

DIESEL

“Remote Secure Hardware Access and Control”

Embedded systems have become prevalent in everyday life from personal mobile communications, automotive and avionic vehicles to domestic and office appliances. With emerging technological advances, embedded systems engineers are experiencing the need to specialise and frequently re-train in advanced fields. Experience has shown that effective training in engineering disciplines requires an interdependent approach combining theoretical material underpinned by practical laboratory exercises. Remote experimentation via the Internet offers the flexibility to access training material to suit the lifestyles, financial commitments and personal developments of modern engineers. Creating an effective and integrated training environment which allows the access, control and monitoring of embedded devices and instrumentation over the Internet is challenging.

Software Description

The Distance-learning Internet-based Embedded Systems Engineering Laboratory (DIESEL) is an internet-based training facility that enables professionals to remotely access and control embedded systems experimental hardware in real-time, from any internet-connected computer in the world, 24 hours a day. The DIESEL technical facility houses a user-customisable suite of embedded systems training modules and instrumentation supplemented with advanced training material. Users can access the remote technical facility over the Internet for training material on tailored technical courses and gain essential practical training on real embedded systems. The facility is designed to complement current professional training courses by supporting remote access, control and monitoring of embedded systems equipment and instrumentation.

The DIESEL software is a client application which provides an integrated training environment whereby users can interface with the remote training facility. The environment integrates several key aspects for remote control of specialised hardware and software including access to:

- Training/product material
- desktop embedded design tools,
- facility for debug instrumentation and embedded hardware/products
- training/product videos
- visual feedback of embedded hardware/products

Within the DIESEL environment, users have access to a menu system from which experiments can be selected, documentation on experiments is available and the remote desktop is displayed where all embedded software tools are made available. In addition, video lectures on practical training exercises, displays of circuit wiring connections showing training board I/O and instrumentation channels and live camera displays of selected training board are available. The benefits of the client application are achieved through the ability to deliver all of the required functionality in a unified training environment. The advantage of flexibility is provided through the seamless control and monitoring of the embedded systems equipment and instrumentation with the capability to specify and make connections between various points on embedded hardware/products and instrumentation.

Applications

- **Professional Training** – the delivery of enhanced web-based distance training courses for the professional training market providing 24 hour scheduled access to real, physical test, and target hardware running embedded software.
- **Early Product Evaluation** – facilitate secure hands on experience of the latest hardware devices and software tools without geographical or time constraints.
- **Collaborative product development** – support the development of products with diversely located design and test engineering staff.