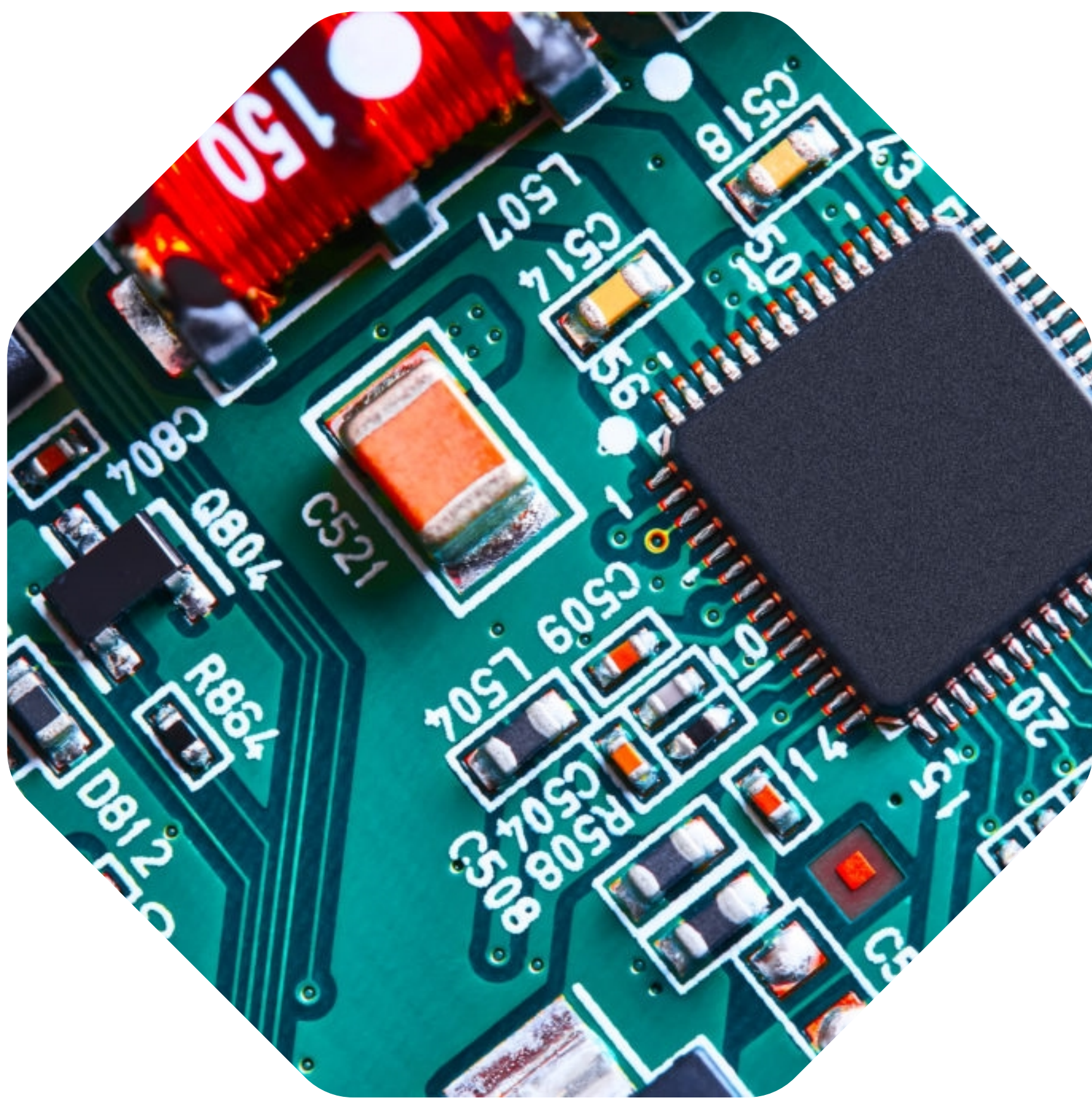


Prodigy
TECHNOVATIONS



EMBEDDED INTERFACES SOLUTION

A typical embedded design mainly has various integrated circuits interconnected using different interfaces based on the architecture needs, The typical interfaces that we come across in any embedded designs are the legacy RS-232, RS-422 and UART and the currently used interfaces like SPI and I2C which are likely to be replaced by the newer I3C. It is good to understand these interfaces, their advantages and limitations to help designers choose the right interface for their specific eco system design needs.



Electronics Circuit

Multiple interfaces like UART/SPI/I2C are used in inter chip communications.

The I2C communication protocol uses only two bidirectional open collector or open drain lines, Serial Data Line (SDA) and Serial Clock Line (SCL), pulled up with resistors. Traditionally typical voltages used have been +5 V or +3.3 V; however, recently +2.5 V, +1.8 V, and +1.2 V have become more common.

Industrial Automation

RS-232/RS-422/UART/SPI/I2C are relevant interfaces used in m/c to m/c communication.

The universal asynchronous receiver-transmitter (UART) takes bytes of data and transmits the individual bits in a sequential fashion. At the receiver, a second UART re-assembles the bits into complete bytes. Each UART contains a shift register, which is the fundamental method of conversion between serial and parallel forms. Serial transmission of digital information (bits) through a single wire or other medium is less costly than parallel transmission through multiple wires.



Motor Controls

Sensor integration for motor controls need interfaces like I2C and SPI.

Three signals are shared by all devices on the SPI bus: SCLK, MOSI and MISO. SCLK is generated by the master device and is used for synchronization. MOSI and MISO are the data lines. The direction of transfer is indicated by their names. Data is always transferred in both directions in SPI, but an SPI device interested in only transmitting data can choose to ignore the receive bytes. Likewise, a device only interested in the incoming bytes can transmit dummy bytes.



Medical Electronics

RS-232/SPI/I2C are common interfaces used in medical electronics.

I2C is well suited for boards with many devices connected on the bus. This helps reduce the cost and complexity of the circuit as additional devices are added to the system.

Lighting Controls

SPI and I2C are now commonly used in Lighting control electronics.

SPI is a very simple communication protocol. It does not have a specific high-level protocol which means that there is almost no overhead. Data can be shifted at very high rates in full duplex. This makes it very easy to use and efficient in a single master single slave condition. With no limitation on the data rate SPI becomes the choice where data rates are important.



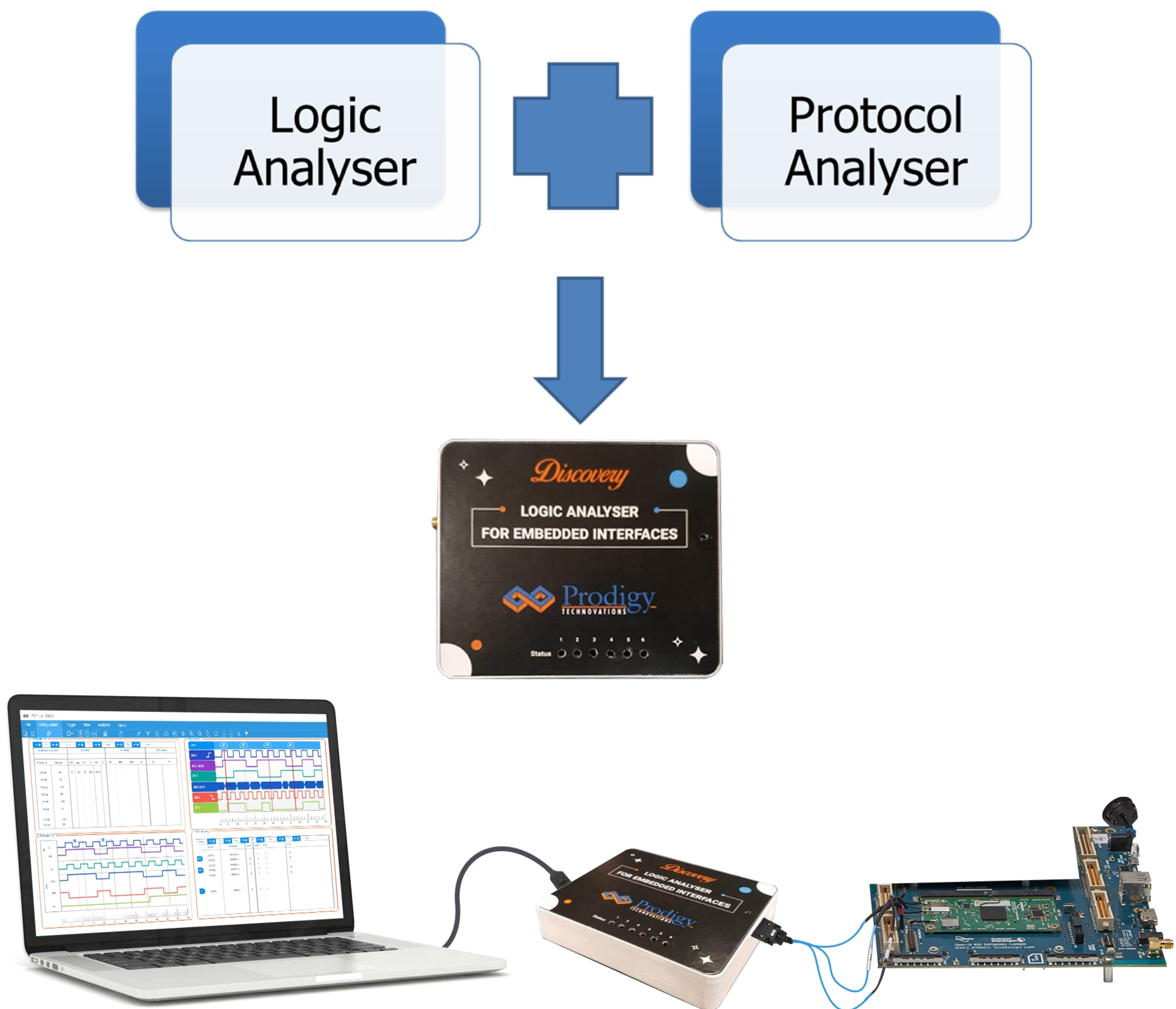
Défense and Educational labs

Défense electronics relies on proven interfaces like RS-232/RS-422, SPI.

RS-232 is a standard originally introduced in 60s for serial communication transmission of data. It defined signals connecting between a DTE (data terminal equipment) such as a computer terminal, and a DCE (data circuit-terminating equipment or data communication equipment), such as a modem. The standard defines the electrical characteristics and timing of signals, the details of the signals, and connectors details.

Introducing the **DISCOVERY** series logic analyser for embedded interfaces analyses :

- 10 Channels logic analyser with timing and state analysis capability
- Multi protocol support : UART-SPI-I2C
- Advanced trigger capability including protocol aware trigger
- Easy to use software
- Continuous streaming of data between logic analyser and host computer via USB interface



Contact Prodigy Technovations for more details and demo

#294, 3rd Floor, 7th Cross, 7th Main | BTM II Stage | Bangalore - 560 076

+91 80 4212 6100

contact@prodigytechno.com