

Single Loop Controller  
YS1000 Series



# YS1000<sup>TM</sup> Series

Single Loop Controller

Bulletin 01B08A01-01E

[www.ys1700.com](http://www.ys1700.com)

**vigilantplant.**<sup>®</sup>  
The clear path to operational excellence

**YOKOGAWA** ◆



The Next Evolution of the YS Series Loop Controller  
25 Years of Reliable Control!



A YS beyond....

# YS1000 Series



CL I, DIV2,  
GPS ABCD; T4  
CL I, ZN2, GRIC

IP54

The new YS1000 series of single-loop controllers is the successor to the Yokogawa YS100 and YS80 single loop controllers. The YS1000 series offers improved connectivity with supervisory systems and incorporates new, enhanced features that help operators work more efficiently. The YS1000 will work efficiently in petrochemical, chemical, power, pulp and paper, boiler and combustion control applications.

Compatible with 72 × 144mm cutout

Envision a plant...

## Easy to use



- Color LCD display with a wide variety of screens
- Designed with a lightweight, compact case.
- Programs using text language or graphical

## High reliability



- Dual CPU's
- Built-in "hard manual"
- CE and FM Class I Div II approvals

## Powerful and Flexible\*



- Ethernet ready (MODBUS TCP)
- Supports MODBUS RTU serial
- Available peer to peer and DCS communication options
- Extended I/O option available

## Compatibility



- Easy upgrade for YS100
- Replacement housings for YS100 and YS80 controllers
- Excellent replacement for obsolete competitive controllers

\*Some of functions are available as optional features or available to a specific model. Please see model and suffix codes for ordering information.

# vigilantplant.®

The clear path to operational excellence

YS1000™ Series is a core building block of Yokogawa's VigilantPlant solutions that promise to bring operational excellence.



# Easy to use



## Functions that support process operations

### Color LCD that's easy to see and easier to use.

#### Meter display



Digital values displayed side-by-side with an intuitive analog meter makes the YS1000 the perfect replacement for YS80 or obsolete "moving coil" controllers.



Single-loop controller

#### Event Display



Displays when events are occurring, messages can be displayed in English, Chinese, Japanese and other languages.



#### TREND Display



Your selection of up to 4 analog inputs or outputs can be displayed as trends.



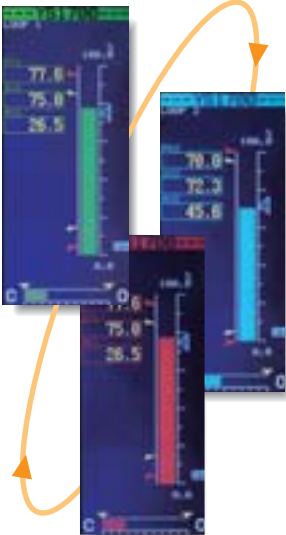
#### ALARM Display

Color LCD alarm display makes it easy to identify and review alarm activity.



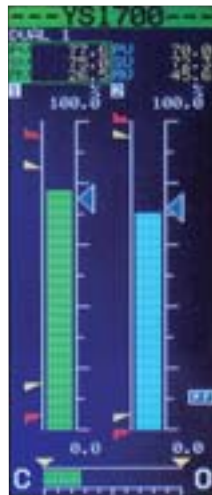
#### LOOP Display

Loops color-coded for easy identification



#### DUAL Display

Ideal for 2-element control such as cascade or selector control



#### Features a half-reflecting LCD

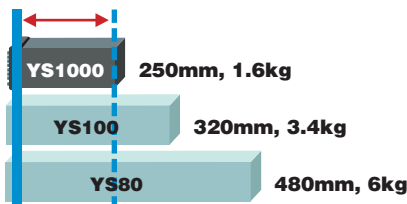
Maintains good visibility, even on panels subject to direct morning and evening sunlight.



Under indoor fluorescent lighting Exposure to Sunlight

Note: Avoid constant exposure to sunlight as this can shorten the lifespan of the LCD display.

### Designed with a lightweight, compact case



#### Provides for greater freedom of instrumentation design

Compact, lightweight design allows the use of smaller and less expensive panel. Moreover, it allows attachment to doors which was previously difficult.



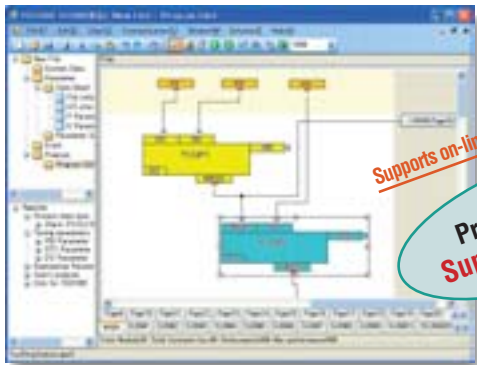
**Reduction of engineering costs**

# YS1000 Configuration and Programming Software **YSS1000™**

Your Choice of Programming Style: Graphical or Text Based

## New Graphic Programming Tool

**NEW**



*Supports on-line module monitoring function*

**Program capacity  
Supports 400 Blocks**

Programming is easier with our intuitive function block programming. The online module monitoring function allows you to confirm the performance while programming.

## Original Text Based Programming

**Compatible**



### YS170

Backwards compatible with existing programs. Conversion software for existing YS170 user programs is available(\*)



### SLPC

Backwards compatible with existing programs. Conversion tool for importing programs from YS80 SLPC ROM is available(\*)

**Program capacity  
Supports 1000 steps.  
2.5 times of the previous YS170.**

STEP	PROGRAM	COMMENT
1	LD S1 1	
2	NOT R	
3	SIF R	
4	LD R 16	
5	ST FL1	
6	LD P 1	
7	ST T 1	
8	LD DO 4	
9	NOT	
10	SIF 24	

Backwards compatible with existing YS170 users programs. Increased programming capacity allows you to create more sophisticated control schemes.

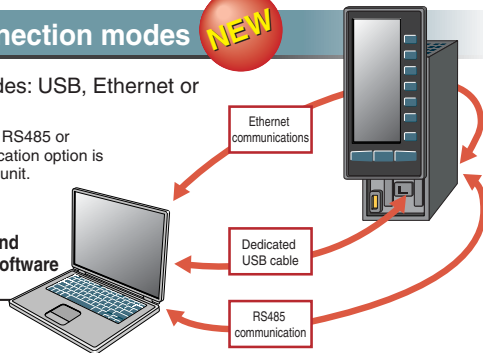
## Three connection modes

**NEW**

Connection modes: USB, Ethernet or RS485

When connecting via RS485 or Ethernet, a communication option is required on the main unit.

Configuration and Programming Software YSS1000



## Full set of computation functions

**NEW**

- Supports parameter setting for all YS1000 models
- Support for YS1700 custom programming.
- Calculations done using Engineering units and Floating point math.
- Includes over one-hundred computation modules for exponents, logarithms, temperature/pressure correction, and other operations.
- Function blocks (sub-programs) can be saved and reused.\*

## Password protection function

**NEW**

Passwords can be assigned to user programs to prevent unauthorized access to proprietary programs. A password on the main unit prevents unexpected changes in the engineering parameters.

## Calibration tool\*

**NEW**

Following the YSS1000's online calibration instructions makes calibration easy. Calibration records and data can be saved on the YS1000, allowing you to load or print past calibration data as needed.

\*: under development. Inquire for release/shipping dates.

# High reliability



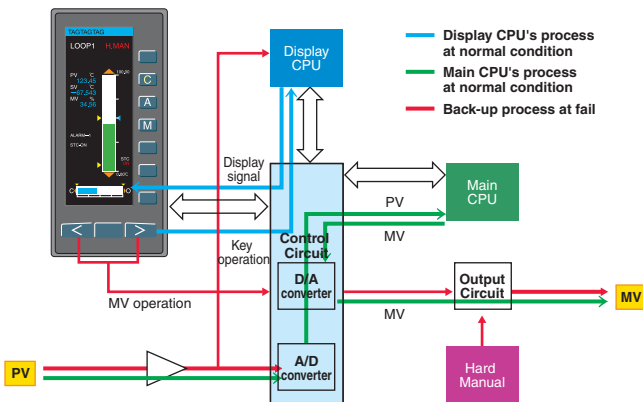
# Improved process up time

## Control output backup function



The control output backup function comes standard with YS1000 series controllers (YS1700 and YS1500) and the Manual Station for MV Setting (YS1360).

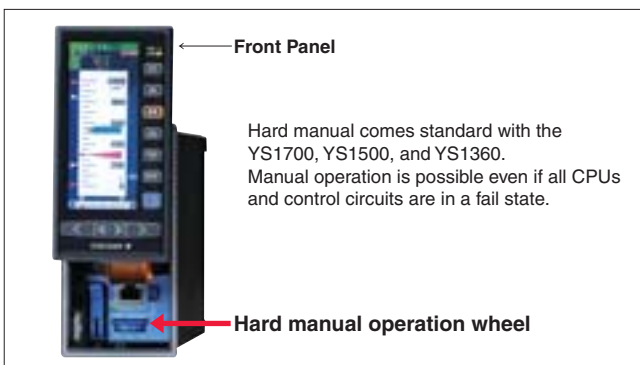
## Dual CPU



With dual-CPU construction (main CPU and display CPU), manual control capability and display continues even if an abnormality occurs on one of the CPUs. If controller self-diagnostics detects a control circuit failure, the controller can suspend analog/digital output, switch to manual mode and allow manual control by operator.

Functions	Failure area		
	Main CPU fail	Display CPU fail	All CPU and Control Circuit
Control with "Hard manual"	✓	✓	✓
Manual operation with front keys	✓	✓	N/A
Display for PV and SV	✓	✓	N/A
Control algorithm	stop	stop	stop

## Manual operation — "Hard manual"



Independent manual override is built into the control circuits, ensuring that control output can continue even when a control circuit including the CPU experiences a problem.

## Battery free memory backup



Nonvolatile memory is used for memory backup. Service life is improved because no batteries, backup capacitors, or other components are used.

## Improved basic control performance



The YS1000 series achieves higher performance than previous models (YS100 series).

- I/O accuracy
  - Voltage input accuracy:  $\pm 0.2\% \rightarrow \pm 0.1\%$
  - Voltage output accuracy:  $\pm 0.3\% \rightarrow \pm 0.1\%$
  - Current output accuracy:  $\pm 1.0\% \rightarrow \pm 0.2\%$
- Internal data resolution of the I/O signal: 1/1000  $\rightarrow$  1/10000
- Internal computation resolution of PID and other computations: 1/4096  $\rightarrow$  1/65536

## AC/DC power supply resists powerline fluctuations.



The AC/DC (100V/24V) power supply powers the instrument to provide consistent performance. Also accepts DC power regardless of polarity (specify 220 V power supply when ordering).

## Controller online replacement function (portable manual station)



Use the YS110 portable manual station when exchanging or performing maintenance on a controller. You can switch to the spare controller without interrupting the control output.



## Front panel conforms to the IP54 waterproof standard





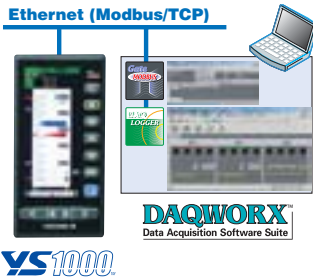
# Powerful and Flexible

## System connectivity functions

### Ethernet support **NEW**

The instrument can be easily connected to DAQWORX, DAQSTATION, general-purpose SCADA, and OPC servers via Ethernet (Modbus/TCP).

#### Ethernet (Modbus/TCP)



YS1000

#### Ethernet (Modbus/TCP)



YS1000

Ethernet : Available to the YS1000 basic type.  
Modbus/TCP server function (one connection).

### Expandable I/O **NEW**

Additional I/O can be added by selecting the YS1700 basic model (with Expandable I/O). The total number of input/outputs points with the main unit and Expandable I/O are 8 analog inputs, 4 analog outputs, and 14 DI/DO.

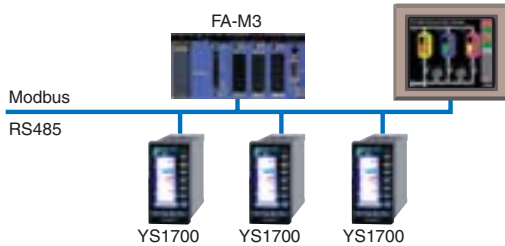


- External AI: 3 inputs
- External AO: 1 outputs
- External DI: 4 points
- External DO: 4 points

Note: An interface for the additional Expandable I/O cannot be added after delivery. If there is a possibility that extra input/outputs will be needed, we recommend that you start with the basic model (with expansion I/O).

### Communication with PLC **NEW**

Connections are enabled using the FA-M3's UT link module and the RS485 communication function. No programming is necessary to exchange data between the instrument and the FA-M3.

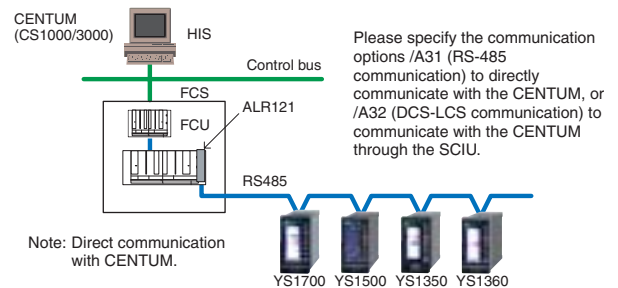


The YS1000 can also be connected to PLCs of various manufacturers via the Modbus communication protocol.

### Communication with CENTUM **Compatible**

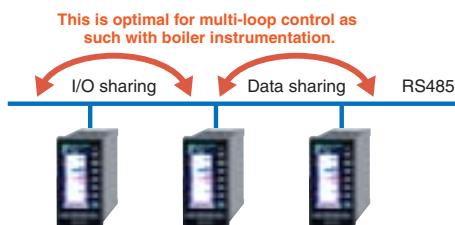
As with previous models, communication with Yokogawa's DCS (CENTUM) is supported. This is ideal for DCS backup in chemical plants and other applications requiring extremely high reliability.

Applicable Models: YS1700, YS1500, YS1350, and YS1360



### Peer-to-peer communication function **NEW**

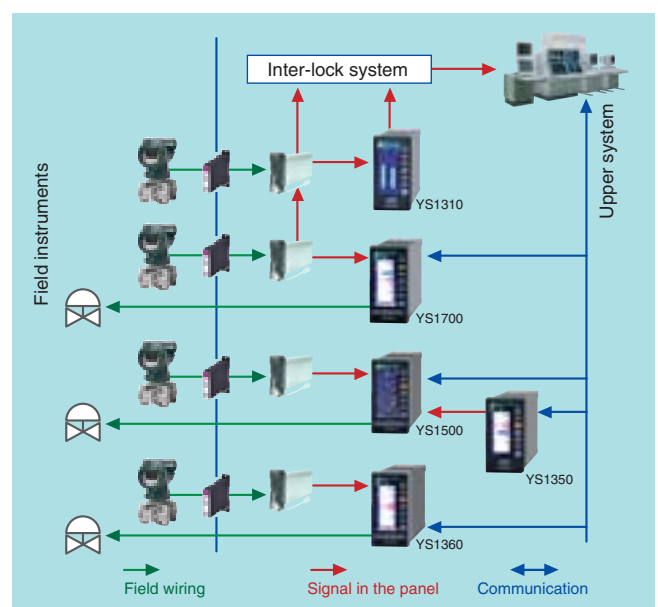
With peer-to-peer communication, up to 32 YS1700 can be connected interchangeably. Four of the connected instruments can each output 4 points of analog data and 16 points of status data. This makes data exchange and I/O sharing possible since all instruments under peer-to-peer communications can read all data (16 analog and 64 status data).



Note: Does not support the YS100 series peer-to-peer communication network (YS-net).

- Maximum no. of connections : 32
- No. of receiving units : 32
- No. of transmitting units : 4
- Transmitted data : 4 analog and 16 status data per transmitting YS1700
- Communication interval : 200 ms average (not synchronized to the control computation interval)

### A sample of System Construction



# Compatibility



**Total cost reduction**

## Cases and housing for replacing old models

**Compatible**

Indispensable for lasting, stable operations at the plant when replacing instrumentation. Case and housing are available for replacement of older-model SLCs by Yokogawa Electric Corp. (the EBS, I, EK, and HOMAC series) allowing you to exchange

instruments without modifying existing instrumentation panels. Moreover, front panel design with analog-like meters lets you update to new instruments without losing the familiarity of the old interface.

YS1000 compatible type internal unit

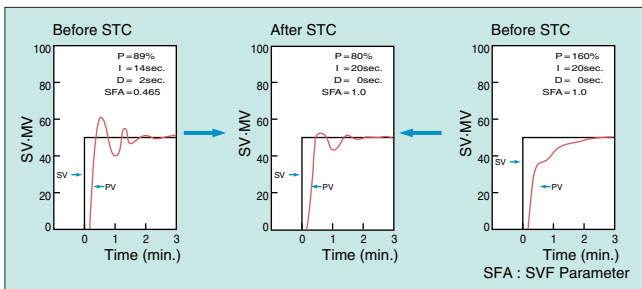
Case Housing Case Housing Housing Housing

\*1: Compatibility is established by inserting the YS1000's internal circuitry of the appropriate compatible type into the existing case.  
 \*2: Compatibility is established by inserting the entire YS1000 unit of the appropriate compatible type into the existing controller housing. Order the housing separately as needed.

## Self-tuning (STC)

**Compatible**

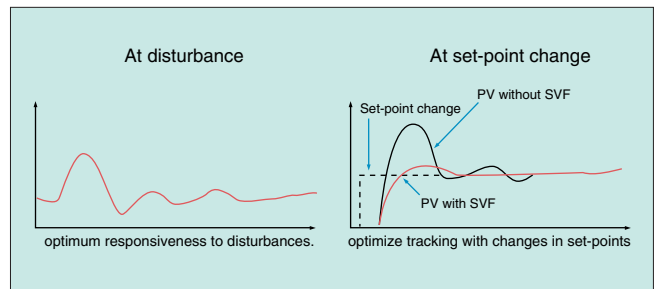
Simplifies tuning when starting up or changing the process unit under control.



## Setpoint filter (SVF)

**Compatible**

Can optimize tracking with changes in set-points. Also can maintain optimum responsiveness to disturbances.



## Flexible DI/DO

**Compatible**

The YS1700/YS1500's six DI/DO terminals can be used for both input and output.

## Programmable function key

**Compatible**

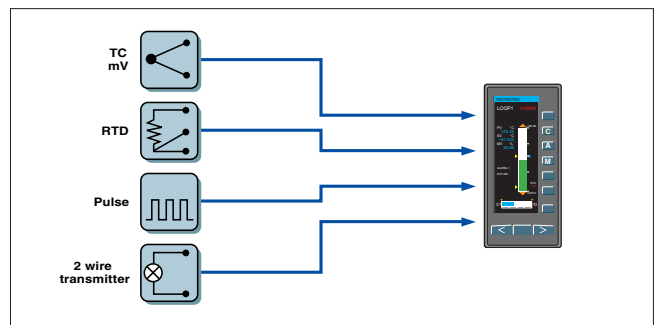
With a user program, the program function key (PF key) on the instrument's front panel can be used as an ON/OFF switch for self-tuning, or as a Start button for sequence operation.



## Direct input function\*

**Compatible**

An optional signal conversion function can be added for 1 channel. Current, voltage pulse, thermocouples, RTDs, mV and potentiometers signals from differential pressure gauges, manometers, and flow meters can be connected directly to the controller. The direct input employs highly noise resistant, isolated inputs.

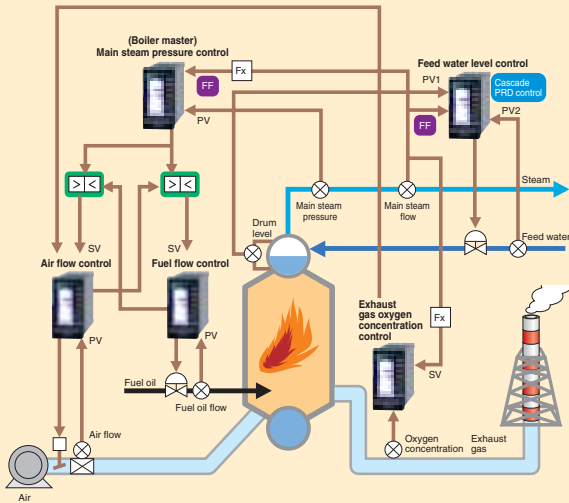


\* Options available for suffix code "2", "4", "5" of "Type".

# Applications

## Automatic Boiler Control

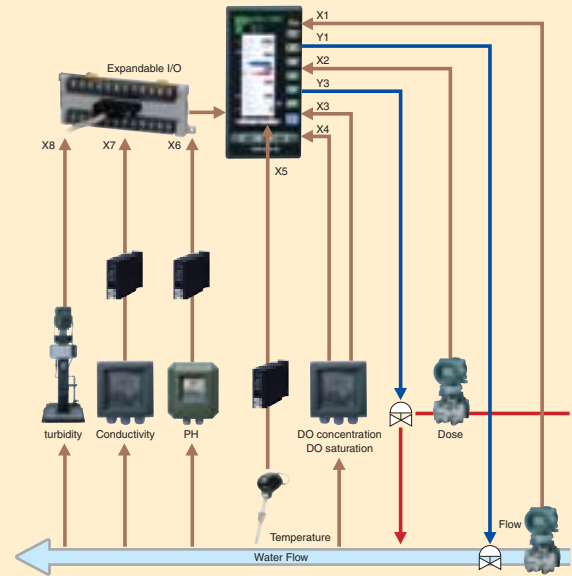
An appropriate distribution of control functionality enables safe and stable automatic boiler control.



- Cascade Primary Direct (PRD) control: Enables stable level control when the boiler is started.
- Cross limiting control calculation: Air and fuel flow are calculated so that air flow always exceeds fuel flow to prevent incomplete combustion and explosion.
- Feedforward (FF) control: The main steam pressure and feed water level are controlled quickly in response to changes in the main steam flow.

## Chemical Injection Control

- The controller can be connected with various sensors by eight analog inputs.
- Feedwater flow and chemical injection volume can be controlled by the dual-loop control function.



# Models and Suffix Codes (See General Specification Sheets for the ordering information in the detail.)

Model	Suffix code	option code	Description
YS1700	—	—	Programmable Indicating controller
YS1500	—	—	Indicating controller
YS1310	—	—	Indicator with alarm
YS1350	—	—	Manual setter for SV setting
YS1360	—	—	Manual setter for MV setting
	-0	—	Always 0
Type	0	—	Basic type CE marking, IP54
	1	—	Basic type with expandable I/O *4 CE marking, IP54
	2	—	Compatible type for YS100 (with YS100 case) CE marking
	3	—	Compatible type for YS80 internal unit, Compatible type for EBS, I, EK and HOMAC *6
	4	—	Compatible type for YS80 (Compatible size for YS80 with YS100 terminal) *6
	5	—	Compatible type for 100 line (with YS100 terminal) *6
Power supply	0	—	100VAC, 24VDC
	1	—	220VAC
Direct input *2	/A01	—	mV input
	/A02	—	Thermocouple input
	/A03	—	RTD input
	/A04	—	Potentiometer input
	/A05	—	Isolator
	/A06	—	2-wire transmitter input (isolated)
	/A07	—	2-wire transmitter input (non-isolated)
	/A08	—	Frequency input
	/DF	—	Direct input with Fahrenheit temperature range function *7
Communication	/A31	—	RS-485 communication (PC-link, Modbus, YS protocol, Peer-to-peer) *3 *5
	/A32	—	DCS-LCS communication *5
	/A34	—	Ethernet communication (Modbus/TCP) *1
Certification	/FM	—	FM nonincendive approved (FM Class I, div 2) *1 *6

Model	Suffix code	option code	Description
YSS1000	—	—	Setting software for YS1000 series
	-0	—	Always 0
	0	—	Always 0 (with CD Media and proprietary cable)

### Accessories (sold separately)

Product name	Model	Remarks
SHUP standard housing	SHUP-000	Available for YS1xx0-03x (Replace for YS80 Series)
SHUP long housing	SHUP-100	Available for YS1xx0-03x (Replace for I Series or EBS Series)
SHUP EK/HOMAC housing	SHUP-420	Available for YS1xx0-03x (Replace for EK or HOMAC Series)
100 Line pneumatic instrument replace housing	YS006	Available for YS1xx0-05x (Replace for 100 Line pneumatic instrument)
120 Ω terminating resistor	YS020	For RS-485 communication
250 Ω shunt resistor	YS021	For a built-in 24 V transmitter power supply

### Option

	YS1700	YS1500	YS1310	YS1350	YS1360
User programming	✓	N/A	N/A	N/A	N/A
Expandable I/O	✓(*4)	N/A	N/A	N/A	N/A
Ethernet communication	✓(*1)	✓(*1)	✓(*1)	✓(*1)	✓(*1)
RS485 communication (PC-link, Modbus, YS protocol)	✓(*5)	✓(*5)	✓(*5)	✓(*5)	✓(*5)
RS485 communication (Peer-to-peer)	✓(*5)	N/A	N/A	N/A	N/A
DCS-LCS communication	✓(*5)	✓(*5)	N/A	✓(*5)	✓(*5)
Direct input	✓(*2)	✓(*2)	✓(*2)	✓(*2)	✓(*2)

\*1 Can be added only for basic type (when selecting type "0" or "1")

\*2 Can be added only for compatible type for YS100 (when selecting type "2", "4" and "5"). Multiple selections are not possible.

\*3 Cannot be combined with type "3"

\*4 For basic type with expandable I/O only (when selecting type "1"). An expansion I/O terminal (model: YS010) and expansion I/O cable (model: YS011) are included.

\*5 /A31 and /A32 cannot be specified together. Please specify the communication options /A31 (RS-485 communication) to directly communicate with the CENTUM CS3000. Please specify the communication options /A32 (DCS-LCS communication) to communicate with the CENTUM CS1000/CS3000 through the SCIU.

\*6 Under development

\*7 This option can be combined only with option code /A02 or /A03. If option code /DF is specified, Fahrenheit temperature range can be available for direct input range in addition to Centigrade temperature range. In case of specifying Fahrenheit temperature range for direct input, option code /DF is required. When the direct input temperature range may be changed to Fahrenheit temperature range after shipment, also specify option code /DF.



# YS1000 Series Line-up



## YS1700 Programmable Indicating Controller

A programmable controller in which control and computational functions are combined by the user with the YSS1000 programming tool. Each YS1700 can run two PID control calculations simultaneously and output the respective 4-20 mA output signals. The YS1700 can also be used as a multi-function controller without programming, in the same way as the Model 1500.

<b>Controller mode</b>	Programmable, Multi-function mode (single-loop, cascade and auto-selector)
<b>Control type</b>	Basic PID control (built-in nonlinear control function), proportional control (built-in nonlinear control function), sampling PI control, (built-in sampling PI control function), and batch PID control
<b>Control period</b>	0.05, 0.1 and 0.2 sec (programmable mode), 0.1 sec (multi-function mode)
<b>Additional control function</b>	Adjustable setpoint filter (SVF), Self-tuning (STC), Non-linear PID control, PID control with reset bias function, output limiter, external cascade-control setpoint signal
<b>Extended control function</b>	Input/output compensation, Variable gain, preset PID
<b>Auxiliary control function</b>	Feed-forward control, output tracking, preset MV output, PV/SV tracking, operation mode change, input filter, Square-root, 10-line-segment characterizer, ratio
<b>Analog input</b>	1 to 5 V DC (5 channels or 8 channels with with expandable I/O)
<b>Analog output</b>	4 to 20 mA (1 or 2 channels), 1 to 5 V DC (2 channels or 3 channels with expandable I/O)
<b>Alarm function</b>	High/low/high-high/low-low limits, deviation limit, and velocity alarm
<b>Digital signal</b>	Six channels (each being common to both input and output)
<b>Retransmission output</b>	PV1, PV2, SV1, SV2, and other analog inputs
<b>Input computation</b>	Square-root with low signal cut off, 10-line-segment characterizer, first-order lag calculation, scaling of external cascade-control setpoint signal, feed-forward signal calculation
<b>Output computation</b>	Output high/low limiting
<b>Computation modules</b>	Four arithmetic operations, square-root, absolute, selector, limiter, ten segmen characterizer, alarm, first-order lag, differentiation, dead time, velocity computations, moving average, timer, program setting, counter, pulse output, temperature/pressure compasations, power, logarithmic, logic computations, comparison, branching, switching, sub-program and register manipulation
<b>Program method</b>	Function block or text (use YSS1000 configuration and programming software)
<b>Program capacity</b>	400 modules (function block), 1000 steps (text)
<b>Security</b>	Protection by password
<b>Communication</b>	Modbus/TCP, RS-485 (modbus, peer-to-peer), and DCS-LCS
<b>Hardmanual</b>	Yes (standard)



## YS1500 Indicating Controller

Incorporates fundamental control functions required for PID control. Necessary functions can be selected in accordance with the user's purpose. The available functions include those necessary for input signal processing, such as square root extraction and linear segment conversion, and feed-forward calculation. Cascade and auto-selector control is also possible.

<b>Controller mode</b>	single-loop, cascade and auto-selector
<b>Control type</b>	Basic PID control (built-in nonlinear control function), proportional control (built-in nonlinear control function), sampling PI control, (built-in sampling PI control function)
<b>Control period</b>	0.1 sec
<b>Additional control function</b>	Adjustable setpoint filter (SVF), Self-tuning (STC), Non-linear PID control, PID control with reset bias function, output limiter, external cascade-control setpoint signal
<b>Auxiliary control function</b>	Feed-forward control, output tracking, preset MV output, PV/SV tracking, operation mode change, input filter, Square-root, 10-line-segment characterizer, ratio
<b>Analog input</b>	1 to 5 V DC (5 channels)
<b>Analog output</b>	4 to 20 mA (1 channel) and 1 to 5 V DC (2 channels)
<b>Alarm function</b>	High/low/high-high/low-low limits, deviation limit, and velocity alarm
<b>Digital signal</b>	Six channels (each being common to both input and output)
<b>Retransmission output</b>	PV1, PV2, SV1, SV2, and other analog inputs
<b>Input computation</b>	Square-root with low signal cut off, 10-line-segment characterizer, first-order lag calculation, scaling of external cascade-control setpoint signal, feed-forward signal calculation
<b>Output computation</b>	Output high/low limiting
<b>Security</b>	Protection by password
<b>Communication</b>	Modbus/TCP, RS-485 (modbus), and DCS-LCS
<b>Hardmanual</b>	Yes (standard)



## YS1310 Indicator with Alarm

Indicating alarm monitor with two inputs for simultaneous monitoring of two loops. High-high, high, low, and low-low alarms can be detected for each of the two inputs, and logical ANDs or ORs of arbitrary alarms can be set. From among these, a total of six alarms can be assigned to alarm output contacts.

<b>Analog input</b>	1 to 5 V DC (2 channels)
<b>Digital signal</b>	Six outputs (with one for digital input as backlight off) and one FAIL contact
<b>Alarm functions</b>	High/low/high-high/low-low limits
<b>Input computation</b>	Square-root with low signal cut off, first-order lag calculation
<b>Security</b>	Protection by password
<b>Trend display</b>	
<b>Communication</b>	Modbus/TCP, RS-485 (modbus), and DCS-LCS



## YS1350 Manual Setter for SV Setting

This manual loader allows an operator to send a setpoint to a remote controller. Its operation mode is switched by the mode keys (C and M) or a status input. A status identification output is provided as standard.

<b>Analog input</b>	1 to 5 V DC (2 channels)
<b>Analog output</b>	1 to 5 V DC (1 channel)
<b>Digital signal</b>	Two input, three outputs and one FAIL contact
<b>Alarm functions</b>	High/low limits
<b>Input computation</b>	Square-root with low signal cut off
<b>Security</b>	Protection by password
<b>Trend display</b>	
<b>Communication</b>	Modbus/TCP, RS-485 (modbus), and DCS-LCS



## YS1360 Manual Setter for MV Setting

This manual loader allows an operator to interrupt a control signal to a final control device and manually control it's operation temporarily. Its operation mode is switched by the mode keys (C and M) or a status input. A status identification output is provided as standard.

<b>Analog input</b>	1 to 5 V DC (2 channels)
<b>Analog output</b>	4 to 20 mA (1 channel) and 1 to 5 V DC (1 channel)
<b>Digital signal</b>	Two input, three outputs and one FAIL contact
<b>Alarm functions</b>	High/low limits
<b>Input computation</b>	Square-root with low signal cut off
<b>Security</b>	Protection by password
<b>Trend display</b>	
<b>Communication</b>	Modbus/TCP, RS-485 (modbus), and DCS-LCS
<b>Hardmanual</b>	Yes (standard)



## YS110 Portable Manual Station

When a YS1700, YS1500 or YS1360 requires maintenance, the YS110 Portable Manual Station can be used to output a 4 - 20 mA signal to the final control element. Simply swing up the front panel of the controller, connect this unit to the controller, and replace the internal assembly while keeping the existing manipulated output active.

<b>Input signal</b>	1 to 5 V DC (1 channel)
<b>Manipulation signal</b>	4 to 20 mA DC (1 channel)
<b>Input/manipulation signal meters</b>	Moving-coil method Range: 0 to 100% Scaling: 20 equal divisions
<b>Output manipulation</b>	Manual using the front-panel dials
<b>I/O connection</b>	I/Os are coupled with the connector on the case using a dedicated cable.
<b>Models to be backed up</b>	YS1700, YS1500, YS1360

# Terminal Block

## YS1700/YS1500 Terminal Arrangements

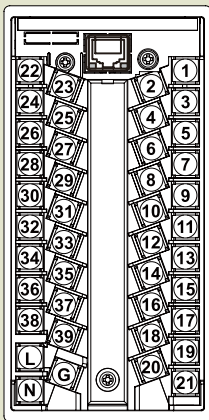
Terminal No.	YS1700/YS1500			
	YS1700 Programmable mode	Single-loop mode	Cascade mode	Selector mode
1	➤ Analog input 1 (1-5V DC)	➤ PV (1-5V DC)	➤ PV1 (1-5V DC)	➤ PV1 (1-5V DC)
2	➤ Analog input 2 (1-5V DC)	➤ Cascade set point input (1-5V DC)	➤ Cascade set point input (1-5V DC)	➤ Cascade set point input 1 (1-5V DC)
3	➤ Analog input 3 (1-5V DC)	➤ Tracking input (1-5V DC)	➤ PV2 (1-5V DC)	➤ PV2 (1-5V DC)
4	➤ Analog input 4 (1-5V DC)	➤ Feedforward input (1-5V DC)	➤ Feedforward input (1-5V DC)	➤ Cascade set point input 2 (1-5V DC)
5	➤ Analog input 5 (1-5V DC)	➤ Direct input signal output (*1)	➤ Direct input signal output (*1)	➤ Direct input signal output (*1)
6	➤ Fail output	➤ Fail output	➤ Fail output	➤ Fail output
13	Transmitter Power supply (24V DC)	Transmitter Power supply (24V DC)	Transmitter Power supply (24V DC)	Transmitter Power supply (24V DC)
14	Communication SG	Communication SG	Communication SG	Communication SG
15	Communication SDA (-)	Communication SDA (-)	Communication SDA (-)	Communication SDA (-)
16	Communication SDB (+)	Communication SDB (+)	Communication SDB (+)	Communication SDB (+)
17	Communication RDA (-) or LCS (+)	Communication RDA (-) or LCS (+)	Communication RDA (-) or LCS (+)	Communication RDA (-) or LCS (+)
18	Communication RDB (+) or LCS (-)	Communication RDB (+) or LCS (-)	Communication RDB (+) or LCS (-)	Communication RDB (+) or LCS (-)
19	➤ Direct input (*1)	➤ Direct input (*1)	➤ Direct input (*1)	➤ Direct input (*1)
20	➤ Analog output 1 (4~20mA DC)	➤ MV1 (4~20mA DC)	➤ MV1 (4~20mA DC)	➤ MV1 (4~20mA DC)
21	➤ Analog output 2 (1-5V DC)	➤ MV2 (1-5V DC)	➤ MV2 (1-5V DC)	➤ MV2 (1-5V DC)
22	➤ Analog output 3 (4~20mA DC/1-5V DC)	➤ SV (1-5V DC)	➤ SV (1-5V DC)	➤ SV (1-5V DC)
23	➤ Digital output 1 or Digital input 6	➤ PV1 high limit alarm output	➤ First loop alarm output	➤ First loop alarm output
24	➤ Digital output 2 or Digital input 5	➤ PV1 low limit alarm output	➤ Second loop alarm output	➤ Second loop alarm output
25	➤ Digital output 3 or Digital input 4	➤ Deviation alarm output	➤ O/C status output	➤ L/R status output
26	➤ Digital output 4 or Digital input 3	➤ C/A-M status output	➤ C/A-M status output	➤ C/A-M status output
27	➤ Digital output 5 or Digital input 2	➤ C/A-M status output	➤ C/A-M status output	➤ C/A-M status output
28	➤ Digital output 6 or Digital input 1	➤ Action mode switching input	➤ Action mode switching input	➤ Action mode switching input
29	L Power supply	➤ Power supply	➤ Power supply	➤ Power supply
30	N Ground (GND)	➤ Power supply	➤ Power supply	➤ Power supply
31	G Ground (GND)	➤ Power supply	➤ Power supply	➤ Power supply

\*1: Only applicable for YS100 compatible terminal type ("2" "4" "5")

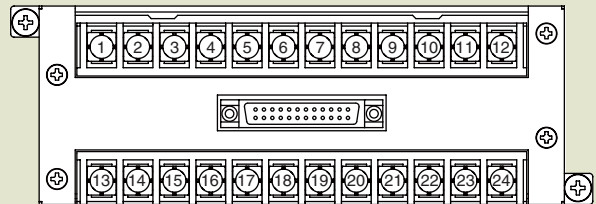
## YS1310/YS1350/YS1360 Terminal Arrangements

Terminal No.	YS1310	YS1350	YS1360
	1	➤ PV1 (1-5V DC)	➤ PV1 (1-5V DC)
2	➤ PV2 (1-5V DC)	➤ Cascade set point input (1-5V DC)	➤ Cascade input (1-5V DC)
3	➤ Direct input signal output (*1)	➤ Direct input signal output (*1)	➤ Direct input signal output (*1)
4	➤ Fail output	➤ Fail output	➤ Fail output
13	Transmitter Power supply (24V DC)	Transmitter Power supply (24V DC)	Transmitter Power supply (24V DC)
14	Communication SG	Communication SG	Communication SG
15	Communication SDA (-)	Communication SDA (-)	Communication SDA (-)
16	Communication SDB (+)	Communication SDB (+)	Communication SDB (+)
17	Communication RDA (-)	Communication RDA (-) or LCS (+)	Communication RDA (-) or LCS (+)
18	Communication RDB (+)	Communication RDB (+) or LCS (-)	Communication RDB (+) or LCS (-)
19	➤ Direct input (*1)	➤ Direct input (*1)	➤ Direct input (*1)
20	➤ Analog output 1 (4~20mA DC)	➤ MV1 (4~20mA DC)	➤ MV1 (4~20mA DC)
21	➤ Analog output 2 (1-5V DC)	➤ SV (1-5V DC)	➤ MV2 (1-5V DC)
22	➤ Alarm output 1	➤ PV1 high limit alarm output	➤ PV1 high limit alarm output
23	➤ Alarm output 2	➤ PV1 low limit alarm output	➤ PV1 low limit alarm output
24	➤ Alarm output 3	➤ C/M status output	➤ C/M status output
25	➤ Alarm output 4	➤ Input for LCD backlight off	➤ Input for LCD backlight off
26	➤ Alarm output 5	➤ Action mode switching input	➤ Action mode switching input
27	➤ Alarm output 6 or Digital input 1	➤ Action mode switching input	➤ Action mode switching input
28	L Power supply	➤ Power supply	➤ Power supply
29	N Ground (GND)	➤ Power supply	➤ Power supply
30	G Ground (GND)	➤ Power supply	➤ Power supply

## YS1000 Series (Basic Type) Terminal Block



## YS010 Expandable I/O Terminal Arrangements



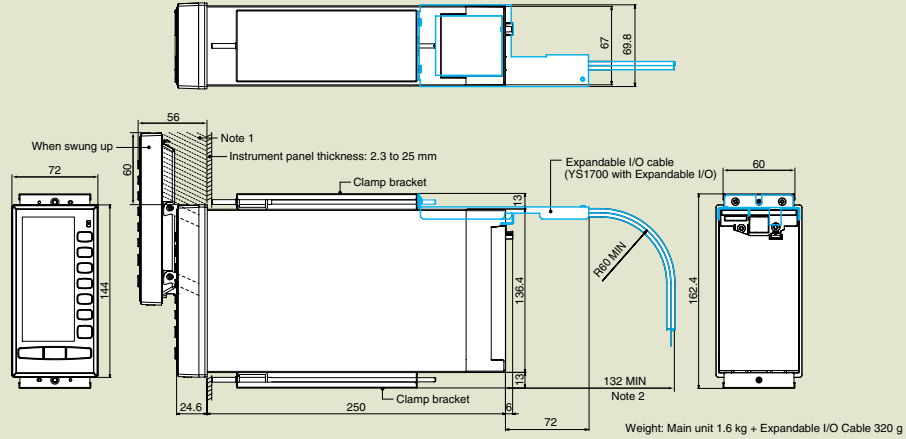
Terminal number	Expandable I/O Terminal	Terminal number	Expandable I/O Terminal
1	➤ Analog input 6	13	➤ Analog input 8
2	➤ Analog input 7	14	➤ Analog output 4 (1 to 5VDC)
3	➤ Digital input 7	15	➤ Digital output 7
4	➤ Digital input 8	16	➤ Digital output 8
5	➤ Digital input 9	17	➤ Digital output 9
6	➤ Digital input 10	18	➤ Digital output 10
7		19	
8		20	
9		21	
10		22	
11		23	
12		24	

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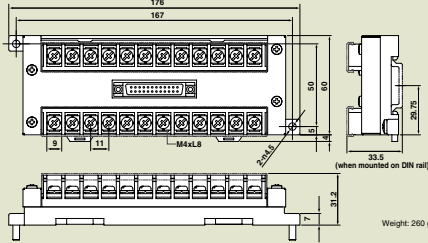
# Dimensions

## Main Unit Dimensions (YS1000 Basic Type) (YS1000 Basic Type with Expandable I/O)



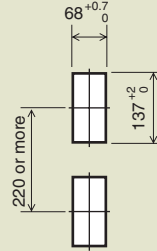
Note 1: If a nameplate, etc. is installed within 60 mm above the instrument, the height of the nameplate, etc. must be 30 mm or less from the panel surface.  
 Note 2: When installing the expandable I/O cable, secure the wiring space of at least 60 mm for a minimum curvature radius of the cable in addition to the mounting bracket space of 72 mm from the terminal cover face of the main unit.

## Expandable I/O Terminal Dimensions

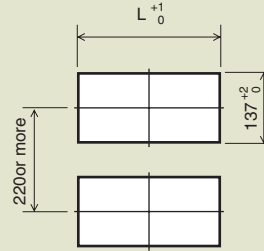


## Panel Cutout Width

(For single mounting)



(For side-by-side mounting)



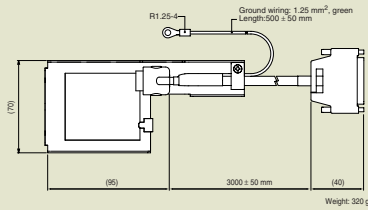
Panel Cutout Width for  
Side-by-side Mounting

Number of instruments to be mounted	L (mm)
2	140
3	212
4	284
5	356
6	428
7	500
8	572
9	644
10	716
11	788
12	860
13	932
14	1004

Third angle projection  
 Unit: mm  
 General tolerance:  $\pm$ (value of tolerance class IT18 based on JIS B 0401-1998)/2

\*1: When attaching a nameplate or the like to the panel within 60 mm above this instrument, ensure that its thickness is less than 30 mm.  
 \*2: To ensure adequate ventilation, allow space of at least 100 mm above and below the panel.  
 \*3: Front display of YS1700 and YS1500 are shown, and they are slightly different from that of YS13C□0 (keytop and front plate and the like).

## Expandable I/O Cable Dimensions



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