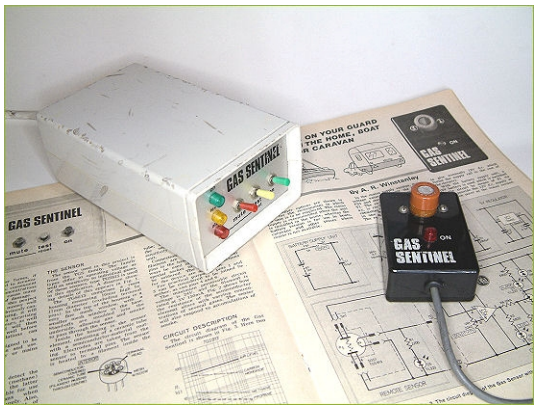
Gas Sentinel

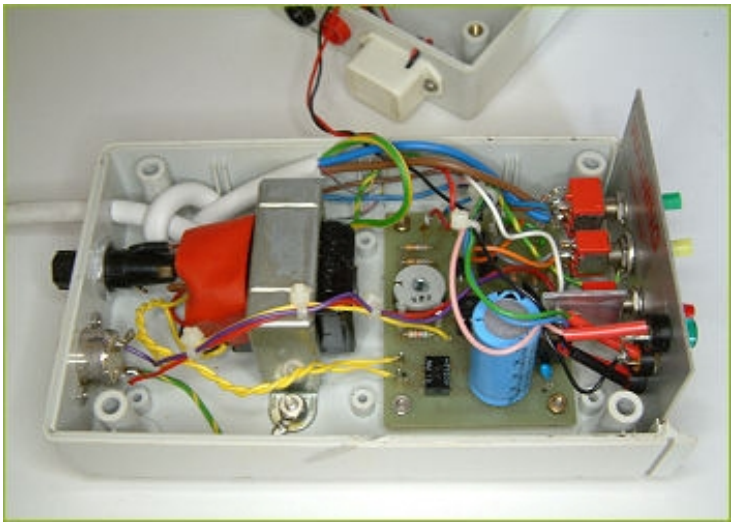
Built in Aug. ’79 and published in April 1980 Everyday Electronics



One of my favourite constructional projects, this gas leakage detector used a Figaro TGS813 sensor with a simple op.amp acting as a comparator. The circuit was very simple, so any hobbyist could build it, and it triggered a thyristor and a transistorised buzzer to warn of a rise in gas levels.

I tried to make the prototype as compact as possible, using a slim Verobox with anodised aluminium panel. I used my (by then) preferred way of styling the front panel with plastic lens clips for the led’s, colourful plastic covers and panel dress nuts for the toggle switches. I combined a Test/ Reset function into one switch. I’d called it “Gas Sensor” but the Publishers re-christened it “Gas Sentinel” and re-did the Letraset accordingly.

It was my first “cover project” (at last!) since my Mains Delay Switch in EE April 1978. Here are some colour pictures:



- My p.c.b. was featured in January 1981 EE “Making Printed Circuit Boards” by Technical Sub Editor Steve Dollin.

The original prototype is scruffy and looks the worse for wear. Inside the unit, everything was like the day I left it back in August 1979, but I guess I'd messed around with it as there was a knot in the mains cable. I knew better by then! I think I'd uprated the 3-core cable from the original 3A one shown in the photos, to 6A. I didn't earth some of the metal parts, I notice.

Today I'd put the transformer and fuse on the p.c.b. as well, to simplify the wiring. I liked to use preset resistors with a little thumbwheel on them rather than the skeleton types which needed a trimmer tool or screwdriver to set them. It wasn't exactly intrinsically safe as there was no spark suppression whatsoever (a neighbour, an oil refinery engineer, scorned the whole thing!). The Gas Sentinel was hardly failsafe either, as the sensor DIN plug could disconnect and the system would never know! But it did its job very well, giving a clear go-no-go indication of gas levels.

I still had no heatshrink (that expensive RS precision heatgun was beyond reach at that time, but it was high on my Wish List) so ordinary PVC sleeve was used here and there. It all fitted together well on its little p.c.b. and looked quite smart by my standards.

The unit's warm-up routine was its party act – thanks to the sensor needing to stabilise, all three led's would light up to start with and after the TGS level dropped again the 'Level' led would go out. The unit could then be reset to 'arm' it. It was a little bit of novel theatre that was fun to watch at the time.

The sensors came from Watford Electronics' mail order shop (who became Saverstore.com, the IT retailers), whom Google Street View shows were a tiny shop in a residential sidestreet (see Interview #3). The remote TGS sensor was fitted on a small box, and an LED (with fancy lens clip of course!) indicated power was being delivered to the sensor's heater. A Q-Max chassis cutter gave a better finish around the TGS socket, and I used yards of thin 3-core cable to hook it up: after all, I had 50m of the stuff left over from my failed Multi Station Home Intercom project. EE added white Letraset.

Fred Bennett also asked about its use as a smoke detector – I replied that it detected the gases within the smoke (carbon monoxide and others) rather than the smoke itself so it 'should' be pretty good as a smoke alarm. There was quite a lot of interest and some interesting reader feedback for a change. One reader pointed out that propane and butane are heavier than air (unlike smoke) so the sensor should be placed low down (unlike a smoke alarm), a good point that I'd overlooked.

I hope to refurbish the prototype and get it running again once I re-solder the DIN plug. The Gas Sentinel was the precursor to a 4-channel system published 3½ years later in December 83. Was I starting to get tired of it all by then?

You can download the original constructional article as a PDF from www.alanwinstanley.com.

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