

# LEF-3L

## 3-Call Master Station with Selective Door Release

### Compatible with any LEF Series Door or Sub Station

## INSTALLATION & OPERATION MANUAL






The LEF-3L is a compact, wall or desk mount master station with the ability to selectively release a door or call up a CCTV camera.

Used with any LE (except LEF-3, 5 and 10) or LS Series (North America only) station. Communication can be established with each station by selecting the channel on the master station. While the channel is selected, pressing the door release button (left of TALK button) will release only the associated door. When used for CCTV camera call-up, a relay closure will be maintained as long as a station is selected. The system can have up to four stations, in any combination of master stations or door stations (e.g. 2 masters and 2 doors). Master-to-master communication is also a standard feature. If communication between master stations is not required, multiple LEF-3L's can be used to talk to 3 door stations.








### PRECAUTIONS

-  Prohibited   
  Do not dismantle unit   
  Keep unit away from water   
  General Precautions

**⚠ WARNING** (Negligence could result in death or serious injury.)

-  1. Do not dismantle or alter the unit. Fire or electric shock could result.
-  2. Do not connect any non-specified power source to the +, - terminals. Also, do not install two power supplies in parallel to a single input. Fire or damage to the unit could result.
-  3. Keep the unit away from water or any other liquid. Fire or damage to the unit could result.
-  4. When existing chime wires are used, it is possible that they contain AC voltage. Electric shock or unit damage could result. Ask a qualified technician.
-  5. Do not use power supply with a voltage other than specified. Fire or electric shock could result.

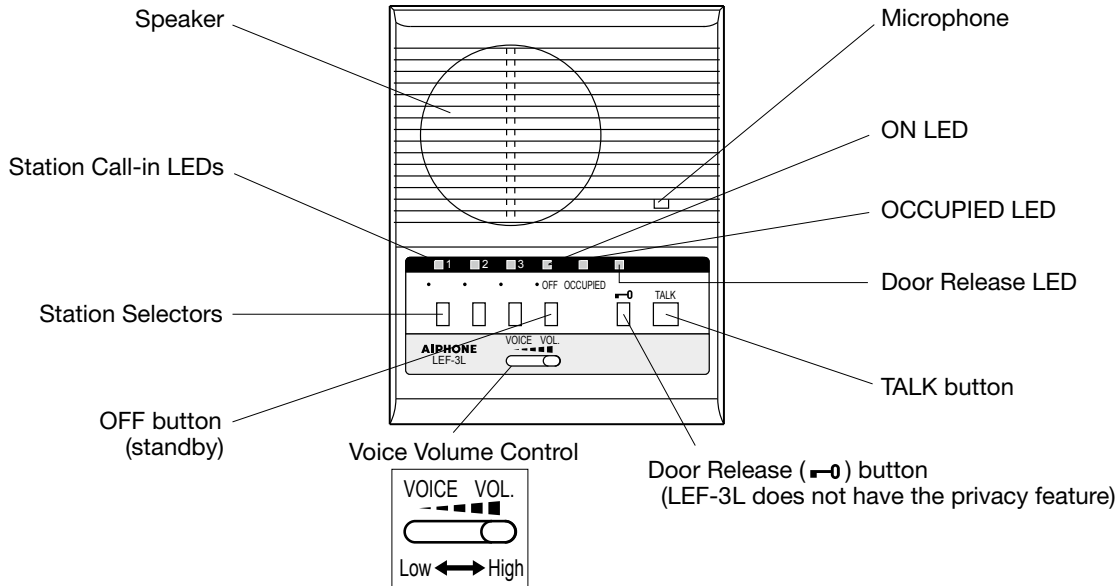
**⚠ CAUTION** (Negligence could result in injury or damage to property.)

-  1. Before turning on the power, make sure wires are not crossed or shorted. Fire or electric shock could result.
-  2. When mounting the unit on wall, install the unit in a convenient location, but not where it could be jarred or bumped. Injury could result.
-  3. For power supply, use Aiphone power supply model specified to use with system. If non-specified product is used, fire or malfunction could result.
-  4. Do not install or make any wire terminations while power supply is plugged in. It can cause electrical shock or damage to the unit.
-  5. In case of electrical storms, unplug the unit from AC outlet. If not, fire or electric shock could result.
-  6. Do not install the unit in any of the following locations. Fire, electric shock, or unit trouble could result.
  - \* Places under direct sunlight, or near heating equipment that varies in temperature.
  - \* Places subject to dust, oil, chemicals, hydrogen sulfide (hot spring).
  - \* Places subject to moisture and humidity extremes, such as bathroom, cellar, greenhouse, etc.
  - \* Places where the temperature is low, such as inside a refrigerated area or in front of air-conditioner.
  - \* Places subject to steam or smoke (near heating or cooking surfaces).
  - \* Where noise generating devices such as dimmer switches or inverter electrical appliances are closeby.
-  7. Do not install the unit in a location subject to frequent vibration or impact. It may fall or tip over, resulting in damage to the unit or personal injury.

**⚠ GENERAL PRECAUTIONS**

1. Keep the unit more than 1 m (3.3') away from Radio or TV sets.
2. In areas where broadcasting station antennas are close by, the intercom system may be affected by radio frequency interference.
3. The unit will not work during power failure.
4. All units, except for door stations, are designed for indoor use only. Do not use at outdoor locations.

# 1 NAMES & FEATURES

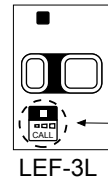


## FEATURES:

- Selective door release control
- CCTV camera call-up capability
- Single or multiple masters can be used in a system
- Intermixable system with up to 4 LEF-3L, using any combination of door stations, master stations, and sub stations.
- Master-to-master communication in a multi-master station system
- Single talkpath, with push-to-talk operation at master station, and hands-free communication at sub station
- Large variety of sub stations available
  - Surface or flush mount, with or without privacy (LE-A, LE-AN, LE-B, and LE-BN)
  - Weather resistant door stations (LE-D, LE-DA, and LE-DL)
  - Vandal proof sub stations (LE-SS, LE-SSR, and LS-NVP/C)\*
- Sub stations call in with momentary tone and LED, remaining lit for approximately 20 seconds
- Selective calling to sub stations
- Selective external device control from the master station in one of two ways with relay
  - Momentary closure while Door Release (-0) button is pushed
  - Maintained closure while door station is selected
- Desk or wall mount
- LE-D and LE-DA can be connected to up to 3 master stations for calling and communication.

## Call tone adjustment

3-position volume switch, located under Operation Plate.  
Adjusts call tone volume (Low - Medium - High).



\* North America only  
3-pos. call tone vol. switch (under Operation Plate)

## Selector switch for Call Tone in Occupied Mode

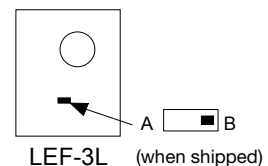
The selector switch setting is preset to the "B" position by the factory. This allows a sub station call-in tone to be heard at a muted level while the master station is in the occupied mode.

"A" position: Mutes call tone at master unit while system is in occupied mode.

"B" position: Call tone is heard when master unit is in occupied mode.

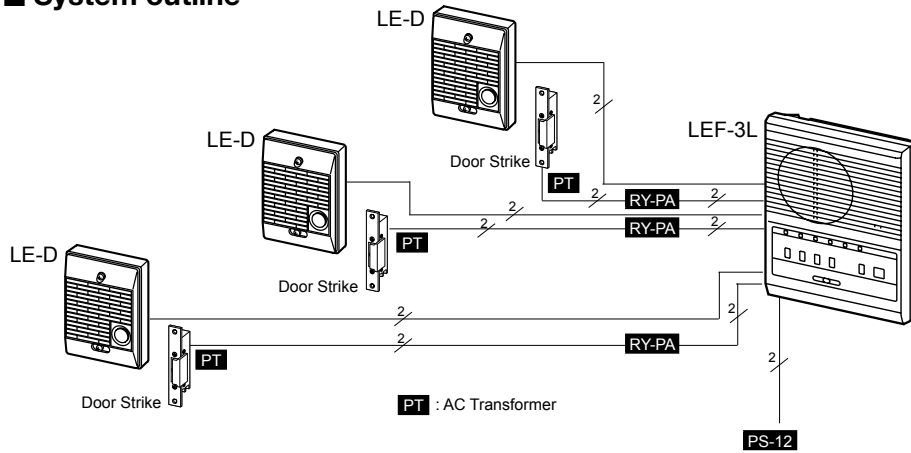
\*No call tone between master stations.

(FRONT CASE BACK VIEW)



# 2 SYSTEM OUTLINE & COMPONENTS

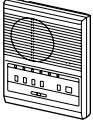



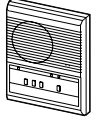
## ■ System outline



## ■ Package contents

- LEF-3L
- Packet of screws
- INSTALLATION & OPERATION MANUAL

## Individual Components for LEF-3L System:

				
<b>LEF-3L</b> 3-call master station with selective door release	<b>LE-D</b> Surface mount door station <b>LE-DL</b> Surface mount door station (Aluminum)	<b>LE-DA</b> Flush mount door station with stainless steel faceplate	<b>LE-A</b> 1-call sub station <b>LE-A3</b> 3-call sub station	

- \*LS-NVP/C Vandal and weather resistant sub station, white powder-coated (optional SBX-NVP surface mount box available - sold separately)
- \*LE-SS/A Stainless steel 2-gang sub station
- \*LE-SSR Stainless steel 2-gang sub station with red mushroom call button
- \*SBX-2G Surface mount box for LE-SS and LE-SSR
- \*LE-SS-1G Stainless steel 1-gang sub station (optional SBX-SS-1G surface mount box available - sold separately)
- \*SA-1 Surge arrestor (1 unit protects 2 wires)
- RY-PA Relay, 12V DC input, N/O dry closure output  
Add one RY-PA per channel requiring a contact closure  
Can be momentary or maintained, according to wiring.
- \*RY-18L 12-18V DC "Form C" relay (N/O and N/C contacts) Refer to RY-18L instructions for detailed wiring diagram.
- PS-1225/S/UL 12V DC, 2.5A power supply (only 1 power supply needed per system)
- PS-1215DIN 12V DC, 1.5A power supply (only 1 power supply needed per system)

## LEF-3L TERMINAL DEFINITIONS:

- +** Positive 12V DC
- Negative
- E** Common communication
- 1~3** Station number, communication to sub station or other master station
- C** Receiving calls from another master station
- R** Occupied light control (0V DC when system is occupied)

## COLOR-CODED WIRES:

- White** Common door release activation (+12V DC when Door Release button is pushed)
- Brown** Ground when station 1 is pushed
- Red** Ground when station 2 is pushed
- Orange** Ground when station 3 is pushed

# 3 Cabling

## Wiring Distance

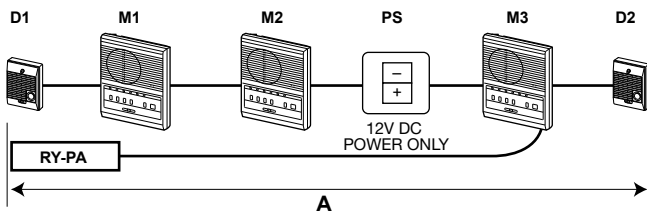


Figure 1

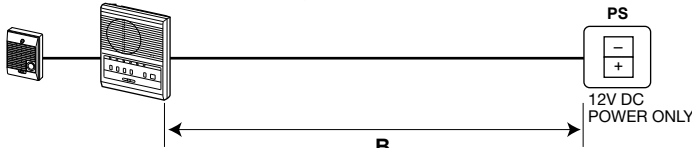


Figure 2

WIRING DISTANCE

Wire	Distance (MAX)	
	A	B
φ 0.65 mm (22AWG)	200 m (660')	100 m (330')
φ 1.0 mm (18AWG)	480 m (1575')	240 m (780')

## Wire Reference Chart (North America only)

Standard Communication				With selective door release and/or camera call-up	
Model #	# of Conductors	Wire # (22AWG)	Wire # (18AWG)	# of Conductors	Wire # (22AWG)
LEF-3L	9	822210	x	12	822212
LE-A	3	822203	821803	x	x
LE-D	3	822203	821803	x	x
LE-DA	3	822203	821803	x	x

### ■ Precautions on Installation & Wiring:

- Make sure to have the proper power supply(ies) and all necessary and compatible equipment for the system.
- Lay out the system in advance, assigning station numbers for all sub station locations.
- Any third party products installed with this system (power supply, external signaling device, etc.) are not covered under Aiphone's warranty.
- Shielded wire is strongly recommended. Refer to Wiring Distance chart above for wire gauge recommendations.

### ■ Cable:

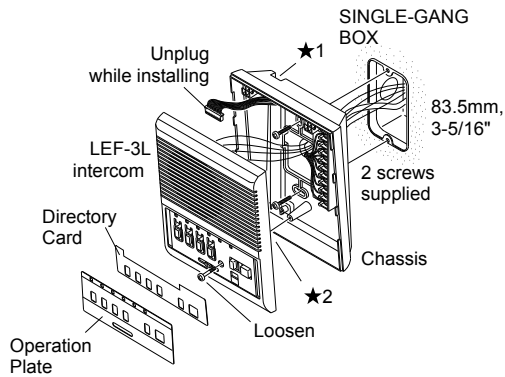
- Use multi-conductor cable with an overall shield, non-twisted, 22AWG to 18AWG (0.65mm to 1.0mm) 12 conductor cable between master stations. Refer to Wiring Distance chart above for wire gauge recommendations.
- In a SINGLE MASTER STATION SYSTEM ONLY: Sub stations can be wired with 2-conductors homerun. Jumpers between  $\boxed{E}$  and  $\boxed{-}$  must be attached on all sub stations and at the master station.
- Multi-conductor cable must be used between master stations. If more than one cable is used to connect master stations, the  $\boxed{E}$ ,  $\boxed{C}$ , and number terminal wires must be in the same jacketed cable. If necessary, run multiple  $\boxed{E}$  wires, one in each cable.

### ■ Wiring Method:

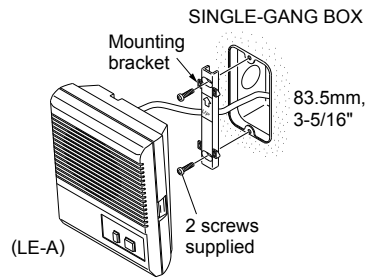
- Run intercom wires at least 50cm (20") away from all AC wiring, fluorescent lights, dimmer switches, and other electrical or electronic devices. Intercom wiring can cross AC wires at 90 degree angles.
- Sub stations can be homerun to the nearest master station or daisy-chained. If daisy-chained, include 2 common wires plus 1 individual wire per station on the run.

# 4 Mounting

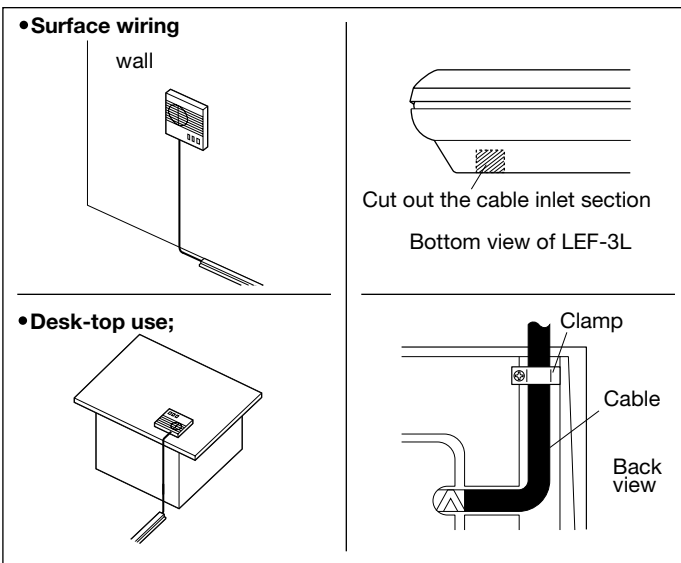
## Back wiring



## LE room subs



## Surface wiring or Desk-top use



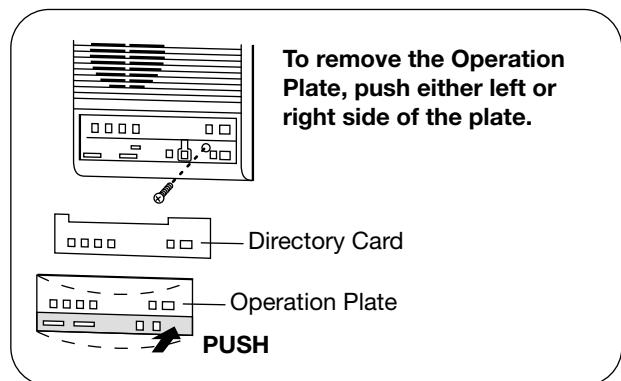
## ■ INTERCOM LOCATIONS TO AVOID

- Do not install intercoms near dimmer or light switches, or other electrical wall devices.
- Do not place sub stations back-to-back on a common wall, feedback may occur.
- Do not install near alarm panels or other electronic equipment that may emit data noise.
- Do not place behind doorways or other areas that may obstruct unit.

★ 1, 2 : When running cable on the surface, pass cable through the top or bottom of the chassis and fasten with the wire clamps (attached, one outside and one inside chassis). To pass the cable through the bottom side of the unit, cut out the cable inlet section.

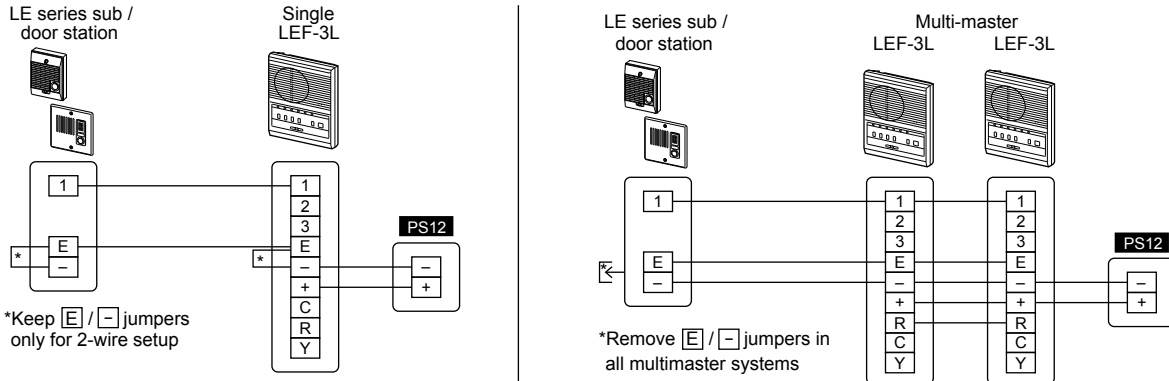
## Accessing inside of unit to connect wires:

1. Remove Operation Plate and Directory Card and loosen the screw on the front of the unit. Do not remove screw.
2. Carefully separate front of intercom from the back chassis.
3. If desired, unplug connectors and set front of intercom aside during mounting and wiring of the back chassis.
4. When wiring is completed, plug in connectors and reassemble. Peel protective covering off of Operation Plate.



# 5 Wiring Diagrams - Important Wiring Rules

## Door or sub station to master station intercom wiring, single or multi-master station



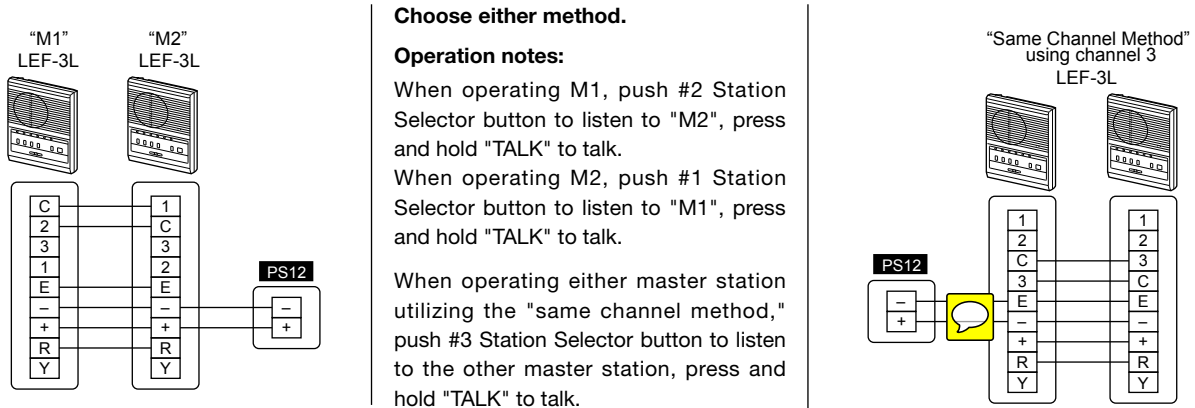
### Intercom Operation:

- To initiate call at sub station, push the station's Call button.
- To answer sub station call at LEF-3L, push the appropriate Station Selector button.
- To talk to sub station, press and hold TALK and release to listen.

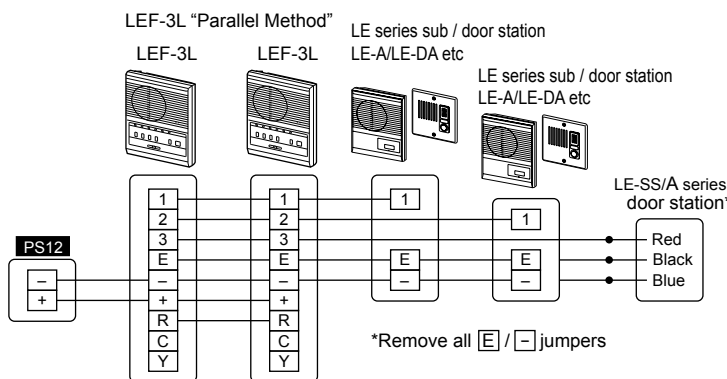
**Notes:** [1] from a sub station can wire to any number [1], [2], or [3] but never [C].  
[C] is only used for internal communication between master stations. See below.

## Master to Master intercom wiring, internal communication between master stations

**Important: Never wire [C] to another master station's [C] terminal.**



## Master to sub intercom only, no internal communication between master stations



LE-SS/A series stations use colored leads

Red	[1] is red lead
Black	[E] is black lead
Blue	[-] is blue lead

### Notes:

[1] from a sub station can go to [1], [2] or [3] but never [C].  
Only master stations can answer calls and communicate with sub stations.

\*LE-SS/A is manufactured by Aiphone Corporation in the U.S.

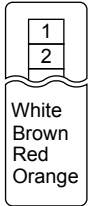
**PS12** PS-1225/S/UL, PS-1215DIN

## Door release relay wiring, one relay per door station

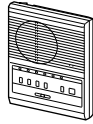
LEF-3L



- White lead is 12V DC when key button is pressed. Colored lead is ground when channel is selected.
- Brown lead is #1
- Red lead is #2
- Orange lead is #3
- Relay is activated when channel is selected and door release button is pressed.



LEF-3L

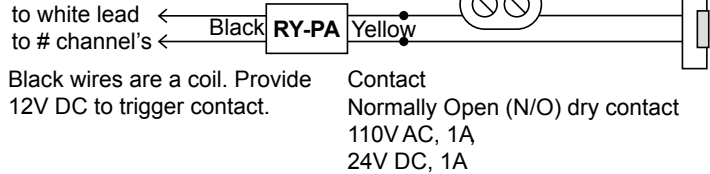


to white lead ←  
to # channel's ←

Black wires are a coil. Provide 12V DC to trigger contact.

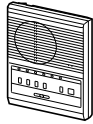
AC Transformer

Door strike

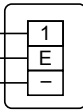
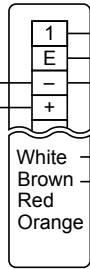
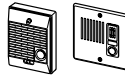


Contact  
Normally Open (N/O) dry contact  
110VAC, 1A  
24V DC, 1A

LEF-3L

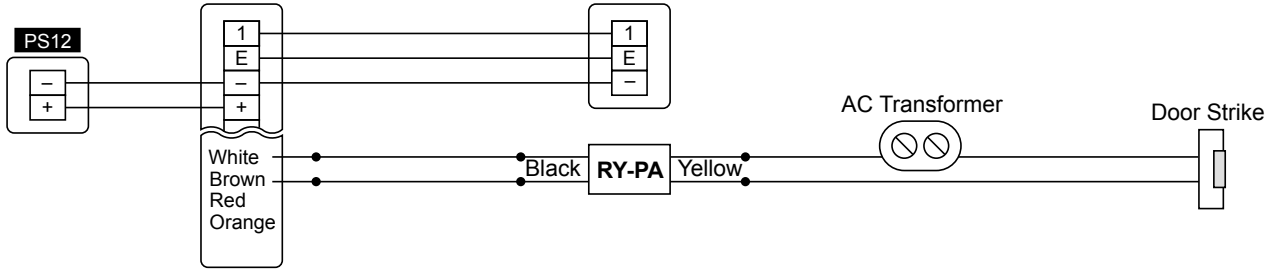


LE-D/LE-DA



AC Transformer

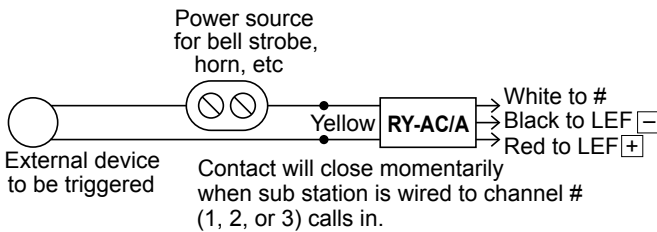
Door Strike



### Operation:

- To release the door, push the Station Selector button, then press "1-0" to release.
- When the coil gets 12V DC, the contact changes state, momentarily. Use the relay to trigger a Request-To-Exit input on any standard access control system, or close an open circuit (shown above).

## External Signaling and CCTV relay wiring, one of either relay (or both) per door station



to PS12 +  
to # channel's selective gnd. ← Black RY-PA Yellow → to CCTV input

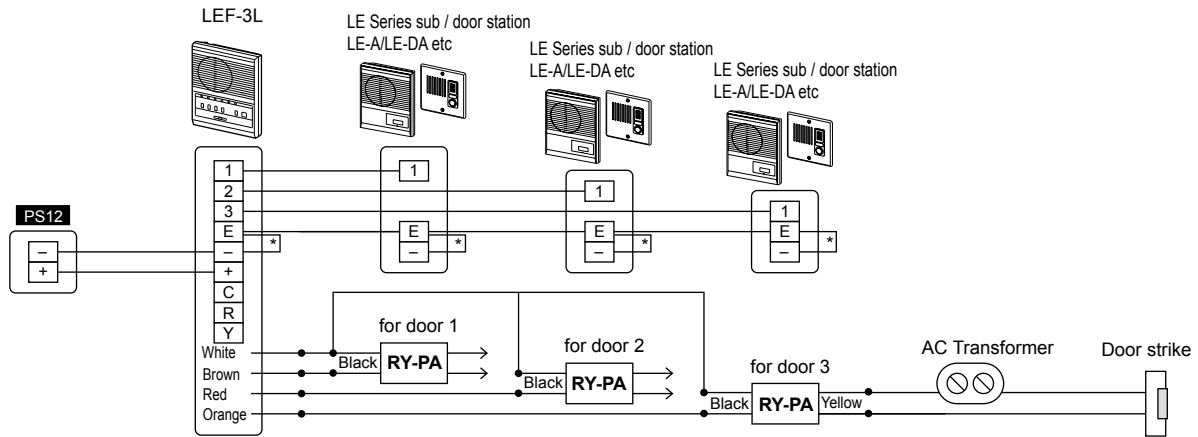
LEF-3L channel's selective gnd. is  
#1 selective gnd. is brown lead  
#2 selective gnd. is red lead  
#3 selective gnd. is orange lead

Contact will be closed as long as channel # is selected

PS12 PS-1225/S/UL, PS-1215DIN

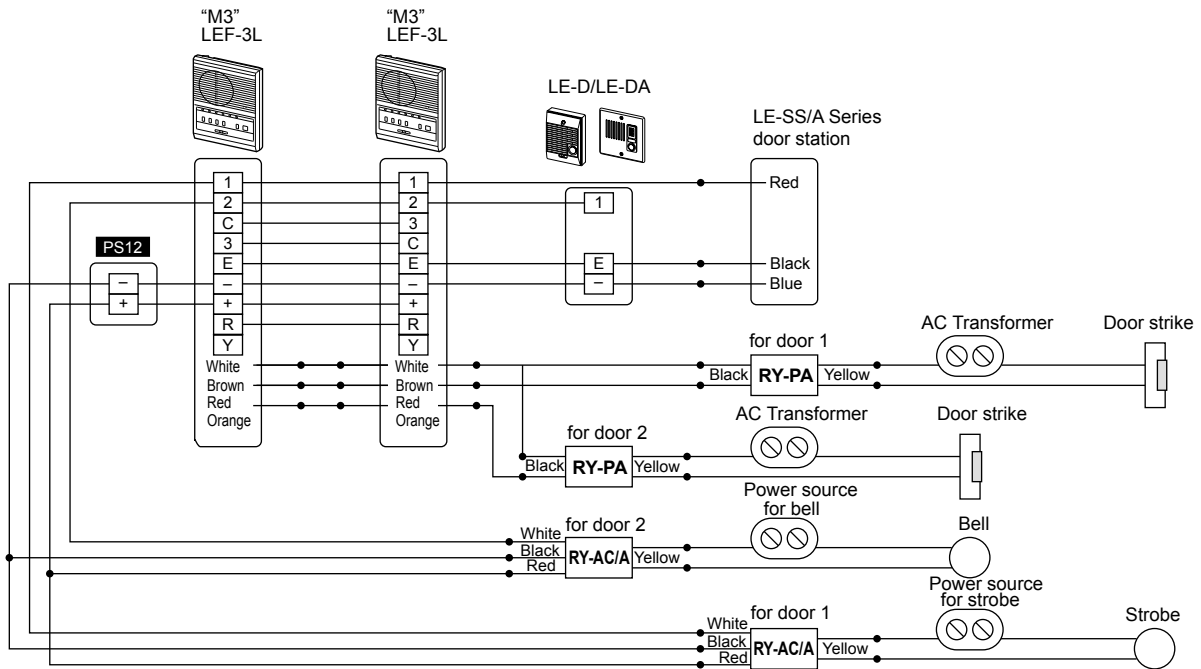
# 5 Wiring Diagrams - Applications

## One master station + three door stations using 2-conductor method with door release

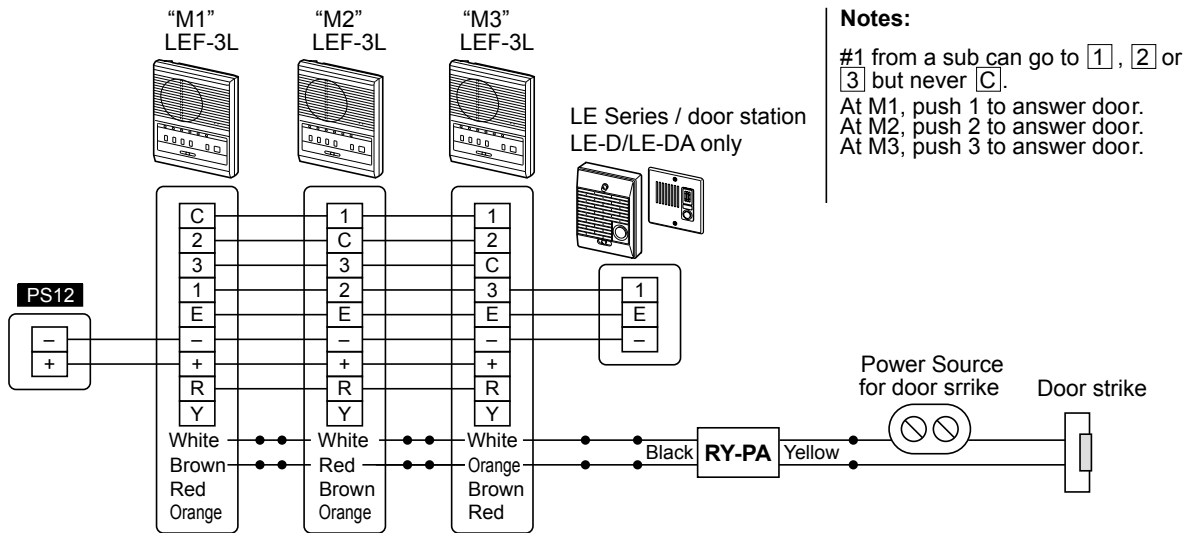


\*Keep [E] / [-] jumpers only for 2-conductor method, remove when installing with 3-conductor method

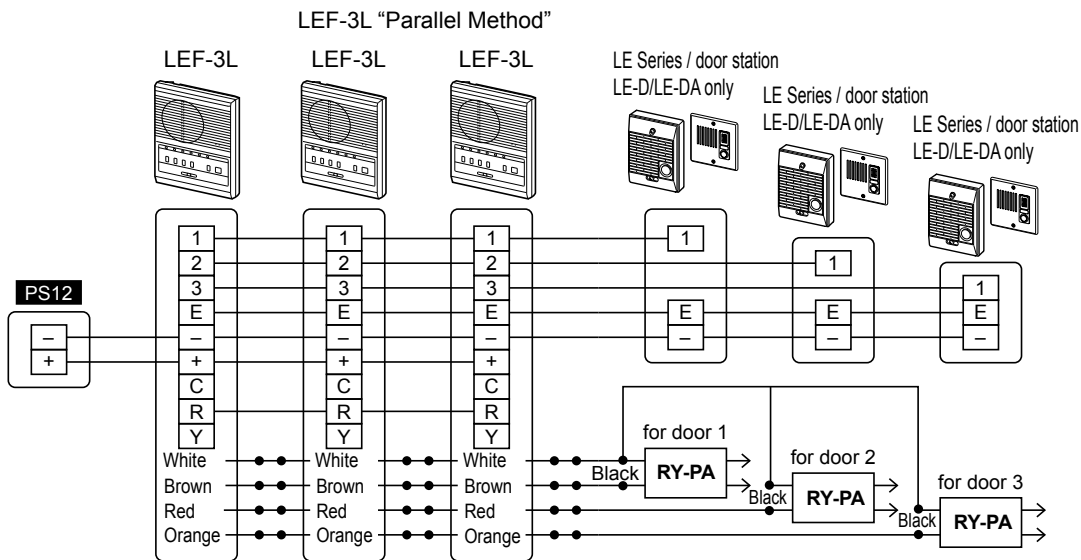
## Two master stations + two sub stations with full communication between all stations, external signaling, and door release



**Three master stations + one sub station with full communication between all stations and door release**



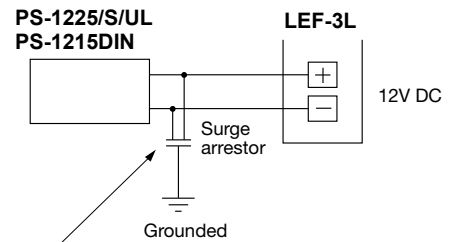
**Master to Sub intercom and door release, no master to master communication**



**PS12** PS-1225/S/UL, PS-1215DIN

**Installing surge arrestors**

- Surge protection for the intercom equipment is recommended. Add SA-1 surge arrestors for the power supply, plus one per two wires connected to the master station.
- When using a power supply with no GROUND terminal, install a surge arrestor near the output.
- Additional surge arrestors can be installed to protect communication lines. One surge arrestor per 2 wires on each master station.



Install a surge arrestor at a location closest to the unit, taken to earth ground.

# 6 OPERATIONS

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## ■ Calling a master station or sub station:

1. Push appropriate Station Selector button 1~3. (Audio can now be heard from selected station.)
2. Press and hold TALK button on master station to speak, release to listen.
3. To end, push OFF button.

## ■ Receiving a call from a sub station:

1. Sub station calls in with tone and LED light indication on master station, Light will stay lit for approximately 20 seconds before timing out.
2. Push corresponding Station Selector button on LEF-3L.
3. Press and hold TALK button on master station to speak, release to listen.
4. Communication at sub station or door station is ALWAYS hands-free.
5. To end call, push OFF button.

## ■ Receiving call from another master station:


1. When a master station calls another master station (no tone or LED), responses are hands-free and do not require any action.
2. The OCCUPIED LED will be on while the initiated master station has a station selected.

Note: There is no designation as to which master station is calling in.

## ■ Door answering (from a master station only):

1. A call tone will sound and an LED will light up to indicate door station calling in. LED will stay lit for approximately 20 seconds.
2. Push corresponding Station Selector button on LEF-3L.
3. Press and hold TALK button on master station to speak, release to listen.
4. To end call, push OFF button.

## ■ Door release with LOCK button:

LEF-3L provides selective door release to multiple doors (one RY-PA for each door). When communication is established with a door station, push the door release (  ) button to release the corresponding door strike.

- Use the door release button only when the TALK button is not pressed. Do not operate the door release when talking.
- Proper (relay) operation may not be guaranteed under the following conditions:
  - When a master station is called from another sub or master station while talking (including when the call tone is sounding)
  - When a master station is called from another master station while the OCCUPIED LED is on

# 7 TROUBLESHOOTING

ENTRY #	PROBLEM	POSSIBLE CAUSE	SOLUTION
1	Door station does not call in (no call tone or LED light).	Missing jumpers	Are there 2- or 3-conductors run to the door station? If 2 wires, jumper must remain attached between [E] and [ ] at both the door station and the master station. Replace jumper. In a multi-master system, the [E] / [ ] jumper should be removed and 3 wires should be connected.
2	Door station does not call in (no call tone or LED light) -- 3-wire connection.	Missing connection of [ ] terminal.	If communication works, check connection between [ ] terminal of door station and master. Test call-in at master station by touching a jumper wire between # and [ ] terminal of master. If this rings the tone and lights the light, the [ ] wire from the door station is not connected properly.
3	Door station does not call in (no call tone or LED light) -- 3-wire connection.	Miswiring of [1] and [E] terminals.	Check that the [1] and [E] wire are not reversed. If they are, communication will work but call-in will not.
4	No communication to door station.	Miswiring of [E] terminal.	Communication is between the [1] and [E] terminal of the door station to a # and [E] terminal of the master station. If call-in works, check the [E] wire for continuity. Check the [1] and [E] wires at the sub to ensure that they are not reversed.
5	No master-to-master communication.	[C] terminals mis-wired between masters.	Communication between masters is carried on the # wire of the calling master to the [C] terminal of the receiving master. Verify that the [C] terminal of the master that is being called is actually wired to the #terminal that is being selected on the calling master.
6	LEF master has no communication or tone, but LED lights work.	Wrong power supply is being used.	The LED lights will operate with a power source from 6VDC - 24VDC. The amplifier in the LEF unit will only work when the system is supplied 12VDC. Proper power supply is the PS-1225/S/UL, or PS-1215 DIN.
7	Feedback when the volume control is turned above halfway.	[E] / [ ] jumpers attached in a multi-master system.	Remove [E] / [ ] jumpers on masters and door stations in the system, provided there are 3 wires to the sub(s). If the sub only has 2 wires in a multi-master system, the jumper must remain in place for the door call-in to work. In this case, the side effect is the feedback problem when the audio volume is turned up. The only alternative is to run the proper wire to the door station(s) and remove all of the jumpers.
8	New installation has AC buzz, noise, or hum in system.	Too close to AC and/or incorrect wire was used.	If the units are too close to an AC source such as AC wiring or dimmer switches, move the intercom at least one stud space away from the AC source. Other precautions include using shielded cable. If shielded wire was used and there is still AC noise, tie all the shields together and ground to an earth ground or negative on the power supply. If more than one jacketed cable was used between masters, make sure the # terminals, [C] terminal, and the [E] terminals are all in the same jacketed cable. If multiple cables were used, include an [E] wire in each cable that carries a station number wire in it.
9	Door release does not work.	Miswire or lack of RY-PA relays.	Check the (WHITE) wire coming out of the PC board for voltage. When pushing the door release ( → ) button, 12VDC is present across (WHITE) and [ ], which activates the relay. Ensure the (BLACK) wires of the RY-PA are connected to (WHITE) and either the (BROWN), (RED), or (ORANGE) wire for selective door release (which provides selective ground when the corresponding channel is selected).
10	No call tone between masters. No Privacy feature on LEF-3L.	Features not available	The LEF-3L unit does not have the PRIVACY feature or the ability to send a call tone to another master station (as with the standard LEF-3). This function is removed to allow the switch to be used for door release instead of privacy.
11	Can't release the door from the 2nd (additional masters)	Wiring not connected properly.	If door release works from the first master station but not another station(s), verify that selective door release wires are connected between master stations ((WHITE), (BROWN), (RED), (ORANGE)). RY-PA are only required at one master.
12	External Signaling device doesn't activate	RY-AC mis-wired	Make sure the WHITE wire of the RY-AC is connected to the # terminal activating the relay, and (RED) and (BLACK) are connected to [ + ] and [ - ], respectively.

# 8 SPECIFICATIONS

## ■ Specifications

- Power Source: 12V DC at master station. Use PS-1225, 1225S, 1225UL (2.5A) or PS-1215 DIN (1.5A). Do not use AC power. Damage to the unit will occur.
- Current Consumption: 440mA
- Communication Output: 800mW @ 20 ohms (receive); 500mW @ 20 ohms (transmit)
- Communication: Push-to-talk, release-to-listen at master station (LEF-3L). Hands-free at sub station.
- Calling: Master station to sub station: By voice  
Master station to master station: By voice  
Sub station to master station: Call tone at sub station and master station, LED at master station remains on for 20 seconds
- Wiring: 2-common plus 1 individual per sub station, looped; or 3-conductors homerun from each sub station.  
2-conductors homerun from each sub station in a single-master station system only.  
Use Aiphone #822202 or #821802 (2-cond., 22 or 18AWG), or #822203 (3-cond. 22AWG)  
12 conductors between master stations. Use Aiphone #822212 (North America only).  
Shielded cable is strongly recommended.
- Dimensions (HxWxD): 180H x 143W x 53.5D (mm). 7-1/16" x 5-5/8" x 2-1/8"
- RY-PA Contact Rating: 1A, 110V AC or 24V DC

## ■ Power supply

The entire LEF system can be powered by one power supply (PS-1225/S/UL 12VDC 2.5A or PS-1215DIN 12VDC 1.5A), located near the center of the wire run.

For a system including All Call and Chime with the BG-10C, one PS-1225/S/UL or PS-1215DIN will power the BG-10C and the LEF system.

## ■ Restrictions

- Only one PS-1225/S/UL, PS-1215DIN power supply can be used per system. Additional power supplies may be needed for external devices.
- Up to 4 master stations can be connected in a multi-master station system, or up to 3 master stations in a system with door stations connected.

### WARRANTY

Aiphone warrants its products to be free from defects of material and workmanship under normal use and service for a period of one year after delivery to the ultimate user and will repair free of charge or replace at no charge, should it become defective upon which examination shall disclose to be defective and under warranty. Aiphone reserves unto itself the sole right to make the final decision whether there is a defect in materials and/or workmanship; and whether or not the product is within the warranty. This warranty shall not apply to any Aiphone product which has been subject to misuse, neglect, accident, power surge, or to use in violation of instructions furnished, nor extended to units which have been repaired or altered outside of the factory. This warranty does not cover batteries or damage caused by batteries used in connection with the unit. This warranty covers bench repairs only, and any repairs must be made at the shop or place designated in writing by Aiphone. This warranty is limited to the standard specifications listed in the operation manual. This warranty does not cover any supplementary function of a third party product that is added by users or suppliers. Please note that any damage or other issues caused by failure of function or interconnection with Aiphone products is also not covered by this warranty. Aiphone will not be responsible for any costs incurred involving on-site service calls. Aiphone will not provide compensation for any loss or damage incurred by the breakdown or malfunction of its products during use, or for any consequent inconvenience or losses that may result.

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