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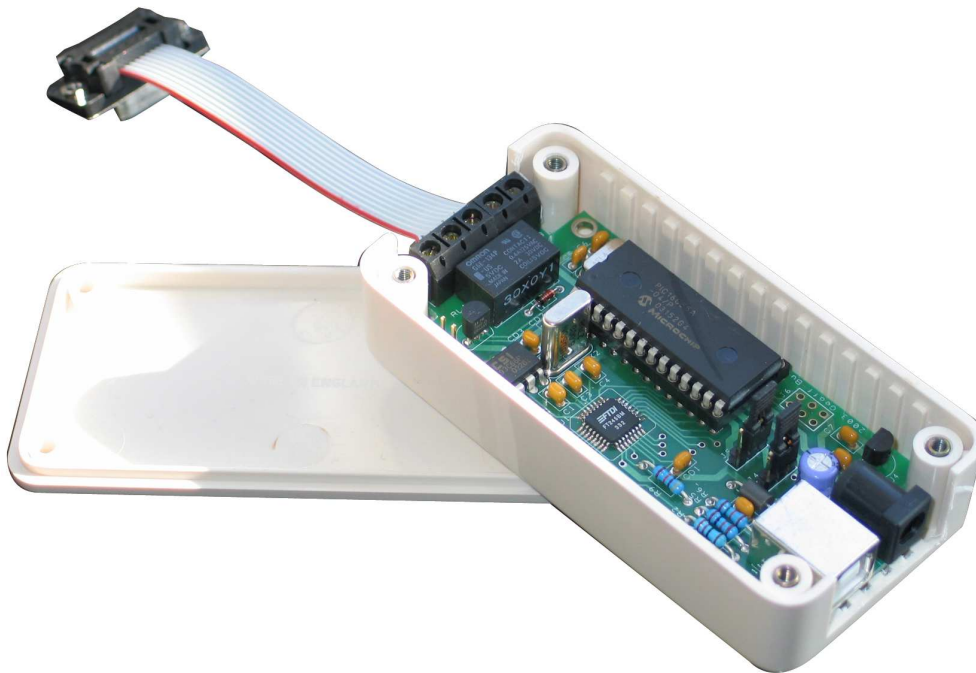
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Case Study Five

GBE in house products: The multi-purpose USB Relay

http://www.gbelectronics.com/usb_relay.htm



The Market

During GBE's design of their successful and award winning BloodTrack[®] product they required a USB powered interface to control the locking mechanism on a range of different blood bag refrigerators. The solution had to be easy to interface into the blood tracking software application, with drivers that could run on a range of operating systems. An extensive market search revealed that there were no such products available, which led to GBE's design team creating the GBS USB Relay.

Product Development

The Brief

GBE's brief was to design a small form factor, low cost device that would allow a PC or Apple Mac to control a single external device using a relay contact attached to the USB port.

The device needed to be simple for a programmer to use and appear as an additional COM port (network port on the Apple Mac) and it had to be easy to interface into a majority of third party software.

The main points of the design were:

- Functionality of the USB Relay, with focus on the simplicity to interface and integrate with third party software
- Small form factor design to be used as a boxed or OEM solution
- Ensure the system passes all relevant EMC, LVD and safety standards
- Design the product with competitive manufacturing costs in mind
- Manufacture, programme, and test the USB Relay onsite at GBE
- Watchdog timer to monitor the internal software application or USB
- Can be externally powered if required - 4.5-12V

New update for 2009 –

- Mains switching
- Custom inputs to detect external digital signals – configurable at the manufacturing stage, to further integrate with final application

The Final Design

The design of the USB Relay was a complete success. Its integration into GBE's BloodTrack[®] unit enabled the kiosk to control the locking mechanism on every blood refrigerator they were connected to. The integration in the BloodTrack[®] software was extremely straight forward. The key benefits of the final product were:

- Low cost
- Bus- or self-powered for flexibility
- N.O or N.C. contacts
- Programmable watchdog monitors application and/or USB
- Screw terminals for easy connection
- Screw terminals also carry 12V power (when self-powered)
- Appears to programmer as additional COM port
- Choice of command sets
- Available in enclosure or as stand-alone PCB for OEM applications
- Mains switching
- Custom input to detect external digital signals

At present the USB relay is now installed in over 150 hospital blood tracking systems throughout the UK, Ireland, North America and Canada.

A copy of the datasheet can be found at:

http://www.gbelectronics.com/downloads/case-studies/gberelay_datasheet.pdf

The product is CE marked and full product release documents detailing the final manufacturing process were prepared in accordance with GBE's ISO9001:2000 certification requirements.

Other Uses and Markets

After designing the product, GBE realised that there were other uses for the USB relay product, both in its current design and with further customisation. This was both by our market analysis and numerous customers responding to GBE posting the product on our Website. We are, of course, always interested to hear of other innovative and interesting uses!

The final applications have varied dramatically (see some examples below), however the main uses can be summarised as:-

- A USB powered, PC or MAC controlled switching device
- Either inside existing equipment (such in a kiosk) or as an external boxed device which can be easily connected between the controlling PC and equipment that requires switching, with no extra power connections required
- Can offer remote switching/control of equipment as part of a networked wireless system
- A virtual COM port, so can be either interfaced to existing software applications or a simple application can be written to control it

Examples of some of the uses and systems the USB Relay has been used in:

- Locks on doors for thumb scanner
- Controlling a door lock and linked to a card swipe system
- Switching of powered devices
- Control of a document shredding machine
- Remote weather stations to control the electricity generator switching (see below)
- Inside a kiosk to control the access to a blood refrigerator (see below)
- University alarm system to signal period end
- Triggering a buzzer on a scanning production line system
- Controlling power to JTAG breakouts on a production line system
- Inside a kiosk to control dispensing of medicine
- Testing push-to-talk (PTT) on a mobile network
- Multi relay version to control a multi-compartment refrigerator (see below)

Remote Weather Station



In late 2004 the USB relay was installed into seven remote weather stations to remotely control power generators. The pictures show the generator and scientist being flow in and the final USB relays *in situ*



BloodTrack® Kiosk

BloodTrack® – installed onsite at the Isle of Man, UK. In this installation the blood refrigerator is just off to the left



HemoNine®



A 10 relay version was designed and built to operate the nine drawer HemoNine® blood refrigerator as part of GBE's BloodTrack® product range.

Note – there are now two part numbers for the USB relay, since the re-design in 2009:

GBS-USBR2-HP – is the mains switching unit

GBS-USBR2-LP – is the low power switching unit

Should you require further information on this or any of our other products, please do not hesitate to contact GBE. <http://www.gbelectronics.com>
