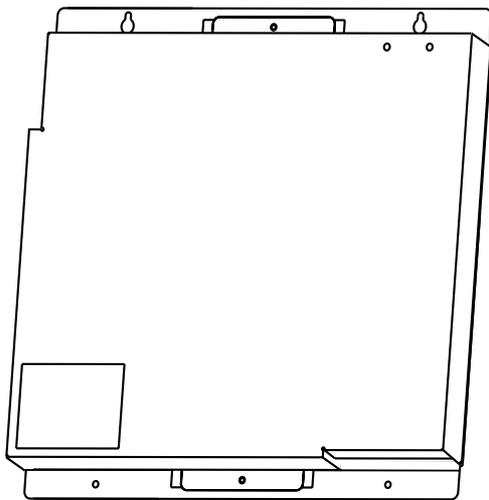


# Building Air-Conditioners Control System

## AIR CONDITIONER INTERFACE

# Model : LMAP02-E

*Installation Manual*



Before using the unit, please read this Installation Manual carefully to ensure correct operation. Store this Installation Manual in a location that is easy to find. Echelon®, LON®, LONWORKS®, Neuron®, 3150® and the Echelon logo are trademarks of Echelon Corporation registered in the United States and other countries. LonMaker™ and the Lon Users logo are trademarks of Echelon Corporation.

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# Safety Precautions

- Before installing this unit, make sure you read all the “Safety Precautions”.
- This manual describes the installation of LM-AP and wiring to the outdoor unit.
- Please look at the installation manual of an air-conditioning unit about the installation method of an air-conditioning unit.
- The “Safety Precautions” provide very important points regarding safety. Make sure you follow them.

## Symbols and Terms

 <b>WARNING</b>	Statements identify condition or practices that could result in personal injury or loss of life.
 <b>CAUTION</b>	Statements identify condition or practices that could result in damage to the unit or other property.

- After reading this installation manual, keep it in a place where the final user can see it anytime he or she wants to it. When someone moves, repairs or uses the LM-AP, make sure that this manual is forwarded to the final user.

## Symbols used in the illustrations

-  : Indicates a part which must be grounded.
-  : Indicates that the main switch must be turned off before servicing.  
(This symbol is displayed on the main unit label.) <Color: Blue>
-  : Beware of electric shock. (This symbol is displayed on the main unit label) <Color: Yellow>
-  **ELV** : Please pay attention to electric shock fully because this is not Safety Extra Low-Voltage (SELV) circuit.  
And at servicing, please shut down the power supply for LM-AP.

## **WARNING**

### **Ask your dealer or technical representative to install.**

Any deficiency caused by your own installation may result in an electric shock and fire.

### **Install in a place which is strong enough to withstand the weight of the unit**

Any lack of the strength may cause the unit to fall down, resulting in a personal injury.  
Any deficiency caused by installation may result in an electric shock, fire or incorrect operation.

### **Wire and connect using the desired cables securely so that any external force from the cable is imparted to the terminal connections.**

Imperfect connection and fixed may result in heating or fire.

### **Never modify or repair the unit by yourself.**

Any deficiency caused by your modification or repair may result in an electric shock or fire. Consult with your distributor for repair.

### **Make sure that the unit is powered by dedicated line.**

Other appearance connected to the same line could cause an overload.

### **If it is assumed that moisture advances into the unit, such as the time of rainy weather, do not do check or work of an electric circuit.**

It may become the cause of damage of a fire and the unit by an electric shock or corrosion.

### **Ensure that installation work is done correctly following that installation manual.**

Any deficiency caused by installation may result in an electric shock or fire.

### **All electrical work must be performed by a licenced technician, according to local regulations and the instructions given in this manual.**

Any lack of electric circuit or any deficiency caused by installation may result in an electric shock or fire.

### **Securely install the cover (panel) of the LM-AP.**

If the cover (panel) is not installed properly, dust or water may enter the unit and fire or electric shock may result.

### **Do not move and re-install the unit yourself.**

Any deficiency caused by installation may result in an electric shock or fire. Ask your distributor or special vender for moving and installation.

### **Make sure that there is a main power switch.**

A ready accessible breaker for power source line helps reduce the risk of electric shocks. Installation of a breaker is mandatory in same areas.

## CAUTION

**Do not install the unit where combustible gas may leak.**

If the gas leaks and accumulates around the unit, an explosion may result.

**Do not use in any special environment.**

Using in any place exposed to oil(including machine oil), steam and sulfuric gas may deteriorate the performances significantly or given damage to the component parts.

**Do not wash with water.**

Doing so may cause an electric shock or a malfunction.

**Do not install in any steamy place such as bath room or kitchen.**

Avoid any place where moisture is condensed into dew. Doing so may cause an electric shock or a malfunction.

**Do not install in any place at a temperature of more than 43 °C or less than -15°C.**

It may become the cause of modification and failure.

**Safety dispose of the packing materials.**

Tear apart and throw away plastic packaging bags so that children will not play with them. If children play with a plastic bag which was not torn apart, they face the risk of suffocation.

**Be sure to shut off the power source of the unit and all the other unit to connected to the unit before wiring.**

Doing so may cause an electric shock or a malfunction.

**This appliance must be earthed.**

Make sure to install a protective earth(PE) line. Do not connect the protective earth line to gas or water pipes, lightning conductors or telephone grounding lines. Improper grounding may cause an electric shock.

**A power-supply line and a transmission line do not band together, or are not contained in the same metal pipe.**

Doing so may cause a malfunction of unit.

**When installing the unit in a hospital, communication station, or similar place, provide sufficient protection against noise.**

The inverter equipment, private power generator, high-frequency medical equipment, or radio communication equipment may cause the air conditioner to operate erroneously, or fail to operate. On the other hand, the air conditioner may affect such equipment by creating noise that disturbs medical treatment or image broadcasting.

**Do not touch any PCB(Printed Circuit Board) with your hand or tools. Do not have dust collected on the PCB.**

Doing so may cause an electric shock or fire.

**Do not install in any place where acidic or alkaline solution or special spray are other be used.**

Doing so may cause an electric shock or a malfunction.

**Never connect the power source to the transmission line.**

Doing so may caused a malfunction or a failure.

**Use only an earth leakage breaker and fuse of the specified capacity.**

If no earth leakage breaker is installed, it may cause an electric shock.

Using fuse and wire or copper wire with too large capacity may cause a malfunction of unit or fire.

**Use standard wires in compliance with the current capacity.**

A failure to this may result in an electric leakage, heating or fire.

**Wire so that it dose not received any tension.**

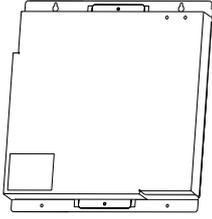
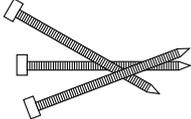
Tension may caused wire breakage, heating or fire.

**Do not touch the switches with wet fingers.**

Touching a switch with wet fingers can cause electric shock.

# 1. Parts Include

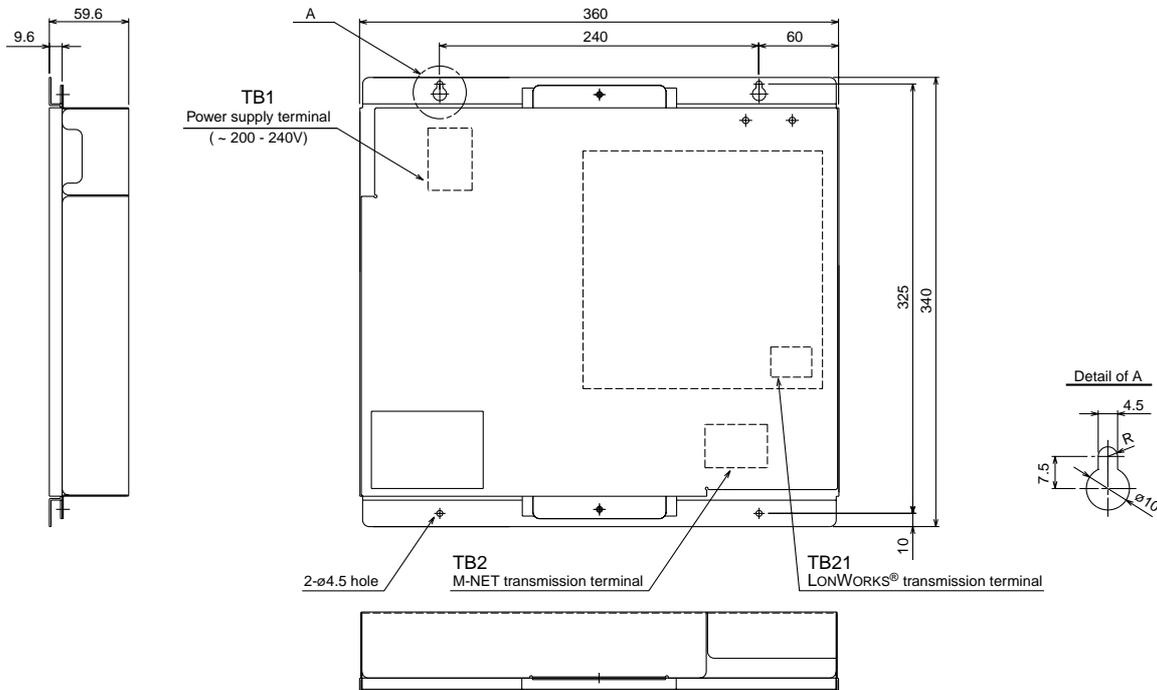
Verify that the following parts are appended to the product.

Name	Main Unit	Installation manual	Binding band
Shape			
Quantity	1	1	3

- The external interface file (XIF) is necessary for the product.
- Upon verifying the 16-digit program ID (PID) which is bonded on the board, please contact your dealer.

# 2. Specifications

## 2-1 External View



## 2-2 Environment Specifications

Item		Description
Dimensions		340 (H) x 360 (W) x 59.6 (D) mm
Net Weight		3.3 kg
Power Source		~ 220 - 240V (50/60 Hz)
Current Consumption		50 mA (Maximum)
Operation Environment	Temperature	Operating Range: -15 to 43°C Storage Range: -20 to 60°C
	Humidity	30 to 95 RH (No condensation)
Installation Environment		In the control box

## 2-3 Connected Air Conditioning Equipment

Item	Description
Connected Equipment	MITSUBISHI ELECTRIC Multiple split type air conditioners CITY MULTI Split-type air conditioners Mr.SLIM Heat recovery ventilators LOSSNAY (* For details of the connected models, please contact the dealer.)
Number of Units	LM-AP can control 50 indoor units (including LOSSNAY)

## 2-4 LONWORKS® Network Specifications

Item	Description	
Neuron CHIP	TMPN3150 (10MHz)	
Network Transceiver	FTT-10A (Free Topology 78kbps)	
Performance	Average communication capacity	2.5 inputs/second
	Peak communication capacity	50 inputs/second (for one second)

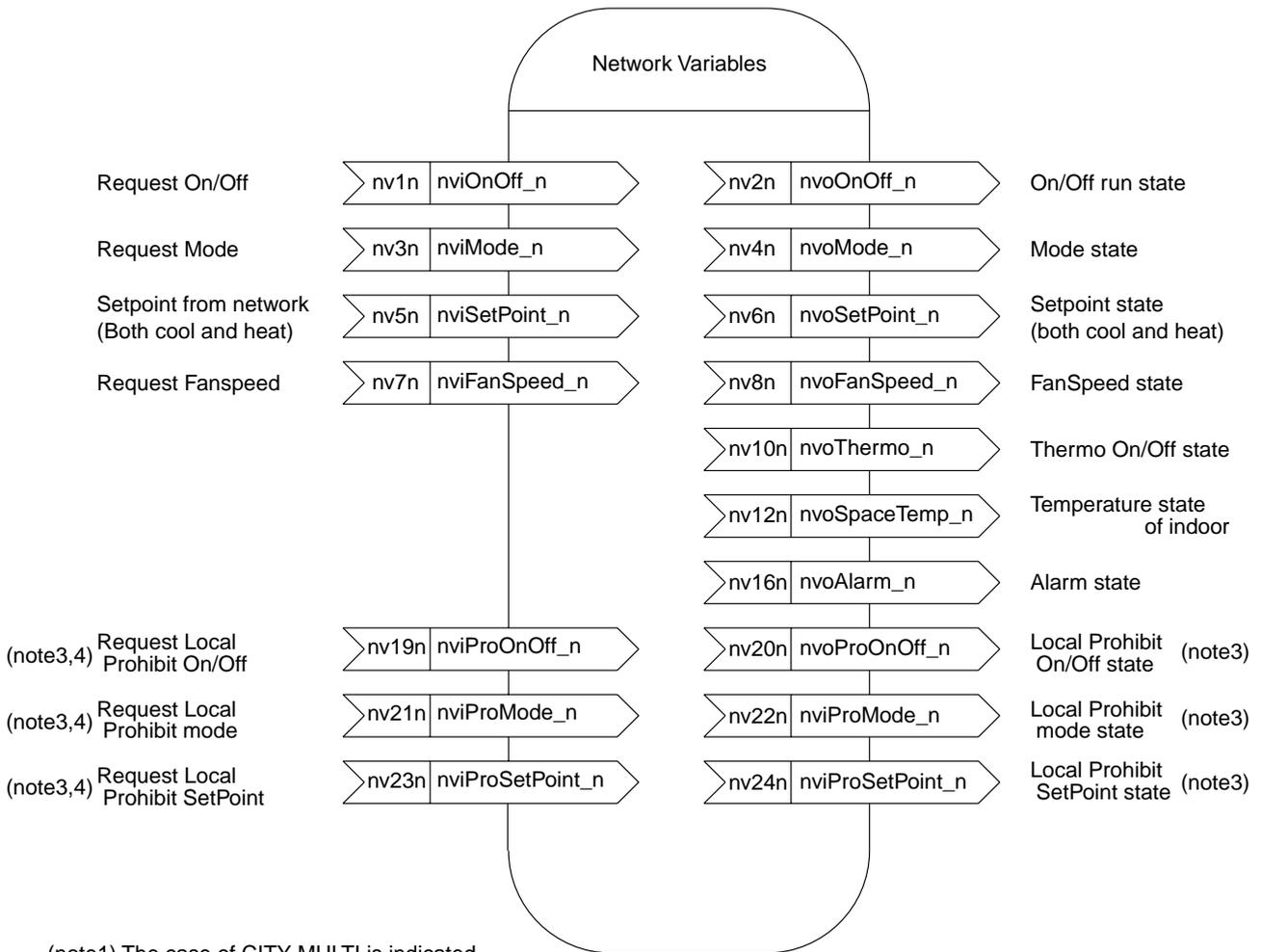
\* The proper communication is not obtainable when communication intervals exceed its performance, assure sufficient intervals.

\* ACK Service is recommended for the network service.

\* Detailed specifications for the LONWORKS® network can be found in "FTT-10A Free Topology Transceiver User's Guide" by Echelon Corporation.

## 2-5 Variables of LM-AP network

The following are applied to the CITY-MULTI type indoor unit of the Multiple split type air conditioners CITY MULTI. If Mr.SLIM or LOSSNAY is used, refer to the technical guide for the details of the network variables.



(note1) The case of CITY MULTI is indicated.

(note2) There is a case which cannot be used with the system configuration of the air conditioners units.

(note3) "n" of the network variable shows indoor unit address (M-NET).

(note4) It is possible to use when the "MA" remote controller.

### Function

Function	Item
Operation	Request On/Off
	Request Mode
	Setpoint from network(Both cool and heat)
	Request Fanspeed
	Request Local Prohibit On/Off
	Request Local Prohibit mode
	Request Local Prohibit SetPoint
Monitor	Request All Off
	On/Off run state
	Mode state
	Setpoint state(both cool and heat)
	FanSpeed state
	Thermo On/Off state
	Temperature state of indoor
	Alarm state
	Local Prohibit On/Off state
	Local Prohibit mode state
Local Prohibit SetPoint state	

### 3. Installation

<Notes>

Read and understand the contents of Chapter 1 "Safety Precautions" before performing the installation.

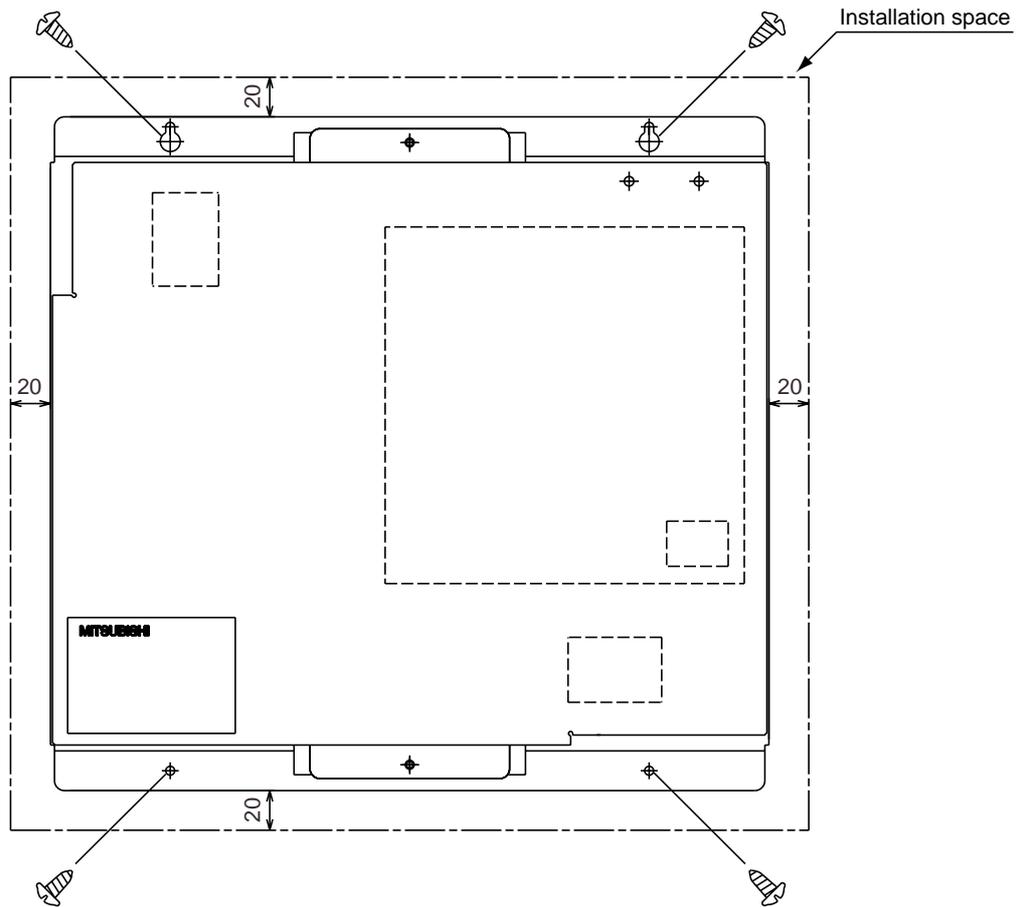
#### 3-1 Locally Procured Parts

Prepare the following prior to installing the unit.

Locally procured parts	Contents																														
Power wire and ground wire	<p>Use the sheathed vinyl cord or wire.            Wire type ..... Waie is not lighter than light poly vinyl            &lt;chloride sheathed flexible cord according to IEC 227            (designation H03 VV-F or H03 VVH2-F)&gt;            Wire size ..... 0.75mm<sup>2</sup> to 1.25mm</p>																														
M-NET transmission wire	<p>Use the sheathed vinyl cord or wire.            Wire type ..... CREVS, CVVS or equivalent"            Wire size ..... Solid wire : ø1.2mm to ø1.6mm            Twist type : 1.25mm<sup>2</sup> to 2mm<sup>2</sup></p>																														
LONWORKS® Network transmission wire	<p>Use the wire which is recommended by Echelon Corporation.            For details, refer to "FTT-10A Free Topology Transceiver User's Guide".            For reference, Cable Types and Tpxical Parameters.</p> <table border="1"> <thead> <tr> <th>Cable type</th> <th>Wire dia /AWG</th> <th>Rloop Ω/km</th> <th>C nF/km</th> <th>Vprop % of C</th> </tr> </thead> <tbody> <tr> <td>Belden 85102, single twisted pair, standed 19/29, unshielded, 150°C</td> <td>1.3mm/16</td> <td>28</td> <td>56</td> <td>62</td> </tr> <tr> <td>Belden 8471, single twisted pair, standed 19/29, unshielded, 60°C</td> <td>1.3mm/16</td> <td>28</td> <td>72</td> <td>55</td> </tr> <tr> <td>Level IV 22AWG, twisted pair, typically solid &amp; unshielded</td> <td>0.65mm/22</td> <td>106</td> <td>49</td> <td>67</td> </tr> <tr> <td>JY(St) Y 2X2X0.8, 4-wire herical twist, solid, shielded</td> <td>0.8mm/20.4</td> <td>73</td> <td>98</td> <td>41</td> </tr> <tr> <td>TIA568A category 5 24AWG, twisted pair</td> <td>0.51mm/24</td> <td>168</td> <td>46</td> <td>58</td> </tr> </tbody> </table> <p>If a shielded cable is used, the shield should be connected to earth ground via a single 470kΩ, 1/4 Ωatt, ≤10%, metal film resistor to prevent static charge build-up.</p>	Cable type	Wire dia /AWG	Rloop Ω/km	C nF/km	Vprop % of C	Belden 85102, single twisted pair, standed 19/29, unshielded, 150°C	1.3mm/16	28	56	62	Belden 8471, single twisted pair, standed 19/29, unshielded, 60°C	1.3mm/16	28	72	55	Level IV 22AWG, twisted pair, typically solid & unshielded	0.65mm/22	106	49	67	JY(St) Y 2X2X0.8, 4-wire herical twist, solid, shielded	0.8mm/20.4	73	98	41	TIA568A category 5 24AWG, twisted pair	0.51mm/24	168	46	58
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TIA568A category 5 24AWG, twisted pair	0.51mm/24	168	46	58																											
Screw	To install the main body, prepare four M4 screws which are suitable for the installation area.																														
Switch	<table border="1"> <thead> <tr> <th colspan="2">Switch</th> <th>Breaker for wiring</th> <th>Breaker for Current Leakage</th> </tr> </thead> <tbody> <tr> <td>Capacity</td> <td>Fuse</td> <td rowspan="2">3A</td> <td rowspan="2">3A 30mA 0.1 sec or less</td> </tr> <tr> <td>3A</td> <td>3A</td> </tr> </tbody> </table> <p>Use a breaker with a contact distance of 3mm or more.</p>	Switch		Breaker for wiring	Breaker for Current Leakage	Capacity	Fuse	3A	3A 30mA 0.1 sec or less	3A	3A																				
Switch		Breaker for wiring	Breaker for Current Leakage																												
Capacity	Fuse	3A	3A 30mA 0.1 sec or less																												
3A	3A																														

### 3-2 Securing the Unit

- When installing the product, assure a space enough to install and remove the cover of the main body.
  - Use M4 screws as shown in Fig. below to fix the product.
- To prevent the product from dropping, make sure to fix four places.



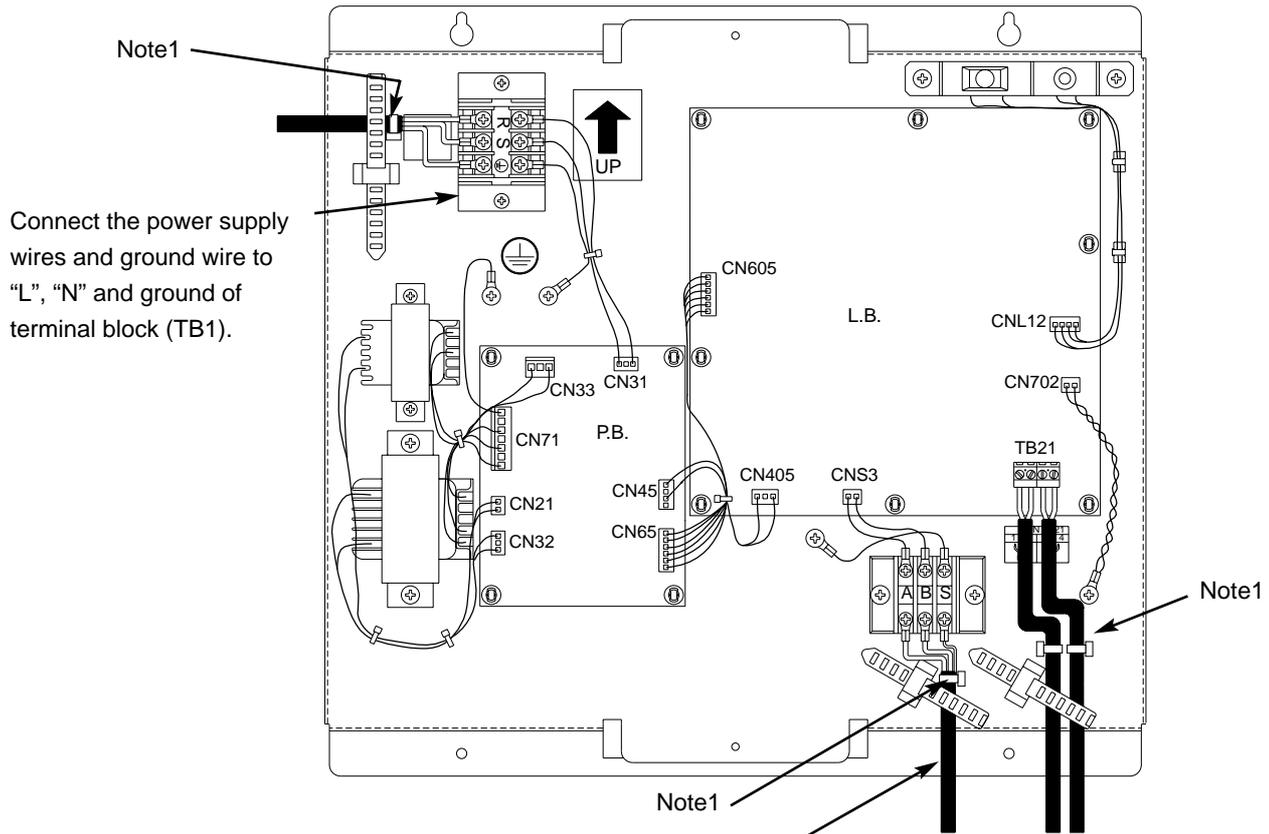
#### CAUTION

- This unit does not have a water-resistant design. Always install the unit indoors or inside a control panel.
- Install in an area capable of withstanding a 3.3 kg load.

### 3-3 Connection Methods

Use wire clamps provided to secure the wires and prevent external force from being conveyed by the wire to the wire connections.

\* External force could cause deformation or damage to the terminal blocks.

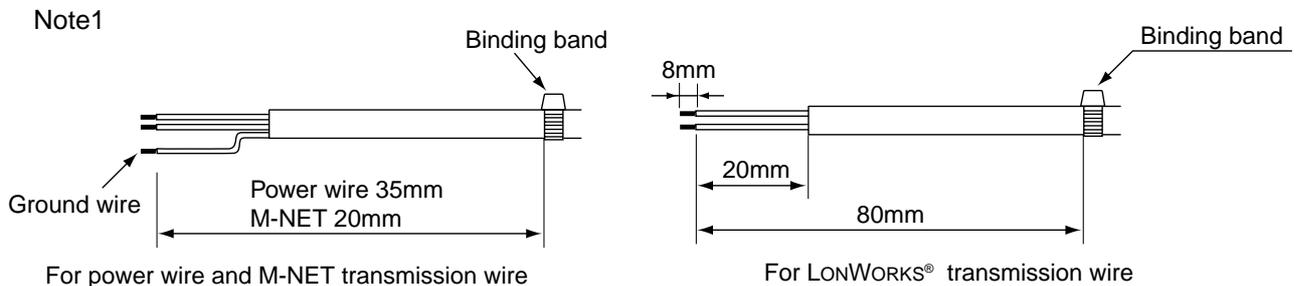


Connect M-NET signal wire to "A" and "B" of terminal block (TB2).

- Connect the M-NET transmission wire to transmission terminal block (TB7) of the central control.

Connect LONWORKS® signal wire to "1", "2" or "3", "4" of signal wire terminal block (TB21).

- TB21-"1" and "3" as well as "2" and "4" of TB21 are connected inside the circuit board.

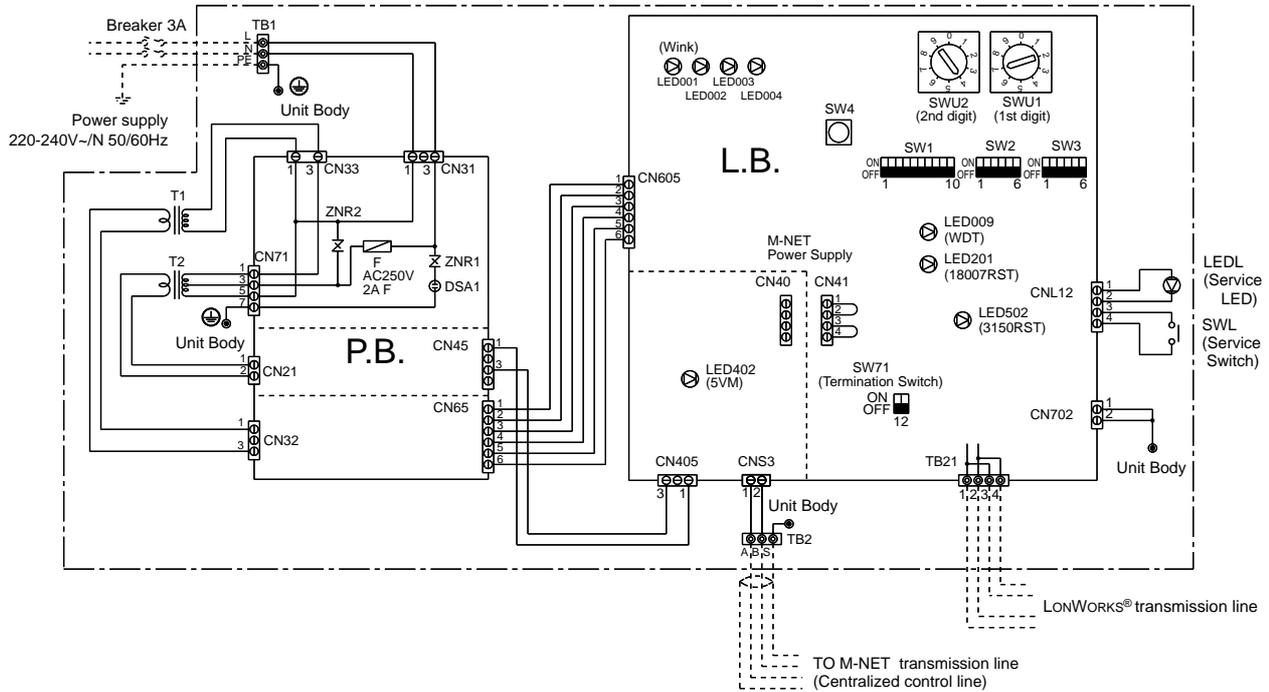


Attach the appended binding band to the power wire and transmission wire, and fasten it, positioning the area at inner side than the wire clamp.

Make sure that the ground wire is longer than the other wires.

Use a small screwdriver to connect diameter 0.2 to 2.5 mm<sup>2</sup> (AWG24 to 12) cable for terminal block (TB21) on the unit. Tightening torque is 0.5 to 0.6 Nm. Up to two wires can be connected to one terminal block.

### 3-4 Electrical Wiring



#### SYMBOL EXPLANATION

SYMBOL	NAME	
L.B	LM-AP main board	
P.B	Power circuit board	
F	Fuse AC250V 2A F	
T1.2	Transformer	
SW1, 2, 3	Switch	Function selection
SW71		Termination selection switch (LONWORKS®)
SWU1, 2		M-NET address switch
SWL		Service switch (LONWORKS®)

SYMBOL	NAME	
LED001 - 004	LED	Maintenance LED Use LED001 as Wink (LONWORKS®) at SW2-1 - 6 OFF
LED009/201/502/402		Status LED
LEDL		Service LED (LONWORKS®)
TB1	Terminal block	Power source
TB2		M-NET transmission line
TB21		LONWORKS® transmission line
CN40/CN41		Power Supply switch connector
⊕		Earth terminal

#### Explanation of function switch

SW	Switch name	Function	Note	Factory setting	Set timing	
SW1-1	Function switch of local prohibit	ON	local prohibit effective	Operation local prohibit nv input from LONWORKS® becomes Effective when switch ON. Operation local prohibit nv input from LONWORKS® becomes invalid when switch OFF.	OFF	Before turning on the power supply
		OFF	local prohibit invalidity			
SW1-2	Used together with MELANS switch	ON	used together with MELNAS		OFF	Before turning on the power supply
		OFF	not used together with MELNAS			
SW1-3	Indoor temperature state interval switch	ON	Transmission interval (1minutes or more)	*number of indoor unit should be connected 30 or less	OFF	Before turning on the power supply
		OFF	Transmission interval (10 minutes or more)			
SW1-5	Function switch of LOSSNAY	ON	LOSSNAY is operation from LONWORKS®	Please turn on the switch when LOSSNAY is operation from LONWORKS®.	OFF	Before turning on the power supply
		OFF	LOSSNAY interlocks with the indoor unit			
SW1-6	Function switch of Mr.SLIM	ON	Mr.SLIM is operation from LONWORKS®	Please turn on the switch when Mr.SLIM is operation from LONWORKS®.	OFF	Before turning on the power supply
		OFF	Mr.SLIM is not operation from LONWORKS®			
SW1-9	Indoor units test run switch	ON	ON(test run) is transmitted to the indoor units		OFF	Always
		OFF	OFF is transmitted to the indoor units			
SW3-2	Initialization switch of the air conditioners units	ON	Connected cancellation command is transmitted to the indoor units		OFF	Always
		OFF	None			

## 4. System Settings

This chapter only addresses the system settings of this product.

For the installation work and electrical work, refer to the last chapter “ 3. Installation ”.

<Notes>

Read and understand the contents of Chapter 1 “Safety Precautions ” before performing the installation.

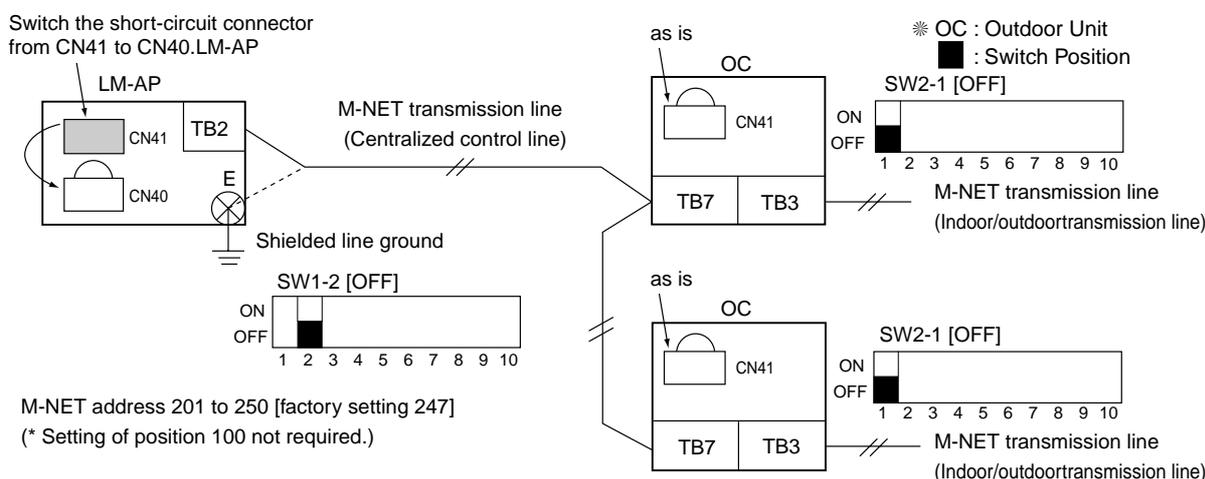
The system setting is different depending on the system configuration connected.

Check the system configuration.

1. When the system controller is not used together.
2. When the system controller is used together.

**Note: Function switch setting of LM-AP is different according to the management item of the equipment connected with LONWORKS® . Carefully set the system.**

### 4-1 If not used together with MELANS.



Item	Setting	Factory setting
M-NET address of LM-AP	SWU2, 1 [201 to 250]	247
LM-AP power switch connector	CN41 to CN40 (supplies power)	CN41
Combined switch for LM-AP system controller	SW1 - 2 [OFF] (Not used together with MELANS)	OFF
OC central control (SC) on/off switch	SW2 - 1 [OFF] (No central control)	OFF
OC power supply connector	CN41 as is (power not supplied)	CN41

**(Note:1)When connecting LOSSNAY, settings must be made in the LM-AP.**

- 1) Do not sequence LOSSNAY to the air conditioner. (Independent LOSSNAY)  
Or when operation is to be controlled from LONWORKS® (BMS etc.) connected to the LOSSNAY remote control.  
LOSSNAY selection switch. (SW1-5)[ON]
- 2) When sequencing LOSSNAY to the air conditioner (sequenced LOSSNAY), and not controlling operation from an LONWORKS®. (BMS etc.)  
LOSSNAY selection switch. (SW1-5)[OFF]  
When sequencing LOSSNAY to the air conditioner, the indoor unit and LOSSNAY sequence must be registered from the remote control.(Refer to the remote control installation manual for details on registering.)

**(Note 2)When changing the system configuration, such as the M-NET address, always carry out the following steps.**

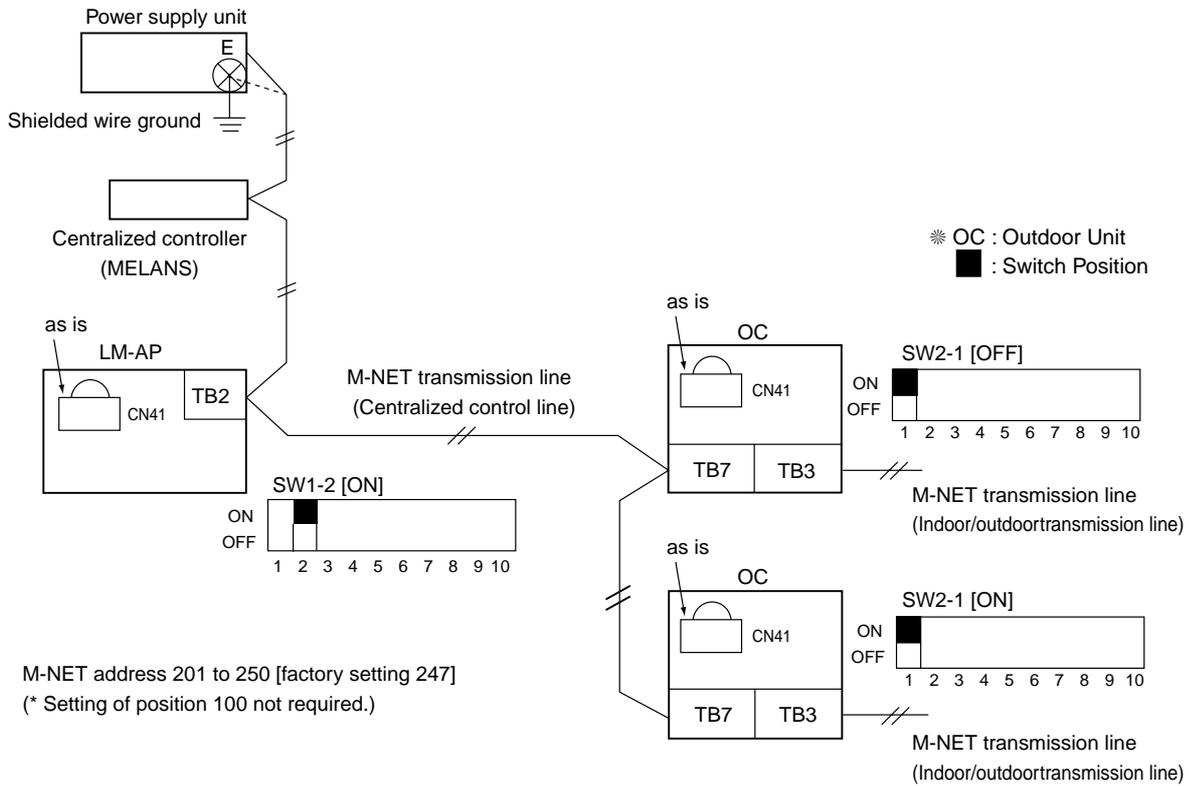
Always turn the power OFF before changing the LM-AP settings.

- 1) Make changes to change the unit system.(Addition of indoor unit, change of M-NET address, change of group, etc.)
- 2) Turn the LM-AP service switch (SW2-1) [ON].  
Change the LM-AP system information delete switch (SW3-2) from [OFF] to [ON].
- 3) When erasing the system information, the maintenance LED “System Information Erase LED (LED001)” will turn ON.
- 4) When the system information has been erased, the maintenance LED “System Information Erase LED (LED001)” will turn OFF, and the maintenance LED “System Information Erase Complete LED (LED002)” will turn ON.
- 5) Turn the LM-AP service switch (SW2-1) [OFF].  
Change the LM-AP system information delete switch (SW3-2) from [ON] to [OFF].  
Turn the LM-AP power OFF.
- 7) To change the LM-AP M-NET address and settings, carry out the changing work.
- 8) Turn the LM-AP power ON.

(Note 3) Refer to the “System Design and Construction Manual” for the outdoor unit for details on the M-NET wiring length.

(Note 4) Set the M-NET address so that it is not duplicated with other units.

## 4-2 If used together with MELANS.



Item	Setting	Factory setting
M-NET address of LM-AP	SWU2, 1 [201 to 250]	247
LM-AP power supply connector	CN411 as is (power not supplied)	CN41
Combined switch for LM-AP MALANS	SW1 - 2 [ON] (Used together with MELANS)	OFF
OC central control (SC) on/off switch	SW2 -1 [ON] (Central control)	OFF
OC power supply connector	CN41 as is (power not supplied)	CN41

**(Note:1) When connecting LOSSNAY, register the sequence must be registered from the shared MELANS.**

**(Note 2) When changing the system configuration, such as the M-NET address, MELANS being shared must be registered or changed.**

(Note 3) Refer to the "System Design and Construction Manual" for the outdoor unit for details on the M-NET wiring length.

(Note 4) Set the M-NET address so that it is not duplicated with other units.

## 4-3 Initialization Settings of LONWORKS® Network

### (1) Termination of LONWORKS®

The product can be set with the termination of LONWORKS® .

Termination Switch (SW71)

SW71-1	SW71-2	Termination Resistance Value
OFF	OFF	– ( Factory setting)
ON	OFF	100Ω ± 1%
OFF	ON	
ON	ON	50Ω ± 1%

For details, refer to “ FTT-10A Free Topology Transceiver User's Guide ” of Echelon Corporation.  
For reference, the system specifications and Transmission specifications are described.

### (2) System Specifications

- Up to 64 FTT-10/FTT-10A transceivers are allowed per network segment.
- LPT-10 transceivers may be used on network segments with FTT-10/FTT-10A transceivers, but are subject to additional constraints, particularly on distance.  
See the LPT-10 Use's Guide for more information.
- The average temperature of the wire must not exceed +55°C, although individual segments of wire may be as hot as +85°C.

### (3) Transmission Specifications

Doubly-Terminated Bus Topology Specifications

	Maximum bus length	Units
Belden 85102	2700	meters
Belden 8471	2700	
Level IV 22AWG	1400	
JY(St)Y 2X2X0.8	900	
TIA Category 5	900	

Free Topology Specifications

	Maximum node-to-node distance	Maximum total wire length	Units
Belden 85102	500	500	meters
Belden 8471	400	500	
Level IV 22AWG	400	500	
JY(St)Y 2X2X0.8	320	500	
TIA Category 5	250	450	

The free topology transmission specification includes two components which must both be met for proper system operation. The distance from each transceiver to all other transceiver and to the termination (including the LPT-10 termination, if used) must not exceed *maximum node-to-node distance*.

If multiple paths exist, e.g., a loop topology, then the longest path should be used for the calculations.

The *maximum total wire length* is the total amount of wire connected per segment.

# 5. Confirming Operation

## 5-1 Pre-operation preparations and settings

- (1) Perform the previous operations described in Chapter 3 “ Installation” , Chapter 4 “ System Settings” .
- (2) Perform a test operation of indoor units. If being used together with MELANS, perform the installation and electrical installation for MELANS.
- (3) Turn on the power supply for LM-AP. If being used together with MELANS, perform the initialization settings.
- (4) The units will be idle until the LM-AP initialization has been completed (LED002 goes out).
  - ※ This requires approximately 5 to 10 minutes. (If being used together with MELANS, it will be approximately 3 minutes after the completion of the initialization settings.)
- (5) Check whether or not LM-AP service LED (LED003 and LED004) have come on.
- (6) Refer to the following chapter “6. Troubleshooting” if the LM-AP connection error (LED003) or unit error (LED004) is ON.

**(Note 1) Always refer to the previous chapter “4. System settings” before changing the system configuration, such as the M-NET address.**

- ※ After confirming the above details, always refer to the following section “5-2. Trial operation procedures” and make confirmations with trial operations.
- ※ Turn all of the switches in the service switch (SW2) [OFF] to confirm the ON/OFF status of the above service LED (LED002, LED003 and LED004).

## 5-2 Test-operation procedure

### (1) Test-operation of the indoor unit from LM-AP

1. Turn on SW1-9 of LM-AP.
  - ※ If there is even one indoor unit that is not running, the LM-AP may not correctly recognize the indoor unit. Refer to the next chapter “Troubleshooting”.
2. Finally turn OFF SW1-9, and verify that all indoor units are stopped.

### (2) Test-operation of the indoor unit from LONWORKS®

If there is any tool which corresponds to LONWORKS®, verify that it can be operated from LONWORKS® network according to the following procedure.

1. Set the LM-AP in the config.
  - If LM-AP has been already bounded to another model (the service LED is not ON), don't apply any new binding.
2. During the test operation, use “ nv1n Reguest On/Off ” to verify that the indoor unit can be operated. For details of “ nv1n Reguest On/Off ” , refer to the following.

#### nv1n Reguest On/Off

*network input SNVT\_switch nviOnOff\_n ;*

This input network variable is used to allow On request or Off request of the indoor unit to be changed via the network.

When the ventilator(LOSSNAY) interlocks with the indoor unit, it becomes the same operations the indoor unit.

#### Valid Range

value field : not used

state field : 0 = Indoor unit or ventilation unit is Off.

state field : 1 = Indoor unit or ventilation unit is On.

: Else = Indoor unit or ventilation unit is Off.

\_n ... Indoor unit address (M-NET)

3. Finally put the LM-AP in the unconfig, and end the test operation.
  - Contact your dealer for details on trial operation from the LONWORKS® network.

## 6. Troubleshooting

### 6-1 Abstract

If LM-AP does not properly operate, first check the following contents.

Item	Normal state	Contents to check
LED009	ON	Check for turn-off on the power supply (TB1) of LM-AP, disconnection on the connectors (CN605, CN65, CN32, CN33, CN31, CN71) and blown fuse (F).
LED402	ON	Check for turn-off on the power supply (TB1) of LM-AP, disconnection on the connectors (CN405, CN45, CN21, CN31, CN71) and blown fuse (F).
Service LED	—	It blinks when it is not binding. At this time, operation is unavailable from the network side from LONWORKS®. Binding the equipment which corresponds to LONWORKS® network.
LED002	OFF	If it is ON when the dip switch SW2 is all OFF, the LM-AP is incompletely initialized. Wait for 15 minutes after the power supply is turned on (Until the initializing process is completed).
LED003	OFF	If it is ON when the dip switch SW2 is all off, check the setting of the switches and so on, and turn on the power supply again.
LED004	OFF	If it is ON when the dip switch SW2 is all off, the indoor unit may be troubled. Check the connection and setting of all indoor units.
CN40/41	—	If the power supply unit is connected, insert the jumper connector to CN41. If the power supply unit is not connected, insert the jumper connector to CN40.
SW71	—	LONWORKS® The switch sets the termination of LONWORKS® network. According to the system design of LONWORKS® network, check whether it is properly set or not.
M—NET Address switch SWU1, SWU2	—	If MELANS is used, check whether M-NET address is overlapped or not. Initial setting of LM-AP is 247.
Dip switch SW1, SW2, SW3	—	Check whether MELANS is present or not (SW1-2), and whether the independent/combined LOSSNAY (SW1-5) is properly set or not. Moreover, verify that all other switches are all off.

## 6-2 Troubleshooting

No.	Error content	Cause	Checking method and remedy
1	Even if it is in test-operation with LM-AP, the air conditioner does not run.	<p>(1)The LM-AP is not completely initialized.</p> <p>(2)Setting on M-NET side is not properly completed.</p> <p>(3)If MELANS is used together LM-AP is not registered to MELANS.</p>	<p>Turn off all SW2. After verifying that LED002 is OFF, test the operation again.</p> <p>Verify that the test operation of the air conditioner is properly completed. Verify that M-NET transmission line is properly connected.</p> <p>In MELANS, register LM-AP as the sub MELANS.</p>
2	Even if the operation is tested on LM-AP, the LOSSNAY does not operate.	<p>(1)The LM-AP is not completely initialized.</p> <p>(2)Setting on M-NET side is not properly completed.</p> <p>(3)If MELANS is used in combination, LM-AP is not registered to MELANS.</p> <p>(4)The independent/combined LOSSNAY of LM-AP is not set.</p>	<p>Refer to 1-(1).</p> <p>Refer to 1-(2).</p> <p>Refer to 1-(3).</p> <p>Turn on SW1-5 of LM-AP, and reset the power supply.</p>
3	Even if it is operated with the remote controller/MELANS, it is not informed to the host on LON side.	<p>(1)The LM-AP is not completely initialized.</p> <p>(2)Setting on M-NET side is not properly completed.</p> <p>(3)If MELANS is used in combination, LM-AP is not registered to MELANS.</p> <p>(4)LONWORKS® network transmission line is not properly connected.</p> <p>(5)The termination of LONWORKS® network is not properly set.</p> <p>(6) Binding of LONWORKS® network is not properly ended.</p>	<p>Refer to 1-(1).</p> <p>Refer to 1-(2).</p> <p>Refer to 1-(3).</p> <p>Check for disconnection on TB21, short-circuit and wire breakage on the network wire and so on.</p> <p>Verify that the termination of LONWORKS® network is properly set according to the system design.</p> <p>Apply the binding again.</p>
4	LM-AP is not completely initialized.	<p>(1)Much time is necessary until the initialization is completed. (Normal state)</p>	<p>In some case, it takes approx. 15 minutes until the initialization process is ended.Wait until the initialization is ended.</p>

	Error content	Cause	Checking method and remedy
5	Independent/combined LOSSNAY can not be operated from the LON side.	<p>(1)The LM-AP is not completely initialized.</p> <p>(2)Setting on M-NET side is not properly completed.</p> <p>(3)If MELANS is used together LM-AP is not registered to MELANS.</p> <p>(4)The independent/combined LOSSNAY of LM-AP is not set.</p> <p>(4)LONWORKS® network transmission wire is not properly connected.</p> <p>(5)The termination of LONWORKS® network is not properly set.</p> <p>(6) Binding of LONWORKS® network is not properly ended.</p>	<p>Refer to 1-(1).</p> <p>Refer to 1-(2).</p> <p>Refer to 1-(3).</p> <p>Refer to 2-(4).</p> <p>Refer to 4-(4).</p> <p>Refer to 4-(5).</p> <p>Refer to 4-(6).</p>
6	Air conditioner can not be operated from the LON side.	<p>(1)The LM-AP is not completely initialized.</p> <p>(2)Setting on M-NET side is not properly completed.</p> <p>(3)If MELANS is used together LM-AP is not registered to MELANS.</p> <p>(4)LONWORKS® network transmission wire is not properly connected.</p> <p>(5)The termination of LONWORKS® network is not properly set.</p> <p>(6) Binding of LONWORKS® network is not properly ended.</p>	<p>Refer to 1-(1).</p> <p>Refer to 1-(2).</p> <p>Refer to 1-(3).</p> <p>Refer to 4-(4).</p> <p>Refer to 4-(5).</p> <p>Refer to 4-(6).</p>

### 6-3 Error code list

Error code	Error content	Symptom	Cause	Countermeasure
6600	M-NET duplex error	<ul style="list-style-type: none"> <li>If it has been confirmed that a unit with the same M-NET address is transmitting.</li> </ul>	<ul style="list-style-type: none"> <li>If there is two or more units with the same M-NET address at the unit and controller.</li> </ul>	<ul style="list-style-type: none"> <li>Check that there are no duplicate addresses. After correcting problem, reset power supply.</li> </ul>
6601	M-NET polarity not set error	<ul style="list-style-type: none"> <li>When discrimination of the polarity of the M-NET transmission wire.</li> </ul>	<ul style="list-style-type: none"> <li>Interrupted power supply, Connectors (CN405, CN45, CN21, CN71). Damage to transformer (T2).</li> <li>Interrupted power supply for M-NET transmission wire.</li> </ul>	<ul style="list-style-type: none"> <li>Check for defects. Once corrected, reset the power supply.</li> </ul>
6607	No ACK error	<ul style="list-style-type: none"> <li>If there is no response (ACK) from the recipient after a transmission.</li> </ul>	<ul style="list-style-type: none"> <li>If recipient of transmission is LM-AP.</li> <li>Defect in transmission line (TB2)between LM-AP.</li> <li>Interrupted power LM-AP power supply (TB1).</li> <li>Blown fuse (F1) in LM-AP disconnection on the loose connector (CN605, CN65, CN32, CN33, CN31).</li> <li>Damage transformer in LM-AP(T1, T2). Damage circuit board (L.B, P.B).</li> </ul>	<ul style="list-style-type: none"> <li>Check these areas. After correcting problem, reset power supply.</li> </ul>



This product is designed and intended for use in the residential,  
commercial and light-industrial environment.

The product at hand is based on  
the following EU regulations:

- Low Voltage Directive 78/23/EEC
- Electromagnetic Compatibility Directive  
89/336/EEC



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