Patented

Intelligent Servo Controller

I-SAC Series

It makes Technological Sense

SANTEST

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What is the most important expectation of Servo Controller worth while called a good one?
You will see at present many products named industrial servo controller in the market, however, to select a good and real servo controller, you need to know exactly what to consider and exactly which performance to be focused on.

We think as follows,

Performance to be expected

Below two points would have to be considered as especially inevitable for servo controller.

1. Response
   How and at which velocity can you reach your target of your desired volume to be controlled?
   (Such as cylinder rod displacement, pressure...)
   The over-run or over-shoot has to be evaded in the process of controlled trajectory.

2. Steady-state error (Positioning Accuracy)
   There would be no meaning in design of servo system if there remains a substantial difference between desired and actual movement even though you could achieve within the time you wanted.
   Therefore the difference between designed and actual; to which degree you can decrease the steady-state error; it is the most important points which determine the total system accuracy.

Easy approach to handling and adjustment

Suppose you used a controller and you were satisfied with above described specifications, can you say it attractive servo controller if controlled performance were deteriorated in say "half a year" or "half a month took in re-adjustment of system" ?
Perhaps it will invite only the increase of field-working engineer's load and irritation.

Above two kinds of mention will be the main factors which are necessitated in the industrial servo controller.
Then, under the conditions of described above, let's see the performance presented by I-SAC servo controller.

● I-SAC Performance

Controller Specification

Fig.1 shows an example of step response of PID and I-SAC Servo-Controller in case of setting target value as 1 in a typical cylinder-positioning control system.
While any PID control has an overshoot and reaching the target with vibrating mode, "I-SAC" is realizing smooth and fast response due to its proprietary high-gain feed-back.
As to steady-state error, I-SAC can make it totally zero because of its integration compensation installed inside, same as PI and PID controller.

Robustness against variance of circumstances

Fig.2 illustrates a typical result of I-SAC controller advantage that is, in the same system described above, we gave three different masses to the cylinder maintaining parameters in the controller same. You see a strong vibration in case of PID control which means necessity of re-adjustment of parameters by engineers at the site. On the other hand, I-SAC sees almost no change of controlled performance due to its automatic adaptive control structure installed inside.

Adjustment of Parameters

There are only a few parameters to be adjusted in the I-SAC controller. Furthermore, no necessity of using gain, phase characteristic and / or transfer-function of the system like PID control, it is quite enough if engineer will adjust a little bit confirming response at the very plant.

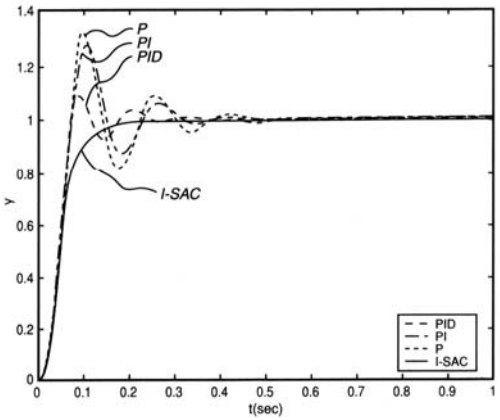


Fig.1

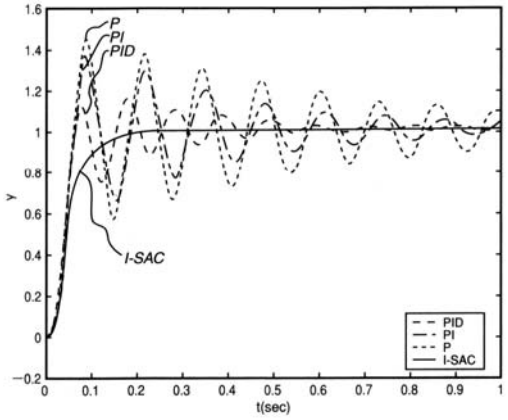


Fig.2

Now, you would see I-SAC controller will be the only choice if you want to design a very high performance servo corollary.
We do hope you will utilize our controller to its best replacing PID or other servo controller.

Application example

1. Remote control construction machine robot (pneumatic: position control)

Apparatus operated remotely in the hazardous area, retrofitting pneumatic cylinders on the joy stick of bulldozer or shovel machine, I-SAC controller was used as servo controller and got the operator's manipulation to its fidelity.

2. Powder Press Machine ① (hydraulic: position/ load control)

I-SAC MX (2 axes) , switching positional control to pressure control, made it possible to get target load with fast response yet without overshoot, thus realized high quality production. In addition, our integrator function may automatically control the change of controlled output due to ambient temperature drift and no parameter re-adjustment was needed.

3. Powder Press Machine ②(hydraulic: position control)

Used for hydraulic servo system of the upper mold tool positional control, Resolving steady-state error arisen from unbalanced pressure in the lower mechanical mold (base) tool, having realized positional accuracy of 10 μ m.

4. Mold Traverse Equipment (pneumatic: position control)

Mold tool weighing over 1 ton is transferred to the distance of approx. 2 meter and is changed to another mold tool.
It took over 1 minute for transferring in the conventional system; I-SAC used pneumatic servo system could shorten the time to approx. 15 seconds only. Also we could overwhelmingly minimize undesired mechanical shock and impact during tool-transferring process.

5. Testing Apparatus of Pitot-Tube (pneumatic: pressure control)

Used in pneumatic pressure control for test apparatus of air fighter velocity measurement system employing Pitot-tube. Shortened settling time by I-SAC controller and realized utmost performance that was impossible by conventional servo controllers due to their poor versatility.

6. Chemical Plant (pneumatic: pressure control)

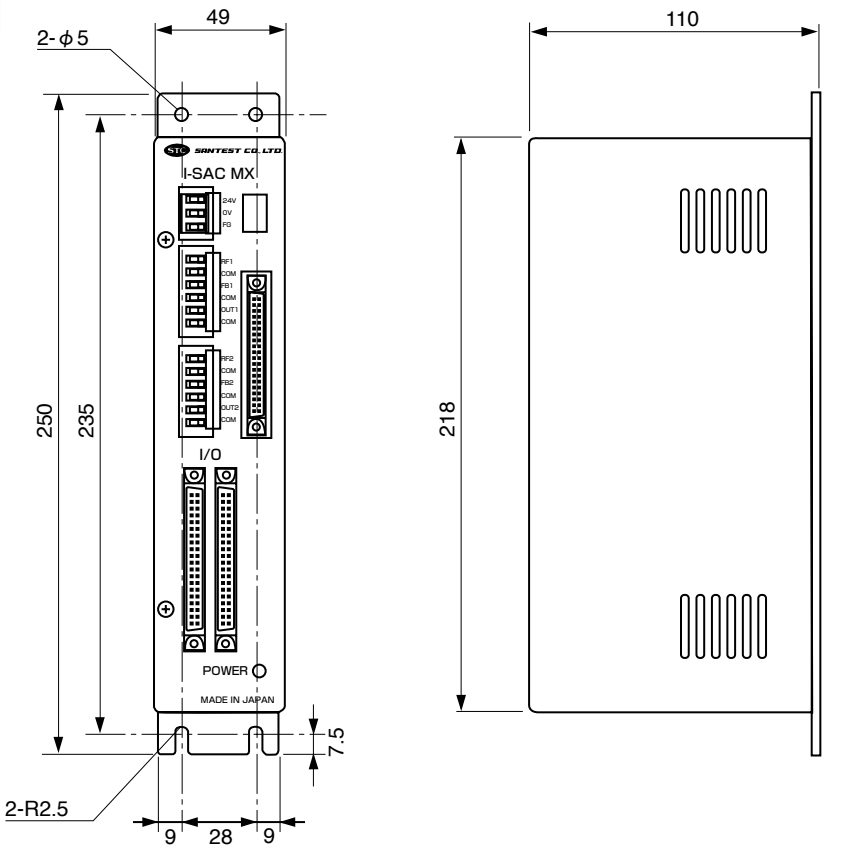
Replacing PID controller and our I-SAC has successfully stabilized apparatus of high-temp compressed air supply system. Pressure change was decreased by one third, thus product quality was enhanced not renewing the plant equipment.

7. Electric Servo-motor control system

As well known, the fabricators of electric servo-motor already provide their own servo controller; however, in almost all the case they employ conventional PID in their units.
If you wish a more high-ended performance, why not try our I-SAC control system!

■I-SAC MX Servo Controller

Dimensions



I-SAC MX is the high-end version of a series employing 32bit DSP, in addition motion control function is integrated and increased I/O interfaces enable flexible measures to most any user needs.

・Motion Programme

User can set a motion profile into ISAC-MX and can automatically control the plant according to the profile. Various interfaces such as with PLC can be worked by giving special target value needed.

・Various Shakehands Signal

Servo On/Off, Automatic Zero Searching, In-Position output etc are equipped and can be friendly interfaced with PLC etc.

・2-Axes Independent control and Axis Switching

Two Independent controllers are built-in and can switch axis during operations. Example is a firstly position control then immediate switch to load control in real time.

Models

I - SAC MX - □□□/□□□
① ② ③ ④ ⑤ ⑥

		symbol
channel1	① command input	V,I,D,O
	② feed-back input	V,I,D,O
	③ controlled output	V or I
channel 2	④ command input	V,I,D,O
	⑤ feed-back input	V,I,D,O
	⑥ controlled output	V or I

Symbol

Command/feed-back

V : analog voltage (±10V)
I : analog current (±20mA)
D : differential line-driver
O : digital open collector

Output

V : analog voltage ±10V
I : analog current ±50mA (load200ΩMAX)

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