



## **Introduction**

Constant Vigil has been supplying battery backup devices to the New Zealand market since 2012. We have a product range, track record and technical expertise unique in the NZ market and are the only local manufacturer of this type of equipment.

## **Who are we?**

Constant Vigil Ltd was founded in 2012 by Wayne Masters and Alan Jacks. At that time, the UFB fibre rollout was at a very early stage within New Zealand and we recognised that backup power support in the event of a power outage was becoming increasingly important.

Alan Jacks is a Chartered Engineer and holds an Honours Degree in Combined Engineering Studies specialising in hardware and radio engineering. He has over 30 years experience in R&D and provides technical consultancy to organisations in NZ, Australia, United Kingdom and the United States through his company Xitek Design Ltd, founded in 2010.

Alan began his career with Plessey Military Communications in 1989 (later becoming Siemens) and has also worked with accomplished companies such as Nokia and Cambridge Silicon Radio (CSR, now Qualcomm). In 2003 he assisted development of the BlueCore BC01 Bluetooth IC, a precursor for their global and dominating product range. Alan co-authored a Bluetooth proximity patent around the same period. Alan has a wealth of design for manufacture experience, taking products from conception to volume manufacture globally.

Wayne has been Managing Director of Yorb Limited since 2001. Yorb is one of NZ largest privately owned technology service providers and offers a broad range of strategic technology services to businesses via branches throughout the North Island.

## **What do we do?**

Constant Vigil Ltd has been selling the Sentry product line to New Zealand users for the past six years. This product line is a battery backup device designed specifically for DC powered devices and initially has been aimed squarely (though not exclusively) at the New Zealand domestic market for end users running a UFB internet setup. Initial consultation with Chorus NZ was instrumental in setting the original specifications.

We are aware through feedback from our clients that there is no comparable product available in New Zealand. Indeed, recent feedback from potential clients in the United Kingdom has been that there is no comparable product available anywhere else in the world at this time. Traditional UPS equipment is designed to support AC based equipment and, whilst readily available and cost effective, is recognised as suffering from poor efficiency, particularly on light loads. They also generate excessive amounts of heat and come in physically large and heavy formats.

We also know that product design and reliability are crucial, and this can be evidenced by the experience Spark had last year with an overseas sourced unit that was clearly poorly designed and constructed. Constant Vigil Ltd have a track record for reliability and safety, proven in the NZ market over the past 8 years.

Please refer to Appendix 1 for more information on our product development history and current product range.

## **Why Battery Backup?**

We know from client feedback and personal experience, that the cellular network can quickly become overloaded when there is a sudden upsurge in demand. Examples are natural disasters, civil



emergencies and power cuts. Even if a phone call or text can be made, access to internet services can be unbearably slow, whereas a battery backup can allow clients to continue to access their VOIP phone systems and internet devices such as laptops, tablets and mobiles reliably and without interruption.

### **Observations from Clients**

Surprisingly, over the period where Constant Vigil Ltd have been selling within New Zealand; no reports of outage times greater than those supported by our product (4-5 hours) have been noted. Customers have not raised any concerns that the current offered support time is in anyway inadequate although some rural customers have been proactive and chosen to utilise larger automotive batteries in combination with our Lite product.

When surveyed, customers are keen to have additional local information e.g. expected run-time, so that some planning can take place should extended outage times be observed. Some customers have enquired about the option for remote monitoring services. All our models are enabled for optional third-party ethernet monitoring capability. This can allow us, or any other party with authorised access, to monitor battery health, unit status and outage history via a secure website.

### **Technology barriers**

Battery technology continues to improve, but despite this, the battery remains the weakest piece of any backup product. Typically lead-acid and lithium batteries can be expected to remain useful for 2-3 years but in most cases, there is little indication of a faulty or failing battery. Patented technologies are available to monitor battery chemistries, but these tend to be costly and generally ineffective.

Generally, the only sure way of knowing a backup battery is operational is to undertake periodic testing. From experience it is clear that this is not an acceptable responsibility to place on the end-user; indeed, users seldom test these products and complain bitterly when batteries have failed some years later, generally at a time when they need them most.

Monitored battery failures, of which there are few over recent years, are indicative of batteries (lead-acid and Lithium) over 3 years of age and this aligns well with Internet reported statistical data. Remote monitoring of units is the only reliable way of ensuring battery capability remains in line with requirements.

Please refer to Appendix 2 for more information on battery technology and performance.

### **The Commission 111 Contact Code**

We can demonstrate that the Sentry Pro system could achieve the 12 hour outage support requirement assuming batteries are new and charge rates/temperature are controlled to ensure best longevity.

Issues with recovery time after an outage however would need to be addressed. With the smart charging technology we employ, a battery will take as long to recover to a full charge as the time it was employed, i.e. if a power outage lasted 4 hours, the battery would require 4 hours to return to a 100% charge.

Batteries require smart testing to ensure they remain operational as end-users cannot be relied upon to undertake such tests. A dual-battery solution provides a platform for monitoring of any individual battery whilst ensuring outage support is not impeded.

There are many ISPs within New Zealand, each offering the end customer a different bundle of equipment. The equipment is wide-ranging and can differ in total power requirements from 10W to



22W. Obviously actual support times will be dependent upon the equipment requiring power. Our testing (above) with an 11W system would see a 50% reduction in support time if retested with a 22W system. To compensate, the Sentry Pro product would require double the battery capacity (40Ah) which is equivalent to a modest size automotive battery.

Techniques can be employed to monitor the batteries and provide local indication of failure. A considerable number of modern homes in New Zealand have a distribution cabinet, usually within the garage, which acts as the entry point for fibre to the building. This is the most obvious place for installation of any backup device but affords the least opportunity for alerts to be heard or observed.

Remote monitoring would be recommended to provide an improved level of care and reliability.

### **Summary**

Constant Vigil Ltd have a proven track record over 8 years in supplying battery backup devices to support DC based equipment, especially UFB domestic installations. Our products are New Zealand designed and assembled and are unique in the marketplace.

### **Offer of Service**

We have the technical expertise to assist the Commerce Commission in finalising the requirements for the code in relation to this type of technology and would be prepared to offer our services and advice without obligation and free of charge. An invitation to participate in the upcoming workshops would be welcome.



## **Appendix 1 – Our Products**

Our product history starts in 2012 with the Sentry Lite model. This unit facilitated an external battery connection allowing user scalability of battery. Rural New Zealand customers, where power supply problems were frequent, typically connect larger (automotive) batteries to the system and ensure supply for several days.

A new Integrated model was developed in 2016 to provide a more aesthetically pleasing wall-mounted solution. Using lithium battery technology, similar outage support times were measured when compared to the early lead-acid technology, and a metal enclosure was developed to ensure user safety.

Over time, and through customer feedback, models have evolved to add features such as USB charging capability and to improve the overall user interface. Design enhancements have been introduced to further improve efficiency and outage support time but also enabled users to connect to solar power systems, further extending outage support.

The current Sentry Lite product range typically provides 4-5 hours backup support time when installed with New Zealand supplied ISP equipment but the support time is variable. A reported UK installation observed 8 hours of support time. It is important to also note that home/office supplied equipment can vary greatly depending upon the ISP and these have wide ranging power requirements.

The Sentry Integrated model has been recently re-designed to enable connection to an optional battery pack, thus doubling support times of this model. It is possible to connect further cascaded battery packs for extreme outage support and also connect solar panels for daylight energy enhancement.

An enhanced Sentry Pro model is scheduled for Q4 2020 which will offer two batteries within a single enclosure as well as further user enhancements.

All models are enabled for third-party ethernet monitoring capability via a secure website.