Panasonic
BUSINESS

# LB-DH8 *series*

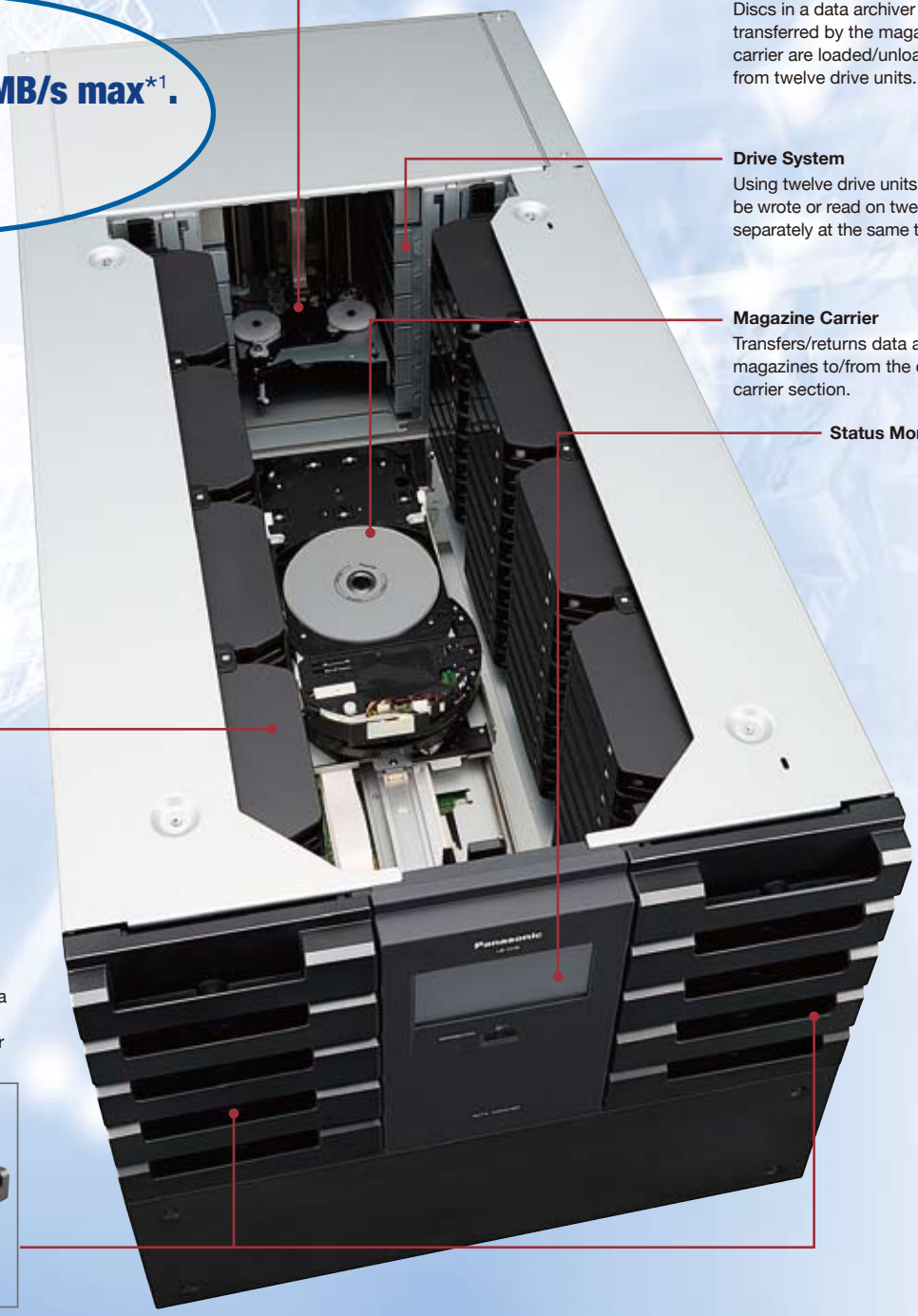
Data Archiver
Made-to-order product

A scalable optical disc library system
that satisfies increasing demand for long-term data storage

# Highly-reliable, low running cost optical disc storage suitable for long-term data storage
# Scalable module configuration to flexibly respond to user needs

The LB-DH8 Series Data Archiver is a scalable optical disc library system that supports ever-increasing demand for longer-term data storage in data center business. Panasonic has leveraged its optical disc drive, media, and advanced robotics technologies to develop a scalable module expansion configuration that can support an increase of data with high reliability that is necessary for long-term data storage.
The system consists of data archiver magazines which hold twelve optical discs. Each magazine can store 1.2 TB of data. The system has a base module (magazine writer unit) and expansion module (magazine loader) that can house up to 76 data archiver magazines respectively. A maximum of 91.2 TB can be stored in each module. The system consists of three types of modules: base module, bottom module (magazine carrier), and expansion module combined with magazine management software. By installing additional expansion modules on the 19-inch rack, a flexible system configuration can be created according to the data volume. Up to seven modules can be installed to realize high-volume optical disc storage of 638.4 TB max. per rack.
The Data Archiver uses RAID technology. Twelve drive units concurrently operate twelve optical discs housed in a data archiver magazine to provide high-speed data transfer up to 216 MB/s*1 and high reliability to protect data from unforeseen failures. Optical discs that have a data storage life of 100 years*2 are adopted to eliminate regular data migration. Standby power consumption is only 7 W*3, significantly lowering power consumption and reducing running cost of data centers.

- **Data transfer rate: 216 MB/s max*1.**
- **RAID 0, 5, 6 is supported**




**Disc Carrier**
Discs in a data archiver magazine transferred by the magazine carrier are loaded/unloaded on/from twelve drive units.

**Drive System**
Using twelve drive units, data can be wrote or read on twelve discs separately at the same time.

**Magazine Carrier**
Transfers/returns data archiver magazines to/from the disc carrier section.

**Status Monitor**

**Data Archiver Magazine (separately sold)**
Houses twelve pieces of recordable Blu-rayDisc™ for archive.
(The picture is used for explanation. The disc cannot be removed from the magazine.)

**Drawer (10 pcs.)**
Up to eight magazines can be installed in a detachable drawer so that magazines can be easily replaced by the unit of drawer for higher operability.

*1: When RAID 0 is applied. Unit measurement value obtained by a Panasonic standard test. Actual writing speed varies depending on environmental conditions, such as the server.
*2: The estimated lifetime based on acceleration tests conducted by Panasonic at a temperature of 30°C and humidity of 70%. Note that it is not a guaranteed value.
*3: In the case of the minimum configuration (base module + bottom module) at 24 V DC input.

# Scalable Module System

## Scalable module configuration to store ever-increasing data

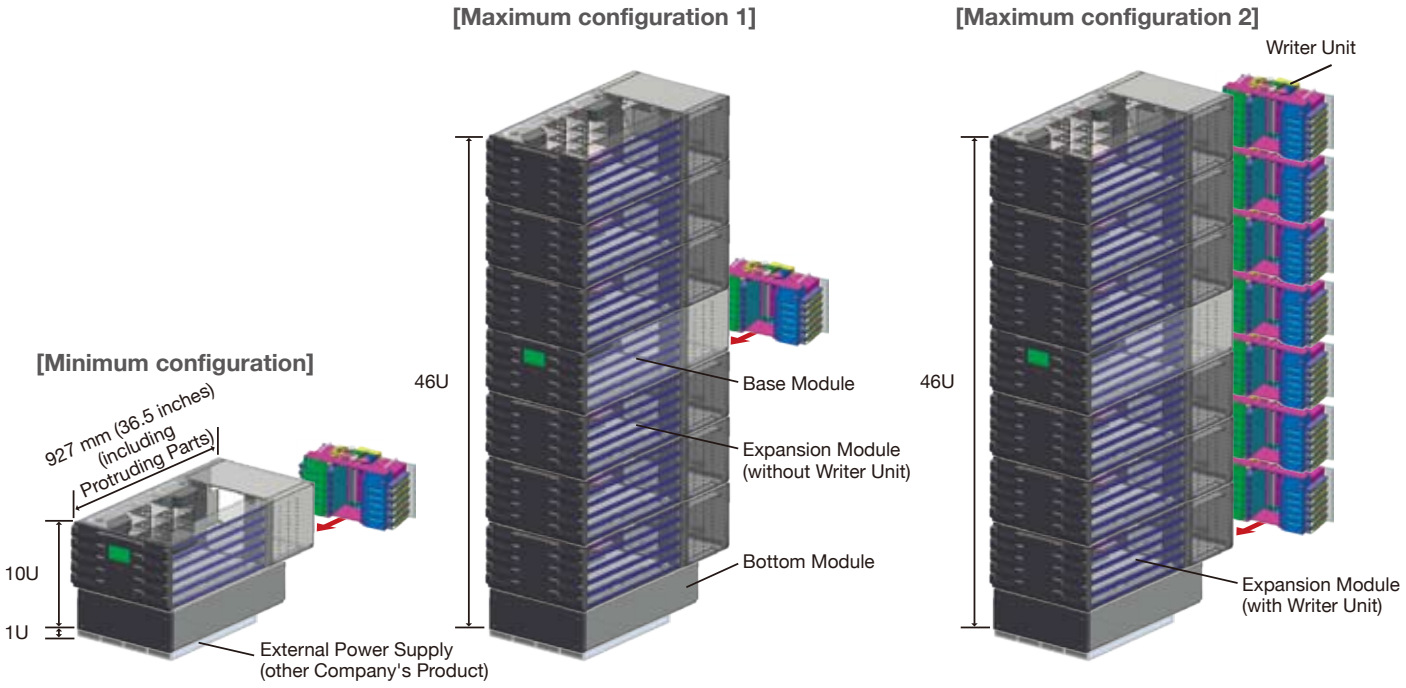
### High-capacity, high-reliability, and high-speed data transfer are achieved

Panasonic's newly-developed robotics technology has realized this module configuration. The magazine carrier installed in the bottom module quickly transfers data archiver magazines housed in each module to the writer unit. In the writer unit, twelve discs in a data archiver magazine are loaded to ensure smooth writing and reading of large volumes of data.
Moreover, RAID technology is used on the twelve optical disks to distribute and record data onto them. It achieves high-speed data transfer up to 216 MB/s*1. The archiver supports RAID 5 and RAID 6 to enable the customer to select their required level of fault tolerance by adding parity to data. It increases availability and reliability to protect data on drives and discs from unforeseen failures. Optical discs that have a data storage life of 100 years*2 are adopted to eliminate regular data migration. Standby power consumption is only 7 W*3, significantly lowering power consumption and reducing running cost.

*1: When RAID 0 is applied. Unit measurement value obtained by a Panasonic standard test. Actual writing speed varies depending on environmental conditions, such as the server.
*2: The estimated lifetime based on acceleration tests conducted by Panasonic at a temperature of 30°C and humidity of 70%. Note that it is not a guaranteed value.
*3: In the case of the minimum configuration at 24 V DC input.

### Scalable configuration allowing more flexible operation

The system offers minimum configuration of one bottom module and one base module. Therefore, the system can be introduced and operated by a minimum initial investment. The base module can house up to 76 data archiver magazines, each storing 1.2 TB of data for reading and writing. A maximum of 91.2 TB can be stored in each module. By adding an expansion module that can house 76 data archiver magazines as well, the storage can be expanded according to the amount of data to be stored.
The EIA-compliant 19-inch rack holding seven modules provides high-capacity storage of 638.4 TB max. (when RAID 0 is applied) at low bit cost. For expansion modules, configuration with/without writer unit can be selected, enabling flexible system operation to satisfy each user's need.
The depth of the archiver is 927 mm (including protruding parts), allowing it to be installed in standard 1,000-mm racks at data centers. This facilitates its use in existing customer environments.




**Capacity: 91.2 TB max.**
**No. of Writer Unit: 1 unit**

**Capacity: 638.4 TB max.**
**No. of Writer Unit: 1 unit**

**Capacity: 638.4 TB max.**
**No. of Writer Units: 7 units**

### Module configuration

| | |
|---|---|
| Minimum configuration: | One bottom module and one base module<br>Adoptable at minimal initial investment cost. Up to 91.2 TB of data can be stored. |
| Maximum configuration 1: | One bottom module, one base module, and six expansion modules (without writer unit)<br>Up to 638.4 TB of data can be stored. This is an optimum configuration, typically for data centers for the purpose of cold archive*3 storage at low bit cost. |
| Maximum configuration 2: | One bottom module, one base module, and six expansion modules (with writer unit)<br>Up to 638.4 TB of data can be stored. Seven writer units in total enable simultaneous writing to and reading from multiple magazines to satisfy customers' demands for multi-access. |

*3: Long-term storage of data rarely used but prohibited to be deleted for the purpose of making such data readily available online.

# Intelligent Software

## Dedicated management software facilitates easy management

### Data Archiver Manager (server OS: compatible with Windows)

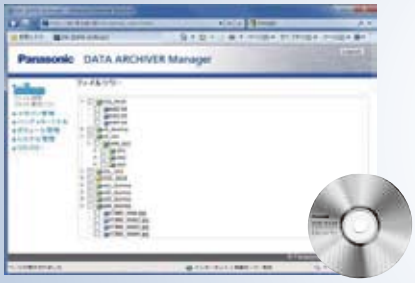
The system can be easily connected to an existing IT system via LAN using Data Archiver Manager software* provided with Data Archiver Manager (server OS: compatible with Windows).

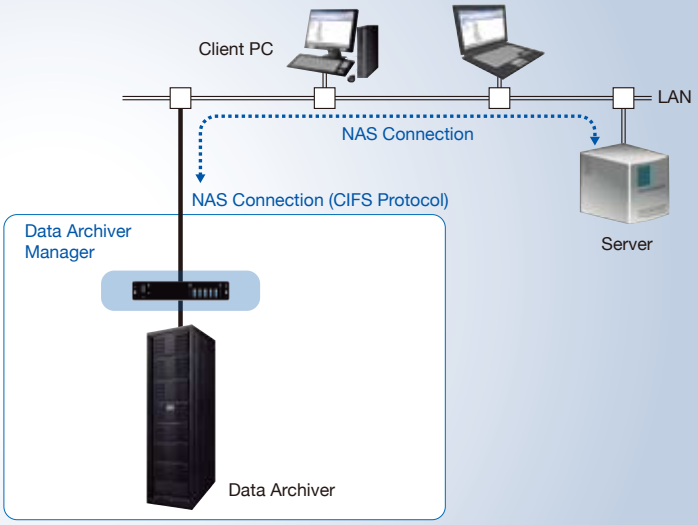
CIFS network protocol supports the NAS head function. Multiple Data Archiver units and all data archiver magazines can be managed as a single logical volume.

* Compatible with Windows Server 2008 R2

### Configuration Example

•Data Archiver Manager (made by Panasonic)
Windows Server 2008 R2



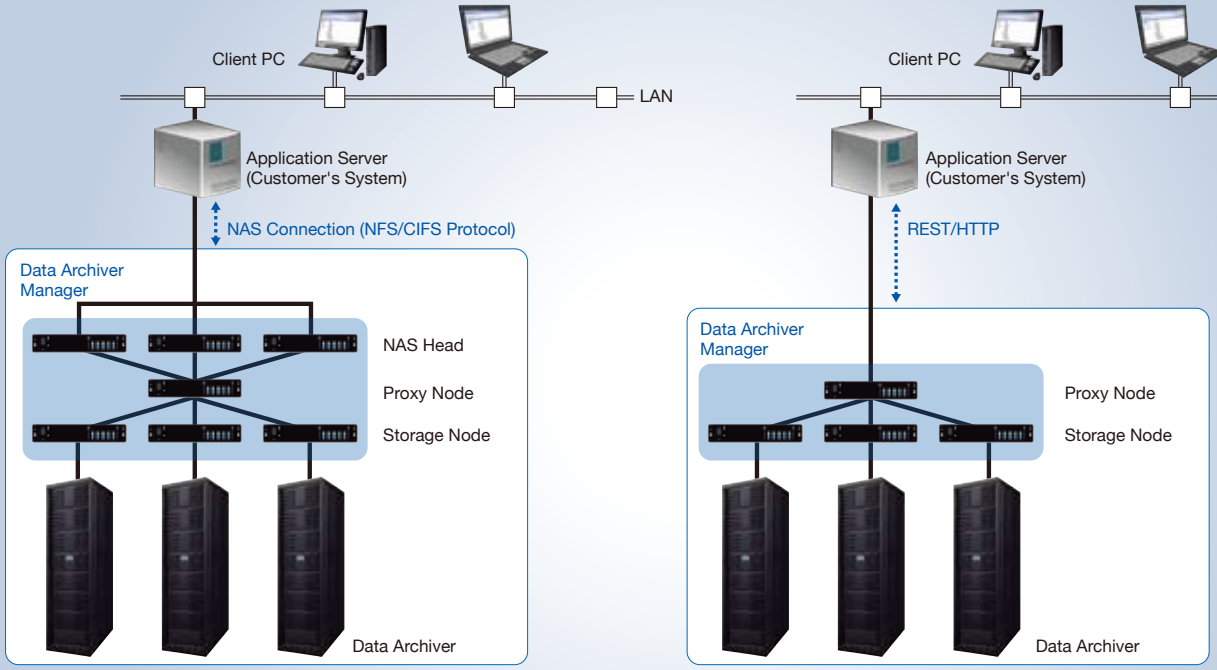




### Data Archiver Manager (Server OS: Compatible with Linux)

Panasonic has newly developed a data archiver manager supported under Linux that can handle large-scale systems by extending its object storage technology. Magazines are managed by controlling the input/output of files using REST*1 based API. A single name space function*2 enables management of large-scale archive data and configuration of scalable storage. The NAS head function is also enabled.

*1: Representational State Transfer, a method of giving a unique identifier (URI) to all resources (files) and accessing using HTTP
*2: A function for expressing data on the network with a unique URL. A system that is well suited for storage scalability of large-volume data

### Configuration Example




* Proxy Node: A server with a role to allocate files to each storage node
* Storage Node: A server to save files in magazines. Data Archiver is connected to it.

* NAS head can be established on a virtual server as well.
* The configuration varies according to the customer's use conditions. The system can be established with one server in some use conditions.
* In the case of NAS connection, a configuration similar to that compatible with Windows is enabled.

# Easy Maintenance

## Higher operability and easier maintenance

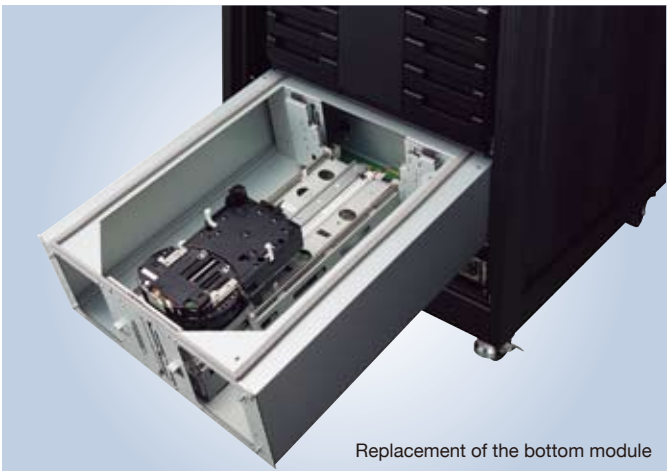
### Replacement of magazines

Up to eight data archiver magazines are installed respectively in a detachable drawer allowing them to be taken from the front face of the base module and expansion module. This design enables users to replace magazines in each drawer easily.

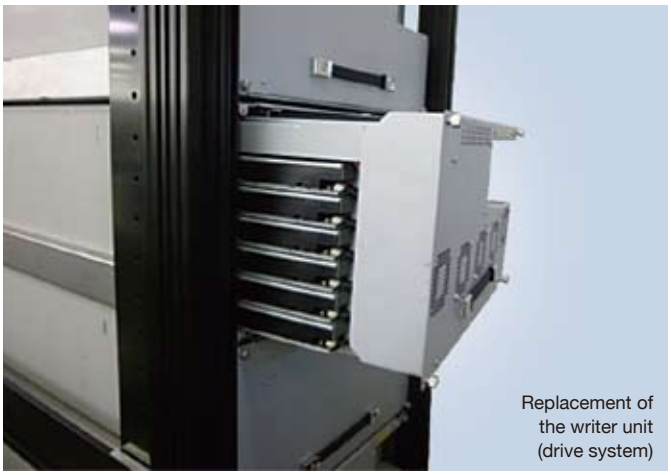
### Replacement of modules and units

Main components including the bottom module and writer unit can be replaced easily in a state where they are installed on the rack.

Replacement of magazines



Replacement of the bottom module



Replacement of the writer unit (drive system)

# Reliable Optical Disc

## Reliable, low-cost optical disc media suitable for long-term data storage

### Data archiver magazine

This magazine is a 1.2 TB media device for data archiver where twelve pieces of recordable Blu-ray Disc™ for archive are stored in a 20.8 mm (H) shell. It protects discs from dust, finger marks, and scratches. The maximum writing/reading speed of 216 MB/s (when RAID 0 is applied) is achieved by separately recording data on twelve discs. Moreover, RAID technology is used to increase reliability and protect important data from unforeseen failures. A magazine has a built-in HF band RFID. Management using bar code labels* is supported.

* Supported 1D code: Code 39, 2D code: QR code (model 2)

### Blu-ray Disc™

Optical discs are highly reliable data storage media with a long history. Recordable Blu-ray Disc™ for archive inherit their characteristics, providing even higher reliability, and achieving a data storage life of over 100 years*. Media storage does not require power so does not generate heat. The discs can be stored at room temperatures because they are highly resistant to temperature and humidity changes.

* The estimated lifetime based on acceleration tests conducted by Panasonic at a temperature of 30°C and humidity of 70%. Note that it is not a guaranteed value.

# Specifications

## Hardware specification (as of December 2014)

### LB-DH8 Series Data Archiver

| | |
|---|---|
| Product No.: | Base module:<br>LB-DH80A0G (SAS model)<br>LB-DH80S0G (iSCSI model)<br>LB-DH80F0G (FC model)<br>Bottom module<br>LB-DH81Z0G<br>Expansion module<br>LB-DH82Z0G (without writer unit)<br>LB-DH82A0G (with writer unit, SAS model)<br>LB-DH82S0G (with writer unit, iSCSI model)<br>LB-DH82F0G (with writer unit, FC model) |
| Dimensions:<br>(W × H × D) | Base module:<br>447 mm × 262 mm × 917 mm<br>(17.6 inches × 10.3 inches × 36.1 inches)<br>(excluding protrusions)<br>482 mm × 264 mm × 927 mm<br>(19.0 inches × 10.4 inches × 36.5 inches)<br>(including mounting hardware and protrusions)<br>Bottom module:<br>446 mm × 171 mm × 851 mm<br>(17.6 inches × 6.7 inches × 33.5 inches)<br>(excluding protrusions)<br>482 mm × 175 mm × 867 mm<br>(19.0 inches × 6.9 inches × 34.1 inches)<br>(including mounting hardware and protrusions)<br>Expansion module:<br>447 mm × 261 mm × 917 mm<br>(17.6 inches × 10.3 inches × 36.1 inches)<br>(excluding protrusions)<br>482 mm × 262 mm × 927 mm<br>(19.0 inches × 10.3 inches × 36.5 inches)<br>(including mounting hardware and protrusions) |
| Weight: | Base module:<br>Approx. 45 kg (99.2 lb)<br>Bottom module:<br>Approx. 22 kg (48.5 lb)<br>Expansion module (with writer unit):<br>Approx. 44 kg (97.0 lb)<br>Expansion module (without writer unit):<br>Approx. 29 kg (63.9 lb)<br>* excluding magazines in the unit. |
| Input Power Supply: | +24 V DC (±5 %) |
| Host Interface: | SAS: 6G bps, iSCSI: 10 Gbps, FC: 8 Gbps<br>Select one from among above. |
| Management Interface (Base module): | LAN: 1 Gbps 2 ports<br>(Web interface, SNMP, notification via email, timer server communication)<br>USB 2.0: 2 ports<br>(to connect USB flash memory, update software, save/restore set values, save logs, and perform maintenance)<br>I/O: 1 port<br>(to monitor/control external power supply) |
| Control Interface: | Base module: Control port: 8 ports<br>Bottom module: Control port: 1 port<br>Expansion module (with writer unit): Control port: 1 port<br>Expansion module (without writer unit): Control port: 1 port |
| No. of Installable Magazines*1: | Max. 76 pieces |
| Storage Capacity*1: | When RAID0 is used: 91.2 TB<br>When RAID5 is used: 83.6 TB<br>When RAID6 is used: 76.0 TB |
| Data Transfer Rate*2: | When RAID0 is used: 216 MB/s<br>When RAID5 is used: 198 MB/s<br>When RAID6 is used: 180 MB/s |
| Functions: | Encryption: XTS-AES256<br>(Operates when encryption is instructed from the application)<br>RAID: RAID0, RAID5, RAID6 |
| Operation Environment: | Temperature: 10 °C to 40 °C (50 °F to 104 °F)<br>(Gradient: 10 °C/h (18 °F/h) or less)<br>Humidity: 20 % to 80 % RH<br>(with no condensation) |
| Transportation Environment: | Temperature: –20 °C to +60 °C (–4 °F to 140 °F)<br>Humidity: 10 % to 90 % RH (with no condensation) |
| Example of Combination: | Minimum configuration:<br>(10U, No. of installable magazines: 76 pieces, Writer unit: 1 unit)<br>LB-DH80A0G x 1 unit, LB-DH81Z0G x 1 unit<br>Maximum configuration:<br>(46U, No. of installable magazines: 532 pieces, Writer unit: 7 units)<br>LB-DH80A0G x 1 unit, LB-DH81Z0G x 1 unit, LB-DH82A0G x 6 units |
| Accessories: | Base module:<br>24 V power cable (3 m) x 1 pc.,<br>19-inch rack mounting angle member x 2 pcs.,<br>19-inch rack mounting support angle member x 2 pcs.,<br>DVD x 1 pc. (Operator Guide, Installation Guide, Data Archiver Manager license file (Windows/Linux))<br>Bottom module:<br>24 V power cable (3 m) x 1 pc.,<br>Special connection cable x 1 pc.,<br>19-inch rack mounting angle member x 2 pcs.,<br>19-inch rack mounting support angle member x 2 pcs.<br>Expansion module (with writer unit):<br>24 V power cable (3 m) x 1 pc.,<br>Special connection cable x 1 pc.,<br>19-inch rack mounting angle member x 2 pcs.,<br>19-inch rack mounting support angle member x 2 pcs.,<br>Cushion sheet x 6 pcs.<br>Expansion module (without writer unit):<br>Special connection cable x 1 pc.,<br>19-inch rack mounting angle member x 2 pcs.,<br>19-inch rack mounting support angle member x 2 pcs.,<br>Cushion sheet x 6 pcs. |

*1: 1 module (base module, expansion module)
*2: Unit measurement value obtained by a Panasonic standard test. Actual writing speed varies depending on environmental conditions, such as the server.

### LM-BM12LB Data Archiver Magazine (option) overall rating

| | |
|---|---|
| Product No.: | LM-BM12LB5 (5 magazines)<br>LM-BM12LB16 (16 magazines)<br>LM-BM12LB30 (30 magazines) |
| Data Capacity: | 1.2 TB*3 (Each magazine holds 12 archival, of recordable Blu-ray Disks™) |
| Dimensions<br>(W × H × D): | 129.5 mm × 20.8 mm × 131.3 mm<br>(5.1 inches × 0.8 inches × 5.2 inches) |
| Weight: | Approx. 300 g (0.66 lb) |
| Operation Environment: | Temperature: 10 °C to 55 °C (50 °F to 131 °F)<br>(Gradient: 15 °C/h (27 °F/h) or less)<br>Humidity: 20 % to 80 % RH<br>(Gradient: 10 % or less, with no condensation) |
| Transportation Environment: | Temperature: –20 °C to +60 °C (–4 °F to 140 °F)<br>Humidity: 10 % to 90 % RH<br>(with no condensation) |

*3: 1 TB=1,000,000,000,000 bytes (All data capacity indicated in the description refers to capacity in the unformatted state.)

## Software specification (as of December 2014)

### Data Archiver Manager software operating environment

| | |
|---|---|
| Supported OS: | Microsoft® Windows Server® 2008 R2 (64 bit) Standard Edition<br>Red Hat Enterprise Linux7, CentOS7 |
| Middleware: | Microsoft® SQL Server® 2012 Express (64 bit) or<br>Microsoft® SQL Server® 2012 (64bit)<br>Required for Windows OS only. |
| Computer: | Satisfies OS and database requirement*4 |
| Hard Disk Capacity: | 1.2 TB or more for cache-memory are necessary*4 |
| Monitor: | Satisfies OS requirements |
| Interface: | Connecting to storage device<br>(Conform the storage device, SAS/FC/network) |

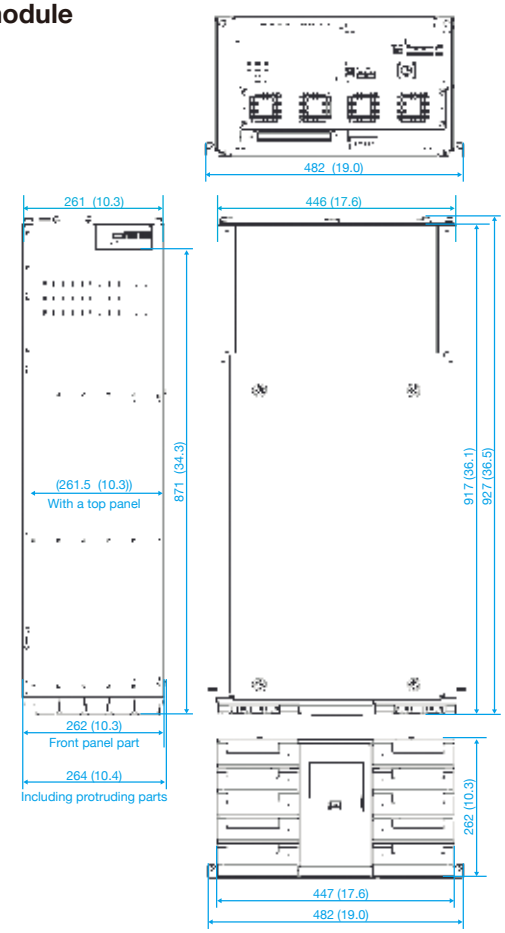
*4: Necessary resources differ according to the use conditions.


• All data capacity indicated in the description refers to capacity in the unformatted state, based on 1 TB = 1012 bytes.
• Product ratings and designs may be subject to change for modification and improvement without prior notice.
• Note that the life performance of the product does not guarantee no damage or failure.

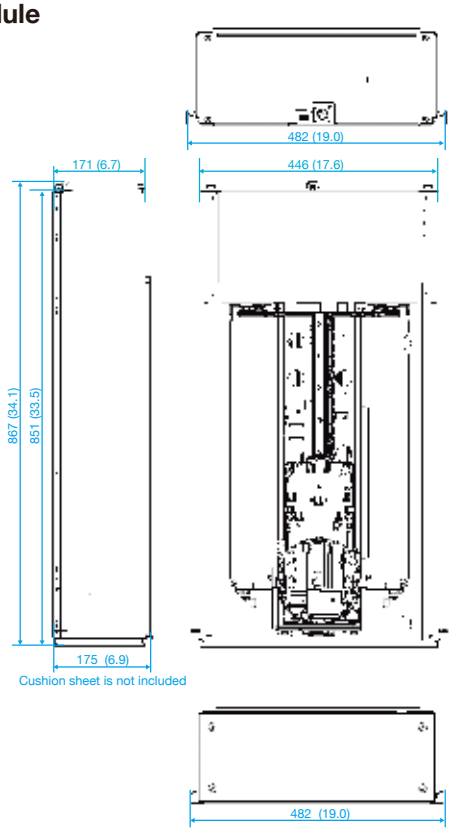
# Dimensions

## External dimensions drawing of each module Unit: mm (inches)

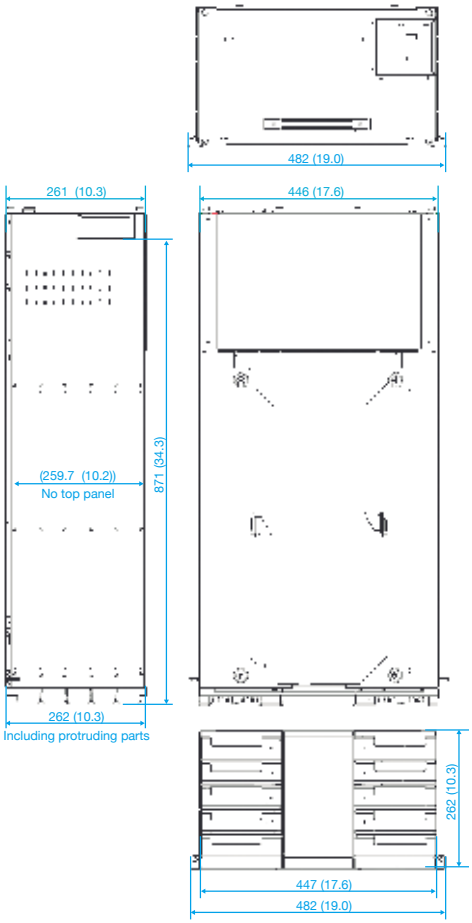
### Base module



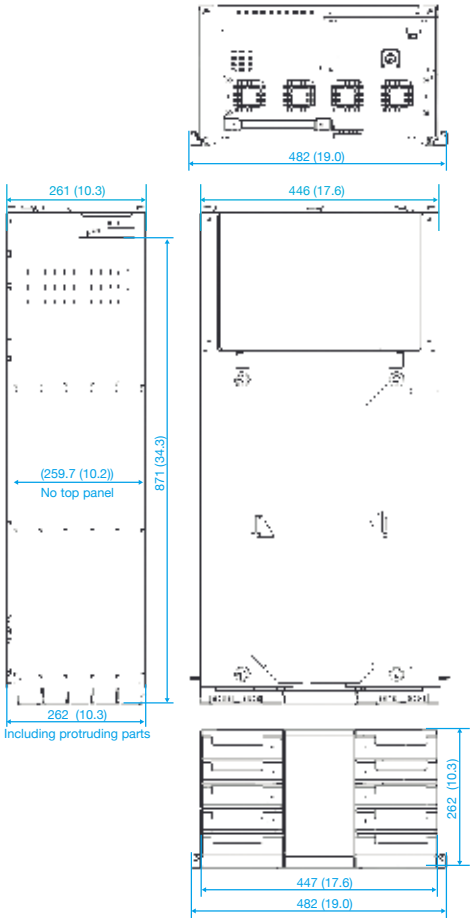

### Bottom module




### Expansion module (without Writer unit)

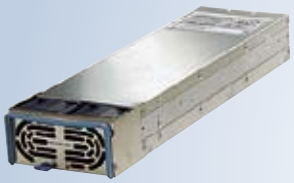



### Expansion module (with Writer unit)



# System Equipment

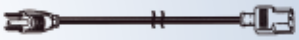
## Products recommended for the system



**HFE1600-24/S**
Power supply unit

**HFE1600-S1U**
Shelf rack

**Z-J**
AC code (Japan)



**HFE/C15-U**
AC code (US)

**HFE/C15-E**
AC code (Europe)

TDK-Lambda Corporation http://www.tdk-lambda.com/

**Product Information Site** **http://panasonic.net/archiver/lb-dh8/**



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SP-CLDH8 ②