

# Technology for Customer Specific products

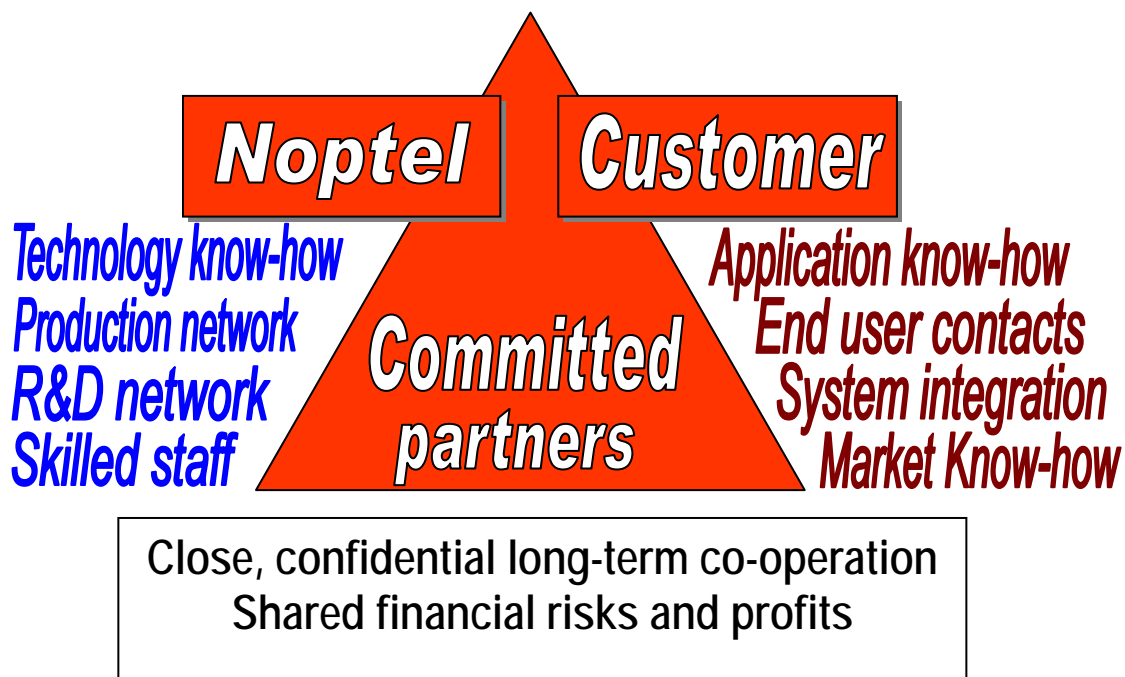
- Alignment and Displacement measurement
- Distance measurement using TOF technology

Noptel specializes in the design and manufacture of innovative optoelectronic products based on its own focused technology know-how. The products use highly integrated technology, and a number have been patented.

The cornerstone of the company's activities is the maintaining of a highly qualified staff, development of the core technologies in conjunction with research institutes, flexible production based on the company's own work and the management of a highly efficient subcontractor network. Close, confidential long-term co-operation with customers and partners is one of the key principles in Noptel's operations.

Technopolis Oulu consists of the University of Oulu, the laboratories of the Technical Research Centre of Finland (VTT) and over 100 high technology companies. It gives Noptel a highly advantageous pattern of co-operation for developing and manufacturing products for partners and customers all over the world.

International market is a familiar working environment for Noptel. It succeeds in covering its wide market area efficiently together with selected partners, through its own marketing efforts and through its focused and thorough technological know-how grounded in scientific research.



# Distance and displacement measurement technology

A customer specific product means a combination of marketing and technology resources and the know-how of two co-operating partners to find the most satisfying solution to fulfill the well-specified, known needs of a certain market.

Noptel offers its partners the necessary specialized technology and R&D know-how together with competitive manufacturing and can also work as part of the customer's own product. The development of a customer specific product may include slight modifications to an existing technology or it may mean the development of a totally new product.



## DISTANCE MEASUREMENT

A very efficient distance measurement method is based on the flight time of a short, eye-safe laser pulse to the target and back. The principle is known as pulsed time-of-flight (TOF) distance measurement.

The main advantages of TOF measurement include its non-contact, non-disturbing nature, high speed and accuracy, high spatial resolution and wide measurement range. Special reflectors are not needed on the target but can be used to increase the maximum range.

Noptel's TOF distance measurement technology originates from the University of Oulu and is part of a tradition dating back to the 1970's. The University of Oulu is still Noptel's most important research partner even today, but also several other national and international organizations are also involved in the company's present active R&D partnership network.

## DISPLACEMENT MEASUREMENT

Noptel position measurement technology allows measurement of small deviations from the reference line in X/Y direction. It permits operating distances of several hundred meters.

Measurement devices employing Noptel technology are light in weight, robust and very suitable for outdoor use. The resulting measurements can be transferred to a computer through a serial interface.

Noptel products represent two basic operating principles: Laser transmitter with active optoelectronic receiver and optoelectronic transceiver with prism target. Noptel detection technology allows reliable measurement under variable environmental conditions. This is achieved mainly by proper beam modulation and the special properties of the receiver, which eliminates the influence of sunlight, temperature, fog, rain, snow etc. on measurement accuracy.

### DISTANCE MEASUREMENT

- Accuracy from few millimeters to few centimeters
- Maximum measurement rate up to 50 000 single shot measurements per second
- Maximum range from tens of meters up to two kilometers
- Highly integrated technology
- Suitable for harsh environments

### DISPLACEMENT MEASUREMENT

- Operating distances of several hundred meters
- Resolution of up to 0.01% of the measuring range
- The range can vary from a few millimeters to several meters
- The measuring speed can be over 1000 readings/second on one or two axes.
- Suitable for harsh environments