

## LONWORKS<sup>®</sup> LN INTERFACE

### Model: TCB-IFLN640TLE

#### For installation professionals

- Thank you very much for purchasing this TOSHIBA LN interface.
- Please read this manual carefully beforehand for proper installation of the LN interface.

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# Precautions for Safety

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- After the installation work, perform a trial operation to check for any problem. Explain how to use and maintain the unit to the customer. Ask the customer to keep this Installation Manual.

## WARNING

- **Ask an authorized dealer or qualified installation professional to install or reinstall the LN interface.**  
Improper installation may result in electric shock or fire.
- **Perform installation work properly according to this Installation Manual.**  
Improper installation may result in electric shock or fire.
- **Do not modify the unit.**  
Any modification may cause a malfunction, resulting in overheating or fire.

## CAUTION

- **Do not install the unit at a place subject to leakage of flammable gas.**  
If flammable gas leaks and remains around the unit, it may catch fire.
- **Perform wiring correctly in accordance with the specified current capacity.**  
Failure to do so may result in short-circuiting, overheating, or fire.
- **Connect the specified cables for the terminals securely to prevent external forces from affecting them.**  
Failure to do so may result in disconnection, overheating, or fire.

# Introduction

## Applicable air conditioners

TCC-LINK compatible air conditioners

## Applications/Functions/Features

### • Applications

The LN interface is connected to the LONWORKS network, and is used to control TCC-LINK compatible Toshiba air conditioners by the building control system using LON (Local Operating Network).

### • Functions

The LN interface converts signals between TCC-LINK signals for air conditioners and LONWORKS signals.

### • Features

The LN interface enables various settings such as air conditioner operation stop, temperature, operation mode switching by the building control system, as well as monitoring of operating status, room temperature, various settings, etc.

One LN interface has a capacity to control indoor units of up to 64 groups. (\*1)

A free topology FTT-10A transceiver is used as the LONWORKS transceiver.

## Specifications

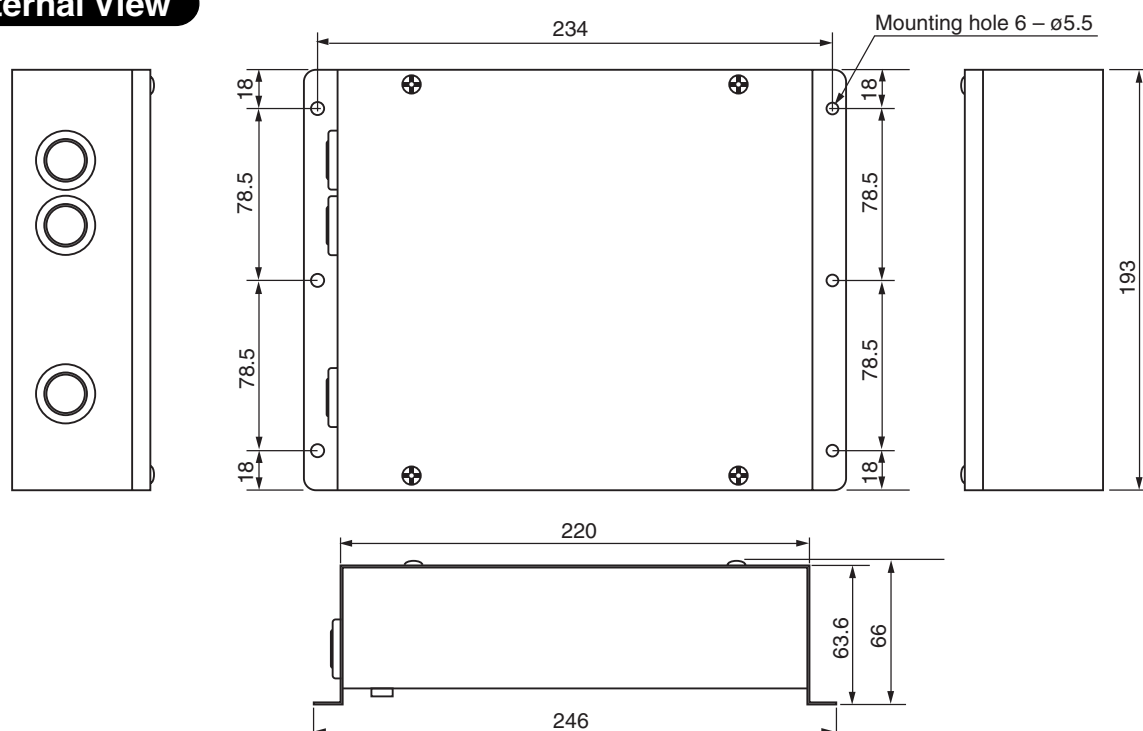
Name	LN interface
Model	TCB-IFLN640TLE
Power supply	220 - 240 VAC, 50/60 Hz
Power consumption	3 W
Number of connectable indoor units	64 groups (*1)
Operating temperature/humidity	0 to 40 °C, 20 to 90% RH
Storage temperature	-20 to +60 °C (no condensation)
Dimensions	66 (H)×246 (W)×193 (D) mm
Mass	1.2 kg

(\*1) Maximum number of connectable indoor units

The maximum number of connectable indoor units is determined by the TCC-LINK and LN interface.

You can connect up to 64 units to the TCC-LINK main bus, therefore the LONWORKS (Local Operating Network) control system is also limited to 64 indoor units.

## External View



# Before Installation

Check the following package contents.

No.	Item	Quantity	Remarks
1	LN interface	1	
2	Installation Manual	1	
3	Screw	4	M4 × 12 mm tapping screws

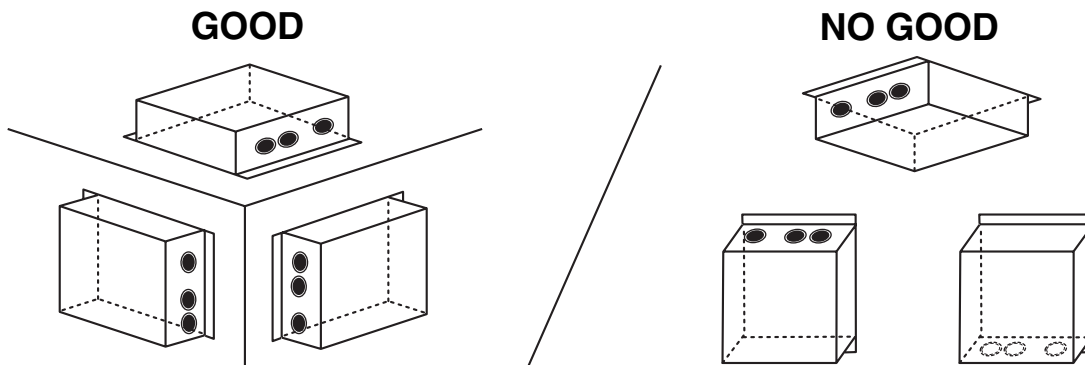
Use the following wiring materials to connect signal lines. (Procured on site)

No.	Signal wires	Description	
1	For TCC-LINK	Type	2-core shield wire
		Wire size	1.25 mm <sup>2</sup> , 1000 m max. (total length including
		Length	2.00 mm <sup>2</sup> , 2000 m max. air conditioner area)
2	For LONWORKS	Type	Twisted pair shield cable (dedicated cable or equivalent)
		Wire size	0.65 mm × 1P
		Length	Free topology : 500 m max. (total length) Bus topology : 1000 m max.

## 1 Installation

### Installation Method and Orientation

There are three installation methods as shown in the figure: surface mount and wall mount. Do not install the unit in any other orientation. Use the attached screws.



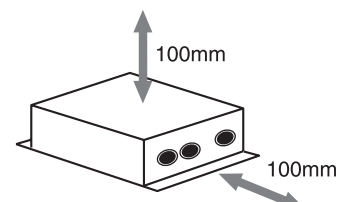
### REQUIREMENT

**Do not install the unit in any of the following places.**

- Humid or wet place
- Dusty place
- Place exposed to direct sunlight or at a high temperature
- Place within one meter from a TV set or radio
- Place exposed to rain (outdoors, under eaves, etc)

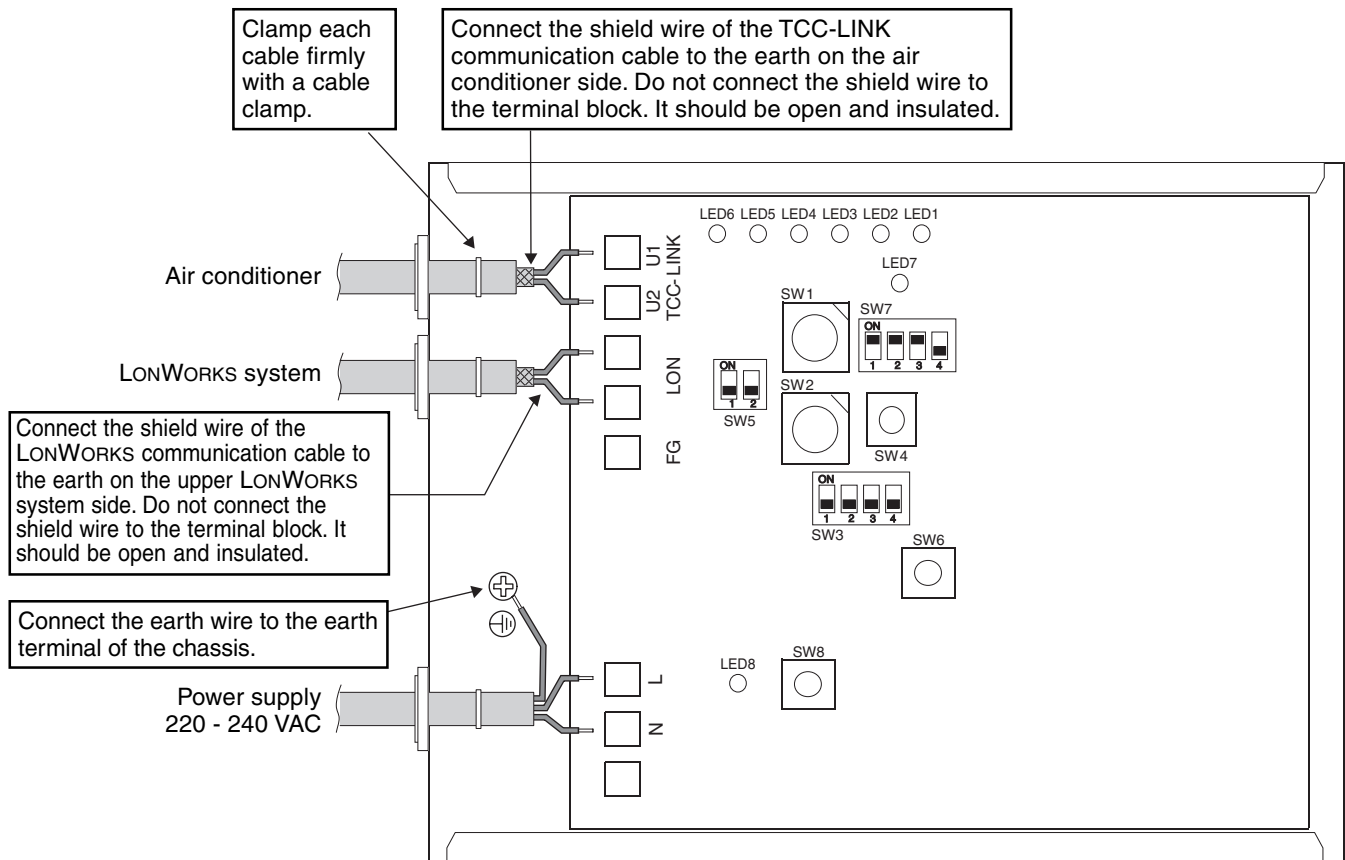
### Installation Space and Maintenance Space

A side space for connection through cable inlets and an upper space for maintenance must be reserved before installation. The other sides can be adjacent to surrounding objects.

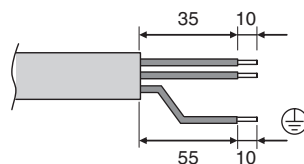


# 2 Connection of Power Cables/Signal Wires/ Earth Wires

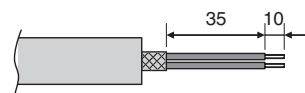
Connect power cables, signal wires, and earth wires to the specified terminals on the terminal block.



Length of stripped power cable



Length of stripped signal wire



## REQUIREMENT

- Install a breaker at the primary side of the power supply.
- The TCC-LINK communication cable and the LONWORKS communication cable have no polarity.

## 2 Connection of Power Cables/Signal Wires/ Earth Wires (continued)

The following describes a connection example on the system.

### Terminator resistor setting

- **TCC-LINK terminator resistor**

The TCC-LINK terminator resistor is set on the air conditioner side.  
(See “3 Setting” for setting.)

- **LON terminator resistor**

The LON terminator resistor is set on the upper LONWORKS system side.

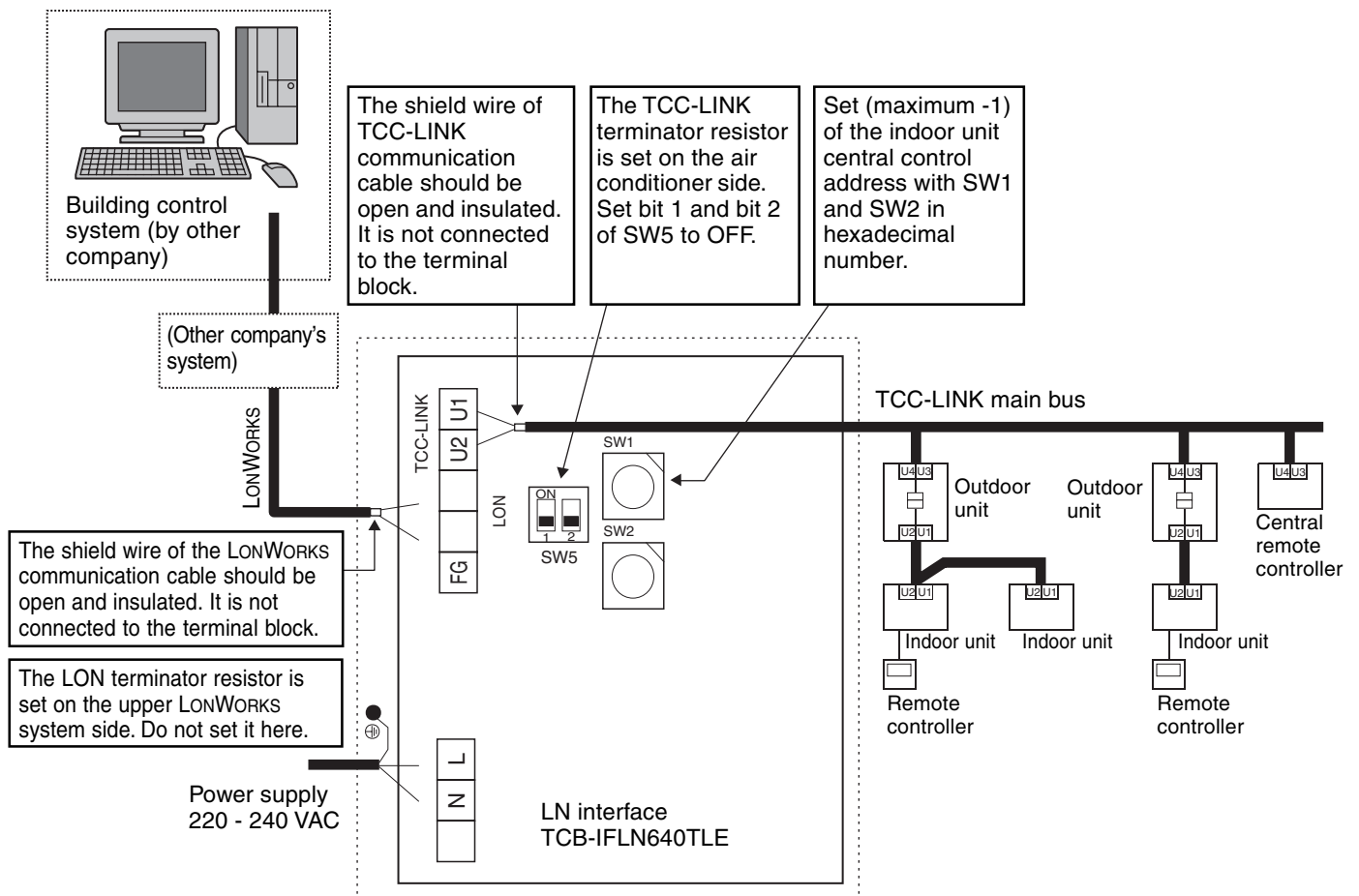
### Shield grounding of communication cables

- **TCC-LINK communication cable**

The shield earth of the TCC-LINK communication cable should be single-point earth on the air conditioner side. The shield wire should be open and insulated.

- **LONWORKS communication cable**

The shield earth of the LONWORKS communication cable should be single-point earth on the upper LONWORKS system side. The shield wire should be open and insulated.



# 3 Setting

The following settings are necessary to use the LN interface.

## TCC-LINK

- SW1/SW2 Set the number of indoor units to be connected. The number is sent to the LN interface. Set the maximum of the indoor unit central control address according to the table below. The factory setting is “3F” (64 units connected).

### REQUIREMENT

The set data is read only when the power is turned on.  
When changing the SW1/SW2 setting, push the reset switch SW6 after setting.

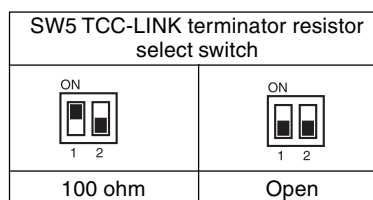
- (\*) Set the indoor unit central control address from 1 to 64 consecutively.  
This means that the maximum of the central control address equals the number of connected indoor units.  
However, if an address is omitted, the maximum of the central control address differs from the number of connected indoor units. In this case, set the maximum of the central control address according to the table below.

Note: The system works normally when the set value is larger than the maximum.  
However, it will result in communication loss.

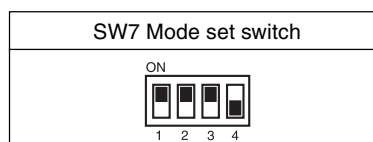
### Indoor unit central control address and SW1/SW2 setting

Indoor unit central control address	SW1	SW2	Indoor unit central control address	SW1	SW2	Indoor unit central control address	SW1	SW2	Indoor unit central control address	SW1	SW2
1	0	0	17	1	0	33	2	0	49	3	0
2	0	1	18	1	1	34	2	1	50	3	1
3	0	2	19	1	2	35	2	2	51	3	2
4	0	3	20	1	3	36	2	3	52	3	3
5	0	4	21	1	4	37	2	4	53	3	4
6	0	5	22	1	5	38	2	5	54	3	5
7	0	6	23	1	6	39	2	6	55	3	6
8	0	7	24	1	7	40	2	7	56	3	7
9	0	8	25	1	8	41	2	8	57	3	8
10	0	9	26	1	9	42	2	9	58	3	9
11	0	A	27	1	A	43	2	A	59	3	A
12	0	B	28	1	B	44	2	B	60	3	B
13	0	C	29	1	C	45	2	C	61	3	C
14	0	D	30	1	D	46	2	D	62	3	D
15	0	E	31	1	E	47	2	E	63	3	E
16	0	F	32	1	F	48	2	F	64	3	F

- SW3 Test switch (not used for normal operation, all OFF)
- SW4 Test switch (not used for normal operation)
- SW5 Used to set TCC-LINK terminator resistor. The TCC-LINK terminator resistor is set on the air conditioner side, and is not set here. Set SW5 to “Open”.



- SW6 Reset switch  
When changing the setting of the number of connected indoor units with SW1 and SW2, push this reset switch after setting to read the set value.
- SW7 Mode set switch  
Used to set MCU operation mode. Do not change the setting.



## LONWORKS System

LONWORKS specific setting called “binding” is required.

A specific tool is used for the setting. Ask a professional engineer for this process.

- SW8 Service pin for LONWORKS system  
Used for binding with the upper LONWORKS system.

# 4 Trial Operation Check

Check the communication status between LN interface and indoor units. It can be checked even when the LONWORKS system is not running.

By using SW1, SW2, and SW3, check the communication status of each connected indoor unit with LED4 and LED5.

## Checking TCC-LINK communication status

Set bit 2 of SW3 to “ON” during normal operation.

Set the central control address of the target indoor unit with SW1 and SW2 according to the table above.

Example: When checking communication status of indoor unit of central control address 25:  
Set bit 2 of SW3 to “ON”, SW1 to “1”, and SW2 to “8”.

## Indication of TCC-LINK communication status

LED4 and LED 5 show communication status of the indoor unit selected by SW1 and SW2.

TCC-LINK communication status	LED5	LED4	Remarks
Normal	ON	OFF	
Error	ON	ON	Communication with the indoor unit was established previously, but is disabled currently.
No indoor unit	OFF	ON	Communication with the indoor unit has never been established.
Invalid indoor unit	OFF	OFF	More indoor units are connected than the LN interface can control.

## End of TCC-LINK communication status check

Re-set SW1 and SW2 to the number of connected indoor units, and set bit2 of SW3 to “OFF”.

### REQUIREMENT

Be sure to re-set SW1 and SW2 correctly.

Wrong setting may result in a malfunction when the unit is reset.

## LED indication during normal operation

LED			Description
LED1	POWER	Power indicator	Lights while the power is on.
LED2	TCC-LINK	TCC-LINK communication status indicator	Blinks during TCC-LINK communication.
LED3	USB	–	Not used
LED4	BUSY	TCC-LINK busy indicator	Lights temporarily when TCC-LINK is busy (during auto address setting of an air conditioner, etc.). Communication restarts soon.
LED5	TEST	Test indicator	Used in the test mode.
LED6	UP-LINK	LONWORKS communication status indicator	Blinks during LONWORKS communication.
LED7	RESET	Reset indicator	Lights when reset operation is performed.
LED8	SERVICE	LONWORKS indicator	

(\*) Ask the manufacturer of the upper system for trial operation check of the LONWORKS system.