



# SIEMENS

## Innovative IO migration solution reduces downtime and hardware costs

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Birla Carbon has relied for many years on a distributed control system from Siemens to optimize the production of carbon black powder. When it came time to modernize their system from APACS+ to SIMATIC PCS 7, they implemented an innovative IO migration strategy – the FAD Solution – to minimize plant down-time and hardware replacement costs.

### Leading an industry with the help of automation

With a footprint extending across 12 countries on 5 continents, Birla Carbon is the one of the world's largest manufacturers and suppliers of high-quality carbon black. This fine carbon powder is vital for enhancing the strength and color of many products we use daily.

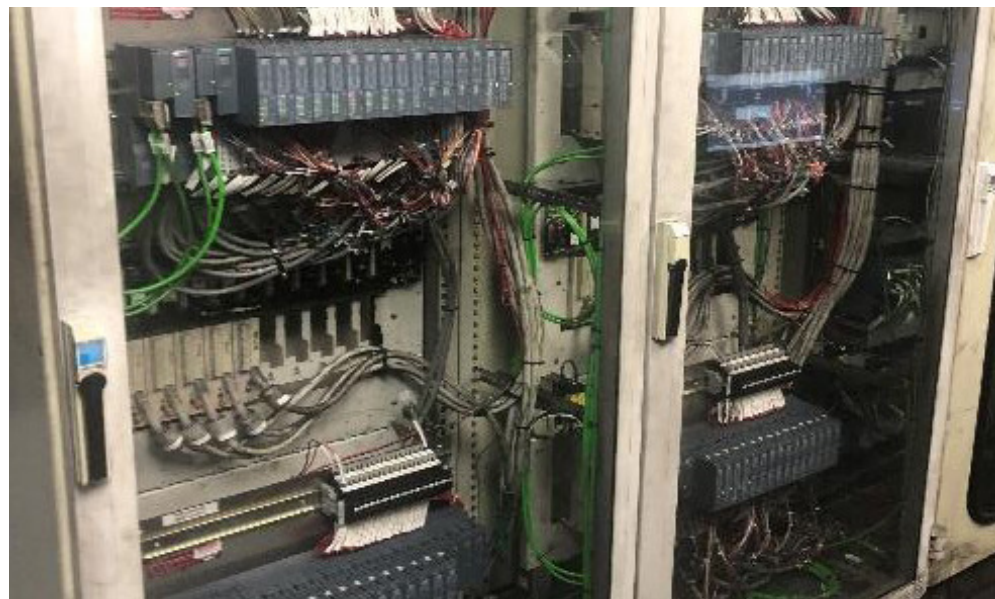
Birla Carbon's 160-acre plant in North Bend, Louisiana, employs 153 people in two production units: a Rubber Unit that produces carbon black for tires and a Specialty Unit that manufactures the powder for paints, plastics and printer cartridges.

The North Bend plant produces carbon black in a high-temperature reactor through a tightly controlled flame-synthesis process that uses oil, and sometimes natural gas, as feedstock. By adjusting reactor conditions, they can produce a wide variety of carbon black grades to meet the diverse needs of customers. Throughout the multistage process, Birla Carbon uses a distributed control system (DCS) from Siemens to ensure all finished products meet the highest standards of quality.

Multiyear path to modernization  
In 2016, Birla Carbon and Siemens initiated a modernization of their Siemens

APACS+ DCS, which had been in operation for more than 20 years. Goals for this complex, multiyear project included improving process efficiencies, better managing yields, increasing the number of measurement points and integrating digital technologies on all new devices across both the Rubber and Specialty Units.

Early stages of the upgrade included installation of the APACS+ OS (HMI) in both the Rubber and Specialty Units, the addition of a Siemens smart motor control center (MCC) to the Specialty Unit, and further enhancement of the MCC with SIMATIC PCS 7 AS410 controllers and PROFINET.



Using the FAD Solution, Birla Carbon reduced costs by mounting the new SIMATIC ET 200SP HA IO modules in the existing APACS+ cabinet and connecting them directly to the MTA cables.



Downtime was minimized by plugging the APACS+ MTA cables into the FAD Adapters.

The next stage involved full migration to PCS 7 starting in 2018, including operating system virtualization and device integration. This phase required transitioning their APACS+ IO modules to the newer and more flexible SIMATIC ET 200SP HA IO, which features a compact footprint, high availability due to redundant PROFINET connections, and field-ready conformal coating with an extended temperature range. But along with a host of benefits came the potential for extended commissioning times and significant hardware replacement costs – both of which Birla Carbon wished to avoid.

### A smarter way to migrate APACS+ IO

To support Birla Carbon in achieving a simplified, lower-cost IO cutover requiring minimal downtime, Siemens process automation experts integrated a new and innovative solution allowing for the ET200SP HA IO to be installed into their existing APACS+ cabinet, with the APACS+ backplane and Marshallled Terminal Assembly (MTA) cable remaining in place. Known as the Front Adapter (FAD) Solution, this strategy would preserve their current cable connection to the APACS+ MTA.

The FAD Solution is comprised of three parts:

- FAD Adapter Rack, which mounts to the APACS+ backplane in place of the APACS+ card cage. The Adapter Rack makes it possible to install a horizontal rail of up to 16 ET200SP HA IO modules.

- FAD Adapter, which plugs into the existing APACS+ MTA cable terminated on the APACS+ backplane. The adapter provides access to all 48 wires within the cable.
- FAD Adapter Cable, which comes in varying lengths (with 1 m as standard). The connector end plugs directly into the FAD Adapter, while the other end consists of flying leads that enable customized wiring in the panel shop for the appropriate ET200SP HA IO module.

### Less downtime, lower costs

By incorporating the FAD Solution as part of their plant-wide modernization to PCS 7, Birla Carbon drastically reduced the amount of production downtime necessary to migrate their DCS. Once the ET200SP HA IO rails were installed in the FAD Adapter Rack, all they needed to do was remove the old APACS+ modules, install the new IO and connect it to the APACS+ MTA cable – making it a true plug-and-play solution. Additionally, all FAD Adapter Cable wiring was pre-verified during Factory Acceptance Testing. As a result, instead of weeks or months, the cutover was so quick and seamless that the North Bend plant returned to full operation in less than three days.

The FAD Solution also lowered the total cost of ownership by maximizing use of Birla Carbon's existing APACS+ hardware. The FAD Adapter Rack fit right

into the APACS+ cabinet and enabled installation of 16 ET200SP HA IO modules in the same space that previously held only 10 APACS+ modules. The upgraded installation retained an identical footprint without requiring new cabinets. The APACS+ backplane, cable and MTA were also preserved, and the solution design ensured that the existing spare IO was not compromised and could be reused with the migrated system.

### Ready for the future

With the ET200SP HA IO in place, Birla Carbon is well equipped to attain their goal of adding digital process instrumentation throughout the entire carbon black manufacturing process to improve efficiencies, optimize production and keep their competitive edge.

Following completion of the North Bend installation, Siemens standardized all hardware design documentation for the FAD Solution. Now, virtually any customer in any industry can benefit from this time- and cost-saving IO migration strategy while modernizing their DCS.

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