EVACTRON

250 watt Evacuation Unit
Model SD250 with tone generator separate
Installation Manual *ver3.2*

The EVACTRON SD series amplifier units are a new range of Building Occupant Warning System (BOWS) which provide Automatic and Manual control of Alert and Evacuation tones.
The SD series units are available in a variety of sizes- 20, 40, 60,120 and 250 watt.

NEW KEY FEATURES INCLUDE

- Main chassis mounted amplifier with separate SD-TG (cables included)
- Removable SD Card with voice-over messages for Alert and Evacuation tones.
- A library of messages and tones easily changed to suit individual customer's requirements.
- 4 x Inputs to play custom tones and messages *e.g. school bell, lock-down, chemical alarm etc*
- Test and False Alarm messages using on-board push buttons.
- 2 wire Monitored Strobe Output, up to **3amps** to directly drive strobe indicators.
- Local microphone connection including socket for plug-in mic using EVACTRON **MIC-SD.**
- Local microphone output, for simple looping of microphone, no balancing transformers required.
- Balanced AUX input for paging/music with 3.5mm socket for speaker testing with IPOD etc.
- T.G. 1V audio output with RCA connection to drive additional slave amplifiers if required.
- Plug-in terminal connectors for easy upgrades and powering up/down.
- Test Tone for 100V speaker output calibration.

OTHER FEATURES INCLUDED

- 22-30vdc power input with reverse-polarity protection.
- Onboard LED indication for fault and function status.
- ALERT and EVACUATE tones (Evac ISO T3-default or Evac2220 selectable via DIP switch)
- Alarm input with ALERT to EVAC change-over timer 0-8 minute.
- Chime feature available for both M1 and M2 if required, upon activation.
- Monitored 100v speaker output with open and short protection.
- Fault output contacts selectable N.O. or N.C. with remote common-fault input and output.
- Fault condition after 10 minutes if no action or left in ISOLATE.
- Connections for standard wired in **003 KEY SWITCH** or **SELECTOR SWITCH**.
- IDC socket for connection to EVACTRON **KEYPAD**.
- LMU4 compatible. Multiple EVACTRON LMU4 cards can be connected.

EVACTRON SD SERIES EVACUATION UNITS

TERMINAL CONNECTIONS

TB1-1	**COM**	Common 0v
TB1-2	**AUTO**	0v to activate.
TB1-3	**EVAC**	0v to activate.
TB1-4	**ALERT**	0v to activate.
TB1-5	**SD-C**	0v to activate. SD Card input, DSW1-3 ON = latched, OFF = un-latched (default)
TB1-6	**SD-D**	0v to activate. SD Card input, DSW1-3 ON = latched, OFF = un-latched (default)
TB1-7	**SD-E**	0v to activate. SD Card input, DSW1-3 ON = latched, OFF = un-latched (default)
TB1-8	**SD-F**	0v to activate. SD Card input, DSW1-3 ON = latched, OFF = un-latched (default)

TB2-1	**M1/1V**	Mic1 audio out, to loop hand mic to multiple SD1's. Matching transformers not required.
TB2-2	**PA1**	0v to activate M1 audio input
TB2-3	**M1+**	Mic1+ balanced audio in, 1mV (default) for hand microphone
TB2-4	**M1-**	Mic1- balanced audio in, 1mV (default) for hand microphone
TB2-5	**0v**	Audio ground, 0V
TB2-6	**M2-**	Mic2- balanced audio in, 1v (default) for line level (music etc)
TB2-7	**M2+**	Mic2+ balanced audio in, 1v (default) for line level (music etc)
TB2-8	**PA2**	0v to activate M2 audio input (must be in AUTO-NON ALARM)

TB3-1	**24VDC OUT**	Output fused 1amp max (+24vdc, power for control relays, paging mics pre-amp etc)
TB3-2	**CON OUT**	Control output, 0v, 300mA max (0v out for LMU4 all call, speaker relays etc, if required)
TB3-3	**ALM+**	24vdc in to activate, reverse polarity protected. *See connection diagram for options*
TB3-4	**ALM-**	0V in to activate, reverse polarity protected. *See connection diagram for options*
TB3-5	**N.O/N.C.**	Selectable common fault relay contacts. N.O. closes in fault, N.C (default) opens in fault.
TB3-6	**COM FAULT**	COM contact for common fault relay.
TB3-7	**R.FLT OUT**	Remote common fault contact out, 0v output up to 1amp max, in fault condition
TB3-8	**R.FLT IN**	Remote common fault in, 0V in to activate, used for fault connection to LMU4/s, SRB1's etc

TB4-1	**STR A+**	Monitored strobe output, 4k7 E.O.L.	**A+ = +24vdc in ALERT**	**A+ = 0vdc in EVACUATE**
TB4-1	**STR E+**	Monitored strobe output, 3amp max	**E+ = 0vdc in ALERT**	**E+ = +24vdc in EVACUATE**

TB5-1	**+24V BATT**	Battery/PSU input +22-30vdc
TB5-2	**0V BATT**	Battery/PSU input 0v

TB6-1	**100V SPK**	Monitored, 100V speaker output	22k E.O.L supplied on speaker output terminals,
TB6-2	**100V SPK**	Monitored, 100V speaker output.	relocate to end of speaker circuit to monitor.

TB7-1	**4R**	Amplifier output 4 ohm to step-up transformer
TB7-2	**C**	Amplifier Common to step-up transformer
TB7-3	**A1 100V IN**	100v from step-up transformer, Loop to A1 input on LMU4 if installed.
TB7-4	**A2 100V IN**	100v from step-up transformer, Loop to A2 input on LMU4 if installed.

CONNECTORS

3.5mm M2 SOCKET A 3.5mm socket has been provided for connection to an IPOD etc for speaker testing.
To activate input, place M2 jumper from CTRL to LOCK and select AUTO.

Note input is looped from M2 in, so only one source can be used at once.
Un-plug TB2 if BGM/paging mic connected whilst using 3.5mm input.
M2 GAIN jumper should be in the 1V position (default) adjust M2 to required level.

4 PIN MIC1 SOCKET 4 Pin socket for connection to plug-in hand microphone EVACTRON model **MIC-SD**

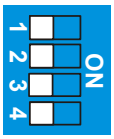
AUD-OUT RCA 1v common audio out to drive slave amplifier/s.

IDC CONNECTOR 16 way IDC- connection for keypad control, EVACTRON model **KEYPAD-SD**.

EVACTRON SD SERIES EVACUATION UNITS

FUNCTION SETTINGS

DIP SWITCH



1-Evacuate T3/2220
OFF (default) = T3 temporal EVAC tone.
ON = old 2220 EVAC tone

2-Messages in manual
OFF (default) = ALERT and EVACUATE messages in AUTO only
ON = ALERT and EVACUATE messages in MANUAL and AUTO.

3-SD-Latching
OFF (default) = Non-latching- SD Card inputs C, D, E & F only play whilst input is low.
ON = Latched - 0v momentary to trigger, will play full file whilst in AUTO.

4-100V Test Tone
OFF = Test tone off (default)
ON = 100v test tone active. Adjust **TONE VOL** to **100vac MAX** on SPK output.

TIMER ALERT to EVACUATE change-over time in AUTO-ALARM mode.

BLACK (Vertical)

0=min straight to EVAC
1=1min ALERT then EVAC
2=2min ALERT then EVAC
3=3min ALERT then EVAC
4=4min ALERT then EVAC
5=5min ALERT then EVAC
6=6min ALERT then EVAC
7=7min ALERT then EVAC
8=8min ALERT then EVAC
9= stay in ALERT

VOLUME CONTROLS

MIC1 VOL Adjusts level of MIC1 input, *see M1 GAIN jumper links below*
MIC2 VOL Adjusts level of MIC2 input, *see M2 GAIN jumper links below*
TONE VOL Adjusts ALERT, EVACUATE & TEST TONE level
MESS VOL Adjusts TONE and MESSAGE files (loaded on SD Card)

JUMPER LINKS

M1 GAIN **1mV** (default) microphone level, **1V** line level (music/PABX) & **3V** if removed.
M2 GAIN **1mV** microphone level, **1V** (default) line level (music/PABX) & **3V** if removed.

FUNC1 SPK Monitoring Disable
ON speaker monitoring is disabled (used when no speaker caps fitted)
OFF (default) speaker monitoring is enabled (22k E.O.L required)

FUNC2 Strobe Monitoring Disable
ON strobe monitoring is disabled (used when connecting multiple SRB1's)
OFF (default) strobe monitoring is enabled (4k7 E.O.L. required)

PA1 STD/SEL
STD (default) for all connections other than selector switch.
SEL link when connecting a selector switch.

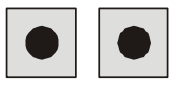
PA2 CTRL/LOCK
CTRL (default) control output 0v is active with any function other than PA2.
LOCK PA2 locked on (0V) and Control output active.
REMOVED all functions activate control output, including PA2.

COM-FLT Common Fault Contacts
N.C. (default) Closed under normal conditions, opens on com fault or loss of power.
N.O. Remains open under normal conditions, closes on com fault or loss of power.

PUSH BUTTONS

F FALSE ALARM MESSAGE
Press button "**F**" to play False **Alarm message.**

T TEST MESSAGE
Press button "**T**" to play **Test Message.**



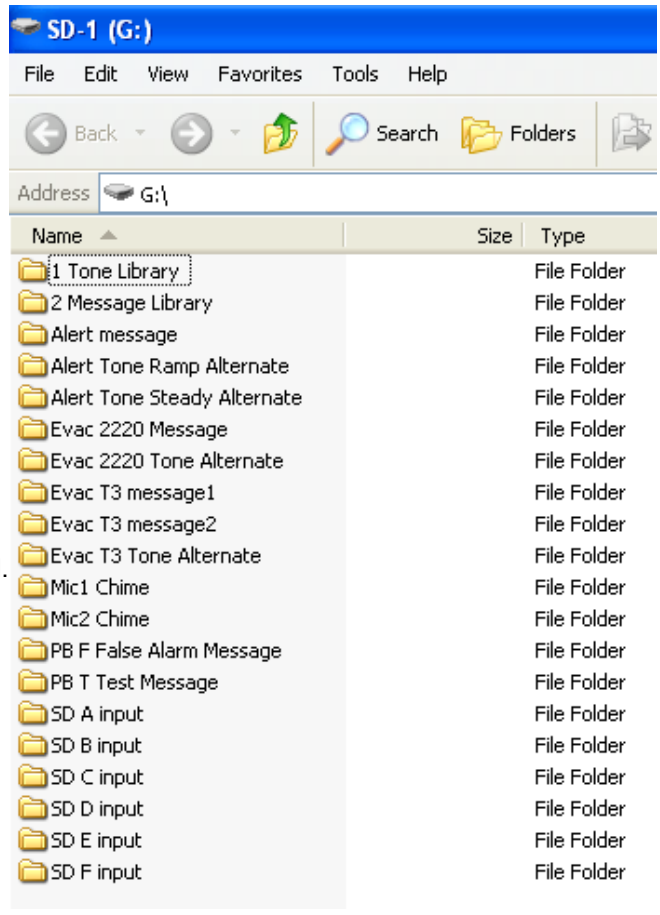
EVACTRON SD SERIES EVACUATION UNITS

SD CARD

The SD1 units have been supplied with a removable SD card, this stores a library of messages and tones for you to choose from if required. Also loaded onto the card are various data sheets and installation notes.
To view files simply remove the SD Card, located under the left hand corner of the PCB (next to IDC) then insert into a SD slot on your computer. Copy files from the library into the required trigger folder, replacing existing ones.
NOTE removing SD Card will not stop ALERT and EVAC tones from functioning.

Multiple files can be loaded into trigger folders. These will play in alphabetical or numerical order, re-name if required.
e.g. 1bell.wav 2bellmessage.wav 3bellmessage.wav (bell tone will play once followed by bell message twice)
Note a file with the same name can not be loaded into a trigger folder as it will try to over-write the file.

1 Tone Library contains various tones files to choose from.
2 Message Library contains various messages to choose from.



TRIGGER FOLDERS

ALERT and EVAC default tones are loaded on to the EEPROM.
If different tones are required, load the new files into the "Alternate" folders and they will override the default tones, once the SD Card is re-inserted. If ALERT or EVAC messages are not required, remove files from the folder.
Note if the old 2220 Evac tone is required, set DSW1-1 to ON.

- **Alert Message** -plays after every 5 tone pulses.
- **Alert Tone Ramp Alternative** -insert a different file if required.
- **Alert Tone Steady Alternative** -insert a different file if required.
- **Evac 2220 Message** -plays after every 4 tone pulses.
- **Evac 2220 Tone Alternative** -insert a different file if required.
- **Evac T3 Message1** -plays after every 3 tone pulses.
- **Evac T3 Message2** -insert for alternating messages in EVAC
  If loaded, message 1 & 2 will alternate after each 3 tone pulses.
- **Evac T3 Tone Alternative** -insert different file if required.
- **Mic1 Chime** -insert chime file, will play when mic1 is activated.
- **Mic2 Chime** -insert chime file if required, when mic2 is activated.
- **PB F False Alarm Message**-default message loaded.
  Press push button 1 "**F**" to activate.
- **PB T Test Message**-default message loaded.
  Press push button 2 "**T**" to activate.
- **SD A Input**- activated via KEYPAD-SD.
  Test message (default) insert different file if required.
- **SD B Input**- activated via KEYPAD-SD.
  False Alarm message (default) insert a different file if required.
- **SD C Input**- default file loaded, change if required.
- **SD D Input**- default file loaded, change if required.
- **SD E Input**- default file loaded, change if required.
- **SD F Input**- default file loaded, change if required.

Inputs C-F can only be activated in AUTO NON-ALARM

LOADING YOU OWN FILES

You may choose to record or supply your own CUSTOM files to load onto SD Card, they must be in the following format.

FILE TYPES SUPPORTED

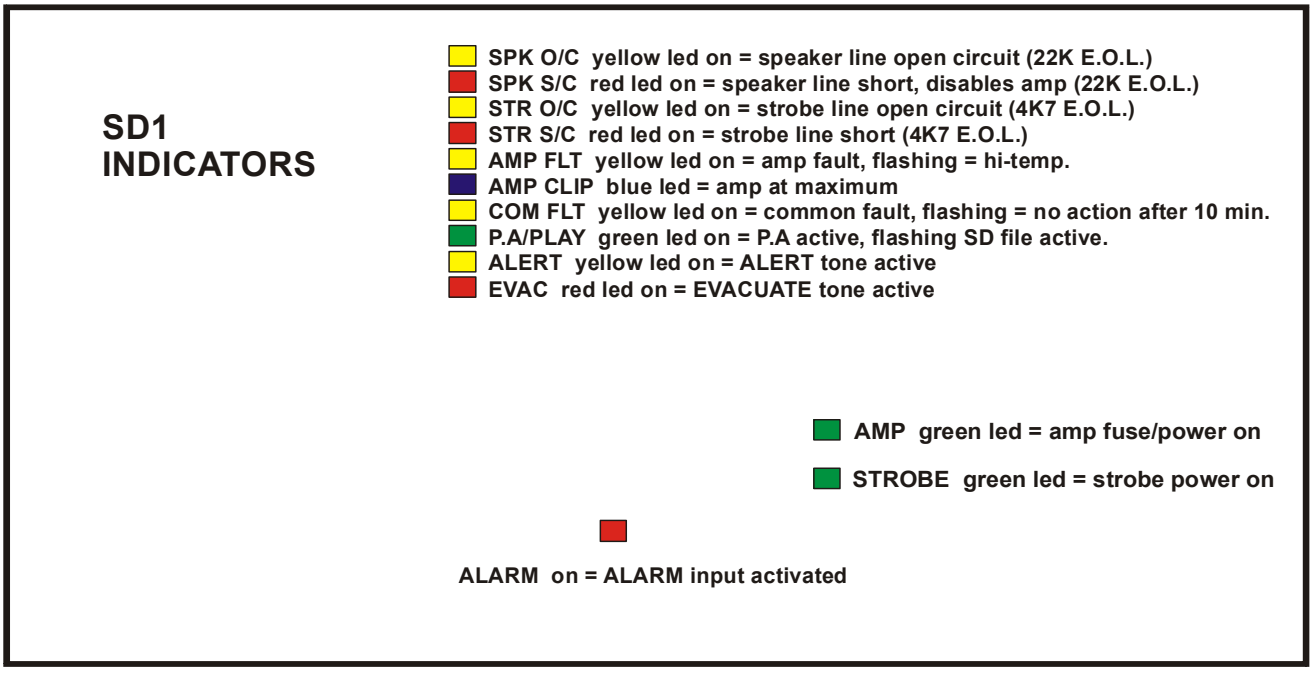
Uncompressed PCM WAVE files with the file extension "**.wav**". Files must only contain a single audio channel (**Mono audio**)
MP3 files will not work and need to be converted. Save as WAV PCM signed 16 bit, mono.
Many free programs are available to convert files to required format. A free program commonly used is called Gold Wave to edit files. Otherwise send file to brad@evactron.com.au and we can have it converted.

EVACTRON SD SERIES EVACUATION UNITS

SPECIFICATIONS

Supply Voltage
22-30vdc
Current Draw Max
Standby 120mA
SD20 20W output- 1.1 FLA
SD40 40W output- 2.0 FLA
SD60 60W output- 2.8 FLA
SD120 120W output- 5.5 FL A
Add loading of strobes if connected.
Speaker Impedance Max using Impedance meter
SD20 20W 500 ohms AC
SD40 40W 250 ohms AC
SD60 60W 166 ohms AC
SD120 120W 83 ohms AC
Speaker Output
22k end of line resistor (E.O.L.)
Recovery Time from S/C 13 seconds
Recovery Time from O/C 20 seconds
Strobe Output
4k7 end of line (E.O.L)
3amp maximum (can drive strobes directly)
Control Output
Open collector transistor 0v switch,
300mA max (to drive relay or multiple LMU4 all call)
Common Fault Contacts
1amp rating, selectable N.O or N.C

Output Levels
M1 Output 1V (for mic looping)
RCA audio out 1V
Input Levels
M1 Gain Jumper
Input Level M1 Top -1mV (mic level)
Input Level M1 Bottom -1V (line level)
Input Level M1 Removed 3V (3V line level)
M2 Gain Jumper
Input Level M2 Top -1mV (mic level)
Input Level M2 Bottom -1V (line level)
Input Level M2 Removed 3V (3V line level)
Frequency Response
Frequency response any channel (-3dB) 50Hz - 15 kHz
Dimensions
SD20-120
221mmL x 115mmD x 90mmH
(Mounted on hat section including transformer)
PCB only 200mmL x 115mmD x 40mmH (no stand-offs)
Individual Transformers
20watt 65mmR x 30mmH,
40watt 95mmR x 35mmH,
60watt 95mmR 35mmH,
120watt 110mmR x 40mmH
All specifications are for supply voltage of 24VDC and ambient temperature of 26C unless otherwise stated



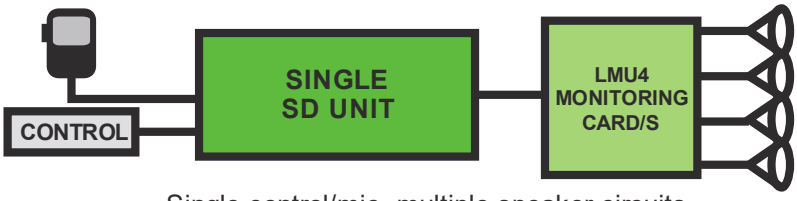
EVACTRON SD SERIES EVACUATION UNITS

TYPICAL AMPLIFIER CONFIGURATION

SINGLE SD UNIT

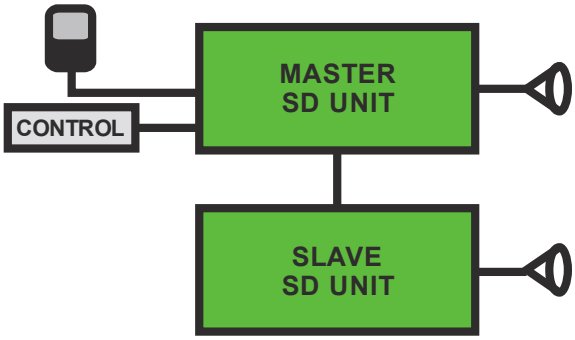
Single control/mic, single speaker circuit

SINGLE SD UNIT WITH 4 WAY LINE MONITOR



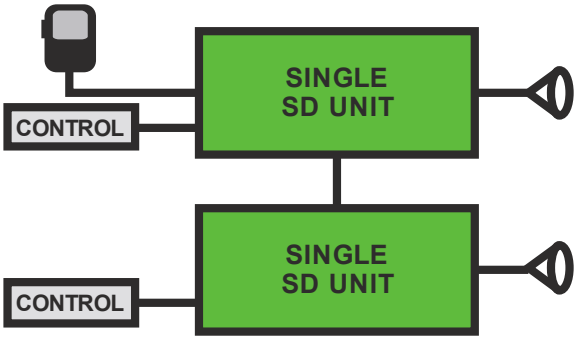
Single control/mic, multiple speaker circuits

SD MASTER/SLAVE



Single control/mic, multiple slaves
e.g 2 x SD120=240w

MULTIPLE SD UNITS



Single mic, multiple controls, multiple SD1 units

RECOMMENDED TEST PROCEDURE

1. **Make sure the PSU is capable of the full load current draw of the installed SD1 unit and ancillaries.**

2. Connect all controls and microphone if required. Leave speaker circuit disconnected for now.

3. Connect 24vdc to BATT input, all LEDS except ALARM will momentarily light up on power-up.
   AMP POWER and STR POWER green leds should remain on at all times whilst power connected.
   SPK S/C led should stay on for 13 seconds and then clear after power-up,
   SPK O/C led will come on, if 22K E.O.L. is not across the speaker output terminals.

4. With the speaker circuit disconnected, place an AC meter across the speaker output and turn DSW1-4 to the ON position (TEST TONE) the meter should read 100VAC, adjust **TONE VOL** if required, **return DSW1-4 to OFF**.

5. Connect a test speaker to speaker output (*this allows local testing without disrupting the building occupants)*

6. Press on-board push button “T” (TEST MESSAGE) the green P.A. led should flash. Adjust **MESS VOL** if required.

7. If a microphone is connected. Select P.A; speak into the microphone, green led P.A. should be steady.
   Adjust **M1 VOL** to required level. *(If key switch fitted, hand microphone will work in AUTO or override EVAC)*

8. Set timer ALERT to EVAC change-over time *see time instructions* (0 min = straight to EVAC)
   Select AUTO and activate a FIP ALARM, the red ALARM led should light. (ALM requires 24vdc supply to activate)
   ALERT or EVAC tones will activate with corresponding led.
   Messages should interrupt the tones and P.A. led will flash whilst messages are playing.

9. Test all other functions as required.

10. Once initial local is complete, disconnect test speaker and connect building speaker circuit.
    The 22K E.O.L. resistor will need to be moved to the end of the speaker circuit for monitoring to be complete.
    Test levels and adjust as required, if adjusting TONE VOL again use DS1-4 TEST TONE function to set up to 100V.
    Exceeding 100v could result damage to speakers. Check speaker supplier’s specifications if required.

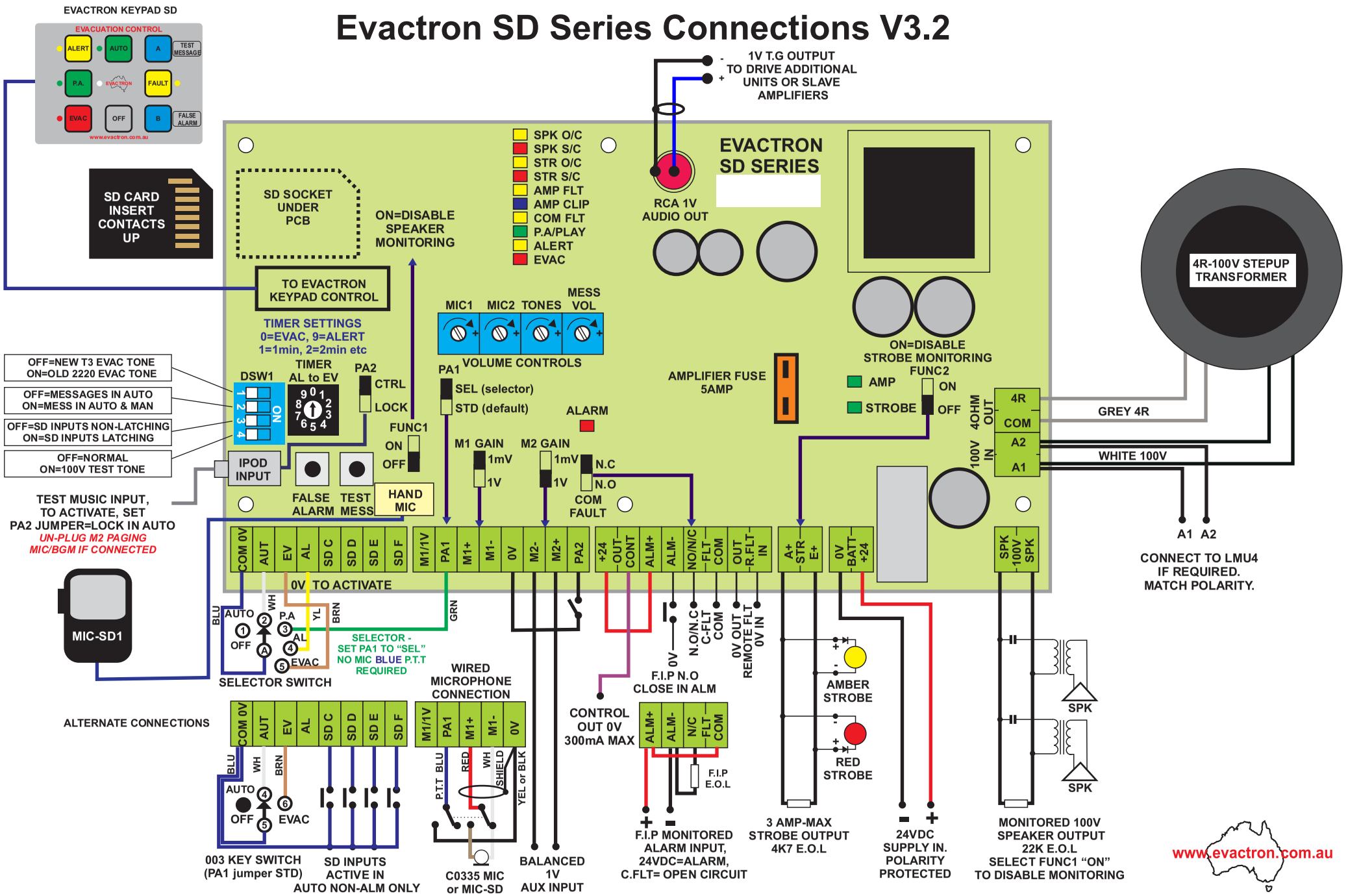
    NOTE POWERING DOWN THE SD UNIT CAN BE SIMPLY DONE BY UN-PLUGGING 2 WAY “BATT 24V” TERMINAL.

EVACTRON SD SERIES EVACUATION UNITS

TROUBLE SHOOTING

FAULT CONDITION	CHECKLIST
No leds on but power connected	Check Battery/PSU polarity and voltage 22-30VDC.
AMP POWER green led - off	Check blade fuse (amplifier fuse only) and replace fuse with same rating.
STR POWER green led - off	Overload on strobe circuit, max 3 amps at one time. Self re-setting poly-fuse.
Alarm input no action	ALM input requires both 0V & +24VDC to activate and in AUTO mode (AUT low)
SPK S/C red led stays on after 13sec	Speaker Short Circuit, disconnect circuit, E.O.L. it should be 22K.
SPK O/C yellow led - on	Open Circuit in speaker line, disconnect circuit, E.O.L. it should be 22K.
No SPK S/C or O/C fault function	Check FUNC1 jumper, should be in OFF position (SPK monitoring enabled)
STR S/C red led on	Strobe Short Circuit, disconnect circuit, E.O.L. should be 4K7.
STR O/C yellow led on	Open Circuit in strobe circuit, disconnect circuit, E.O.L. should be 4K7.
No Strobe S/C or O/C fault function	Check FUNC2 jumper, it should be in the OFF position (STR monitoring enabled)
AMP CLIP blue led on/flashing	Amplifier close to maximum gain, **indicator only**.
AMP FAULT-yellow led - on	Amplifier shut down due to over-load or over temperature, check loading.
AMP FAULT-yellow led flashing	Amplifier High Temperature condition, fan should come on.
Fan on	Fan will cycle on as heat sink requires, depending on temp/load.
COM FAULT yellow led on	Fault condition O/C or S/C, Amp fault, remote fault in, supply voltage under 22VDC.
COM FAULT yellow led flashing	Fault condition after 10min with no input activated e.g. left in OFF position.
No audio out of speakers	Check for speaker fault condition. Use tone test (DSW1-4) for 100v test tone.
No SD tones/messages working	Check the SD Card is inserted underneath (pins to top) re-insert.
SD C-F not working	SD1 must be in AUTO with no ALARM to operate as SD C-F inputs.
SD C-F not staying on	If momentary trigger is required, set DSW1-3 to ON (latched), file should play fully.
SD C-F stays on	Set DSW1-3 to OFF, file will only play whist C-F input is low. Adjust M1/M2 VOL to suit (1mV=hi gain, 3V= low gain) Press either on-board push buttons to test. If P.A led flashes check MESS VOL.
Custom message not playing	Check format of loaded files, try one from library. See SD Card file type instructions
Multiple tones/messages playing	Check input folder for more than one file loaded in folder. Leave required one.
M1 level too low/high	M1 GAIN - **1mV=mic level (default)** 1V=line level & 3V if removed. Adjust M1 VOL.
M2 level too low/high	M2 GAIN - 1mV=mic level **1V=line level (default)** & 3V if removed. Adjust M2 VOL.
Alert to EVAC Timer issues	BLUE timer switches **with clear power relay**, use the following settings- 0=EVAC, 1=2min, 2=1, 3=3, 4=8, 5=10, 6=ALERT stays on, 7=11, 8=4, 9=6min.
LMU4/s connection problem	Check 100V to LMU4, it must come from A1 & A2 of step up transformer on SD1, to A1 & A2 on LMU4, matching polarity. SD1 should have 22K across SPK *See LMU4 connection drawing for details.*
SRB1's connection problem	If using SRB1's on STR output, check FUNC2 jumper, it should be in the **ON** position (STR monitoring disabled) to allow 0V switching to strobe relays. *See SRB1 connection drawing for details.*

Evactron SD Series Connections V3.2



Evactron SD250 Connections