

Preface

Thank you for using the ICS3.5 Serial Manager. The purpose of this software is to change the configuration of ICS3.5 standard servo motor. Before using, please read the following carefully.

Disclaimer

- This software is a free software. Redistribution is allowed, but in doing so, please attach this software manual.
- Copyright for the present software, as well as all rights for the designs of icons other than the following Primo icons and the Kondo Science logo belongs to Kondo Kagaku Co., Ltd.
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- Please use the present software at your own personal risk. The creators are not liable for any failures that may result from using this software.
- Specifics of the present software may be changed or modified without prior notice.
- The present software may not be disassembled, decompiled, or reverse engineered.
- The icons used in the present software are those of Primo Icon Set by Webdesigner Depot (<http://www.webdesignerdepot.com>).

Operating Requirements

- .NET Framework2.0
- Operation on WindowsXP SP2(32bit), WindowsVista(32bit) and Windows7(32bit) have been confirmed.

How to Use

■ Install/Uninstall

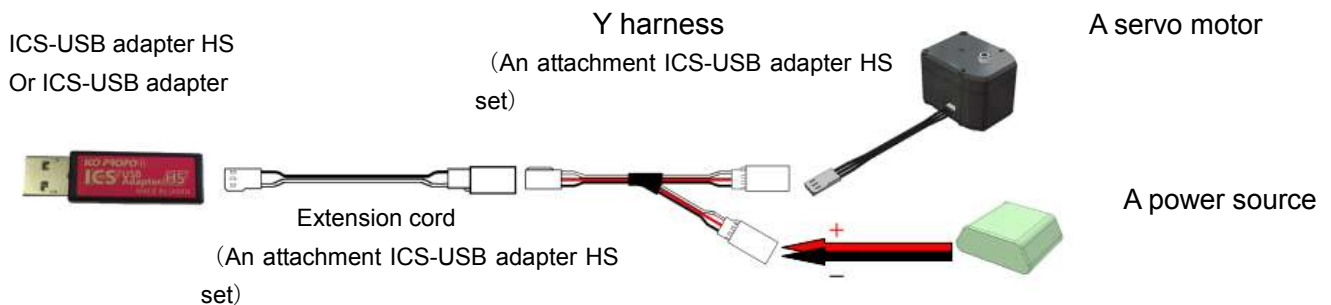
After extracting the file, please confirm that the following files are in the folder.

- ICS3.5Manager.exe (executable file)
- IcsBaseClass.dll (library file)
- ICS3.5 ManagerSoftwareManual.pdf (the file you are reading now)

When uninstalling, delete the entire folder including the extracted files.

■ Connecting Equipments

Real-time operation (operation test) and various settings of servo are enabled by connecting the ICS-USB adapter HS (No.02043) or the ICS-USB adapter (No.01106) to servo and another power source.



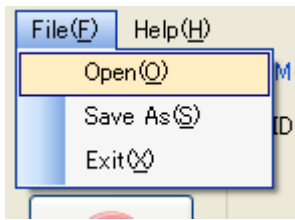
- ※ Connect to the Y harness using connection cables accompanying the servo motor. Basically, only one should be connected.
- ※ For power, use DC 9V ~ 12V. Operation outside this range may cause damage to the servo's internal components.
- ※ When changing settings of the main unit, the ICS-USB adapter HS and the servo motor can be directly connected (but not for real-time operation).
- ※ Do not set the baudrate to above 115 kbps when using the ICS-USB adapter.

■ Software Execution

By executing ICS3.5Manager.exe, the following screen appears.



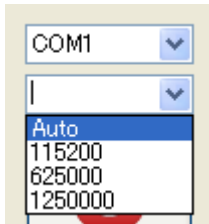
- File - Help



FILE ... For saving current settings, reading saved data, and exiting present software.

HELP... Displays version information of the present software.

- COM Setting



Set and connect COM port.

Select COM number distributed to ICS-USB adapter HS and baudrate (communication speed); open port with the "Connect" button.

*COM number can be confirmed using the Device Manager on Windows. For details, see the manual accompanying ICS-USB adapter HS.

Baudrate may be changed while port is connected.

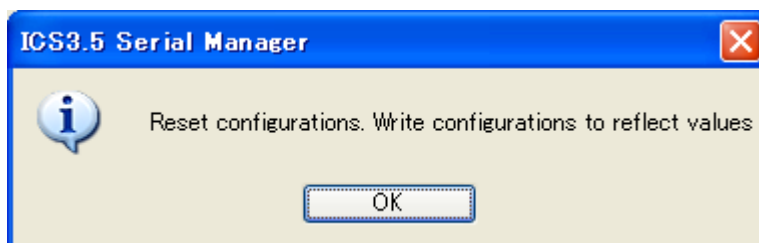
Besides communication speed, "Auto" is also available in the Baudrate section. This function automatically matches the servo's communication speed and ID. When this article is selected at a state of disconnection/connection, automatic reconnection takes place.

- Read, Write, Reset

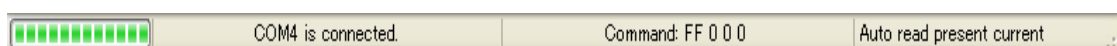


Read and Write EEPROM settings for the servo connected.

The reset button resets the settings on display to the standard condition at software execution. Under this condition, settings are not written to servo. To reflect settings to servo, press Write.



- Display Status



Description of buttons and current status are displayed.

• RAM

Changing contents of the servo RAM.

The screenshot shows a control interface for a servo's RAM. It includes fields for ID (0), Position (7500), Stretch (60), Speed (127), Temperature, and Current. Each field has a 'Set' or 'Get' button. There are also checkboxes for 'Real-Time' data retrieval for Temperature and Current, and a 'FREE' button for the Position parameter.

- **ID** --- Write and retrieve ID. (Initial value: 0)
- **Position** --- Operation of servo that is connected. Press the FREE button to obtain the present angle of the servo.
- **Stretch** --- The present value of stretch is set and retrieved.
- **Speed** --- The present value of speed is set and retrieved.
- **Temperature** --- The present temperature is retrieved. Check "Real-time" and press the "Retrieve" button to retrieve consecutive data.
- **Current** --- The present electric current is obtained. Check "Real-time" and press the "Retrieve" button to retrieve consecutive data.

[Position] Real-time operation of servo

Servo motor is moved in real-time by operation of the Manager.

Range of Parameter	Around Step
(Backward) 3500~11500 (Forward)	10

Relationship Between Parameter and Angle of Position of Servo	Parameter	Angle of Operation
	3500	-135° (Backward)
	7500	0° (Neutral)
	11500	+135°
	Around Step(10)	0.34°

[Stretch] [Speed] Real-time setting change of servo.

Servo motor settings are changed in real-time by operation of the manager.

* This feature is for checking operation. The parameters set at this point will not be written to the servo.

Range of Parameter(Stretch)
(Soft) 1 ~ 127 (Hard)

Range of Parameter(Speed)
(Slow) 1 ~ 127 (Fast)

[Temperature] [Current]

Temperature	<input type="checkbox"/> Real-Time	<input type="text"/>	<input type="button" value="Get"/>
Current	<input type="checkbox"/> Real-Time	<input type="text"/>	<input type="button" value="Get"/>

Servo motor temperature and electric current are retrieved in real-time by operation of the manager. Check "Real-time" and press the "Retrieve" button to retrieve consecutive data.

Range of Parameter(Temperature)
(High) 1~127 (Low)

Value	Temperrature
73	100°C
84	95°C
96	90°C
108	85°C
121	80°C

Range of Parameter(Current)
Forward: (Low) 64 ~ 127 (High) Backward: (Low) 0 ~ 63 (High)

Forward		Backward	
Value	Current	Value	Current
64	0A	0	0A
64	0.1A	1	0.1A
69	0.5A	5	0.5A
74	1.0A	10	1.0A
79	1.5A	15	1.5A
84	2.0A	20	2.0A

• Settings

Changes settings within servo (EEPROM).

The screenshot shows a software interface for configuring a servo motor. It has two main sections: 'Configurations' and 'Option Flags (Modes)'. Under 'Configurations', there are radio buttons for Baudrates (1.25Mbps, 625Kbps, 115.2Kbps) and a list of settings with sliders and numeric input boxes. Under 'Option Flags (Modes)', there are checkboxes for Reverse, Serial (checked), Slave, and Rotation. The settings listed are: Stretch (60), Stretch1 (SET1) (60), Stretch2 (SET2) (30), Stretch3 (SET3) (90), Speed (127), Punch (0), Dead Band (4), Response (3), Damping (40), Protection (20), Limit (Forward) (11500), Limit (Backward) (3500), Temperature Limit (75), Current Limit (40), User Offset (0), and Version (empty).

- **Baudrate** --- Sets the baudrate between servo motor and board. (Initial value: 115.2 kbps)
* When using ICS-USB adapter, do not change from 115.2 kbps.
- **Option Flags (Modes)** --- Select use of reverse, dedicated serial, slave, and rotate mode.
- **Stretch** --- Changes retention characteristics of the servo motor.
- **Speed** --- Sets the maximum rotation speed of the servo motor.
- **Punch** --- Sets the torque offset when servo motor is in operation.
- **Dead Band** --- Sets neutral band (dead-band) of servo motor.
- **Response** --- Sets the rising characteristics when servo motor is operated.
- **Damping** --- Sets the outage property of the servo motor.
- **Protection** --- Sets time until protection start-up when output shaft locks.
- **Limiter** --- Specifies maximum operating angle of the servo motor.
- **Temperature Limit** --- Sets the operating point for protective functions in case of temperature rise.
- **Current Limit** --- Sets the operating point for protective functions in case of current overload.
- **User Offset** --- Sets optional position offset for user.
- **Version** --- Displays firmware version.

[Stretch]

Changes the retention characteristic of the servo motor.

Range of Parameter (Stretch)	Initial			
	Stretch	SET1	SET2	SET3
(Soft) 1 ~ 127 (Hard)	60	60	30	90

Stretch (SET1) (SET2) (SET3) are values used in the characteristic change in HeartToHeart3.

[Speed]

Sets the maximum rotation speed of the servo motor.

Range of Parameter (Speed)	Initial
(Slow) 1 ~ 127 (Fast)	127

[Punch]

Sets the torque offset when servo motor is in operation.

Range of Parameter (Punch)	Initial
(Low) 0 ~ 10 (High)	0

[Dead Band]

Sets neutral band (dead-band) of servo motor.

Range of Parameter (Dead Band)	Initial
(Min) 0 ~ 10 (Max)	4

[Response]

Sets the rising characteristics at operation startup of output shaft.

The smaller the number, the smoother the initial motion appears.

Range of Parameter (Response)	Initial
(Slow) 1 ~ 5 (Fast)	3

[Dumping]

Sets the braking characteristic of the output shaft at motion stoppage.

The smaller the number, the smoother the motion until stoppage appears.

Range of Parameter(Dumping)	Initial
(Slow) 1 ~ 255 (Fast)	40

[Protection]

Sets time until protection operation startup.

The protection function is a protective feature for lockup. When in operation, the servo power is automatically reduced by 50%.

Recovery automatically occurs when lockup is resolved.

Protection is only valid when the servo speed parameter is set to 127.

Range of Parameter (Offset)	Per one Parameter	Initial
(Short) 10 ~ 255 (Long)	0.056 sec	20

[Limiter]

Sets the maximum operation range of servo.

	Range of Parameter(Limiter)	Initial
Limiter (Forward)	(Min) 8000 ~ 11500 (Max)	11500(Max)
Limiter (Backword)	(Min) 3500 ~ 7500 (Max)	3500(Min)

[Temperature Limit]

Set the temperature threshold.

When the sensor mounted on the servo board receives an output larger than the set temperature, servo goes to a state of weakness. When the temperature decreases below the threshold, motion is resumed.

Range of Parameter(Temperature)	Initial
(High) 1 ~ 127 (Low)	75 (102°C)

Temperature	Value
100°C	73
95°C	84
90°C	96
85°C	108
80°C	121

[Current Limit]

Sets the electric current threshold.

When the sensor mounted on the servo board receives a value larger than the set electric current, servo goes to a state of weakness. When the current decreases below the threshold, motion is resumed.

Range of Parameter (Current)	Initial
(Low) 0 ~ 63 (High)	40 (4.0A)

Current	Value
0A	0
0.1A	1
0.5A	5
1.0A	10
1.5A	15
2.0A	20

[User Offset]

The user can arbitrarily set the initial position of the output shaft.

Range of Parameter (User Offset)	Initial
(Backward) -127 ~ 127 (Forward)	0

[Option Flags (Modes)]

- **Reverse**
Reverses the direction of rotation of the servo to signal. (Initial: OFF)
- **Serial**
Check for serial control and remove check for PWM control. (Initial: ON)
- **Slave**
Prevents servo from responding to the board. By setting this, communication interference is avoided when using double servo joints with the same ID on a robot. (Initial: OFF)
- **Rotation**
Set the servo axis to rotate like a wheel. (Initial: OFF)

■ Exit

The following message appears when you choose File > End. To exit, press OK; to cancel, press CANCEL.



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