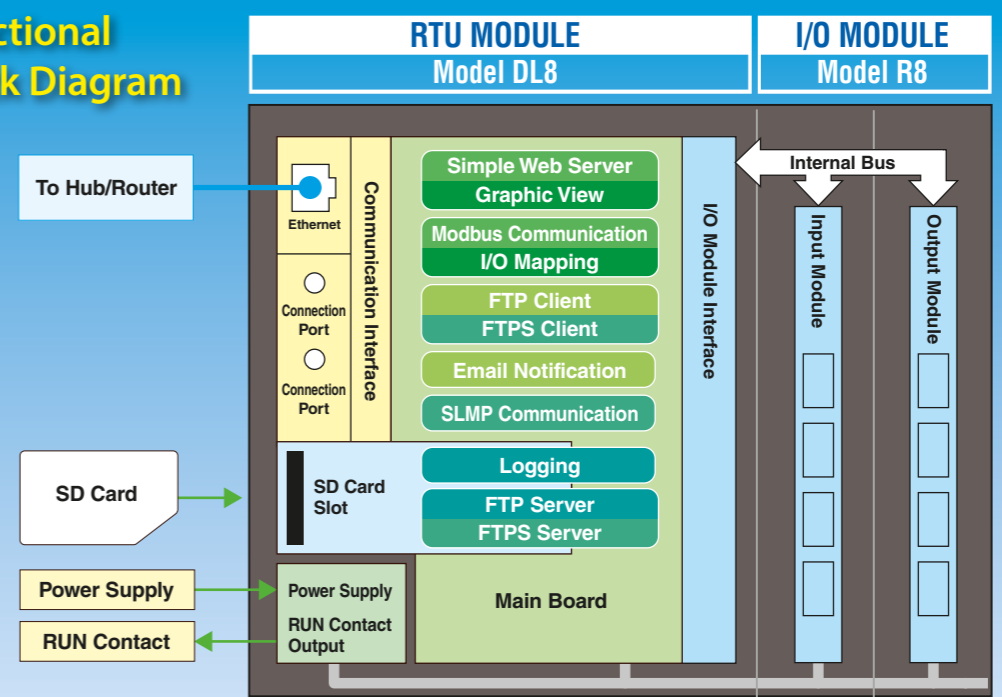
Signal Type	Max. Capacity* per module	Function	Model		
Analog input	32 points	DC current input (2 points, isolated)	R8-SS2		
		DC current input (4 points, non-isolated)	R8-SS4N		
		DC current input (4 points, non-isolated, sensor exc.)	R8-SS4NJ		
		DC current input (8 points, isolated, tension-clamp terminal block)	R8-SST8		
		DC voltage input (2 points, isolated)	R8-SV2		
		DC voltage input (4 points, non-isolated)	R8-SV4N		
		Thermocouple input (2 points, isolated)	R8-TS2		
		RTD input (4 points, non-isolated)	R8-RS4N		
		DC voltage/current input (4 points, non-isolated, sensor exc., tension-clamp terminal block)	R8-FST4N		
		DC voltage/current input (16 points, non-isolated, sensor exc.)	R8-FS16N		
		Discrete input	64 points	Contact input (4 points, NPN)	R8-DA4A
				Contact input (16 points, NPN)	R8-DAM16A
Contact input (8 points, NPN, tension-clamp terminal block)	R8-DAT8A2				
Contact input (16 points, NPN, tension-clamp terminal block)	R8-DAT16A2				
Contact input (8 points, PNP, tension-clamp terminal block)	R8-DAT8B2				
Pulse input	32 points	Totalized pulse input (4 points, NPN/PNP/voltage pulse)	R8-PA4		
		High-speed totalized pulse input (4 points, NPN)	R8-PA4F		
AC power input	32 points	AC current input (4 points, non-isolated, clamp-on current sensor)	R8-CT4E		
Analog output	32 points	DC voltage output (4 points, non-isolated)	R8-YV4N		
		DC current output (4 points, non-isolated, tension-clamp terminal block)	R8-YST4N		
		DC current output (2 points, non-isolated, sensor exc.)	R8-YS2NJ		
		DC current output (2 points, isolated)	R8-YS2		
Discrete output	64 points	Transistor output (4 points, NPN, shortcircuit protection)	R8-DC4A		
		Transistor output (4 points, NPN, voltage contact, shortcircuit protection)	R8-DC4A2		
		Photo MOSFET relay output (4 points)	R8-DC4C		
		Relay output (4 points, tension-clamp terminal block)	R8-DCT4D		
		Transistor output (16 points, NPN, shortcircuit protection)	R8-DCM16A		
		Transistor output (16 points, NPN, shortcircuit protection, full interlock)	R8-DCM16ALZ		
		Transistor output (16 points, NPN, shortcircuit protection, full and individual interlock)	R8-DCM16ALK		
		Transistor output (16 points, NPN, shortcircuit protection, full and partial interlock)	R8-DCM16ALH		
		Transistor output (32 points, PNP, shortcircuit protection)	R8-DCM32B2		
		Transistor output (8 points, NPN, shortcircuit protection, tension-clamp terminal block)	R8-DCT8A2		
		Transistor output (16 points, NPN, shortcircuit protection, tension-clamp terminal block)	R8-DCT16A2		
		Transistor output (8 points, PNP shortcircuit protection, tension-clamp terminal block)	R8-DCT8B2		
Pulse output	32 points	Pulse output (4 points, open collector)	R8-PC4A		

POWER SUPPLY MODULE

Function	Model
Power supply module for extension	R8-PS1

* Including extended remote I/Os

Functional Block Diagram



Remote Setting
More Info in Page 19

All setting parameters except the communication setting are easily set and changed via the Internet.

RTU MODULE

Five types selectable by usable functions



DL8-Type	Browse	Report	Log	I/O Marshalling Advanced View	Advanced Communication	Model
A	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	DL8-A
B	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	DL8-B
C	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	DL8-C
D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	DL8-D
E	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	DL8-E

Function Description of DL8

DL8-Type	Function	Details
<input type="radio"/>	Simple Web Server	Allows data browsing and operation from the browser screen of a smartphone or PC.
<input type="radio"/>	Modbus Communication	Interfaces the I/O data of the remote I/O.
<input type="radio"/>	FTP Client	Sends data to a server on the Internet.
<input type="radio"/>	Email Notification	Automatically reports alarms and events by email.
<input type="radio"/>	Logging	Stores the data collected at a constant cycle to SD card.
<input type="radio"/>	FTP Server	Sends the data stored in the memory to FTP client over the Internet.
<input type="radio"/>	Graphic View	Can provide original graphic views defined by the customer.
<input type="radio"/>	I/O Mapping	Assigns Modbus/TCP signals to specific terminals of remote devices.
<input type="radio"/>	Encrypted Communication	Performs encrypted communication by using HTTPS and FTPS protocols.
<input type="radio"/>	SLMP Communication	Collects data from a PLC using SLMP client function.

Abnormality Notification

The abnormality notification is a function that monitors a machine or device and sends notification by email when abnormality occurs.



Volcanic Gas Detection

System Configuration Page 16 No.1

Mobile Router DL8

- Hydrogen Sulfide
- Sulfurous Acid Gas
- Outside Temperature
- Humidity

Owakudani Valley, Hakone Mountain

If gas is detected, email and data are sent.

BEFORE

AFTER

Hydrogen sulfide! It stinks! Run away!

Microbrewing

System Configuration Page 17 No.6

LAN

Mobile Router DL8

- Tank Internal Pressure
- CO₂ Concentration

The tank pressure and CO₂ concentration determine the taste of beer.

No.2 Tank Alarm

I can be easy in my mind because I receive email automatically when any of the tanks show abnormality.

BEFORE

AFTER

I have to monitor all of the tanks for 24 hours.

Water Quality Analyzer

System Configuration Page 16 No.2

Mobile Router DL8

- Turbidity
- Chromaticity
- pH

Water Quality Analyzer

Water Pipe

Internet

No more need for going the round. I will receive email when there is even 1 case of abnormality.

BEFORE

AFTER

Off to go the round for water quality monitoring!

Cleanroom

System Configuration Page 17 No.6

LAN

Mobile Router DL8

- Ventilation Air Volume
- External Air Pressure
- Internal Pressure
- Operating Status of FAN

I can be easy in my mind because I receive email report every hour.

BEFORE

AFTER

Abnormality may occur! I cannot leave the place.

Landslide Hazard

System Configuration Page 16 No.1

Mobile Router DL8

- Pulse Signal of Rain Gauge
- Wind Direction, Wind Velocity
- Outside Temperature

I will receive email when the rainfall exceeds the set value.

BEFORE

AFTER

Here is a designated landslide risk hazard area.

Extra-High Voltage Substation

System Configuration Page 17 No.6

LAN

Mobile Router DL8

- Leak Current Alarm
- Reactive Power

Abnormality notification! Hurry to the site!

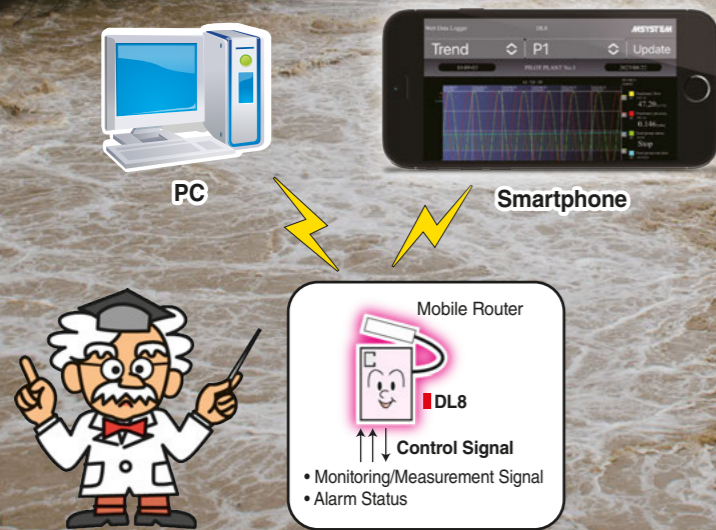
BEFORE

AFTER

Someone must be on duty at all times according to the safety regulations.

Remote Monitoring/Operation

You can monitor and operate widely distributed machines and devices on the Internet without having to go to the site.

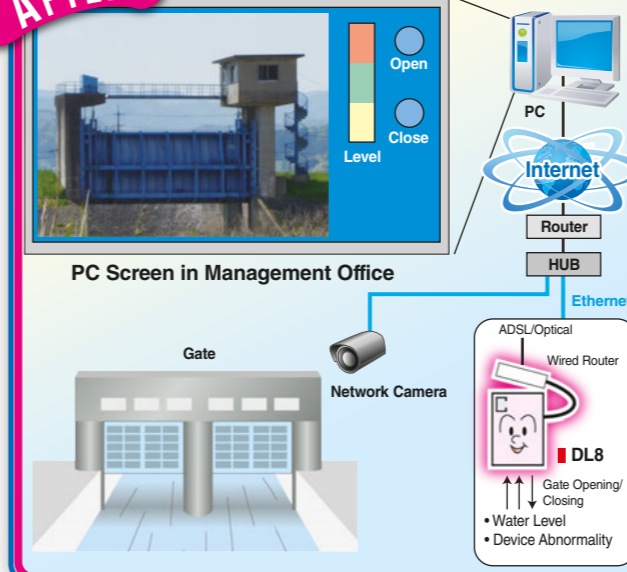


Irrigation Channel Gate

System Configuration Page 16 No.3

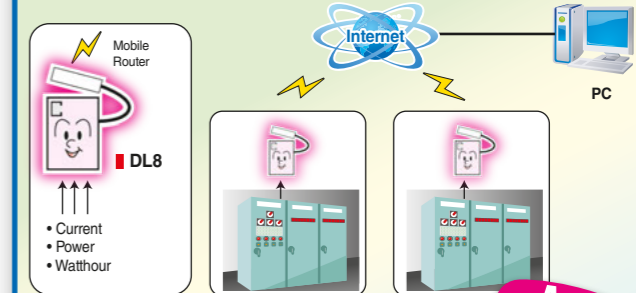
It's so convenient when it rains heavily that we can control the gate from the management office.

AFTER



Power Monitoring of Resort Hotel

System Configuration Page 16 No.1



The DL8 connects to the Internet wirelessly. No network wiring work!

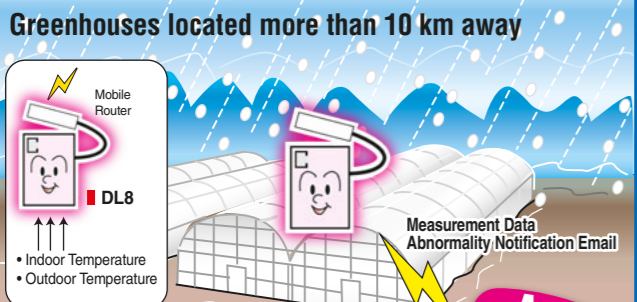
AFTER

BEFORE



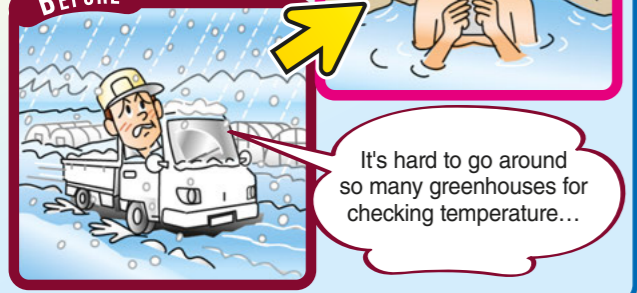
Greenhouses

System Configuration Page 16 No.2



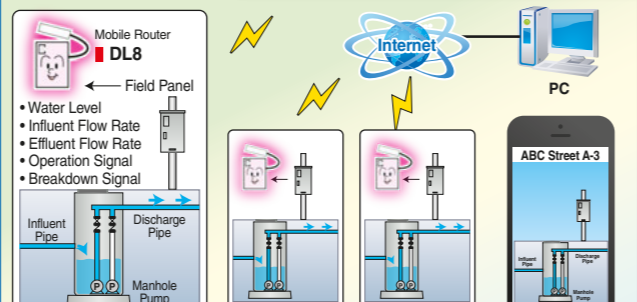
AFTER

BEFORE



Manhole Pump

System Configuration Page 16 No.1



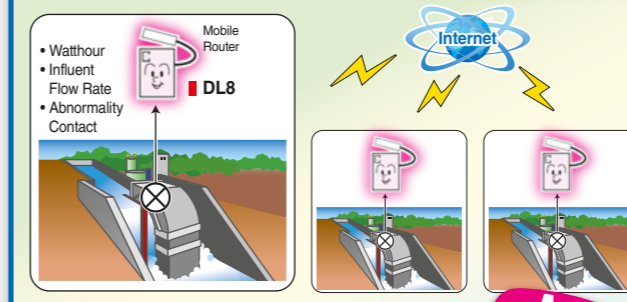
AFTER

BEFORE



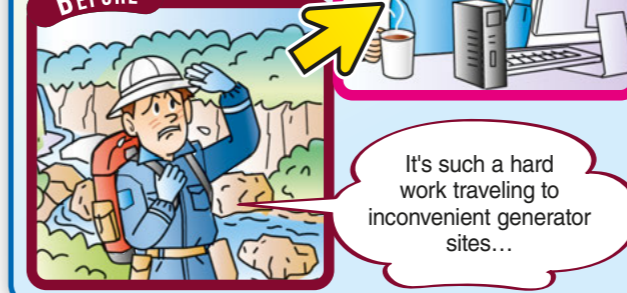
Micro Hydropower Generator

System Configuration Page 16 No.1



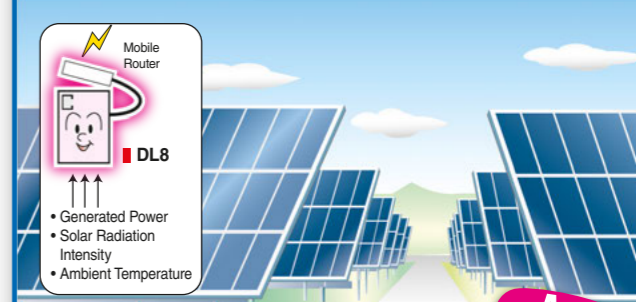
AFTER

BEFORE



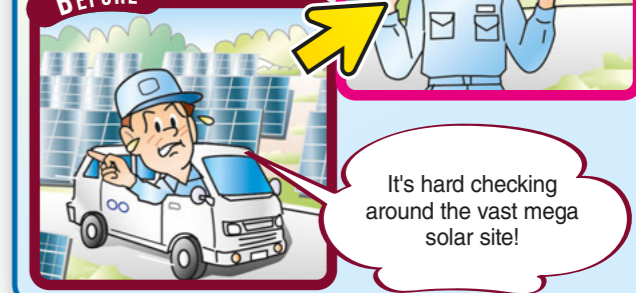
Solar Power Generation

System Configuration Page 16 No.1



AFTER

BEFORE



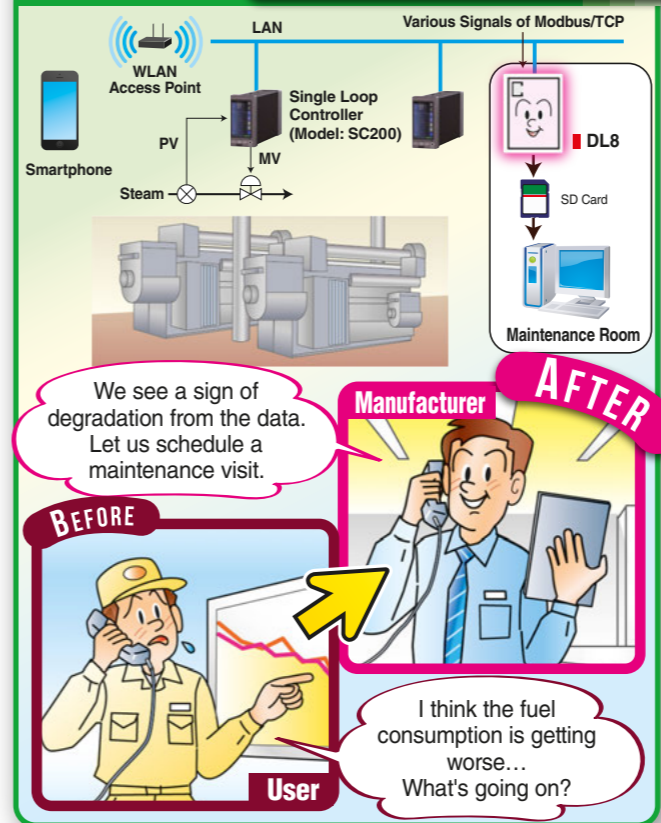
Predictive and Preventive Maintenance

Determining the degree of wear by storing the measurement data of machines and devices in the server via the Internet and LAN prevents problems in advance.



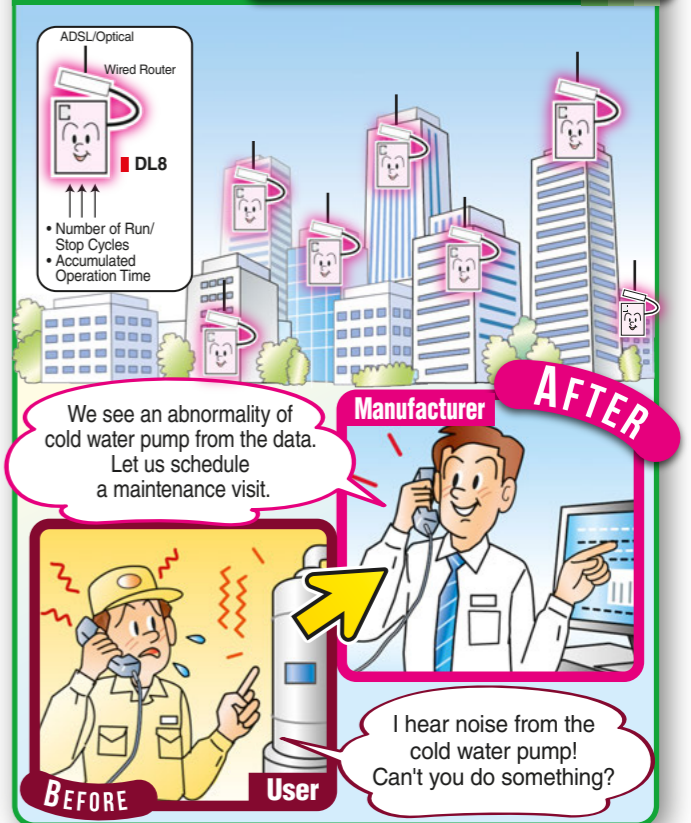
District Heating/Cooling

System Configuration Page 17 No.7



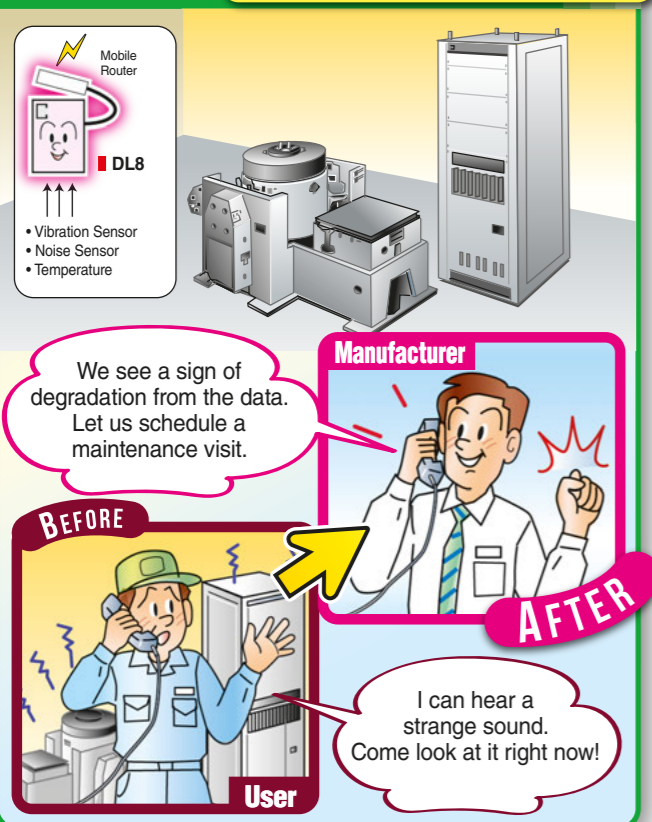
Building Maintenance

System Configuration Page 16 No.3



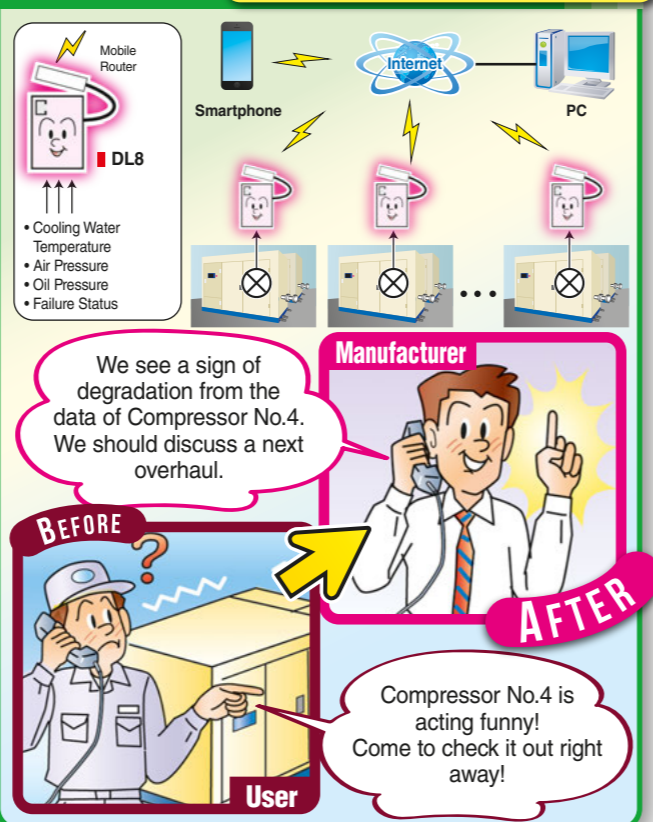
Vibration Test Systems

System Configuration Page 16 No.1



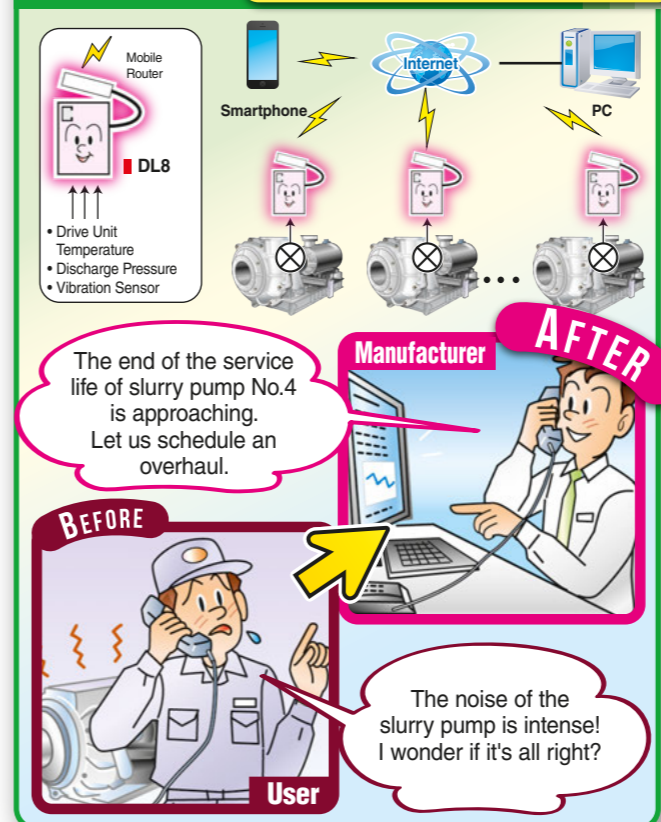
Compressors

System Configuration Page 16 No.4



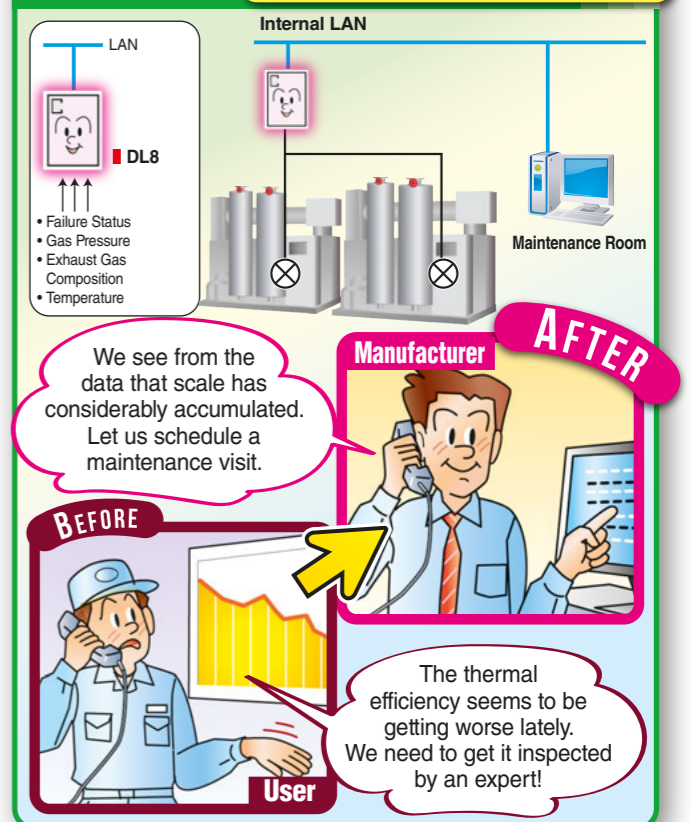
Slurry Pump

System Configuration Page 16 No.1



Boiler

System Configuration Page 17 No.6



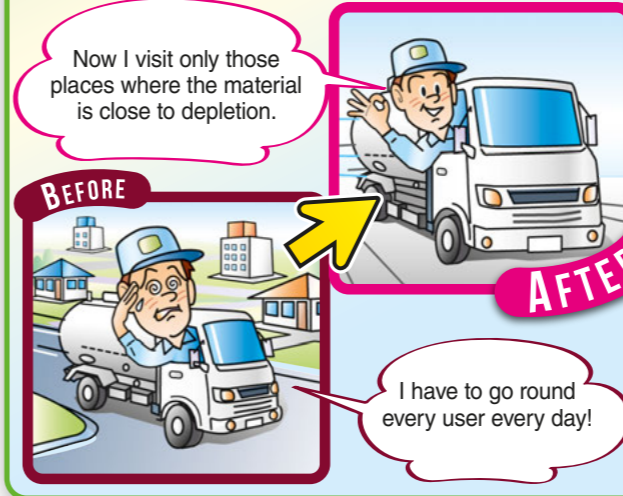
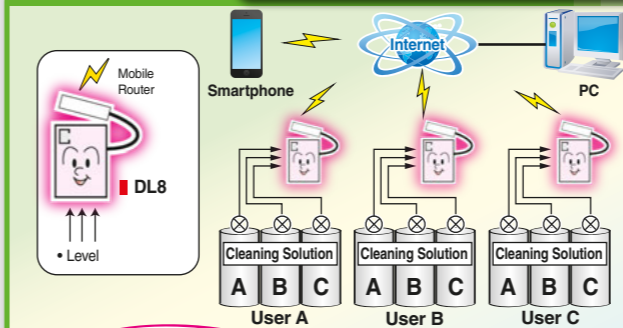
Remaining Amount Management of Stored Liquids

Managing the usage trend and remaining amount of stored liquids in hospitals and factories via the Internet or LAN can prevent raw materials from running out while enabling the delivery plan with increased efficiency.



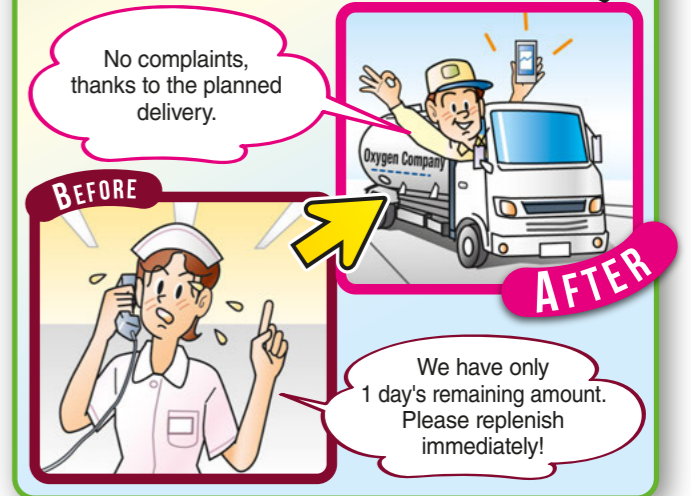
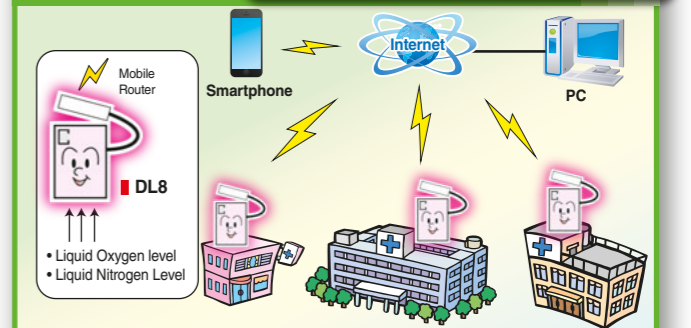
Cleaning Solution

System Configuration Page 16 No.1



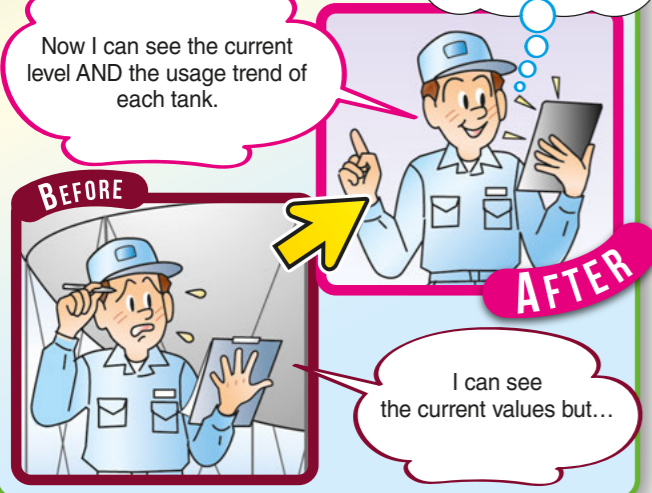
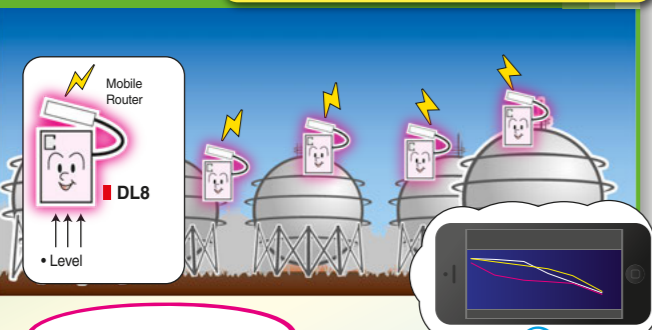
Liquid Oxygen/Nitrogen

System Configuration Page 16 No.1



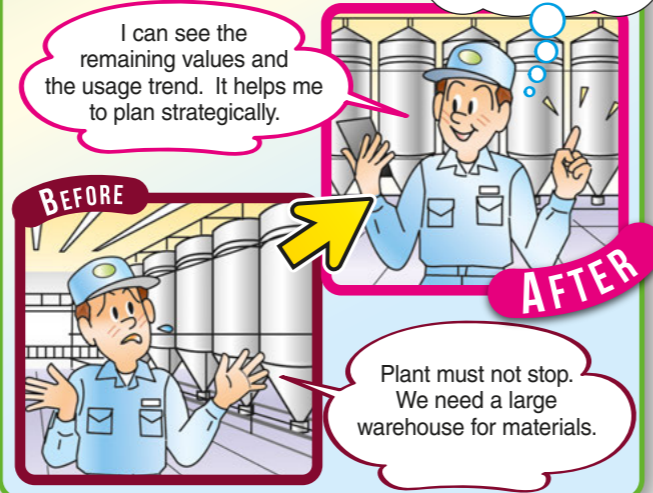
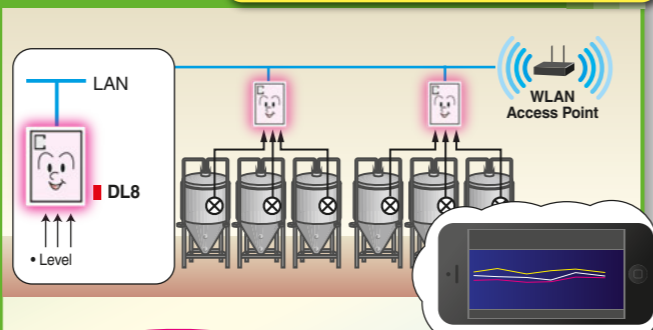
Gas

System Configuration Page 16 No.1



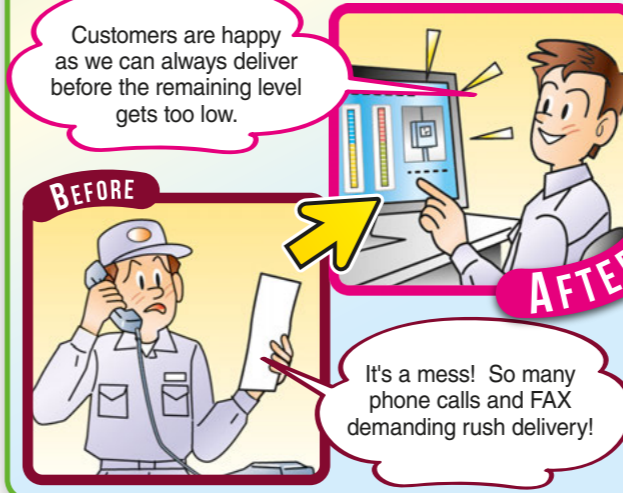
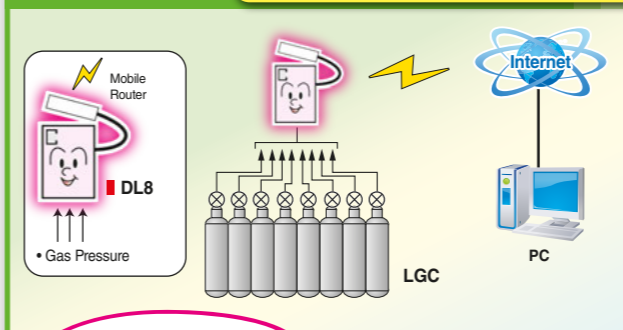
Seasoning

System Configuration Page 17 No.6



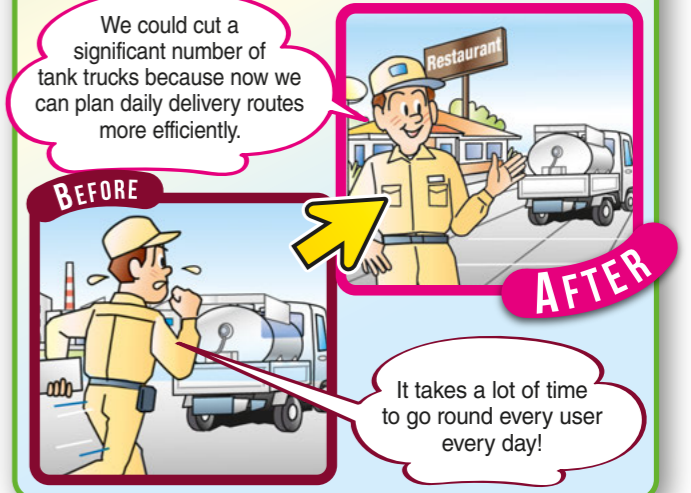
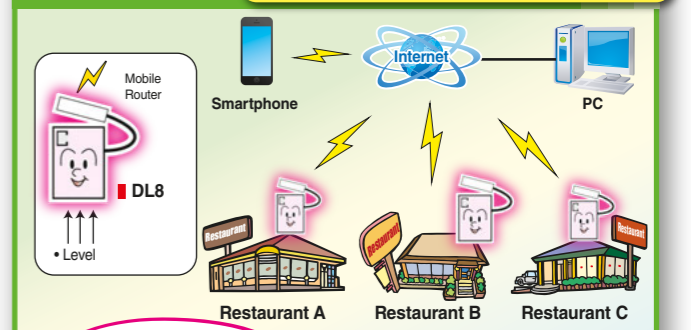
LGC for Factory (Liquid Gas Container)

System Configuration Page 16 No.1



Detergent for Chain Restaurant

System Configuration Page 16 No.1



Labor-Saving Maintenance

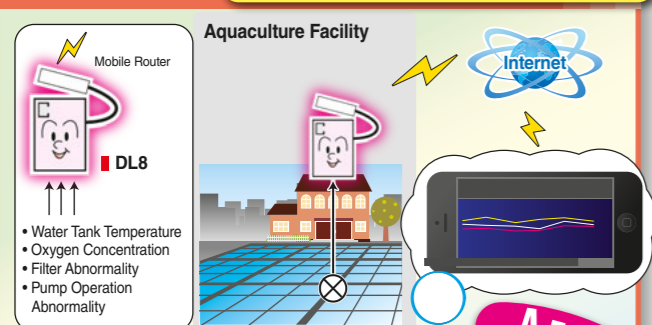
Maintenance routines can be significantly reduced by connecting machines and devices to the Internet or LAN.



Process Plant

Aquaculture Facilities

System Configuration Page 16 No.1



BEFORE

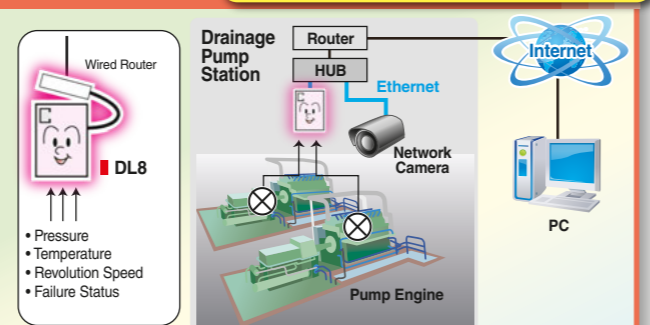
I need to check frequently the dissolved oxygen concentration and temperature.

AFTER

I can check the temperature and trend of all the measurement points in my office.

Engine

System Configuration Page 16 No.3



BEFORE

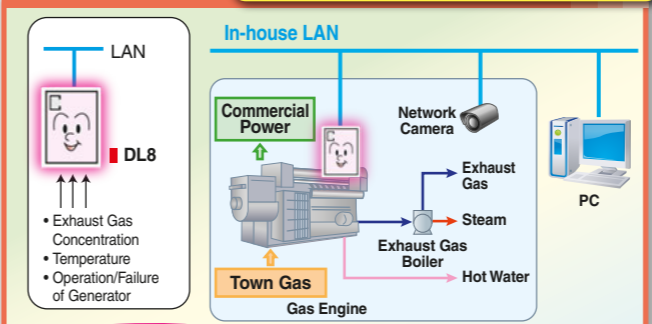
I have to go round every pump station for testing.

AFTER

It is convenient that I can remotely perform test runs of all pump stations and collect operation data.

Gas generator

System Configuration Page 17 No.6



BEFORE

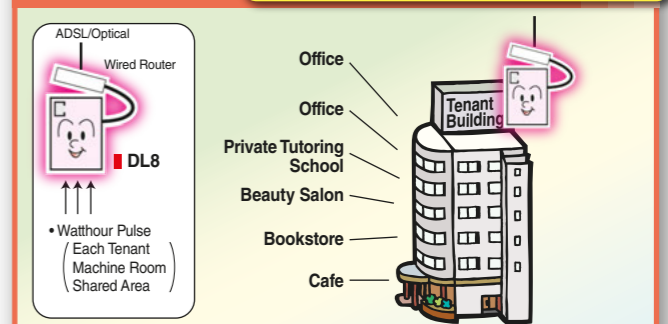
It takes a lot of time to go round all the generators every day!

AFTER

I do not need to go round as I can check the site by the web camera and operation data are stored in the server.

Automatic Watthour Metering of Tenant Building

System Configuration Page 16 No.3



BEFORE

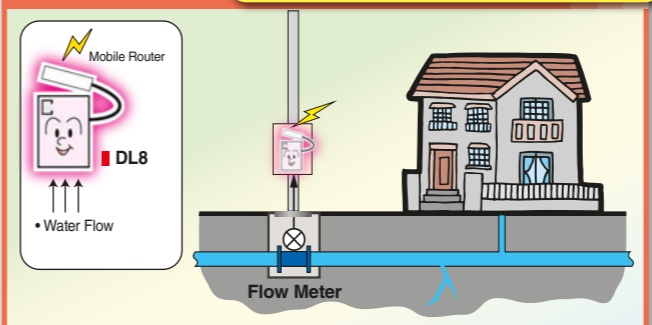
It's hard to go around reading the meters every month!

AFTER

Now all meter values are in the server, and billing and debit transfer is automatic.

Water Leak Detection

System Configuration Page 16 No.2



BEFORE

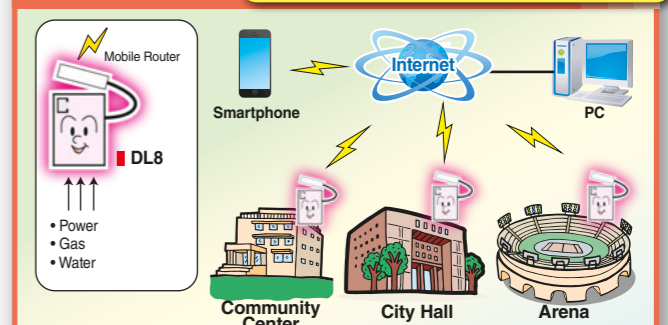
Only skilled persons can find the leakage points!

AFTER

We can find leakage points easily by continuously measuring water flow.

Energy Monitoring

System Configuration Page 16 No.2



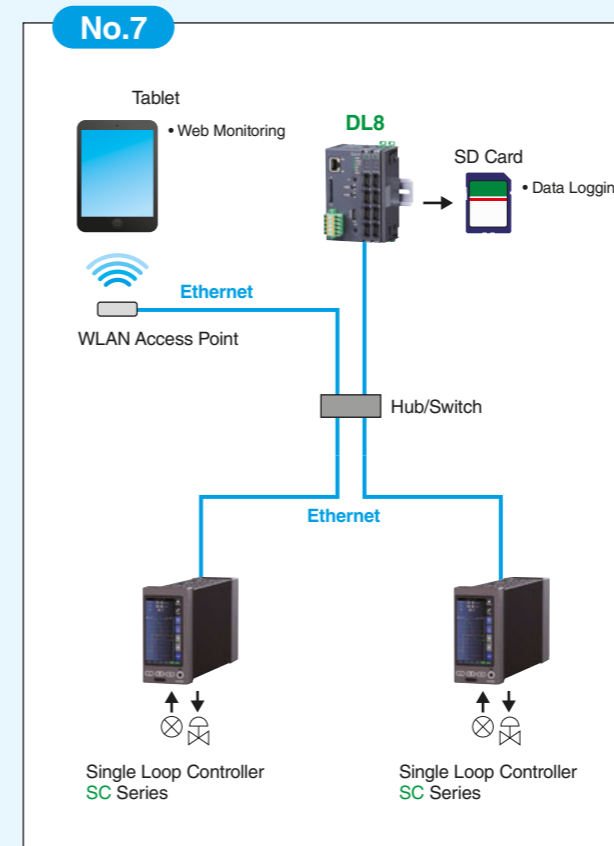
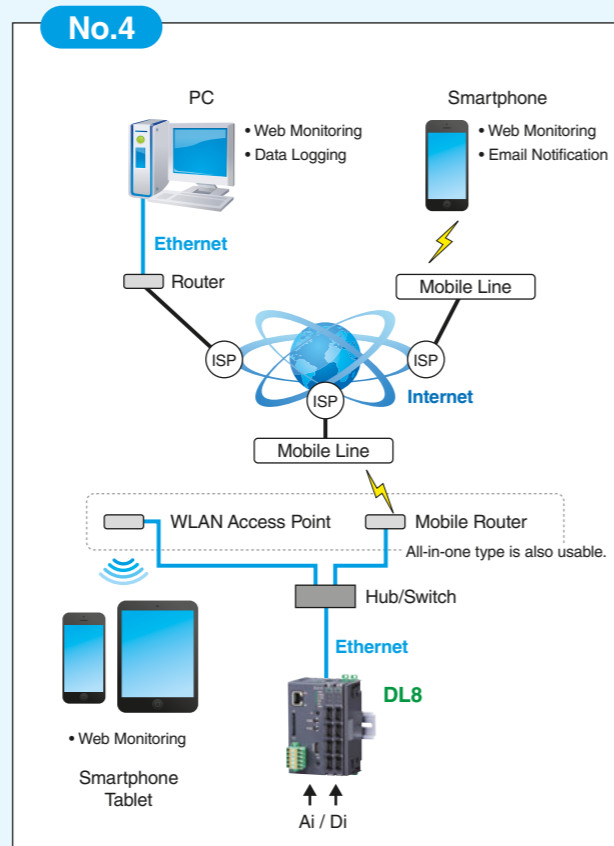
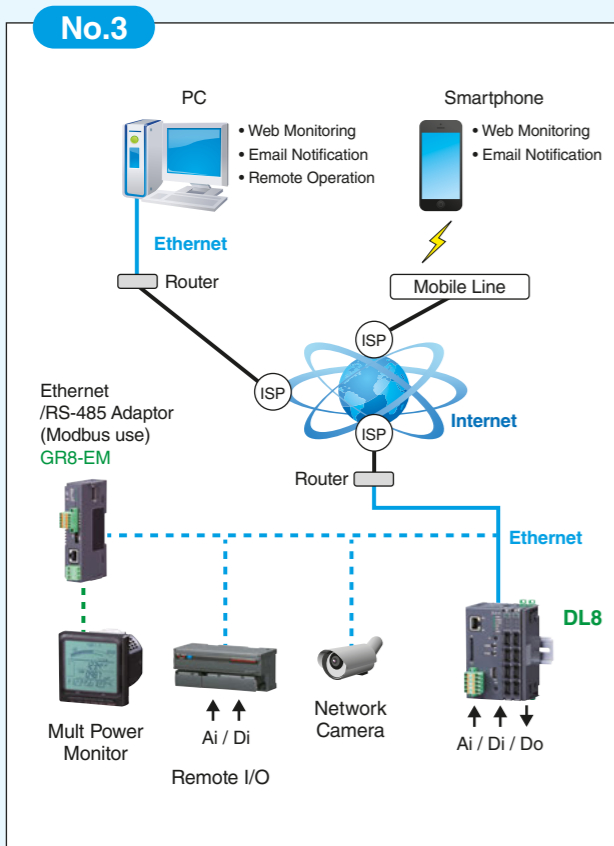
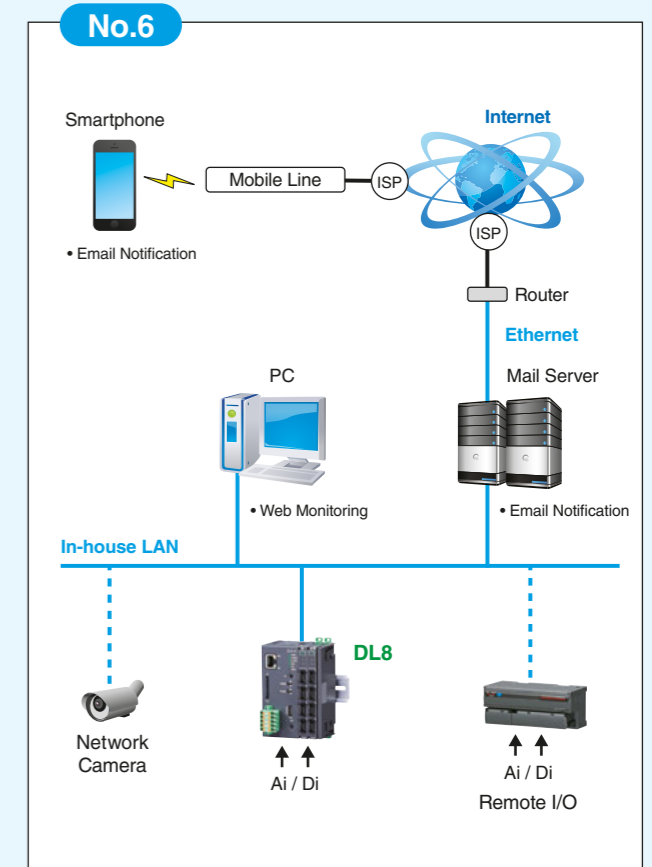
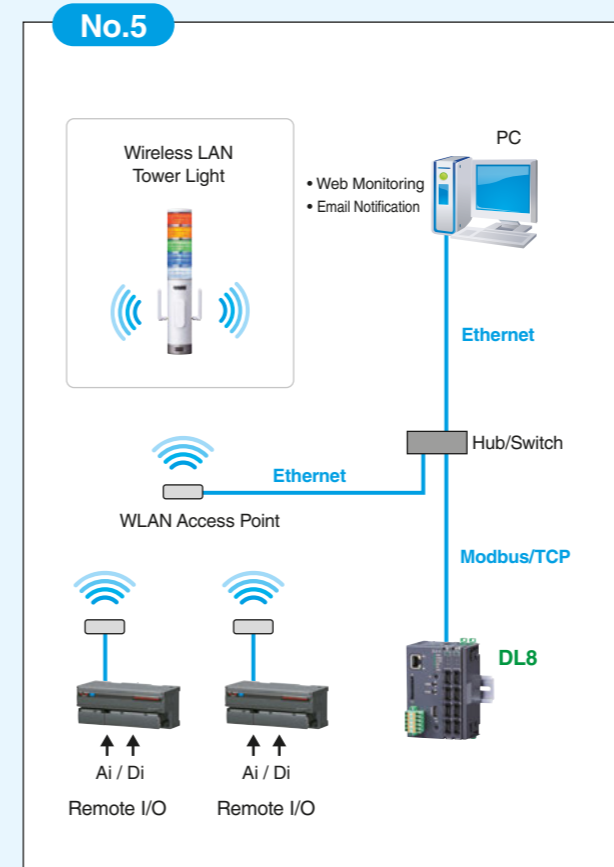
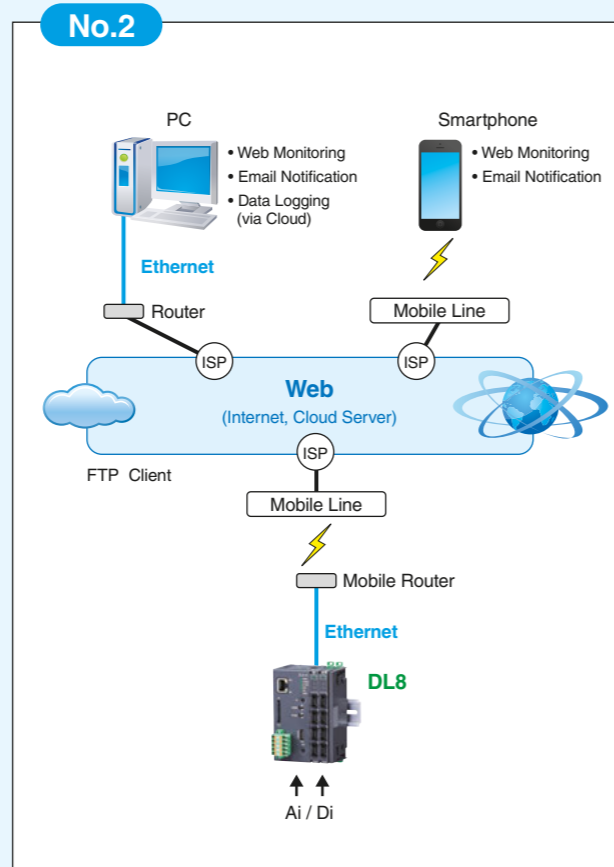
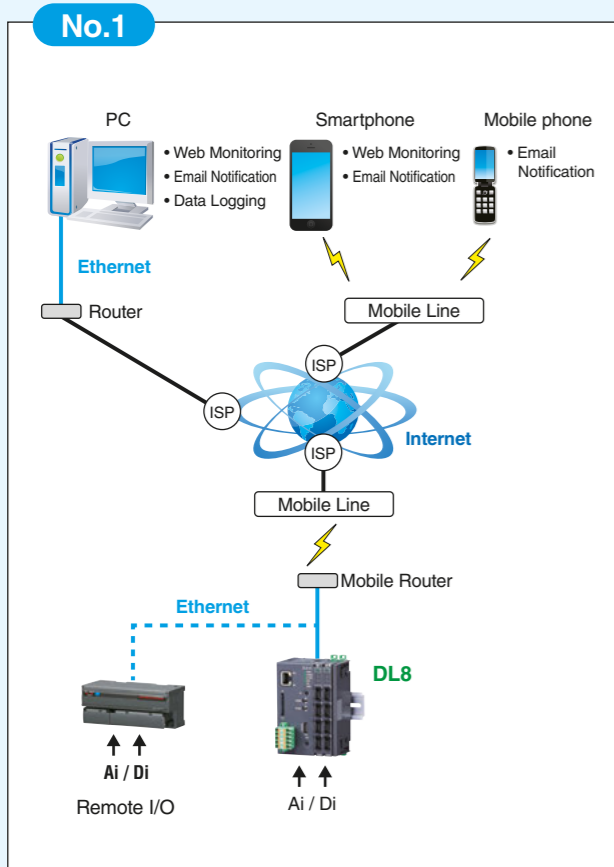
BEFORE

It's hard to go around reading the meters in 600 places!

AFTER

We can manage the usage of electricity, gas and water via server over the Internet.

System Configuration Examples



RTU MODULE SPECIFICATIONS

Refer to our website for information on the I/O modules.

GENERAL SPECIFICATIONS

Max. number of I/O modules: 16
(Max. consumption current of I/O modules: 1.6 A)
Isolation: Ethernet to internal bus or internal power or power supply (exc. supply) to RUN contact output*1 to FE
Calendar clock: Year (4 digits), month, date, day, hour, minute, second
Status indicator LED: POWER, LOGGING, SD CARD, SEND, COM, ERROR
RUN contact output*1: Photo MOSFET relay (no polarity); (OFF in error detected)
*1. Run contact output is applicable for Type C with the DL8 firmware version 1.4.x or later.

ETHERNET COMMUNICATION

Communication Standard: IEEE 802.3u
Transmission: 10BASE-T, 100BASE-TX
Baud rate: 10/100 Mbps (Auto Negotiation function)
Protocol: TCP/IP, Modbus/TCP, SLMP, HTTP, HTTPS, FTP, FTPS, SMTP, SNTP
Transmission media: 10BASE-T (STP, Category 5), 100BASE-TX (STP, Category 5e)
Max. length of fieldbus segment: 100 meters
Ethernet indicator LED: DPLX, LNK
IP address: 192.168.0.1 (factory setting)

INSTALLATION

Power input: 24 V DC
Power consumption: Approx. 12 W 24 V DC
@ internal power max. current 1.6 A
Internal power supply (power supply for I/O module): 5 V DC, 1.6 A
Excitation supply output (excitation for I/O module): 24 V DC $\pm 10\%$, operational current 7 A
(From power supply (excitation supply) connector, via connector for internal bus, supplied to each I/O module. Power output current consumption must be under operational current.)
Operating temperature: -10 to +55°C (14 to 131°F)
Operating humidity: 30 to 90 %RH (non-condensing)
Atmosphere: No corrosive gas or heavy dust
Mounting: DIN rail
Weight: 190 g (0.42 lb)

PERFORMANCE

Battery: Vanadium-lithium secondary battery (undetachable)
Calendar clock accuracy: Monthly deviation 2 minutes at 25°C
Battery backup: Approx. 2 months
Insulation resistance: $\geq 100 \text{ M}\Omega$ with 500 V DC
Dielectric strength: 1500 V AC @ 1 minute (Ethernet to internal bus or internal power or power supply (exc. supply) to RUN contact output to FE)

COMPATIBLE BROWSING DEVICE

- **Software requirement**
Functional checked environment
- **PC**
 - OS: Windows 8.1 (32-bit/64-bit), Windows 10 (32-bit/64-bit)
 - Browser: Internet Explorer 11, Microsoft Edge 96.0, Chrome 97.0, Firefox 95.0
- **Tablet**
 - OS: iPad (iPadOS 15.2); Android terminal (Android 10.0)
 - Browser: iOS: Safari; Android: Chrome
- **Smart phone**
 - OS: iPhone (iOS 15.2); Android terminal (Android 10.0)
 - Browser: (iOS) Safari; (Android) Chrome

COMMUNICATION

IP: DHCP client is supported. Manual setting of IP address, subnet mask, default gateway and DNS server available too.
Modbus/TCP slave: Remote observation system via SCADA etc. Number of connections 4
Modbus/TCP master: I/O expansion with remote I/O, e.g. R3 or R7 series, is available. Measuring points in multiple locations can be handled collectively.
SLMP Client: DL8 allows I/O expansion by connecting with the SLMP-compatible CPU unit of Mitsubishi programmable-controller MELSEC; and collectively handles data from measuring points in multiple locations.
Web server function (Direct): This unit can be a Web server, and 'Data,' 'Trend' and 'Event Log' views are available from remote location.
Web server function (Cloud): This unit can be an FTP client, and upload the Web files to a cloud server. Users can browse the cloud server. Multiple users can access it at once without extra load at the unit. (only browsing, operation not available.)
Analog input: 32 points
Discrete input: 64 points
Pulse input: 32 points
Discrete output: 64 points
Analog output: 32 points (firmware version of the unit: 1.4.x or later)
(For pulse input, only 32 bit data is available. It is not available for the products using 16 bit data (model: R3-PA16 etc.).)

ALARM OUTPUT (Type B, C, D, E)

Event can trigger an alarm contact at a discrete output module.

- Transition of analog input zone
- Transition of pulse input zone
- Status change of discrete input
- Count up of discrete input

EVENT REPORTING (Type B, C, D, E)

Reporting email function available at event or designated time.
Encrypted communication is supported. (SMTP over SSL).
The DL8 turns a designated Do ON after transmitting the report.

- Number of email attention: 32
- Number of event report text: 32
- Number of regular report text: 1
- Channel status: AI, DI, PI, DO, AO status attachable to email (DO and AO are available with firmware version of the unit 1.4.x or later)
- Output at transmitting failure: 1 point

LOGGING (Type C, D, E)

Log files in text format are stored into an SD card. The number of logs depends on the free space of the SD card.

- Log file: System log, event log, email report log, channel log

FTP CLIENT (Type B, C, D, E)

The recorded data is uploaded to an FTP server and FTPS server (Type E) in CSV format in specified interval time.
User can define the CSV file.

- Number of channel: Max. 32 (Selectable within AI, DI, DI (counter), PI, DO, AO) (AO is selectable with firmware version of the unit 1.4.x or later)
- Sampling rate (Firmware version 1.6.x or later) 1 or 2 sec (Interval time: 1 or 10 min. or 1 hr.) 5, 10 or 30 sec. (Interval time: 10 min. or 1 hr.) 1, 2, 5, 10, 15, 20 or 30 min. (Interval time: 1 day)
- Sampling rate (Firmware version 1.2.x or later) 1 or 2 sec (Interval time: 1 or 10 min. or 1 hr.) 5, 10 or 30 sec. (Interval time: 10 min. or 1 hr.) 1, 2, 5, 10 or 30 min. (Interval time: 1 day)
- Sampling rate (Firmware version 1.1.x or earlier) 1, 2, 5, 10 or 30 sec. (Interval time: 1 hr.) 1, 2, 5, 10 or 30 min. (Interval time: 1 day)

 To confirm the firmware version, use the configurator software, model: DLCFG. Event can trigger an alarm contact at a discrete output module.

TREND DATA STORING (Type C, D, E)

The logged data is written into the SD card in CSV format.
User can define the CSV file.

- Number of channels: Max. 32 (Selectable within AI, DI, DI (counter), PI, DO, AO) (DO and AO are selectable with firmware version of the unit 1.4.x or later)
- AI sampling: Momentary, average, peak (max.), peak (min.)
- Logging rate: Second: 1, 2, 5, 10, 20, 30 sec. Minute: 1, 2, 5, 10, 15, 20, 30 min. (15 min. is selectable with firmware version 1.5.x or later) On the hour: 0 to 23 o'clock (1 or more times available; specify time delay for each set time) Day start time and days to log are available.
- Recordable up to the SD card size. Automatically deleted. (Auto delete is available with firmware version of the unit 1.4.x or later)
- Recording period (as a guide): Approx. 180 days (logging rate: 1 sec, 32 channels, only trend storing)

FTP SERVER (Type C, D, E)

Reading and deleting files in the SD card by an FTP client and an FTPS client (Type E) are available.
 Compatible FTP client

- Explorer
- FFFTP 4.4

 Compatible FTPS client

- FFFTP 5.6

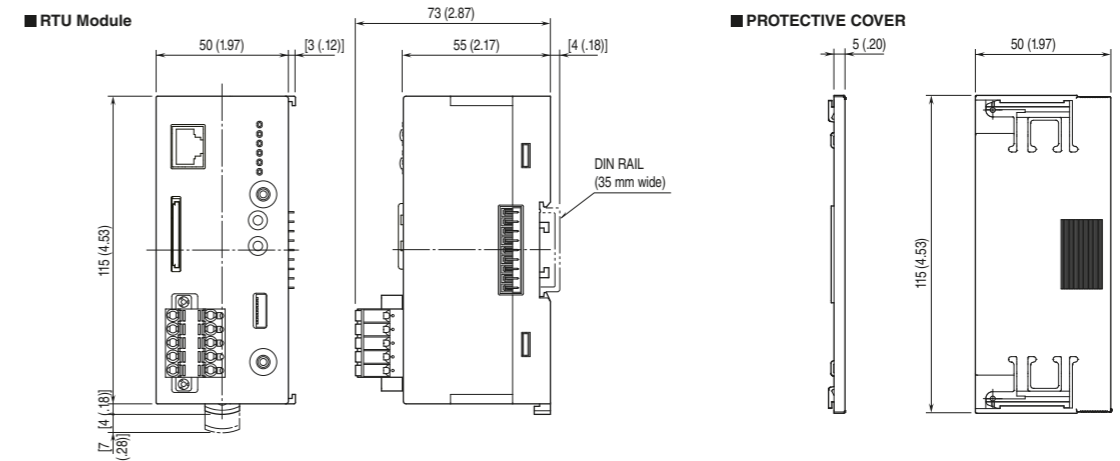
I/O MAPPING (Type D, E)

Multiplex Data Transmission for remote I/O and IP telemeter is available by registering DI-to-DO or AI-to-AO mapping information.

USER DEFINED BROWSER VIEW (Type D, E)

The browser view is user-definable. Development tools for HTML file are not available by us. Provide by customer.

EXTERNAL DIMENSIONS unit: mm (inch)



How To Setup the DL8

Setup System Configuration

