



ANS Audio Notification System Installation Sheet

Product description

The Audio Notification System (ANS) is a self-contained amplifier, tone generator, digital message repeater, and supervisory interface. It is designed for use with a UL Listed fire alarm control panel (FACP) to provide a listed voice evacuation alarm system. See Table 1 for a list of ANS models.

The FACP provides all initiating circuitry and a notification appliance circuit (NAC) that connects to the ANS. The ANS provides its own internal supervision and supervision for its speaker lines. The ANS reports faults to the FACP by placing an open on the FACP NAC. Optionally, faults can be reported to the FACP by connecting a supervisory circuit to the ANS. The ANS reports internal failures and speaker line faults by placing an open on the supervisory circuit.

All models of the ANS are powered by a 120 V, 60 Hz supply. Optionally, the ANS can be powered by 24 Vdc from a UL Listed fire alarm power supply. Each model provides a different power level, but all models can be configured for 25 or 70 Vrms speakers (by jumper). The factory setting is for 25 Vrms.

ANS models

ANS model numbers have the format: ANS999MDC. Each model is a complete audio notification panel, including a built-in tone generator, power transformer, and cabinet. The 999 portion represents the output power: 25, 50, 100, 150, or 200 watts. M indicates the inclusion of a microphone. D indicates the inclusion of a digital message repeater (DMR). C indicates the cabinet color, either gray (G) or red (R).

Expander model numbers have the format ANS999XC. Each model is a complete expander panel, including a built-in tone generator, power transformer, and cabinet. The 999 portion represents the output power. X indicates an expander module. Expanders have no microphone and no DMR. C indicates the cabinet color, either gray (G) or red (R).

Amplifier model numbers have the format AMS999AMD. The amplifiers include a built-in tone generator, but no transformer or cabinet. The 999 portion represents the power output. The A designation indicates an amplifier. M indicates the inclusion of a microphone. D indicates the inclusion of a digital message repeater.

An Expander can operate as a slave amplifier when connected to an ANS999AMD, which supplies source audio to the slave. Expanders can also operate as stand-alone audio notification systems with only tone and microphone amplification.

Some models use multiple amplifier configurations. These models are configured and prewired at the factory.

Table 1: ANS models

Model number	Description	Amplifier modules	Audio circuits
ANS25MD(G/R)	25 W ANS	ANS25AMD	1
ANS50MD(G/R)	50 W ANS	ANS50AMD	1
ANS100MD(G/R)	100 W ANS	ANS100AMD	1
ANS150MD(G/R)	150 W ANS	ANS100AMD ANS50A	2
ANS200MD(G/R)	200 W ANS	ANS100AMD ANS100A	2
ANS25X(G/R)	25 W Expander	ANS25A	1
ANS50X(G/R)	50 W Expander	ANS50A	1
ANS100X(G/R)	100 W Expander	ANS100A	1
ANS150X(G/R)	150 W Expander	ANS100A ANS50A	2
ANS200X(G/R)	200 W Expander	ANS100A ANS100A	2

Specifications

Table 2: Specifications

Model	ANS25	ANS50	ANS100
Input voltage	120 Vac at 60 Hz or 24 Vdc		
Input current (at 120 Vac)	1.4 A	0.8 A	2.0 A
Input current (battery)			
Standby	0.18 A	0.13 A	0.18 A
Alarm	1.00 A	1.00 A	2.50 A
Standby with aux. load	0.31 A	0.26 A	0.85 A
Output power	25 W	50 W	100 W
Frequency response	800 to 2800 Hz	400 to 4000 Hz	400 to 4000 Hz
Output voltage	25 or 70 Vrms selectable		
Optional 24 Vdc input [1]			
Standby	0.60 A	0.60 A	0.60 A
Alarm	1.00 A	1.00 A	2.60 A
Sine	2.90 A	3.40 A	6.50 A
Output protection	Power-limited, open and short circuit protected		

Model	ANS25	ANS50	ANS100
Battery charging capacity [2]			
Minimum	24 V, 7 Ah		
Maximum	24 V, 18 Ah	24 V, 18 Ah	24 V, 24 Ah
FACP NAC circuit current	10 mA maximum		

[1] Input current measurements are determined using test conditions specified in UL 1711. *Sine* represents measurements made while the unit produces a continuous, undistorted sine wave of 1 kHz into the rated load of 25, 50, or 100 W at the rated output voltage. *Alarm* is the average current the unit experiences delivering an alarm signal, temporal whoop, to the rated load. *Standby* is the current draw of the unit with all normal power on and auxiliary terminals fully loaded. *Battery standby* is the current draw from the batteries on loss of power in an otherwise normal standby state.

[2] All ANS cabinets hold two 12 V, 7 Ah batteries. Larger batteries require an external battery cabinet.

Installation instructions

Ensure that all wiring and devices installed in the system meet the following standards:

- NFPA 70 *National Electrical Code*
- NFPA 72 *National Fire Alarm and Signaling Code*
- NFPA 101 *Life Safety Code*
- Applicable state and local codes

Install this equipment in a clean, dry environment. Avoid installation where the equipment could be subjected to vibration. Remove all electronic assemblies from the enclosure *before* drilling or punching the enclosure. Where possible, make all cable entries from the rear or sides. Before making any modifications to the enclosure, be certain that they will not interfere with the assemblies or batteries.

Wiring instructions

Refer to Figure 1 for terminal designations, and to diagrams in the “Applications” section for wiring diagrams.

1. Connect the speaker lines to TB1-5(+) and TB1-6(–).

Be sure to observe polarity and connect all speakers using the same polarity. For Class A (Style Z) the returns are TB1-7(–) and TB1-8(+).

Note: When using 70 VRMS speakers, the speaker wiring must be enclosed in grounded metal conduit.

2. Connect the microphone to connector P2.

If the microphone is not installed, ensure that switch SN2-8 is in the OFF position.

3. Attach the appropriate EOLR for the FACP to TB3-3 and 4 and for the speaker circuit to TB3-5 and 6.

You must use EOLR value specified for the FACP notification appliance circuit (NAC). See the FACP installation instructions provided by the manufacturer.

Note: if your system includes one or more ANSZS4B zone splitters, the FACP EOLR must be relocated. See the ANSZS4B installation sheet (P/N 3101185).

4. Connect the FACP signaling circuit to TB1-3(+) and TB1-4(–), using the FACP alarm polarity.
5. Connect the mains power (120 Vac at 60 Hz) to the black and white pigtail leads from transformer primary. Secure the ground lead to the grounding stud in the cabinet.
6. Connect the battery wiring harness, Red(+) and Black(–). Observe the correct polarity.

Use two 12 V batteries connected in series. (See Figure 4.) If the unit does not have its own batteries and relies on an external power supply with battery backup, ensure that switch SN2-7 is in the OFF position.

Note: Wiring for batteries is nonpower-limited. Maintain a minimum spacing of 1/4 in. between power-limited wiring and nonpower-limited wiring.

If the batteries must be located in a separate enclosure, provide a separate conduit run for the battery wiring only.

7. When all power and circuits are connected, the green LED turns on (and stays on) to indicate that the ANS is fully operational and all circuits are normal.

Terminal designations

Refer to Figure 1 for the locations of the terminals.

Table 3: Terminal descriptions

Terminal	Description
TB1-1, -2	Power input 24 to 32 Vac/Vdc [1][4]
TB1-3, -4	FACP NAC input. 10 mA max. Alarm polarity is shown. [1][4]
TB1-5, -6	Speaker loop, Style Y/Z (Class A/B start) [2][4]
TB1-7, -8	Speaker loop Style Z (Class A return) [2][4]
TB2-1	Circuit negative
TB2-2	Aux audio input. 0.5 Vrms nominal, 1 Vrms, 1 mA max. [1][3]
TB2-3	Preamp in/out. 600 Ω , 0 dBm. [1][3][5]
TB2-4	Factory Programmable output [1][3][5]
TB2-5	Signal active [1][3][5]
TB2-6	Aux audio enable. +24 Vdc, 32 Vdc, 5 mA max. [1][3]
TB2-7	Aux signal activate. +24 Vdc, 32 Vdc, 5 mA max. [1][3]
TB2-8	Alarm voltage. +24 Vdc, 0.1 A when unit is in alarm condition. [2][3][5]
TB2-9	Interrupted V+. +24 Vdc, 0.1 A. Disconnected in alarm condition. [2][3]
TB2-10	V+. +24 Vdc, 0.1 A. [2][3]
TB2-11	Microphone PTT. +24 Vdc, 0.1 A. [5]
TB3-1, -2	Optional FACP supervisory circuit. See installation instructions for details. 32 Vdc, 0.4 A max.). Must be configured using J1. [1][4]
TB3-3, -4	FACP Signal/Supervisory circuit EOLR

[1] Intended for connection to listed Class 2 or Class 3 (power-limited) sources only

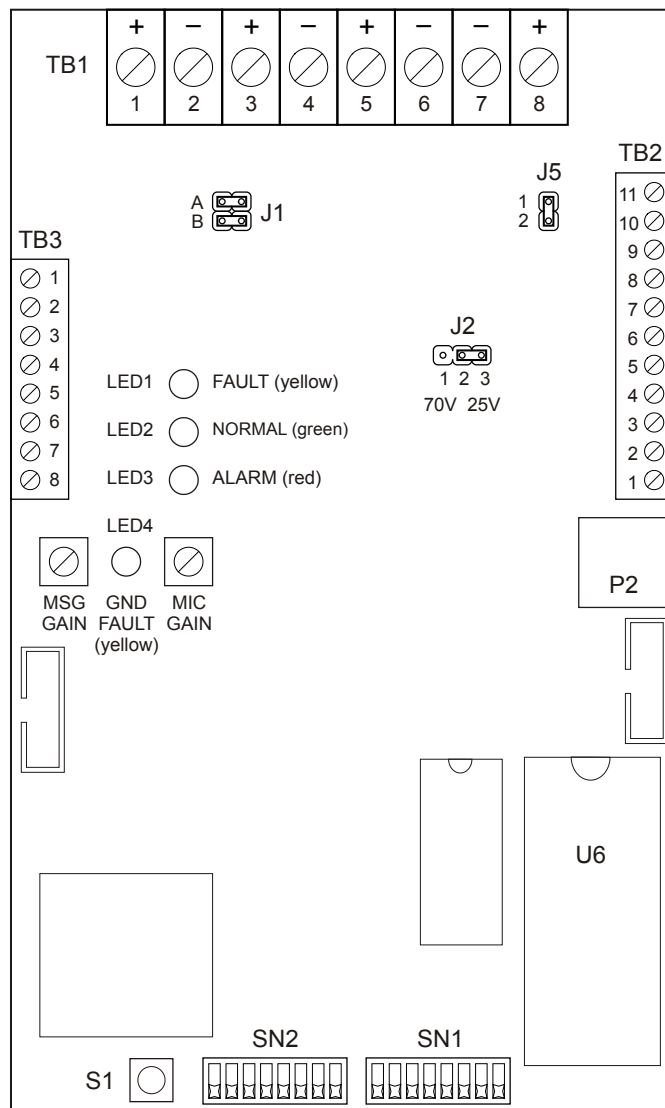
[2] Power-limited

[3] Unsupervised

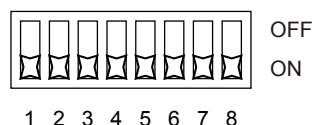
[4] Supervised

[5] Terminating equipment must be installed in the same room as the ANS

Figure 1: ANS features



DIP switch detail



MSG GAIN and MIC GAIN

The MSG GAIN (message gain) and MIC GAIN (microphone gain) potentiometers are factory set and should only be adjusted by trained technicians with the proper test equipment.

To increase the output of a speaker, change the speaker tap connection or setting to a higher wattage.

Switch S1

Pressing switch S1 performs a hard reset of the ANS microprocessor. This is not required during normal operation, and should only be done at the request of our support technicians.

DIP switch settings

Factory settings

Refer to Figure 1 for DIP switch locations. The following table shows the factory settings and descriptions for the switches.

Table 4: Factory DIP switch settings

Switch	Setting	Description
SN1-1	Off	8 second initial delay
SN1-2	On	
SN1-3	Off	
SN1-4	On	8 second repeat delay
SN1-5	Off	
SN1-6	On	Message on
SN1-7	Off	Three repeats
SN1-8	On	
SN2-1	Off	Temporal whoop signal
SN2-2	Off	
SN2-3	Off	
SN2-4	Off	Fault code lock off
SN2-5	Off	Factory set. Do <i>not</i> change.
SN2-6	Off	AC fault delay
SN2-7	On	Battery connected
SN2-8	On	Microphone connected

Custom settings

Table 5: Custom DIP switch settings

Switches	Settings
SN1-1/2/3	Sets the initial delay before the message starts to play. The tone sounds during this delay. There are eight options. Off Off Off = No delay On Off Off = 4 second delay Off On Off = 8 second delay On On Off = 12 second delay Off Off On = 16 second delay On Off On = 20 second delay Off On On = 24 second delay On On On = 28 second delay
SN1-4/5	Sets the delay between repetitions of the message. The tone sounds during this delay. There are four options. Off Off = 4 second delay Off On = 8 second delay On Off = 12 second delay On On = 16 second delay
SN1-6	Sets the message play mode. There are two options. Off = Message off On = Message on
SN1-7/8	Sets the number of times the message plays. There are four options. Off Off = 1 play Off On = 3 plays On Off = 2 plays On On = Continuous play
SN2-1/2/3	Sets the evacuation tone. There are eight options. Off Off Off = Temporal slow whoop On Off Off = Hi-lo Off On Off = Horn On On Off = Bell Off Off On = None On Off On = Chime Off On On = None On On On = 1 kHz sine
SN2-4	Sets the diagnostics mode. With diagnostics ON the last fault condition is displayed even if the fault is no longer present. There are two options. Off = Diagnostics off On = Diagnostics on
SN2-5	Not used
SN2-6	AC power failure report delay. There are two options. Off = No delay On = 6-hour delay
SN2-7	Batteries. There are two options. Off = Batteries are not connected On = Batteries are connected
SN2-8	Microphone. There are two options. Off = Microphone is not connected On = Microphone is connected

Jumper settings

Refer to Figure 1 for the locations of the jumpers. Table 6 shows the settings and descriptions for the jumpers.

Table 6: Jumper settings

Jumper	Setting	Description
J1 (A and B)	In	No FACP supervision. See "Optional supervisory circuit" below
J1 (A and B)	Out	FACP provides supervision. See "Optional supervisory circuit" below
J2	1 to 2	70 Vrms speaker output
J2	2 to 3	25 Vrms speaker output (factory setting)
J5	In	Ground fault detection enabled (factory setting)
J5	Out	Ground fault detection disabled

Options

Aux +24 Vdc output

Terminals TB2-4, -8, -9, and -10 provide a maximum of 200 mA of regulated 24 Vdc power for auxiliary functions. Do not exceed a combined load of 200 mA on these terminals. These terminals are for connection to ANS accessory modules and listed general signal devices only and are not for use with fire protective signaling applications. Terminal TB2-4 activation is programmed in the U6 EPROM chip. Standard chips are programmed for TB2-4 to go active (+24 Vdc) under the following conditions:

- Aux signal active
- Aux audio enable
- Bell circuit active
- RSI active

Reprogramming of these functions must be done at the factory and requires replacing the EPROM U6.

Aux audio source connection

Terminals TB2-1 and -2 allow connection of an aux audio source from additional paging equipment to augment an existing paging system. This option is not intended for continuous signal input, but may be used for paging applications. For such an operation the aux audio enable input, TB2-6, must be powered from the interrupted V+, TB2-9. This ensures that in the event of an alarm, the aux audio will not override the evacuation signal. See Figure 9 for connection details. Use of an ANSAUX Audio Transponder Module may be required for some audio sources (to match the auxiliary audio line signal.)

Optional supervisory circuit

Terminals TB3-1 and -2 can be used to connect a supervisory circuit from the FACP to the ANS. In place of normal supervision via the notification appliance circuit, an alternate method may be employed using any supervisory circuit from the FACP. TB3-1 and -2 provide a normally closed connection to the EOLR on TB3-3 and -4. The relay contact in the circuit opens on any trouble condition and reports an open circuit trouble to the FACP.

Note: To use this option, you must remove jumper shorting blocks A and B from J1. See Figure 7 for connection details.

Expander installation

The Expander is a self-contained amplifier, tone generator, power supply, and supervisory interface. It is designed to be used in conjunction with the ANS to provide additional speaker output power. An Expander can also be used as a stand-alone audio notification system, in conjunction with a fire alarm control panel, to provide voice evacuation where an automatic message is not desired. See Table 1 for a list of Expander model numbers and descriptions.

Installation and operation of the Expander is identical to the ANS with the exception that no digital message is present. When used in conjunction with an ANS, the expander acts as a slave, reproducing the tone and message generated by the master. When used as a stand-alone system, the expander connects to the FACP exactly as the ANS does, to provide automatic tone in alarm and voice override capability with the microphone.

Expander terminal designations and volume controls are identical to those for the ANS, but DIP switch configuration differs. The Expander has only one DIP switch, SN1. This determines tone, master/slave, battery, and microphone settings.

The following table shows the settings and descriptions for switch SN1. Note that the factory settings are for slave configuration.

Table 7: SN1 settings for master and slave

Switch	Master	Slave	Description
SN1-1	Off	Off	Temporal whoop signal
SN1-2	Off	Off	
SN1-3	Off	Off	
SN1-4	Off	Off	Not used
SN1-5	Off	Off	Not used
SN1-6	On	Off	Master / slave On = Master Off = Slave
SN1-7	On	On	Batteries connected On = Yes Off = No
SN1-8	On	Off	Microphone connected On = Yes Off = No

Operation

When the ANS is in normal (standby) state, the green LED stays on.

When the ANS is in an alarm state, the red LED turns on and stays on as long as the unit is in alarm. The green LED also stays on in the alarm state.

When using the factory settings, operation is as follows.

Alarm audio: Alarm signal 5 seconds - digital message plays - alarm signal 5 seconds - digital message plays - alarm signal 5 seconds - digital message plays - unit reverts to alarm signal until the alarm condition is cleared. If the microphone is keyed it will override both the tone and the message so a direct broadcast can be made. If this occurs during the initial sequence the digital message will be reset and will not play.

When the microphone is keyed or when the message is played, the green LED dims. The intensity of the green LED varies with the level of the broadcast audio. This is true in alarm state as well.

When the ANS is in a fault state, the yellow LED turns on and stays on. The green LED flashes. The flashes are coded so as to indicate the specific type of fault. When there is a fault condition, the contact connecting the FACP signal circuit to the EOLR opens, indicating the fault to the panel, which then provides annunciation.

During a ground fault condition, the second yellow LED (LED4) turns on.

Trouble codes

When the ANS enters the trouble state, the yellow LED turns on and stays on until the trouble is cleared.

The green LED flashes, using a code to indicate the specific type of fault. This code repeats with a pause between repetitions. When multiple trouble conditions occur at the same time, the codes are added together.

The number of flashes and the associated trouble conditions are listed below.

Table 8: Trouble codes

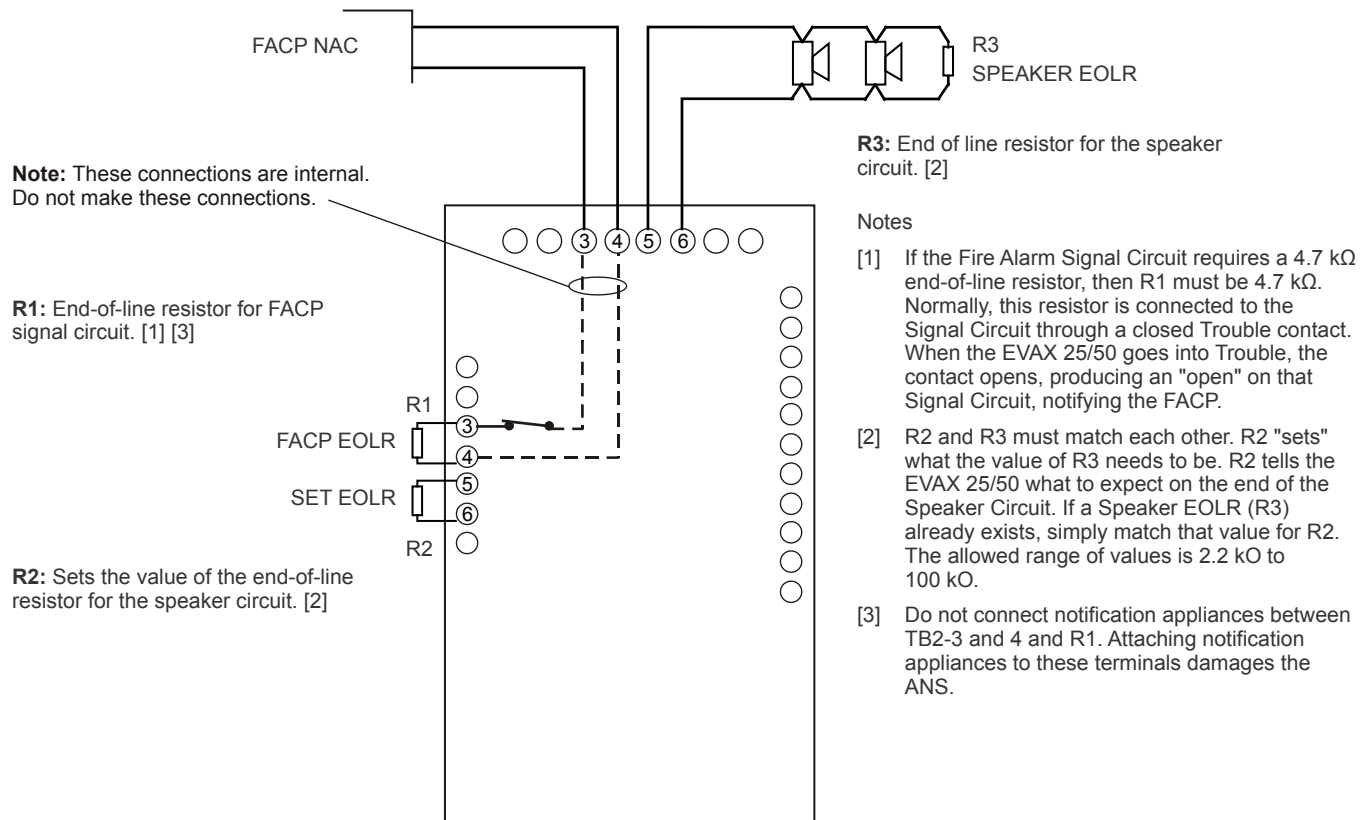
Code	Trouble
1	Power failure
2	Open speaker circuit
4	Shorted speaker circuit
6 [1]	External trouble / ground fault
8	Amplifier trouble
16	Microphone trouble
32	Battery trouble

[1] 6 flashes typically indicates an external trouble (such as trouble with an ANSREM). However, when LED 4 is also on, 6 flashes indicates a ground fault.

If both a ground fault condition and an external trouble occur simultaneously, the fault codes do not combine to create a 12-flash code.

End of line resistors

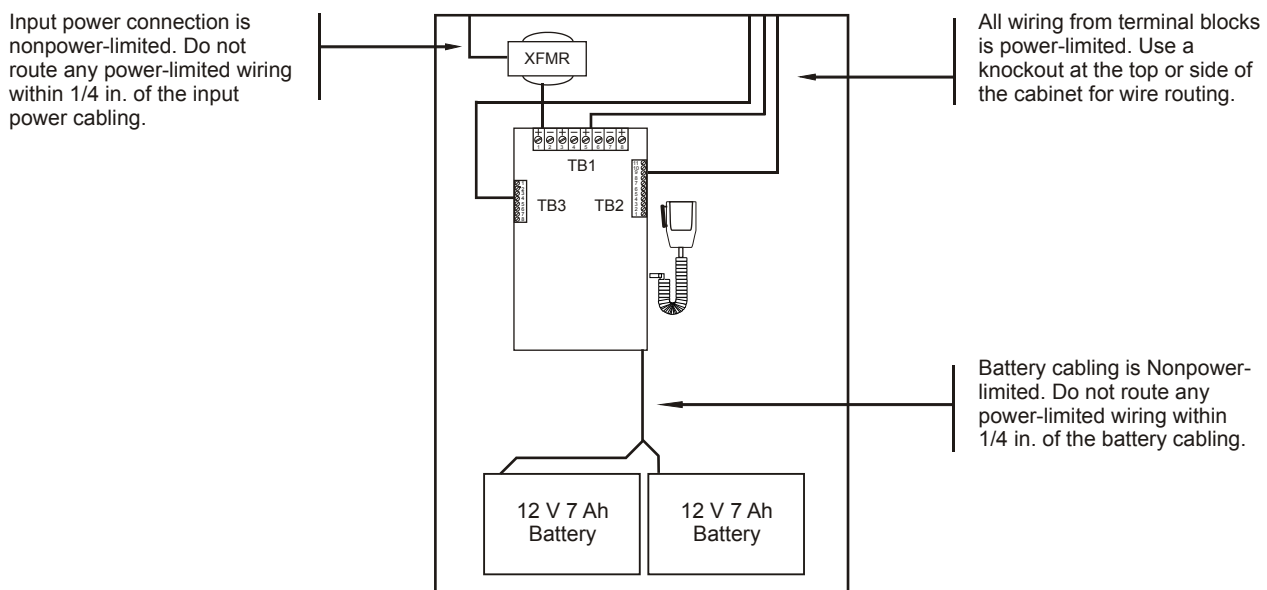
Figure 2: Details of the EOLRs used by the ANS



Applications

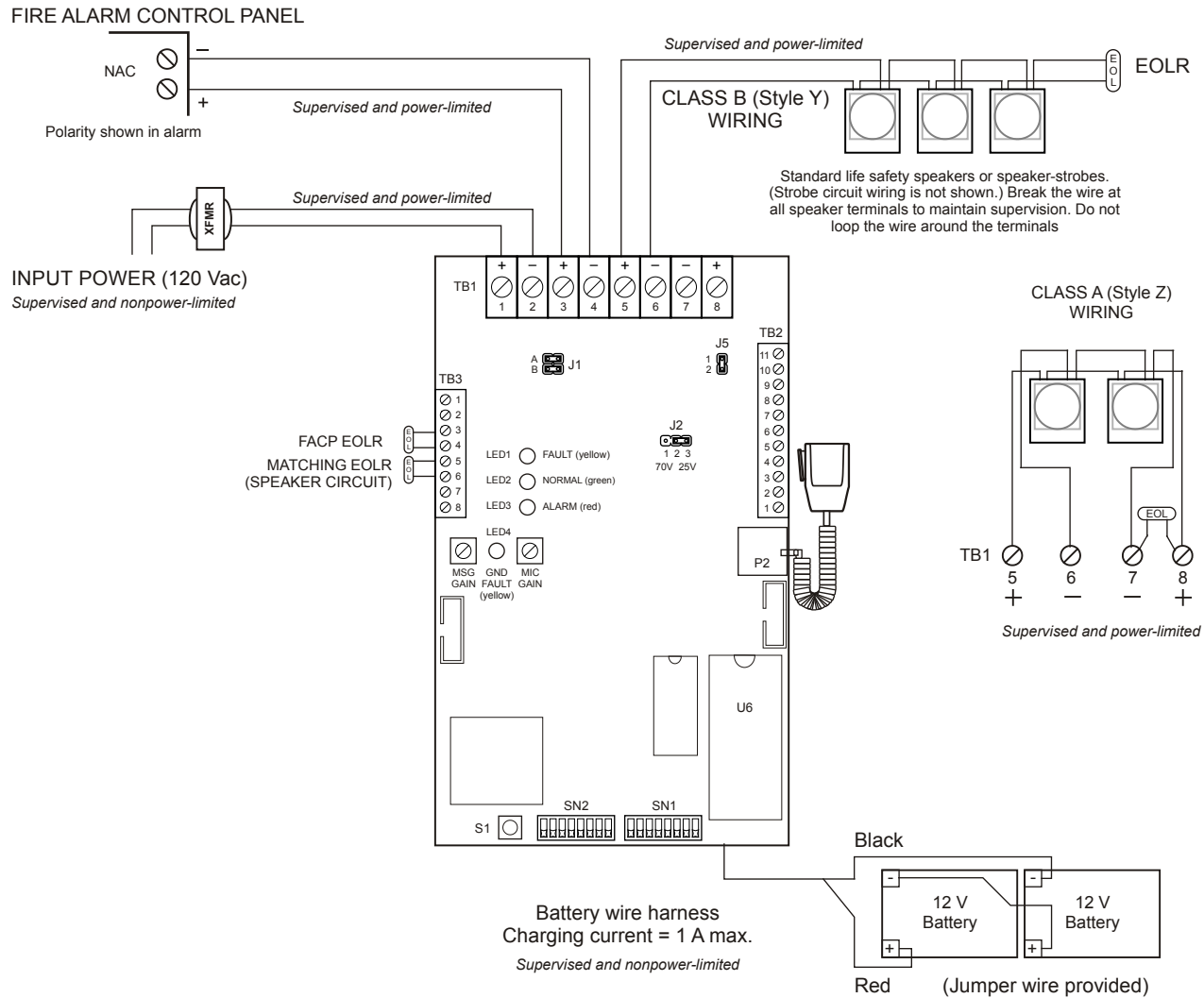
Cabinet layout

Figure 3: Cabinet layout showing wire routing



Typical installation

Figure 4: Typical installation with an FACP NAC circuit dedicated



Addressable systems

Figure 5: Wiring for an addressable system using a riser module or notification appliance circuit module

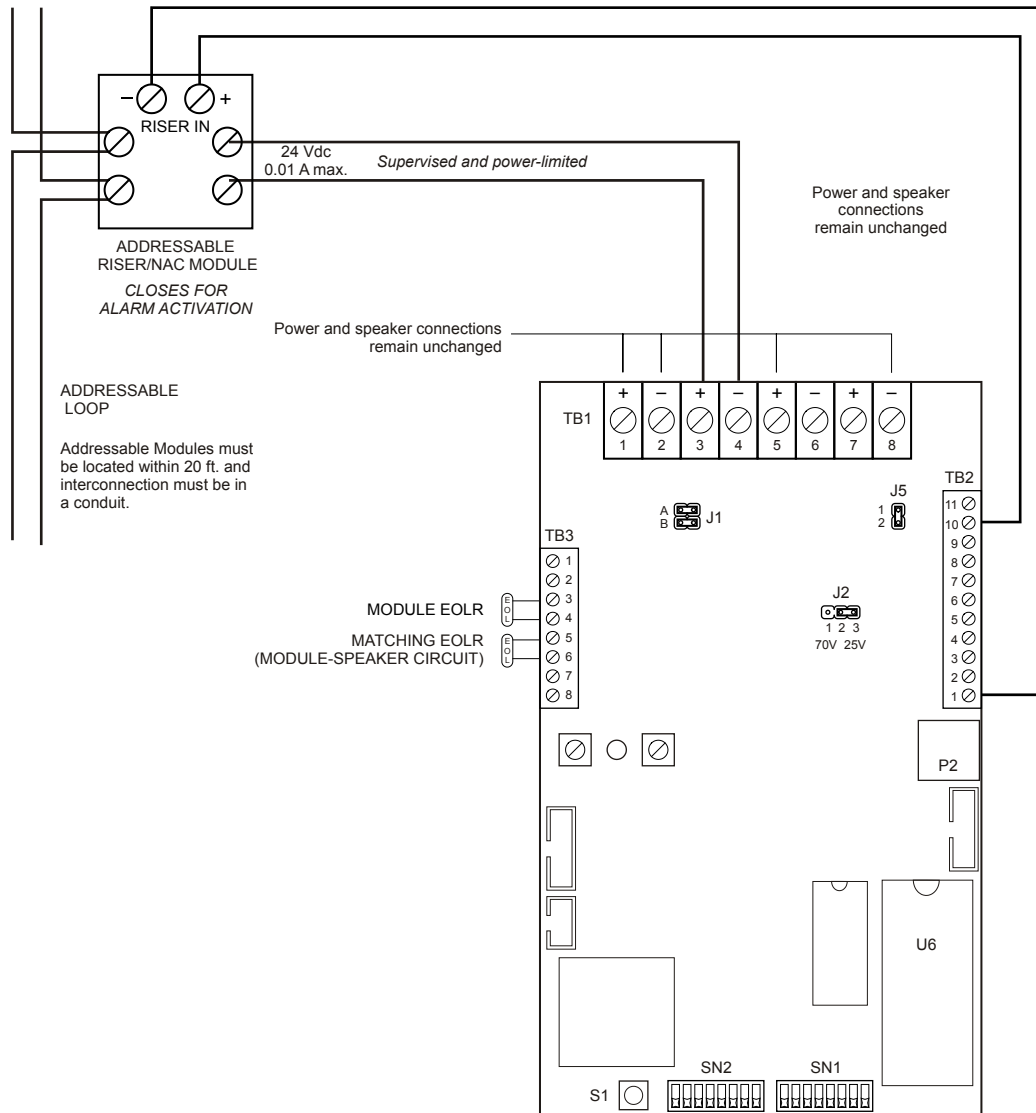
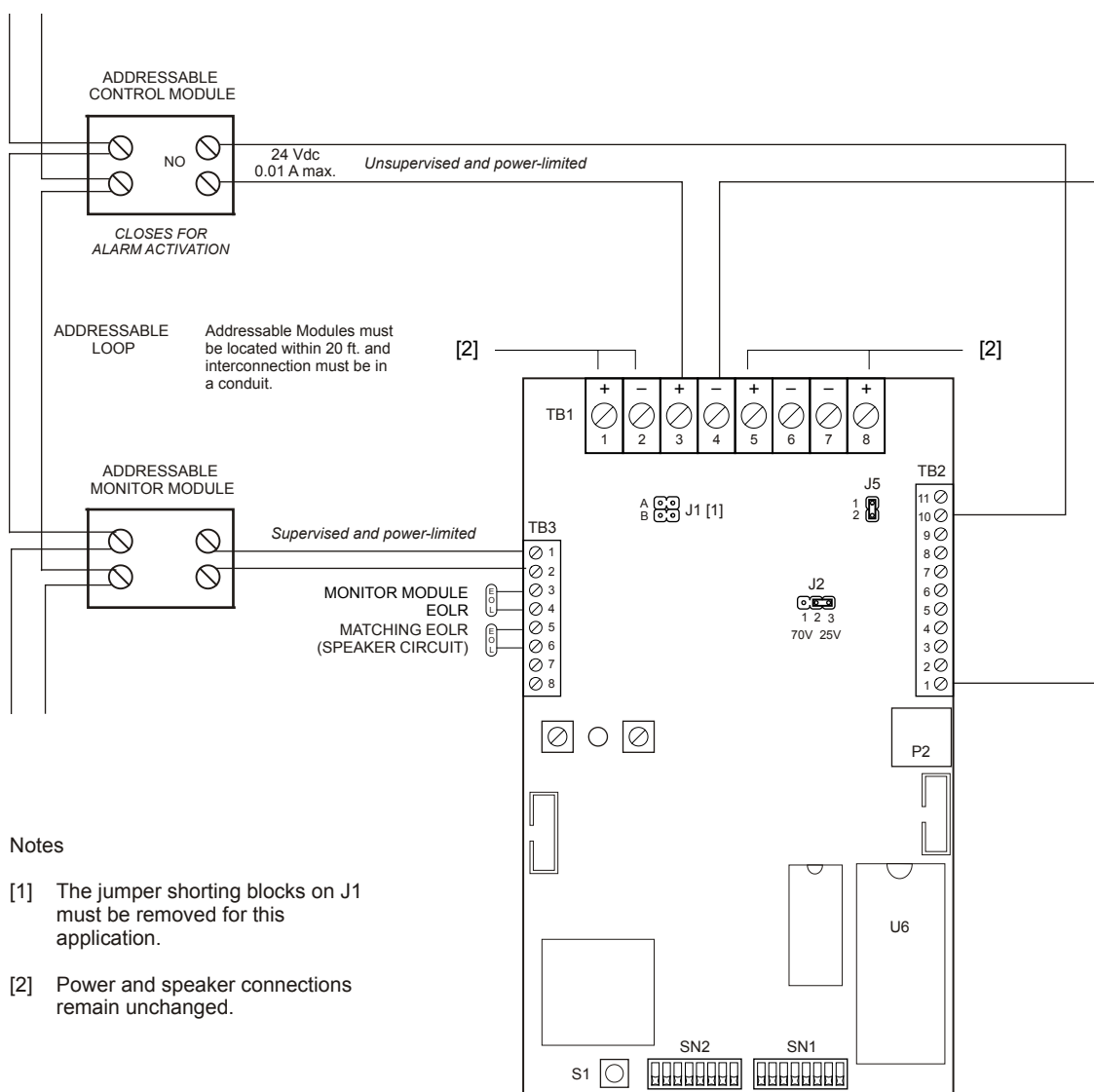


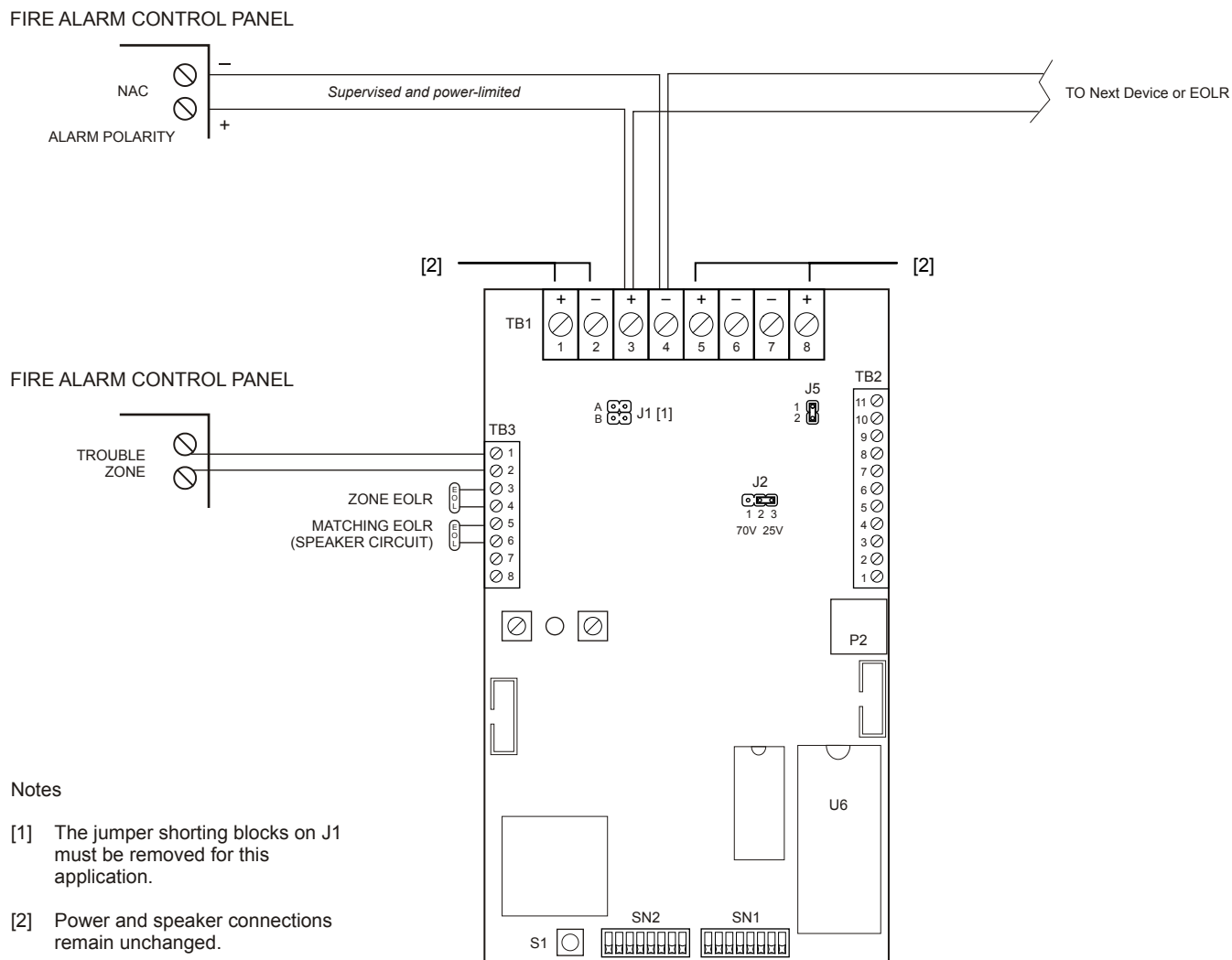
Figure 6: Wiring for an addressable system using a relay module to activate the ANS and a monitor module for supervision



Optional supervisory circuit

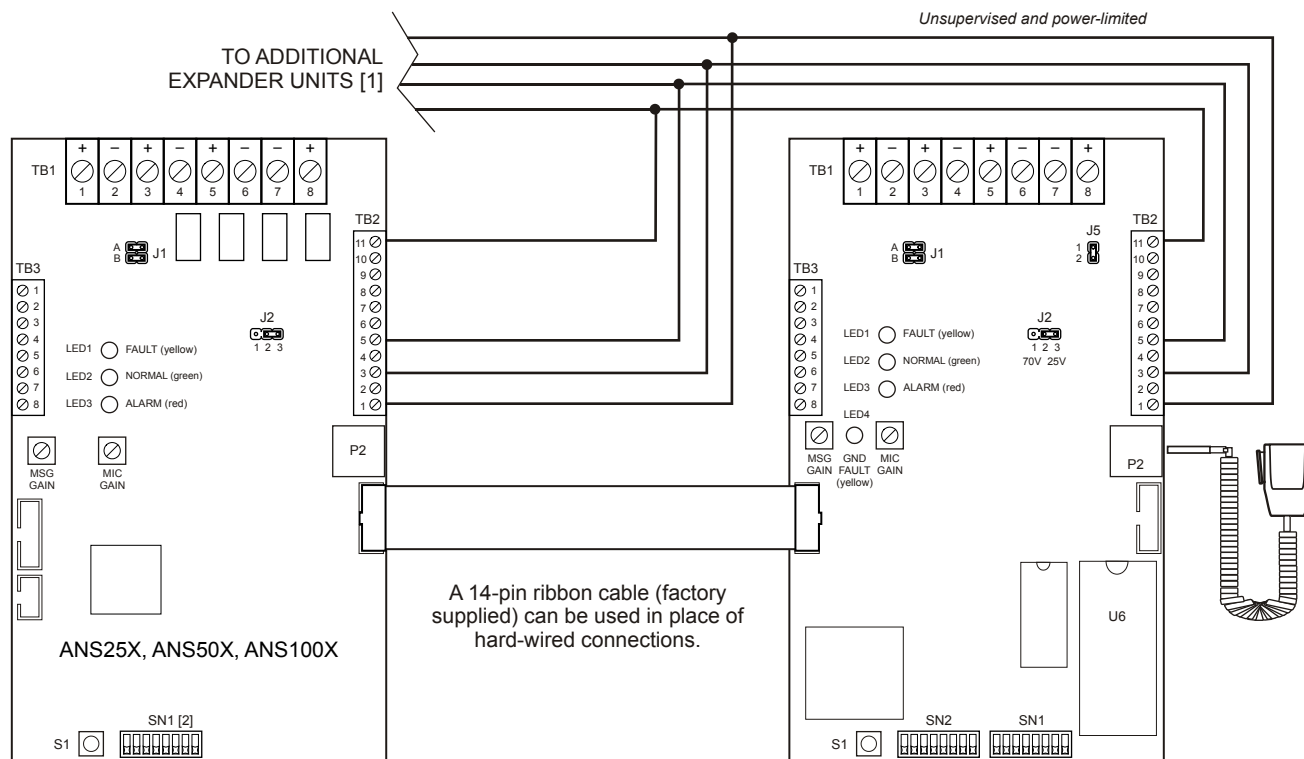
Note: We recommend that you connect the ANS to a dedicated NAC circuit using the wiring methods shown in Figure 4, Figure 5, or Figure 6. Failure to do so may cause down-line devices to be disabled in the event of some ANS fault conditions.

Figure 7: Using an FACP supervisory circuit



Multiple unit connection

Figure 8: Wiring an Expander to a primary ANS

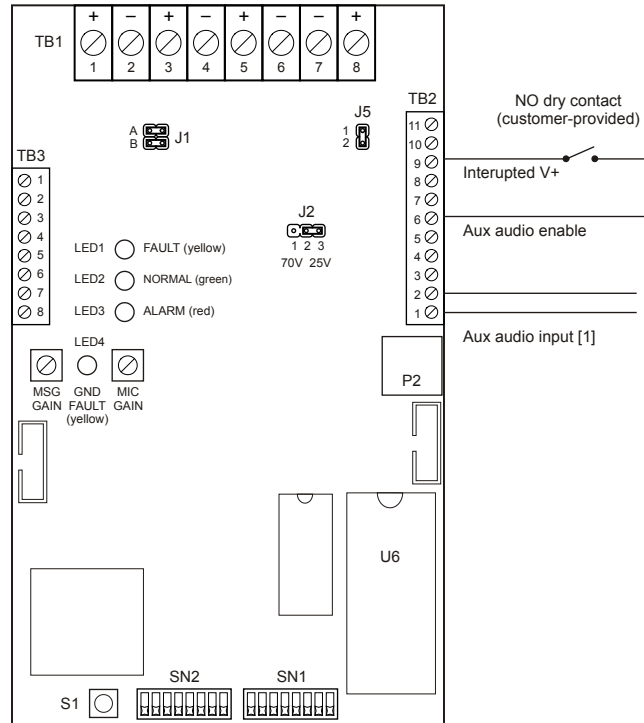


Notes

- [1] The maximum number of units that can be cascaded is 15.
- [2] Switch SN1-8 must be OFF for all units with no microphone.
3. All power, supervisory and speaker connections remain unchanged.
4. The modules must be in the same cabinet, or must be located within 20 ft. and use conduit for interconnections.

Aux audio enable connection

Figure 9: Wiring for aux audio



Notes

- [1] Aux audio input: 0.5 Vrms nominal, 1 Vrms, 1 mA max.
2. For additional input options or VOX activation an ANSAUX module must be used