

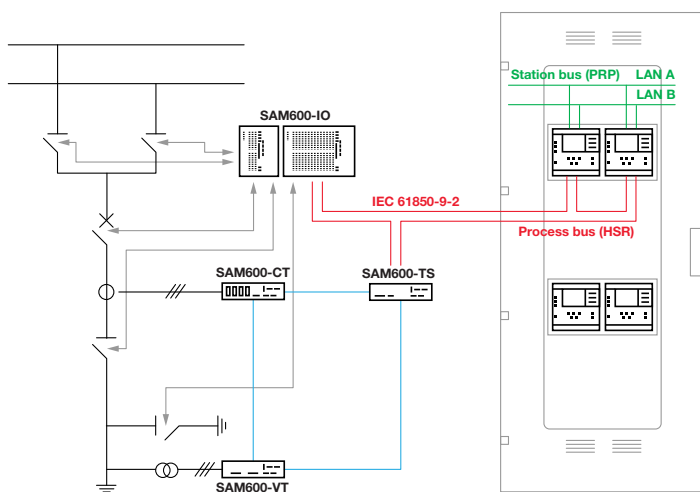
## Grid Automation

# SAM600 process bus I/O system

Enabling the digital substation

The SAM600 process bus I/O system integrates conventional instrument transformers into modern, IEC 61850-9-2 process bus substation automation, protection and control systems.

The modular design of SAM600 enables safe, efficient, and extendible retrofit of any substation. In order to maximize the benefits of IEC 61850 process bus, SAM600 modules are placed across the switchyard close to the primary apparatus.



01 Application example of SAM600 placed in the switchyard and exchanging information over HSR with bay level equipment

### The Digital Substation

Digital technology has already revolutionized communications across utility networks, and now the same techniques are being applied within the substation to enable robust, fast, and responsive messaging over Ethernet and fiber optic channels. But existing sensors aren't built for this digital world and replacing them is expensive and unnecessary when SAM600 can bridge between the worlds of digital and analog signalling.

### Improved safety

Distributing current and voltage information digitally through optical fibers reduces the risk of wrong handling current and voltage circuits, increases personnel safety and reduces the risk of equipment failure.

### SAM600-CT



### SAM600-VT



### SAM600-TS



### SAM600-IO



02 SAM600 unique modular concept lifts process bus applications to a new level of flexibility, safety and efficiency

Building standard-compliant IEC 61850 process bus systems allows for the integration of non-conventional instrument transformers, which further enhance safety in the substation.

#### Reduced outage times for substation retrofits

The modular process bus systems can be tested in the factory, from station automation system down to the process interface units. Deploying the pretested system on site minimizes installation, cabling and commissioning time on site.

#### Cost efficient maintenance

Constant supervision of all electronic components and digital communication in the substation minimizes the need for periodic maintenance and allows fast remedial action in case of failure.

#### More efficient project delivery and installation

Reduction of field cabling not only reduces the use of expensive copper, but minimizes engineering efforts, installation and on-site testing.

#### Unrivalled flexibility

The SAM600 family of products provides IEC 61850 process-level connectivity to conventional current and voltage instrument transformers (SAM600-CT, SAM600-VT), as well as switchyard connectivity of primary apparatus such as circuit breakers, disconnectors and earth switches (SAM600-IO).

Multiple communication ports allow for realizing highly flexible process bus architectures, either in direct point-to-point communication links, or support communication redundancy protocols such as PRP, HSR or RSTP. Time synchronization is supported by means of 1PPS or IEC/IEEE 61850-9-3.

SAM600-IO supports IEC61850 Ed 2.1, and is optimized for low-latency GOOSE communication. State-of-the-art security features, features for supporting commissioning and testing, as well as support for COMTRADE 2013 disturbance recorder provide a compelling feature set.

#### Optimal placement of modules

SAM600 comes in a compact form factor and is DIN-rail or wall mountable for fast installation and replacement. The modules can be installed in existing protection and control panels, or placed close to primary apparatus in marshalling kiosks in the switchyard.

Depending on the number of primary apparatus to be interfaced, SAM600-IO comes in form factors 1/2 19" and 1/1 19", offering the possibility to adapt optimally to the number of primary apparatus to be controlled and monitored.

#### Safe and simple testing and maintenance

Customizable terminals allow the use of standard cables, tools and work procedures. This reduces the time needed for installation, testing and maintenance activities

#### Efficient design and operation

Strict adherence to the IEC 61850 standard results in futureproof installations that take advantage of enhanced tool suites for configuration, engineering and testing, such as Hitachi Energy's PCM600 protection and control IED manager, IET600 system configuration tool and ITT600 SA Explorer for simple and efficient testing.

SAM600 complements Hitachi Energy's IEC 61850 process bus portfolio from NCIT's for GIS applications as well as Relion® series protection and control IED's, with process bus interfaces for conventional instrument transformers.