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1000 SERIES

DOOR MONITORING SYSTEM

SYSTEM REFERENCE GUIDE

DOCUMENT NO. D1000-REF

INTRODUCTION:

ABOUT THIS REFERENCE GUIDE:

The 1000-Series Reference Guide is intended to provide a basic understanding of the 1000-Series Door Monitoring System, and its proper application and operation in the field.

REFERENCE GUIDE CONTENTS:

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A summary of the various components and important concepts, which are essential to understanding what makes-up a 1000-Series Door Monitoring System:

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A. SYSTEM DESCRIPTION:

A01. GENERAL / OVERVIEW:

1000-Series Door Monitoring Systems are Tone / Visual Signaling Systems. They are normally utilized to monitor the status of designated Doors and/or other Monitored Points within a facility, and to provide several means to Bypass such Monitoring when it is desired to do so.

In its simplest form - a 1000-Series System could monitor Emergency Exits, with a single Master Panel. This would involve the following:

- LED indicators for each door
- An Arm / Bypass Switch for each door
- Audible Tone for ALARM conditions

In this case, all that is needed at each door is a Door Position Switch (DPS)

By adding optional features and additional equipment – the capabilities of the system may be expanded as needed, to meet the functional requirements of the project at hand:

- Secondary “Slave” Annunciators (both with and without the ability to Arm/Bypass Doors)
- Several different options for Local Control of selected doors:
 - Local Keypads (2 Versions - Arm / Bypass / Delay & Delay Only)
 - Local Zone Control (Simpler than a Keypad – enabled via a Key)
 - Key-Operated Delay Control
- Local ALARM Sounder – can be installed separately, or built into Keypad / Zone Control

IMPORTANT GENERAL NOTES:

A1-A. When referring to 1000-Series Door Monitoring Systems:

- “CONTROL” means the ability to Arm and Bypass / Reset a Monitored Door or Point.
- “MONITOR” means the ability to see Visual Indicators and/or to hear Audible Indicators (LEDs and Sounders), which represent the status condition of the associated Doors / Points

A1-B. 1000-Series Systems are intended for MONITORING of doors (or other devices / points). They ARE NOT “ACCESS CONTROL SYSTEMS”. BECAUSE OF THIS, THEY ARE NOT INTENDED TO CONTROL LOCKING DEVICES, SUCH AS ELECTRIC STRIKES AND/OR MAG-LOCKS

A1-C. ALL Keyswitches that are used within the 1000-Series are keyed alike (Alcoswitch “AL101”)

A1-D. 1000-Series Systems are not hardened against Electro-Static Discharge (ESD). Because of this, Cornell recommends the following measures (particularly where systems will be installed in regions with dry climates):

- *Run a Green (Ground) conductor to each Control Device (Panels and Zone Controls) for Earth Ground Connection to such devices.*
- *Install devices that will be touched by people (Zone Controls, Keypads, Panels, etc.) on Metallic Back Boxes, and ensure that such boxes are properly Grounded.*

A02. MASTER PANEL (PART NUMBERS STARTING WITH A-10nn):

The functional “Heart” of each 1000-Series System is a Master Panel, and its corresponding Power Supply. [NOTE: Zone Cards (See A3) ARE NOT INCLUDED with Master Panels, and must be ordered separately.]

Master Panels are built in multiples of four (4) Doors. This is reflected in the Cornell Part Numbers as follows:

A-1004	=	4-Door Master Panel
A-1008	=	8-Door Master Panel
A-1012	=	12-Door master Panel [and so, on, up to →] ...
A-1028	=	28-Door Master Panel (Maximum <u>STANDARD</u> size.) (Larger units may be available via Special Order – contact your Cornell Representative)

STANDARD FEATURES OF MASTER PANELS:

Each Master Panel is equipped with the following Standard features:

- Sounder – Beeps in response to ALARM Status Conditions
- A “Tone Silence” Pushbutton – Temporarily silences the Sounder until a New ALARM occurs
- Remote Sounder Output – Drives Sounders in Remote Control / Monitor Panels (See A05 & A06)
- Alarm Output – Provides a Voltage on any ALARM condition occurring at the Master Panel
- Volume Control – Allows adjustment of the Master Panel Sounder (Panel must be opened to adjust)
- Arm / Bypass Switch per Door (Press to Arm / Press again to Bypass or Reset)
- A Zone Card Socket (“Slot”) for each Door
- Door / Point Status LEDs – one pair built into each Arm / Bypass Switch – operation as follows:
 - Green - Illuminated Steady = Door / Point is Bypassed
 - Red - Illuminated Steady = Door / Point is Armed
Illuminated Flashing = Door / Point is in ALARM

OPTIONAL FEATURES OF MASTER PANELS:

Each Master Panel may be ordered with the following Optional features, where such features are desired:

- Door Status LEDs [“DS” Option] – Adds (1) Yellow LED for each Door [Illuminates whenever corresponding door is Open, regardless of Armed / Bypassed]
- 2-Position Keyswitch to Enable / Disable the Arm / Bypass Switches (Cornell Part Number 4550-002):

This option is useful to discourage unwanted use of the Master Panel Arm / Bypass Switches during times when the Master Panel may be unattended.

If you want to add this feature to an existing Master Panel, you can install one EXTERNALLY, on a 1-Gang Plate. In this case, order Cornell Part Number A-1900

BACK BOXES FOR MASTER PANELS:

Each Master requires a corresponding Back Box, into which the Master Panel will be installed.

The Back Box must be ordered in the appropriate size for the corresponding Master Panel (Consult the Cornell Price List, or contact your Cornell Sales Representative).

The following types of Back Boxes are available from Cornell.

- STANDARD FLUSH-MOUNT BACK BOXES (“BB-” Series) :
Standard Flush-Mount Back Boxes are fabricated from Galvanized Steel, and are designed to be built into the wall structure or millwork, on which the Master Panel will be installed
- SLOPED ENCLOSURE FOR COUNTER-TOP USE (“SE-” Series):
Sloped Enclosures are fabricated from a wooden (Red Oak) frame, with a metal back plate. These enclosures are designed such that when they are installed on a desk or counter-top, the faceplate of the Master Panel installed within them shall be oriented nearly parallel to the counter-top on which the enclosure is placed, with a slight “tilt” towards the user/operator of the System.
- WALL ENCLOSURE FOR SURFACE WALL-MOUNT USE (“WE-“ Series):
Wall Enclosures are fabricated from a wooden (Red Oak) frame, with a metal back plate. These enclosures are designed such that when they are installed on a wall, the faceplate of the Master Panel installed within them shall be oriented parallel to the wall surface.

REPLACING EXISTING MASTER PANELS – IMPORTANT NOTE:

When replacing an existing Master Panel, it is important to verify the faceplate dimensions, the back box type, and mounting hole pattern of the existing panel – some “old” 1000-Series Master Panels were fabricated prior to Cornell developing standard faceplate sizes. If such information is not verified - the new Master Panel may not properly fit into the existing opening / enclosure.

A03. ZONE CARD (PART NUMBER A-1211 & 8010-266):

Zone Cards provide the required Inputs, Outputs, and Circuitry that is needed for each monitored door.

One Zone Card is needed per each Door / Point that will be monitored via the 1000-Series System.

Zone Cards are designed for easy serviceability - with plug-in (Card-Edge Connectors) at both ends:

- One end plugs into a Socket on the rear of the Master Panel with which the Card is associated
- Field Wiring Terminations associated with the monitored door plug into the other end of the Card

ALL Field Wiring associated with any particular monitored door terminates to the corresponding Zone Card. Such wiring includes, but shall not be limited to the following:

- Door Position Switch(es) / point contact(s)
- 1000-Series Keypad(s) that are linked to the monitored door/point
- 1000-Series Local Zone Control (keyswitch/LED plate) for the associated door / point
- Alarm Indicator (Sounder / Light) for the associated door / point
- 1600-Series Remote Control "Slave" Panel for the associated door / point
- 1700-Series Remote Monitoring "Slave" Panel for the associated door / point

Zone Cards may be ordered from Cornell in two different configurations:

- CORNELL PART NUMBER A-1211 = Zone Card with Pluggable Terminal Strip for Field Wiring

Use this Part Number when

- Estimating / Ordering Zone Cards for a NEW 1000-Series System
- Replacing "old" Zone Cards – Some old versions had field wiring soldered directly to an edge connector socket, rather than via Screw Terminals. This can sometimes make servicing difficult. (Old Zone Cards are sometimes marked with Cornell Part Number "A-1511")

- CORNELL PART NUMBER 8010-266 = Zone Card Only (without Pluggable Terminal Strip)

Use this Part Number when:

- When ordering replacement Zone Cards for servicing existing systems

A04. POWER SUPPLY – CORNELL MODELS P-512241A, P-512243A, & B-5243A:

Each 1000-Series System operates requires a Power Supply.

INPUT POWER - Cornell Power Supplies utilize hard-wired 120 Volts AC Inputs. Where Emergency Power (Generator and/or UPS) is available, Cornell recommends that such Primary AC Sources should be used.

OUTPUT POWER – ALL Cornell Power Supplies are field-configurable for Output of either 12 or 24 Volts DC.

WHEN USED FOR 1000-SERIES SYSTEMS, CONFIGURE EACH POWER SUPPLY FOR 12-VOLTS.

POWER SUPPLY SELECTION GUIDE:

Consider the following choice of features, when selecting the proper Power Supply for each 1000-Series System:

<u>CORNELL MODEL NUMBER:</u>	<u>OUTPUT CAPACITY AT 12-VOLTS:</u>	<u>BATTERY SUPPORT INFORMATION:</u>	<u>CORNELL SUGGESTIONS:</u>
P-512241A	1 Amp	External Battery *	For small systems with a handful of keypads
P-512243A	4 Amps	External Battery *	Med-Lg Systems where Battery is not needed
B-5243A	4 Amps	Included	Med-Lg Systems requiring Battery Back-Up

* These models do not include the Battery or the Harness, and the cabinet is not sufficiently deep to accommodate the battery internally

A05. REMOTE CONTROL PANEL (PART NUMBERS STARTING WITH A-16nn):

Cornell manufactures (2) different types of Remote Panels ("Slave" Panels), as follows:

- A-1600 SERIES (THIS Section) – Called "CONTROL" because they have the ability to ARM and BYPASS each Door / Point with which they are associated, in addition to the Monitoring / Status functions performed by the A-1700 Series.
- A-1700 SERIES (Refer to Section "A06") – Called "Monitor" because they only have the ability to remotely Indicate the Status of the Doors / Points with which they are associated.

Each A-1600 Series Remote Control Panel wires to an associated A-1000 Master Panel.

Remote Control Panels are built in multiples of four (4) Doors in the same manner as the Master Panels. This is reflected in the Cornell Part Numbers as follows:

A-1604	=	4-Door Remote Control Panel
A-1608	=	8-Door Remote Control Panel
A-1612	=	12-Door Remote Control Panel [and so, on, up to →] ...
A-1628	=	28-Door Remote Control Panel (Maximum <u>STANDARD</u> size) (Larger units may be available via Special Order – contact your Cornell Representative)

STANDARD FEATURES OF A-1600 REMOTE CONTROL PANELS:

Each Remote Control Panel is equipped with the following Standard features:

- Power Indicator LED (Green) – Indicates that the panel is receiving 12-Volt DC Power
- Sounder – Beeps in response to ALARM Status Conditions
- Volume Selector Switch – (High = Max. Volume / Low = adjustable (see below))
- Volume Control – Allows adjustment of the "low" setting (panel must be opened to adjust)
- [A second, non-functional switch (normally for Lamp Test, but inoperable on A-1600 & A-1700)]
- Arm / Bypass Toggle Switch per Door - 3-Position: Center = "off", Momentary Arm & Bypass
- Door / Point Status LEDs – one pair per Door / Point:
 - Green = (Duplicates function of Green LED at Master Panel)
 - Red = (Duplicates function of Green LED at Master Panel)

A-1600 Panels have NO OPTIONAL FEATURES

BACK BOXES FOR REMOTE CONTROL PANELS:

Each Remote Control Panel requires a corresponding Back Box, into which it will be installed.

Remote Control Panel Back Boxes are handled in the same manner as Master Panel Back Boxes. (Refer to "Back Boxes" under Section "A02")

A06. REMOTE MONITOR PANEL (PART NUMBERS STARTING WITH A-17nn):

Cornell manufactures (2) different types of Remote Panels ("Slave" Panels), as follows:

- A-1700 SERIES (THIS Section) – Called "MONITOR" because they only have the ability to remotely Indicate the Status of the Doors / Points with which they are associated.
- A-1600 SERIES (Refer to Section "A05") – Called "Control" because they incorporate Arm / Bypass switches for each Door / Point, in addition to Monitoring / Status functions.

Each A-1700 Series Remote Control Panel wires to an associated A-1000 Master Panel.

Remote Monitor Panels are built in multiples of four (4) Doors in the same manner as the Master Panels. This is reflected in the Cornell Part Numbers as follows:

A-1704	=	4-Door Remote Control Panel
A-1708	=	8-Door Remote Control Panel
A-1712	=	12-Door Remote Control Panel [and so, on, up to →] ...
A-1728	=	28-Door Remote Control Panel (Maximum <u>STANDARD</u> size) (Larger units may be available via Special Order – contact your Cornell Representative)

STANDARD FEATURES OF A-1700 REMOTE MONITOR PANELS:

Each Remote Monitor Panel is equipped with the following Standard features:

- Power Indicator LED (Green) – Indicates that the panel is receiving 12-Volt DC Power
- Sounder – Beeps in response to ALARM Status Conditions
- Volume Selector Switch – (High = Max. Volume / Low = adjustable (see below))
- Volume Control – Allows adjustment of the “low” setting (panel must be opened to adjust)
- [A second, non-functional switch (normally for Lamp Test, but inoperable on A-1600 & A-1700)]
- Door / Point Status LEDs – one pair per Door / Point:
 - Green = (Duplicates function of Green LED at Master Panel)
 - Red = (Duplicates function of Green LED at Master Panel)

A-1700 Panels have NO OPTIONAL FEATURES

BACK BOXES FOR A-1700 REMOTE MONITOR PANELS:

(Same as Master Panel / Remote Control Panel – Refer to “Back Boxes” in Sections “A2” & “A5”.)

A07. DOOR CONTACTS:

Door Contacts are usually needed for each Door that will be monitored by the system – their function is to electrically tell the system if the corresponding Door is Opened or Closed.

Door Contacts are installed directly on/in the Door and associated Door Frame, and need to be wired to the Zone Card in order to function properly.

IMPORTANT:

FOR LOCATIONS WHERE APPEARANCE IS IMPORTANT, PRE-INSTALL COORDINATION WITH THE DOOR / DOOR FRAME PROVIDER IS VERY IMPORTANT! CAREFULLY OBSERVE THE FOLLOWING:

On Retrofit projects, you can treat the following as “precautionary measures”:

- *EXTERIOR DOORS, DOORS TO STAIRWELLS AND DOORS INSTALLED WITHIN FIRE-RATED WALLS USUALLY HAVE THEIR FRAMES “MUDDERED-IN” WITH CONCRETE. (This makes installation of concealed wiring and concealed Door Contacts difficult “after the fact”. Metal Door Frames may sometimes be ordered with a welded-in “pocket” for the Door Contacts, which can be attached to a rigid or EMT conduit stub – into an accessible ceiling space.) If such measures are not coordinated, use of Surface-Mount Door Contacts and Wiring / Raceway may be unavoidable.*
- *METAL DOORS AND FRAMES CAN INTERFERE WITH PROPER OPERATION OF DOOR CONTACTS – Particularly when installing Magnetic Door Contacts on / within Ferrous Metal (Steel) Doors and Frames, be sure to utilize contacts that are suitable for such applications. Flush-Mount Contacts usually incorporate some sort of “spacer” to minimize the affects of the metal on the magnet and corresponding reed switch.*

Cornell stocks (2) different models of Door Contacts, as follows:

- **ROLLERBALL CONTACT** (Cornell Part Number 4560-016) – For locations where visual appearance is important. Once installed, these devices are concealed within the door frame, and are hardly visible unless the corresponding door is opened.

Rollerball Contacts require a relatively large hole to be bored into the Door Frame for installation.

They are customarily installed on the Hinge Side of the Door Frame, such that when the door is closed, the integral “roller plunger” is depressed into the housing by the edge of the door.

The Contact Housing and associated Field Wiring are hidden within the Door Frame / Mounting Hole.

This type of Contact is somewhat less secure than Magnetic Types – because the door must usually be opened to a considerable arc / swing before the internal switch will be actuated.

- **SURFACE-MOUNT MAGNETIC DOOR CONTACT** (Cornell Part Number 4560-017) – This type of contact, and at least a short section of wiring will usually be visible when it is installed.

Magnetic Door Contacts consist of two components:

- The Contact, consisting of a Reed Switch and screw terminals concealed within a small housing. This component mounts to the Door Frame with Field Wiring being terminated to it. Most of the

Field Wiring is usually concealed within the Frame and Jamb of the door. The internal Reed Switch is actuated when it is in the presence of the magnet's field.

- The Magnet, which mounts to the door, nearly touching the Contact when the door is closed.

Magnetic Contacts are highly reliable, long-life devices – mainly because the reed switches are encapsulated inside small glass tubes filled with inert gas; minimizing corrosion of the contacts within.

Magnetic Contacts are usually more secure than Rollerball / Plunger Types – because as soon as the door is opened by a few inches, the Magnet and Contact become sufficiently separated to Actuate.

Other types and styles of Door Contacts are available via various Alarm-Industry Manufacturers and Suppliers. Such devices may be preferable to the standard products that are offered by Cornell.

OTHER SYSTEMS AT DOOR - Where other systems will be used on doors being monitored by the 1000-Series System - such systems may be able to provide an "Alarm" Output Contact that is actuated when access to the associated Door is violated (Delayed Egress Locks / Card Access Systems, etc.).

In such cases, the Alarm Output of such Systems may be preferable to the customary Door Contact - because this arrangement is usually less complex than interfacing the systems together some other way.

A08. REMOTE ZONE CONTROLS – KEYSWITCH-STYLE:

Remote Zone Controls are intended to be used to Arm and Disarm, or to Momentarily Bypass individual Doors and/or Monitor Points within 1000-Series Systems.

Cornell manufactures (3) different Remote Zone Controls for applications where operation via Keyswitch is desired, as follows:

- **MODEL A-1800 – STEADY ARM / STEADY BYPASS** – This unit is intended for Doors or Monitor Points, which will need to be manually Bypassed and Re-Armed for extended periods of time.

Typical Application of Model A-1800:

Model A-1800 Remote Zone Controls are ideal for locations where the following conditions apply:

- Manned / under direct supervision of personnel during normal hours – Bypassed during such times, in order to avoid creating nuisance Alarms.
- Need to be secured after hours / at other times – Armed during such times
- Need to perform Bypass and Re-Arming Locally, within the immediate area of the Door / Point
- Local Arm / Bypass restricted to Authorized Personnel (those who will be provided with a Key)

Examples include: Main Entries with Reception Desks that are manned during open hours and Loading Dock Doors that need to remain Bypassed for extended loading and un-loading.

Standard Features of Model A-1800:

- **FACEPLATE SIZE:** 1-gang, Stainless Steel (Also refer to "Optional Features")
- **KEYSWITCH** – The Keyswitch is used to restrict operation of the Toggle Switch. The Keyswitch provides two positions and the key is removable in either position
 - Disable Position = Arm / Bypass Toggle Switch function is inhibited
 - Enable Position = Arm / Bypass Toggle Switch may be used
- **DOOR / POINT STATUS INDICATOR LEDs (RED AND GREEN)** – Provide positive feedback of Armed / Bypass Status, by duplicating the function of the corresponding Master Panel LEDs.
- **ARM / BYPASS TOGGLE SWITCH** – 3-Positions, as follows:
 - Center = Off (Switch spring-returns to this position when released)
 - Left = (Towards Green LED) = Disarm / Bypass / Reset
 - Right = (Towards Red LED) = Arm

- **MODEL A-1801 – TIME-DELAYED BYPASS** – This Remote Zone Control is intended for locations where an individual Door or Monitor Point will need to be Bypassed for a brief interval, to allow a person or escorted person to pass-through, and will then automatically Re-Arm at the end of this interval.

Typical Application of Model A-1801:

Model A-1801 Remote Zone Controls are ideal for locations where the following conditions apply:

- Door / Point needs to be secured at ALL Times
 - Needs to be Bypassed briefly, and then Automatically re-armed
 - Local Arm / Bypass restricted to Authorized Personnel (those who will be provided with a Key)
- A-1800 units are not recommended for doors that need to remain bypassed for extended periods of time – such as doors where packages and/or supplies need to be carried through them.

Standard Features of Model A-1801:

- FACEPLATE SIZE: 1-gang, Stainless Steel (Also refer to “Optional Features”)
 - KEYSWITCH – The Keyswitch is used to actuate the delay feature. The Keyswitch provides momentary action – Insert, twist briefly, and remove; to actuate the timing circuits
 - ARMED / ALARM INDICATOR LEDs (RED) – Provide positive feedback of Armed / Alarm Status. Turns “Off” during timed Bypass Mode
 - TIMER CIRCUIT TRIMPOT – Allows time delay adjustment between approx. 2 seconds and 2 minutes.
- **MODEL A-1802 – SLAVE UNIT FOR A-1801** – This Remote Zone Control is intended for locations where an individual Door or Monitor Point will need to be Bypassed for a brief interval, to allow a person or escorted person to pass-through, and will then automatically Re-Arm at the end of this interval.

Standard Features of Model A-1801:

- FACEPLATE SIZE: 1-gang, Stainless Steel (Also refer to “Optional Features”)
- KEYSWITCH – The Keyswitch is used to actuate the delay feature. The Keyswitch provides momentary action – Insert, twist briefly, and remove; to actuate the timing circuits
- ARMED / ALARM INDICATOR LEDs (RED) – Provide positive feedback of Armed / Alarm Status. Turns “Off” during timed Bypass Mode

OPTIONAL FEATURES – ALL KEYSWITCH-OPERATED ZONE CONTROLS:

SONALERT OPTION (Add “/SON” to the END of the Cornell Part Number) – This option is essentially the same as adding a Cornell Model D-113P to the faceplate of the associated device (Refer to Section A10). The standard Sonalert produces a Pulsing tone pattern (beep, pause, beep, pause, beep...) Chime and Steady sounders may also be available at added cost.

Selecting the Sonalert Option also increases the faceplate size by 1-Gang (Example: A-1801/SON is a 2-Gang device, vs. 1-gang without the Sounder.)

LARGER FACEPLATES – For a modest additional charge, faceplates can be increased in size to 2 or 3-Gang size for retrofit applications, or for where incorrect back boxes are roughed-in in the field.

(Where such options are desired, contact your Cornell Sales Representative for more information.)

BACK BOXES FOR KEYSWITCH-OPERATED REMOTE ZONE CONTROLS:

These units utilize U.S. Standard Electrical Boxes, with a minimum inside depth of 2-1/2 inches.

STANDARD SIZE: 1-Gang Opening (1-Gang Masonry Box or 1-Gang Plaster Ring over 4” square box, etc.)

OPTIONAL SIZES: 2-Gang for Standard Units with “/SON” (Sonalert) Option

(Larger where Controls are special-ordered with different Faceplates)

A09. REMOTE ZONE CONTROLS – KEYPAD-STYLE:

Remote Zone Controls are intended to be used to Arm and Disarm, or to Momentarily Bypass individual Doors and/or Monitor Points within 1000-Series Systems.

Cornell manufactures (3) different Remote Zone Controls for applications where operation via Numerical Keypad is desired, as follows:

- **MODEL A-1806D – FULL FUNCTION KEYPAD (TIMED ACCESS / STEADY ARM / STEADY BYPASS)** - This Keypad unit is intended for individual Doors or Monitor Points, which will need to be manually Bypassed and Re-Armed for extended periods of time in addition to momentary / timed access.

Typical Application of Model A-1806D:

Model A-1800 Remote Zone Control Keypads are ideal for locations where the following conditions apply:

- Manned / under direct supervision of personnel during normal hours – Bypassed during such times, in order to avoid creating nuisance Alarms.
- Need to be secured after hours / at other times – Armed / Timed operation during such times
- Need to perform Bypass and Re-Arming Locally, within the immediate area of the Door / Point
- Local Arm / Bypass restricted to Authorized Personnel (those who will be provided with a Code)
Examples include: Main Entries with Reception Desks that are manned during open hours and Loading Dock / Delivery Doors that need to remain Bypassed for extended loading and un-loading.

Standard Features of Model A-1806D:

- FACEPLATE SIZE: 2-gang, Stainless Steel (Also refer to “Optional Features”)
 - KEYPAD (12-KEY NUMERIC): (0 thru 9, plus “*” & “#”) - Used for entry of Codes and Programming
 - TERMINAL STRIPS – For connection to associated 1000-Series System Wiring.
 - RED & GREEN LEDs – Provide positive feedback of Armed / Bypass Status. These LEDs replicate the operation of the Master Panel LEDs for the corresponding Door / Point.
 - YELLOW LED – Used during Delay Mode Operation & Programming
 - ACCESS CODE: Any Numerical Code (minimum of 1-digit up to maximum of 6-digits)
 - ACCESS CODE MEMORY: Single Access Code with Memory back-up for up to 48-hours (If Keypad loses power for more than 48-hours, it is likely to require re-programming.)
 - EXIT TIME DELAY INTERVAL: Exit Delay Interval MUST be between 10 and 60 seconds
 - REQUEST-TO-EXIT INPUT: For connection to a Normally Open, Momentary type switch. When closed, actuates time delay cycle. Useful for button at supervisory desk or motion detector on un-secured side of door.
- **MODEL A-1808D – TIMED ACCESS ONLY KEYPAD** – This Keypad is identical to Model A-1806D (above), except for a difference in the firmware (programmed internal chip).

The Steady Arm and Steady Bypass functions are eliminated from this version of the Keypad.

Typical Application of Model A-1808D:

Model A-1806D Remote Zone Control Keypads are ideal for locations where the following conditions apply:

- Need to be secured nearly 100% of time, with Delayed Exit to let authorized personnel through, one-at-a-time, when needed
- Local Arm / Bypass restricted to Authorized Personnel (those who will be provided with a Code)

A-1808D Keypads are not recommended for doors that need to remain bypassed for extended periods of time – such as doors where packages and/or supplies need to be carried through them.

- **MODEL A-1809D – STAND-ALONE KEYPAD WITH RELAY OUTPUT:**
(Model A-1809D/C = Full Function Version – Similar to A-1806D)
(Model A-1809D/A = Timed Access Only Version – Similar to A-1808D)

These Keypads are intended for Stand-Alone use – where an entire 1000-Series System is not desired.

Possible applications include, but are not limited to the following:

- Doors / Monitor Points needs to be controlled and/or Monitored LOCALLY.
- For Control of other non-Cornell Systems, where consistent operation with the Cornell 1000-Series System (as installed on other Doors / Points within the facility?) is desired.

All that is needed for their operation is a 12-Volt DC Power Supply and a properly-installed Door Contact.

Standard Features of Model A-1809D (Both Versions):

- FACEPLATE SIZE: 2-gang, Stainless Steel (Also refer to “Optional Features”)
- KEYPAD (12-KEY NUMERIC): (0 thru 9, plus “*” & “#”) - Used for entry of Codes and Programming
- TERMINAL STRIPS – For connection of each Keypad to the associated Door / Point Wiring.
- RELAY OUTPUT – Each A-1809D Keypad incorporates one Relay Output, rated as follows:
 - Type / Style = SPDT (Single Pole, Double-Throw / Form-C)
 - Contact Rating = 1.0 Amp at 24 VDC (non-inductive)
0.5 Amp at 24 VAC (non-inductive)
- RELAY ENERGIZED OUTPUTS – The circuitry that is used to energize the internal Relay (see above) is also tied to two terminals on the Terminal Strips, which function as follows:
 - Terminal 6 = Negative (-) Output when internal Relay is Energized
 - Terminal 7 = Positive (+) Output when internal Relay is Energized
- RED & GREEN LEDs – These LEDs connect to Inputs on the Keypad Terminal Strips. In order for them to operate, a switched Negative Voltage must be applied to the proper Input(s). (If these LED Inputs are not wired to some externally-controlled source, they will not do anything.)
- YELLOW LED – Used during Delay Mode Operation & Programming
- ACCESS CODE: Any Numerical Code (minimum of 1-digit up to maximum of 6-digits)
- ACCESS CODE MEMORY: Single Access Code with Memory back-up for up to 48-hours (If Keypad loses power for more than 48-hours, it is likely to require re-programming.)
- EXIT TIME DELAY INTERVAL: Exit Delay Interval MUST be between 10 and 60 seconds
- REQUEST-TO-EXIT INPUT: For connection to a Normally Open, Momentary type switch. When closed, actuates time delay cycle. Useful for button at supervisory desk or motion detector on un-secured side of door.

OPTIONAL FEATURES:

SONALERT OPTION (Add “/SON” to the END of the Cornell Part Number) – This option is essentially the same as adding a Cornell Model D-113P to the faceplate of the associated device (Refer to Section A10). The standard Sonalert produces a Pulsing tone pattern (beep, pause, beep, pause, beep...) Chime and Steady sounders may also be available at added cost.

Selecting the Sonalert Option also increases the faceplate size by 1-Gang
 (Example: A-1806D/SON is a 3-Gang device, vs. 2-gang without the Sounder.)

LARGER FACEPLATES – For a modest additional charge, faceplates can be increased in size to 3-Gang size for retrofit applications, or for where incorrect back boxes are roughed-in in the field.

(Where such options are desired, contact your Cornell Sales Representative for more information.)

BACK BOXES FOR KEYPAD-OPERATED REMOTE ZONE CONTROLS:

These units utilize U.S. Standard Electrical Boxes, with a minimum inside depth of 1-3/4 inches.

STANDARD SIZE: 2-Gang Opening (1-Gang Masonry Box or 1-Gang Plaster Ring over 4” square box, etc.)

OPTIONAL SIZES: 3-Gang for Standard Units with “/SON” (Sonalert) Option

A10. REMOTE ALARM SOUNDERS (MODELS D-113P, D-113S, & D-113CH):

When used in conjunction with 1000-Series Systems, Remote Alarm Sounders are intended to provide Remote Audible Indication of Alarm Conditions – either for particular Doors / Points, or for the entire System

These Sounders are similar to the “/SON” Option available on key-operated and keypad-style Zone Controls, except that these are intended for separate installation, on their own faceplate.

MODEL D-113P (PULSING) Provides a sound that is most similar to the Master Panel Sounder. It produces a repeating “beep, pause, beep, pause, beep, pause...” sound.

MODEL D-113S (STEADY) Provides a Steady Squeal sound. Cornell suggests that these should only be used for relatively high-priority Alarm conditions – since this sound rapidly becomes “annoying”.

MODEL D-113CH (CHIME) Provides a sound that emulates a repetitive electronically-synthesized chime. It produces a repeating “ding, pause, ding, pause, ding, pause...” sound.

B. SYSTEM PLANNING / DESIGN:**B1. INTRODUCTION:**

This section covers planning and design for 1000-Series Door Monitoring Systems – including information about estimating, layout, and cable requirements. Other information helpful in the planning and layout of typical 1000-Series Systems has also been provided.

B2. CONFIGURING THE SYSTEM:

Properly configuring a 1000-Series System requires information including, but not limited to the following:

- Detailed information about the facility where the system will be installed (floor plans)
- A basic understanding of the 1000-Series System architecture
- An understanding of how the End-User plans to utilize the system, and associated doors / monitor points

The following approach is a good starting point.

A WORD ABOUT BUILDING CODES:

The 1000-Series System is intended to be a MONITORING type system, and is not intended to directly control electrical or electro-mechanical locking and/or Delayed-Egress Systems. Because of this, the 1000-Series System should have no impact upon code-driven “means of egress” requirements.

However, 1000-Series Systems are often used to monitor the status of other Access Control and/or Delayed Egress systems. Because of this, it is important for the system designer and installer to be familiar with applicable building code requirements for the locality where any such system is located.

B2-a. General Layout of Facility / “Units” within the Facility:

The first task of planning a system is to understand the use of the facility and/or of each distinct AREA within the facility. Different facilities have different Security needs and concerns.

Take a “big-picture” look at the facility layout – note how the facility is sub-divided into Units / Care Areas and/or areas in which different levels of care are provided.

If your project involves direct negotiation with the End User and/or Design-Build project delivery; then this is a good starting point to develop the overall goals for Door Monitoring within the affected facility / complex.

Within a typical facility, issues that include, but are not limited to the following should be discussed:

- Boundaries between Staff-Only Areas and areas that are accessible to Patients, Residents, etc.
- Sub-divisions within any such Areas – in which some areas may contain Patients or Residents that are a higher security risk than others. (Dementia, Flight Risk, or High Security Zones / Wards, etc.)
- Monitoring Locations – Who needs to be notified of violations and where will they be located?
- Is there any need for local indication at violated doors / points? (Local Sounder / Lights?)

B2-b. Examine and Classify the Usage / Security Needs of various Doors:

Within each defined area, examine the various Doors, and try to classify them into the following categories:

B2-b1. MODAL DOORS – These doors will typically have relatively high traffic during daytime / normal / visiting hours, and dramatically lower traffic after-hours. In most cases, these doors or the area associated with them will be under direct staff supervision / observation during un-secured hours.

Examples include: Main Entrances, doors to Activity / Dining Areas, or to patios / outdoor areas.

B2-b2. OCCASIONAL USE DOORS – These doors will typically be need to be secured, but will need access by Staff Members or residents / trustees who are not considered to be a security risk.

Examples include: Delivery Doors / Loading Docks, Employee-Only Entrances, doors between different parts of or security zones within a facility

B2-b3. EMERGENCY EXITS – These doors are required by Code, in order to provide exits in the event of an evacuation, but will need to be secured almost 100% of the time.

B2-b4. SECURED VIA SOME OTHER SYSTEM – Within some facilities, other systems; such as Card Access, Delayed Egress, and/or Wandering Patient Systems may be in-place or planned.

In these cases, the most effective solution usually involves allowing such systems to control access to the associated door(s). Any Keypads, Card Readers, Electric Locking, Fire Alarm Release, or Remote “Buzz-Through” Switches should be as recommended by the manufacturer of the system.

The connection from any such Door to the 1000-Series System should normally be accomplished via an “Alarm” Output Contact from such systems. This way, the 1000-Series System will only be actuated if the other system is violated.

Other methods may work, but are usually more complex – (if unsure, Contact Cornell Tech. Support)

NOTE: WHERE SUCH INTERFACES WILL BE USED, IT IS IMPORTANT FOR THE INSTALLER(S) TO PROPERLY TRAIN END-USER REPRESENTATIVES, SUCH THAT THE PROPER ENTITY CAN BE IDENTIFIED AND CONTACTED WHEN PROBLEMS OCCUR. (Cornell also recommends carefully labeling and/or tagging the connected equipment, such that when troubleshooting such doors, interconnection of equipment from different vendors and their function is made clear to service personnel.)

B2-b5. NO SECURITY NEEDED – These doors usually fall into one or more of the following sub-categories:

- They will be locked all the time, such that only key-carrying staff members will have access to the room / area secured by the door in question,
- They are located within areas of the building that are secured by other doors - such that opening and closing them has no affect on the security goals of the facility.

B2-c. Identify the Monitoring and/or Control (and Power Supply) Locations:

Examine the locations that will be staffed both during Normal Business Hours and After Hours. Then, after discussing the needs and response plans with the End-User, identify locations such as the following:

B2-c1. MASTER PANEL LOCATION:

The logical place to start usually involves determining the location for the Master Panel:

- ACTIVELY MONITORED = “YES”: If this unit will be actively monitored by End-User Staff, it should be located at the Primary Location for people who will be responding to Door Alarms.
 - In a Secure Location – If the Master Panel will be installed within a Secure Location (one that is constantly attended, and where Staff and/or Residents who should not have access to it are usually not present) then it is probably OK to use the Standard configuration at such locations.
 - NOT in a Secure Location – If it will be left unattended or if unauthorized Staff and/or Residents WILL have access to it, then one of the Keyswitch Options [See A02] should be considered.
- ACTIVELY MONITORED = “NO”: If the Master Panel WILL NOT actively monitored by End-User Staff, then it is usually best to locate it within a Centrally-Located space that is easily accessible for system wiring – such as a secured Electrical / Utility Room. (Again, if access to the Master Panel is a concern, then one of the Keyswitch Options [See A02] should be added to it.

B2-c2. POWER SUPPLY LOCATION:

The Power Supply location usually depends upon the location of the Master Panel/System that it feeds:

- GENERAL – ACCESSIBLE: Cornell recommends installing the Power Supply at an easily-accessed location, such that Maintenance and Service personnel may check on it easily, with minimal interruption to staff at Security / Nurse Desks etc.
 - Generally, installing Power Supplies above a lay-in ceiling is not recommended.
 - Installing them behind desks, which must be moved for access, is also not recommended.
- ENVIRONMENT CONSIDERATIONS: Power Supplies should be installed in areas that do not get too hot. Attics and other non-cooled areas are generally a bad idea – particularly in Southern climates.
- MASTER PANEL HIDDEN IN UTILITY AREA: Where this situation is applicable, the most logical place for the Power Supply would be adjacent to the Master Panel.
- MASTER PANEL IN FINISHED AREA: In this case, it is usually best to find a Utility / Electrical / Janitorial Room somewhere relatively near to the Master Panel.
- LABELING - In order to reduce the difficulty of future service work:
 - Label the Power Supply as “Power Supply for Cornell Door Monitoring System”
 - Leave a note (Permanent Marker / Label) on the back side of the Master Panel, stating where the Power Supply is located (if it is not adjacent to the Master Panel).

B2-c3. REMOTE CONTROL AND MONITORING LOCATIONS:

After the Master Panel Location has been identified, the next logical location(s) to discuss are those where Remote Control and Monitoring of All or Particular Doors is required / desired. Recommended criteria for evaluating such locations are as follows:

NOTE: When referring to the 1000-Series System:

- “CONTROL” means the ability to Arm and Bypass / Reset a Monitored Door or Point.
- “MONITOR” means the ability to see Visual Indicators (LEDs) and/or to hear Audible Indicators (Sounders), which are actuated in response to the various status conditions of the Doors / Points
- CONTROL / MONITORING OF MORE THAN ONE OR TWO DOORS = Use A-1600 Series Remote Control Panels [See A05]. Then, the same conditions apply as with the Master Panel:
 - In a Secure Location – Where such Remote Panels will be installed at a Secure Location, then it is probably OK to use the Standard configuration at such locations.
 - NOT in a Secure Location – If it will be left unattended or if unauthorized Staff and/or Residents WILL have access to it, then one of the Keyswitch Options [See A05] should be considered.
- CONTROL / MONITORING OF INDIVIDUAL DOORS = Use Remote Zone Controls:
 - Keyswitch Type: A-1800, A-1801, A-1802 [See A08]
 - Keypad Type: A-1806D, A-1808D [See A09]
- REMOTE MONITORING OF DOORS = Use A-1700 Series Remote Monitor Panels [See A06]. Because no Switches are involved at such locations, there is no concern over keyswitch options.

B2-d. Determine the Equipment needed for each Secured Door:

At this point, you should re-examine every door where Monitoring will be required. In most cases, the doors will follow types / categories of Monitoring corresponding to the Categories identified within B2-b.

It is often helpful to organize this information into some form of “spreadsheet”, with Categories listed across the Top and the Door Descriptions (Door Numbers, if New Construction) listed at the Left Side.

Some suggestions for handling the various categories are as follows:

B2-d1. MODAL DOORS – Where traffic patterns change dramatically, based on time-of-day, the following types of equipment are usually required:

- Door Contacts [See A07] – One or more of them
- Some form of Control, to allow them to be bypassed when they are under direct supervision.
 - When they can be controlled from the Main Control Panel – that may be all that is required.
 - Sometimes, Zone Controls should be placed at the supervising location (Reception / Security Desk) that serves the area during high-traffic hours. Other times, near to the Door / Point.
 - Model A-1800 Keyswitch Zone Control [See Section A08]
 - Model A-1806D Keypad [See Section A09]
 - Where multiple doors / points will be monitored at such locations, “consolidating” several into a single A-1600 Series Remote Control Panel at such locations may be preferable.

B2-d2. OCCASIONAL USE DOORS – Doors that need to be secured most of the time, but which also need to be bypassed for short periods of time, usually require the following:

- One (or more) Door Contacts [See A07]
- Some form of Local Control, to allow each such Door / Point to be Bypassed when needed:

Each such Door / Point should be evaluated for the amount of traffic that it will handle. In addition, the time interval duration, during which each such Door / Point will need to be bypassed should also be considered when selecting the appropriate Local Zone Control.

Cornell recommends that wherever Automatically Timed Bypass will work, devices that are limited to this mode should be selected. Such devices minimize the chance that a Door / Point will be left in a Bypassed State when it would be undesirable to do so.

 - Local Keyswitch-Type Zone Controls:
 - Model A-1801 (A-1802 on opposite side, where needed) where Timed Bypass will work.
 - Model A-1800 for Doors that will need to be left in a Bypassed state for extended times

Two devices (A-1800 AND A-1801) may be installed at the same door – One for Timed Bypass and the other for extended Bypass when needed (Keyed differently by Installer?)
 - Local Keypads:
 - Model A-1808D where Automatically Timed Bypass will work.
 - Model A-1806D for Doors that will need to be left in a Bypassed state for extended times

B2-d3. EMERGENCY EXITS – Doors that will only be used in the event of an Emergency / Evacuation are usually quite simple. Such Doors usually only require:

- One (or more) Door Contacts [See A07]

B2-d4. SECURED VIA SOME OTHER SYSTEM: Where Doors will be Controlled via some other system, such as: Card Access, Delayed Egress, and/or Wandering Patient Systems – it is usually to assign PRIMARY Control of such Doors / Points to the other system.

In nearly all cases, such systems will / may incorporate and ALARM Output (Contact or Voltage) which may be used for Monitoring Interface to the 1000-Series System.

Where such “Other Systems” are not being provided by the same entity responsible for the 1000-Series System; then the Contractor responsible for the 1000 Series Door Monitoring System needs to coordinate such connections with appropriate Contact People from the other firm(s).

- Where the other system will provide a Contact-Closure Output, all that is usually needed is Wiring from the associated Zone Card(s) to such Outputs. The Contact Closure Output is wired-in to the Zone Card as if it were the Door Contact.
- Where the other system provides Voltage-Type Outputs, the following items are usually needed:
 - (1) Properly-selected Relay Module per each such Voltage Output. The Relay Module will be energized by the Voltage Output and provide a suitable Contact-Closure, which will be wired into the 1000 Series Zone Card in the same manner as 4D-1 above.

B2-d5. NO SECURITY NEEDED – These doors are easy – You do not need to do anything for these!

B3. WIRING FOR 1000-SERIES SYSTEMS:

The following guidelines may be applied when estimating / installing wiring for 1000-Series Systems:

B3-1. 1000 Series Wiring – General:

The following general factors should be applied to wiring for any 1000-Series Door Monitoring Systems:

- **SYSTEM VOLTAGE** – 1000 Series System Equipment utilizes 12-Volt Direct Current for power. This 12-Volt Power is usually obtained from a Cornell Power Supply, which wires to a 120 VAC Circuit and converts this to suitable 12-Volt Operating Power.
- **ELECTRICAL CODE CLASSIFICATION** - 1000 Series Systems utilize Power Supplies that are compliant with the Class-2 Requirements / Limitations, as specified within the National Electrical Code (NFPA-70)
- **CABLE TYPE** - Wiring for 1000-Series Systems is customarily installed within a Partial Raceway System (Conduit Stubs to accessible ceiling / attic spaces). Because of this, and because of the Electrical Code Classification (see immediately above), Cornell generally recommends use of the following cable types:
 - WHERE PLENUM-TYPE CABLES ARE NOT NEEDED – Use Type “CM” or Type “CL2”
 - WHERE PLENUM-TYPE CABLES ARE NEEDED – Use Type “CMP” or Type “CL2P”
 - WHEN RUNNING CABLES BETWEEN FLOORS – Use Type “CMR” or Type “CL2R”
- **NATURE OF 1000-SERIES CIRCUITS** – The Circuits that are used within 1000-Series Door Monitoring Systems generally function by switching DC Power. None of the connections utilize Digital techniques and/or Serial Protocols. Because of this, specialized and/or shielded cables are not required.
- **WIRE GAUGE GUIDELINES** - The only real item of concern for the cables is ensuring that each cable / conductor is sized sufficiently (Wire Gauge) for the amount of current being carried by each cable / conductor. Some general guidelines for this are as follows:
 - Use #18 AWG Wire for:
 - Power to Master Panels, Remote Control Panels, and Remote Monitor Panels
 - Wiring to Door Contacts, Zone Controls, and Remote Sounders where the distance between the Master Panel and any such device will exceed 1000 feet (#20 AWG is usually sufficient for this.)
 - LED and Switch Wiring to Remote Control and Monitor Panels, where the distance between the Master Panel and any such device will be less than 1000 feet. (#20 AWG usually sufficient.)
 - Use #22 AWG Wire for:
 - Wiring to Door Contacts, Zone Controls, and Remote Sounders where the distance between the Master Panel and any such device will be less than 1000 feet
 - LED and Switch Wiring to Remote Control and Monitor Panels, where the distance between the Master Panel and any such device will be less than 1000 feet.
- **STRANDED / SOLID** – Cornell generally recommends using Stranded Wire for 1000-Series Systems. When used in #22 AWG, stranded wire is less prone to conductors breaking. In All Gauges used, stranded wire is generally more flexible – which makes handling Master and Remote Panels less complicated.

B3-2. Wiring to 1000 Series Devices:

The following instructions should be followed for wiring to each typical 1000-Series Device:

B3-2a. Power Supply to 1000-Series Master Panel:

#18 AWG, 3-Conductors (4-Conductor cable is usually more readily available)
(In the case of unusually large panels, it may be advisable to up-size this to #16 AWG)

B3-2b. Zone Wiring for 1000-Series Master Panel:

This wiring will depend upon the device(s) used in conjunction with each Door / Point. Because of this, refer to the Remainder of B3-2 as follows.

B3-2c. A-1600 Series Remote Control Panel to 1000-Series Master Panel:

Two “sets” of wiring are required for each A-1600 Remote Control Panel:

POWER CABLE: #18 AWG, 4-Conductors
(Use the 4th Conductor for “HI”, which is the Sounder Trigger Wire)

ZONE WIRING: (4) #22 AWG Conductors per zone

Notes – Zone Wiring for Remote Control Panels:

Cornell recommends running wiring for ALL Zones, even if all of them will not actually be used. This permits the un-used zones to be utilized easily in the future, even if they are not presently needed.

Sometimes, it makes more sense to run (1) 4-Conductor Cable per zone. At other times, a single multi-conductor cable makes more sense. Either method is acceptable.

B3-2d. A-1700 Series Remote Monitor Panel to 1000-Series Master Panel:

Two “sets” of wiring are required for each A-1700 Remote Monitor Panel:

POWER CABLE: #18 AWG, 4-Conductors
(Use the 4th Conductor for “HI”, which is the Sounder Trigger Wire)

ZONE WIRING: (2) #22 AWG Conductors per zone (same Zone Wiring Notes as B3-2c above)

B3-2e. Door Contact to 1000-Series Master Panel:

(1) #22 AWG, 2-Conductor (Home-Run per Door / Point)

Door Contact Wiring may be combined with the wiring for any Local Zone Control / keypad / sounder that is associated with any particular door – resulting in a single, multi-conductor cable to the Door / Point.

Run (2) Conductors from the Door Contact to the back box for the associated Zone Control, etc., and splice the 2-Conductor into the multi-conductor cable (try to be consistent in the use of the conductor colors each time this is done).

B3-2f. A-1800 Local Zone Control (Key-Operated, Arm / Bypass) to 1000-Series Master Panel:

Wiring for Model A-1800 Zone Control consists of a “home-run” of the following for each Door/Point:

Basic A-1800: (6) #22 AWG Conductors (Home-Run per Door / Point)

Add “/SON” (Sounder) Option - ADD: (1) #22 AWG Conductor

[Plus, any additional wiring for Door Contact – see “B3-2e”]

B3-2g. A-1801 Local Zone Control (Key-Operated, Timed Operation) to 1000-Series Master Panel:

Wiring for Model A-1801 Zone Control consists of a “home-run” of the following for each Door/Point:

Basic A-1801: (6) #22 AWG Conductors (Home-Run per Door / Point)

Add “/SON” (Sounder) Option - ADD: (1) #22 AWG Conductor

[Plus, any additional wiring for Door Contact – see “B3-2e”]

B3-2h. A-1802 Local Zone Control (Key-Operated Slave Unit) to A-1801 Local Zone Control:

These Zone Control Units are designed to work together. Wherever a Model A-1802 Unit is used, the following wiring needs to run from it to the associated A-1801 Zone Control:

(5) #22 AWG Conductors (Home-Run per Door / Point)

B3-2i. A-1806D & A-1808D Zone Control Keypads to 1000-Series Master Panel:

Wiring for both of these Keypad Models is identical, and consists of a “home-run” of the following for each Door/Point:

Basic Keypad: (7) #22 AWG Conductors (Home-Run per Door / Point)

Add “/SON” (Sounder) Option - ADD: (1) #22 AWG Conductor

[Plus, any additional wiring for Door Contact – see “B3-2e”]

Where (2) Keypads are wired to a single Door/Point, simply parallel the wiring listed above between the two keypads (omit the Door Contact Wiring between them).

B3-2j. D-113 Series Remote Sounder to 1000-Series Master Panel:

Wiring for any Remote Sounder consists of a “home-run” of the following for each Door/Point:

(2) #22 AWG Conductors (Home-Run per Door / Point)

[Plus, any additional wiring for Door Contact – see “B3-2e”]

B3-2j. “Worst-Case” Wiring – ANY DOOR AND ZONE CONTROL 1000-Series Master Panel:

For estimating purposes, when time is short and it is uncertain exactly what the End User will want, the following may prove useful:

- 1000 MASTER PANEL TO ACCESSIBLE CEILING (Coil in Ceiling near each Door, or run to 2 or 3-Gang Back Box with Blank Cover, which may be used for future Zone Control or Keypad, if needed):
 - (1) 10-Conductor, #22 AWG Cable
- DOOR CONTACT TO MULTI-CONDUCTOR CABLE LISTED IMMEDIATELY ABOVE:
 - (1) 2-Conductor, #22 AWG Cable

With this type of cabling in-place, nearly ANY 1000-Series Component may be added, as needed, with little or no reason to modify the wiring.