Industrial Systems

In the industrial systems field, Toshiba acts as a pillar supporting social lifelines, aiming to achieve an environment-friendly society that is also secure and safe for people.
By combining cutting-edge technologies with highest reliability, we supply every industry with energy-saving and environment-conscious industrial systems and components, elevators that satisfy various user needs, and so on.

"Unified controller nv series" New Model of Industrial Controller

Unified controller nv series

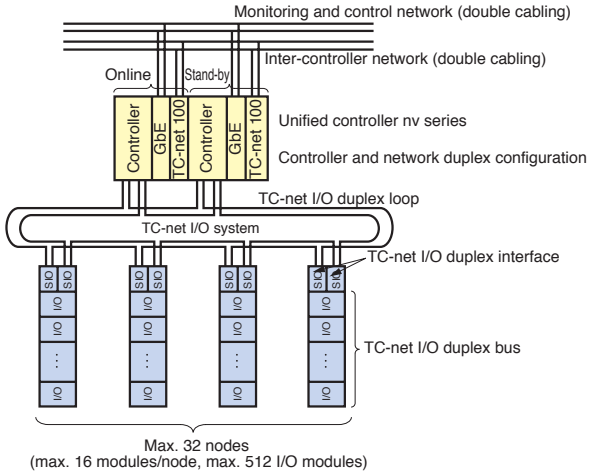
Toshiba has launched the Unified controller nv series which is used as an industrial control component, such as programmable logic controller (PLC) or distributed control system (DCS) controller. It is also the next model of our "Integrated controller V series".

This product is used in various fields such as paper and pulp, oil and chemicals, steel and metals, water and sewage, and waste disposal plant systems. During the development, we improved the reliability of the component itself by implementing memory error correction circuits and so on.

Moreover, the input/output system consists of remote I/O modules on a high-speed serial bus (100 Mbit/s), which has a loop topology and also double cabling. Therefore, we have improved maintainability (online attachment and detachment, etc.) and robustness.

Furthermore, the program execution performance is accelerated by a newly developed language operation processor, and gigabit Ethernet (1 Gbit/s) is used for the monitoring system and information system network.

The programming language and engineering tools based on the International Standard IEC 61131-3, and also real-time network TC-net 100, are inherited from the existing V series integrated controller. We aim to combine it with the existing system to expand the scope of application.



GbE: Gigabit Ethernet I/O: Input/Output SIO: Serial I/O

System configuration of Unified controller nv series

Manufacture of Vacuum Interrupters Started in China

Opening ceremony of TBV

Toshiba has been manufacturing Toshiba-brand vacuum interrupters in the joint venture Toshiba Baiyun Vacuum Interrupters (Jinzhou) Co., Ltd. (TBV) established in Jinzhou of Liaoning in China since November 2007.

TBV was established as a base to manufacture and sell vacuum interrupters for equipment such as vacuum circuit breakers and vacuum load-break switches used in electric power plants, substations and factories.

Before starting manufacturing, we introduced new manufacturing equipment, improved it, trained staff, improved the quality of locally procured parts, and thus achieved the quality required of Toshiba products.

Recently, demand for power has increased in China, and so the demand for vacuum interrupters, which are a key component of vacuum circuit breakers and vacuum load-break switches, has also expanded. We will manufacture mainly 12 kV and 40.5 kV vacuum interrupters for the Chinese market, on a scale of about 100 000 units or more a year in the future.

Vacuum interrupters

Handheld Terminal Wireless Automatic Meter-Reading System for Power Meter

Toshiba has developed a handheld terminal wireless automatic meter-reading system using ARIB STD-T67 compliant 400 MHz-band specified low power radio to acquire various data from power meters. In this system, the handheld terminal which a meter reader uses and the wireless main unit are connected by Bluetooth™.

The main features are as follows:

- High workability
  The wireless main unit is equipped with Bluetooth™ and communicates wirelessly with the handheld terminal. Therefore, the wireless main unit can be freely carried and the meter reader's workload is reduced.
- Downsizing
  The wireless main unit is about 10% smaller than the conventional unit thanks to the integrated circuit.
- High communication quality
  The wireless main unit adopts a high gain helical antenna, which improves communication performance.
- Long life
  The wireless subunit fixed on a power meter can run on battery for 10 years.

ARIB: Association of Radio Industries and Business

ARIB STD-T67: ARIB standard for 400 MHz-band and 1200 MHz-band telemeter, telecontrol and data transmission radio equipment for specified low power radio stations

Wireless main unit　　Wireless subunit

Handheld terminal wireless automatic meter-reading system for power meter

Supply of Electric Equipment for 25 kVac/3 kVdc Dual Voltage Electric Locomotive in South Africa

In recent years, the demand for mineral resources has increased worldwide.

South Africa, one of the richest countries in terms of mineral resources, is planning to boost the production of mineral resources. Thus, there is an urgent need to expand its transportation capacity.

Toshiba received an order for electric equipment for 110 dual voltage (25 kVac/3 kVdc) electric locomotives of which the axle arrangement is Bo-Bo and the maximum output power is 3000 kW for TRANSNET in the Republic of South Africa and has started shipping the equipment. The scope of supply performed by Toshiba includes power conversion cubicle (PCC), main transformer, traction motor, train control and monitoring system (TCMS) and other electric equipment. The overall locomotive system design was also orchestrated by Toshiba.

The PCC, which consists of the main conversion equipment and auxiliary power supply equipment with a capacity of 250 kVA, uses 6500 V-600 A insulated gate bipolar transistor (IGBT) devices and a water cooling system to achieve the high power output.

The locomotives are expected to enter service by the end of 2008.

25 kVac/3 kVdc dual voltage electric locomotive in South Africa

Logic Controller for Automatic Block Signal between Railway Stations

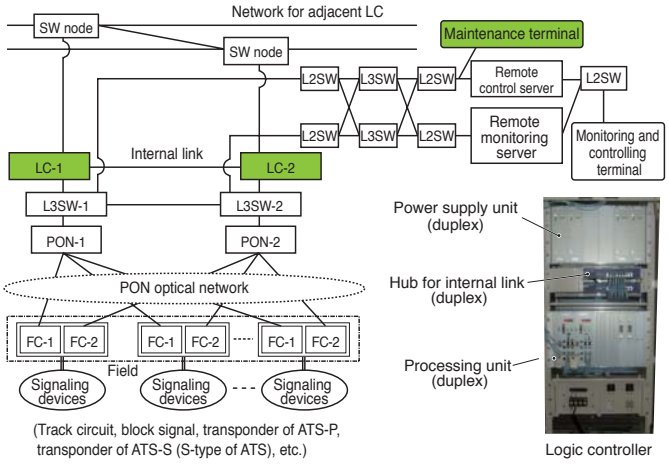
In a conventional railway signaling system for Automatic Block Signal (ABS) between stations, signaling devices are distributed and connected with copper wires to exchange control signals. However, this requires complicated hardware and wiring work, and system reliability is low because all the devices are simplex and there is limited information for maintenance.

To overcome these disadvantages, East Japan Railway Company (JR East) and Toshiba have developed a prototype of logic controller (LC) for a new signaling system for ABS between stations that controls the signaling devices via an IP (Internet Protocol) network.

The LC has the following features:

- For greater system reliability, the LC operates as a duplex system, in which all of the control logic such as block signal, track circuit, automatic train stop (i.e. automatic train protection) system with pattern (ATS-P) and so on are integrated.
- To support installation test and maintenance works, the LC has advanced functions (i.e. test mode function (simulation), changeover function between two program areas, etc.).
- The software of the LC has better maintainability, flexibility, and scalability by adopting object-oriented techniques (OOT).

JR East and Toshiba will introduce the LC after some additional improvements in functions.



L3SW : Layer 3 Switch L2SW : Layer 2 Switch SW node: Switching node
PON : Passive Optical Network FC : Field Controller
: Scope of development performed by Toshiba

Configuration of new signaling system for ABS between stations, and logic controller

Application of Electricity Storage for Central Japan Railway Company Series 313 Commuter EMU

Toshiba and Central Japan Railway Company (CJRC) have developed an electricity storage system for electric multiple-unit (EMU) equipped with an electric double layer capacitor (EDLC).

This system can absorb regenerated energy when an EMU is braking, and it can supply the stored energy as traction power. Therefore, this new system recycles the regenerated power, and is expected to offer the following benefits:

- Stability of catenary voltage
- Prevention of regenerative brake failure
- Energy saving

EDLC provides quick electric charging and discharging, and has a longer life and requires less maintenance than secondary batteries such as lead-acid batteries and nickel metal hydride batteries. In addition, it improves safety and the environment.

Toshiba and CJRC put this device on the Series 313 Commuter EMU of CJRC and analyzed its effectiveness. As a result, we confirmed that this system can store about 50% of the energy which the motor car used for mechanical braking. This result means that approximately 8% of regenerated electric power can be reused for 2% of traction energy.

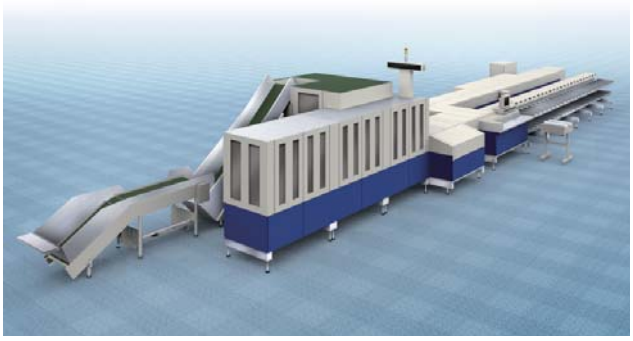
Central Japan Railway Company Series 313 Commuter EMU

TSC-1000 Culler-Facer-Canceller for La Poste of France

The new TSC-1000 culler-facer-canceller for La Poste of France sorts out mails suitable for machine processing and those that need manual handling from among the various mails collected by the city, detects the stamp of the mail, arranges the front, reverse, upper and lower sides, and cancels the stamp by an inkjet printer. Furthermore, this machine recognizes the postal code and address written on the mail and has sorting and stacking functions according to the category.

Toshiba developed the TSC-1000 to become the global standard machine with the highest processing speed and performance in the world. In order to attain this high target while improving the conventional techniques, we also have developed new key technologies.

The first machine was installed in La Poste in 2006 and is working well, and at least another 110 machines are planned to be installed. This machine is Toshiba's strategic product for mail-processing in the overseas market, mainly in Europe.



TSC-1000 culler-facer-canceller

CS-701 Currency Sorter

Toshiba has developed a currency sorter, the CS-701, which processes banknotes for overseas financial institutions such as commercial banks and cash-in-transit (CIT) companies.

The CS-701 is capable of counting banknotes by checking (detecting) counterfeits, sorting them by denomination, aligning them by facing and orientation, and strapping them into hundred-note bundles while processing mixed denominations of banknotes deposited from multiple places such as supermarkets.

In recent years, commercial banks overseas have been increasingly re-circulating banknotes without returning them to a central bank except for non-reusable banknotes due to damage, etc. Therefore, there is increasing demand for better ability to determine the banknotes' reusability (fitness sorting function) even among commercial financial institutions.

The CS-701 offers greater performance than the previous products, with the ability to process 660 to 750 banknotes per minute and with a finer resolution of the sensor used for the fitness sorting function.

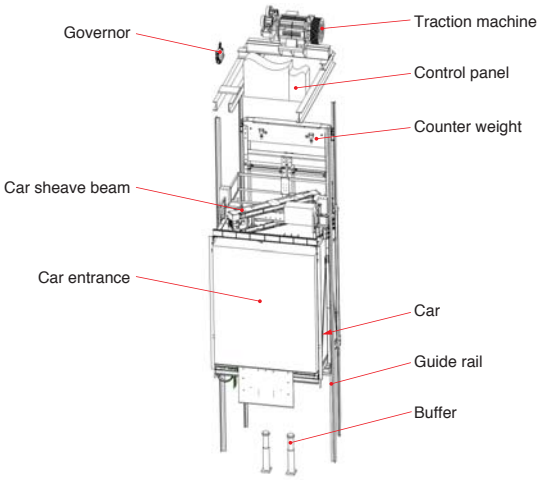
CS-701 currency sorter

Full Lineup of Medium- or Low-Speed Elevators for the Chinese Market

China's economic growth is remarkable and the demand for elevators is diverse. The loading capacity is increasing and various artistic designs are desired.

To meet these market needs, Toshiba Elevator and Building Systems Corporation has launched two types of new market-oriented products, expanding the product lineup to 24-person loading: the space-saving machine-room elevator ELCOSMO™ and the machine-room-less (MRL) elevators SPACEL-UNI™ series.

The design concept was based on a common platform, and the development process was shortened by applying various analysis techniques. Moreover, we have developed a new type of powerful permanent magnet synchronous motor which improves riding comfort. Furthermore, the products are designed to allow for increases in elevator car weight resulting from the addition of user options such as artistic car designs, thus satisfying various user needs.



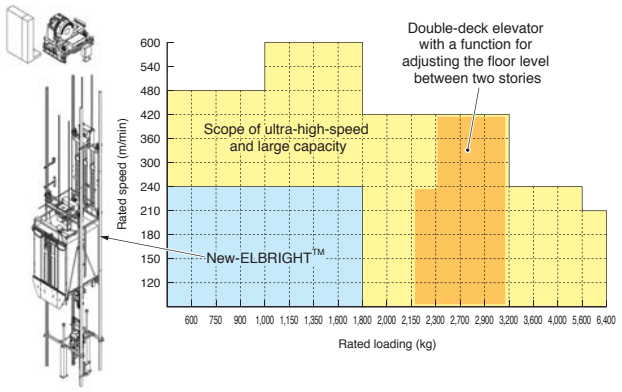
Outline of ELCOSMO™ small machine-room elevator

Full Lineup of High-Speed Elevators for the Chinese Market

The demand for high-speed, large-capacity elevators is increasing with the boom in large, multistory buildings overseas, especially in China and the Asian area.

Toshiba Elevator and Building Systems Corporation launched in August 2007 a high-speed elevator, New-ELBRIGHT™, having the rated speed of 240 m/min and 24-person loading which complies with the regulations of each country. Artistic designs and various high-grade options such as a liquid-crystal indicator, of equal performance to the Japanese version, have been developed to meet customers' demands.

The product lineup will be completed by March 2008 for the Chinese market. This includes ultra-high-speed products of up to 600 m/min and 24-person loading, including a mass double-deck elevator (an elevator linking 2 cars) with a function for adjusting the floor level between two stories, while complying with the regulations of Hong Kong and Singapore. The product will satisfy various market demands.



Outline of New-ELBRIGHT™ high-speed elevator and scope of development