

iChip Breathes New Life into Pulmonary Testing Procedures with ndd's IP-Enabled Medical Device

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nnd Medizintechnik AG of Zurich, Switzerland is a developer and manufacturer of spirometers, which measure the quantity and speed at which air is forcefully expelled from fully inflated lungs. nnd was established in 1996 with the goals of setting new standards in pulmonary function testing and offering innovative, easy-to-use products for routine clinical applications. Their products are based on an advanced ultrasound flow sensor developed by the company.

Spirometry is the recommended method for diagnosing and monitoring of asthma and Chronic Obstructive Pulmonary Disease (COPD). Spirometry also is useful in the treatment of a number of other pulmonary diseases, such as emphysema, chronic bronchitis, pneumonia, tuberculosis, and congestive heart failure with pulmonary edema. Approximately 90% of all COPD cases are caused by smoking. COPD affects an estimated 15 million people in the United States, half of whom are undiagnosed. It kills over 110,000 people annually and is the fourth leading and fastest growing cause of death in the United States. Only spirometry can detect the onset of COPD years before symptoms develop.



EasyOne Net

The Challenge

nnd needed to add an Internet connectivity solution to EasyOne Net in order to send graphic test reports of daily examinations as encrypted MIME attachments. The solution had to be as simple and easy-to-use as their product was designed to be. Software engineer André Wetzel thought about developing an in-house software solution, but, with a customer waiting for a solution, he decided to use Connect One's iChip™ Internet Controller™. André says “it was more cost-effective to use iChip than to do our own software development. Also, time-to-market was extremely important.”

The hardware design of iChip into a prototype board began in January, 2004 and took less than three weeks. Adding AT+i™ commands to interface iChip to the application was simple and straightforward, and took only three months. The project was completed within a total of six months. ndd began selling iChip-enabled spirometers during Q4, 2004.

The iChip Advantage

After data is collected in the handheld device, it is encrypted, downloaded into the EasyOne Net cradle and sent via iChip to an Internet Service Provider (ISP). Encrypted data is sent by email binary attachment via iChip through the dial-up modem to the ISP, while other applications output the data directly to the modem for transmission over the public switched telephone network (PSTN). The emails are decrypted at the data collection site and converted into XML format for loading into a database for QA review or for analysis in ndd's EasyWare PC-based software program.

By sending daily emails, iChip facilitates the centralized collection of data from studies conducted each day in dozens of centers worldwide. ndd's customers can now collect data and compile the results of their studies or tests more efficiently.

According to ndd's VP Research & Development, Christian Buess, Ph.D., "Thanks to iChip, we were able to quickly design EasyOne Net, which Clinical Research Organizations in the United States and Europe are using in their studies."

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A Young Patient with EasyOne Spirometer

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