



Logging Unit for Energy Measuring Unit (EcoMonitorLight, EcoMonitorPlus)

Model EMU4-LM If you are considering using this unit for special purpose such as nuclear power plants, aerospace, medical care or passenger vehicles please refer to our sales representative.

User's Manual (Digest) Before using this unit, please read both this manual and Details carefully and pay attention to safety to handle this unit correctly. Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

ABOUT MANUALS You can download User's manual (Details) of this unit from the following site. <http://www.mitsubishielectric.com/faq/worldwide/index.html>

1. Features

- This unit can memorize the data of various quantities related to electricity such as voltage, current, power and energy (hereinafter referred to as measured data) measured by Energy Measuring Unit (EcoMonitorLight, EcoMonitorPlus) for a certain period.
- Memorized measured data can be output to an SD memory card in CSV format.
- You can check the data files output to the SD memory card by Microsoft Excel or GX LogViewer (Version 1.30G or after).

Microsoft Excel is the registered trademark of the U.S. Microsoft Corporation in the U.S. and other countries. The SD and SDHC logos are either registered trademarks or trademarks of SD-3C, LLC.



2. Checking package contents

The following items for this device are included in package. Check that no items are missing.

- (1) Logging Unit x1
- (2) Battery (EMU4-BT) x1
- (3) User's Manual (Digest) x1

3. Safety Precautions

3.1 Precautions for Operating Environment and Conditions

This Unit is premised on being used in pollution degree II environment. When used in higher pollution degree, protect this unit from pollution on another device side to be incorporated. (For the definition of the pollution degree and the over voltage category, refer to EN61010-1/2/10.) Do not use this product in the places listed below. Failure to follow the instruction may cause malfunctions and a life decrease of product.

- Places the operating humidity exceeds the range from 30 to 85%RH or places with dewfall
- Places in strong electromagnetic field or places large amount of external noise etc.
- Places the operating temperature exceeds the range from -10 to +55°C
- Places exposed to direct sunlight
- Operating altitude exceeds 2000m
- Vibration and impact exceed the specifications
- Places the average daily temperature exceeds +35°C
- Dust, corrosive gas, saline and oil smoke exist
- Places exposed to rain or water drop
- Places metal fragments or conductive substance are flying

This unit is the open type device, which are designed to be housed within another device for prevention of electric shock. House this unit within the device such as the control panel before use (indoor use).

3.2 Matters concerning the precaution before use

Use the unit in specified usage environment and conditions.

3.3 Installation and Wiring Precautions

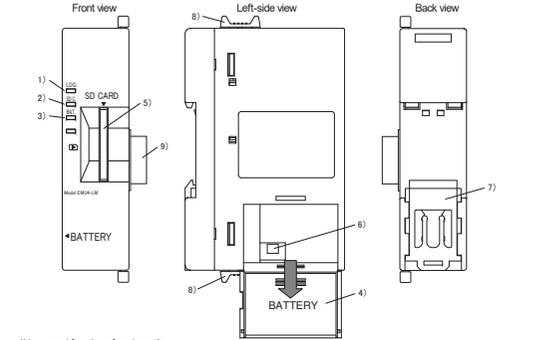
- Danger** Do not touch the electrically charged portion. It may cause electric shock, electric burn injury or burnout of the device.
 - Work under the electric outage condition when installing.
 - Any person who is involved in installation and wiring of this unit should be fully competent to do this work.
- Caution** Work under electric outage condition when installing and wiring. Failure to do so may cause electric shock, a failure of the unit, a fire etc.
 - When tapping or wiring, take care not to enter any foreign objects such as chips and wire pieces into this unit.
 - Check the connection way when connecting to the Energy Measuring Unit. Wrong wiring may cause failure of the unit, a fire or electric shock.

- Caution** Removed lithium batteries may have electric charge. Store them separately so as not to touch other metal, otherwise evolution of heat, burst or ignition may occur.

3.8 About packaging materials and this manual

For reduction of environment load, packaging materials are produced with cardboard.

4. Name and function of each part



No.	Name	Function
1)	LOG LED	This indicates a state of logging operation. Turn on: Logging is running Turn off: Logging stopped Blink slowly ¹⁾ (5 seconds): Change of logging condition settings finished Blink quickly ²⁾ (30 seconds): Change of logging condition settings failed ³⁾ Blink quickly ⁴⁾ (5 seconds): Error or occurrence ⁵⁾
2)	SD C. LED	This indicates a state of communication with the SD memory card. Turn on: Communicating Turn off: Stop communicating Blink quickly ¹⁾ (30 seconds): SD memory card error ²⁾ Blink slowly ³⁾ (5 seconds): Normal battery voltage
3)	BAT. LED	This indicates a state of battery voltage. Turn on: Low battery voltage ¹⁾ Turn off: Normal battery voltage
4)	Battery box	This stores a battery to back up present time data, logging data and system log data.
5)	SD memory card slot	This is a slot to insert an SD memory card.
6)	Battery connector	This connects a battery.
7)	IEC rail stop	This is used to fix to an IEC rail.
8)	Connection stop	This is used to connect the Logging Unit to the Energy Measuring Unit.
9)	Connector	This is used to connect the Energy Measuring Unit.

[Note 1] Blink slowly: Repetition of 0.5-second on and 0.5-second off
 [Note 2] Blink quickly: Repetition of 0.25-second on and 0.25-second off
 [Note 3] Refer to "Error display and measures" if this indicates.
 [Note 4] Present time data and logging data are erased by power-off with battery voltage low, ("Logging ID", "Logging mode", "Logging start time", "Detailed data logging cycle" and "Logging item" are not erased, which are memorized in the nonvolatile memory.) If BAT. LED turns on, change a battery.

3.4 Precautions for Use

- Before operating the product, check that active bare wire and so on does not exist around the product. If any exposed conductor is found, stop the operation immediately, and take an appropriate action such as isolation protection.
- In the event of a power outage during the setting, the unit is not set correctly. Please set again after power recovery.
- During communication with the SD memory card, the operations such as power-off, reset and ejection of the memory card may cause data corruption of the memory card or failure of this unit or the memory card. Power off or reset the unit, or eject the SD memory card after checking that SD C. LED turns off.
- Make sure to use the SD memory card manufactured by Mitsubishi Electric Corporation (Model EMU4-SD2GB). Using the other types of the SD memory card may cause the trouble such as data destruction of the memory card or system failure. For the SD memory card on the market, please refer to the Sales and Service No.YAMA192 from our site. However, at the time of use, please verify sufficient by the customer that there is no problem.
- Format an SD memory card in the way specified in this manual. Format is done already as of the purchase, so a SD memory card made by Mitsubishi Electric Corporation (Model EMU4-SD2GB) has use just as it, and is no problem.
- Insert the SD memory card with the write protect switch "OFF". If the write protect switch is "ON", read/write to the SD memory card is stopped.
- Present time data and logging data are erased by power-off with BAT. LED on, "Logging ID", "Logging mode", "Logging start time", "Detailed data logging cycle" and "Logging item" are not erased, which are memorized in the nonvolatile memory.) If BAT. LED turns on, output logging data to the SD memory card and change a battery.
- All logging data of the Logging Unit erased when you change the setting of "Preset time system", "Primary voltage" (Use or start use of V1, Direct voltage with V1, Special primary voltage)", "Primary current" (Direct sensor, 5A sensor, Special primary current)" or "Sensor type of the Energy Measuring Unit (EcoMonitorLight Model EMU4-BD1-MB/EMU4-HD1-MB, EcoMonitorPlus Model: EMU4-BM1-MB/EMU4-HM1-MB/EMU4-A/2 EMU4-A2)
- All logging data of the Logging Unit erased when you change the setting of "Preset time system" and "Measurement mode" of the Energy Measuring Unit with Insulation Monitoring (EcoMonitorPlus Model: EMU4-LG1-MB). Before changing the setting of the Energy Measuring Unit, output the logging data to the SD memory card and check the output data in the PC whether the logging data is memorized properly.
- All logging data of the Logging Unit erased when you change the setting of "Present time", "Logging mode", "Logging start time", "Detailed data logging cycle" or "Logging item" of the Logging Unit. Before changing the setting of the Logging Unit, output the logging data to the SD memory card and check the output data in the PC whether the logging data is memorized properly.
- The Logging Unit should not be used for multiple Energy Measuring Units. Otherwise all logging data of the Logging Unit may be erased, or there may be some data for different Energy Measuring Units in the Logging Unit.

- Danger** Do not touch the electrically charged portion. It may cause electric shock, electric burn injury or burnout of the device.
 - Work under the electric outage condition when installing.
- Caution** Do not disassemble or modify this unit. It may cause failure, malfunction, injury or fire.
 - Work under the electric outage condition when installing.

3.5 Maintenance Precautions

- Use a soft dry cloth to clean off dirt of the unit surface. Do not let a chemical cloth remain on the surface for an extended period of time nor wipe the surface with thinner or benzine.
- Check for the following items to use this unit properly for long time.
 - (1) No damage on this unit
 - (2) No abnormality with LED indicators
 - (3) No abnormal noise, smell or heat
- "Daily maintenance"

3.6 Storage Precautions

- To store this unit, put it in a plastic bag.
- For long-time storage, avoid the following places. Failure to follow the instruction may cause a failure and reduced life of the unit.
 - Places the relative humidity exceeds the range from 30 to 85% or places with dewfall
 - Places the storage temperature exceeds the range from -10 to +60°C
 - Places the average daily temperature exceeds +35°C
 - Vibration and impact exceed the specifications
 - Dust, corrosive gas, saline and oil smoke exist
 - Places exposed to rain, water drop or direct sunlight
 - Places metal fragments or conductive substance are flying

3.7 Disposal Precautions

- When disposing of this unit, treat it as industrial waste.
- Lithium batteries are disposed of according to local regulation.
- In EU member states, there is a separate collection system for waste batteries. Dispose of batteries properly at the local community waste collecting/recycling center. The symbol shown upper right is printed on the packaging of the unit. [Note] This symbol is for EU member states only. The symbol specified in the new EU Battery Directive (2006/69/EC) Article 20 "Information for end-users" and Annex II.
- The symbol indicates that batteries need to be disposed separately from other wastes.

5. Procedure for operation

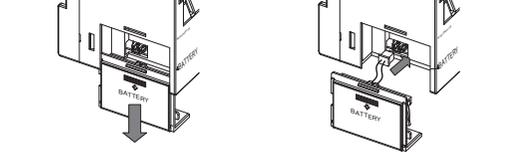
Procedure for operation of this unit is as follows: Please refer to User's Manual (Details).

No.	Procedure	Content
1)	Connect the battery to the Logging Unit	Refer to this manual 6.1 "How to connect the battery"
2)	Connect the Logging Unit to the Energy Measuring Unit	Refer to this manual 6.2 "How to connect the Logging Unit"
3)	Mount the Energy Measuring Unit and the Logging Unit to the panel	Refer to this manual 7 "Installation" * Refer to User's manual (Details) of Logging Unit about "Panel mounting".
4)	Turn on the Energy Measuring Unit	
5)	Set the present time of the Logging Unit	EcoMonitorLight: Refer to User's manual (Details) "Set the present time" of Energy Measuring Unit EcoMonitorPlus: Refer to User's manual (Details) "Clock setup"-the settings for the clock of "Small Type Display Unit for Energy Measuring Unit"
6)	Set logging ID of the Logging Unit	EcoMonitorLight: Refer to User's manual (Details) "Setting menu 5: Logging setting" of Energy Measuring Unit EcoMonitorPlus: Refer to User's manual (Details) "Logging setup"-the settings for the logging ID" of "Small Type Display Unit for Energy Measuring Unit"
7)	Set logging condition in the Logging Unit	Refer to User's manual (Details) 7 "Directions" "Set condition in the Logging Unit" of Logging Unit. * For setting, it is necessary to create a setting file using Logging unit utility or Microsoft Excel * Setting is necessary when connecting to Energy Measuring Unit with Insulation Monitoring. If not setting, an error occurs/system log codes:502.

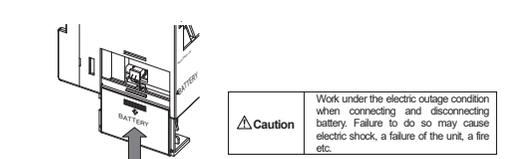
6. How to connect

6.1 How to connect the battery

- (1) Slide the battery box down to open it.
- (2) Connect the connector of the battery cable to the battery connector.



(3) Fix the battery box to the Logging Unit.

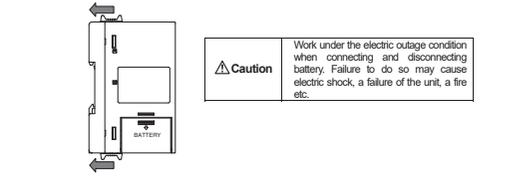
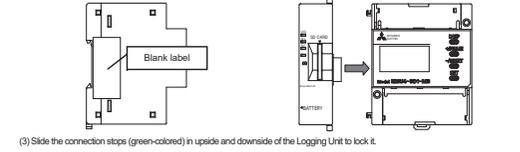


Caution Work under the electric outage condition when connecting and disconnecting battery. Failure to do so may cause electric shock, a failure of the unit, a fire etc.

6.2 How to connect the Logging Unit

This unit can be attached to EcoMonitorLight in below. This unit can be attached to EcoMonitorPlus as well. In EcoMonitorPlus, connect to the base unit (model name: EMU4-BM1-MB/EMU4-HM1-MB/EMU4-LG1-MB/EMU4-CNT-MB).

- (1) Remove the blank label stuck to the left side of the Energy
- (2) Insert the connector of the Logging Unit into that of the Energy Measuring Unit and contact the unit.



6.3 How to insert the SD memory card

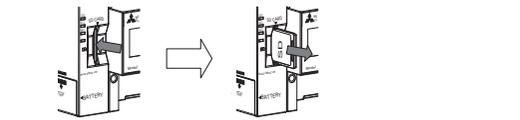
Slide the SD memory card straight into the slot until it clicks into place.



Caution Make sure to use the SD memory card manufactured by Mitsubishi Electric Corporation (Model EMU4-SD2GB). Using the other types of the SD memory card may cause the trouble such as data destruction of the memory card or system failure.
Format an SD memory card in the way specified in this manual.
Insert the SD memory card with the write protect switch "OFF". Otherwise read/write to the SD memory card is stopped.

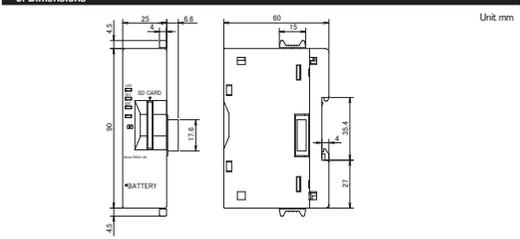
6.4 How to eject the SD memory card

Push the SD memory card in unit it clicks into place. The SD memory card comes out by itself.



Caution During communication with the SD memory card, ejection of the memory card may cause data corruption of the memory card or failure of this unit or the memory card. Check that SD C. LED turns off to eject the SD memory card.

8. Dimensions



9. Specifications

Item	Specifications
Model	EMU4-LM
Rating	8.4V DC (powered by the Energy Measuring Unit)
Competition for power failure	Battery (EMU4-BT) Total time of compensation is 1 year (average daily temperature is not more than +35°C). It is recommended that the battery is changed every 3 years.
Setting values	Memorized in FRAM (nonvolatile memory) The data is not erased during power failure.
Logging data	Memorized in SRAM (volatile memory)
System log data	Data is erased if power failure occurs under low battery voltage condition (BAT. LED turns on). After power recovery, logging is started from Jan. 1, 2013, 00:00:00.
Timing	Timing is stopped if power failure occurs under low battery voltage condition (BAT. LED turns on).
Memory	SD memory card (SD, SDHC)
Accommodating model	EcoMonitorLight Model: EMU4-BD1-MB/EMU4-HD1-MB EcoMonitorPlus Model: EMU4-BM1-MB/EMU4-HM1-MB/EMU4-LG1-MB/EMU4-CNT-MB/EMU4-A/2/EMU4-A2
Standard	EMC: EN-61326-1: 2013
Usage environment	-5°C to +55°C (average daily temperature is not more than +35°C) Operating humidity: 30% to 85%RH (No condensation) Storage temperature: -10°C to +65°C Operating altitude: 2000m or lower
Mass	0.1kg (Mass of the Logging Unit only)
Optional	SD memory card (EMU4-SD2GB) ¹⁾ ²⁾ ³⁾ ⁴⁾ ⁵⁾ ⁶⁾ ⁷⁾ ⁸⁾ ⁹⁾ ¹⁰⁾ ¹¹⁾ ¹²⁾ ¹³⁾ ¹⁴⁾ ¹⁵⁾ ¹⁶⁾ ¹⁷⁾ ¹⁸⁾ ¹⁹⁾ ²⁰⁾ ²¹⁾ ²²⁾ ²³⁾ ²⁴⁾ ²⁵⁾ ²⁶⁾ ²⁷⁾ ²⁸⁾ ²⁹⁾ ³⁰⁾ ³¹⁾ ³²⁾ ³³⁾ ³⁴⁾ ³⁵⁾ ³⁶⁾ ³⁷⁾ ³⁸⁾ ³⁹⁾ ⁴⁰⁾ ⁴¹⁾ ⁴²⁾ ⁴³⁾ ⁴⁴⁾ ⁴⁵⁾ ⁴⁶⁾ ⁴⁷⁾ ⁴⁸⁾ ⁴⁹⁾ ⁵⁰⁾ ⁵¹⁾ ⁵²⁾ ⁵³⁾ ⁵⁴⁾ ⁵⁵⁾ ⁵⁶⁾ ⁵⁷⁾ ⁵⁸⁾ ⁵⁹⁾ ⁶⁰⁾ ⁶¹⁾ ⁶²⁾ ⁶³⁾ ⁶⁴⁾ ⁶⁵⁾ ⁶⁶⁾ ⁶⁷⁾ ⁶⁸⁾ ⁶⁹⁾ ⁷⁰⁾ ⁷¹⁾ ⁷²⁾ ⁷³⁾ ⁷⁴⁾ ⁷⁵⁾ ⁷⁶⁾ ⁷⁷⁾ ⁷⁸⁾ ⁷⁹⁾ ⁸⁰⁾ ⁸¹⁾ ⁸²⁾ ⁸³⁾ ⁸⁴⁾ ⁸⁵⁾ ⁸⁶⁾ ⁸⁷⁾ ⁸⁸⁾ ⁸⁹⁾ ⁹⁰⁾ ⁹¹⁾ ⁹²⁾ ⁹³⁾ ⁹⁴⁾ ⁹⁵⁾ ⁹⁶⁾ ⁹⁷⁾ ⁹⁸⁾ ⁹⁹⁾ ¹⁰⁰⁾ ¹⁰¹⁾ ¹⁰²⁾ ¹⁰³⁾ ¹⁰⁴⁾ ¹⁰⁵⁾ ¹⁰⁶⁾ ¹⁰⁷⁾ ¹⁰⁸⁾ ¹⁰⁹⁾ ¹¹⁰⁾ ¹¹¹⁾ ¹¹²⁾ ¹¹³⁾ ¹¹⁴⁾ ¹¹⁵⁾ ¹¹⁶⁾ ¹¹⁷⁾ ¹¹⁸⁾ ¹¹⁹⁾ ¹²⁰⁾ ¹²¹⁾ ¹²²⁾ ¹²³⁾ ¹²⁴⁾ ¹²⁵⁾ ¹²⁶⁾ ¹²⁷⁾ ¹²⁸⁾ ¹²⁹⁾ ¹³⁰⁾ ¹³¹⁾ ¹³²⁾ ¹³³⁾ ¹³⁴⁾ ¹³⁵⁾ ¹³⁶⁾ ¹³⁷⁾ ¹³⁸⁾ ¹³⁹⁾ ¹⁴⁰⁾ ¹⁴¹⁾ ¹⁴²⁾ ¹⁴³⁾ ¹⁴⁴⁾ ¹⁴⁵⁾ ¹⁴⁶⁾ ¹⁴⁷⁾ ¹⁴⁸⁾ ¹⁴⁹⁾ ¹⁵⁰⁾ ¹⁵¹⁾ ¹⁵²⁾ ¹⁵³⁾ ¹⁵⁴⁾ ¹⁵⁵⁾ ¹⁵⁶⁾ ¹⁵⁷⁾ ¹⁵⁸⁾ ¹⁵⁹⁾ ¹⁶⁰⁾ ¹⁶¹⁾ ¹⁶²⁾ ¹⁶³⁾ ¹⁶⁴⁾ ¹⁶⁵⁾ ¹⁶⁶⁾ ¹⁶⁷⁾ ¹⁶⁸⁾ ¹⁶⁹⁾ ¹⁷⁰⁾ ¹⁷¹⁾ ¹⁷²⁾ ¹⁷³⁾ ¹⁷⁴⁾ ¹⁷⁵⁾ ¹⁷⁶⁾ ¹⁷⁷⁾ ¹⁷⁸⁾ ¹⁷⁹⁾ ¹⁸⁰⁾ ¹⁸¹⁾ ¹⁸²⁾ ¹⁸³⁾ ¹⁸⁴⁾ ¹⁸⁵⁾ ¹⁸⁶⁾ ¹⁸⁷⁾ ¹⁸⁸⁾ ¹⁸⁹⁾ ¹⁹⁰⁾ ¹⁹¹⁾ ¹⁹²⁾ ¹⁹³⁾ ¹⁹⁴⁾ ¹⁹⁵⁾ ¹⁹⁶⁾ ¹⁹⁷⁾ ¹⁹⁸⁾ ¹⁹⁹⁾ ²⁰⁰⁾ ²⁰¹⁾ ²⁰²⁾ ²⁰³⁾ ²⁰⁴⁾ ²⁰⁵⁾ ²⁰⁶⁾ ²⁰⁷⁾ ²⁰⁸⁾ ²⁰⁹⁾ ²¹⁰⁾ ²¹¹⁾ ²¹²⁾ ²¹³⁾ ²¹⁴⁾ ²¹⁵⁾ ²¹⁶⁾ ²¹⁷⁾ ²¹⁸⁾ ²¹⁹⁾ ²²⁰⁾ ²²¹⁾ ²²²⁾ ²²³⁾ ²²⁴⁾ ²²⁵⁾ ²²⁶⁾ ²²⁷⁾ ²²⁸⁾ ²²⁹⁾ ²³⁰⁾ ²³¹⁾ ²³²⁾ ²³³⁾ ²³⁴⁾ ²³⁵⁾ ²³⁶⁾ ²³⁷⁾ ²³⁸⁾ ²³⁹⁾ ²⁴⁰⁾ ²⁴¹⁾ ²⁴²⁾ ²⁴³⁾ ²⁴⁴⁾ ²⁴⁵⁾ ²⁴⁶⁾ ²⁴⁷⁾ ²⁴⁸⁾ ²⁴⁹⁾ ²⁵⁰⁾ ²⁵¹⁾ ²⁵²⁾ ²⁵³⁾ ²⁵⁴⁾ ²⁵⁵⁾ ²⁵⁶⁾ ²⁵⁷⁾ ²⁵⁸⁾ ²⁵⁹⁾ ²⁶⁰⁾ ²⁶¹⁾ ²⁶²⁾ ²⁶³⁾ ²⁶⁴⁾ ²⁶⁵⁾ ²⁶⁶⁾ ²⁶⁷⁾ ²⁶⁸⁾ ²⁶⁹⁾ ²⁷⁰⁾ ²⁷¹⁾ ²⁷²⁾ ²⁷³⁾ ²⁷⁴⁾ ²⁷⁵⁾ ²⁷⁶⁾ ²⁷⁷⁾ ²⁷⁸⁾ ²⁷⁹⁾ ²⁸⁰⁾ ²⁸¹⁾ ²⁸²⁾ ²⁸³⁾ ²⁸⁴⁾ ²⁸⁵⁾ ²⁸⁶⁾ ²⁸⁷⁾ ²⁸⁸⁾ ²⁸⁹⁾ ²⁹⁰⁾ ²⁹¹⁾ ²⁹²⁾ ²⁹³⁾ ²⁹⁴⁾ ²⁹⁵⁾ ²⁹⁶⁾ ²⁹⁷⁾ ²⁹⁸⁾ ²⁹⁹⁾ ³⁰⁰⁾ ³⁰¹⁾ ³⁰²⁾ ³⁰³⁾ ³⁰⁴⁾ ³⁰⁵⁾ ³⁰⁶⁾ ³⁰⁷⁾ ³⁰⁸⁾ ³⁰⁹⁾ ³¹⁰⁾ ³¹¹⁾ ³¹²⁾ ³¹³⁾ ³¹⁴⁾ ³¹⁵⁾ ³¹⁶⁾ ³¹⁷⁾ ³¹⁸⁾ ³¹⁹⁾ ³²⁰⁾ ³²¹⁾ ³²²⁾ ³²³⁾ ³²⁴⁾ ³²⁵⁾ ³²⁶⁾ ³²⁷⁾ ³²⁸⁾ ³²⁹⁾ ³³⁰⁾ ³³¹⁾ ³³²⁾ ³³³⁾ ³³⁴⁾ ³³⁵⁾ ³³⁶⁾ ³³⁷⁾ ³³⁸⁾ ³³⁹⁾ ³⁴⁰⁾ ³⁴¹⁾ ³⁴²⁾ ³⁴³⁾ ³⁴⁴⁾ ³⁴⁵⁾ ³⁴⁶⁾ ³⁴⁷⁾ ³⁴⁸⁾ ³⁴⁹⁾ ³⁵⁰⁾ ³⁵¹⁾ ³⁵²⁾ ³⁵³⁾ ³⁵⁴⁾ ³⁵⁵⁾ ³⁵⁶⁾ ³⁵⁷⁾ ³⁵⁸⁾ ³⁵⁹⁾ ³⁶⁰⁾ ³⁶¹⁾ ³⁶²⁾ ³⁶³⁾ ³⁶⁴⁾ ³⁶⁵⁾ ³⁶⁶⁾ ³⁶⁷⁾ ³⁶⁸⁾ ³⁶⁹⁾ ³⁷⁰⁾ ³⁷¹⁾ ³⁷²⁾ ³⁷³⁾ ³⁷⁴⁾ ³⁷⁵⁾ ³⁷⁶⁾ ³⁷⁷⁾ ³⁷⁸⁾ ³⁷⁹⁾ ³⁸⁰⁾ ³⁸¹⁾ ³⁸²⁾ ³⁸³⁾ ³⁸⁴⁾ ³⁸⁵⁾ ³⁸⁶⁾ ³⁸⁷⁾ ³⁸⁸⁾ ³⁸⁹⁾ ³⁹⁰⁾ ³⁹¹⁾ ³⁹²⁾ ³⁹³⁾ ³⁹⁴⁾ ³⁹⁵⁾ ³⁹⁶⁾ ³⁹⁷⁾ ³⁹⁸⁾ ³⁹⁹⁾ ⁴⁰⁰⁾ ⁴⁰¹⁾ ⁴⁰²⁾ ⁴⁰³⁾ ⁴⁰⁴⁾ ⁴⁰⁵⁾ ⁴⁰⁶⁾ ⁴⁰⁷⁾ ⁴⁰⁸⁾ ⁴⁰⁹⁾ ⁴¹⁰⁾ ⁴¹¹⁾ ⁴¹²⁾ ⁴¹³⁾ ⁴¹⁴⁾ ⁴¹⁵⁾ ⁴¹⁶⁾ ⁴¹⁷⁾ ⁴¹⁸⁾ ⁴¹⁹⁾ ⁴²⁰⁾ ⁴²¹⁾ ⁴²²⁾ ⁴²³⁾ ⁴²⁴⁾ ⁴²⁵⁾ ⁴²⁶⁾ ⁴²⁷⁾ ⁴²⁸⁾ ⁴²⁹⁾ ⁴³⁰⁾ ⁴³¹⁾ ⁴³²⁾ ⁴³³⁾ ⁴³⁴⁾ ⁴³⁵⁾ ⁴³⁶⁾ ⁴³⁷⁾ ⁴³⁸⁾ ⁴³⁹⁾ ⁴⁴⁰⁾ ⁴⁴¹⁾ ⁴⁴²⁾ ⁴⁴³⁾ ⁴⁴⁴⁾ ⁴⁴⁵⁾ ⁴⁴⁶⁾ ⁴⁴⁷⁾ ⁴⁴⁸⁾ ⁴⁴⁹⁾ ⁴⁵⁰⁾ ⁴⁵¹⁾ ⁴⁵²⁾ ⁴⁵³⁾ ⁴⁵⁴⁾ ⁴⁵⁵⁾ ⁴⁵⁶⁾ ⁴⁵⁷⁾ ⁴⁵⁸⁾ ⁴⁵⁹⁾ ⁴⁶⁰⁾ ⁴⁶¹⁾ ⁴⁶²⁾ ⁴⁶³⁾ ⁴⁶⁴⁾ ⁴⁶⁵⁾ ⁴⁶⁶⁾ ⁴⁶⁷⁾ ⁴⁶⁸⁾ ⁴⁶⁹⁾ ⁴⁷⁰⁾ ⁴⁷¹⁾ ⁴⁷²⁾ ⁴⁷³⁾ ⁴⁷⁴⁾ ⁴⁷⁵⁾ ⁴⁷⁶⁾ ⁴⁷⁷⁾ ⁴⁷⁸⁾ ⁴⁷⁹⁾ ⁴⁸⁰⁾ ⁴⁸¹⁾ ⁴⁸²⁾ ⁴⁸³⁾ ⁴⁸⁴⁾ ⁴⁸⁵⁾ ⁴⁸⁶⁾ ⁴⁸⁷⁾ ⁴⁸⁸⁾ ⁴⁸⁹⁾ ⁴⁹⁰⁾ ⁴⁹¹⁾ ⁴⁹²⁾ ⁴⁹³⁾ ⁴⁹⁴⁾ ⁴⁹⁵⁾ ⁴⁹⁶⁾ ⁴⁹⁷⁾ ⁴⁹⁸⁾ ⁴⁹⁹⁾ ⁵⁰⁰⁾ ⁵⁰¹⁾ ⁵⁰²⁾ ⁵⁰³⁾ ⁵⁰⁴⁾ ⁵⁰⁵⁾ ⁵⁰⁶⁾ ⁵⁰⁷⁾ ⁵⁰⁸⁾ ⁵⁰⁹⁾ ⁵¹⁰⁾ ⁵¹¹⁾ ⁵¹²⁾ ⁵¹³⁾ ⁵¹⁴⁾ ⁵¹⁵⁾ ⁵¹⁶⁾ ⁵¹⁷⁾ ⁵¹⁸⁾ ⁵¹⁹⁾ ⁵²⁰⁾ ⁵²¹⁾ ⁵²²⁾ ⁵²³⁾ ⁵²⁴⁾ ⁵²⁵⁾ ⁵²⁶⁾ ⁵²⁷⁾ ⁵²⁸⁾ ⁵²⁹⁾ ⁵³⁰⁾ ⁵³¹⁾ ⁵³²⁾ ⁵³³⁾ ⁵³⁴⁾ ⁵³⁵⁾ ⁵³⁶⁾ ⁵³⁷⁾ ⁵³⁸⁾ ⁵³⁹⁾ ⁵⁴⁰⁾ ⁵⁴¹⁾ ⁵⁴²⁾ ⁵⁴³⁾ ⁵⁴⁴⁾ ⁵⁴⁵⁾ ⁵⁴⁶⁾ ⁵⁴⁷⁾ ⁵⁴⁸⁾ ⁵⁴⁹⁾ ⁵⁵⁰⁾ ⁵⁵¹⁾ ⁵⁵²⁾ ⁵⁵³⁾ ⁵⁵⁴⁾ ⁵⁵⁵⁾ ⁵⁵⁶⁾ ⁵⁵⁷⁾ ⁵⁵⁸⁾ ⁵⁵⁹⁾ ⁵⁶⁰⁾ ⁵⁶¹⁾ ⁵⁶²⁾ ⁵⁶³⁾ ⁵⁶⁴⁾ ⁵⁶⁵⁾ ⁵⁶⁶⁾ ⁵⁶⁷⁾ ⁵⁶⁸⁾ ⁵⁶⁹⁾ ⁵⁷⁰⁾ ⁵⁷¹⁾ ⁵⁷²⁾ ⁵⁷³⁾ ⁵⁷⁴⁾ ⁵⁷⁵⁾ ⁵⁷⁶⁾ ⁵⁷⁷⁾ ⁵⁷⁸⁾ ⁵⁷⁹⁾ ⁵⁸⁰⁾ ⁵⁸¹⁾ ⁵⁸²⁾ ⁵⁸³⁾ ⁵⁸⁴⁾ ⁵⁸⁵⁾ ⁵⁸⁶⁾ ⁵⁸⁷⁾ ⁵⁸⁸⁾ <