Software Specifications

Control mode		RUN ／ HALT/ERROR
Programming language		IEC 61131-3 compliant
Program capacity		64POU
Program type		Task type 1
Program processing capacity	Control loop	8 loop
	Program capacity	6k steps
	Performance	1 loop/100ms 8 loops/500ms
Main scan cycle		50 ～ 5000ms (at 50-ms increments)
Engineering Tool		Ethernet connection (modular connector)
Power failure decision		None(only long interruption)
Network service		Ethernet, EC BUS
Inter-controller transmission		Ethernet：64W×32 station/1sec cycle EC BUS：V parameter 32 (16 station or less/ within 4 seconds) (31 statsion or less/within 8 seconds)
Self-diagnosis function		Watchdog timer(WDT)monitor, memory diagnosis(RAM/ROM), peripheral LSI diagnosis, board revision management, analog input diagnosis, MV read-back diagnosis
Monitor function		Program congestion monitor, battery monitor
Alarm function		System alarm, process alarm
Maintenance function		Online monitor system logs (error log, event log, intervention event logs, transmission event log)

Tag specifications

Tag meter variable	No. of points	Explanation
Display(PV)	48	・Variables for analog input (instantaneous value, integrated value).
Control(LP)	8	・Variables for analog output. LP is used with PV.
Push bottan(PB)	32	・Tags for digital input/output.

Engineering tool

Engineering tool	nV-Tool4(model：HET81J4SS)
Add in soft	New Function Block Library(MCS type)（model：GET9NJMSS)

General Specification

Electrical conditions	Power supply		24Vdc +10%-15% (ripple of 1% or less)
	Consumption power		Main unit power supply: 24VDC-Approx.0.2A DI/O power supply: 24VDC-50mA or less
	Allowable instantaneous interruption time		1ms or less
	Memory backup		Data retention：1year（Lithium battery）temperature 25℃
	Online installation and removal		Online installation and removal of the LC531 main unit can be done.
			Installation/removal from the housing
Casing	External dimensions	LC531E*S	72W×144H×250D(mm)
		LC531S*S	72W×144H×450D(mm)
	Weight	LC531E*S	Approx. 2kg
		LC531S*S	Approx. 3.5kg
	Panel cutout dimensions		68W×138H(mm) square hole, plate thickness 8mm or less
	Panel material		Panel: ABS resin (UL94-V0)-Black
			Case: Iron plate-Black paint
	External line terminal block		Power supply, signal, RS485 transmission: M3.5 screw terminals
			Ethernet：RJ45 connector
	Draw-out operation of LC531 main unit		Fixed/draw-out operation is possible with 2-stage stopper mechanism

I/O Specifications

Analog input(AI)	Number of input points	6 points
	Input range	1 to 5Vdc
	Insulation unit	No insulation between channels
	Input impedance	During energization: 1MΩ or more During power down: 1MΩ or more
	Resolution	16bit
	Conversion data	12800 to 64000 counts
Operation output(MV)	Number of output points	2 points
	Output range	4 to 20mA
	Insulation unit	No insulation between channels
	Resolution	16bit
	Conversion data	12800 to 64000 count
	Load resistance range	0 to 600Ω
Analog output(AO)	Number of output points	2 points
	Output range	1 to 5Vdc
	Insulation unit	No insulation between channels
	Resolution	16bit
	Conversion data	12800 to 64000 count
Digital input(DI)	Number of output points	3 points
	External signal	No voltage contact (external 24V 5mA±20% at contact ON)
Digital output(DO)	Number of output points	5 points
	Output type	FET open-drain output
	Maximum rating	30V-0.1A
WDT output	Number of output points	1 point
	Output type	FET open-collector output
	Output signal	Normally “ON”, In case of an error “OFF”
	Maximum rating	30V-0.1A

- The specifications and design in this catalog are subject to change without notice due to their design change or other reason.
- The content of this catalog shows the information as of June 2012.
- Inlaid composite images are used for this catalog.
- The names of products listed in this catalog may be used by each company as their trademark.

Environment Specification

Environment conditions	Operating ambient temperature	0 to 55℃
	Storage temperature	-40 ～ 70℃
	Relative humidity	10% to 95% Level RH2 (with no condensation)
	Dust	0.3mg/m3 (no conductive dust)
	Corrosive gas	No corrosive gas shall be present.
	Vibration resistance	5≦f＜9Hz ：Half amplitude of 3.5mm 9≦f＜150Hz ：Constant acceleration of 9.8m/sec^2
	Impact resistance	147m/S^2
	Altitude	2000m or less
	Grounding	Type-D grounding
	Installation location	Inside an indoor control panel
	Cooling	Natural cooling

Ethernet Transmission Specifications

Transmission Path specifications	Function	Connection between PLC server, OIS-DS/SMART, LC531, and nV Engineer Tool4
	Standard	10Base-T,100Base-TX
	Topology	Star type
	Protocol	PCMP
	Transmission speed	10Mbps/100Mbps
	Length of transmission path	10Mbps ：Max.100m 100Mbps：Max.40m
	Connection connector	RJ45 modular connector
	No. of units connected to LC531	OIS-DS/SMART：16 PLC server ：64
	Insulation	Insulation between power supply and internal circuit
Transmission cable		UTP cable (Cat5e or more)

USB specification

Transmission path specifications	Standard	USB2.0
	Function	Connection to nV Engineer Tool 4
	Topology	1：1
	Transmission speed	12Mbps
	Length of cable	2m
	Insulation	Insulation between power supply and internal circuit

USB Cable Specifications

Standard	USB2.0(full speed)
PC side connector	USB, Terminal A（male）
LC531 side connector	USB, Terminal B（male）
Length of cable	2m or less (Extension cable cannot use)

RS485 Communication Specifications

Transmission path specifications	Specifications	ECBUS/H
	Function	Connection between LC531 and EC329
	Standard	RS485
	Topology	Bus type
	Protocol	ECBUS（MODBUS base）
	Transmission speed	300/1200/2400/4800/9600/19.2K/38.4K/208K (bps)
	Length of transmission path	300 ～ 19.2K(bps)：1Km 208K(bps)：200m
	Connection type	M3.5 screw terminal block
	Number of Station	32(including host devices)
	insulation	insulation between power supply and internal circuit
Communication method		2-line method
Transmission method		Asynchronous
Transmission cable		Twisted pair cables with shield

⚠ DISCLAIMER

- In no event shall Toshiba be liable for any damages caused by use of or inability to use this product, either express or implied, (including but not limited to loss of business profits, business interruption, loss of business information, or any other.
- This product is not manufactured for systems that is directly related to human lives such as described below. If you need to use this product for such purpose, please contact our sales representative.
  [Example]
  - The propulsion machinery control system of a nuclear power plant, safety protection system of a nuclear facility, and any other systems important for safety
  - Control system of collective transport system operation and air traffic control system
  - Medical control system that is related to human lives
- Please use the product properly after thoroughly reading and understanding the instruction manual.
- This product can not be used for the application product which manufacturing and sales are prohibited by domestic and overseas laws and regulations.
- Export or provision to overseas of this product is restricted by foreign exchange law and foreign trade law.
- This product is under restriction of US Export Administration Act, and permission from US government is necessary for export depending on the exporting destination.

Contact Information

TOSHIBA

TOSHIBA CORPORATION

Social Infrastructure Systems Company

Automation Products & Facility Solution Division

TEL. +81-3-3457-4894 FAX. +81-3-5444-9409

1-1, Shibaura 1-chome, Minato-ku, Tokyo 105-8001, Japan (Toshiba Building)

EG15620

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TOSHIBA

Leading Innovation

Unified Controller nv series™

Single-Loop Controller LC531

TOSHIBA eco style

Toshiba Group contributes to
the sustainable future of planet Earth.

The single-loop controller which accomplished the further evolution inheriting compatibility. It is the realization at this one set about various system control !

Overview

Single-Loop Controller LC531 is an instrumentation panel controller, which supports various applications with user programs. Toshiba continuously enrich the features, excellent reliability and user friendliness.Simultaneously securing the compatibility of attachment to limited space, panel cut and depth result to the advanced features.

Features

- **High speed operation and power saving**
  - Processing speed is twice of conventional models.*1*2
  - Power conservation of about 60%.*1

  *1 Compared to conventional model LC521
  *2 In case the maximum registration composition is 8 PID tags
- **Network**

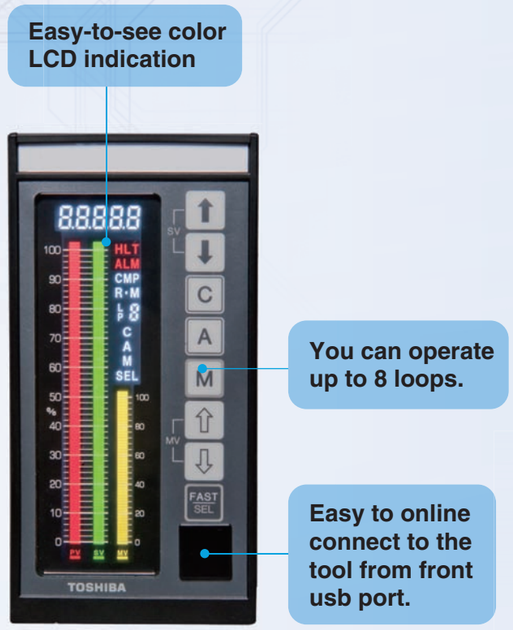
  Ethernet

  Construction of OIS-DS/SMART supervision and control system and OIS-DS supervision and control system through PLC server and communication between single loop controller.

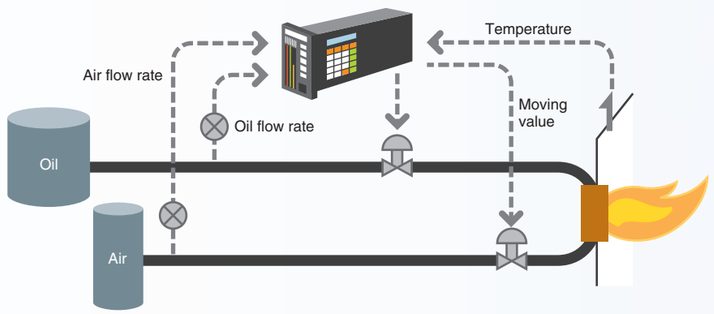
  RS485

  Support EC Bus transmission and share connection with EC300 series.
- **PID control**
  - Toshiba possess the original hyper PID control.
  - Advance control system carried out easily.
- **Engineering**
  - Applications of new function block corresponding to the programming which abides the IEC61131-3 standard.
  - Developments of efficient program contribute to reduction of development cost.
- **Size line up**

  There are 2 lines up available;Size 450mm: easy replacement. Size 250mm: new compact type.

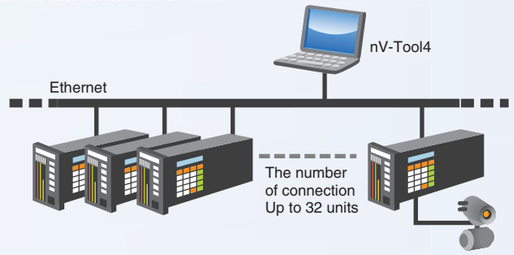


Application example ***Boiler combustion control***



System configuration example

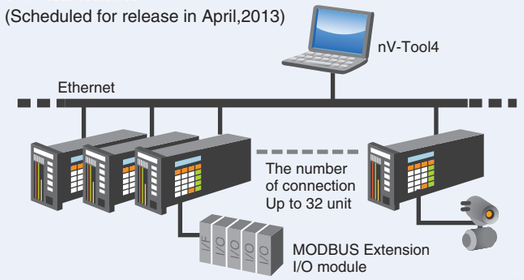
Instrumentation Panel



- Clear bar graph, display value and variety of advanced control functions.
- Operation value setting and data output is carried out using the front panel.

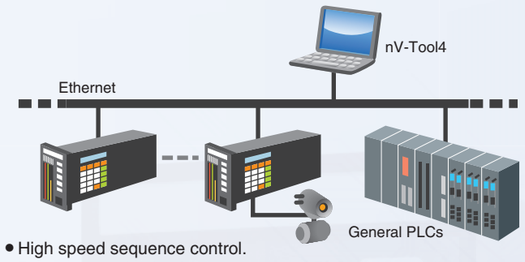
I/O extention

(Scheduled for release in April,2013)



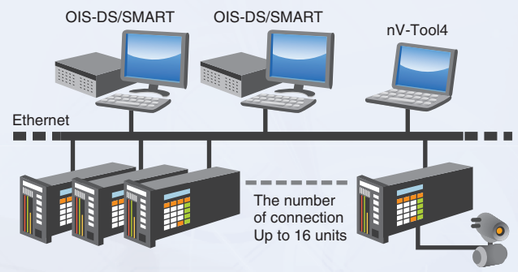
- MODBUS-RTU support I/O extension, which carry out the loop-control and sequences-control.

High speed processing with general PLC



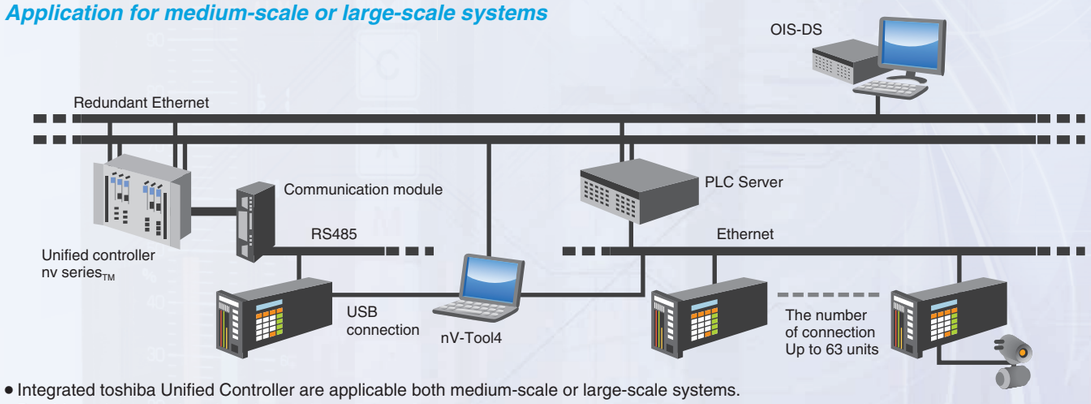
- High speed sequence control.
- Data communication between general PLC and controllers through Ethernet.
- Integrated engineering achieved by combination of Toshiba PLC through nV Tool.

Connection of HMI for DCS



- Toshiba TOSDIC-CIE DS system is a universal supervision and control system, which combine up to 16 units of controllers or up to 8 units of OIS-DS/SMARTs.

Application for medium-scale or large-scale systems



- Integrated toshiba Unified Controller are applicable both medium-scale or large-scale systems.
- Provide an integrated engineering environment.