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# FURUNO

## USER'S MANUAL

**Single-band Access Point**

**MODEL: WN-701-W**

FURUNO SYSTEMS CO., LTD.

PRINTED IN JAPAN



## TABLE OF CONTENTS

FOREWORDS .....	C
DISCLAIMER.....	C
TRADEMARKS.....	C
COPYRIGHT.....	D
DISPOSAL OF LITHIUM BATTERY .....	D
FCC MANUAL STATEMENT .....	D
SAFETY LEVELS & MARKS .....	F
HANDLING PRECAUTIONS FOR THIS UNIT .....	G
SECURITY ON USING WIRELESS LAN .....	I
<b>1. Features.....</b>	<b>1</b>
<b>2. System Configuration .....</b>	<b>2</b>
<b>3. Controls &amp; Switches.....</b>	<b>3</b>
<b>4. INSTALLATION: Introduction .....</b>	<b>5</b>
4-1 Materials required .....	5
4-2 Installation Procedure Guideline.....	6
<b>5. INSTALLATION: Notes on radio wave path.....</b>	<b>7</b>
5-1 Radio wave attenuation by wall, metallic net, etc.....	7
5-2 Interference from ISM devices .....	7
5-3 Mounting Location.....	7
5-4 Installing multiple access points.....	9
<b>6. INSTALLATION: Cabling &amp; Mounting .....</b>	<b>10</b>
6-1 Notes on Cabling .....	10
6-2 Mounting Procedure .....	11
6-3 Notes on PoE Power Supply .....	14
<b>7. INSTALLATION: Initial Setup.....</b>	<b>15</b>
7-1 Initial Setup Items .....	15
7-2 Initial Setup Procedures.....	17
7-3 Calling MainMenu through network by telnet .....	17
7-4 Calling MainMenu through COM port .....	18
7-5 Settings on MainMenu.....	19
7-6 Initial Setup by MORS Terminal Manager.....	23
<b>8. Daily Maintenance .....</b>	<b>24</b>
<b>9. Before calling service .....</b>	<b>25</b>
<b>10. Specifications.....</b>	<b>27</b>
<b>11. Equipment List .....</b>	<b>31</b>

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## **FOREWORDS**

Congratulations and thank you for deciding and purchasing this unit.

Before start using the unit, read this manual carefully to operate it properly and derive full performance.

This manual explains installation procedure, very basic usages and the important information (cautions, etc.) required when using the unit. For daily operations or other information of the entire system including the host computer, refer to relative manuals for that system.

Always keep this manual in the place accessible from the operators.

## **DISCLAIMER**

This manual was edited very carefully and the information contained in this manual is thought to be correct in every respect, however, in no event FURUNO SYSTEMS be liable to you for any damages, including any lost profits, lost savings or consequential damages arising from incorrect and/or insufficient information in this manual. The entire risks are assumed by you.

The information in this manual may be revised without notice.

## **TRADEMARKS**

Product names used in this document are for identification purposes only and may be trademarks of their respective companies.

# **COPYRIGHT**

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## **DISPOSAL OF LITHIUM BATTERY**

This unit contains a Lithium battery. For disposal of the Lithium battery, follow the directions of your local government. Feel free to contact the vendor of your unit for any inquiry on this matter.

## **FCC MANUAL STATEMENT**

### **FCC WARNING**

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

### **Part 15 Subpart B Class B Statement**

#### **NOTICE**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver.

-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with FCC radiation exposure limits set forth for uncontrolled equipment and meets the FCC radio frequency (RF) Exposure Guidelines in Supplement C to OET65. This equipment should be installed and operated with at least 20cm and more between the radiator and person's body (excluding extremities: hands, wrists, feet and ankles).

This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

# SAFETY LEVELS & MARKS

The following indications are used throughout this manual to show safety levels:



Disobedience to the instructions in this column may directly result in serious injury or death.



Disobedience to the instructions in this column may result in injury or damage of this unit.



Notes or tips in using this unit fully.

The following marks clearly indicate if you must do something or if you must not do something:



You must do something indicated by this mark.



Action indicated by this mark is prohibited.



# HANDLING PRECAUTIONS FOR THIS UNIT

When using this unit, follow the instructions given below in order to prevent danger to you or nearby people or to prevent failure of this unit.

<b>⚠ WARNING</b>	
<b>⊘</b>	Never use the unit near flammable material such as gas, gunpowder, etc. The material may explode and the unit may burst or burn.
	This unit is not splash-proof. Do not use the unit in the environment where splash or rain drop is anticipated. Never use the unit which was water-splashed. If so done, the unit may burn due to short circuit.
	Never use the unit in the environment where strong shock or vibration is anticipated. The unit may burn or you may get an electric shock.
	Never leave foreign objects (such as metal) within the unit. The unit may burn or you may get an electric shock.
	When smoking, overheating or odd smell is felt, immediately shut down the power supply.
	Do not use this unit for vital or critical mission which requires extraordinarily high reliability.
	When thunder is coming, do not touch the unit or cables. You may get an electric shock.
<b>⚠ CAUTION</b>	
<b>⊘</b>	Never attempt to disassemble or modify this unit.
	Never use the unit in dusty environment like desert or in the atmosphere of corrosive gas (such as exhaust gas). Metallic parts such as connector pins may deteriorate, resulting in communication errors, etc.
	Never use or store the unit in abnormally hot environment such as in direct sunlight or near heater. The unit may be damaged, performance may lower, or life may shorten.

(Cont'd)

**⚠ CAUTION**



Never use the unit in the place where temperature changes frequently and condensing is anticipated. The unit may be damaged, performance may lower or life may shorten.

Never use the unit in strong electric or magnetic field. The unit may be damaged, performance may lower or life may shorten.

Never stick seal onto the antenna aperture of this unit. Performance of the antenna may lower.

Because wireless LAN of IEEE802.11a specification employed in this unit uses 5 GHz radio wave, it is prohibited by law to use this unit outdoors.



To avoid radio interference, make sure that obstacles (metallic objects, etc.) are not placed around this unit.

Wipe off the dirt on the surface of this unit with soft cloth damped with a bit of solution of neutral cleanser thinned with clean water. Never use solvent such as alcohol, thinner, benzene, toluene, acetone, etc., or plastic parts (housing, etc.) may melt, deform, whiten, etc.

**NOTE**

Communication range of this unit subject to surrounding condition including existence of obstacles. Wireless LAN of IEEE802.11b/g specification employed in this unit uses 2.4 GHz ISM (Industry Science Medical) band which is shared by various kinds of ISM equipment including microwave ovens, high-frequency medical equipment, etc. For this reason, communication by this unit may be interfered from them.

Also, communication by this unit may be interfered from adjacent electric/electronic equipment which emit radio wave or generate magnetic field, office equipment, and home electric appliances like TV.

# SECURITY ON USING WIRELESS LAN

Wireless LAN uses radio signal (rather than wired one) for communication between equipment like PC and a wireless access point. This is great advantage in that you may LAN-connect to any station so long as you are within the wireless communication range. Because radio signal can sometimes reach outside beyond obstacles (wall,) this may cause the following problems unless security settings are done properly:

## Outsider may spy your communication

Outsider may intentionally receive radio signal emitted from your equipment to spy invaluable information including various ID's, passwords, personal information like credit-card numbers, e-mails, etc.

## Outsider may invade/hack into your personal or company's network to:

- Steal personal or secret information. (Leakage of Information)
- Impersonate someone else to communicate with another, and distribute harmful information. (Impersonation)
- Falsify intercepted information and distribute it. (Falsification)
- Destroy data/system by distributing computer virus, etc. (Destruction)

Generally security system is built in wireless LAN equipment or wireless access point, and proper setting of the security system minimizes the possibility of these problems.

Wireless LAN equipment is sometimes shipped without setting the built-in security system. For this reason it is vitally important to complete security settings on wireless LAN equipment before start using its LAN capability.

Due to the nature of wireless LAN, security may be broken by unpredictable special manner. Always bear this in mind when using wireless LAN equipment. If you have any question/problem in security settings, do not hesitate to call the vendor of the wireless LAN equipment.

Always do security settings after you have understood everything completely. Again, the entire risks are always assumed by you.



# 1. Features

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This single-band access point incorporates durability, reliability and safety which are required for professional use.

- **Compliant with 3 Wireless LAN Specifications:**

- IEEE802.11g in 2.4 GHz band
- IEEE802.11b in 2.4 GHz band
- IEEE802.11a in 5 GHz band.

You may select either 2.4 or 5 GHz band by internal setting.

NOTE: To use IEEE802.11g or IEEE802.11a, our integrated network management tool "UNIFAS" is required.  
5 GHz band may not be used in some countries.

- **Support by Integrated Environment**

With our reliable middleware "MORS Evolution", this unit best matches to mobile information terminal Model finpad 500f, and realizes true mobile communication.

- **Tight Security**

Connection control is performed in the communication between finpad 500f and MORS Evolution.

- **Attractive Design**

Compact and attractive design fits to your office or lobby.

- **PoE-compliant**

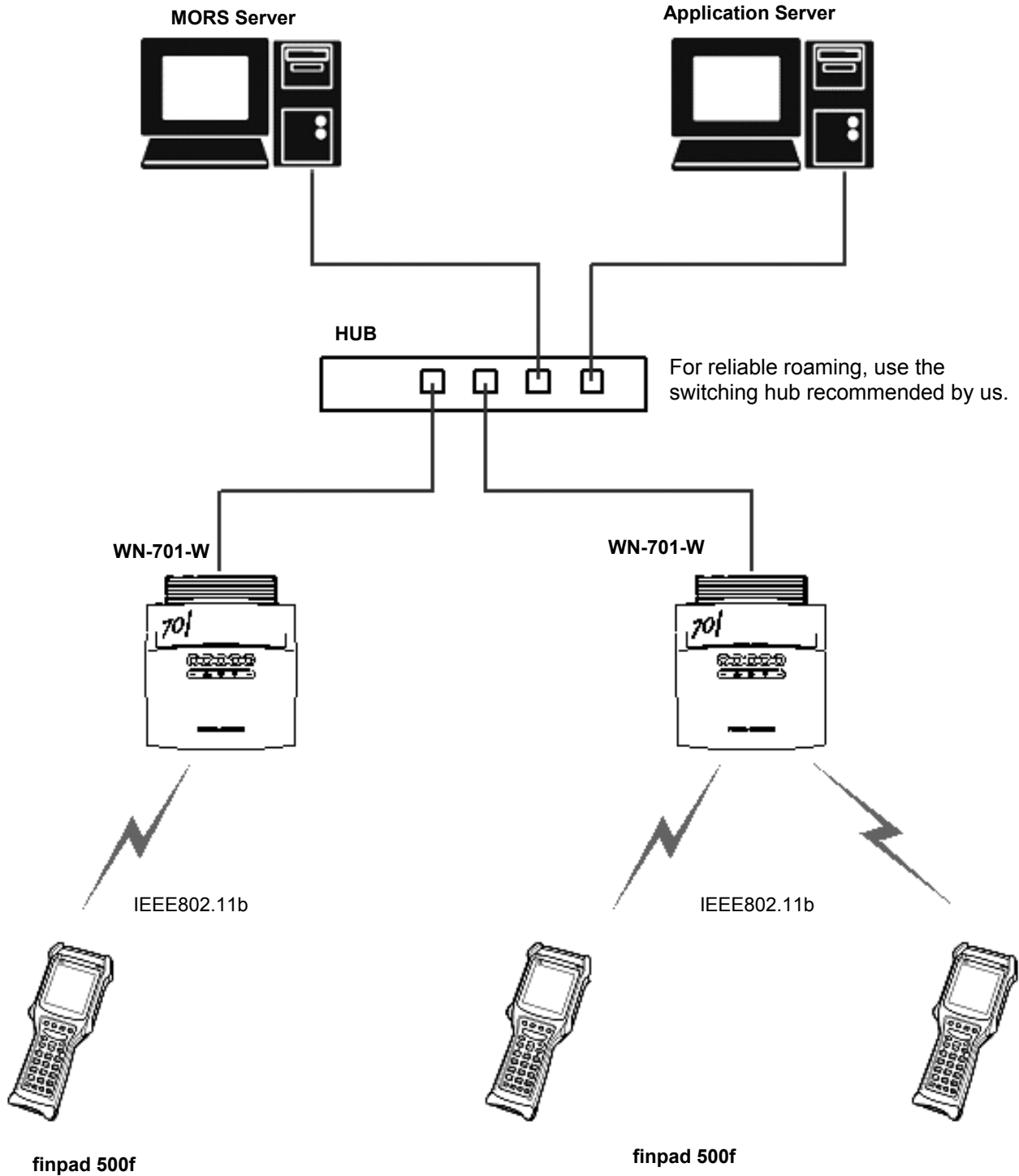
This unit has PoE (Power-over-Ethernet) capability as defined by IEEE802.3af, and may be powered from the device like mid span or PoE hub through Ethernet cable. Connection of power cable is not required.

- **High-performance Hardware**

High-performance network processor is built in this unit to enhance processing power.

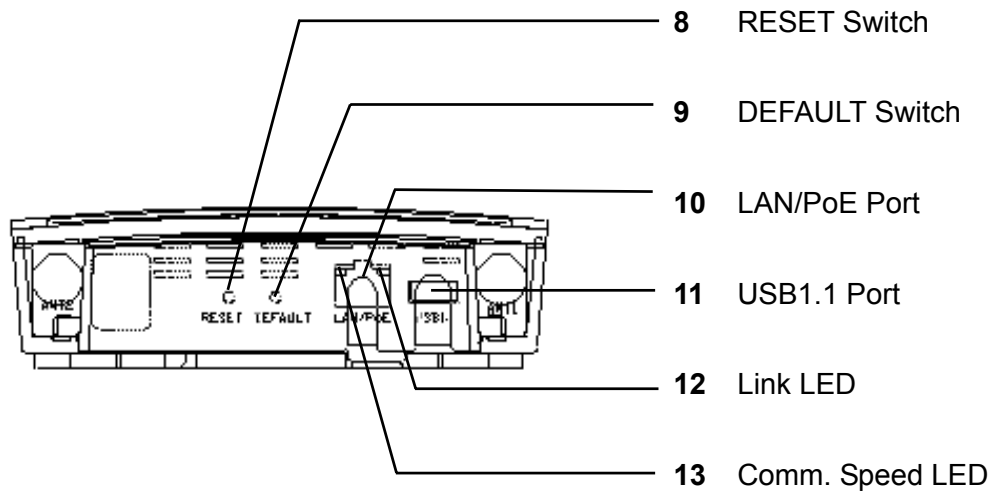
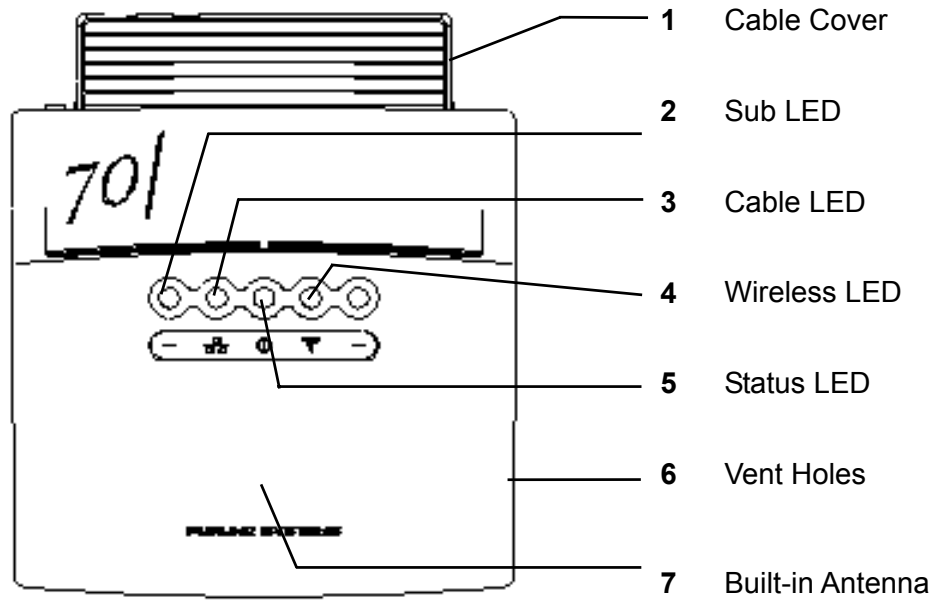
## 2. System Configuration

You may build warehousing system, factory management system using finpad 500f. An example of the system is given below:



### 3. Controls & Switches

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#	NAME	FUNCTION
1	Cable Cover	After cabling, install this cover.
2	Sub LED	Indicates hardware condition of this unit: RED (blink/lit): Hardware is faulty.
3	Cable LED	Indicates LAN communication status: GREEN (blink): Receiving YELLOW (blink): Transmitting
4	Wireless LED	Indicates wireless communication status: GREEN (blink): Receiving YELLOW (blink): Transmitting (If blinking in YELLOW in synchronization with Status LED, wireless channel is set out of approved range.)
5	Status LED	Indicates status of the access point: WHITE (lit): Starting. YELLOW (lit): Preparing for normal operation while communicating with MORS server. GREEN (lit): Operating normally. YELLOW (blink): Wireless communication stopped. (The hub may not be connected to LAN/PoE port properly. Also suspect that the wireless channel is set out of approved range.) RED (lit/blink): Failure in hardware.
6	Vent Holes	Do not mask the vent holes.
7	Built-in Antenna	Antenna is built under this portion.
8	RESET Switch	Restarts the access point. (Press with a thin pin. Do not use sharp one.)
9	DEFAULT Switch	Returns the internal settings to factory default. (Press with a thin pin. Do not use sharp one. Press longer than 3 seconds during normal operating condition.)
10	LAN/PoE Port	Connected to cable LAN through Ethernet cable. This unit is powered from IEEE802.3af-compatible PoE power source through Ethernet cable.
11	USB1.1 Port	Connected to PC's COM port through USB-RS232C conversion cable plus cross RS232C cable. Used for setting by console menu or for setting from MORS server by using MORS Terminal Manager.
12	Link LED	Indicates link status of the LAN port: GREEN (lit): Connected to the hub, and link is established. GREEN (blink): Communicating Extinguished: A hub is not connected.
13	Comm. Speed LED	Indicates the communication speed through the LAN port: YELLOW (lit): 100 Mbps. Extinguished: 10 Mbps (when linked)



## 4. INSTALLATION: Introduction

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### 4-1 Materials required

Make sure that the following items are available:

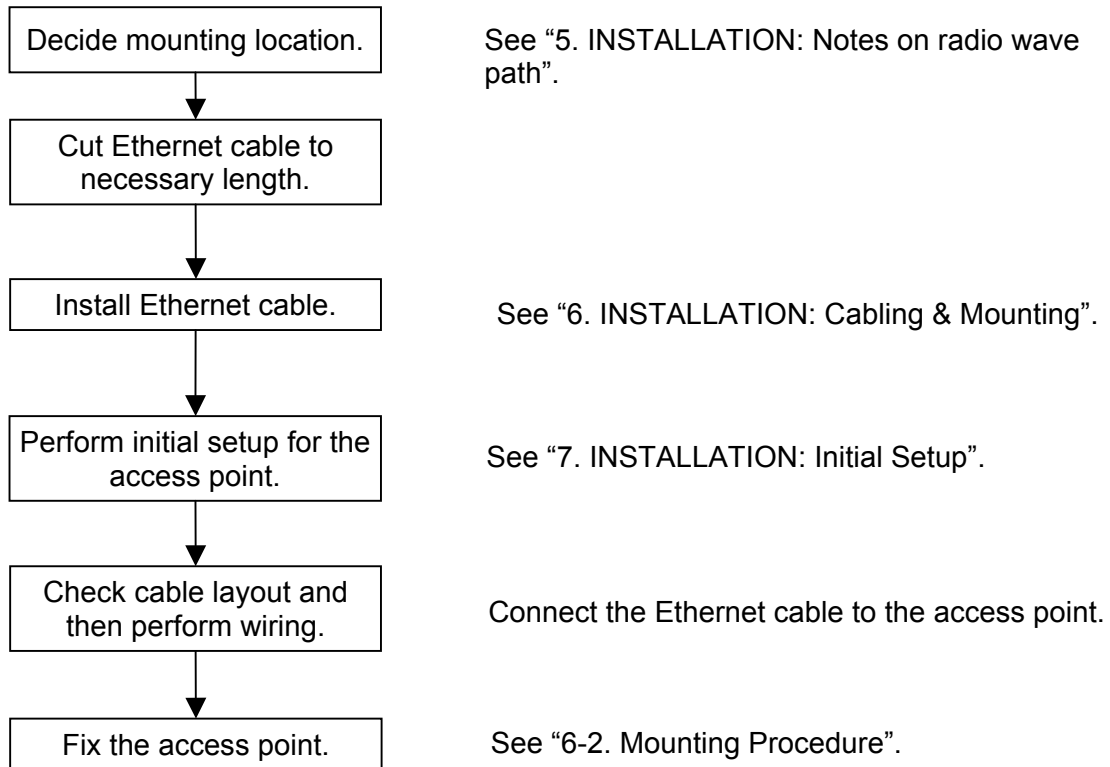
Standard Parts come with Access Point WN-701-W	
- Cable Cover	1 pc.
- Rubber Cushion	4 pcs.
- Wood Screw	2 pcs. (for wall mount)
- Quick Reference	1 copy

Optional Parts
- Mounting Base Kit This kit is required when installing the unit overhead or on the wall. (When installing the Mounting Base, use the wood screws that can fix the Mounting Base onto the wall securely.)

Material to prepare locally
- Ethernet Cable - Cable Clamps - Additional Fixing Parts Additional fixing parts may be required if special mounting (ex. hanging from the ceiling) is employed. - Standard Tools

## 4-2 Installation Procedure Guideline

Typical installation procedure is given below for your reference:



## 5. INSTALLATION: Notes on radio wave path

### 5-1 Radio wave attenuation by wall, metallic net, etc.

Radio wave is heavily attenuated by wall, metallic net, etc. If heavy attenuation is anticipated, checking by measuring instrument is required.

### 5-2 Interference from ISM devices

IEEE802.11b/g-compatible wireless LAN device like this unit uses 2.4 GHz ISM (Industry Science Medical) band. The 2.4 GHz ISM band is widely used by microwave ovens, high-frequency medical equipment, etc.

If such ISM devices are installed nearby, you have to check mutual interference beforehand by using measuring instrument. For a microwave oven, check communication quality while heating water in a heat-proof bowl.

### 5-3 Mounting Location

Tabletop, overhead or wall mount is available. Decide mounting location, taking the following points into consideration:

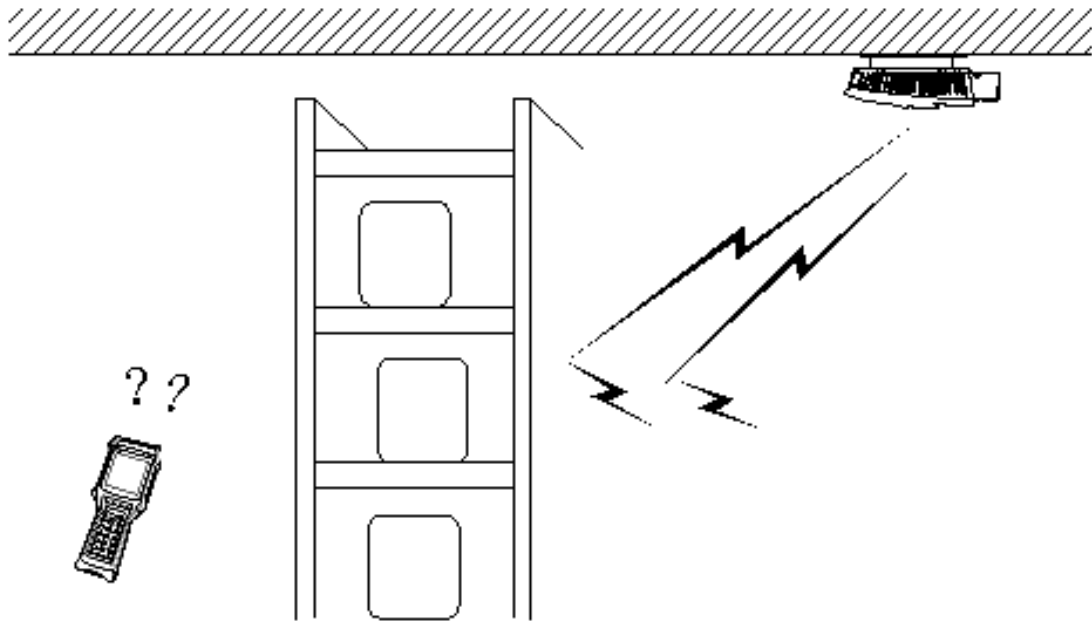
- Measure or guess radio wave coverage of your access point. For measurement, consult with the vendor of this unit.

For guess, use the following guideline:

ENVIRONMENT (INDOOR)	COVERAGE (DIAMETER)
Open	Shorter than 100 m (No obstacle on line of sight)
Semi-open	Shorter than 50 m (Medium between "Open" and "Closed" environment)
Closed	Shorter than 20 m (Enclosed in compartment which reaches ceiling)

- Select a high location around the center of the intended communication area.
- Strong vibration or mechanical shock is not anticipated.
- Ambient temperature is not high but not extremely low, and humidity is low.
- Splash or rain drop is not anticipated.
- Avoid corrosive or exhaust gas environment.
- Select a place accessible for mounting and maintenance.
- Avoid the places where interference is anticipated. Make sure that there is no metallic obstacle around this unit.

Depending on obstacles, communication area becomes extremely small. A typical example is shown below.



In this example obstacles are as high as the ceiling. In this case, radio wave can hardly reach the terminal.

## 5-4 Installing multiple access points

When installing several access points to cover larger area, decide their mounting locations, considering the following points into consideration:

### Channel Setting

- Generally “*One common channel for one area*” rule is recommendable.

Set all the access points in your intended to a common channel. If an area covers several floors, use a single channel commonly among all the access points.

- It is recommendable to select a channel which is at least 6 channels away from existing system. Mutual interference will be avoided by this measure.

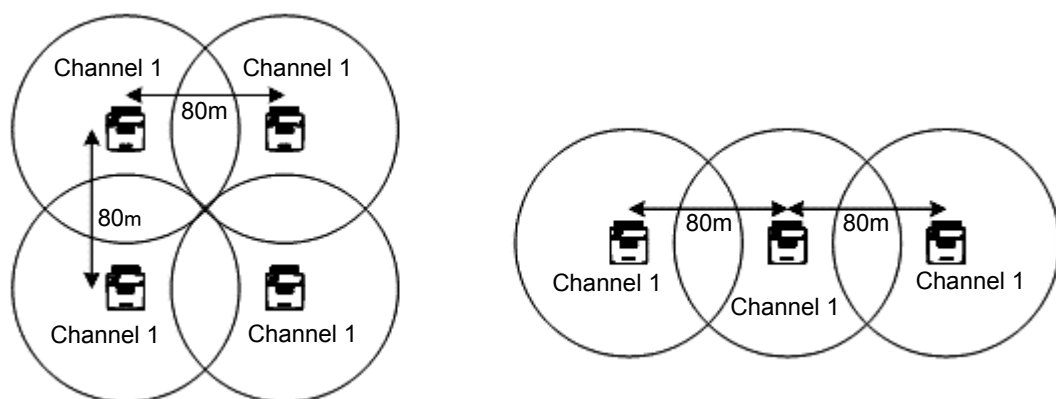
If another 2.4-GHz (IEEE802.11b/g) wireless LAN exists already, mutual interference is anticipated. In such a case, select a channel which is at least 6 channels away from that LAN. If Channel 3 is used by the existing LAN for example, select Channel 9.

Generally, channels are used efficiently among multiple systems when Channel 1, 7 or 13 is used.

Take note that some channels may not be approved in your country.

### Cell Mapping

The area (called “cell”) covered by one access point is typically a circle of 50-meter diameter in a warehouse, etc. Distance between neighboring access points is usually around 80 m if sight is favorable between them. An examples of cell mapping are given below:



**NOTE:** The cell ranges shown above are for reference only. Actual cell ranges vary according to surrounding environment, etc.

## 6. INSTALLATION: Cabling & Mounting

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### 6-1 Notes on Cabling

#### Cable Routing & Clamping

- Take care not to deform the profile of the cable by clamping it too tightly or by bending it too sharply.
- Do not slack the cable. In the passage, it is a good practice to clamp the cable with shorter interval or pass it through a pipe to prevent the cable from being caught by some object. Avoid the places where damage of the cable is anticipated, or protect the cable by passing it through a pipe.
- Take care so that the cable may not be caught by the cable cover of the access point.
- To prevent interference by induction, separate the cable from power cables or the ones which handle large power:

POWER LINE	REQUIREMENT
Low-voltage Line (below 600 V)	Separate 30 cm or more
High-voltage Line (up to 7000 V)	Separate 1 m or more

To install the cable in shorter distance from the power lines, pass it through a metallic pipe which is grounded sufficiently.

#### Static Discharge

If the unit or cable is installed at the place where objects (human body, cargo boxes, etc.) touch it frequently, the unit may sometimes malfunction due to static discharge from it. In such a case, take the following measures:

- Use STP (Shielded Twisted Pair) cable.
- When you use STP cable, use the STP-version of the hub, too. Also, do not forget to ground the body of the hub.

Of course, you may usually use UTP (Unshielded Twisted Pair) cable rather than STP cable.

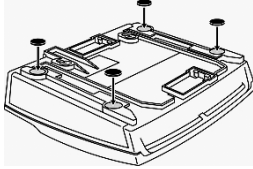
#### Power Supply

Power is fed through the Ethernet cable connected to the LAN/PoE Port (IEEE802.3af compliant). Stick a label to the power supply-end of the Ethernet cable so that you may identify which access point is connected to. (These measures are helpful when turning on-off specific access points.)

## 6-2 Mounting Procedure

### Table-top Mount

- 1 To prevent the unit from slipping on the table, stick 4 pieces of Rubber Cushions (standard supply) onto the bottom of the unit as shown below:

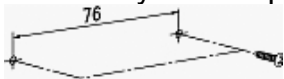


- 2 Next, place the unit on the table.

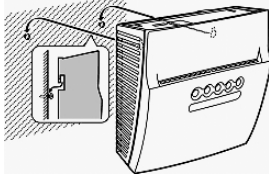
### Wall Mount

Mount the unit, using the Mounting Base Kit (optional supply). You may also mount the unit, using 2 pieces of Wood Screws (standard supply) as follows:

- 1 Screw 2 pieces of Wood Screws (3.5 x 18 mm) into the wall with 76mm horizontal pitch. The screw head (surface) must be extruded from the wall surface by 5 mm approx.

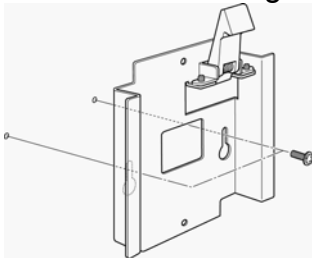


- 2 Hang the unit on the wood screws that you installed in step 1.



### Mounting with Mounting Base Kit (optional supply)

- 1 Install the Mounting Base onto the wall as shown below:

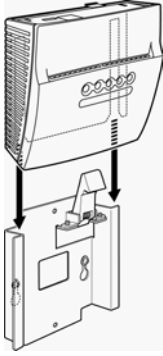


**NOTE:** Use the wood screws which can fix the plate to the wall securely.

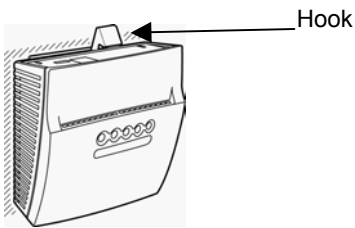
Recommended one is:

- Type: + Pan-head Screw
- Size: M4
- Length: 10 mm or longer
- Material: Steel or stainless steel

2 Slide the unit into the Mounting Base as shown below:

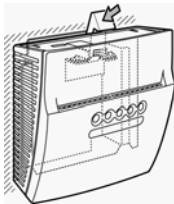


3 Lock the unit with the hook as shown below:

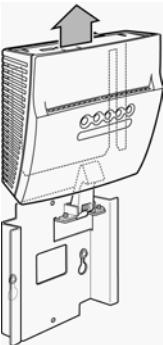


If you want to remove the unit from the Mounting Base for some reason, do as follows:

1 Unlock the unit as shown below:



2 Slide the unit out of the Mounting Base as shown below:



### **Overhead Mount**

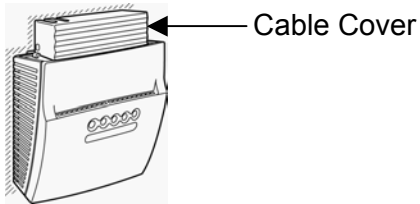
Mount the unit onto the ceiling, using the Mounting Base Kit (optional supply).

**WARNING:** Never mount the unit directly onto the ceiling by 2 pieces of wood screws only, without using the Mounting Base Kit. If so done, the unit will drop!



## **Cable Cover**

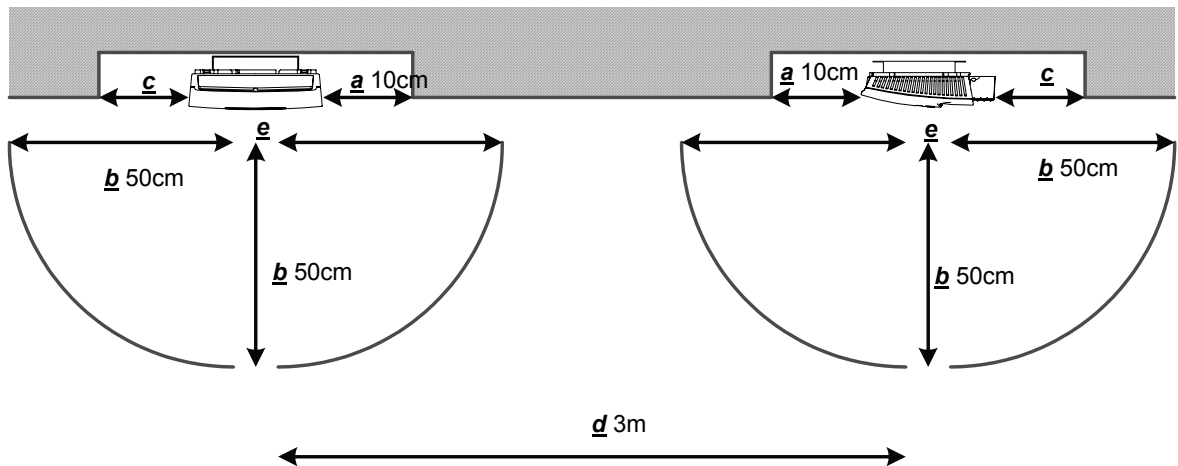
When the unit is installed, install the Cable Cover (standard supply) as shown below. It prevents dusts from entering the connectors.



## **Notes on Spacing**

Meet the following requirements, or communication area may become very small. If you have any difficulty, call the vendor of this unit.

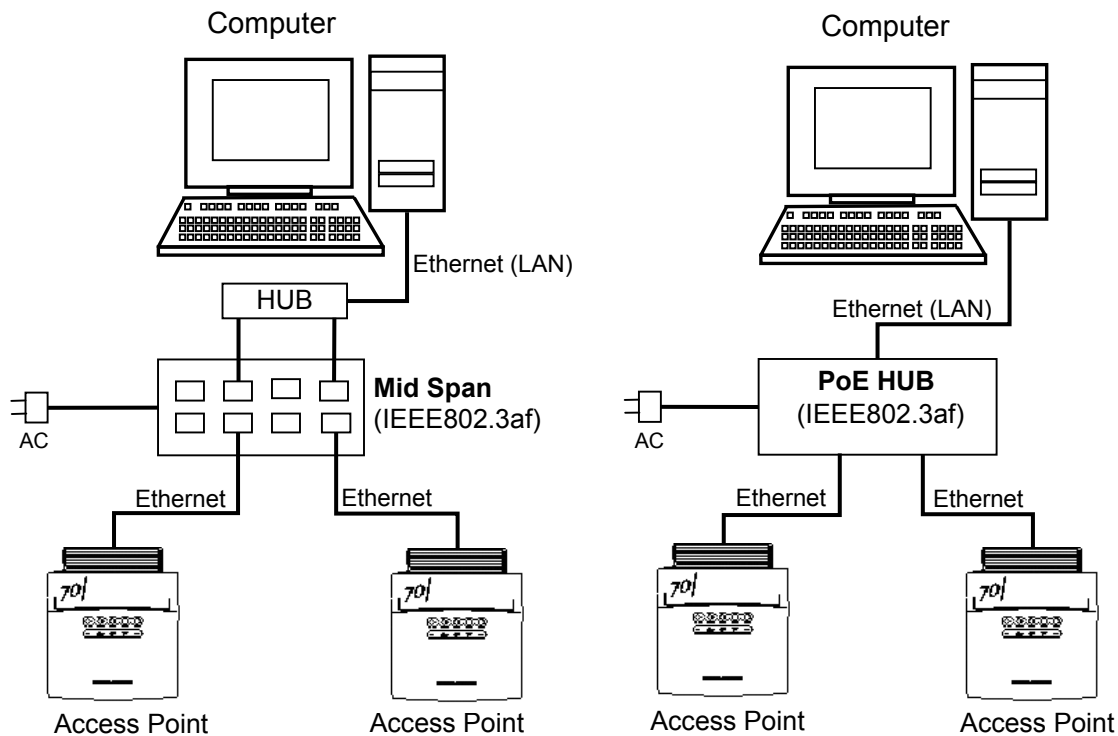
- a** Leave at least 10-cm space around the unit.
- b** Make sure that metallic objects do not exist within 50 cm around the unit.
- c** Do not mask the vent holes arranged on the unit.
- d** Separate the unit from another access point more than 3 m.
- e** Make sure that the LED's, switches, etc. are visible/accessible easily.



## 6-3 Notes on PoE Power Supply

Power is fed from PoE power source through the Ethernet cable. This method is handy because connection of power cable is not required. Two types of PoE power sources are available, “Mid Span” and “PoE Hub”.

- The mid span is placed between a hub and access point. The access point is powered from the mid span.
- The PoE hub incorporates both a hub and PoE power source, and an access point is connected to it directly.



**Configuration with Mid Span**

**Configuration with PoE Hub**

**NOTE:** - Use a mid span or PoE hub approved by FURUNO SYSTEMS only. Do not use proprietary products of other makes.

- Each power source (mid span or PoE hub) has output capacity, and the number of access points hosted is limited. It is recommended to limit the number of access points so that totaled power consumption of all the connected access points may not exceed 50% of the capacity of the power source. This rule lowers the load of the power source, thereby increasing the reliability of the total system. Usually, this rule is met if half of the ports of each power source are left unused (open).
- Stick a label to the power supply-end of each Ethernet cable so that you may identify which access point is connected. (These measures are helpful when turning on-off specific access points for testing.)

## 7. INSTALLATION: Initial Setup

---

Before start using the access point, you have to complete initial setup. The setup differs between the following two cases:

- The system in which the access point communicates with wireless terminals finpad 500f, using MORS server.
- The system in which the access point communicates with terminal PCs, using UNIFAS Managed Server or UNIFAS Small Office.

### **Initial Setup for connection to finpad 500f**

The setup comprises the following two:

- Basic Settings for connection to Cable LAN
- In-depth Settings involving Wireless LAN.

#### **7-1 Initial Setup Items**

This sub-section lists the initial setup items.

**NOTE:** The items with "*(REQUIRED)*" are always required.  
The items with "*(OPTIONAL)*" are required, depending on system configuration.]

#### **Basic Settings for connection to Cable LAN**

**NOTE:** You will perform network-related settings here. If you do not know the values to set, ask to your network administrator.

##### **IP Address** (*REQUIRED*)

Set the IP address that is assigned to the access point.

##### **Subnet Mask** (*REQUIRED*)

Set the subnet mask that is assigned to the network in use.

##### **Default Gateway Address** (*OPTIONAL*)

Set the IP address that is assigned to the device (usually a router) which relays to external network.

##### **Primary Server Address** (*REQUIRED*)

Set the IP address that is assigned to the MORS primary server.

##### **Secondary Server Address** (*OPTIONAL*)

Set the IP address that is assigned to the MORS secondary server.

##### **Device Name** (alphanumeric within 8 letters) (*REQUIRED*)

Give a unique name to each access point. It is recommended to append the channel or IP number to the unique base name. This eases the site survey (included in Communication Area Measuring Tool) from finpad 500f.

## **In-depth Settings involving Wireless LAN**

### **Channel** (REQUIRED)

Select a channel from 1 to 14. Select a common channel number for all the access points installed in a common wireless communication area. If another wireless LAN system using 2.4 GHz exists, separate your channel from it by more than 6 channels.

### **SSID** (alphanumeric within 32 letters) (REQUIRED)

This is a ID specific to a wireless communication area. Assign a common SSID to neighboring access points and finpad 500f terminals. If SSID differs, communication is not available.

### **WEP** (OPTIONAL)

This setting protects the security of wireless communication. For security, set to WEP ON. The setting must be equal among all the access points and finpad 500f terminals within the wireless communication area. If the setting differs, communication is not available.

### **Encryption Key Length** (OPTIONAL)

Select either 64 bits or 128 bits. The setting must be equal among all the access points and finpad 500f terminals within the wireless communication area. If the setting differs, communication is not available.

### **Encryption Key** (OPTIONAL)

Set the encryption key as follows:

- If Encryption Key Length is 64 bits, set 10 digits of hex. data.
- If Encryption Key Length is 128 bits, set 26 digits of hex. data.

The Encryption Key setting must be equal among all the access points and finpad 500f terminals within the wireless communication area. If the setting differs, communication is not available

**IMPORTANT:** For security, the setting you entered can not be read any more. Never forget it. (It is best to write it down on paper and keep it in safe place.)

### **MORS Filter** (OPTIONAL)

This setting enables or disables the filter that eliminates non-MORS communication. For security, set the MORS filter to ON. External wireless communication will be filtered out.

### **Cable LAN** (OPTIONAL)

This setting is for transmission speed and duplex mode. For transmission speed, you have three choices, 10 Mbps (fixed,) 100 Mbps (fixed) and Automatic Switchover (default). For duplex mode, you have three choices, Half-duplex, Full-duplex and Automatic Switchover (default).

### **Cable LAN Monitor** (OPTIONAL)

You may enable (default) or disable the LAN-monitoring capability which monitors the communicating condition of the cable LAN. If enabled, wireless communication is stopped automatically when link of the cable LAN is not available. This prevents undesired connection of finpad 500f and consequential abnormal communication when cable LAN is disconnected.

## 7-2 Initial Setup Procedures

The following three methods are available:

### **Manual Setup by MainMenu**

You perform all the settings (both Basic and In-depth Settings) manually from the MainMenu (explained later on).

### **Setup by MORS Terminal Manager**

You connect the access point to the MORS server through RS-232C cable, and download all the settings (both Basic and In-depth Settings) which you made by MORS Terminal Manager.

### **Hybrid Setup by MainMenu + MORS Terminal Manager**

You perform Basic Settings manually from the MainMenu (explained later on), and then connect to the network. After start-up, download In-depth Settings (which you made by MORS Terminal Manager) automatically from the MORS server.

## 7-3 Calling MainMenu through network by telnet

You may call up MainMenu through telnet, connecting your PC to the access point through the hub.

**NOTE:** The factory-set IP address of the access point is:

**192.168.1.10**

If the IP address is changed locally and you forgot it, you may return the IP address setting to the factory default as follows:

- 1 Make sure that the Status LED is blinking in GREEN color.
- 2 Keep pressing the DEFAULT switch (with a clip tip, etc.) for longer than 3 seconds until the access point restarts. As a result the IP address setting returns to the factory default "192.168.10".

### **PROCEDURE**

- 1 Connect both PC and the access point to the network, and start them. Wait about 1 to 2 minutes until the Status LED illuminates in GREEN color on the access point.

- 2 Start telnet on the PC, then remote-connect to the access point.

**NOTE:** To start telnet from DOS prompt, type "telnet xxx" then press [Enter], where "xxx" is IP address of the access point.

- When the access point is connected normally, press the [Enter] key. As a result, MainMenu shows up like this:

MainMenu		4650371XXX
<u>Selection</u>	<u>Description</u>	
1	Configuration Menu	
2	Diagnostics Menu	
3	Save and Exit	
9	Reset Access Point	
Enter a selection number or <ESC> for previous menu ->		

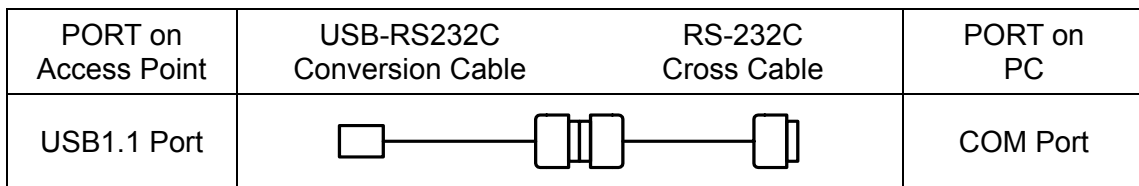
- Through MainMenu, perform Basic Settings as explained in sub-section 7-5. Also, perform In-depth Settings continually unless In-depth Settings are downloaded from the MORS server.

## 7-4 Calling MainMenu through COM port

You may call up MainMenu by terminal emulator, connecting your PC to the access point through a serial cable.

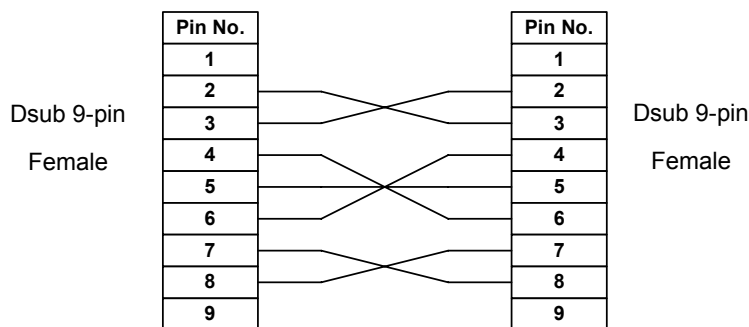
### **PROCEDURE**

- Connect between PC and the access point with a serial cable as shown below:



**NOTE:** Use the USB-RS232C conversion cable approved by us. No special driver software is required when using this cable. For further information, call the vendor of the access point.

Use the RS-232C cross cable with the following pin connections:



- Start both the access point and PC, and wait about 1 to 2 minutes until the Status LED illuminates in GREEN color on the access point.
- Start a terminal emulator on the PC, and connect to the access point through the COM port in use.

**NOTE:** As a terminal emulator, use Hyper Terminal which comes with Windows 2000/XP. Set the RS-232C parameters as follows:  
115200 bps, 8 data bits, No parity, 1 stop bit, No flow control.

- 4 At the terminal emulator, press the [Enter] key. As a result, MainMenu (shown in step 3 in sub-section 7-3) shows up.
- 5 Through MainMenu, perform Basic Settings as explained in sub-section 7-5. Also, perform In-depth Settings continually unless In-depth Settings are downloaded from the MORS server.

## 7-5 Settings on MainMenu

This sub-section explains how to conduct settings on MainMenu.

- 1 With MainMenu displayed, press [1] then [Enter], and "Configuration Menu" displays:
- 2 From within the Configuration Menu", perform settings as shown in the following examples.

NOTE: The items with "*(REQUIRED)*" are always required.  
The items with "*(OPTIONAL)*" are required, depending on system configuration.

### **"1. TCP/IP Configuration"**

On "Configuration Menu," press [1] ("TCP/IP Configuration Menu") then [Enter].

#### **IP Address** (*REQUIRED*) (Basic Setting)

EXAMPLE: Set to "**192.168.1.10**".

- (1) On "TCP/IP Configuration Menu," press [1] then [Enter].
- (2) On "IP Address (LAN)," press [1] then [Enter].
- (3) Type "**192.168.1.10**" then press [Enter].
- (4) "TCP/IP Configuration Menu" redisplay.

NOTE: If you want to return to "Configuration Menu" ("MainMenu,") press [Esc] once (twice).

#### **Subnet Mask** (*REQUIRED*) (Basic Setting)

EXAMPLE: Set to "**255.255.0.0**".

- (1) On "TCP/IP Configuration Menu," press [2] then [Enter].
- (2) On "Subnet Mask (LAN)," press [1] then [Enter].
- (3) Type "**255.255.0.0**" then press [Enter].
- (4) "TCP/IP Configuration Menu" redisplay.

NOTE: If you want to return to "Configuration Menu" ("MainMenu,") press [Esc] once (twice).

**Default Gateway Address** (OPTIONAL) (Basic Setting)

EXAMPLE: Set to "**192.168.1.254**".

- (1) On "TCP/IP Configuration Menu," press [5] then [Enter].
- (2) On "Default Gateway," press [1] then [Enter].
- (3) Type "**192.168.1.254**" then press [Enter].
- (4) "TCP/IP Configuration Menu" redisplay.

NOTE: If you want to return to "Configuration Menu" ("MainMenu,") press [Esc] once (twice).

**"3. MORS Configuration"**

On "Configuration Menu," press [3] ("MORS Configuration Menu") then [Enter].

**Primary Server Address** (REQUIRED) (Basic Setting)

EXAMPLE: Set to "**192.168.1.1**".

- (1) On "MORS Configuration Menu," press [1] then [Enter].
- (2) Type "**192.168.1.1**" then press [Enter].
- (3) "MORS Configuration Menu" redisplay.

NOTE: If you want to return to "Configuration Menu" ("MainMenu,") press [Esc] once (twice).

**Secondary Server Address** (OPTIONAL) (Basic Setting)

EXAMPLE: Set to "**192.168.1.2**".

- (1) On "MORS Configuration Menu," press [2] then [Enter].
- (2) Type "**192.168.1.2**" then press [Enter].
- (3) "MORS Configuration Menu" redisplay.

NOTE: If you want to return to "Configuration Menu" ("MainMenu,") press [Esc] once (twice).

**Device Name** (REQUIRED) (Basic Setting)

EXAMPLE: Set to "**AP001**".

- (1) On "MORS Configuration Menu," press [3] then [Enter].
- (2) Type "**AP001**" then press [Enter].
- (3) "MORS Configuration Menu" redisplay.

NOTE: If you want to return to "Configuration Menu" ("MainMenu,") press [Esc] once (twice).

**MORS Filtering** (OPTIONAL) (In-depth Setting)

EXAMPLE: Set to "**ON**".

- (1) On "MORS Configuration Menu," press [4] then [Enter].
- (2) Press [1] ("**ON**") then press [Enter].
- (3) "MORS Configuration Menu" redisplay.

NOTE: If you want to return to "Configuration Menu" ("MainMenu,") press [Esc] once (twice).



## **"2. Radio Configuration"**

On "Configuration Menu," press [2] ("Radio Configuration Menu") then [Enter].

### **Channel** (REQUIRED) (In-depth Setting)

EXAMPLE: Set to Channel "7".

- (1) On "Radio Configuration Menu," press [1] then [Enter].
- (2) Type "7" then press [Enter]. ("1" to "14" allowed.)
- (3) "Radio Configuration Menu" redisplay.

NOTE: If you want to return to "Configuration Menu" ("MainMenu,") press [Esc] once (twice).

### **SSID** (REQUIRED) (In-depth Setting)

EXAMPLE: Set to "1234".

- (1) On "Radio Configuration Menu," press [2] then [Enter].
- (2) Type "1234" then press [Enter].
- (3) "Radio Configuration Menu" redisplay.

NOTE: If you want to return to "Configuration Menu" ("MainMenu,") press [Esc] once (twice).

### **WEP** (OPTIONAL) (In-depth Setting)

EXAMPLE: Set to "Enable (ON)".

- (1) On "Radio Configuration Menu," press [3] then [Enter].
- (2) Press [1] ("Enable (ON)") then [Enter].
- (3) "Radio Configuration Menu" redisplay.

NOTE: If you want to return to "Configuration Menu" ("MainMenu,") press [Esc] once (twice).

NOTE: Settings of the WEP parameters (Encryption Key Length & Encryption Key) become valid if WEP is set to "Enable (ON)".

### **Encryption Key Length** (OPTIONAL) (In-depth Setting)

EXAMPLE: Set to "64-bit".

- (1) On "Radio Configuration Menu," press [4] then [Enter].
- (2) Press [1] ("64-bit") then [Enter].
- (3) "Radio Configuration Menu" redisplay.

NOTE: If you want to return to "Configuration Menu" ("MainMenu,") press [Esc] once (twice).

NOTE: This setting becomes valid if WEP is set to "Enable (ON)".

## **Encryption Key** (OPTIONAL) (In-depth Setting)

**PRECAUTION:** *You will enter encryption key. For security, the key you set can never be redisplayed once setting is completed. When typing a key, you must be very careful about mis-typing. Also, it is strongly recommended to write your key down on paper and store it in safe place. Take utmost care so that outsiders may not spy your key.*

- (1) On “Radio Configuration Menu,” press [5] then [Enter].
- (2) In accordance with the setting of Encryption Key Length, type a key then press [Enter].

**NOTE:** Each digit of a key (8-bit) is represented with 2 hex. letters ('0'-'9', 'a'-'f').

WEP 64bit: 5-digit key (40 bits) for example is represented by 10 hex. letters. Up to 8-digit key is allowed.

WEP 128bit: 13-digit key (104 bits) for example is represented by 26 hex. letters. Up to 16-digit key is allowed.

- (3) “Radio Configuration Menu” redisplay.

**NOTE:** If you want to return to “Configuration Menu” (“MainMenu,”) press [Esc] once (twice).

**NOTE:** This setting becomes valid if WEP is set to “Enable (ON)”.

## **"4. LAN Configuration"**

On “Configuration Menu,” press [4] (“LAN Configuration Menu”) then [Enter].

### **LAN Speed** (OPTIONAL) (In-depth Setting)

**EXAMPLE:** Set to “**Auto**”.

- (1) On “LAN Configuration Menu,” press [1] then [Enter].
- (2) Press [3] (“**Auto**”) then [Enter].
- (3) “LAN Configuration Menu” redisplay.

**NOTE:** If you want to return to “Configuration Menu” (“MainMenu,”) press [Esc] once (twice).

### **LAN Duplex** (OPTIONAL) (In-depth Setting)

**EXAMPLE:** Set to “**Half Duplex**”.

- (1) On “LAN Configuration Menu,” press [2] then [Enter].
- (2) Press [1] (“**Half Duplex**”) then [Enter].
- (3) “LAN Configuration Menu” redisplay.

**NOTE:** If you want to return to “Configuration Menu” (“MainMenu,”) press [Esc] once (twice).

### **LAN Monitor** (OPTIONAL) (In-depth Setting)

**EXAMPLE:** Set to “**ON**”.

- (1) On “LAN Configuration Menu,” press [3] then [Enter].
- (2) Press [1] (“**ON**”) then [Enter].
- (3) “LAN Configuration Menu” redisplay.

**NOTE:** If you want to return to “Configuration Menu” (“MainMenu,”) press [Esc] once (twice).

## 7-6 Initial Setup by MORS Terminal Manager

You may perform the setup from MORS Terminal Manager, connecting the access point to the MORS server through RS-232C cable.

### **PROCEDURE**

- 1** Connect between PC and the access point with USB-RS232C Conversion Cable + RS-232C Cross Cable. (See sub-section 7-4.)
- 2** Start both access point and PC, and wait about 1 to 2 minutes until the Status LED illuminates in GREEN color.
- 3** In MORS Terminal Manager, make settings and download them at a time. For details of MORS Terminal Manager, see Help for MORS Evolution.

## 8. Daily Maintenance

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Daily maintenance is essential to keep the unit ready for operation at full performance. Do maintenance from time to time as instructed below.

### Housing

Gently wipe off dirt or stain from the housing by using soft cloth dampened with a bit of water.

 <b>CAUTION</b>	
	Never use solvent such as thinner, benzene, toluene, acetone, etc., or plastic body may melt, deform, whiten, etc.
	When wiping the housing with damp cloth, squeeze out water well. If not, metallic parts such as connector pins or switch contacts may deteriorate, resulting in poor contact.

### Connectors

If the unit is left in high-humidity or corrosive atmosphere for a long time, connectors may be corroded, resulting in poor contact. To refresh the contacts, repeat plug-in and out action several times. (Note that too many plug-in/out operations may waste the contacts.)

## 9. Before calling service

This unit is designed and manufactured carefully for trouble-free operation. However, if you think the unit is faulty, first perform the following checks. If the checks can not solve your problem, call the vendor of this unit for service.

**⚠ DANGER**



Never disassemble this unit or touch internal electronics.

### Symptoms & Checks

SYMPTOM	CHECK
Unit does not work at all. (No LED illuminates)	Power may not be fed to the unit. Check the following points: <ul style="list-style-type: none"> <li>- Is the PoE power source turned ON?</li> <li>- Is the PoE power source compatible to IEEE802.af?</li> <li>- Is the PoE power source set properly?</li> <li>- Is the network cable connected to the LAN/PoE port properly?</li> <li>- Is the network cable connected to the PoE power source properly?</li> </ul>

(Cont'd)

SYMPTOM	CHECK
No communication	<p>Problem may be in network.</p> <p><b>[ Only Status LED is blinking in YELLOW color. ]</b>            In this case, the unit is not linked to the hub properly, and the wireless communication disabled automatically.            Check the following points:</p> <ul style="list-style-type: none"> <li>- Is the network cable connected to the LAN/PoE port properly?</li> <li>- Is the network cable connected to the hub properly?</li> <li>- Is the hub turned ON?</li> <li>- Is proper network cable used?</li> <li>- Isn't the network cable broken?</li> </ul> <p><b>[ Status LED is lit in GREEN color. ]</b>            In this case, check the following points:</p> <ul style="list-style-type: none"> <li>- Is the initial setup for this unit performed properly?</li> <li>- Are IP address, subnet mask, etc. set properly?</li> <li>- Are the initial settings for the finpad 500f terminals or terminal PCs alright?</li> <li>- Is the MORS server started?</li> </ul>
	<p>Problem may be in wireless communication.</p> <p><b>[ Wireless Communication Environment ]</b></p> <ul style="list-style-type: none"> <li>- Isn't there any obstacle around the unit?</li> <li>- Is the antenna selection set properly?</li> <li>- Isn't external antenna selected although an external antenna is not connected?</li> </ul> <p><b>[ Wireless LAN Setting ]</b></p> <ul style="list-style-type: none"> <li>- Are SSID, WEP, etc. for finpad 500f or terminal PC set properly?</li> </ul> <p><b>[ Both Status and Wireless LEDs blink in YELLOW color. ]</b></p> <ul style="list-style-type: none"> <li>- Is a right channel selected for this unit? If the channel approved in your country is not selected, wireless communication is disabled automatically.</li> </ul>
	<p>Any failure may be detected in self-test.</p> <p><b>[ Status and/or Sub LED is blinking or lit in RED color. ]</b>            Failure was detected in self-test. Call the vendor of this unit for service.</p>

# 10. Specifications

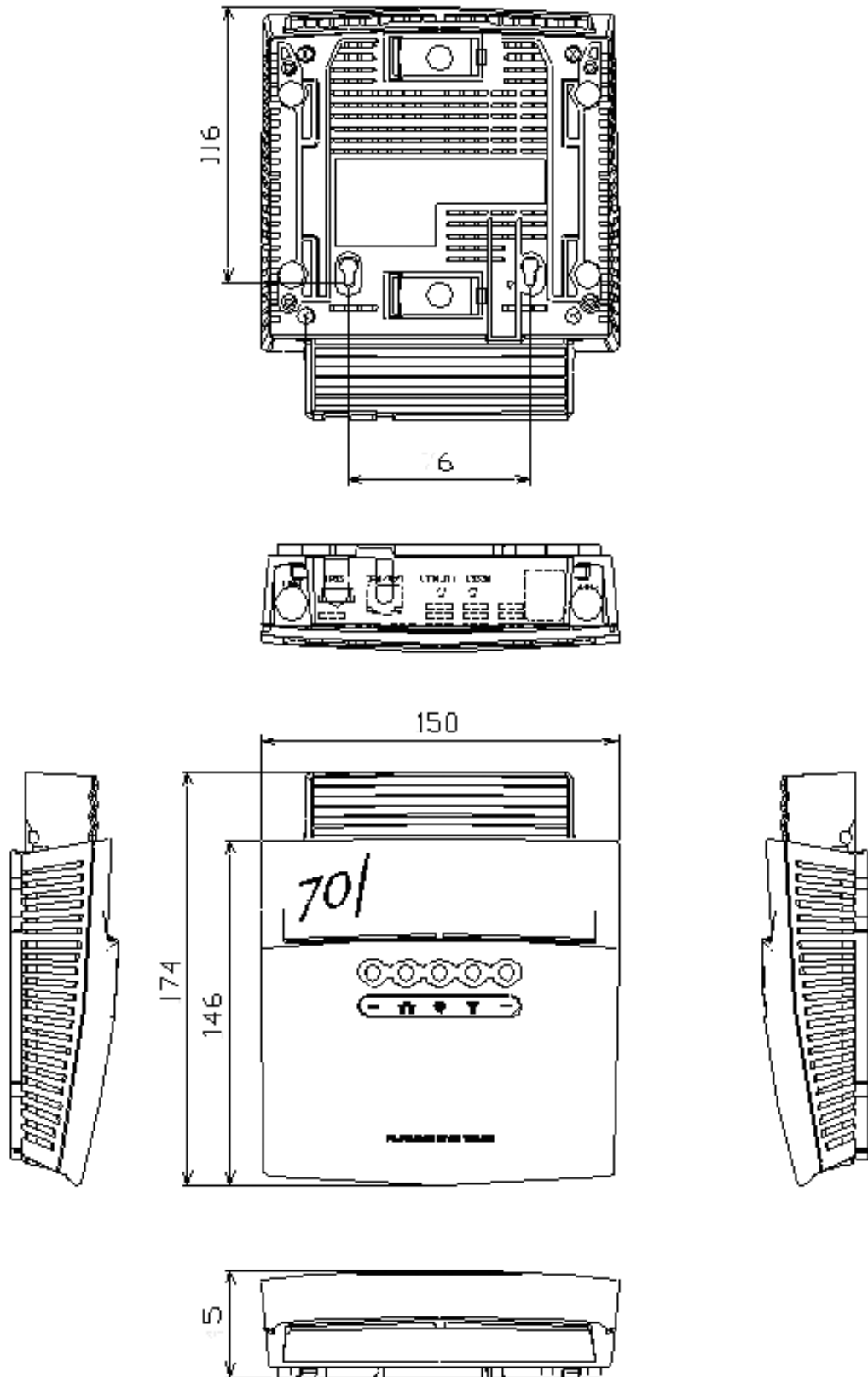
## SPECIFICATIONS OF WN-701-W

ITEM		SPECIFICATION
Processor	CPU	32-bit RISC
	Memories	Flash Memory: Loader=512 KB Program=64 MB RAM: 64 MB
	Security Engine	Built in.
Wireless Communication	Compliance	IEEE802.11a/g/b
	Modulation	OFDM/DS-SS
	Transmission Speed	IEEE802.11a: 6/9/12/18/24/36/48/54 Mbps IEEE802.11g: 6/9/12/18/24/36/48/54 Mbps IEEE802.11b: 1/2/5.5/11 Mbps
	Communication Range	Outdoor: Max. 200 m ( line-of-sight) (IEEE802.11g/b) Indoor: Max. 100 m ( line-of-sight) (IEEE802.11a/g/b)
	Radio Frequencies	<u>For China</u> IEEE802.11g/b: 2412 to 2472 MHz (Ch 1 to 13) IEEE802.11a: 5745 to 5825 MHz (Ch 149/153/157/161/165) <u>For Thailand</u> IEEE802.11g/b: 2412 to 2462 MHz (Ch 1 to 11)
	Communication Control	CSMA/CA
	Aerial Power	+15 dBm
	Antenna	Half-wavelength, Built in
	Encryption	WEP (64/128 bits), AES
	Authentication	IEEE802.1X
I/O Ports	LAN/PoE Port	10BASE-T/100BASE-TX PoE: Compatible to IEEE802.3af
	USB1.1 Port	Mode: Host Speed: 12 Mbps Power Supply: 100 mA
Power Supply (PoE)		48 VDC, Max. 250 mA
Switches		RESET (Push Button) DEFAULT (Push Button)
Indicators		5 pcs. of RGB LEDs
Buzzer		Magnetic Type (Pitch/Volume: Software-controlled.)

(Cont'd)

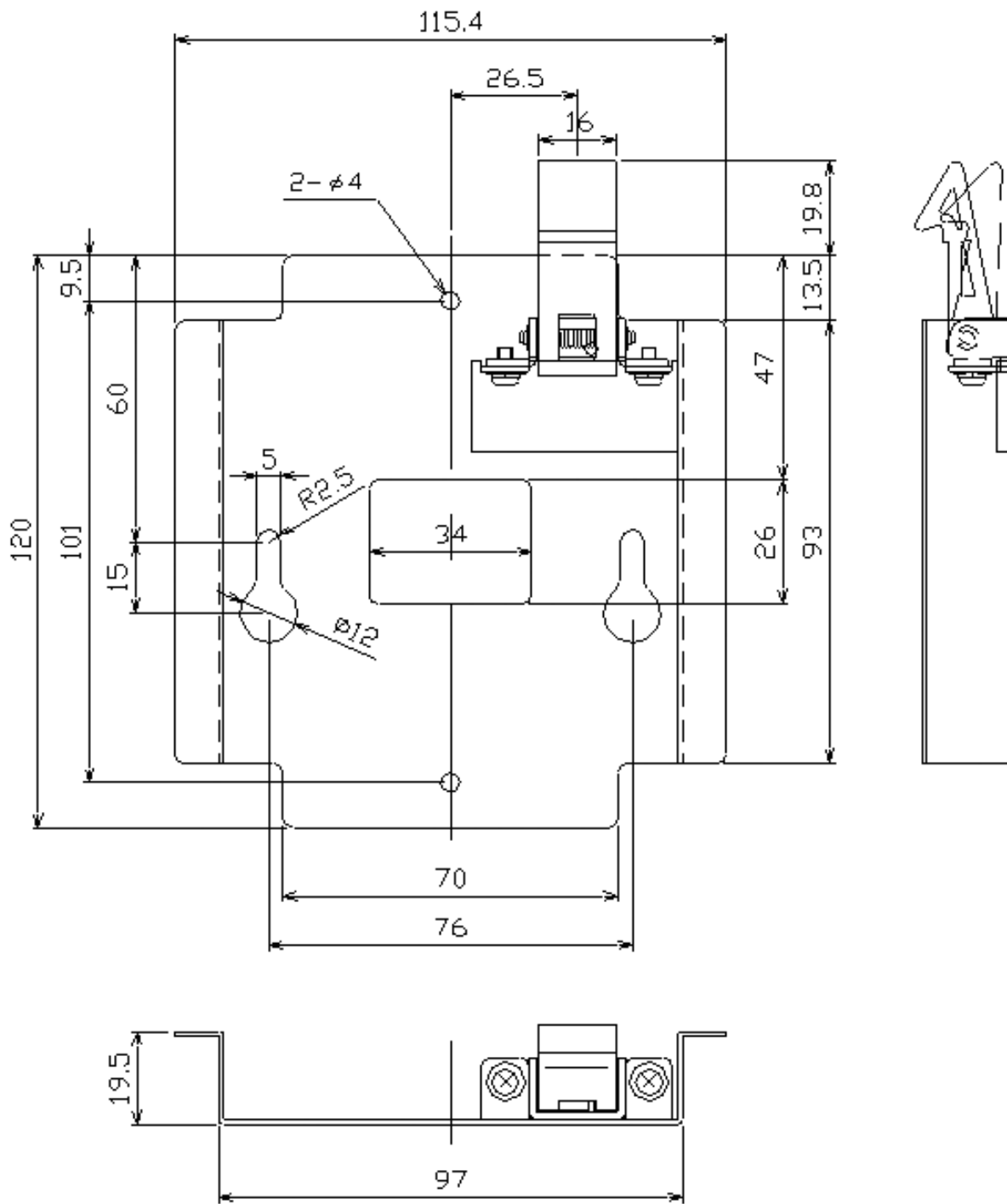
ITEM		SPECIFICATION
Real-time Clock		Year/Month/Day/Hour/Minute/Second/Day of Week (Auto leap year adjustment) Accuracy: $\pm 100$ ppm Battery Backup: Provided.
Mechanical	Dimensions	174 (D) x 150 (W) x 46 (H) mm (including Cable Cover)
	Weight	About 350 g (including Cable Cover)
Environmental	Temperature	-10 to +55°C (Operating) -20 to +65°C (Storage)
	Humidity	30 to 85%RH (No condensing) (Operating) 30 to 85%RH (No condensing) (Storage)
Safety Compliance		CISPR: Class B CB Certificate: Granted





UNIT=mm

**SINGLE-BAND ACCESS POINT WN-701-W**



UNIT=mm

**MOUNTING BASE** (Optional)

# 11. Equipment List

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## Standard Supply

ITEM	MODEL	Q'TY	NOTE
Single-band Access Point	WN-701-W	1 set	with Standard Accessories

## Standard Accessories

ITEM	MODEL/TYPE	Q'TY	NOTE
Cable Cover	46-079-6010	1 pc.	
Rubber Cushion	TM-182-816-10	4 pcs.	
Wood Screw	3.5 x 18	2 pcs.	For wall mount
Quick Reference	OME-R07904	1 copy	

## Optional

ITEM	MODEL/TYPE	NOTE
Mounting Base Kit	OP-E0017	For overhead or wall mount.