



HEIFEI CHANGXIN 12-INCH DRAM WAFER PROJECT

Ruili Integrated Circuit Co. Ltd, the parent company of ChangXin Memory Technologies Inc., raised \$2.39 billion from a group of investors including Hefei State-owned Assets Supervision and Administration Commission, Xiaomi Changjiang Industrial Fund, Gigadevice Semiconductor Beijing Inc., and the National Integrated Circuit Industry Investment Fund to build the first 100% Chinese owned semiconductor facility.

This 12-inch DRAM Wafer project in Hefei (referred to as "506 project") is the first 100% Chinese-owned DRAM integrated design and mass production manufacturing facility in Mainland China, as well as the largest industrial project with independent investment in Anhui province. It is in the Airport Economic Demonstration Zone, covering an area equal to 105 hectares with a total investment of \$22.3 billion. It plans to produce 125,000 DRAM wafers per month when running at full capacity.

Those DRAM are mainly used for electronic devices such as computers, mobile phones and mobile devices. It will be divided into three phases of implementation. The first phase plans to invest approximately \$2.4 billion to build a 12-inch memory product line.

By the end of 2020, Hefei Changxin 12-inch DRAM wafer manufacturing project had reached the expected capacity of 40,000 wafers per month in advance and started the construction of the second production line of 60,000 wafers / month.

This project is a cornerstone of Hefei's master plan to transform the region and China into a powerful independent electronics superpower and was completed in 2018.

The power monitoring of a FAB is a critical system, even more critical than the process monitoring itself as the single fault can cause the halt of the production and loss of millions. With the collaboration of China Electronics Corporation NO.3 Engineering and System company and Beijing Locamation (1) Co., Ltd, the power control system was designed with the utmost security and reliability in mind. The field communication network was made redundant using 3-layer switches and to ensure 100% uptime of this critical core system, a 3-layer (2) redundant SCADA system was implemented.

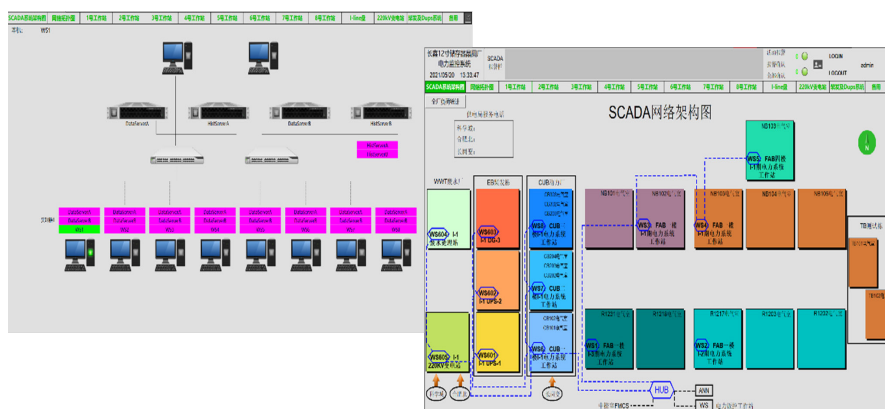
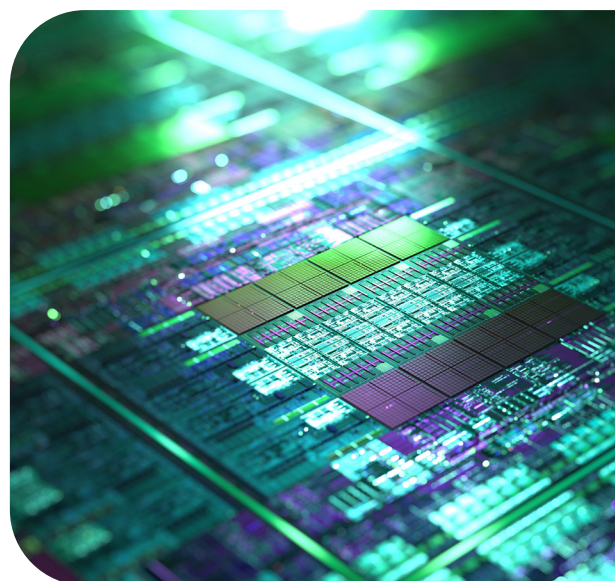


Fig.1 - SCADA Architecture

The different system under supervisions includes the wastewater treatment stations, the 220 Kv Substation, the 380V power distribution system, the UPS system, the diesel generators and the DUPS system.

The overall site runs 541 protection relays from ABB (RET615) and Bay controller from Alstom (C264, now Schneider), the highest number of IEC 61850 devices in use in the industry.

Overall, PcVue records more than 40 thousand IEC 61850 equipment tags in real time, plus thousands additional IEC 104 datapoints from subsystems (I-Line), and thousands more Modbus RTU and TCP/IP connection to auxiliary systems. PcVue truly works as the data digitalization hub by sharing data to other systems via OPC such as the FMCS and the Power dispatching control station.

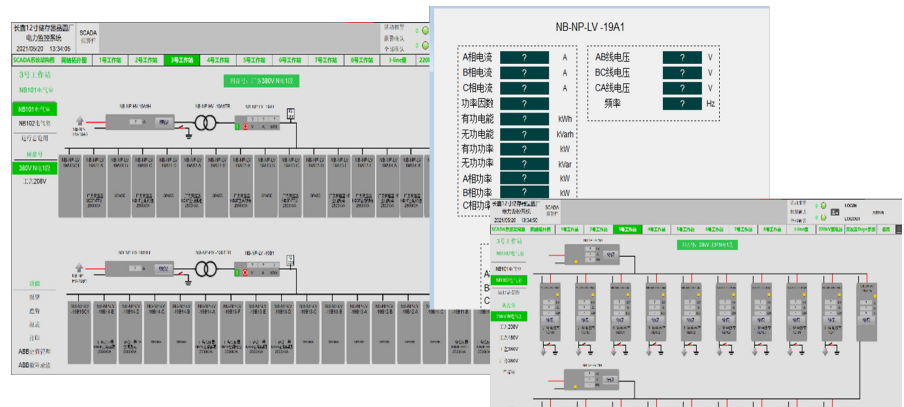


Fig.2 - Project Overview

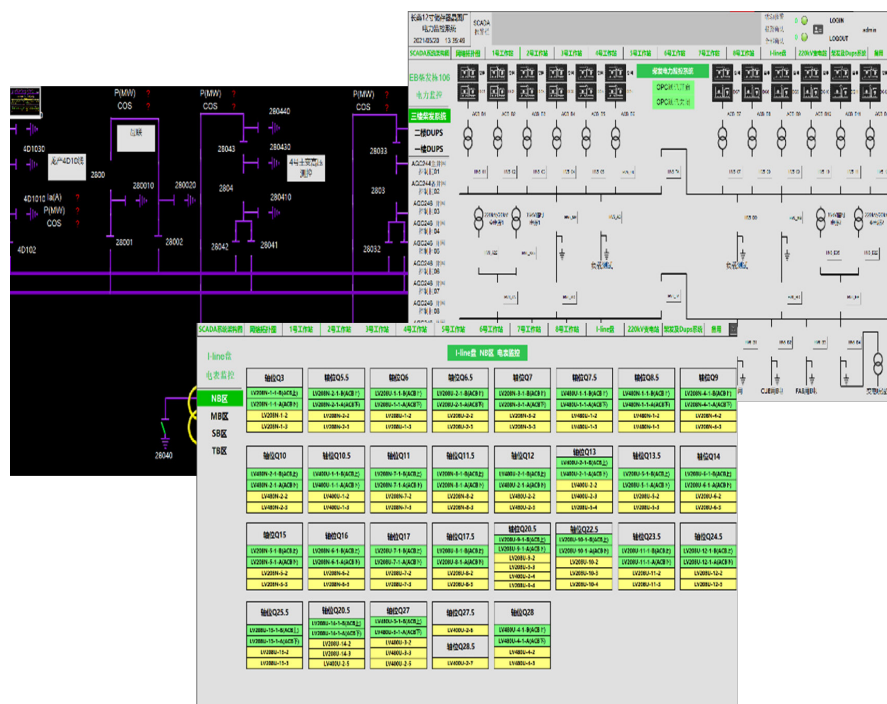


Fig.3 - Project Overview



Fig.4 - PcVue Team on-site

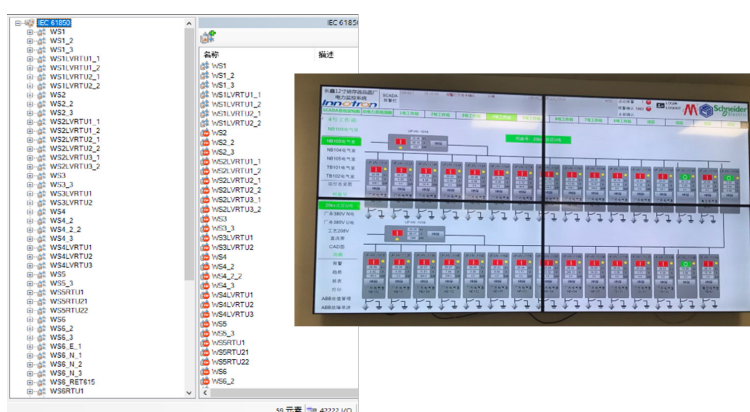


Fig.5 - From Central Control Room

(1): Locamation is part of PowerGo (Beijing) company

(2): In the central control room, a central real time data acquisition server is connected to each of the 8 separate production sites servers. It stays in hot/cold redundancy in case one of them fails. There is a second central real time data acquisition server acting as a backup redundant server as well. Both are connected to two historical data servers used for archive and replays, also redundant and synchronized.



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