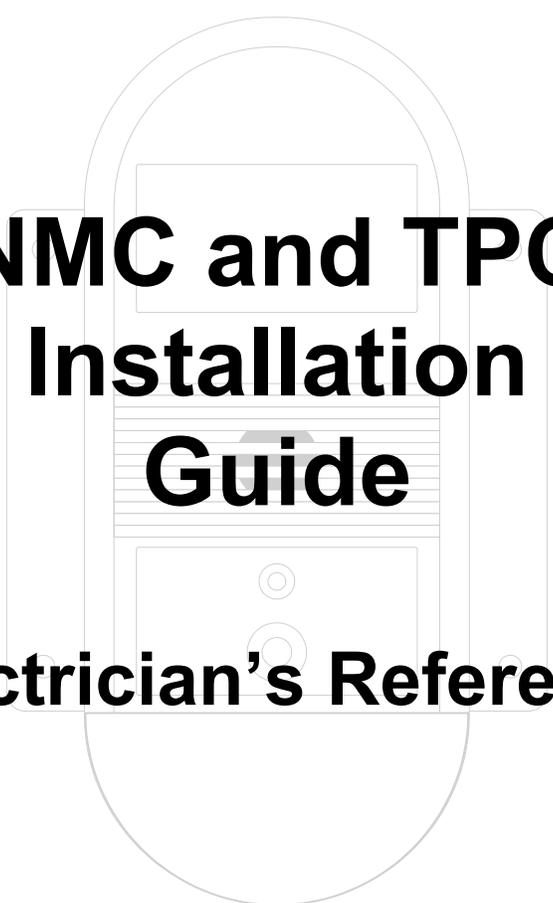


# **FIRE-LINK® II**



## **NMC and TPC Installation Guide**

### **Electrician's Reference**

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**1.0 General Product Information**

**1.1 \*\*\* IMPORTANT \*\*\* Site Prequalification Requirement**

The Fire-Link®II Site Prequalification form must be completed by the dealer or installer AND approved by Signalink Technologies prior to installation of any Fire-Link® equipment. Equipment and/or installation warranties may be void if this installation is not approved by Signalink Technologies.

**1.2 Documentation Reference**

The chart below lists the pertinent documentation to install Fire-Link®II equipment.  
 This is Document Number: **077.0024 - NMC and TPC Installation Guide**

Fire-Link® II		Documentation Reference
Document Number	Document Name	Description
077.0024	NMC and TPC Installation Guide	Installation and 120V Wiring of the NMC, TPC and CHK-400
077.0050	TPC Installation Guide	TPC and CHK-400 Installation Instructions (Enclosed in TPC Unit Box)
077.0048	NMC Fire Alarm Wiring Guide	NMC Fire Alarm and Fire Alarm Control Panel (FACP) Interconnect Wiring
077.0049	ISD Installation, Operation and Maint. Guide	ISD Installation, Operations and Maintenance Guide
077.0045	NMC Programming Manual	NMC and ISD Programming and Set Up
077.0046	Signalink System Configurator User's Manual	System Configurator User's Guide for NMC Programming Via Laptop
077.0025	Building Manager's Guide	NMC and ISD Operation, Test and Inspection Guide

**1.3 Applicable System Components**

This document applies to the following system components:

Fire-Link® II	System Components		
	160kHz	132kHz	Color
NMC	NMC-101R	NMC-102R	RED
	NMC-101W	NMC-102W	WHITE
TPC	TPC-101	TPC-102	
CHK-400			

### 1.4 System Component Compatibility

The Fire-Link®II components are not compatible with previous Series 2.1 or Series 2.3 components. In addition, Fire-Link®II components are frequency dependent therefore one frequency series is not compatible with devices of a different frequency series. See Compatibility Chart below.

	ISD-1000 Rev 2.1	ISD-1000 Rev 2.3	ISD-2501 160kHz	ISD-2502 132kHz	PPC-600	SPC-3P	TPC-101 160kHz	TPC-102 132 kHz
■ = Compatible								
NMC-100 Rev 2.1	■							
NMC-100 Rev 2.3		■						
NMC-101 160kHz			■					
NMC-102 132kHz				■				

### 1.5 UL/ULC Listing Information

Fire-Link® II		UL / ULC Listing Reference	
Model Number	UL / ULC Listing Standard	Description	
NMC-101W, NMC-101R NMC-102W, NMC-102R	UL-985 .....	Residential Fire Warning Systems	
	UL-864 Accessory .....	Commercial Fire Alarm Applications (Accessory)	
	ULC-S527 .....	Commercial Fire Alarm Applications (Accessory)	
	ULC-S545 .....	Residential Fire Warning Systems	
TPC-101, TPC-102, CHK-400	UL-508	Industrial Control Equipment	

## 2.0 Pre-Installation Check List

### 2.1 Location of the Building's Electrical Equipment

Fire-Link®II uses the buildings electrical distribution system as its sole means of communications. Locating ALL of the building's electrical distribution equipment prior to installation can save time by avoiding potential problems when installing this product. Below is a list of equipment to look for:

- Location of the building's low voltage (120/208) transformer(s). A building may have more than one transformer and they may be located in various locations within the building.
- Does the transformer feed more than one building? Multiple buildings can be serviced by only one transformer.
- Number of electrical phases. Is the building single (2 phase) or 3 phase?
- Location of the building's electrical rooms. There may be more than one electrical room.
- Location of the house (common) distribution panels. There may be more than one house panel.. Additional house panels may be located in separate electrical rooms. Are the house panel phases the same as the building's phases. Some house panels are single phase but the building is three phase.
- Is the house panel on a separate transformer than the suites?
- Available spare breaker spots in the house panel. A sub panel may need to be installed if there is no spare availability in the house panel.
- Location of the meter banks, if any.
- Location of the emergency generator, if equipped.
- Location of the fire alarm panel.

### 2.2 Installation to Avoid

Certain building electrical configurations make it difficult or maybe even impossible to install this product. Below is a list of configurations that may present installation problems.

- If the service transformers service more than one building AND each building has its own fire alarm system AND the Fire-Link®II product is to be installed in each building, a separate NMC will have to be installed in each building with its own TPC and CHK-400. If the buildings are in very close in proximity, crosstalk can occur and may interfere with each other.
- If the building is serviced by more than one transformer, a TPC must be installed for each transformer. If the panels that are fed from these transformers are located greater than 60 feet (20 meters) from each other, there may be considerable signal loss when connecting between them.
- If there are more than two transformers, considerable signal loss will occur.
- If there is an emergency generator, the TPC must not be installed on the emergency panel. In most configurations, the emergency transfer switch will open the circuits which supply the suites thus opening the signal path.
- If the house panel does not have the same number of phases as the building, e.g. the panel is single phase (2 phase) and the building is three phase, the third phase will not be coupled and provisions must be made to couple to the third phase.
- If the house panel is on a separate transformer than the suites, provisions must be made to couple to the suite transformer.
- If there are no spare breaker spaces in the house panel to connect the TPC, provisions will have to be made such as adding a sub panel.

Please do not attempt to install this equipment if there is any doubt about how or where to install the TPC and/or the CHK-400. Contact **Technical Support at 1-888-765-7514** Monday to Friday, 7:30 - 4:30 Pacific Time.

**FOR INDOOR USE ONLY**

This equipment is to be installed by qualified personnel only and in accordance with all applicable electrical and fire alarm codes and in accordance with the Authority Having Jurisdiction (AHJ).

** DO NOT:**

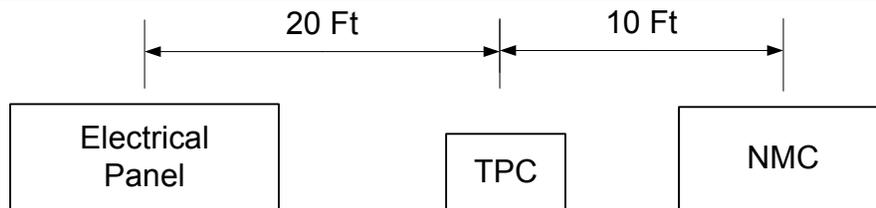
- Install the equipment outdoors.
- Install the equipment where it may be subjected to extreme heat, 120°F (48°C).
- Install the equipment where it may be subjected to extreme cold, 32°F (0°C).
- Install the equipment where it may be subjected to rain, moisture or steam.
- Install the equipment where it is exposed to direct sun light.
- Install the equipment in a hazardous location.
- Install the equipment near flammable, explosive or corrosive chemicals or materials.
- Install the equipment where it may be subjected to excessive dust or dirt.
- Install the equipment near flame or sources of heat or ignition.
- Install the equipment on or near sources of excessive vibration.
- Install the equipment inside an electrical distribution or control panel.
- Install the equipment near sources of electro magnetic interference (EMI) such as lighting ballasts or motor control centers.
- Install on the equipment LINE side of any buck, boost or distribution transformer.
- Install on any service exceeding 250 Volts RMS. (TPC)
- Install the equipment near obstructions or where it could be subject to obstruction or prevent operation, servicing or maintenance.
- Install the equipment where it could be subjected to physical damage.
- Install the equipment on any surface other than a flat surface.
- Allow wiring to be exposed or installed in a manner in which the wiring could become exposed.
- Attempt to modify the equipment in any way.

**3.0 Installation Guideline**

**3.1 General Installation Guidelines**

The NMC and TPC are generally installed in the building’s electrical room where the electrical services are located. When installing the NMC and TPC, a suitable location near the electrical panel where power is to be fed and where the NMC and TPC can be mounted in close proximity to each other is preferred. The greater the distance is between the NMC, the TPC and the electrical panel, the greater the signal loss. Although not always possible, Figure 1 shows preferred layout and preferred maximum distances between the equipment. Once a suitable location is identified for the TPC and NMC, mount the TPC and NMC per Sections 4 and 5.

**NOTE**  
**If the building service is 3 phase, the TPC will require its own separate 3 phase breaker. The TPC must be connected to all three phases. Provision must be made to connect to the three phases if 3 phase service is not available near the location of the TPC.**



**Figure 1: Maximum Distances (Preferred)**

**3.2 Multiple Transformer Installations**

As stated in Section 1, there may be times when multiple transformers supply electrical service to the suites. Fire-Link®II signals do not readily propagate through transformers, therefore provisions must be made to install additional TPCs for each transformer that supply service to the suites or where Fire-Link®II equipment is to be installed. A TPC is **NOT** required for transformers that do not supply service where Fire-Link®II equipment is **NOT** to be installed. Ideally these transformers would be located in the same electrical room where the wiring distances can be kept to a minimum. If the transformers are located within the same electrical room, a building with two transformers can be considered for installation. If the transformers are not located within the same electrical room and there is a considerable distance between the transformers, significant signal loss can be expected. Contact Signalink Technologies’ Technical Support prior to multiple transformers applications.

**3.3 Additional Considerations**

In addition to keeping the electrical wiring distances to a minimum, other considerations needs to be given to the location of the NMC and the TPC relative to each other as well as where the electrical and fire alarm wiring enters to the NMC. The wiring entrances to the NMC are governed by the internal components of the NMC. See Section 5 for mounting the NMC. Adequate clearances must be provided for the NMC and TPC to allow access and serviceability.

**3.4 Order of Installation**

Once the locations of the NMC and TPC has been identified and the equipment is mounted, it is generally preferred that the TPC be wired first. The 120VAC single phase wiring can then be made to the NMC. Verify the wiring prior to powering up the NMC to prevent damage to the equipment.

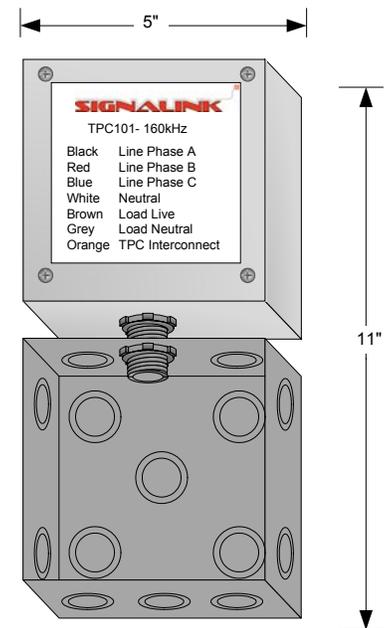
**4.0 TPC / CHK-400 Installation**

**4.1 TPC Clearances**

Due to the number of wires and the size of the CHK-400, the TPC should be mounted on a deep steel junction box of a minimum size of 4-11/16". The TPC can be mounted in any position however there should be a minimum clearance around the box and the TPC. Adequate clearance should also be made to account for conduit entry. Figure 2 below shows a minimum clearance around the TPC and junction box. This **DOES NOT** account for conduit clearance. Do not install the TPC or junction box behind or near any obstruction that will prevent servicing. Do not modify the TPC in any fashion except wire length.

**4.2 The CHK-400 Installation Requirement**

The CHK-400 (CHK) is a noise filter and must be installed with the TPC that is to be used for the NMC. For multiple transformer applications, a CHK is not to be used with the TPCs that are used on those transformers. The CHK is only used for the NMC. **DO NOT** install a CHK with additional TPCs. It is preferred that the CHK is installed in the same junction box that is used for making connections for the TPC wiring. If the CHK can not be physically mounted in the same junction box, it should be mounted in a junction box immediately next to the TPC junction box.



**Figure 2: Minimum Installation Clearance**

**WARNING:** The CHK is **ONLY** rated to supply power to the NMC. **DO NOT** connect additional loads, equipment or apparatus to the **LOAD** side of the CHK. Equipment damage or electrical hazards may occur if anything other than the NMC and TPC are connected as later shown.

**4.3 TPC/CHK-400 Color Codes**

Figure 3 shows the wire colors of the TPC and CHK-400 and their connection names. The connections are described below. Refer also Figures 5, 6 and 7.

Single Transformer:

- TPC Black, Red and Blue** – Connected to the individual Line Phases  
Note: If the building is Single Phase, generally only the Black and Red are connected.
- TPC White and TPC Grey** – Connected together to Neutral. This is the **LOAD NEUTRAL** connection to the NMC.
- TPC Brown and CHK Brown** – Connected together. This is the **LOAD** connection to the NMC.
- TPC Black and CHK Black** – Connected together to Line Phase A. This is the **NMC AC Source** connection.
- TPC Orange** – No connection.

Multiple Transformers:

- TPC Black, Red and Blue** – Connected to the individual Line Phases  
Note: If the building is Single Phase, generally only the Black and Red are connected.
- TPC White and TPC Grey** – Connected together to Neutral. This is the **LOAD NEUTRAL** connection to the NMC.  
Then connects to addition TPCs Grey connections.
- TPC Brown and CHK Brown** – Connected together. This is the **LOAD** connection to the NMC.  
Then connects to addition TPCs Brown connections.
- TPC Black and CHK Black** – Connected together to Line Phase A. This is the **NMC AC Source** connection.
- TPC Orange** – Connects to additional TPCs Orange connections.

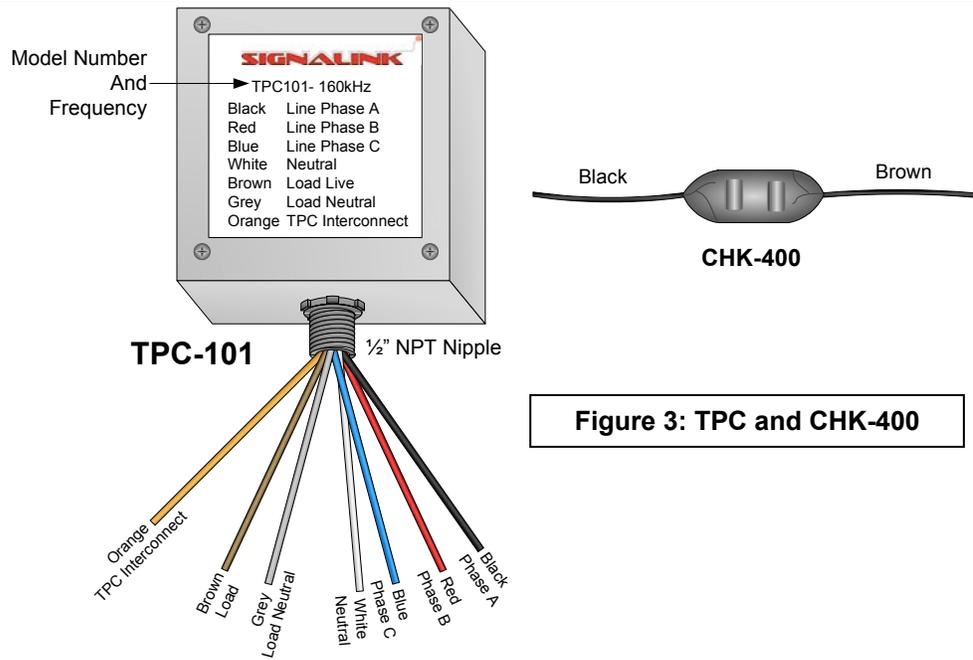


Figure 3: TPC and CHK-400

#### 4.4 TPC and CHK Block Diagram

Figure 4 shows a block diagram of the TPC and CHK-400. **NOTE:** The NMC AC Source is generally connected to Phase A. Any electrical noise that may be present on the NMC AC Source line is filtered off by the CHK-400. The TPC then couples the Fire-Link®II signals to the other Line phases.

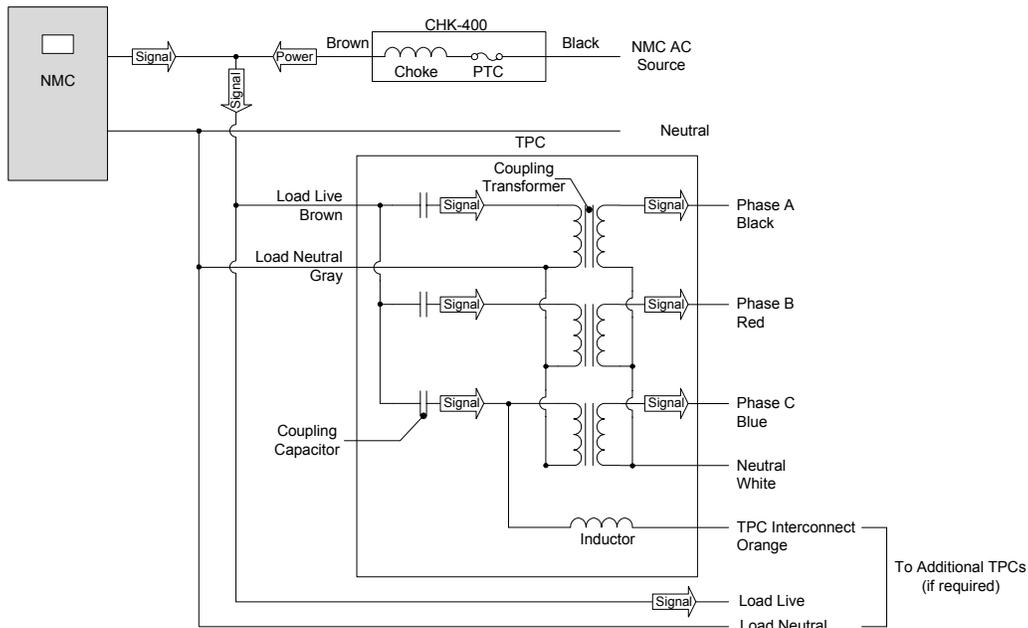
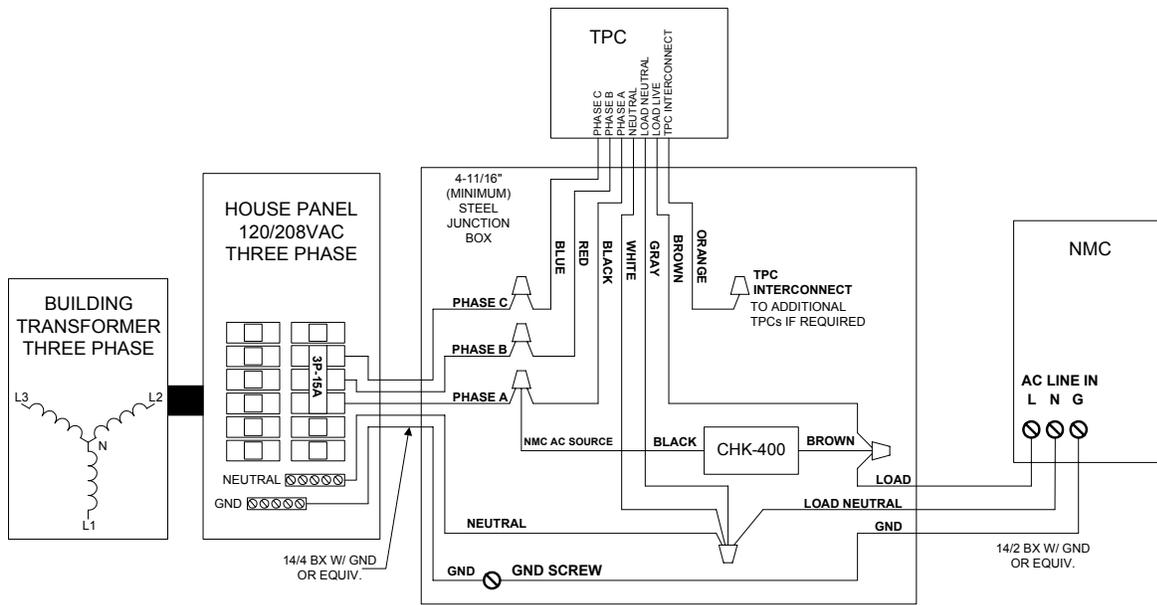


Figure 4: TPC and CHK-400

### 4.5 Typical Three Phase Installation

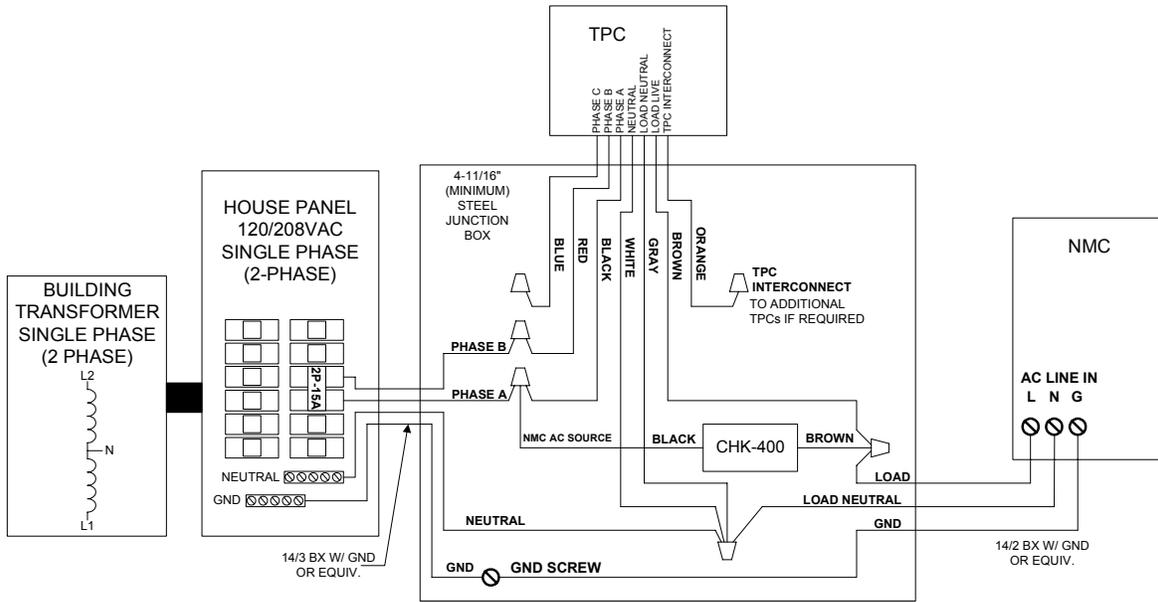
Figure 5 shows a typical three phase, single transformer installation.



**Figure 5: Typical Three Phase Installation**

### 4.6 Typical Single Phase Installation

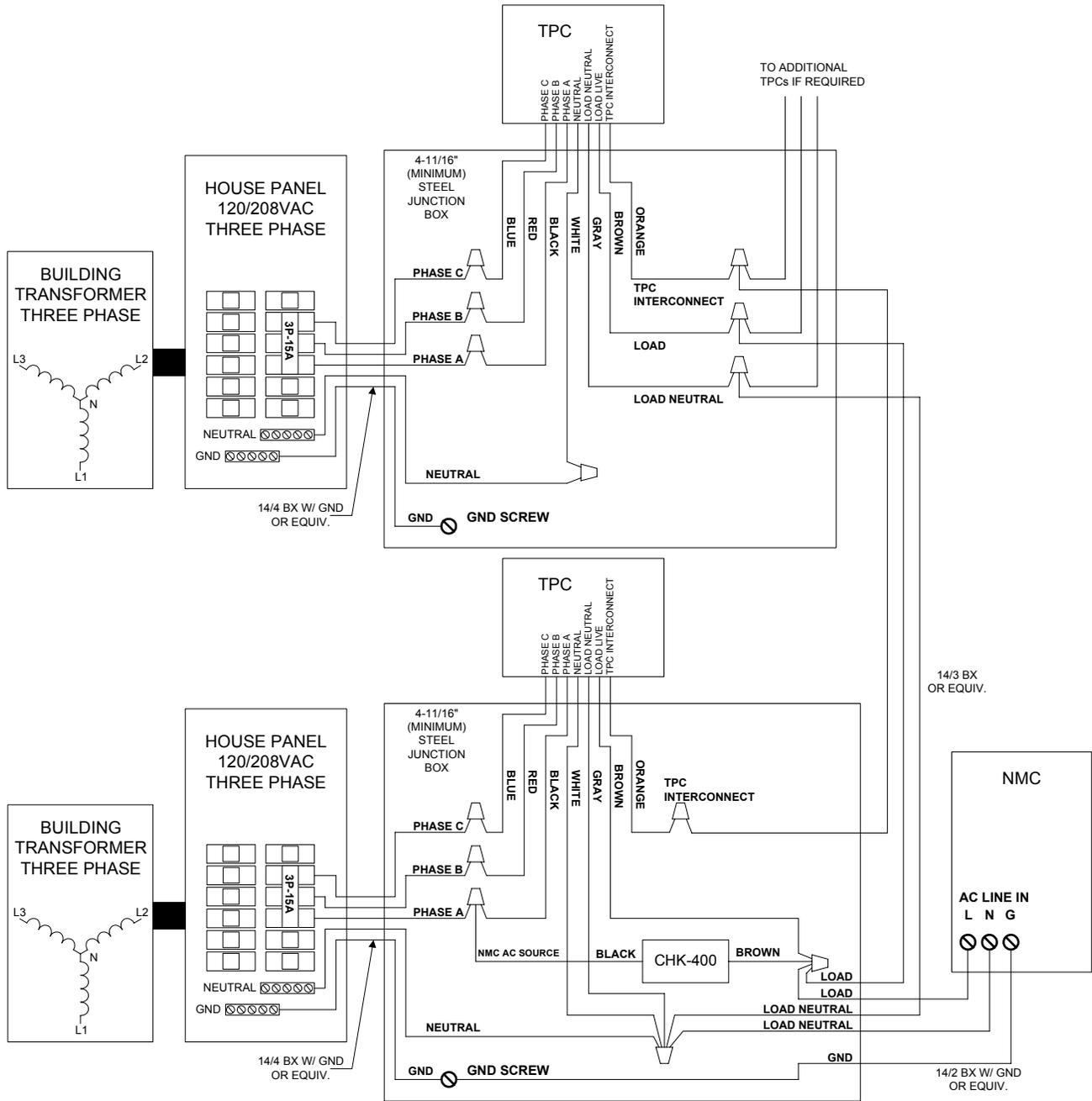
Figure 6 shows a typical single phase, single transformer installation.



**Figure 6: Typical Single Phase Installation**

### 4.7 Multiple Transformer Installation

Figure 7 shows a typical three phase, multiple transformer installation. Note that the CHK-400 is NOT used on the second TPC. Note also the connection of the Orange, Brown and Gray wires. The wiring distances should be kept to an absolute minimum.

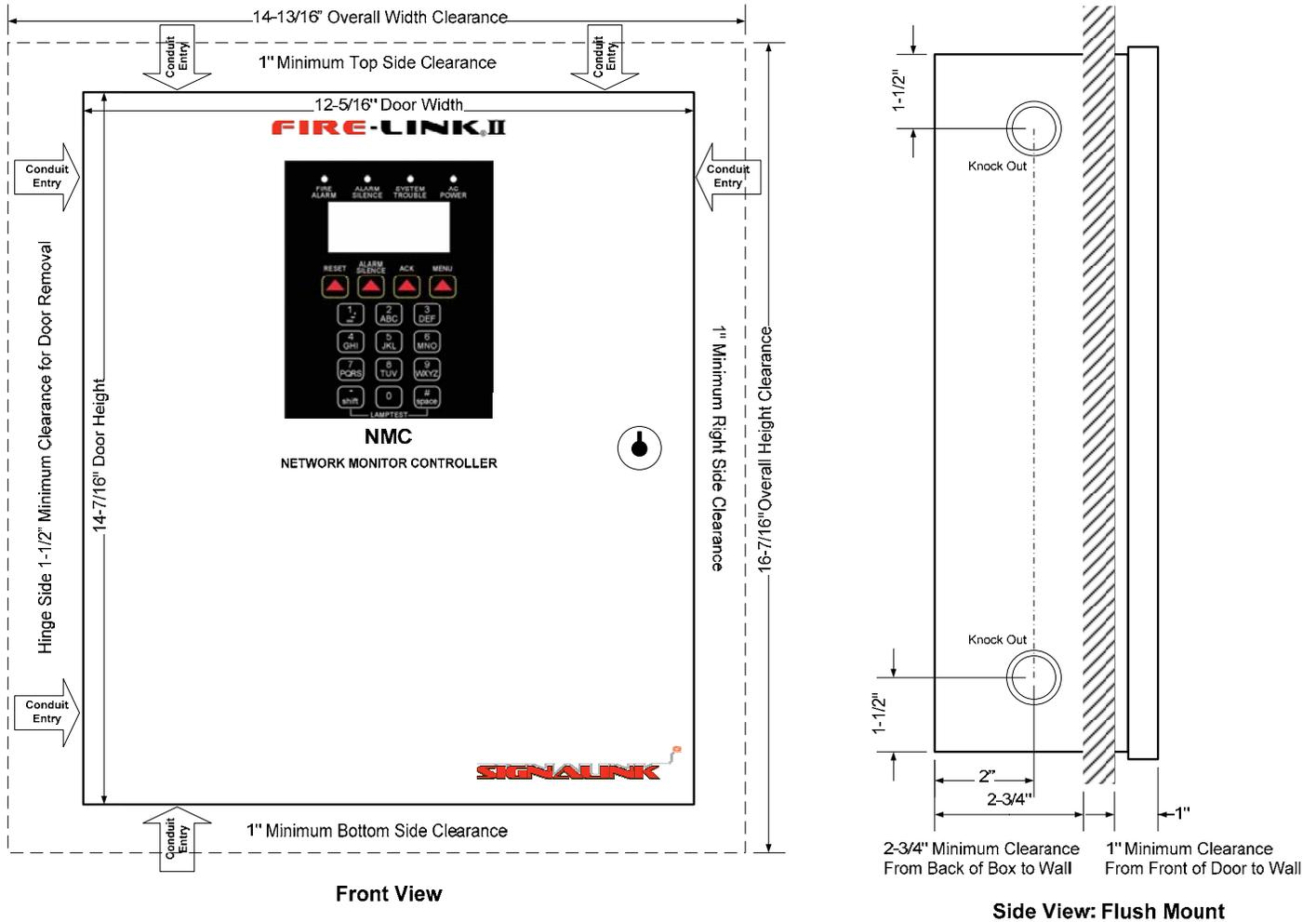


**Figure 7: Typical Multiple Transformer Installation**

**5.0 NMC Installation**

**5.1 NMC Clearance Requirements**

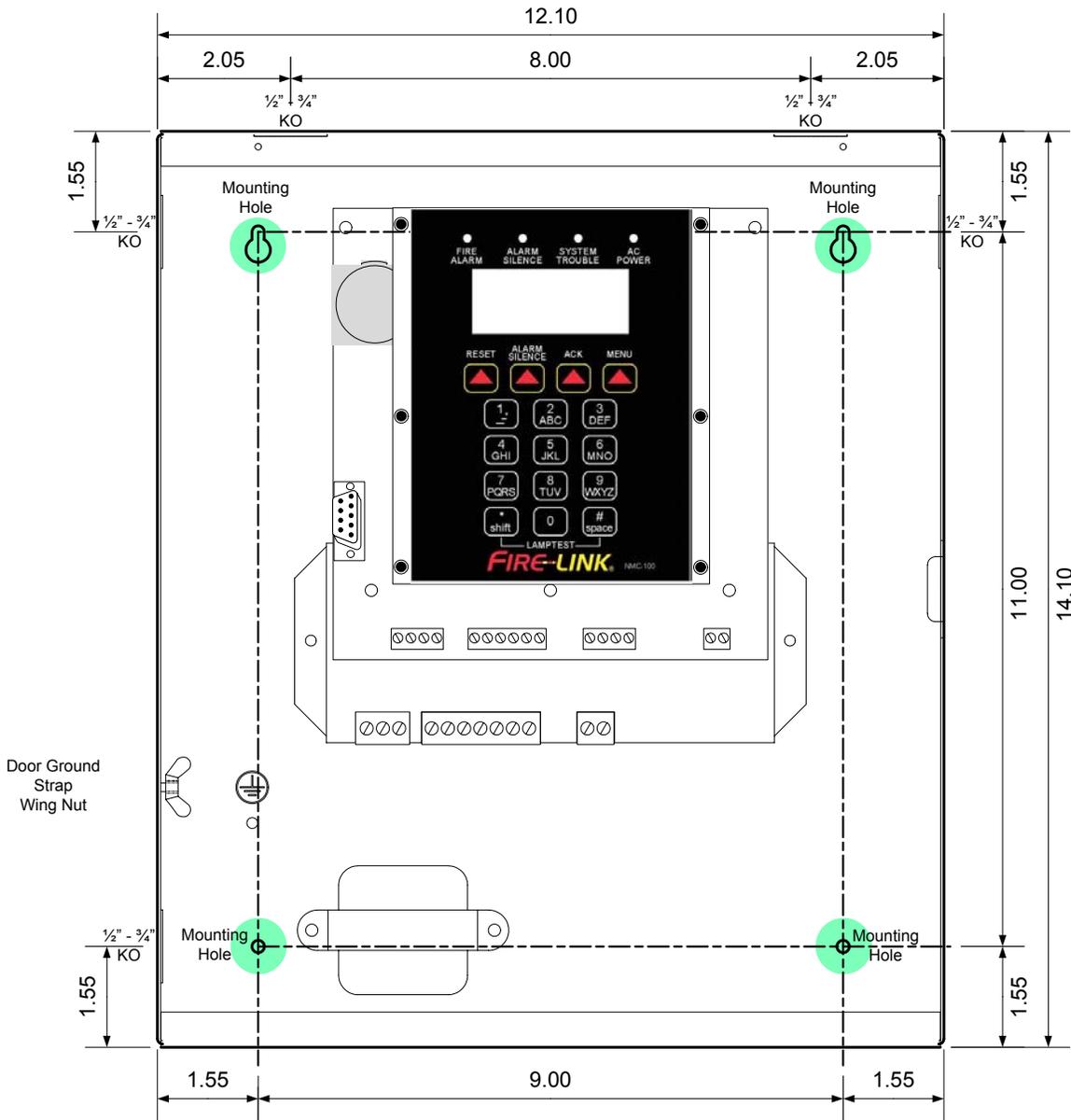
The NMC is generally surface mounted however it can be flush mounted depending on the application. The NMC requires adequate clearance around the unit to allow for door opening and removal, wiring and servicing. Consideration needs to be given with regards to the location conduit entrances and the space required making the connections. Figure 8 below shows the minimum clearances required.



**Figure 8: Minimum Clearances**

### 5.2 NMC Mounting

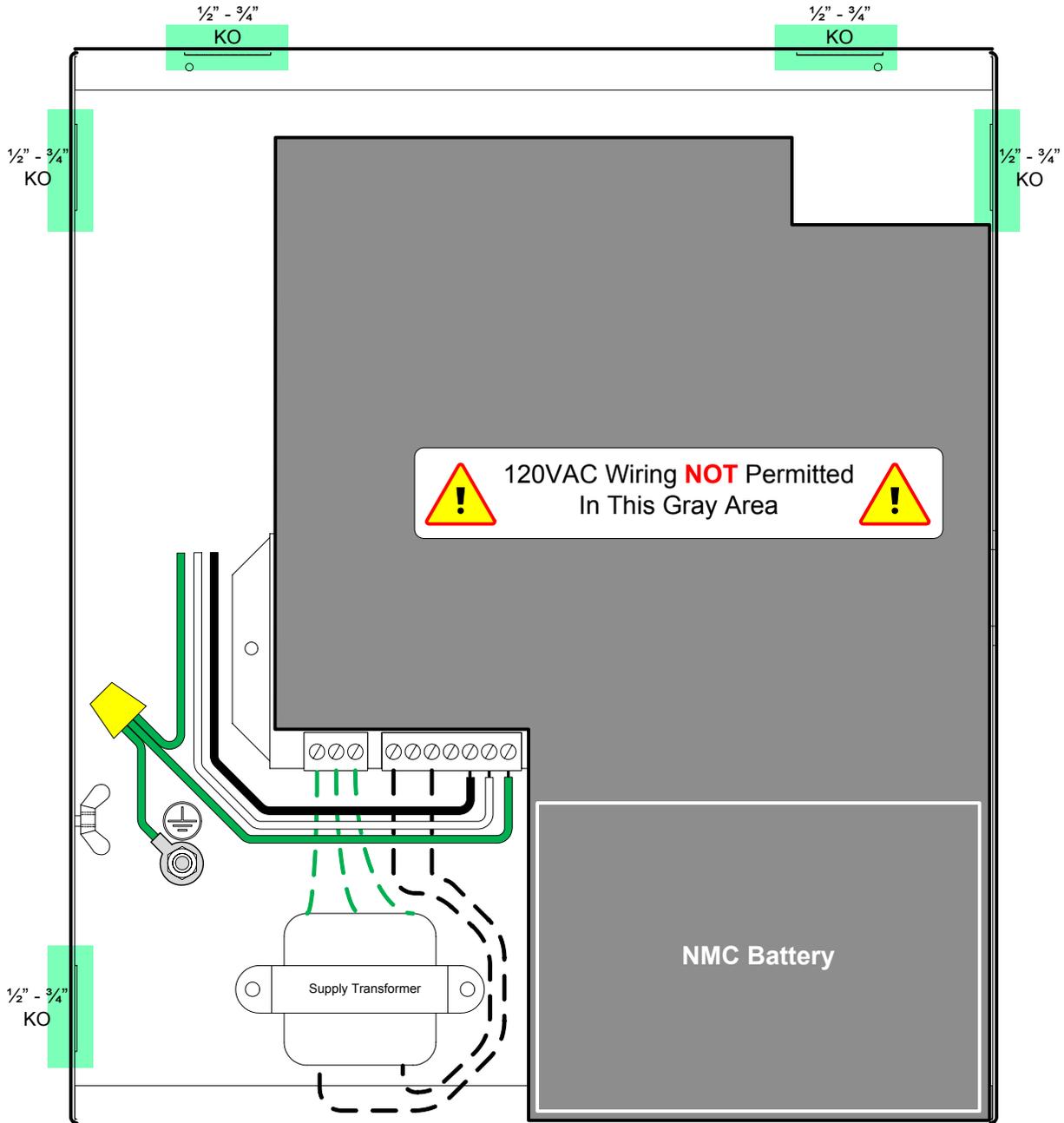
Figure 9 below shows the location of the 4 mounting holes used to mount the NMC. To access the mounting holes, remove the dead front. To avoid damage to the door, remove the door by disconnecting the door grounding strap. Open the door to the perpendicular (straight out) position then lift up and to the left. The NMC should be anchored with 4 screws sufficient to carry the weight of the unit plus the battery. The NMC should be mounted on a flat surface and such that the display is at average eye level. If the NMC is mounted too high or too low, the viewing angle of the display makes it difficult to read the display. When mounted, the NMC should be plumb and level. Care should be taken when mounting the NMC to avoid damage to the circuit boards. DO NOT remove the NMC circuit boards to mount the unit as damage may occur. If the NMC is to be flush mounted, construct a secure backing structure and use the 4 mounting holes provided. DO NOT drill holes or modify the unit in any manner.



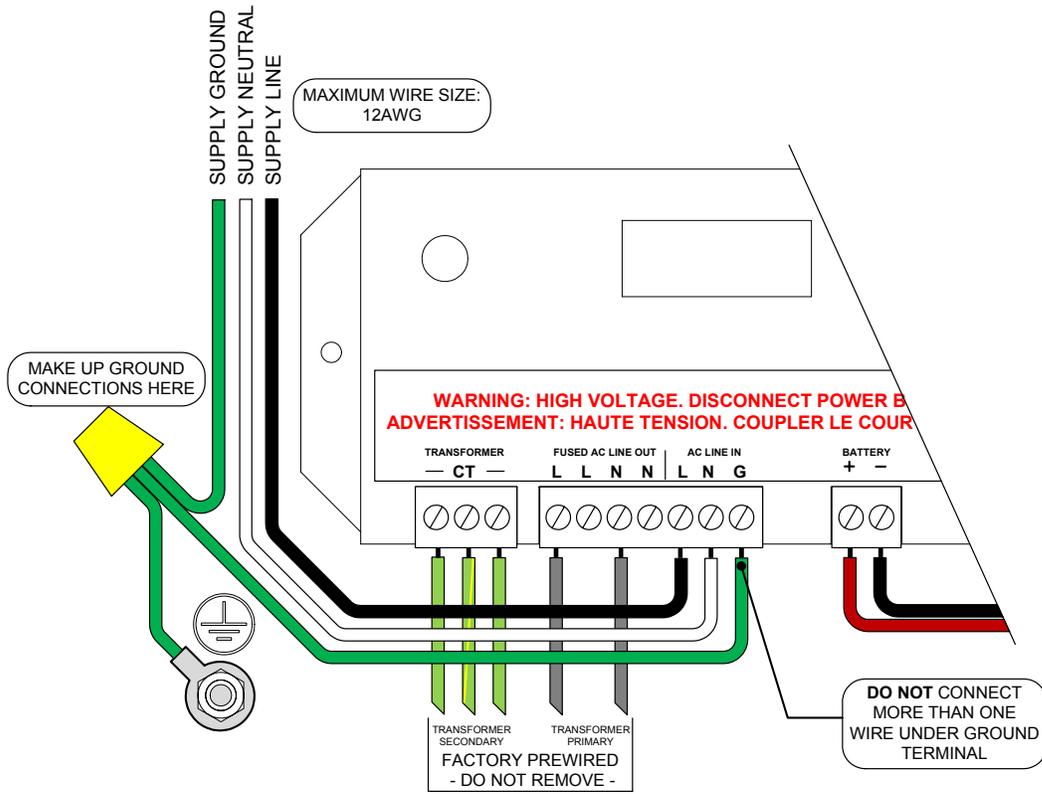
**Figure 9: NMC Mounting**

**5.3 NMC 120 Volt Wiring**

There are five 1/2" – 3/4" knock outs available for conduit entry into the NMC. **DO NOT** modify the enclosure for additional knockouts or alternate wiring entrances. The low voltage fire alarm wiring and the 120VAC wiring should not be run in the same conduit. Figure 10 shows the region within the enclosure that 120VAC wiring is not permitted. The supply transformer is factory pre-wired and does not require additional wiring. Figure 11 shows the 120VAC wiring detail. NOTE: Only one ground wire is permitted under the ground connection. All ground connections should be wire together with only one ground wire terminated at the terminal block. 14AWG wire size is preferred and no greater than 12AWG is permitted for all 120VAC wiring.



**Figure 10: NMC Wiring Zone**



**Figure 11: 120VAC Wiring Detail**

## Customer Feedback

We strive to make our documentation accurate and easy to understand. To help us improve our documents, your feedback is very important to us.

If you have any comments or suggestions on how we can improve our technical literature, please email us at:

[feedback@signalink.com](mailto:feedback@signalink.com)

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