

Welcome to Knight School

5820XL-EVS

Module 1



**SILENT
KNIGHT**

by Honeywell

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5820XL-EVS

 **Addressable Fire Alarm Control Panel Features:**

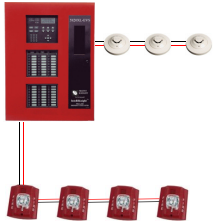
- ◆ Up to 792 points using SK Series
 - 396 Sensors
 - 396 Modules
- ◆ Up to 508 points using SD Series
 - Any combination of detectors and modules

 **6A power supply**

 **6 Flexputs™**

- ◆ Inputs

 **Digital dialer**





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 **Addressable Fire Alarm Control Panel with Emergency Voice System**

 **All three systems integrated into one control**

- ◆ Addressable Fire Alarm Control Panel
- ◆ Voice Evacuation System
- ◆ Emergency Communication System





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Origins of ECS/MNS

 **Department of Defense (DOD) began requiring Mass Notification Systems (MNS) after the 1996 attack on Khobar Towers in Saudi Arabia**

 **Unified Facilities Criteria (UFC) became effective in 2002**

 **An Annex to the NFPA 72 2007 provided guidance for the design and installation of MNS**



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Origins of ECS/MNS


UL 2572





NFPA 72 2010 name changed to National Fire Alarm and Signaling Code

- ◆ Addition of new chapter 24 “Emergency Communication Systems”
- ☞ Includes:
 - Emergency Voice
 - Alarm Communication Systems
 - Firefighter Communications
 - Mass Notification



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NFPA72 – 2010



National Fire Alarm and Signaling Code

- ◆ Systems used for more than just fire hazards
- ◆ ECS message can be higher priority than Fire
- ◆ Weather, terrorist attacks, chemical hazards

Risk Analysis

- ◆ To be developed for each facility
- ◆ Basis for emergency response plan
- ◆ Consider fire and non-fire emergencies
- ◆ Risk Assessment appears 44 times in Chapter 24

New Chapter 24 – Emergency Communications Systems

- ◆ “Protection of life by indicating the existence of an emergency situation and communicating information necessary to facilitate an appropriate response and action”



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Visual Appliances NFPA 72 2010



In-Building ECS

- ◆ Where audible notification is provided, MNS shall also provide visible notification information to serve the hearing impaired and for high-noise areas

NFPA 72 2010 24.4.2.19.1
- ◆ Strobes used in combination systems where the same strobe is used for MNS and fire alarm, it shall be clear and meet UL1971, have no marking or be marked “ALERT”

NFPA 72 2010 24.4.2.20.4
- ◆ Strobes used for mass notification shall meet the synchronization requirements

NFPA 72 2010 24.4.2.20.10



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Visual Appliance Network

Individual Building MNS

- Strobes are located as required for a fire alarm system

UFC 4-3.4.2

- Combined MNS/FACP systems may use either one clear strobe or two strobes ...clear for fire and amber for MNS as specified by the AHJ

UFC 4-3.4.2

- Clear strobes activated by the fire alarm system shall not operate during periods when the amber strobes are in operation, but otherwise shall operate continuously until the fire alarm system is reset

UFC 4-6.2.3




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Notification Appliance Network

Exterior speakers provide notification to areas commonly used by building occupants

- Courtyards, covered break areas, designated smoking areas, and sidewalks leading from the building's exit doors to a public street or from parking areas for a distance up to 16 ft from the building

UFC 4-3.4.1

- Use speakers with directional characteristics located near entrance/exit doors.

UFC 4-6.1



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NFPA interface with Wide Area MNS

- Telephone alerting
- Paging system
- Cell phones
- PDA activation
- e-blast
- Message scrolling
- Reverse 911
- Fax transmission
- Highway advisory sign or radio

NFPA 72 2010 A.24.4.3.3



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UFC interface with Wide Area MNS

 The **Individual Building MNS** communicates with the **Wide Area MNS** providing

- ◆ Status information
- ◆ Receive commands
- ◆ Activate pre-recorded messages
- ◆ Originate live voice messages

UFC 4-3.5



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Wide Area MNS Subsystems

 **High Power Speaker Arrays (HPSA)** communication links

UFC 3-4.2
NFPA 72 2010 24.4.3.4.2

 **Giant/Big Speaker Systems**

NFPA 72 2010 A.24.4.3



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UFC Wide Area MNS Speakers

 Wide Area MNS speakers shall provide

- ◆ **Voice** - Intelligible live and pre-recorded voice

UFC 3-3.1
- ◆ **Music** - National Anthem, Attention to Colors, Reveille, and Taps

UFC 3-3.2
- ◆ **FEMA** - Weather warning tones
- ◆ **Military** - Specific warning tones
 - ☞ Conventional attack warning
 - ☞ Non-conventional attack warning
 - ☞ All clear
 - ☞ System test tone

UFC 3-3.3

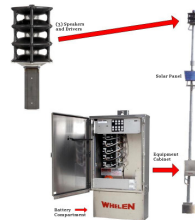


Whelen System

-  **Whelen manufactures a High Power Speaker Array (HPSA) that can be used for outdoor mass notification**

◆ WPS2900 Series product line

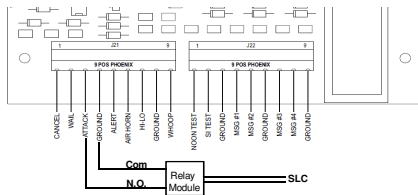
- ☞ **Speaker and Driver “Cells” at the top**
- ☞ **Equipment cabinet**
 - Amplifiers
 - Controller
 - Batteries
 - Various other interface equipment
- ☞ **Optional Solar Battery Charger**



- Whelen's system is fully functional as a standalone system**

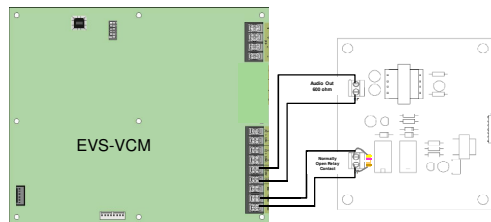
Whelen System

- The Whelen system will activate the different audio messages based on specific contact closures**



Whelen System

- Audio Output**
◆ Can be used as Aux Audio Input on EVS-VCM



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Connection to LED Signs

- Contact closure
- Up to 8 contact closures can be used for specific messages
- Sign includes software for setup and messages

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Autonomous Control Unit (ACU)

- Individual Building MNS
 - Establish priority for passing messages to prevent interference between the ACU, LOC, and the Wide Area MNS
- Silent Knight EVS panel is the ACU on the system

UFC 4-4.2

Note:
Silent Knight Emergency Communication priorities are set through software

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NFPA Priority of Control

- Actions taken at the ACU shall take precedence over actions taken at any remote location, including the Local Operating Console (LOC), or inputs from the Wide-Area Mass Notification System

NFPA 72 2010 24.4.2.13.3

- On the Silent Knight EVS system the LOC can be either:
 - Onboard EVS-VCM
 - EVS-RCU

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NFPA Voice Evacuation Control Locations

Control locations shall be secured to allow access only by **trained** and **authorized personnel**

NFPA 72 2010 24.4.1.5.2

If there are multiple voice/alarm control locations, **only one shall be in control** at any given time

NFPA 72 2010 24.4.1.5.4

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UFC Operations

The **ACU** has the same capabilities to operate the system as a LOC, plus the **ability to override or disable the mass notification capability**

Access to the **ACU** is limited to emergency response personnel

UFC 7-3.3

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Emergency Communication System

- ◆ Up to 4 EVS-RCU (Remote Control Units)
 - Equals Local Operating Console (LOC)
- ◆ EVS-RCU Includes:
 - 5860 Remote Annunciator
 - Remote Voice Control Module (VRM)
 - Supervised Remote Microphone
 - 16 Voice output group selections
 - 8 dedicated ECS buttons to activate ECS messages

5820XL-EVS EVS-RCU

SBUS (4-conductor)

VBUS (2-conductor shielded)

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UFC Individual Building

Pre-recorded messages should address

- ◆ Bomb threat
- ◆ Intruder/hostile person sighted
- ◆ Directions to take cover
- ◆ Evacuation using exits other than the normal main exit
- ◆ Emergency weather conditions appropriate for the local area
- ◆ “All Clear” message
- ◆ A test message

UFC 4-4.2

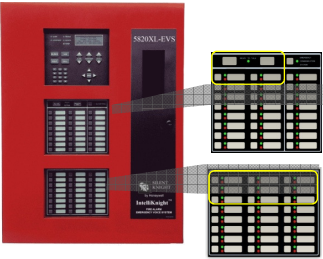
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Voice Evacuation System

- ◆ 16 Voice Output group selections
- EVS-SW24 adds 24 additional voice output group selections



Built-in

EVS-24SW

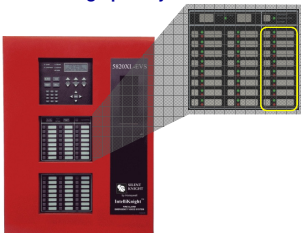
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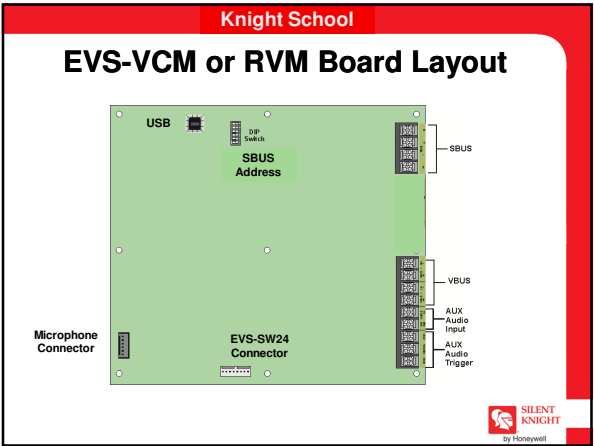
Emergency Communication System

- ◆ 8 programmable ECS messages
- ◆ 8 dedicated ECS buttons to activate ECS messages
- ◆ Messages can be customized
- ◆ Programmable message priority



Built-in

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Line input from another source

Using AUX Audio Input

- Recording messages
- Play messages from another source
 - PA system, Muzak, Reveille and Taps

AUX Audio Triggers

- Additional FACP input points
- ECS triggers
 - Voice Aux Status
 - No Alarm LED
 - Displays "Voice Aux 1 Active"
 - Voice Aux ECS
 - General Alarm LED
 - Displays "ECS Aux 1 Active"

The diagram shows a green board with a connector. A red arrow labeled "Aux Audio Trigger" points to the connector. A cable is connected to the connector.

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5880 LED/Contact Module

Can be used as remote ECS Inputs

- Must select ECS functions under edit module
- Points 41-48 will follow ECS switches 1-8
- Contacts can be setup as latching or non-latching

The diagram shows a green board with a connector. The board is labeled "5880 Board". The connector has 16 pins. The pins are labeled: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16. The pins 1-8 are labeled "ECS" and the pins 9-16 are labeled "LED".

4.7K Ohm
EOL Resistor

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New Amplifiers

EVS-50W and EVS-125W

- ◆ 4 circuits
- ◆ Add an EVS-CE4 to gain an additional 4 circuits

- ◆ 50 watts total
- ◆ All circuits rated for 50 watts
- ◆ 25 and 70.7 Volt RMS options

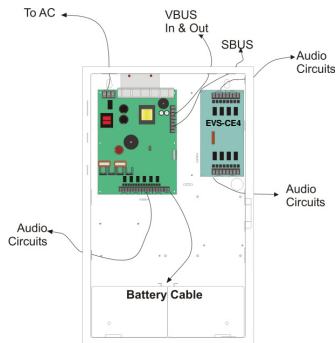
 EVS-125W

- ◆ 125 watts total
- ◆ Circuit 1 – 100W capable
- ◆ Others circuits are good for 50W



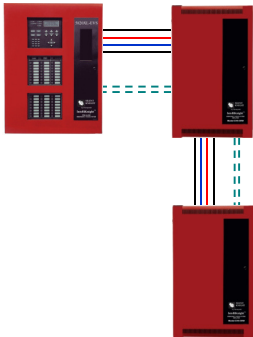
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Amplifier Layout



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Installation



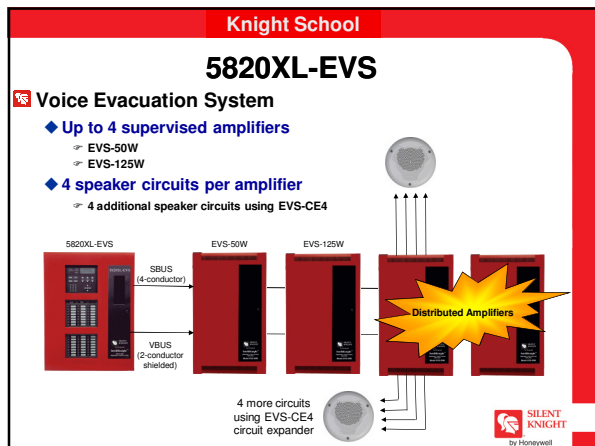
- Connect EVS to at least 1 amplifier**

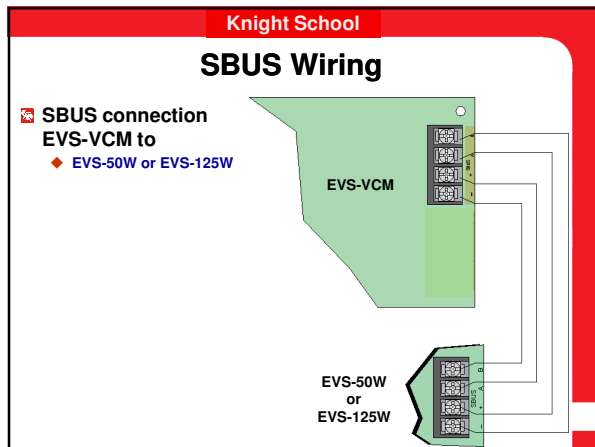
- ◆ **Connect via SBUS**

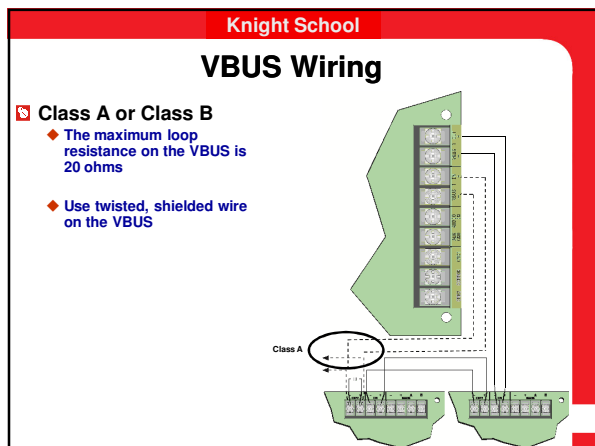
-  **Wire VBUS to each amplifier**

- ◆ **Class A**
- ◆ **Class B**
- ☞ Needs 15k EOL resistor









EVS Speaker Wiring

**EVS-50W
or
EVS-125W**

CIRCUIT 4 CIRCUIT 3 CIRCUIT 2 CIRCUIT 1

IN -> OUT IN -> OUT IN -> OUT IN -> OUT

15K Ohm
EOL

 **The IN terminals are used for Class A speaker circuits**

- ◆ No EOL required for Class A
- ◆ Use twisted, shielded wire

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Wire Lengths

Table 3-3 Wire Lengths

Number Of Speakers		Total Load		Wire Distance In Feet			
@1/2 W	@1 W	Vrms	Watts	18 AWG	16 AWG	14 AWG	12 AWG
10	5	25Vrms	5W	3900	6200	9860	15680
		70Vrms		25000	39700	63200	100520
20	10	25Vrms	10W	2125	3380	5375	8540
		70Vrms		13200	24150	38400	61100
30	15	25Vrms	15W	1460	2320	3690	5870
		70Vrms		11000	17500	27800	44200
40	20	25Vrms	20W	1100	1750	2780	4420
		70Vrms		8500	13510	21500	34175
52	26	25Vrms	26W	760	1200	1920	3050
		70Vrms		6100	9700	15400	24520
80	40	25Vrms	40W	550	875	1390	2200
		70Vrms		4100	6500	10360	16480
100	50	25Vrms	50W	450	715	1130	1800
		70Vrms		3500	5560	8850	14070

 Silent Knight recommends shielded wire for all speaker loops

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[illegible]
