Panasonic® Extension Unit Instructions WJ-HDE300



Before attempting to connect or operate this product, please read these instructions carefully and save this manual for future use.

WARNING:

- To prevent fire or electric shock hazard, do not expose this appliance to rain or moisture. The apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.
- All work related to the installation of this product should be made by gualified service personnel or system installers.

CAUTION:

 Read the label on the rear of the unit for identification of this product, and the power ratings.



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.



Power disconnection. Unit with or without ON-OFF switches have power supplied to the unit whenever the power cord is inserted into the power source; however, the unit is operational only when the ON-OFF switch is in the ON position. The power cord is the main power disconnect for all units. This Class A digital apparatus complies with canadian ICES-003. Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

- For U.S.A.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Caution: To assure continued compliance, (example use only shielded interface cables when connecting to computer or peripheral devices). Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

The serial number of this product may be found on the rear of the unit.

You should note the serial number of this unit in the space provided and retain this book as a permanent record of your purchase to aid identification in the event of theft.

Model No. WJ-HDE300

Serial No. -

Important Safety Instructions

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Do not use this apparatus near water.
- 6) Clean only with dry cloth.
- 7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 8) Do not use near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the points where they exit from the apparatus.
- 11) Only use attachments/accessories specified by the manufacturer.
- 12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-overs.



13) Unplug this apparatus during lightning storms or when unused for long periods of time.

14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

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General

The extension unit WJ-HDE300 can contain up to four hard disk drives per unit to add available disk space to the digital disk recorder WJ-HD316/WJ-HD309. Up to seven extension units can be connected to a digital disk recorder. The units can be operated in RAID level 5* mode for high tolerance to disk error.

* RAID level 5 (Redundant Arrays for Independent Disks, independent data disks with distributed parity blocks) RAID level 5 regards 3 or more drives as one drive, and it is possible to read data by automatically attaching error correction data even though one of the drives is broken. (It is impossible to read data if 2 or more drives are broken.) RAID level 5 requires a minimum of 3 drives to implement.

When using the RAID function, logical disk size of the extension unit will be as below.

Logical disk size = Smallest size of the disk among the disks in the extension unit x (Number of the disks in the extension unit - 1) The actual space may be several percent lower than the logical space.

* Important

When set to RAID level 5, the digital disk recorder will not access the HDD preinstalled in it, but will access only the HDDs in the extension unit.

Precautions

• Do not operate the appliance beyond its specified temperature, humidity or power source ratings.

Do not use the appliance in an extreme environment where high temperature or high humidity exists. Use the appliance at temperatures within +5 °C to +45 °C (41 °F to 113 °F) and humidity below 85 %.

The input power source for this appliance is 120 V AC 60 Hz.

• Avoid shock and vibration

Shock or vibration may damage the HDD.

The HDDs are fragile especially when the HDD motors are revolving and the HDD POWER indicator lights. Be sure to turn off either switch: the POWER switch on the rear panel, or the HDD POWER switch inside the front lid: before you mount the unit into a rack or dismount it. Do not move the HDD for 30 seconds after turning off the power.

• Pay attention to static electricity

Put your hand on a metallic surface to discharge static electricity before installation.

Do not touch components mounted on the HDD directly with your hand.

Hold only the two sides of the HDD when installing.

- Avoid condensation on the surface of the HDD. If this happened, do not turn on the power of the appliance and leave the appliance for around 2 hours. Wait until the dew evaporates in any of the following cases.
 - The appliance is moved to a place significantly different in temperature or humidity.
 - The appliance is moved out from an air-conditioned room.
 - The appliance is placed in an extremely humid place.
 - The appliance is placed in a room where a heater has just been turned on.
- Consumable parts

Contact your dealer about replacement when the time comes.

A hard disk drive needs replacing after a certain length (depends on the model) of operation.

Cooling fans also need replacing after around 20 000 - 30 000 hours of operation.

• Do not block the ventilation opening or slots on the cover.

To prevent the appliance from overheating, place it at least 5 cm (2 inches) away from the wall.

• Avoid placing the unit on an inclined surface. Otherwise, malfunction or damage to the disk may occur. Place the unit horizontally.



Front View



1) Error indicator [ERROR]

Lights when an error occurs. Refer to TROU-BLESHOOTING for details. **Red:** System error

Orange: Thermal error or malfunction of the cooling fan.

2 HDD power indicator [HDD POWER]

ON: Indicates that HDDs are powered.

OFF: Indicates that the HDDs are not powered.

Note: Do not move the unit until the motors of the HDDs stop completely. To stop the motors, turn off the HDD POWER switch behind the front cover. Move the unit after confirming that the indicator has gone out.

③ Operate indicator [OPERATE]

Lights green when turning on the power switch on the rear panel.

(4) HDD access indicators [HDD 1] [HDD 2] [HDD 3] [HDD 4]

Each indicator lights to indicate the status of the respective HDD.

- Green: Indicates that the respective HDD is running normally.
- **Red:** Indicates that the respective HDD is the first faulty drive among the HDDs in the unit.
- **Red blink:** Indicates that the respective HDD is the second or subsequent faulty drive among the HDDs in the unit.
- **Orange-red alternate blink/Orange:** Indicates that the respective drive is currently being recovered in RAID level 5 mode.

These indicators normally indicate the status of the respective drive, but they work as a set when a system error occurs. Refer to Troubleshooting for further information.

Important

When one of the indicators lights red, replace the respective HDD immediately. If two or more indicators light/blink red, it will be impossible to recover data. There may be cases where it is eventually impossible to recover data if two drives are coincidentally damaged or the second drive fails during the data recovery process.

5 Front cover

Detach the front cover when it is necessary to install HDDs or to operate the switches inside the unit.



6 Serial in connector [IN]

Connect the WJ-HD300 series digital disk recorder or other extension unit with the supplied serial cable.

⑦ Serial out connector [OUT1] [OUT2] Connect another extension unit with the supplied serial cable.

8 Cooling fan

9 Signal GND terminal [SIGNAL GND]

Connect this terminal to the SIGNAL GND terminal of other equipment to avoid possible grounding loop and noise if required.

10 Power switch [POWER]

Turn on the power of the unit with this switch before turning on the power of the digital disk recorder, or turn them on simultaneously. Otherwise, the HDDs will not be mounted.

When turning off the power of the unit with this switch, turn off the power of the digital disk recorder first, and then turn off the power of this unit after confirming that all HDD access indicators are not lit or blinking.

1 AC inlet [AC IN]

Connect the supplied power cord.

① Cable clamp fixing hole

Inside the Front Lid



①'Error indicators

Functions as same as that on the front panel. **Red:** System error **Orange:** Thermal error or malfunction of the cooling fan.

2 HDD power indicator

Functions as same as that on the front panel.ON: Indicates that HDDs are powered.OFF: Indicates that the HDDs are not powered.

③'Operate indicator

Functions as same as that on the front panel. Lights green when turning on the power switch on the rear panel.

13 Reset button [RESET]

This button is located inside the unit. To access this button, it is necessary to detach the front cover. Press this button using a small screw driver (not supplied).

- When SINGLE is selected After adding or replacing any of the HDDs, press this button only. Refer to page 11 and 12 for details.
- When RAID 5 is selected

This button is used in combination with the RECOVER button and MODE switch after adding or replacing any of the HDDs. Refer to page 11 and 12 for details.

Important

Do not press the RESET button and the RECOVER button simultaneously when SINGLE is selected. Otherwise, the setting of the digital disk recorder may be initialized and it may cause a malfunction.

14 Mode switch [MODE]

- **RAID 5:** Applies RAID level 5 mode (striping at the byte level also stripe error correction information).
- **SINGLE:** Applies SINGLE mode (no striping across drives for data or error correction information). **Default position**

Important

- Changing the MODE switch will not be accepted when the ERROR indicator lights red and/or when HDD 1-4 indicate a system error status by lighting red and orange. When this happens, ask your dealer to solve the error.
- When set to RAID5, the HDD preinstalled in the digital disk recorder will not work. Instead, it is applied only to the HDDs installed in the extension unit and the digital disk recorder will perform storage and readout of the image data by accessing the extension unit.
- The position of the MODE switch of all units in a system must be the same.
- The available disk space of the unit can be logically calculated as follows. The actual space may be several percent lower than you calculated depending on the HDD type used and their combination. The most efficient way is to use the same type drives.

When SINGLE is selected, it will be the sum of all the HDD sizes.

When RAID 5 is selected, it will be as follows.

When 3 HDDs are in the unit: It will be double the size of the smallest HDD size.

When 4 HDDs are in the unit: It will be triple the size of the smallest HDD size.

For example, if 4 HDDs of 80 GB, 120 GB, and two 160 GB are mounted, the available disk space will be 80 G x 3 = 240 GB.

15 HDD power switch [HDD POWER]

Use this switch in the ON position for normal operation. **ON:** Supplies the power to the HDDs and the HDD power indicators will light. **Default position**

OFF: Does not supply the power and the HDD power indicators will go off.

16 Recover button [RECOVER]

Use this button with the RESET button after replacing HDDs used in the RAID 5 mode to start data recovery. Refer to page 12 for details.

■ Replacing/Mounting HDDs

Up to four HDDs (locally procured) can be installed in an extension unit.

HDD 2	B HDD 4	

The HDDs should be installed in the proper positions in order as shown above. Do not skip or reverse the order of the HDD positions.

Important

- The position of the MODE switch of all units in a system must be the same.
- When set to RAID5, the digital disk recorder will not access the HDD preinstalled in it, but will access only the HDDs in the extension unit.
- Refer to the dealer for the compatible HDDs with this unit.
- The replaced/added HDDs will be formatted.
- **SINGLE mode:** Only the replaced/added HDD will be formatted. For example, when the HDD 4 of the extension unit 2 is replaced, only the HDD4 of the extension unit 2 will be formatted.
- **RAID 5 mode:** All HDDs of the extension units will be formatted when a new HDD is added or a preinstalled HDD is removed. For example, when the HDD 4 of the extension unit 2 is added, all HDDs of the extension unit 2 will be formatted.
- Data readout will not be performed when the HDD positions are changed after once the system has been operated.

Procedures

1. HDD power-off procedures

Perform either of the following procedures depending on the installation situations to stop the HDD motors.

Important

If turning off the POWER switch of a unit, the latter units may not work because of interrupted data transmission.

Case 1: When the rear of the units is **accessible**, turn off the power switches of the digital disk recorder and extension units, then detach all the power plugs from the outlets.



Case 2: When the rear of the units is inaccessible, for example mounted in a rack, open the setup menu of the digital disk recorder and set the HDD safety mode to ON (default position). The extension units will turn to the HDD power-off mode.

Refer to the Operating Instructions included with the digital disk recorder for details on it.

Detach the front cover and the front panel.
 2-1 Remove the two screws.



- 2-2 Slide the front cover to the left.
- 2-3 Pull the front cover toward you.



2-4 Disconnect the harness.



2-5 Remove the six screws (marked with Δ) and detach the thin metal plate covering the front side.



2-6 Disconnect the cables when adding or replacing the HDD.



- **3.** Remove two of the HDD mounting brackets.
- Remove the four screws and pull the brackets toward you.



- When replacing an HDD, remove it from the bracket.
- 4. Prepare the HDDs to be fixed on the brackets.
- Release the static electricity from your body before touching the HDDs.
- Put the conductive bag (in which the HDD was packed) on a soft surface and place the HDD on it with the circuit board side down.
- **5.** Fix the HDDs on the brackets.
 - 5-1 Slide the HDD onto the bracket.
 - 5-2 Tighten the four screws (supplied) to fix the HDD on the bracket.
 - 5-3 Repeat above steps to fix all the HDDs on the bracket.

Do not use an electric screwdriver to fix them. Recommended tightening torque = 0.49 N \cdot m {5 kgf \cdot cm}



 Set all the HDDs as master using the jumper connector.
 Note: This setting is subject to change without notice. Refer to the diagram attached on the HDD or the operating instructions of the HDD for the jumper connector assignment.

- **7.** Place the brackets with the fixed HDDs into the unit and fix them using the four screws removed in step 3.
- Do not use an electric screwdriver to fix them. Recommended tightening torque = 0.784 N·m {8 kgf·cm}



8. Connect the cables.



9. Attach the metal plate removed in step 2 with the six screws (marked with Δ) previously removed.



10. Connect the detached harness as it was.



- **11.** Attach the front cover as it was.
 - 11-1 Align both the left edges of the front cover and the unit, and then push the front cover onto the unit.
 - 11-2 Slide the front cover to the right.



- **Note:** The front cover may be attached and detached as necessary in the next step 12. Be careful not to damage the harness.
- **12.** Turn on the power of the system to reconstruct the system.

See the table on the next page to perform start-up procedures. Note that step 1 in the next page depends on how you have cut the motor power in case 1 or 2 mentioned in page 9.

Take the steps in order depending on the cases A, B, C, and D.

- **Case A:** Extension units not configured yet and newly installed or added to be run in SINGLE or RAID5 mode.
- **Case B:** Extension units already configured in SINGLE mode and having HDD added, removed, or replaced.
- **Case C:** Extension units already configured in RAID5 mode having HDD added or removed.
- **Case D:** Extension units already configured in RAID5 mode having replaced HDD.
- **Important:** Turn the units on in the following order. The extension units need to be turned on first and the digital disk recorder is the last.
- **Note:** The digital disk recorder will need about three to five minutes to complete the system check that is started as it is turned on. The time length depends on the connections and number of the extension units.

Device	Case & Step				Start-up Procedures			
	A 1	B 1	C 1	C D ● For Case 1, turn on the power switches → The unit will be restarted.	 For Case 1, turn on the power switches of the extensior → The unit will be restarted. 	s of the extension units .		
					For Case 2, jump to step 2.		♥	
Extension Unit WJ-HDE300	2	2			Press the RESET button.		RESET	
			2		 Initializing Procedures 1. Set the MODE switch to SINGLE. 2. Hold down the RECOVER button. (Do not release it yet.) 3. Press the RESET button while holding down the RECOVER button. → The HDD POWER indicator will go off. 4. Release the RESET button first. (Do not release the RECOVER button yet.) 5. Confirm that the HDD POWER indicator turns on, then release the RECOVER button. It may take around 5 seconds until the indicator turns on. 6. Set the MODE switch back to RAID5. 	HDD POWER	SINGLE RAIDS	
	Case A: SINGLE/RAID unit added or new	Case B: SINGLE unit with added/replaced HDD	Case C: RAID unit with added/removed HDD	Case D: RAID unit with replaced HDD R	 Data Recovery Procedures Confirm that the MODE switch is set to RAID5. Hold down the RECOVER button. (Do not release it yet.) Press the RESET button while holding down the RECOVER button. → The HDD POWER indicator will go off. Release the RESET button first. (Do not release the RECOVER button yet.) Confirm that the HDD POWER indicator turns on, then release the RECOVER button. → Data recovery will start automatically. Repeat the above steps until all the extension units start data recovery. It will take around 12 hours to complete data recovery It spossible to start operation of the digital disk recor is recovering data although it may take a longer time to the touch any button or switch during data recovery nately blinks orange and red or steady orange. When d off or blinks green. 	HDD POWER POWER HDD POWER HDD so der even wh o complete . Otherwise, the HDD ac ata recovery	SINGLE RAID5 SINGLE RAID5	
Digital Disk Recorder	3	3	3	3	 When the POWER switch is off, turn it on after comple When HDD SAFETY MODE is set to ON in the menu s and press the SET button. → The digital disk recorder will start up. In the case of A, B, or C, "HDD DISK MENU" will be a matically. Then, format and configure the target hard In the case of D, the "REMOVE" status will be display of the WJ-HD316/309. To cancel it, manually open "Honce, and click the "EXIT" button. Refer to the operating instructions of the digital disk records. 	ting the insta etup, set it to displayed au disk. red on the ta IDD DISK M order for de	allation. o OFF uto- usk bar IENU"	

13. Attach the front cover as it was.

- 13-1 Align both the left edges of the front cover and the unit, and then push the front cover onto the unit.
- 13-2 Slide the front cover to the right.



13-3 Tighten the two screws.



Connections

You can connect up to seven extension units with the digital disk recorder (the WJ-HD300 series) as shown below using the supplied serial cables.

Important

- If turning off the power of a unit, none of the connected following units will work because of interrupted data transmission.
- Never use extension cables (locally procured). Be sure to use the supplied serial cables for connection. Do not lay cables in a redundant route. Otherwise, it may cause data transmission error.
- Make a space of 1 U (44 mm) between the units in a rack for ventilation.
- Follow the recommended connection form. Otherwise, it may cause malfunction of the system.
- Physical connections determine the unit number in a system for each unit. Connect units with the recorder in numeric order as shown in the figure. For example, connect the sixth and seventh units to the third unit when five units have been already installed.
- Do not change connections after the system has run. Otherwise, the recorder will no longer recognize the extension units as before. You can change connections only when you can discard all existing data stored in the units.

Recommended Connection Form



Cable Connections

The figure below shows cable connections.

- 1. Connect the EXT STORAGE port of the recorder and the IN port of extension unit #1 using the supplied serial cable.
- Connect the OUT port of unit #1 and the IN port of unit #2 using the supplied serial cable.
- **3.** Repeat connections in the same way for the remaining units.
- 4. Confirm the cable layout after connections.
- **5.** Secure the cables using the clamp (supplied) and fix it to the rear of the units.



Rack Mounting

• Unit Layout

You need to make a plan on the unit layout in a rack considering the connection form (page 14), cable connections (page 15), and ventilation.

Note: Be sure to make a space of 1 U (44 mm) between the units for ventilation in a rack.



<Unit Layout & Wiring in a Rack>

Serial cable (1 m, supplied)

• How to Mount

- Turn off the power of the unit and detach the plug from the outlet.
 When not turning off the power, open the front cover and turn off the HDD POWER switch.
- **2.** Remove the six rubber feet by removing the six screws from the bottom of the unit

3. Fix the Rack Mounting Brackets (supplied) on both sides of the unit with the four screws (M4X10, supplied).



M4X10 (Supplied)



Rack Mounting Bracket (Supplied)



- **4.** Install the unit in the rack securing it with four screws (M5x12, not supplied).
- **5.** Turn on the power of the unit. When the HDD POWER switch is turned off, turn it on and attach the front cover as it was.

Cautions:

- Make a space of 1U (44 mm) between the units for ventilation, and install them in the rack as low as possible.
- Keep the temperature in a rack below 45 °C (113 °F).
- Install a fan in the rack when the ambient temperature is above 30 °C (86 °F).
- Do not block the ventilation openings or slots on the cover to prevent the unit from overheating.

Troubleshooting

Symptom	Cause	What to do
No power is supplied.	Insufficient power cord connection POWER switch or HDD POWER switch is turned off.	Securely connect the power cord. Turn on the POWER switch and HDD POWER switch.
ERROR indicator lights orange. Thermal error stops the unit.	Cooling fan(s) may be faulty. Ambient temperature exceeds the operable range. Ventilation may be blocked.	Repair cooling fan(s). Arrange the ambient temperature so that it lies within the acceptable range. Remove obstacles blocking the open- ings or slots. See below for cleaning.
ERROR indicator lights red.	System fault	Repair is required.
Extension unit or added HDD is not recognized.	Connection cables other than supplied may be used. Insufficient connector junction Powering up the recorder and units in opposite order The recorder and units are connected to differ-	Use the supplied cable. Firmly join the cables and connectors. The order should be "the extension units first, then the recorder" or at the same time. Keep the above order for powering up,
	ent AC mains HDD installation position is wrong. MODE switch setting	or rearrange AC mains connection to the same source. Install HDDs in order from the position #1, #2, #3, and #4. Never skip or reverse. Set the MODE switch appropriately.
HDD access indicator alternately blinks orange and red or blinks green though no recording/play- back.	In recovery process of RAID5 Automatic periodic (every 5 seconds) data check in RAID5	Not a problem
Data recovery fails after replac- ing the HDDs in the RAID 5 mode.	The HDD to be recovered may be faulty. Size of the new HDD may be smaller than before although nominally same. The HDDs have not been replaced correctly. The cables are not connected correctly to the HDDs.	Repair the faulty HDD. Install an HDD larger than before or the same size. Never skip or reverse the position. Check that the cables are connected to the HDDs correctly and firmly.
HDD access indicator light/blink red.	Disk drive is faulty in RAID5 mode. The steady light means it is the first faulty drive, the blinking light means it is one of the later ones.	Repair the faulty HDD and implement the recovery process.
HUD access indicator light red and orange.	System fault Red and orange lighting of these four bits dis- plays error status as shown below. •: Red •: Orange ••••: Hardware error ••••: Hardware error	Repair is required.



Required power: Power consumption: Interface: Operating temperature: Operating humidity: Dimensions:

Weight:

120 V AC 60 Hz 85 W (including 4 HDDs when installed) 2-wire serial, 480 Mbps logical speed +5 °C to +45 °C (41 °F to 113 °F) Less than 85 % 420 mm (W) x 88 mm (H) x 350 mm (D), rubber feet exclusive 19-9/16" (W) x 3-7/16" (H) x 13-13/16" (D) 7.2 kg (16 lbs) (not including hard disk drives)

Weight and dimensions indicated are approximate. Specifications are subject to change without notice.

Accessories

Operating instructions (this document)..... 1 pc.

The following are for installation.

Power cord	1	pc.
Serial cable	1	pc.
Rack mounting bracket	2	pcs
Bracket fixing screw	4	pcs.

HDD fixing screw	16 pcs.
Cable clamp	1 pc.
Clamp fixing screw	1 pc.

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