Toshiba pioneered the development of numerical substation automation technology during the 1980s and has since built a wealth of experience in supplying systems for all voltage ranges including UHV substations.

GSC1000 is today’s state-of-the-art system compliant with the IEC 61850 standard for substation communications and provides the following features.

- **Open system architecture**
  - IEC 61850 compliant open system
  - Standardized information models and communication services
  - Standardized engineering tools using SCL*
  - Client/Server system architecture
  - Bay oriented distributed system

- **Flexible system configuration**
  - Flexible configuration for all voltage levels
  - Integration of protection relays and other IEC 61850 compliant IED**s
  - Integration of non-IEC 61850 IEDs

- **Minimized life cycle cost**
  - Optimized maintenance cycle
  - Efficient support assistance

- **Applications**
  - All substation voltage ranges
  - GIS (Gas Insulated Switchgear) substations
  - AIS (Air Insulated Switchgear) substations
  - Refurbishment of existing systems

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*SCL* : Substation Configuration Language

**IED** : Intelligent Electronic Device

The data given in this catalog are subject to change without notice.
Toshiba GSC1000
Leading innovation in the creation of total solutions for Substation Automation

- Safe, secure and reliable solutions for Substation Automation based on IEC61850
- Minimised life-cycle cost through ease of maintenance and low resource usage
- Flexible configuration for all system voltage levels

**SYSTEM CONFIGURATION**

Typical system configuration of the GSC1000 is shown in Figure 1.

- **Station level**
  - The station level equipment consists of duplicated station computer, an operator work-station, a printer, a GPS receiver, and the station bus.

- **Substation**
  - For an AIS substation
  - For a GIS substation

- **Remote monitoring**
  - Remote monitoring through station blueprint
  - Remote maintenance

**Communication bus**
- Ethernet LAN, multicast/TX/UX
- IEC 61850 protocol

**Control points**
- Three level hierarchy
  - Remote control point (Network level)
  - Substation control point (Station level)
  - Local control point (Bay level)

**Remote monitoring**
- Remote monitoring through station blueprint
- Remote maintenance

**GSC1000** presents sophisticated functions for realizing secure operation of the whole system.

- **Functions**
  - Monitoring
  - Measurement
  - Recording
  - Fault analysis
  - Data management and maintenance
  - High reliability

- **Protection**
  - Fault proof philosophy
  - Reliability
  - Protection from electrical interference
  - Insulation of optical cables
  - TVS diodes for surge protection
  - High bandwidth
  - Redundant communication
  - Interlocks for closed loop operation
  - Automatic synchronization for split system

- **Easy maintenance**
  - Easy bay extensions
  - Engineering tools and easy configuration
  - On-line diagnostic maintenance
  - Easy and safe monitoring on test cards
  - Quick plugging and screwed fastening

- **Bath protection**
  - Minimum control cables and auxiliary equipment
  - On-demand printing
  - Low power consumption

**SYSTEM CONFIGURATION**

**GSC1000** is configured in a bay oriented and distributed system structure. Its components are modular based and facilitate easy upgrading to the latest model of such devices.

**FUNCTIONS**

**Remote control center interface (RCI)**
- The RCI functions control is executed through the computer with communication with the remote control center equipment and the bay level power apparatus.
- The IEC61850 protocol is used for communication with the remote control center equipment and the bay level power apparatus.
- Use of the IEC61850 protocol provides the following functions:
  - Control
  - Plant operating commands to protection relay equipment
  - Receiver command to protection relay equipment
  - Interlocking of protection relay equipment

**Protection of field equipment**
- Protection relay equipment are available.
- IEC 61850 compliant IEDs can be connected via an interface card.
- The Ethernet LAN, IEC61850, is used for the station computer to connect station level equipment and LEDs.
- Ethernet switches are used for the station bus.
- ETHC61850 is applied for communication between the station computer and the LEDs.
- Other equipment such as operation panels, screen monitors, printers, and so on are connected to the station computer via interfaces from port apparatus.
- Enhanced control and monitoring functions
- The following IEC communication standards are available.
  - IEC 60870-5-101
  - IEC 60870-5-104

**Protection relay and other IEDs**
- Protection relay and other IEDs can be connected to the station bus directly by IEC 61850 based communication.
- New IEC 61850 compliant IEDs can be connected to the station bus.