



TECHNICAL Practice

TELECOM SOLUTIONS FOR THE 21ST CENTURY

K-1705 Series
Video Entry Phones
with Keypads

October 12, 2011

Vandal Resistant Handsfree Entry Phones with Built-In Keypad

The **K-1705 Series** entry phones provide a tough and attractive handsfree phone for apartment, and residential door entry or applications requiring a vandal resistant speaker phone. The **K-1705 Series** entry phones are available in two attractive finishes: "brushed stainless steel" and "oil rubbed bronze".

When the "Call" button is pressed, the **K-1705-3** returns dial tone. The keypad may then be used to dial any number. If no Touch Tone is entered within 8 seconds, CPC is detected, a busy signal is detected, or the programmable maximum call time has elapsed, the **K-1705-3** will automatically disconnect. Alternatively, the **K-1705-3** may be disconnected by pressing the "Call" button again. The **K-1705-3** comes complete with a standard, flush mount, rough-in box. In addition, an optional **VE-6x7** weather resistant, surface mount box is available (see **DOD# 424**).

The **K-1705-3-EWP** shares all of the features of the **K-1705-3** in addition to Enhanced Weather Protection (EWP) for outdoor installations where the unit is exposed to precipitation or condensation. EWP products feature foam rubber gaskets and boots, sealed connections, gel-filled butt connectors, as well as urethane or thermal plastic potted circuit boards with internally sealed, field-adjustable trim pots and DIP switches for easy on-site programming. For more information, see **DOD# 859**.



K-1705-3 "Brushed 316 Stainless Steel" (similar to brushed nickel)



K-1705-3-BN "Oil Rubbed Bronze" (satin dark brown powder paint with fine copper metallic)

Features

- Built-in high resolution color video camera with wide viewing, tilt/swivel adjustments and wide operating temperature of -30°F to 150°F
- Audio and video transmission on one CAT5E cable (page 5)
- **Vandal Resistant Features:** 14 gauge louvered 316 stainless steel faceplate with permanent laser etched graphics, stainless steel speaker/mic screen, heavy duty metal keypad and "Call" button, impact and scratch resistant camera lens and hex drive mounting screws
- **Weather Resistant Features:** Marine grade 316 stainless steel faceplate, screws and push button switch. Switch internally sealed per IP67. Mylar speaker. Self-draining mic mount. Faceplate, mic and speaker gaskets. Sealed camera lens. Potted camera circuit board. Stainless steel phone and camera mounting hardware
- **K-1705-3-EWP** is designed to meet IP66 Ingress Protection Rating (see **DOD# 859** for more information)
- Available in 2 standard faceplate finishes: 316 brushed stainless steel or oil rubbed bronze
- Yellow "in use" LED
- Telephone line powered
- Volume adjustments for microphone and speaker
- Advanced call progress detection: disconnects on busy signal, return to dial tone, CPC, reorder tone, maximum call time out and 40 second silence time out
- Selectable auto-answer feature and push button disconnect
- Zinc plated steel rough-in box with (2) 3/4" conduit knockouts
- Optional **VE-6x7** Surface Mount Box available
- Selectable VOX switching speed

Applications

- Apartment entry phone when used with the **K-1900-3** Apartment Entry Dialer or **C-4000** Apartment/Office Entry Controller or **C-3000** Apartment Entry Controller
- Residential gate or door entry phone when used with the **C-2000B** Door Entry Controller
- Courtesy and customer assistance phone
- Automated teller (ATM) phone
- Security or emergency phone
- Hot-Line phone when used with the **K-1900-5** Hot-Line Dialer **Note:** When installing a line powered phone on a low voltage and/or low loop current phone system extension, a **TBB-1B** Talk Battery Booster may be required (**DOD# 630**).
- Kiosk phone with (100 number speed dialing) when used with the **K-1900-9** Multi-Number Dialer

Phone...715.386.8861

Specifications

Dimensions: Overall: 140mm x 165mm x 66mm (5.5" x 6.5" x 2.6"), Rough-in box: 114mm x 140mm x 64mm (4.5" x 5.5" x 2.5")

Shipping Weight: 1.6 kg (3.5 lbs)

Operating Temperature: -34°C to 65°C (-30°F to 150°F)

Connections: Standard model: (3) gel-filled butt connectors (3M Scotchlok UR2) and 2-position terminal block, EWP model: (5) gel-filled butt connectors (3M Scotchlok UR2)

(See page 2 for complete specifications)

IF YOU HAVE A PROBLEM WITH A VIKING PRODUCT, PLEASE CONTACT: VIKING TECHNICAL SUPPORT AT (715) 386-8666

Our Technical Support Department is available for assistance Monday 8am - 4pm and Tuesday through Friday 8am - 5pm central time. So that we can give you better service, before you call please:

1. Know the model number, the serial number and what software version you have (see serial label).
2. Have your Technical Practice in front of you.
3. It is best if you are on site.

RETURNING PRODUCT FOR REPAIR

The following procedure is for equipment that needs repair:

1. Customer must contact Viking's Technical Support Department at 715-386-8666 to obtain a Return Authorization (RA) number. The customer MUST have a complete description of the problem, with all pertinent information regarding the defect, such as options set, conditions, symptoms, methods to duplicate problem, frequency of failure, etc.
2. Packing: Return equipment in original box or in proper packing so that damage will not occur while in transit. Static sensitive equipment such as a circuit board should be in an anti-static bag, sandwiched between foam and individually boxed. All equipment should be wrapped to avoid packing material lodging in or sticking to the equipment. Include ALL parts of the equipment. C.O.D. or freight collect shipments cannot be accepted. Ship cartons prepaid to: **Viking Electronics, 1531 Industrial Street, Hudson, WI 54016**
3. Return shipping address: Be sure to include your return shipping address inside the box. We cannot ship to a PO Box.
4. RA number on carton: In large printing, write the R.A. number on the outside of each carton being returned.

RETURNING PRODUCT FOR EXCHANGE

The following procedure is for equipment that has failed out-of-box (within 10 days of purchase):

1. Customer must contact Viking's Technical Support at 715-386-8666 to determine possible causes for the problem. The customer MUST be able to step through recommended tests for diagnosis.
2. If the Technical Support Product Specialist determines that the equipment is defective based on the customer's input and troubleshooting, a Return Authorization (R.A.) number will be issued. This number is valid for fourteen (14) calendar days from the date of issue.
3. After obtaining the R.A. number, return the approved equipment to your distributor, referencing the R.A. number. Your distributor will then replace the product over the counter at no charge. The distributor will then return the product to Viking using the same R.A. number.
4. **The distributor will NOT exchange this product without first obtaining the R.A. number from you. If you haven't followed the steps listed in 1, 2 and 3, be aware that you will have to pay a restocking charge.**

LIMITED WARRANTY

Viking warrants its products to be free from defects in the workmanship or materials, under normal use and service, for a period of one year from the date of purchase from any authorized Viking distributor or 18 months from the date manufactured, whichever ever is greater. If at any time during the warranty period, the product is deemed defective or malfunctions, return the product to Viking Electronics, Inc., 1531 Industrial Street, Hudson, WI., 54016. Customer must contact Viking's Technical Support Department at 715-386-8666 to obtain a Return Authorization (R.A.) number.

This warranty does not cover any damage to the product due to lightning, over voltage, accident, misuse, abuse, negligence or any damage caused by use of the product by the purchaser or others. This warranty does not cover non-EWP products that have been exposed to wet or corrosive environments.

NO OTHER WARRANTIES. VIKING MAKES NO WARRANTIES RELATING TO ITS PRODUCTS OTHER THAN AS DESCRIBED ABOVE AND DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTIES OR MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

EXCLUSION OF CONSEQUENTIAL DAMAGES. VIKING SHALL NOT, UNDER ANY CIRCUMSTANCES, BE LIABLE TO PURCHASER, OR ANY OTHER PARTY, FOR CONSEQUENTIAL, INCIDENTAL, SPECIAL OR EXEMPLARY DAMAGES ARISING OUT OF OR RELATED TO THE SALE OR USE OF THE PRODUCT SOLD HEREUNDER.

EXCLUSIVE REMEDY AND LIMITATION OF LIABILITY. WHETHER IN AN ACTION BASED ON CONTRACT, TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR ANY OTHER LEGAL THEORY, ANY LIABILITY OF VIKING SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF THE PRODUCT, OR AT VIKING'S OPTION, REFUND OF THE PURCHASE PRICE AS THE EXCLUSIVE REMEDY AND ANY LIABILITY OF VIKING SHALL BE SO LIMITED.

IT IS EXPRESSLY UNDERSTOOD AND AGREED THAT EACH AND EVERY PROVISION OF THIS AGREEMENT WHICH PROVIDES FOR DISCLAIMER OF WARRANTIES, EXCLUSION OF CONSEQUENTIAL DAMAGES, AND EXCLUSIVE REMEDY AND LIMITATION OF LIABILITY, ARE SEVERABLE FROM ANY OTHER PROVISION AND EACH PROVISION IS A SEPARABLE AND INDEPENDENT ELEMENT OF RISK ALLOCATION AND IS INTENDED TO BE ENFORCED AS SUCH.

FCC REQUIREMENTS

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. Inside the front panel of this equipment is a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. If requested, this number must be provided to the telephone company.

The REN is used to determine the number of devices that may be connected to a telephone line. Excessive REN's on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of the REN's should not exceed five (5.0) To be certain of the number of devices that may be connected to a line, as determined by the total REN's, contact the local telephone company. For products approved after July 23, 2001, the REN for this product is part of the product identifier that has the format US:AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point (e.g., 03 is a REN of 0.3). For earlier products, the REN is separately shown on the label.

The plug used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of this K-1705-3 does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

If the K-1705-3 causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make

the necessary modifications to maintain uninterrupted service.

If trouble is experienced with the K-1705-3, for repair or warranty information, please contact:

Viking Electronics, Inc., 1531 Industrial Street, Hudson, WI 54016 (715) 386-8666

If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

Connection to Party Line Service is subject to State Tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

WHEN PROGRAMMING EMERGENCY NUMBERS AND (OR) MAKING TEST CALLS TO EMERGENCY NUMBERS:

Remain on the line and briefly explain to the dispatcher the reason for the call. Perform such activities in the off-peak hours, such as early morning or late evenings.

It is recommended that the customer install an AC surge arrester in the AC outlet to which this device is connected. This is to avoid damaging the equipment caused by local lightning strikes and other electrical surges.

PART 15 LIMITATIONS

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Specifications

Entry Phone Specifications

Power: Telephone line powered 20V DC/20mA minimum
Dimensions: Overall: 140mm x 165mm x 66mm (5.5" x 6.5" x 2.6") ,
Rough-in box: 114mm x 140mm x 64mm (4.5" x 5.5" x 2.5")
Shipping Weight: 1.6 kg (3.5 lbs)
Speaker Volume: Approximately 70 db maximum @1m
Ring Voltage: 25V AC RMS minimum (for auto answer)
CPC Disconnect Time: 500ms minimum
REN #: 0.5 A

Camera Specifications

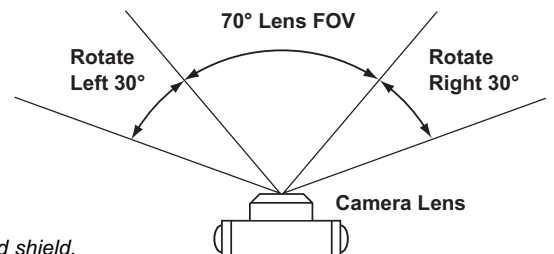
Power: 3.5-6V DC regulated 150mA (5V DC regulated adapter included)
Image Sensor: 1/4" color CMOS
Video Output: 1 VP-P composite, NTSC, 75 ohms
Resolution: 420 lines (640 x 480 @ 30fps / 307,200 pixels)
Sensitivity: 0.26 LUX (20 IRE) F 2.0
Lens: 3.4mm, pinhole 70° FOV (Field of View)
Tilt/Swivel Adjustment: Vertical +/- 20°, horizontal +/- 30° (see **Diagram A**)
IR Compatibility: This camera is equipped with an OLP (Optical Low Pass) filter to maintain correct video color in outside applications. The standard camera is **NOT** compatible with IR illuminators. If IR illumination is required, you will need to replace the existing camera with a Viking model **VCAM-11R**. For more information, see **DOD# 190**.
Maximum Wire Run Length: 750 ft with *RG59/RG6 for video and CAT5 for power (3 pairs) and entry phone audio (1 pair). 150 ft with CAT5E for video, power and entry phone audio (longer video runs are possible by using video balun transceivers, see **Installation** section

F, page 5). * **Note:** RG59 or RG6 with solid center conductor and 95% bare copper braid shield.

Entry Phone / Camera Specifications

Operating Temperature: -34° C to 65° C (-30° F to 150° F)
Humidity: Standard model: 5% to 95% non-condensing, EWP model: Up to 100%
Connections: Standard model: (3) gel-filled butt connectors (3M Scotchlok UR2) and 2-position terminal block, EWP model: (5) gel-filled butt connectors (3M Scotchlok UR2)
Recommended Surface Mount Box: Viking model **VE-6x7** (DOD# 424)

Diagram A
Camera Field of View:



Features Overview

Mounting Screws: 6-32 x 0.75" long flathead with 5/64" hexdrive, marine grade 316 stainless steel to prevent corrosion.

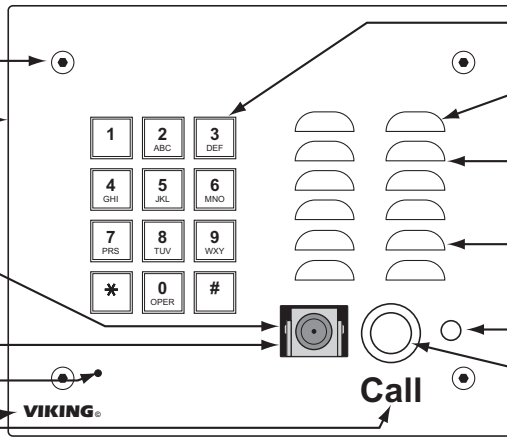
Faceplate: 14 gauge (0.075" thick) marine grade 316 stainless steel to prevent corrosion.

Color Video Camera: Wide operating temperature range of -30°F to 150°F, NTSC composite video output with 420 lines of resolution, 70° wide viewing angle lens, tilt and swivel adjustments for aiming towards visitors.

Protective Camera Window: Impact resistant polycarbonate lens with scratch resistant coating and water-tight gasket.

Condensation Drain Hole

Permanent Laser Etched Graphics



Keypad: Metal construction with internal seal to provide vandal and weather resistance.

Microphone: Omni-directional microphone with protective water-resistant cloth.

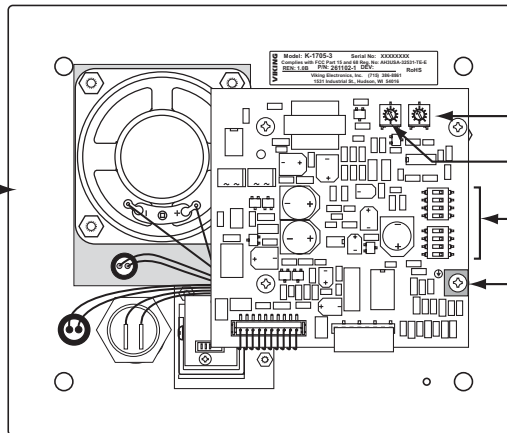
Speaker: Mylar speaker with rubber gasket to maintain water-tight seal and eliminate water deterioration.

Speaker Screen: Stainless steel speaker screen with 0.018" diameter holes to prevent punctures from paperclips, etc.

LED: Lights yellow for "In-Use" indication.

Push Button Switch: Push to initiate call, push again to disconnect. Solid marine grade 316 stainless steel internally sealed per IP67.

Faceplate Gasket: 1/8" thick closed cell PVC to provide a water-tight seal.



Speaker Volume

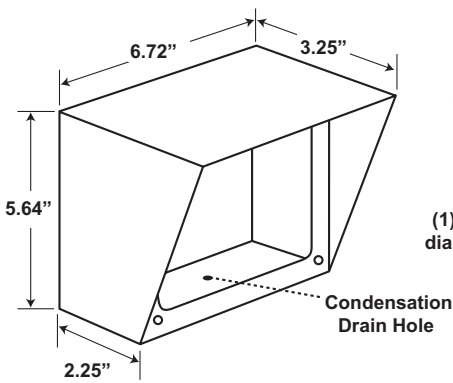
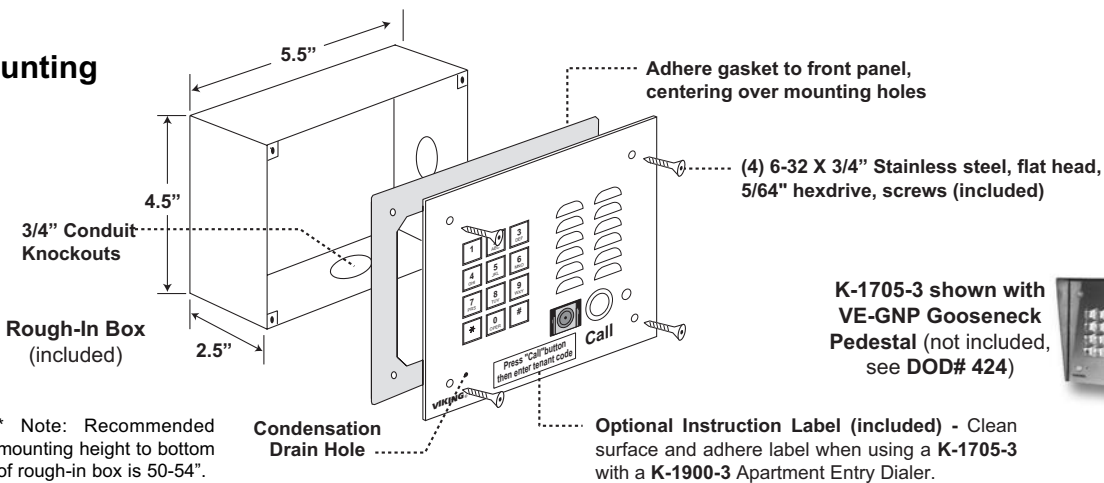
Microphone Volume

DIP Switches (see page 6)

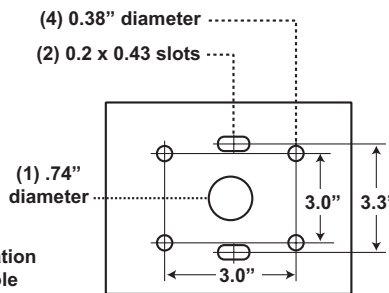
Earth Ground: To increase surge protection, loosen the screw labeled ⊕ (as shown) and fasten a wire with spade terminal (included) from the mounting screw to Earth Ground (grounding rod, water pipe, etc.)

Installation

A. Mounting



Front View of Optional VE-6x7 not included (DOD# 424)



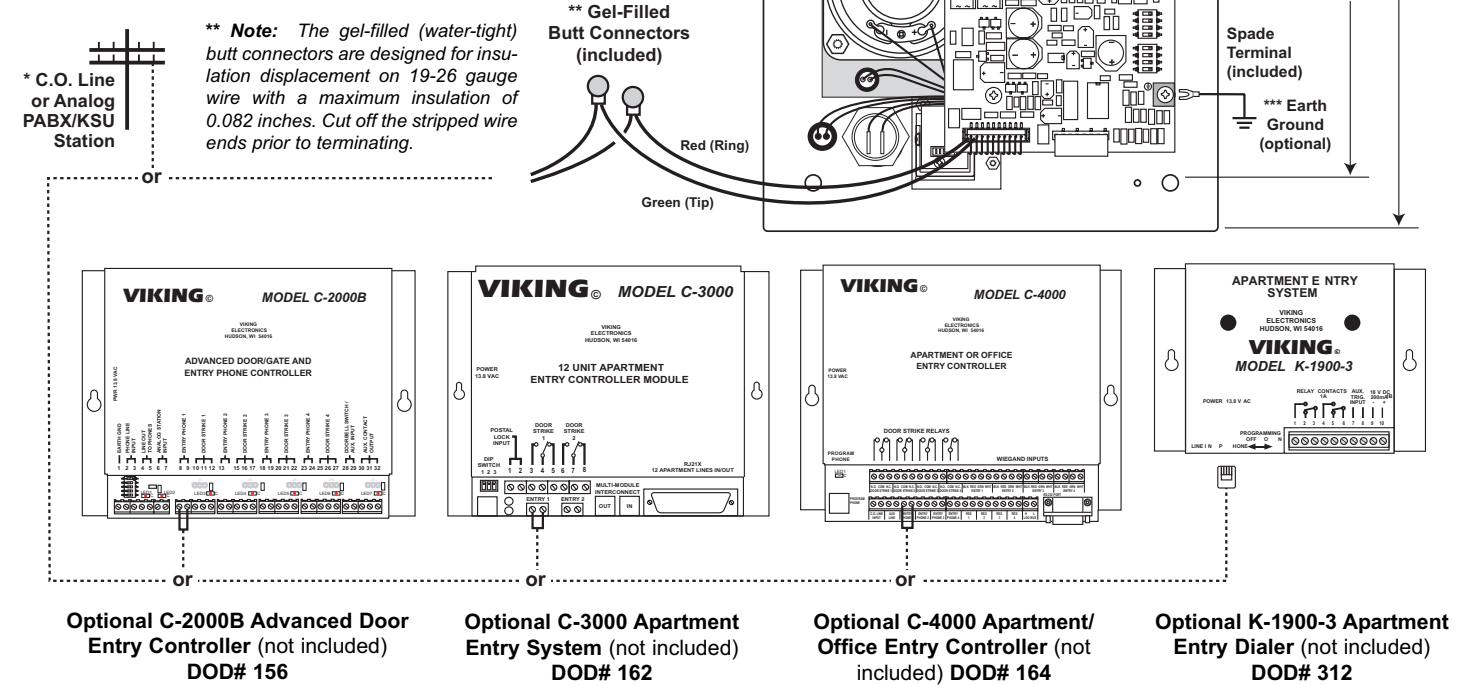
Rear View of Optional VE-6x7 not included (DOD# 424)

The optional **VE-6x7** Surface Mount Box is designed to be surface mounted to a single gang box, double gang box or **VE-GNP** gooseneck pedestal (right). For more information on the **VE-6x7** or the **VE-GNP**, retrieve Fax Back Document 424.

B. Wiring the K-1705-3 Phone Board

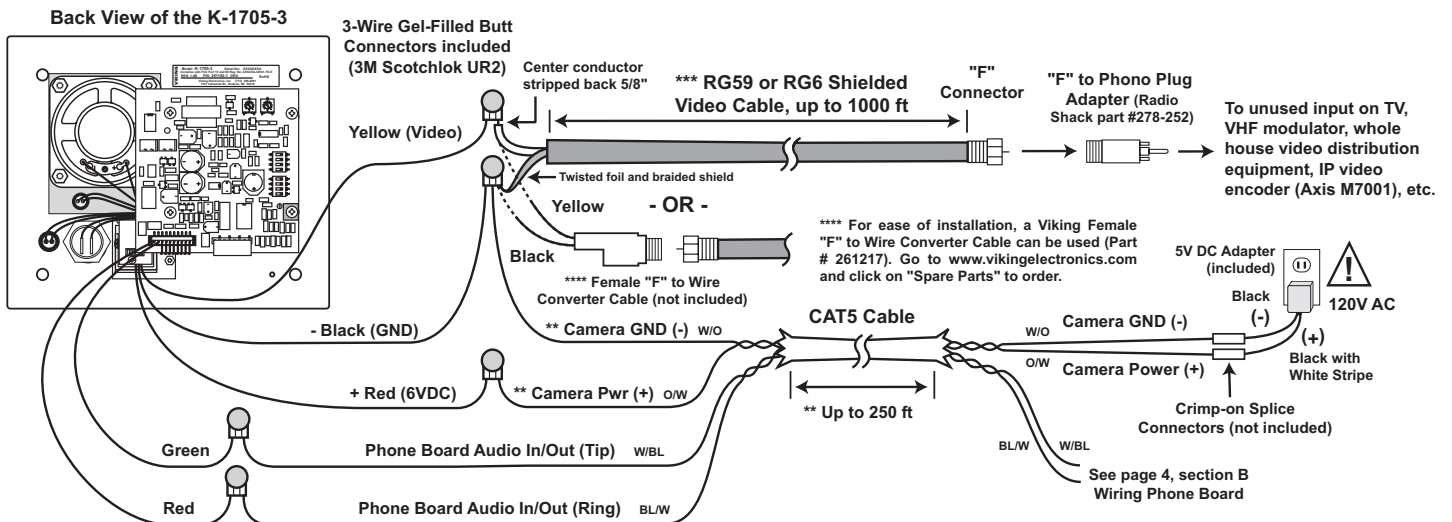
* **Note:** When installing a line powered phone on a low voltage and/or low loop current phone system extension, a **TBB-1B** Talk Battery Booster may be required, see **DOD# 632**.

*** **Note:** To increase surge protection, loosen the PCB mounting screw labeled ⊕ (as shown right) and fasten a wire with spade terminal (included) from the mounting screw to Earth Ground (grounding rod, water pipe, etc.)



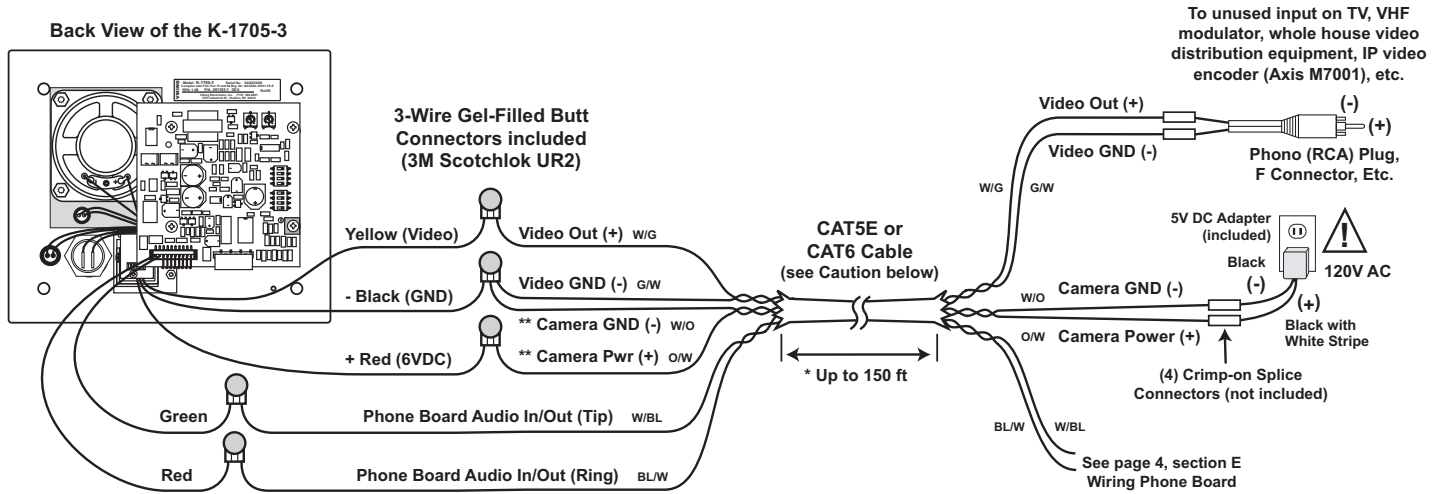
C. Wiring the K-1705-3 Camera

1. Using RG59 for Video and CAT5 for Camera Power and Phone Board Audio (Recommended)



IMPORTANT: Electronic devices are susceptible to lightning and power station electrical surges from both the AC outlet and the telephone line. It is recommended that a surge protector be installed to protect against such surges.

2. Using CAT5E or CAT6 for Video, Camera Power and Phone Board Audio (see Caution below)



*** Note:** Up to 150 ft video cable run length can be achieved using CAT5E or CAT6 cable. Longer cable runs can be used if a passive or active video Balun transceiver is used on each end of the cable. Generally, passive transceivers can achieve up to 750 ft cable runs where active transceivers can achieve up to 3000 ft runs depending on cable type, etc. The type of video balun transceiver required is specific to your cable run length. For more information on video balun transceivers go to: www.northernvideo.com.

**** Note:** The maximum camera power supply wire run length is 250 ft of 24 gauge wire (CAT 5/6), longer runs are possible by doubling pairs, increasing the wire gauge or using a 6V DC 200mA power adapter (Viking part # L122110). Go to www.vikingelectronics.com and click on "Spare Parts".

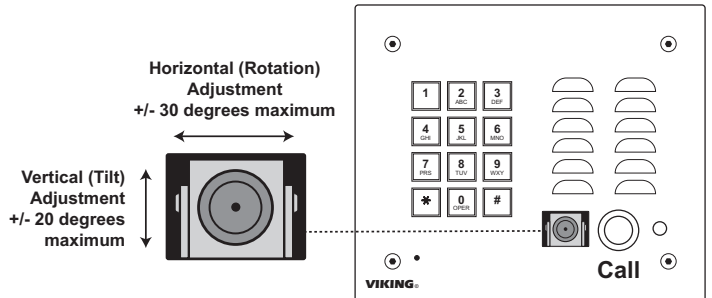
***** Note:** RG59 or RG6 with solid center conductor and 95% bare copper braid shield.

Caution: When routing CAT5E or CAT6 cable, maintain a minimum distance of 3 ft from any parallel high voltage wire (110 VAC) and a minimum of 2 ft from crossing any high voltage wire. For installations where RF noise is expected (commercial applications) or wire runs are near high voltage (110 VAC) wires, a shielded video cable such as RG6 is recommended.

D. Adjusting the Camera

The camera can be tilted and rotated to your desired position. A portable service (test) monitor can be used to determine the correct viewing angle during installation.

Important: To prevent the edge of the faceplate from being viewed in the video image, do not rotate the camera beyond 30 degrees or tilt beyond 20 degrees.



Programming

A. Dip Switch Programming

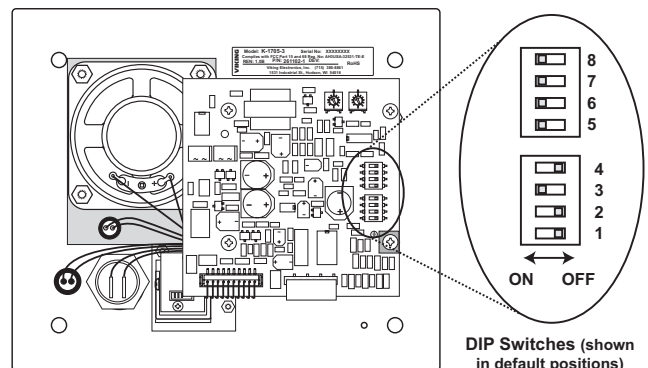
Switch 1	Switch 2	Maximum Call Time
OFF	OFF	Disabled (default)
ON	OFF	1 minute
OFF	ON	3 minutes
ON	ON	9 minutes

Switch 3	Disconnect on Dial Tone
OFF	Off
ON	On (default)

Switch 4	VOX Switching Speed
OFF	Fast, 0.2 seconds (default)
ON	Slow, 0.7 seconds

Switch 5	Switch 6	Audio Detection
ON	ON	Normal audio detection
OFF	OFF	Increase audio detect sensitivity for low level lines. Useful in applications in which voice or busy signals have trouble breaking over the speaker.

Rear View of the K-1705-3



Switch 7	Auto Answer Feature
OFF	Automatic answer disabled
ON	Automatic answer enabled (default)

Switch 8	Push Button Feature
OFF	Connects calls only
ON	Connects/disconnects calls (default)

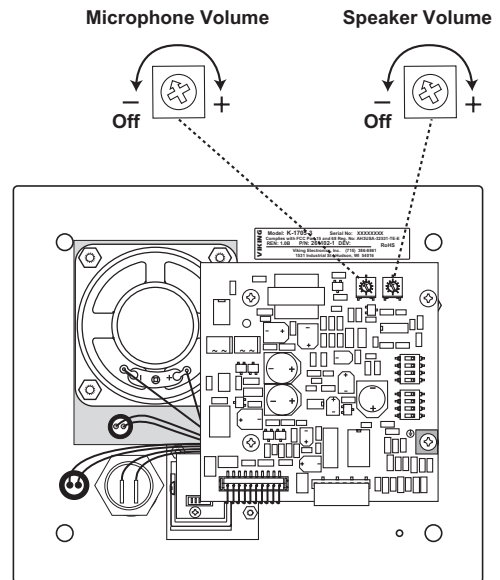
B. Volume Adjustments

1. Microphone

Certain noisy locations (background traffic, machinery or wind) may cause one way talk path (only microphone audio is heard). In this case, the microphone volume may need to be decreased as shown.

2. Speaker

To increase, decrease or turn off the speaker (for monitoring purposes only), adjust the speaker volume control as shown.



C. Auto-Answer Feature (DIP Switch 7)

With DIP switch 7 in the “ON” position (default), the **K-1705-3** will automatically answer the line during the first incoming ring. This feature is useful for monitoring entrances. In the “OFF” position, the **K-1705-3** will not automatically answer incoming calls.

D. Push Button Hang Up (DIP Switch 8)

With DIP switch 8 in the “ON” position (default), the “Call” button alternately connects and disconnects calls. In the “OFF” position, the “Call” button is only used to connect and the **K-1705-3** must rely on call progress (busy, return to dial tone, silence time-out, or maximum call time) for an automatic disconnect.

E. VOX (Talk/Listen) Switching Speed (DIP Switch 4)

With DIP switch 4 in the “OFF” position (default), the VOX switching speed (delay time between talk and listen mode) is set to fast (0.2 seconds). In the “ON” position, it is set to slow (0.7 seconds).

F. Advanced Call Progress Detection

The **K-1705-3** will output 3 beeps and automatically hang-up after detecting any of the following: busy signal (standard or fast/reorder), CPC (short break in line current when called party hangs up), return to dial tone, maximum call time or silence time out.

Operation

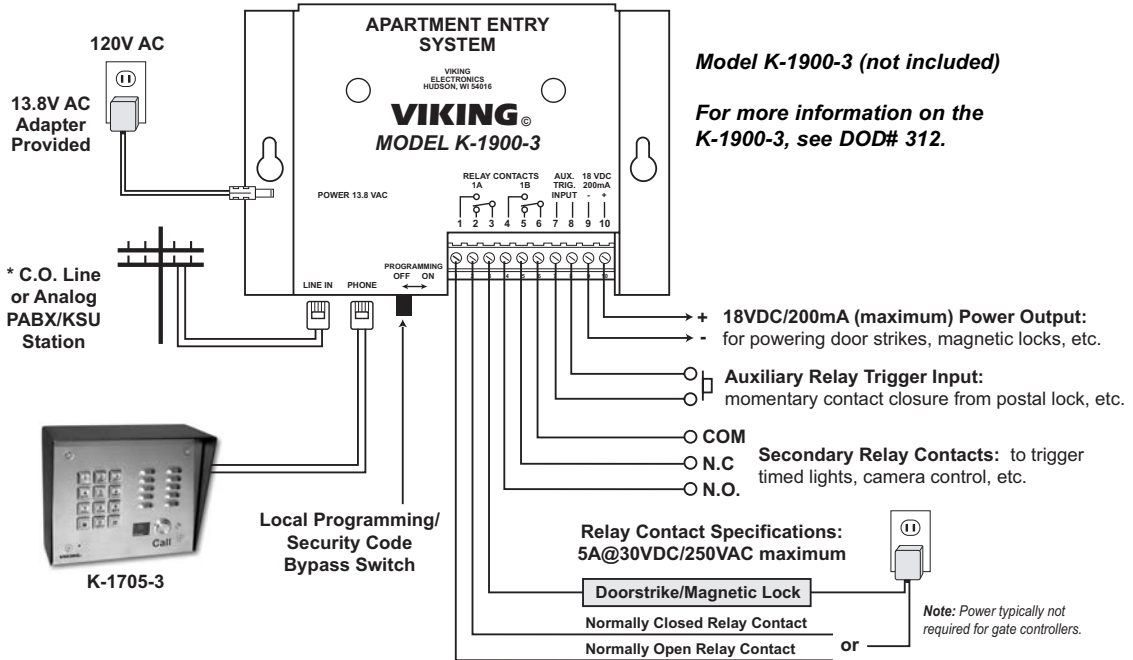
When the push button is pressed, the **K-1705-3** phone goes off-hook, much like a standard speaker phone. The keypad may then be used to dial any number. In the event that the line is busy, the **K-1705-3** will hang-up. The **K-1705-3** will also automatically hang up on CPC, silence, busy signal, return to dial tone or time out. If programmed to auto-answer (DIP switch 7 ON), the **K-1705-3** will also answer any incoming call.

The **K-1705-3** color video camera operates completely independently of the **K-1705-3** phone board. With power supplied to the camera, it will continuously output a video signal.

Applications

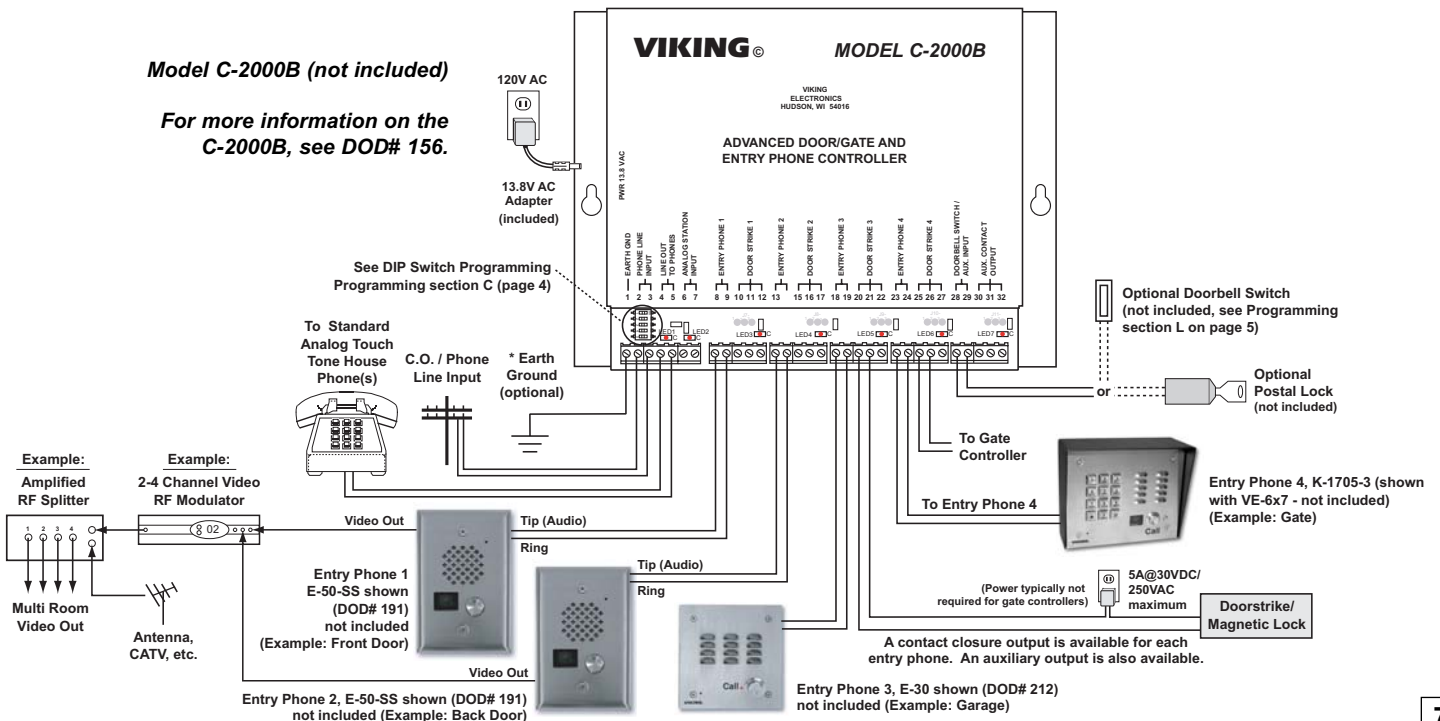
A. K-1900-3 Apartment/Office Entry Dialer

The **K-1900-3** converts any Touch Tone phone into a multi-number auto dialer that will store up to 150 telephone numbers in non-volatile memory. Use with Viking's **K-1705-3** or **K-1900-8** phones to provide vandal resistant handsfree or handset communication. When a call initiated by the **K-1900-3** is answered by an apartment or business tenant, a built-in contact closure may be activated to control an electric gate or door strike. Up to 150 keyless entry codes may also be programmed, providing tenants with keyless entry. The **K-1900-3** can be programmed locally or remotely using a standard Touch Tone phone. The **K-1900-3** has built-in user dialing restriction to help prevent unauthorized calls and toll fraud.



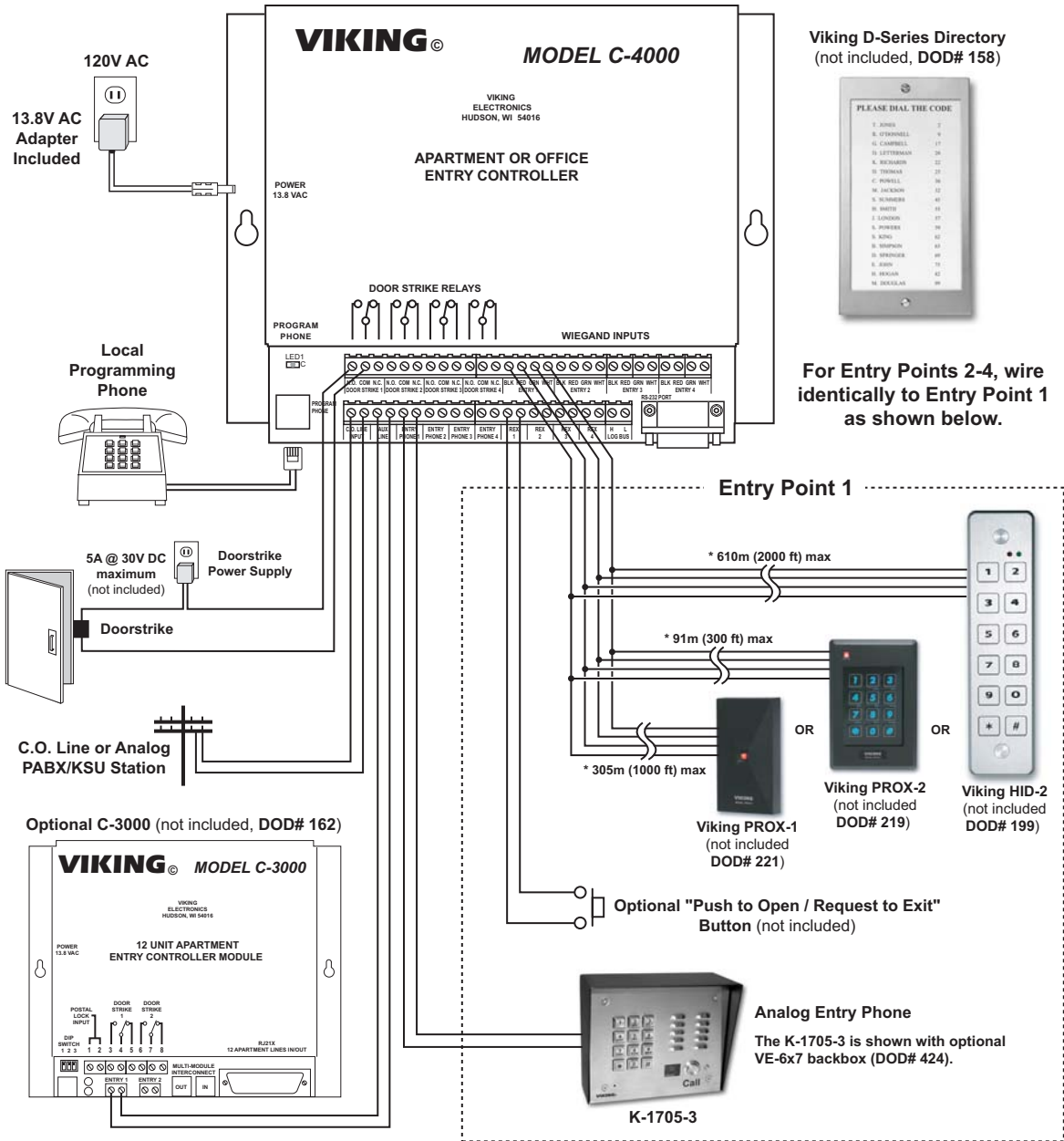
B. C-2000B Advanced Door/Gate and Entry Phone Controller

The **C-2000B** allows up to 4 entry phones to call into your existing residential or business phones or phone system. Tenants may answer the call, converse with the visitor and activate a contact closure to control electronic gates or door strikes. The **C-2000B** provides "Caller ID," "Call Waiting ID" and "Call Waiting" tone when the phone line is in use. Tenants may gain entry at each gate by entering a Touch Tone keyless entry code. Tenants may call out to each entry phone for monitoring purposes. An auxiliary input is also available for connecting a common garage door opener/receiver and auxiliary keyless entry keypads.



C. Provide 4 Door Entry Points with Keyless Entry (or Optional Card Readers) for up to 250 Apartments or Offices

The **C-4000** converts any four Touch Tone phones into multi-number auto dialers that will store up to 250 telephone numbers in non-volatile memory. Use with Viking's **K-1705-3** phone to provide vandal resistant handsfree or handset communication from entry points to apartments or offices. When a call initiated by the **C-4000** is answered by an apartment or business tenant, a built-in contact closure may be activated to control an electric gate or door strike. Up to 250 entry codes may also be programmed providing tenants with keyless entry or optional **HID-1** Card Readers may be added for Proxy card entry. The **C-4000** can be programmed locally or remotely using a standard Touch Tone phone. The **C-4000** has built-in user dialing restriction to help prevent unauthorized calls and toll fraud.



If some tenants do not have C.O. phone service, the Viking model C-3000 can be added to ring up to 12 tenant's phones. Up to eight C-3000 units can be cascaded to support a total of 96 "No C.O." tenants.



IMPORTANT: Electronic devices are susceptible to lightning and power station electrical surges from both the AC outlet and the telephone line. It is recommended that a surge protector be installed to protect against such surges.

* **Note:** Maximum Wiegand run length is 1800 feet using 24 gauge wire when using the Viking model **PROX-1** proximity card reader, 300 feet for the **PROX-2** keypad, and 2000 feet for the **HID-2** keypad. Run length is reduced to half if two share the same wire run from the same **C-4000** entry point. Run length will also be reduced if using a Wiegand device other than the Viking model **PROX-1**, that requires more than 35mA average operating current. Run lengths can be doubled by doubling up on the BLACK and RED 24 gauge wire, or using 21 gauge (or larger) wire. Certain electrically noisy locations might require shielded wire.

Product Support Line...715.386.8666

Fax Back Line...715.386.4345

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