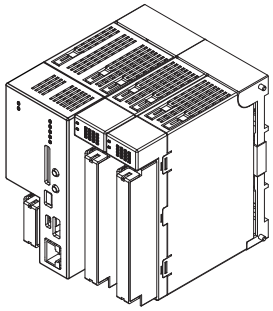
Web Data Logger DL30

WEB-ENABLED REMOTE TERMINAL UNIT

Functions and Features

• Remotely monitors temperature, pressure, voltage, and operation status of instruments and equipment through the communication infrastructure, and records them in an SD card.
• Allows Web browsing of the current and recorded data.
• Creates daily, monthly, and annual reports.
• Provides user-friendly web browser screens (trend, data, event, and report views).
• Allows users to create custom graphic views.
• Monitors input signals and reports by e-mails when certain conditions are met.
• Flexibly combined with R30 series I/O modules depending on required signal types and the number of points.
•Communication function
- Modbus/TCP master and slave
- SLMP client



MODEL: DL30-G-R[1]

ORDERING INFORMATION

• Code number: DL30-G-R[1]
Specify a code from below for [1].
(e.g. DL30-G-R/Q)
• Specify the specification for option code /Q
(e.g. /C01)

MODULE TYPE

G: High functionality

POWER INPUT

DC power
R: 24 V DC
(Operational voltage range: ±10 %; ripple 10 %p-p max.)

[1] OPTIONS

blank: none
/Q: Options other than the above (specify the specification)

SPECIFICATIONS OF OPTION: Q

COATING (For the detail, refer to M-System's web site.)
/C01: Silicone coating
/C02: Polyurethane coating
/C03: Rubber coating

FUNCTIONS & FEATURES

DL30 is used in combination with an installation base (model: R30BS) and I/O modules (Remote I/O R30 series)

■ DL30

•Collection and recording of input data, and transmission of output data

DL30 collects data from I/O modules via the internal bus of the installation base, and records the data to the internal memory and to an SD card;
connects with remote I/O modules using Modbus/TCP via Ethernet, and collects and records input data of the remote I/O modules;
connects with Mitsubishi programmable-controller MELSEC via SLMP to access data of the CPU of MELSEC; and
outputs an alarm to an output module according to the preset alarm level.

• Web server

DL30 works as a web server to display collected data on the web browser of a PC or tablet.
Various setting and operation can be performed through the web browser.

• Internal power

Internal power required for DL30 and I/O modules is generated from supplied power.

■ I/O MODULES

An output module outputs data received through the internal bus as discrete outputs; and outputs discrete input data and A/D converted analog input values to the internal bus. (Refer to the specification of each R30 I/O module for details.)

■ INSTALLATION BASE

The base for mounting modules thereon incorporates PWB for internal power and the internal bus. (Refer to the specification of R30BS)

RELATED PRODUCTS

• Remote I/O R30 series
• PC Configurator cable
USB 2.0 compatible cable
(DL30 connector: mini-B type, 5.0m max.)
• PC configurator software (model: DL30GCFG)

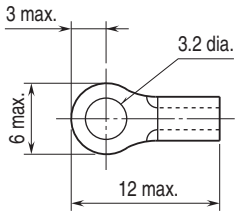
• PC configurator software (model: R30CFG)
• User-defined web browser screen designing software (model: DL30 Web Designer)
• Local certification authority creator (model: LCA-DL30)
Software downloadable at M-System's web site.
• SD card
An SD card is required to store data in the unit.
Use an SD card of the designated model number which is available commercially and from M-System.
- Hagiwara Solutions NSD6-016GH(B20SEI, NSD6-004GH(B21SEI
(NSD6-004GH(A00SDI ... discontinued)

GENERAL SPECIFICATIONS

Connection
RUN contact output, power supply: M3 separable screw terminal (torque 0.5 N·m)
Ethernet: RJ-45 modular jack
Internal bus: Via the Installation Base (model: R30BS)
Internal power supply: Via the Installation Base (model: R30BS)
Solderless terminal: Refer to the Applicable Solderless Terminal Size drawing.
Recommended manufacturer: Japan Solderless Terminal MFG.Co.Ltd, Nichifu Co.,ltd
(Ones with insulation sleeve do not fit.)
Applicable wire size: 0.25 – 0.75 mm^2
Screw terminal: Nickel-plated steel
Housing material: Flame-resistant resin (gray)
Max. number of R30 I/O modules: 16
(Max. consumption current of I/O modules: 500 mA)
Isolation: Ethernet to internal bus or internal power to RUN contact output to power supply to FE
Calendar clock: Year (4 digits), month, date, day, hour, minute, second
Internal bus communication cycle: Approx. ≤ 1 msec. (when max. No. of modules connected)
Status Indicator LEDs: PWR, RUN, DL30 RUN, LOGGING, SD CARD, MAINT, ERROR
(Refer to Operating Manual for details)

■ RUN CONTACT OUTPUT
RUN contact turns ON in normal conditions, and turns OFF when the power is not supplied or when an error occurs (internal memory error, SD card error, or R30 module error).
Rated load: 250 V AC @ 0.5 A (cos ø = 1)
30 V DC @ 0.5 A (resistive load)
(Less than 50 V AC to conform with EU Directive)
Maximum switching voltage: 250 V AC or 30 V DC
Maximum switching power: 250 VA (AC) or 150 W (DC)
Minimum load: 5 V DC @ 10 mA
Mechanical life: 2×10^7 cycles (rate: 300 cycles/min.)
When driving an inductive load, external contact protection and noise quenching recommended.

■Recommended solderless terminal size - M3 (unit: mm)



R30 CONNECTION

■ DL30 INSTALL POSITION
Install DL30 on the R30BS using the PWR slot (the leftmost slot) and the COM slot to the right of the PWR slot.

■ COMPATIBLE R30 SERIES MODULES

TYPE	MODEL
Base	R30BS
Discrete input	R30XN16A
Discrete output	R30YN16A
	R30YN16C
DC voltage/current input	R30SV2
	R30SV4
DC voltage/current input, high speed	R30SVF4
DC voltage/current output	R30YV4
	R30YS4
Thermocouple input	R30TS4
RTD input	R30RS4
Potentiometer input	R30MS4
AC current input	R30CT4E
Universal input	R30US2
	R30US4
Totalized pulse input	R30PA2
Blank filler module	R30DM
Interface I/O module	R30GCIE1
	R30GECT1

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, SMTP, FTP, FTPS, SNTP
Transmission media: 10BASE-T (STP, Category 5) 100BASE-TX (STP, Category 5e)
Max. segment length: 100 meters
Status Indicator LEDs: DPX, LNK
IP address: 192.168.0.1 (factory default)

INSTALLATION

Power consumption
•DC: Approx. 18 W 24 V DC (@ output current max. 500 mA)
Internal power

• **Max. rated output voltage / current**: 21 V DC / 500 mA
Total current consumed at the R30 I/O modules used combination with TR30 must be within above current.
Operating temperature: 0 to 50°C (32 to 122°F)
Storage temperature: -10 to +60°C (14 to 140°F)
Operating humidity: 10 to 90 %RH (non-condensing)
Atmosphere: No corrosive gas or heavy dust
Mounting: Installation Base (model: R30BS)
Weight: 300 g (0.66 lb)

PERFORMANCE

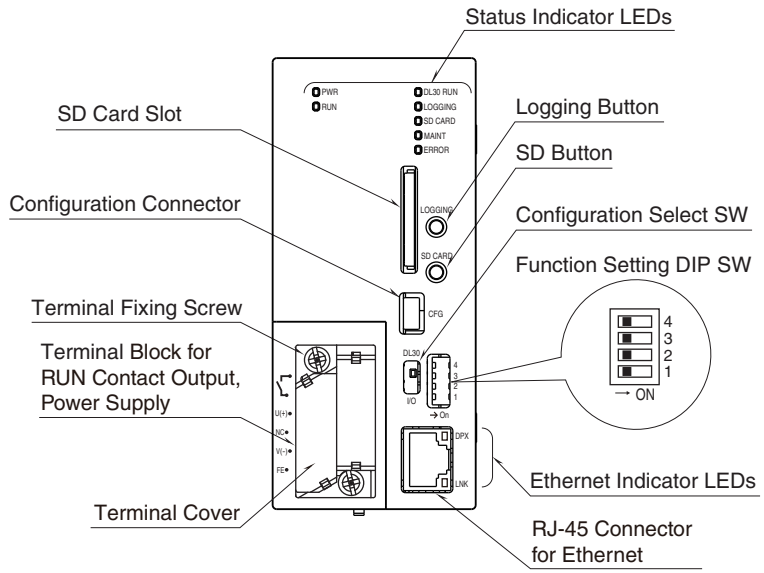
Calendar clock: (with battery backup)
Accuracy: Monthly deviation 2 minutes at 25°C
Back up period: Approx. 2 years at 25°C
Battery: Primary lithium battery (non-removable)
(In order to prevent battery drain, battery back up is OFF at factory default. Turn it ON prior to start using.)
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength: 1500 V AC @ 1 minute
(Ethernet to internal bus or internal power to RUN contact output to power supply to FE)

STANDARDS & APPROVALS

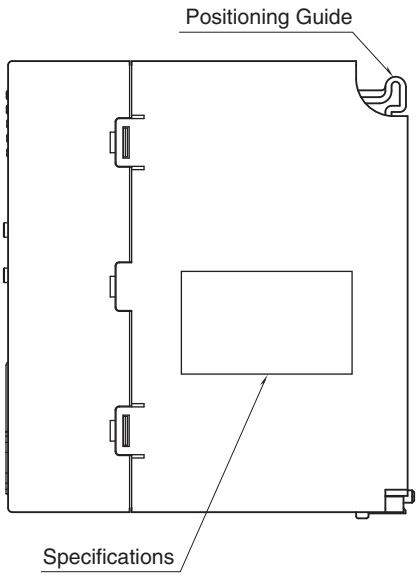
EU conformity:
EMC Directive
EMI EN 61000-6-4
EMS EN 61000-6-2
RoHS Directive

EXTERNAL VIEW

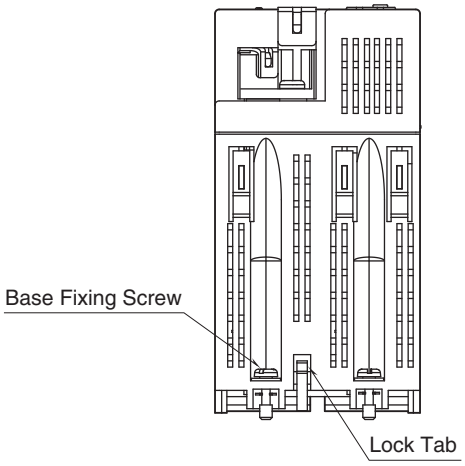
■ **FRONT VIEW**



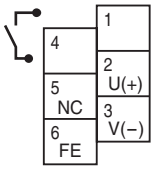
■ **SIDE VIEW**



■ **BOTTOM VIEW**

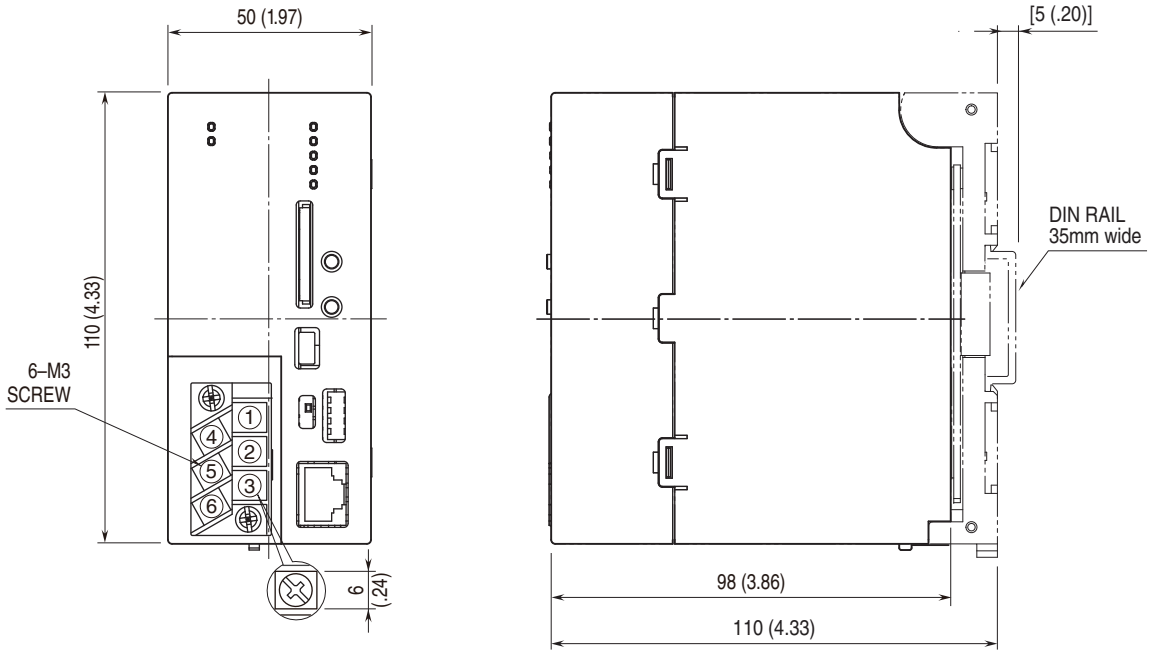


TERMINAL ASSIGNMENTS



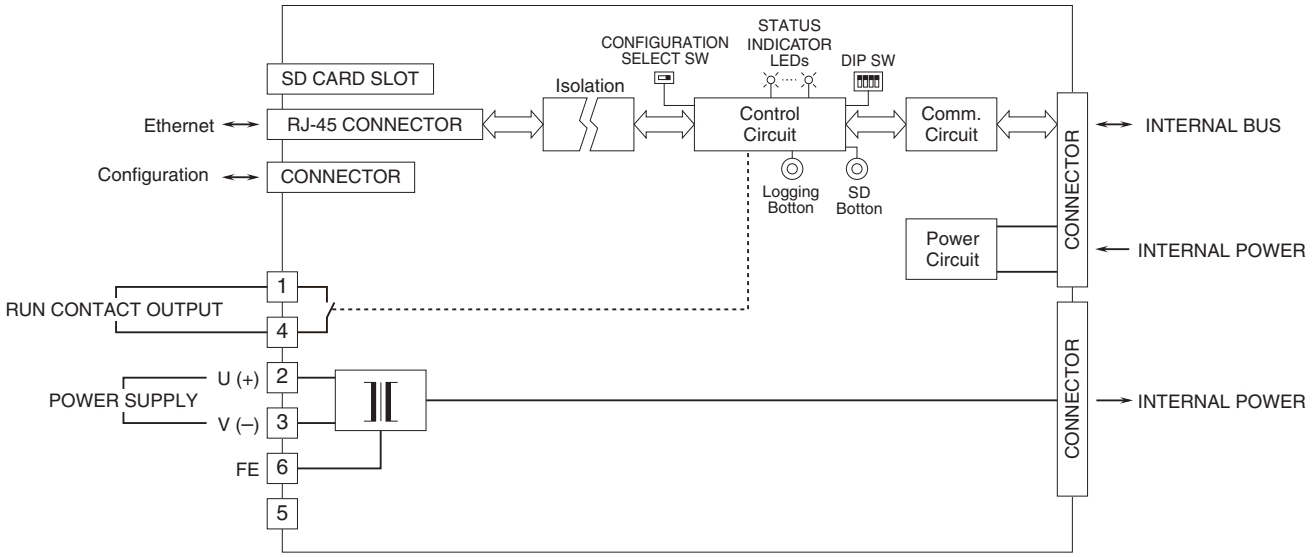
NO.	ID	FUNCTON
1	RUN contact output	RUN contact output
2	U (+)	Power supply (24 V DC)
3	V (−)	Power supply (0 V DC)
4	RUN contact output	RUN contact output
5	NC	Not used
6	FE	Functional earth

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm



SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

Note: In order to improve EMC performance, bond the FE terminal to ground.
Caution: FE terminal is NOT a protective conductor terminal.



DATA STORING

Trend data, logging data, and report data are written into the internal memory at a specified writing cycle.
The logging data and report data can be transferred to an SD card at a timing according to the writing cycle.

Event data (event logs, system logs, communication logs) is written into the internal memory every time an event occurs, and can be transferred to an SD card in a one-minute cycle.

■ TREND DATA

• Pen

Max. 64 points (selectable from among: analog input; discrete input; pulse input; digital computing register; analog computing register; analog output; discrete output; and grouped digital output)

• Page

4 pens/page x 16 pages

• Writing cycle: 1, 5, 10, 30 sec., 1, 5, 10, 15, 30 min., 1 hour, 1 day (set for each page)

• No. of data samples: 50000

■ LOGGING DATA

• Channel

Max. 128 points (selectable from among: analog input; discrete input; pulse input; digital computing register; analog computing register; analog output; discrete output; and grouped digital output)

• Writing cycle

In seconds: 1, 2, 5, 10, 20, 30 sec.

In minutes: 1, 2, 5, 10, 15, 20, 30 min.

In hours: 0 to 23 hr (multiple selections allowed; delay time (minutes, seconds) can be set for each set time)

* In addition, days of the week can be specified (Sunday to Saturday; multiple selections allowed).

• Sampling method

Selectable from among: momentary value; average value; and peak value (max. or min.) for analog input, pulse input, analog computing register, and analog output.
Fixed to momentary value for discrete input, digital computing register, discrete output, and grouped digital output.

• Internal memory

Capacity: 16 data

• Internal memory data transfer timing

Daily when the writing cycle is set in seconds or minutes.
Monthly when the writing cycle is set in hours.
When the system time has been changed.

• SD card

Data is saved in CSV format when the data is transferred from the internal memory.
The type of character encoding is selectable between Shift-JIS and UTF-8.

• Auto deletion function

Folders for the oldest year (excluding the latest year) are deleted when the capacity of the SD card becomes ≤ 100MB.

■ REPORT DATA

• Channel

Max. 128 points (selectable from among: analog input; pulse input; and analog computing register)

• Writing cycle: hourly (on the hour)

• Sampling method

Selectable from among: momentary value; average value; and peak value (max. or min.)

• Reports

Daily, monthly, and annual reports are created for the specified channel.

• Internal memory

Daily: for 32 days

Monthly: for 16 months

Annual: for 4 years

• Internal memory data transfer timing

Daily: At a designated time

Monthly: On a designated day (1 to 28) of the month

Annual: On a designated date

* All reports are transferred when the system time has been changed.

• SD card

Data is saved in CSV format when the data is transferred from the internal memory.
The type of character encoding is selectable between Shift-JIS and UTF-8.

• Auto deletion function

Data older than 4 years are deleted when the year of current time changes.

■ EVENT DATA

• Event logs

Events occurred at status change of discrete inputs, transition of analog input zone, etc.

• System logs

Unit-related logs such as turning-on/off of the power supply, SD card access error, full-disk error, etc.

• Communication logs

SMTP (e-mails), FTP, SNTP (time synchronization) logs

• Schedule logs

Scheduling fuction-related logs such as schedule output, schedule output type maintenance, one-time schedule assignment, permanent schedule assignment, etc.

• Internal memory

Capacity: 2000 logs/block x 4 blocks for each of event, system, communication, and schedule logs.

• **Internal memory data transfer timing**

When the recorded data reaches 2000 pieces, and when the year changes.

• **SD card**

Data transferred from the internal memory is saved in CSV format.

Newly added data is saved in a one-minute cycle and also at the internal memory transfer timing.

• **Auto deletion function**

When the auto deletion function is enabled, folders older than 4 years are deleted when the year changes.

■ FILE SIZE PER BLOCK OF INTERNAL MEMORY (APPROX.)

• Logging Data File (written period: 24 hours)

WRITING CYCLE	16 PENS (MB)	32 PENS (MB)	64 PENS (MB)	128 PENS (MB)
1 sec.	21.43	41.21	80.76	159.69
2 sec.	10.72	20.60	40.38	79.85
5 sec.	4.29	8.25	16.16	31.94
10 sec.	2.15	4.13	8.08	15.97
20 sec.	1.06	2.03	3.96	7.99
30 sec.	0.72	1.38	2.70	5.33
1 min.	0.37	0.69	1.35	2.67
2 min.	0.19	0.35	0.68	1.34
5 min.	0.08	0.15	0.28	0.54
10 min.	0.04	0.08	0.14	0.27
15 min.	0.03	0.05	0.10	0.18
20 min.	0.03	0.04	0.08	0.14
30 min.	0.02	0.03	0.05	0.09
1 hr.	0.19	0.36	0.70	1.38

• Report Data File

REPORT TYPE	16 PENS (KB)	32 PENS (KB)	64 PENS (KB)	128 PENS (KB)
Daily	8.14	15.92	31.49	62.24
Monthly	9.93	19.46	38.53	75.40
Annual	5.07	9.85	19.41	39.67

• Event Data File

TYPE	SIZE / LINE (BYTE)	SIZE / FILE (KB)
Event Log	373	728.5
System Log	50	97.66
Communication Log	99	193.36
Schedule Log	250	488.42

COMMUNICATION

■ IP

DL30 supports DHCP client;

Allows manual setting of IP address, subnet mask, default gateway, and DNS server.

■ WEB SERVER FUNCTION

DL30 works as a Web server, allowing the user to check 'Data,' 'Trend,' 'Event,'and 'Report' on a web browser from a remote location.

DL30 uses HTTPS protocol for secure communication.

Compatible Terminals & Browsers

• **iPad (iPadOS 14.4.2)**: Safari

• **Android tablet (Android 10):** Chrome 90.0

• **Windows PC (Windows 7, 8.1, 10)**:

- Internet Explorer 11
- Microsoft Edge 89.0
- Firefox 81.0
- Chrome 89.0

■ MODBUS/TCP MASTER

DL30 allows I/O expansion with remote I/Os such as R3 or R7 series;

Collectively handles data from measuring points in multiple locations.

■ CONNECTABLE DEVICES (Modbus slaves)

• R3-NE1
• R5-NE1
• R6-NE1, R6-NE2
• R30NE1
• R7E series
• R9EWTU
• 72EM2-M4
• GR8-EM
• DL8 series
• TR30-G
• IT series
• 73VR series

■ SLMP CLIENT

DL30 allows I/O expansion by connecting with the SLMP-compatible CPU unit of Mitsubishi programmable controller MELSEC;

Collectively handles data from measuring points in multiple locations.

■ CONNECTABLE MELSEC MODEL

• MELSEC iQ-R series
• MELSEC iQ-F series
• MELSEC Q series

■ MAX. NO. OF CONNECTABLE DEVICES (No. of slaves)

• 32 (nodes) (selectable between Modbus/TCP and SLMP)

■ MAX. I/O POINTS

• Analog input (AI): 128 points
• Discrete input (DI): 256 points
• Pulse input (PI): 128 points
• Analog output (AO): 64 points
• Discrete output (DO): 128 points

■ MODBUS/TCP SLAVES

No. of socket connections: 4

DL30 remotely monitors slaves with SCADA.

ALARM OUTPUT

MD or DO designated as alarm contact output can be turned ON at event occurrence.

EVENT REPORTING E-MAIL

DL30 transmits an 'event reporting' e-mail at occurrence of event or at designated time.
Encrypted communication supported. (SMTP over SSL).
DL30 turns MD or designated DO ON after transmitting an e-mail.
Report data attachable to the e-mail.
'Report Filter' to filter e-mail destinations by time period of day.

- **No. of e-mail destinations**: 64
- **No. of event reporting texts**: 128
- **Channel status**: Multiple channels can be selected from AI, DI, PI, MA, MD, AO, DO, and GDO and attached to an e-mail;.
- **Output at transmission failure**: 1 point

FTP CLIENT

Logging data file, event data file, and report data file saved in an SD card can be uploaded to an FTP server.
FTPS protocol allows encrypted communication.

- **Transmission timing**

Logging data file: when a designated MD is turned ON or when a new file is created and the previous file is determined.
Event data file: when a designated MD is turned ON or when a new file is created and the previous file is determined.
Report data files:
- **Daily**: on the hour every hour
- **Monthly**: when the month changes
- **Annual**: when the year changes

- **Output at transmission failure**: 1 point

FTP SERVER

Files in an SD card can be read / deleted through an FTP client.
FTPS protocol allows encrypted communication.
Compatible FTP clients:

- Windows Explorer
- Web browsers
  - Internet Explorer version 11
- FFFTP 4.3

I/O MAPPING

Registration of Input-to-Output mapping information allows multiplex data transmission for remote I/Os and allows DL30 to work as an IP telemeter.

- **Allowable I/O combinations**:

AI-to-AO; DI-to-AO; MA-to-AO; MD-to-AO; DI-to-DO; MD to DO; DI to GDO, and MD-to-GDO

USER-DEFINABLE WEB SCREENS

Web browser screens are user-definable.
Use M-System's user-defined screen designing software (model: DL30 Web Designer), or any
support tool for editing HTML files, etc. prepared by the customer.

COMPUTING FUNCTION

- **Analog Computing Register (MA)**

Capable of addition and subtraction, multiplication, division, square root, moving average, delay
buffer, exp, common logarithm, natural logarithm, peak hold (max/min), power, analog
accumulation, F value calculation, scaling, and inverse logarithm.

- **Digital Computing Register (MD)**

Capable of logical operation (=, AND, OR, XOR, NOT, RUN). After detection of an OFF-ON operation of the self-reset timer MD, the MD is turned OFF when the set time period has elapsed.

SCHEDULING FUNCTION

Allows schedule outputs for operating DO, MD, or GDO channels according to scheduled time.
A pattern consisting a group of scheduled outputs for a day is registered and assigned to a day of the week, allowing scheduled outputs for the respective days of the week.
Up to 8 schedules per pattern and up to 64 patterns can be registered.

■ ONE-TIME SCHEDULE ASSIGNMENT

Schedule patterns for one week from the current day can be set to be applied one time only.
The set schedules can be viewed on a web screen and can be changed via the web screen or the configurator software (model: DL30GCFG).

■ PERMANENT SCHEDULE ASSIGNMENT

Schedule patterns which are valid only for specific dates can be set for up to 10 days.
The set schedules can be viewed on a web screen and can be changed via the web screen or the configurator software (model: DL30GCFG).

GDO (GROUPED DIGITAL OUTPUT) CHANNEL FUNCTION

Digital function (MD) and Discrete output (DO) channels can be grouped into a GDO and defined as a virtual channel.
Operation on a single GDO is effective for all MD and DO channels registered in the GDO.

No. of GDO channels: max. 32 points
No. of MD/DO channels grouped to a GDO: max. 32 channels

PROCESS OPERATION MONITOR FUNCTION

DL30 defines a single analog channel or a group of discrete channels of different types as a “process” and monitors each process using Gantt chart for displaying the operational history and Andon screen for displaying the process status.
No. of processes: Max. 32 processes
Type of process: Analog / Digital

■ ANALOG PROCESS

A single analog channel (AI, PI, MA) is selected as an analog process.
DL30 monitors the status and alarm zone transition history of the selected analog channel.

■ DIGITAL PROCESS

1 to 5 digital channels (DI, MD) are selected and grouped as a digital process and parameter items such as display colors are set for the respective channels.
DL30 monitors the current status and the status transition history of each of the grouped channels and displays the status of the channel of the largest number preferentially among the channels which are currently ON.

■ GANTT CHART

Sampling cycle: 1 minute (fixed)
Number of samples: Max. 2880 samples (in the last 2 days)
Number of samples displayed per screen: 720 samples (in the last 12 hours) to be scroll-displayed

■ ANDON SCREEN

Sampling cycle: 1 minute (fixed)
Display contents:
• Analog process
Status display: Process name, display comment, color
Digital display: CH name, engineering unit value, engineering unit, CH name of digital display (sub), engineering unit value, engineering unit
• Digital process
Status display: Process name, display comment, color
Digital display: CH name, comment, engineering unit value, and engineering unit for main digital display; CH name, engineering unit value, and engineering unit for each sub digital display

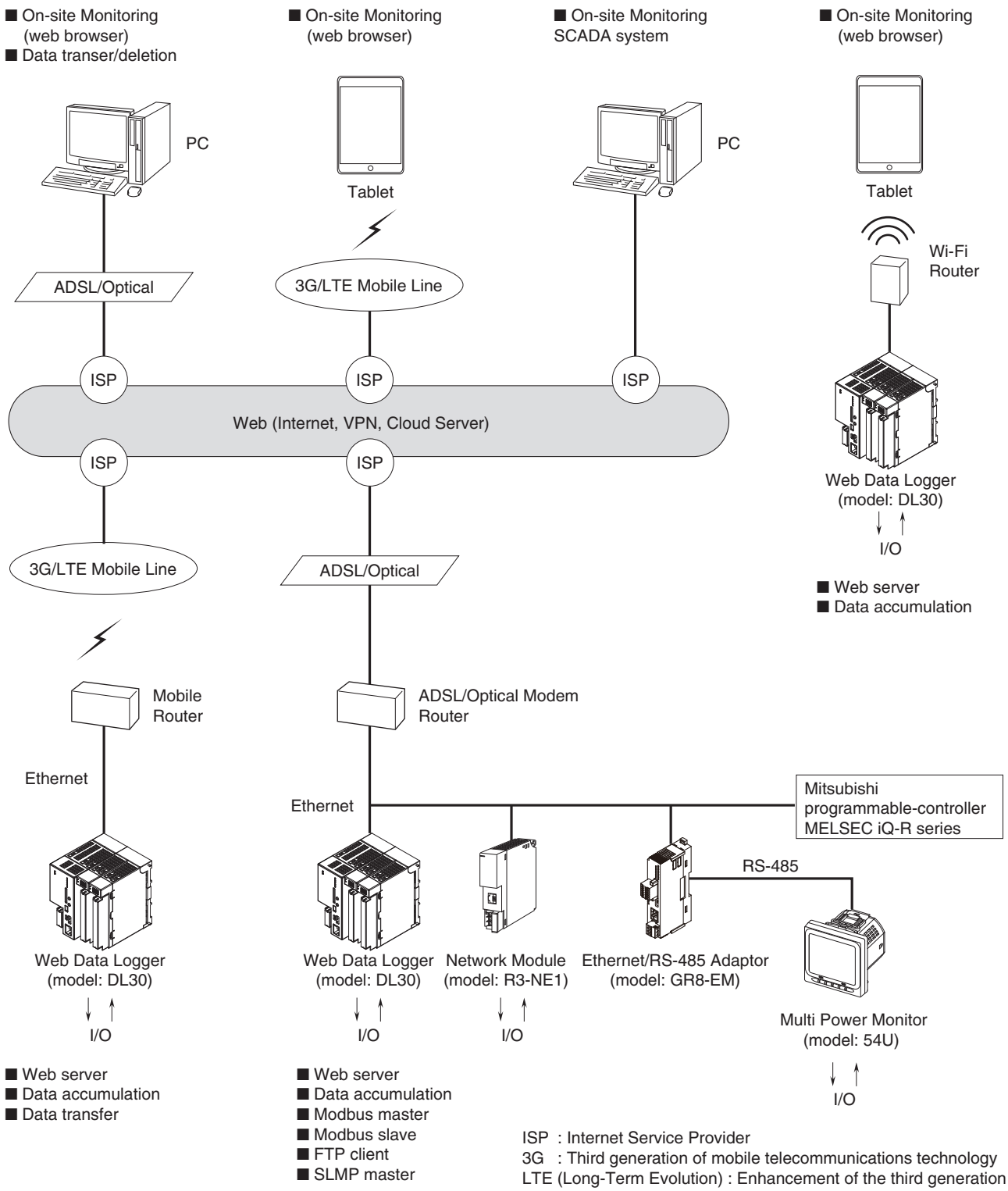
OTHER FUNCTIONS

•Maintenance

- Various settings and operations are available from the Maintenance menu on the configurator software (model: DL30GCFG).
- E-mail setting, alarm zone setting, time setting, etc. are configurable from the web screen.

SYSTEM CONFIGURATION EXAMPLES

Devices other than the DL30 in the configuration below shall be provided by the user.



Note: To use the event reporting e-mail function, an e-mail account from an internet service provider is required.
To monitor via the internet, you need to have a fixed IP address, or use dynamic DNS service.
As to types of mobile router to be used with, consult M-System.

⚠ Specifications are subject to change without notice.