

Mini-Gen Mk 2

Multi Tone & Speech Generator

INSTALLATION & OPERATING INSTRUCTIONS

PA1025 Mini-Gen Mk2 – 12V

The VIGILANT Mini-Gen Mk2 is a self-contained tone and speech generator that produces a 100Vrms “Line” output for powering suitable 100V line loud speakers. It is designed to connect directly to VIGILANT fire alarm panels, but may be connected to other suitable panels. It utilises the fire alarm panel's output supervision (e.g. Bells and end-of-line resistors) to supervise the wiring from the panel to the unit, and from the unit to the speakers, for open and short circuit faults.

Mini-Gen Mk2 is available in 2 versions: PA1025 for 12V operation; PA1026 for 24V (refer to LT0364 for instructions).

Operation

Mini-Gen Mk2 has two control inputs (ALERT– , SYNCH–) suitable for internal panel connection only. It illuminates its green “ON” LED and generates the selected speech/tone combination whenever power is applied to the DC IN terminals. With power reversed it draws no current.

Signal/tone selection is by fitting 4 mini-jumpers in various combinations to pins C to G, allowing a variety of options. The tone selection jumpers may be changed while Mini-Gen Mk2 is running and the new selection will take effect at the end of the tone cycle in progress.

Up to five Mini-Gen Mk2s may be synchronised by linking their SYNCH– terminals.

If the 100V line is over-loaded (e.g. short circuit), Mini-Gen will stop generating the warning signal and illuminate its yellow LED until the overload is removed.

Connection and Fault Monitoring

The simplest method of connection is 2-wires in, 2-wires out. This is ideal for unsupervised alarm system outputs, e.g. retrofits, and those supervised by polarity reversal (ALPHA 4, SIGMA 5, FP1600, OMEGA 64, Bell Monitor Board). For these the 2-W jumper must be fitted. Refer to Fig 1.

Removing the 2-W jumper allows use of the dedicated Supervision terminal on Mini-Gen Mk2 for a 4-wire in, 2-wire out supervised connection to a panel with clean relay contacts and a separate supervision input (as with most Vigilant Australian panels) Refer to Fig.2.

The fire alarm panel supervises the 100V speaker line while the output is not active. Capacitively coupled 100V line speakers must be used, and the appropriate end-of-line resistor (EOLR) must be installed at the end of the speaker run and sometimes at the input to the Mini-Gen itself. The speaker circuit EOLR must be capable of handling 100Vrms. For values below the 27k commonly used in NZ this will need to be a higher power device. Note the power dissipated by the end-of-line resistor must be included in the output power loading (e.g. a 10k EOL resistor dissipates 1 Watt).

The capacitors must be bipolar, rated at 10V minimum, and their value should be 1 - 5uF per Watt of their speaker's load (see below). Higher values may be used, but this will increase the Fault delay after turnoff.

Table 1 – Recommended Capacitor Values for 100V Speaker Line

Speaker Load	0.33W – 0.5W	1W - 5W	10W - 20W
Recommended Capacitor	1uf Bipolar	10uF Bipolar	33uF Bipolar

Due to the charge time of the blocking capacitor at each speaker, a supervision defect/fault condition may occur on some panels each time Mini-Gen is de-activated (e.g. after a test). This will clear and can be reset after a few seconds. A label to this effect is included to stick in the panel as a reminder.

For a New Zealand fire panel with Bells supervision of up to three branches, the following combinations are possible. Fit the 2-W Supervision jumper(s) on the Mini-Gen(s). Where an EOLR is fitted to the Mini-Gen it is fitted to the DC Looping terminals of the last unit (i.e. furthest from panel). Refer to Fig 1.

Table 2 - Branch Supervision

Number of Mini-Gen Mk2s	EOLR on DC Terminals	Number Spkr Line Branches per unit	EOLR on Each Branch
1	2 x 27k in parallel	1	27k
1	27k	2	27k
1	-	3	27k
2	27k	1	27k
2	-	1 & 2 (3 total)	27k
3	-	1	27k

For added Branches, use multiple Bell Monitor Boards to split the panel evacuation output in the usual way, but check total loading of relays and fuses.

Synchronised Operation

Up to 5 Mini-Gen Mk2s may be synchronised provided that the Mini-Gen and their controlling fire panel share a common 0V connection. Wire the SYNCH- terminals on each Mini-Gen together as shown in Fig 1. The signal/tone selection must be the same on all Mini-Gen and, if used, the ALERT- signal must be wired to all Mini-Gen.

Alert/Evac Switching

With some signal options the Mini-Gen Mk2 can optionally be switched from Evac mode to Alert mode by the fire panel switching the ALERT- input of the Mini-Gen to their -DC IN terminal by means of a co-located relay (refer to Fig 1). Refer to Table 4 to see which selections this applies to.

On panels that permanently connect their Bells- to 0V (e.g. Alpha 4, Sigma 5, FP1600/Omega 1930-82 and 1930-89 versions) an open collector output can be used to drive ALERT- .

100V Speaker Line Wiring

The 100V line wiring is not SELV, and so must be segregated as per the appropriate wiring regulations. Note also the line capacitance limits - Mini-Gen Mk2 is not designed for driving very long lines. Full 20W output loading is only permitted on lines less than 1.5km of total cable length (TPS). Shorter distances will apply to highly capacitive cable (e.g. MIMS) - consult the cable manufacturer's specifications.

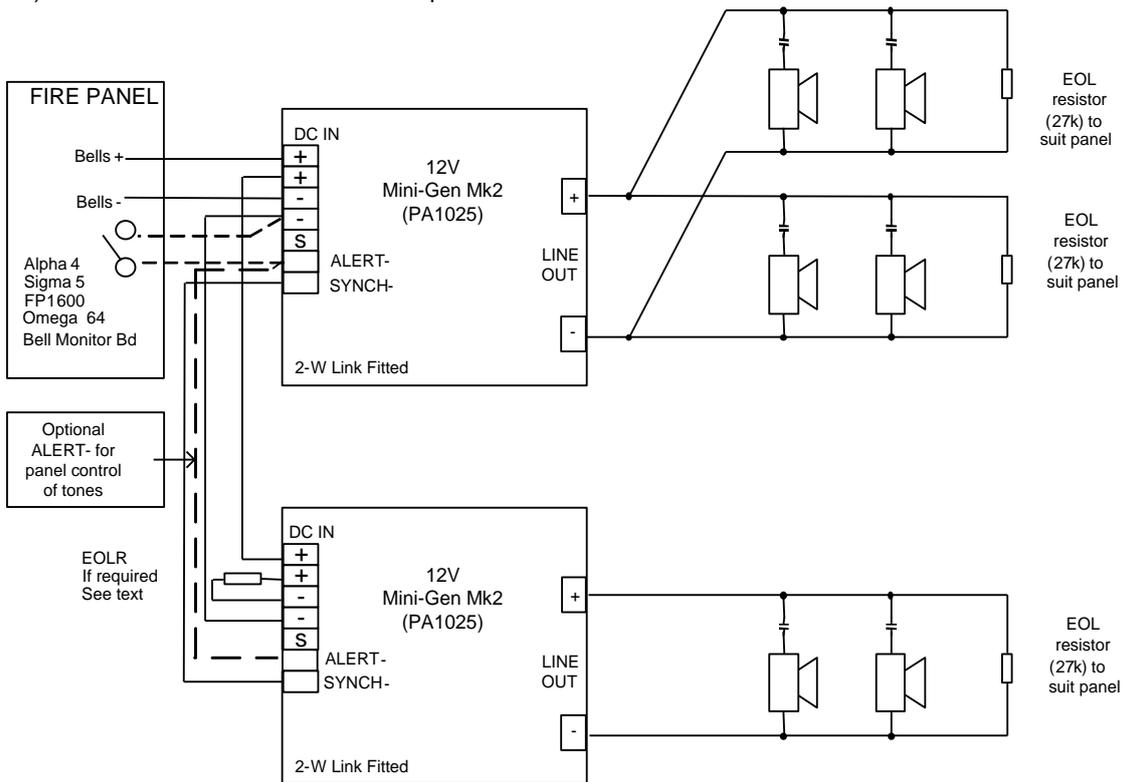


Fig 1

Example of Multiple Branches on Fire Panel with Bell 3 Branch Supervision

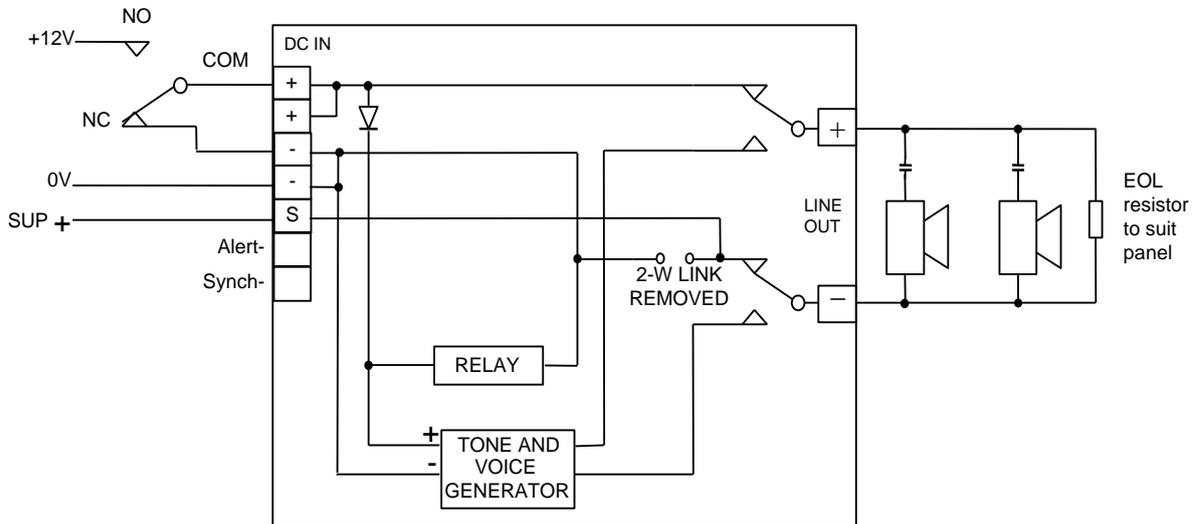


Fig 2

Mini-Gen Mk2 Connection With Separate Supervision (single pole / 4 wire)

Signal Descriptions and Features

Table 3 - Signal Tone & Message Description

Signal	Speech Message Included in Tone	
	NZ	Aust
AS 2220/NZS 4512 ALERT (MODIFIED)	16 seconds of alert tone, then "Warning, the fire alarm system has operated. Stand by for further instructions."	16 seconds of alert tone, then "Warning, the fire alarm system has operated. Stand by for further instructions."
AS 2220/NZS 4512 EVAC	16 seconds of evacuate tone, then "Evacuate the building using the nearest fire exit"	16 seconds of evacuate tone, then: "Evacuate as directed" (x2)
ISO 8201 ALERT	8 seconds of alert tone, then: "Warning, the fire alarm has operated. Stand by for further instructions."	8 seconds of alert tone, then: "Warning, the fire alarm system has operated. Stand by for further instructions."
ISO 8201 EVAC	8 seconds of T3 tone and keywords (as per Aust), then: "Evacuate the building using the nearest fire exit".	8 seconds of T3 temporal tone with "Emergency" and "Evacuate Now" keywords interspersed, then: "Evacuate as directed" (x2)
Bell	Continuous bell signal	Continuous bell signal
RH3	RH3 sound. No speech.	-----
1 min/3 min Changeover	Automatic changeover from Alert signal to Evac signal after the specified time.	

* In NZ mode the Alert tone does not have a soft start amplitude escalation. In Aust mode, soft start intervals are included, but are less than the full AS 2220 specification of 10dB.

Signal Tone Selection Jumper Settings

Table 4 – Tone Selection

N=link not fitted		F=link fitted						
Jumpers	CDE	CDE	CDE	CDE	CDE	CDE	CDE	CDE
FG	NNN	NNF	NFN	NFF	FNN	FNF	FFN	FFF
NN	NZ Speech AS 2220*	NZ Speech AS 2220 1 min changeover	Aust Speech AS 2220*	Aust Speech AS 2220 1 min changeover	Tone Only AS 2220*	Tone Only AS 2220 1 min changeover	Reserved for future use	Reserved for future use
NF	NZ Speech ISO 8201*	NZ Speech ISO 8201 1 min changeover	Aust Speech ISO 8201*	Aust Speech ISO 8201 1 min changeover	Tone Only ISO 8201*	Tone Only ISO 8201 1 min changeover	Reserved for future use	Reserved for future use
FN	Bell if ALERT– AS 2220 NZ Evac Speech otherwise	NZ Speech AS 2220 3 min changeover	Bell if ALERT– AS2220 Aust Evac Speech otherwise	Aust Speech AS 2220 3 min changeover	Reserved for future use	Tone Only AS 2220 3 min changeover	Reserved for future use	Reserved for future use
FF	Bell if ALERT– RH3 otherwise	NZ Speech ISO 8201 3 min changeover	Bell if ALERT– Aust Speech ISO 8201 otherwise	Aust Speech ISO 8201 3 min changeover	Reserved for future use	Tone Only ISO 8201 3 min changeover	Reserved for future use	DO NOT USE (factory test mode)

* = Pulling ALERT– input low selects Alert signal

Table 5 – General Function of Each Jumper

Link	General Function of Each Jumper (not fitted/fitted)
C	Speech/ No Speech
D	NZ/Aust Messages
E	No Changeover/ Changeover
F	1 min/3 min changeover or Standard/ Non-standard
G	AS 2220/ISO 8201 or Bell & AS 2220/Bell & RH3

Notes; the user must always refer to Table 4 for signal tone/speech message selection. The general functions of Table 5 are an indication of operation only, and do not apply in some combinations. If Link E (changeover) is not fitted, the "ALERT –" input state generally determines whether the tone is ALERT (input shorted to 0V) or EVAC (input left open).

Changing any of the jumper settings in change-over modes causes the change-over timer to reset completely and start from the beginning (even if it has reached the evacuate phase).

WARNINGS

Jumper links are unprotected inputs. Use only a local relay if switching, and use anti-static procedures when changing by hand.

Some components on Mini-Gen Mk2 will get hot when it has been running for a time into a heavy load, especially if a long line is used. This applies mainly to the transformer, which should therefore not be touched.

The loading must not exceed the fuse rating and the relay rating of the fire panel.

On power-up Mini-Gen Mk2 checks the contents of its speech message memory. If it finds the memory corrupt, it runs in tone-only modes and flashes the Overload LED (yellow) at 0.5Hz (i.e. 1 second on, 1 second off).

Earthing

Generally, earthing of the Mini-Gen should not be required. Provision has been made for earthing via two of the mounting holes, if required, for a specific application.

Mini-Gen Mk2 Specifications (PA1025)

Board Dimensions:	93mm x 67mm. Height 36mm from bottom of pcb.
Mounting Holes:	4 x Ø4.0 holes at 83mm x 57mm, 4 x 10mm high plastic standoffs supplied with Mini-Gen for fitting in Ø6.35 holes, drilled in 0.8-1.6mm thick sheet metal.
Shipping Weight:	0.25kg.
Temperature:	Operating 0°C – 45°C Storage 0°C – 70°C.
Humidity:	0% to 95% RH (non-condensing).
Operating Voltage:	9 – 14.5Vdc.
Operating Current:	2.2A @ 13Vdc with 20W load.
Non-operating Current:	Nil.
Power Output:	20Wrms @ 100V line at 13Vdc, 150nF line capacitance (1.5km maximum of TPS). 15Wrms @ 100V line at 13Vdc, 200nF line capacitance (2km maximum of TPS). Power reduces with reduction of input voltage.
Overload:	Automatic shutdown at 180% nominal overload.
Indicators:	On (Green), Overload (Yellow). Overload also used for speech memory fault (flashing).
Supervision Links:	Select 2-wire or 4-wire input supervision (link 2-W).
Signal/Tone Selection:	Mini-jumper links (31 combinations using 5 links possible. See Tables 4 & 5).
Signal/Tone Specifications:	Refer to Table 3.
Recorded Messages:	Refer to Table 3.
Inputs:	ALERT– : Pull below 1.2V (@ 1.3mA) to select Alert signal in preference to Evac signals. SYNCH– : Synchronises signals between up to 5 Mini-Gens.

Mounting Provisions in Other Products

FP1600: There are two Mini-Gen footprints at the bottom left hand corner of the FP1600 gear plate. These footprints have Ø6.35 holes for fitting plastic standoffs, HW0130, that are supplied with the Mini-Gen.

Sigma 5: There is one Mini-Gen mounting position at the bottom left hand corner of a Sigma 5 Panel. Sigma 5 Panels are supplied pre-fitted with Mini-Gen mounting hardware.

Accessories included with PA1025

PART NO	DESCRIPTION	QTY	WHERE USED
HW0130	PBR10 PCB Standoff	4	For mounting Mini-Gen in Ø6.35mm holes
LB0565	Warning Label	1	Fit to panel if required
RR0762	27k0 1% resistor	3	EOLR for Bell Monitor Bd, Alpha 4, Sigma 5, FP1600
CN0123	PCB jumper links	3	Signal Tone selection

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