ELLIPSOMETRY IN THE ERA OF INDUSTRY 4.0

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In times of Internet of Things and Industry 4.0 production lines require more automation than ever. The operators influence on the resulting product is pushed back to minimize failure. Multiple diagnostic tools are used, spinning a tight monitoring network throughout the production cycle. The vast amount of data produced by the variety of diagnostic tools must be organized, crosslinked and evaluated to maximize yield and product quality.

The data are typically processed by a host software specifically designed for the production line. The communication between the host and the large variety of equipment is performed using SECS (SEMI Equipment Communications Standard) or more specifically SECS/GEM (General Model for Communications and Control of Manufacturing Equipment). The SECS/GEM defines standard commands, replies and events allowing the host to control and monitor the manufacturing equipment.

Being a standard in microelectronics for a while now, the SECS/GEM also becomes more and more popular in other industrial fields like photovoltaics and optoelectronics. An ellipsometer designed to be placed in such a demanding environment must match these requirements as well. In addition, precision, repeatability and measurement speed are traditional challenges for production control.

Typical requirements for equipment performance, software compatibility and maintenance are presented on actual cases of major optoelectronic manufactures. Special emphasis is put on the SECS/GEM compliance. Some examples are shown of how SECS/GEM can be used either as local remote control of the measurement software or even by complete remote access via the company network. The later even allows to perform measurements with a standard tablet.

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References