

Broadband Telecommunications and Opto-Electronics

Client: *CEOS Product*

Product: *Gigabit Telecommunications Electronic Backplanes*

CEOS has completed the development of high speed telecommunications backplanes operating at serial bit-rates of up to 1.25 Gbits/s. This includes point-to-point and complete bus connections. These backplanes are manufactured using competitively priced FR4 printed circuit board (PCB) and 2mm connectors. CEOS is currently developing a high speed telecommunications backplane operating at a serial bit-rate of up to 3.2 Gbits/s. This backplane is being designed with next generation PCB laminates and high speed connectors. It will be used in a broadband telecommunications product.

Client: *CEOS Product (Licensed to OEMs)*

Product: *Telecommunications Cable Equalisation Module*

CEOS has developed a twinaxial cable equalisation product that is supplied in a number of different versions. It can be supplied as an integrated module with a twinaxial cable assembly or as a complete active module with drive and receive circuitry. It currently operates at serial bit-rates of up to 1.3 Gbits/s and it will be further developed to operate at bit-rates of up to 2.5 Gbits/s.

Client: *Joint Product between CEOS and Photonics Research Laboratory (Ongoing)*

Product: *Metropolitan Area Network using DWDM Optical Technology*

This is a joint project between CEOS and the Photonics Research Laboratory that is a part of the Australian Photonics CRC. The product is a DWDM optical access network that uses burst mode packet transmission and high speed electronic control to optimise the available bandwidth. It is a broadband network with a scalable bandwidth per node that will be developed in the next phase to be up to 2.5Gbits/s.

Client: *CEOS Product (New Project)*

Product: *DWDM Cross-Connect Switch for Access and Trunk Networks*

This is a new project that CEOS has completed the initial design review for the high speed electronics. This product is a DWDM crosspoint switch that can be used in access and trunk networks. It is a transparent switch that could be customised for different applications. The high speed electronics will be capable of operating with serial data rates of up to 3.2 Gbits/s.

Client: *Photonics Research Laboratory*

Product: *Optically Transparent Packet Switch*

The research and development of the world's first ATM active optical network (ATM-AON) 2 × 2 packet switch with fibre loop memories for contention resolution. The ATM-AON packet switch operates at header rates of up to 2.5 Gbits/s with burst-mode clock recovery.

Client: *Photonics Research Laboratory*

Product: *Optically Transparent Header Replacement Module*

The research and development of the world's first optical header replacement module for ATM-AON. This module is used to replace the header of a packet in an optical ATM network.

Client: *CEOS Product (New Project)*

Product: *Burst-Mode Opto-Electronic Receiver and Clock Recovery Module*

This is a new project that CEOS is starting in 2000 that builds on the previous burst mode projects that CEOS has completed. The initial product will operate at a serial bit-rate of 622 Mbits/s and it will be suitable for the next generation ATM-PON. Concurrently CEOS is developing a second version that will operate with packet header rates of 1.25 Gbits/s.

Client: *CEOS Product*

Product: *Laser Driver Module*

This product operates at a serial bit-rate of up to 3.3 Gbits/s. It comes in a number of different versions that vary in complexity from the stand-alone driver to a fully temperature controlled unit with microprocessor control. The temperature control is achieved with a switch-mode unit to minimise heat dissipation.

Defence Telecommunications

Client: *Redflex Systems Pty Ltd*

Product: *Line Interface Module for a Navy Frigate Communications System*

CEOS developed a line interface module (LIM) for Redflex Systems that is part of a communications system on a Defence Frigate. This defence contract required a very high level of reliability and rapid development was critical. The LIM was developed using three 62,000 gate field programmable gate arrays (FPGA) that were developed using a hardware description language called VHDL.

Client: *Redflex Systems Pty Ltd*

Product: *Line Interface Module for an Airforce Communications System*

CEOS developed a LIM for Redflex Systems that is part of an airforce communications system. The LIM was developed using three 85,000 gate FPGAs that achieved 98% utilisation. Xilinx, the world's largest manufacturer of FPGAs, is now promoting CEOS on their web-site as an expert FPGA design company.

Wireless and Sensor Products

Client: *CEOS Product (Licensed to OEMs)*

Product: *Radio Frequency (RF) Transmitter and Receiver Modules*

CEOS has developed a complete product range of RF transmitters and receivers with both AM and FM low power operation. They are designed for high volume manufacture in high reliability applications. CEOS licenses OEMs to manufacture the modules as a part of their products.

Client: *CEOS Product (Licensed to OEMs)*

Product: *Shock and Motion Sensor for Monitoring the Aged and Infirm*

CEOS has developed a shock and motion sensor that has leading edge sensitivity and that operates with ultra-low power. It is licensed to OEMs for manufacture as a part of their product.

Control Electronics

Client: CEOS Product (Licensed to OEMs)

Product: Industrial Single Board Computer

The complete development of embedded single board computers that operate from -40°C to +85 °C with isolation of extreme transient voltages. The single board computers are designed for ultra-high reliability and they use LINUX as the operating system. They are designed to operate together with a complete control system. CEOS has also developed a version that has low power consumption and that is supplied in a PC104 format.

Intelligent Transport Systems

Client: CEOS Product

Product: Remote Infra-Red Traffic Monitoring System (RIRTM)

CEOS has developed a traffic counting, classification, and speed measurement system that is based on laser technology. It is developed with an ultra high sensitivity laser-based sensing system that has “world first” performance. It utilises analogue and digital electronics, DSP design, and complex software control. This new technology is being transferred to a separate company for commercialisation.

Additional Products

CEOS was involved in a variety of electronics development projects in its early growth phase. The products developed by CEOS in this phase include:

- CEOS developed a **transponder that is used for automatic vehicle identification** that included high sensitivity analog infra-red input circuitry, microprocessor control, and an RF output transmitter operating in the 300 MHz band.
- Complete design of a **low transient current supply** that is used to power opto-electronic devices that are sensitive to power supply transients.
- Complete development of a **high speed, high voltage switching sub-system** that is used in a mass spectrometer and that included leading edge analogue electronics.
- CEOS developed an **electronic controller that is used to control a forensic light source** that is used by police and crime agencies around the world.
- CEOS developed a **nerve, body cell and muscle stimulator (TENS unit)** that uses analogue and digital electronics together with a microprocessor to provide software control.
- Initial development of a **high speed industrial inkjet printer** that required a substantial amount of electronics and software design.