Remote Controller

SRC-201・Instruction Manual

Ver. 1.0

SIGMA KOKI CO., LTD

History

1st edition   February 21, 2014

Information on use of this manual and product

Please read this manual thoroughly in order for you to make good use of the product.

（1）**Technical information represented on this material is not granted to practice or use rights that Sigma Koki Co.,Ltd. owns including intellectual property rights.**

（2）**Technical information represented on this material is subject to change without notice, from it of issuing point.**

（3）**Technical information represented on this material has been written with precision and caution. However, Sigma Koki Co.,Ltd. is not liable for any damage resulting from error or fault in description of this material.**

（4）**All rights reserved. Preliminarily request written permission from copyright holder, Sigma Koki Co.,Ltd. to reprint or duplicate whole or any part of this material.**

Please do not hesitate to contact us for any inquiries regarding the use of product. Contact information is listed below.

CONTENTS

For Your Safety

Before using this product, thoroughly read this manual and all warnings or cautions in the documentation provided in order to prevent any damage or property losses, or personal injury that may cause to user or others. After reading this manual, keep it in a safe place for future reference.

The Symbols Used in This Manual

Symbols below are used to indicate the exact nature of the warning or caution in order to prevent any damage or property losses, or personal injury that may cause to user or others.

⚠ **WARNING**	⚠ **CAUTION**
This symbol marks warnings that should be read and used to prevent serious injury or death.	This symbol indicates where caution should be used to avoid possible injury to yourself or others, or damage to property.

Disclaimer of Liability

①SIGMA KOKI CO.,LTD. does not accept liability for damages resulting from the use of this product or the inability to use this product.

②SIGMA KOKI CO.,LTD. does not accept liability for damages resulting from the use of this product that deviates from that described in the manual.

③SIGMA KOKI CO.,LTD. does not accept liability for damages resulting from the use of this product in extraordinary conditions, including fire, earthquakes, and other acts of God, action by any third party, other accidents, and deliberate or accidental misuse.

⚠ WARNING

●Do not use this product in the presence of flammable gas, explosives, or corrosive substances, in areas exposed to high levels of moisture or humidity, in poorly ventilated areas, or near flammable materials.

●Do not connect or check the product while the power is on.

●Installation and connection should be performed only by a qualified technician.

●Do not touch the internal parts of the products.

●Do not bend, pull, damage, or modify the power, motor or connecting cables.

●Should the product overheat, or should you notice an unusual smell, heat, or unusual noises coming from the product, turn off the power immediately.

●Do not turn on the power in the event that it has received a strong physical shock as the result of a fall or other accident.

●Use dry clothes only for cleaning the equipment.

●Do not touch the product when your hands are wet.

●Do not leave the product in an enclosed area or in areas in which it would be exposed to direct sunlight or vibration.

⚠ CAUTION

●When unplugging the product, pull on the plug rather than the cord.

●Because some electrical change remains after the power has been cut, do not touch the input or output terminals for ten seconds after the product has been turned off.

●When connecting peripherals to the product, adjust the product's initial setting (parameter settings) to suit the peripheral.

●Turn off the power before connecting the product to other devices. Connection should be performed following the connection diagram.

●Before turning the equipment on (or when beginning operations), be sure that you can turn the power off immediately in the event that an abnormality occur.

●Do not repair, modify, or disassemble the product.

●Do not use in outdoors.

Chapter 1. Before You Begin

1. Package Contents

Purchasers of this product are advised to find that the package contains the items listed below. Check the package contents by using the following checklist. Contact our International Sales Division as soon as possible in the event that you find that any item is missing or damaged.

SRC-201 Package (Standard Set)

□ SRC-201	1
□ AC adapter	1
□ I/O connector	1
□ Instruction Manual	1
□ Bumpon (Nonslip strip)	1set

SRC-201 Options

□ Remote Actuator   Part Number：SGDC10-13

※SRC-201 is compatible with Remote Actuator manufactured by Sigma Koki.

□ MDC Cable   Part Number：MDC-4-△

※Extension cable for compatible Remote Actuator. 2/3/5 (cable length in meter) for △ in Part Number.

※Performance of Remote Actuator is not guaranteed, when total extension exceeds 5m by connection of a few cables.

□ RS232C Cable   Part Number:RS232C/STR-△

※Communication cable for PC control. 1.8/3/4.5 (cable length in meter) for △ in Part Number.

□ USB Cable   Please use cable to connect commercially available USB A and USB mini-B (Male)
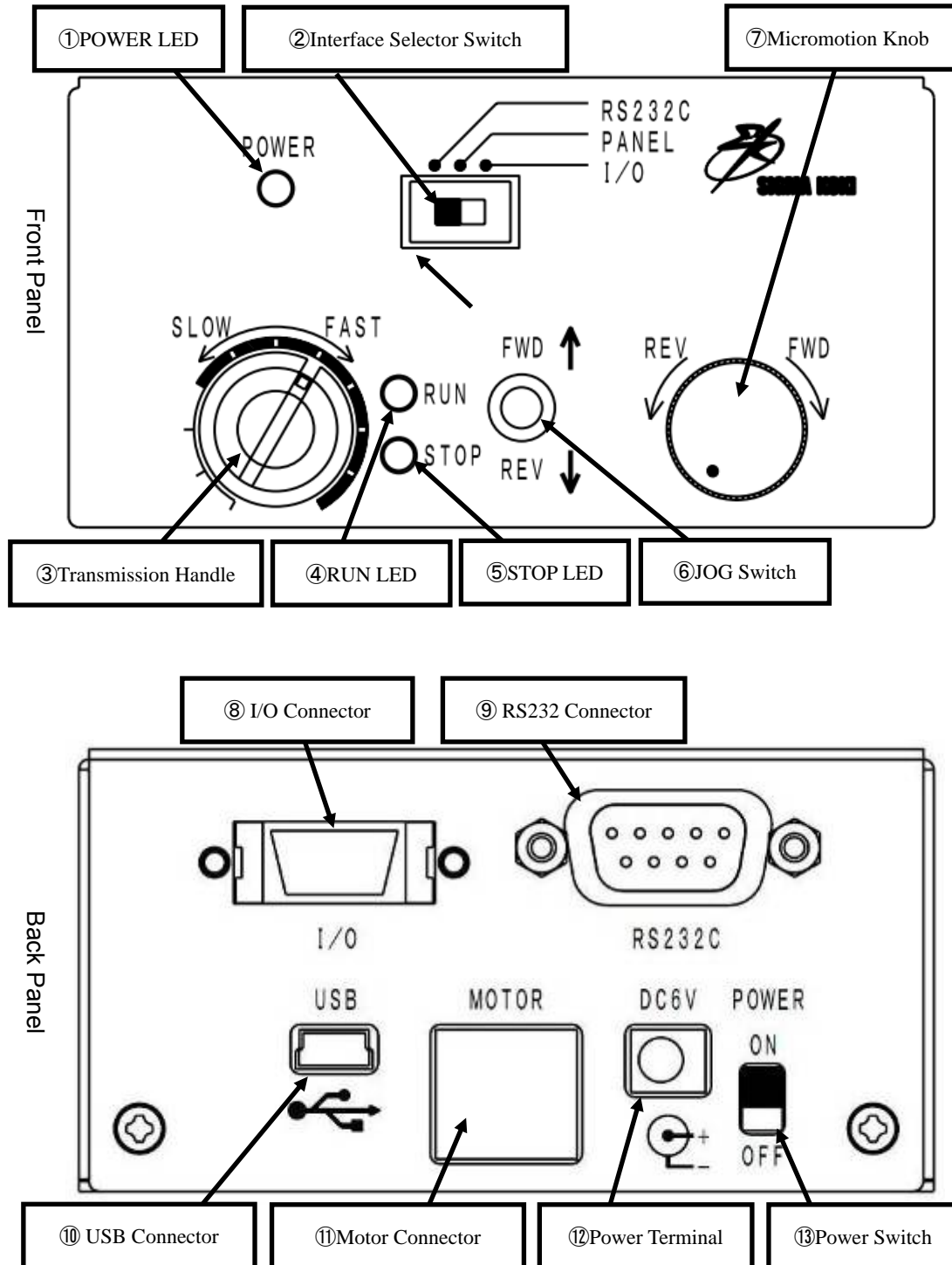
※Driver should be installed in PC for PC control. Please refer to Chapter 3 for installation.

2. Overview

The SRC-201 is exclusive controller for Remote Actuator operation. Micromotion similar to Micrometer head by Micromotion Knob, and simple manual operation by JOG Switch can be performed. Actuator can be controlled from PC connected using USB and RS232C interface.

3. Name and Function of Each Part

3-1. Name of Each Part

①POWER LED	②Interface Selector Switch	⑦Micromotion Knob

Front Panel

POWER

RS232C
PANEL
I/O

SLOW   FAST

RUN

STOP

FWD ↑

REV

REV   FWD

③Transmission Handle	④RUN LED	⑤STOP LED	⑥JOG Switch

⑧ I/O Connector	⑨ RS232 Connector

Back Panel

I/O

RS232C

USB   MOTOR   DC6V   POWER

ON

OFF

⑩ USB Connector	⑪Motor Connector	⑫Power Terminal	⑬Power Switch

3-2. Function of Each Part

①POWER LED   Green LED is lit when power is on.

②Interface Selector Switch   An interface can be set up by changing a switch.

※This product changes an interface by the position of Interface Selector Switch at the time of the power activation.

③Transmission Handle   To set operation speed of actuator. Overload detection is available at range where tick color is white.

※Scale for reference only

④RUN LED   Green LED is lit while actuator is being operated.

⑤STOP LED   Red LED is lit when it stopped after overload is detected.

(Overload may not be detected depending on conditions such as fine drive by Micromotion Knob or M command, low-speed motion, or electric signal level.) ☞ Please refer to Chapter6 for more information.

⑥JOG Switch   Actuator can be operated with constant speed.

※Jog Switch can be used when Interface Selector Switch is set to PANEL.

⑦Micromotion Knob   Actuator can be operated with micromotion similar to micrometer head.

※Micromotion Knob can be used when Interface Selector Switch is set to PANEL.

⑧I/O Connector   I/O connector is used for control of external device.

Please connect the I/O jump connector that comes with product.

※ Equivalent to **10214-52A2PL** by Sumitomo 3M

⑨RS232C Connector   For serial communication control.

※ Equivalent to **XM3B-0942-502L** by Omron

⑩USB Connector   For serial communication control.

※ Equivalent to **DX2R005HN2** by JAE

⑪Motor Connector   Connect with compatible Remote Actuator or MDC cable. Make sure not to pull the connector by force as it is lock type.

※ Equivalent to **TCS7147-012177** by Hosiden

⑫Power Terminal   Connect to our exclusive use AC adapter. Do not use the adapter other than the attached.

⑬Power Switch   Power is on/off when the switch is set to ON/OFF.

3-3. Switching of the interface

Please set up before power activation. Before turning on the power, please set based on the reference table of interface selector switch below.

Interface Selector Switch	Drive command	Inquiry command
① RS232C	RS232C	RS232C
② PANEL	PANEL or USB	USB
③ I／O	I／O	RS232C

① When the switch position is RS232C, a drive command and inquiry command is received via RS232C.

② When the switch position is PANEL, a drive command is received via a front panel or USB. Inquiry command is received via USB.

③ When the switch position is I/O, a drive command is received from external device. Inquiry command is received via RS232C.

Chapter 2. Operation Manual for SRC-201

4. SRC-201 Connecting Order

① Connection between SRC-201 and Remote Actuator

Please make sure that this product has been powered off. Connect actuator to motor connecter of this product.

② Connection between SRC-201 and I/O jump connector

Please connect I/O jump connector attached to the I/O connector.

③ Connection between SRC-201 and AC adapter

Please connect exclusive use AC adapter to power terminal of this product.

④ Setting of the interface selector switch

Please set to PANEL interface selector switch.

⑤This product can be powered on by setting its power switch to ON.

RUN LED and STOP LED on front panel will light simultaneously when power is applied, then lights will be doused after approximately a second.

※Check AC adapter connection if LED is not lit.

⚠ **CAUTION** Please make sure that power has been cut off before connecting cables.

5. Basic Operations

Actuator can be easily operated manually with its switches and knobs on front panel of this product. Basic operations are listed below.

5-1. Transmission handle operations

Actuator motion speed can be switched during operation from front panel.

・ Set it to FAST for high-speed motion and to SLOW for low-speed motion.

5-2. JOG Switch operations

The actuator can be manually operated in JOG mode.

・ When JOG Switch is set to FWD side, actuator operates towards (＋) direction.

・ When JOG Switch is set to REV side, actuator operates towards (－) direction.

・ RUN LED is lit while actuator is operated.

・ It stops when JOG Switch is released.

5-3. Micromotion knob operations ①

Micromotion of actuator can be performed by turning micromotion knob. Micromotion operation of actuator is activated by each one click of knob rotation.

・ When knob is turned to FWD side, actuator moves towards (＋) direction.

・ When knob is turned to REV side, actuator moves towards (－) direction.

・ RUN LED is lit while actuator is operated.

※Travel distance per each click of knob rotation varies depending on speed setting
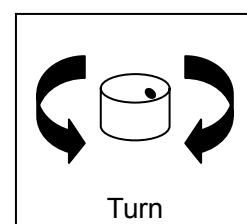
Turn

5-4. Micromotion knob operations②

Jog operation of actuator can be performed by turning the knob while pressing. Operation speed varies depending on the number of click turned from the position where handle is pressed. The more the number of click is, the faster the operation speed goes. By this operation, speed set with transmission handle will become invalid.

・ When handle is turned to FWD side from the position being pressed, actuator moves towards (＋) direction.

・ When handle is turned to REV side from the position being pressed, actuator moves towards (－) direction.

・ Jog operation will be performed with constant speed corresponding to the number of click turned when the pressed condition is maintained.

・ RUN LED is lit when actuator is operated.

・ It stops when handle is released.

Turn while pressing
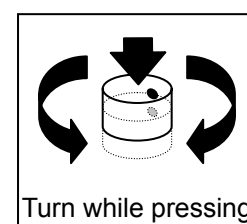
6. Alarm

This product has a safety alarm. Automatically stops its operation when it detects an alarm. When an alarm is detected, STOP LED lights up or flashes.

6-1. Overload detection

This product detects overload at stroke end and automatically stops its operation, when jog operation is made over the prescribed speed. When overload is detected, STOP LED on front panel lights.

Prescribed speed range for detecting the overload is indicated by ticks marked in white on transmission handle. However, please note that overload may not be detected depending on conditions such as operation by micromotion knob or M command, low-speed operation or electric signal level, etc.

Also, when the actuator reached at stroke end, it is mostly mechanically locked, and overload may be falsely detected when recovering from stroke end. When recovering from stroke end, make operation at maximum speed.

6-2. Long-running alarm

To prevent heating of the motor by a long continuous operation, the actuator automatically stops when the specified time has elapsed. When long-running alarm is detected, STOP LED on front panel flashes once per second. Please power down once and then turn on power after interval.

Speed	Running time
48	100 sec
47	150 sec
46	200 sec
45	300 sec
44	600 sec
1～43	3000 sec

6-3. Overload detection of internal circuit

This product detects overload at internal circuit and automatically stops its operation. When internal circuit alarm is detected, STOP LED on front panel flashes twice per second. Please power down once and check the status of the load.

Chapter 3. USB Serial Communication Operating SRC-201 from PC

7. SRC-201 Connecting Order
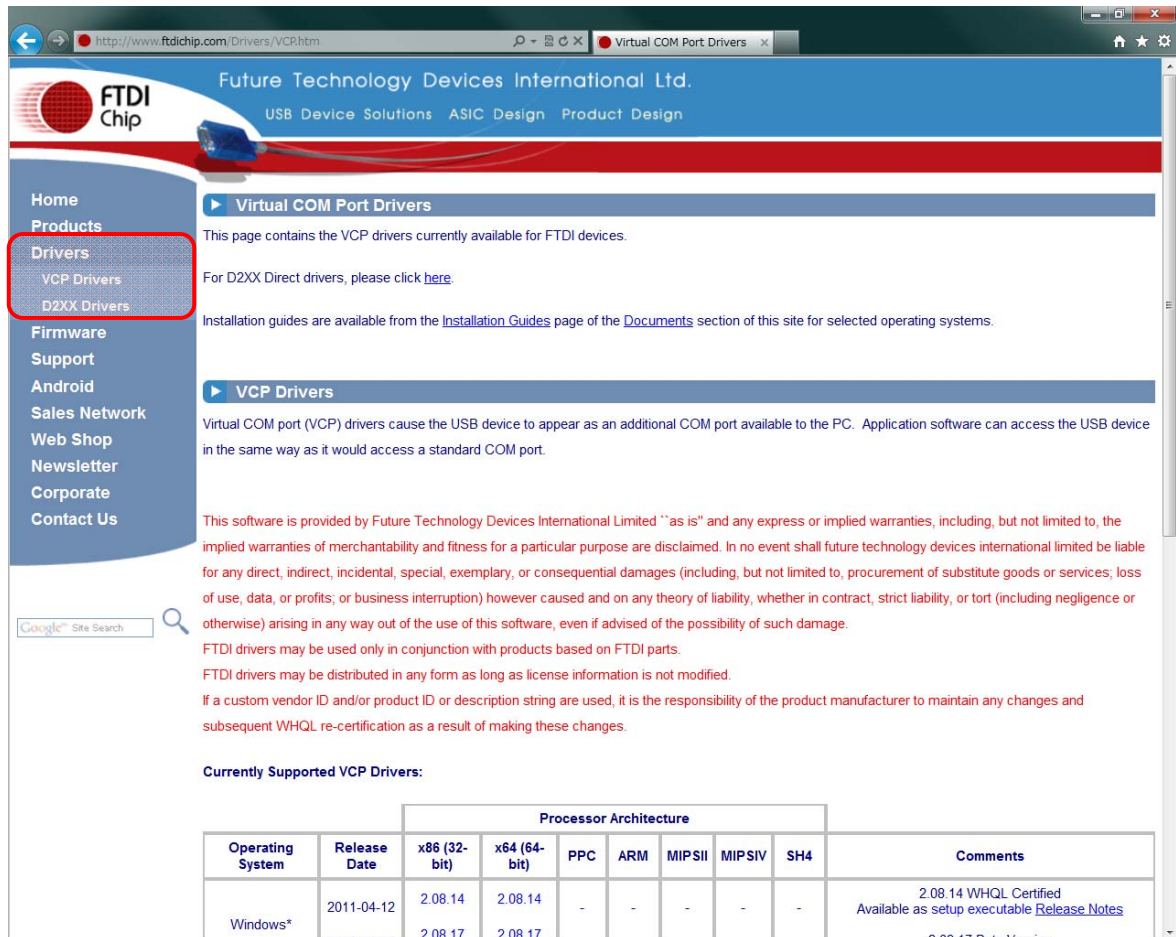
7-1. Driver Installation (for Windows XP)

This product performs USB serial conversion using FT232 by FTDI. For PC control, driver should be installed in PC.

Installation order of Windows 32bit driver Ver.2.08.08 will be described below as an example. Windows is registered trademark for Microsoft Corporation USA in the USA and other countries.

①Access to FTDI homepage. (http://www.ftdichip.com/index.html)

②Download corresponding driver to OS, from Items on the left＞Drivers＞VCP Drivers.

（Please be aware of that the homepage directory is subject to change.）

③Unzip a zip file

CDM20808

CDM20808

     Downloaded example   Unzipped example

④Connect USB mini-B (male) side connector of USB cable to USB connector on back panel of this product.

Connect USB A (male) side of USB cable to USB port in PC.

⑤Connect AC adapter to power terminal of this product.

⑥Power this product on by setting power switch to ON.

⑦Install driver after startup of new hardware search wizard.

Select 'Install from a list or specific location (Advanced)'

⑧Assign a folder unzipped.
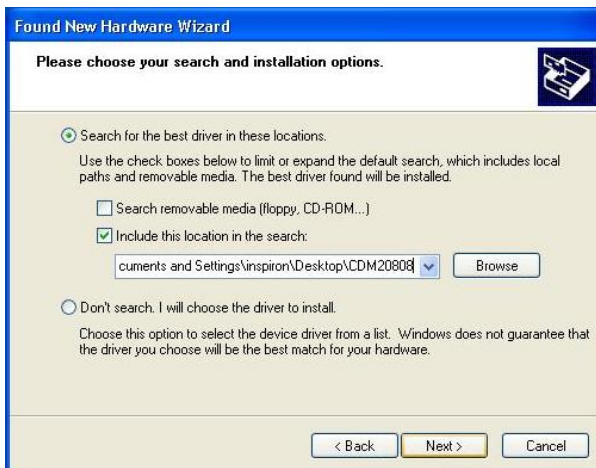
⑨Install USB Serial Converter.

Select 'Continue Anyway'

⑩Select 'Install from a list or specific location (Advanced)'

⑪Assign a folder unzipped.
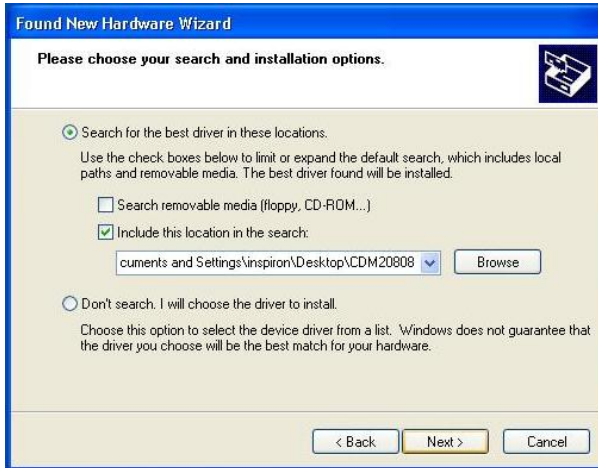
⑫Install USB Serial Port.

7-2. COM Port Number switch

USB serial communication is implemented via VCP (Virtual COM Port) generated in PC when driver is installed. Untaken port number is allocated to COM port and the COM port number does not change even when USB outlet has been changed. Information on how to change COM port number is described below.

①Select Control Panel → System (Performance and maintenance) → Hardware → Device Manager. Open Device Manager and check COM number for USB Serial Port. (COM2 is used in example)
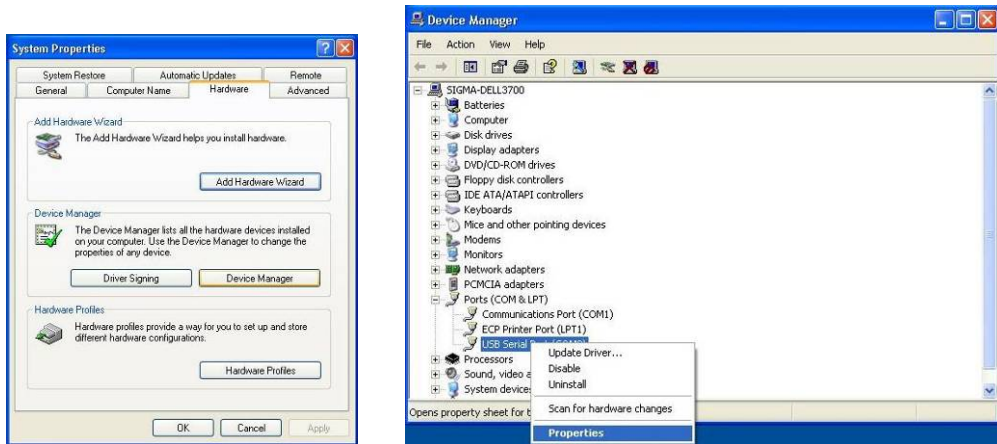
②Set COM Port number you wish to use from Port settings → Setting details. ※Do not select Port number currently in use. It may cause communication problem with other device in connection.
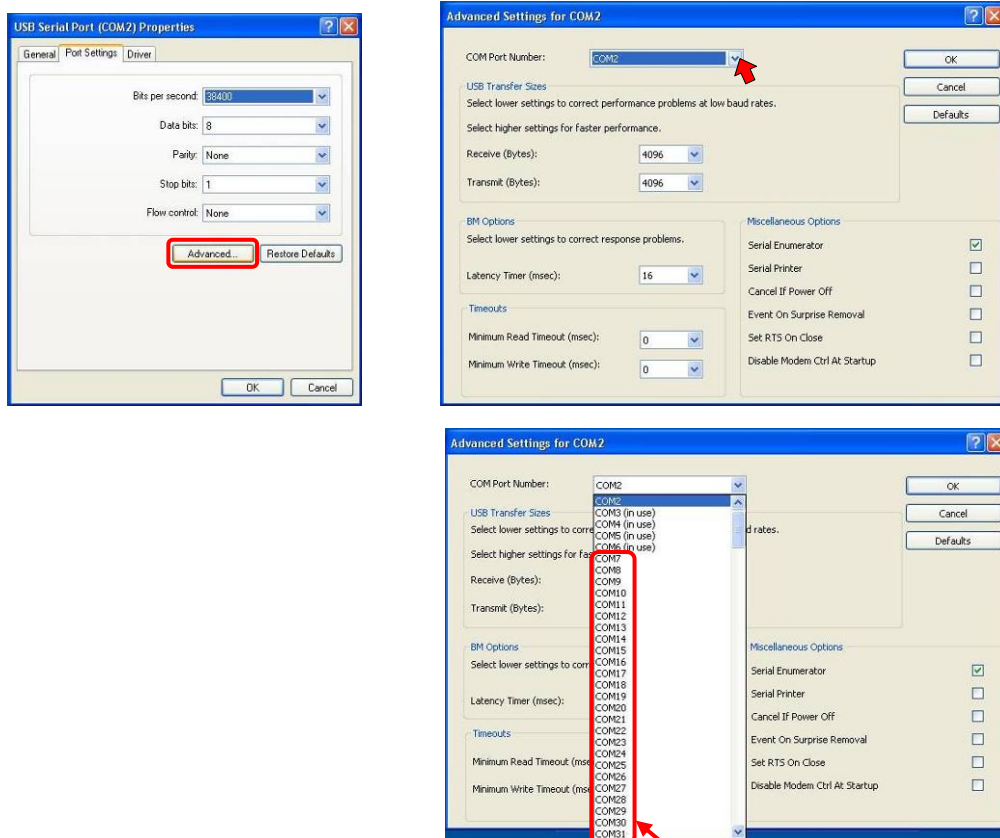
Unused Port Number

7-3. Connect SRC-201 to PC

Connect SRC-201 to PC.

①Please make sure that power has been set off.

②Connect actuator of your choice to motor connecter of this actuator.

③Connect I/O jump connector to I/O connector of this product.

④Connect AC adapter to power terminal of this product.

⑤Connect USB mini-B (male) side connector of USB cable to USB connector on back panel of this product.

   Connect USB A (male) side of USB cable to USB port in PC.

⑥Switch to PANEL interface selector switch on the front panel.

⑦Power this product on by setting power switch to ON.

RUN LED and STOP LED on front panel will light simultaneously when powered on, then they will light-out

after approximately a second.

※Check AC adapter connection if LED is not lit.

※ If the STOP LED is lit, please check the connection of I/O jump connector.

> ⚠ **CAUTION** Please make sure that power has been cut off before connecting cables.
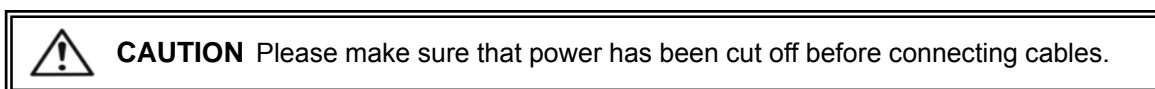
8. Communication Settings

Communication settings for this product are listed below. PC settings should be completed in accordance
with the table below.

Setting items	Setting contents
Baud rate	38400bps
Delimiters	CR+LF
Parity	None
Data bits	8bits
Stop bit	1bit
Flow control	None

9. Command list

Actuator can be controlled by transmitting command (character string) from PC to this product.

9-1. Command list

Commands used in this product are listed in the table below.

Command	String	Details	Panel operation invalidity
Mechanic Origin Return command	H:	Travel to mechanic origin of actuator.	✔
Jog Operation command	J:	Assign travel direction of jog operation.	✔
Command to set number of relative travel pulse	M:	Assign relative travel distance.	✔
Activation command	G:	Start activation.	
Stopping command	L:	Stop movement.	✔
Electric (Logical) Origin setting command	R:	Set current coordinates to electric (logical) origin.	
Speed setting command	S:	Set speed.	✔
Speed setting command 2	D:	Set speed.	✔
Status check command	Q:	Respond status such as coordinate values, etc.	
Status check command 2	!:	Respond B(Busy) or R(Ready).	
Software Version	?:V	Return software version number.	
Speed check command	?:S	Return the speed setting	

※Attention 1. Command may not be accepted while front panel operation is ongoing.

※Attention 2. When a command that panel operation invalidity column is ticked in table above is issued, front panel operation will be invalid unless it is powered off.

※Attention 3. Transmit the latter command after confirming acceptance of response for former command as flow control is not performed.

※Attention 4. Operation stops automatically at stroke end by overload detection. Speed settings enabling overload detection ranges from 16 to 48. However, note that overload detection may not work depending on conditions such as operations by micromotion knob or M command, low-speed operation or electric signal level, etc.

※Attention 5. Also, when the actuator reached at stroke end, it is mostly mechanically locked, and overload may be falsely detected when recovering from stroke end. When recovering from stroke end, make operation at maximum speed.

9-2. Command Format

1 response to 1 command is used in communication protocol with PC.

Command character string   :   Accepted

Response character string   :   Transmitted

Response character string for successfully accepted command character string is 'OK', otherwise 'NG'. But there will be response data for commands with data response, such as status check command (Q:,   !:), in place of 'OK'.

9-3. Command

(1)H Command (Mechanical Origin Return command)

・Command type

  H:1 (or H:W)

・Comments

  It operates mechanical Origin Return of actuator. G command is not required.

  RUN LED flickers during the Origin Return operation. RUN LED will go out after Origin Return operation has been completed.

  Origin Return operation will stop when stop command was issued during Origin Return operation.

・CAUTION

  Only stop command and status check command can be accepted while Mechanical Origin Return operation is ongoing.

  Mechanical Origin Return position is close to stroke end at (－) direction of actuator.

  Coordinate value after Mechanical Origin Return is zero.

  Prescribe (＋) direction when transmitting M command after Origin Return operation has been completed.

(2)J Command (Jog operation command)

・Command type

  J:1 m (or J:W m）

・Parameter

  m   :＋ or －   Set to + for (＋) direction, Set to － for (－) direction

・Comments

  It sets jog operation and operation direction. G command is required after implementing this command.

Example)

  J:1－   Jog operation towards (－) direction

  G: Activation starts.

(3)M Command　(Command to set number of relative travel pulse)

　・Command type

　　M:1 m P x　(or M:W m P x)

　・Parameter

　　m　　:＋ or －　　　　　　　Set to + for (＋) direction, Set to － for (－) direction

　　x　　:Destination coordinate　　　Pulse number can be set from 0 to 1,000,000.

　・Comments

　　It sets travelling axis, travel direction and relative travel distance. G command is required after
　　implementing this command.

　Example)

　　M:1＋P1000　　　　　　Set actuator to travel 1000pulse toward (＋) direction.

　　G:　　　　　　　　　　Activation starts.

(4)G Command (Activation command)

　・Command type

　　G:

　・Comments

　　It starts activating actuator. This command is required after J and M commands.

(5)L Command (Stopping command)

　・Command type

　　L:1　(or L:W)

　・Comments

　　It stops activation of actuator.

(6)R Command

　・Command type

　　R:1 (or R:W)

　・Comments

　　It sets current coordinates to electric (logical) origin. Coordinate will be set to zero after this command has
　　been implemented.

(7)S Command　(Speed setting command)

　・Command type

　　S:J n

　・Parameter

　　n　　:1 to 48

　・Comments

　　It is a command to set actuator speed. Available speed settings range from 1 to 48. Default value is set according to position of transmission handle on front panel. Once the power is switched off, speed will be reset.

　Example）

　　S:J48　　　　　　　　Set to speed 48.

(8)D Command　(Speed setting command)

　・Command type

　　D:1 S0 F100 R0 (or D:W S0 F100 R0)

　・Parameter

　　"S"＋rate　　　　Void (Rates range from 0 to 500000)

　　"F"＋rate　　　　Speed settings range from 100 to 4800

　　"R"＋rate　　　　Void　(Rates range from 0 to 1000)

　・Comments

　　It is a command to set actuator speed which can be set from transmission handle on front panel. F value is equivalent to 100 times of the value for S command. S and R are minimum speed (during the actuator activation), and acceleration and deceleration time respectively, both of which cannot be set. Default value is set according to the position of transmission handle. Once the power is switched off, speed will be reset.

　Example)

　　D:1S0F2100R0　　　　　　　　Set to speed 2100.

(9)Q command (Status check command)

・Details

It responds status of this product.

Coordinate value returns pulse value. Coordinate value after power-on reset is zero.

Coordinate value is zero after Origin Return operation has been completed.

ACK1 responds implemented results of former command.

ACK2 represents last movement results. When overload is detected while being moved, it returns L. When axial movement stopped by force by 'stopping command', it returns K.

ACK3 returns B during the positioning movement, and R otherwise.

・Command type

Q:

・Response data type

0, ACK1, ACK2, ACK3

0	Coordinates	Current coordinate values (For reference use)
ACK1	X	Command error or parameter error
	K	Command successfully accepted
ACK2	L	Stopped by overload detection (stroke end)
	K	Stopped successfully
ACK3	B	Busy status	L, Q, ! and ? commands can be accepted
	R	Ready status	ready to accept any commands

Example)

Q:		Status check
1000,K,L,R		Data response

(Results) Coordinate 1000 , command accepted successfully, overload detected, Ready for command

┌───┐
│ ※ Please note that coordinate values are for reference use only as there is no position feedback. │
└───┘

(10) ! Command   (Status check command 2)

・Command type

!:

・Returning data type

B	Busy status	L, Q, and ! commands are acceptable
R	Ready status	Ready to accept any commands

・Comment

It responds status of stage movement. (ACK3 : response data of Q command)

(11)?:V Command   (Software Version check command)

　・Command type

　　?:V

　・Returning data type (Example)

　　　V01.00

　・Comment

　　It responds software version (ex. Ver.1.00)

(12)?:S Command (Speed check command)

　・Command type

　　?:S

　・Returning data type (Example)

　　　00043

　・Comment

　　It responds the speed setting. Available speed settings range from 1 to 48.

Chapter 4. RS232C Serial Communication Operating SRC-201 from PC

10. SRC-201 Connecting Order for RS232C

Connect SRC-201 to PC.

①Please make sure that power has been set off.

②Connect actuator of your choice to motor connecter of this actuator.

③Connect I/O jump connector to I/O connector of this product.

④Connect AC adapter to power terminal of this product.

⑤Connect Male side connector of RS232C cable to RS232C connector on back panel of this product.

　Connect Female side of RS232C cable to RS232C port in PC.

⑥Switch to RS232C interface selector switch on the front panel.

⑦Power this product on by setting power switch to ON.

RUN LED and STOP LED on front panel will light simultaneously when powered on, then they will light-out after approximately a second.

※Check AC adapter connection if LED is not lit.

※ If the STOP LED is lit, please check the connection of I/O jump connector.

11. Communication Setting & Command list

Communication settings & command list in the RS232C is the same as the USB serial communication. PC settings should be completed in accordance with the table below.

Please refer to Chapter 3 "9.Commands" for details of commands.

| Setting items	Setting contents
Baud rate	38400bps
Delimiters	CR+LF
Parity	None
Data bits	8bits
Stop bit	1bit
Flow control	None

Chapter 5. I/O Control

12. I/O connector signal

Please connect according to the following table in the case of controlling with an external device. Please use an external power supply to the input-output DC24V. Please pass a current through the opto-coupler input. Output is normal in Short.

Number	Name	Detail	Note
1	Input common		
2	Disabled		
3	−OT output	Normal in Short, OT in the Open	Open collector output
4	＋OT output	Normal in Short, OT in the Open	Open collector output
5	RUN/STOP output	RUN in Short, STOP in Open	Open collector output
6	ERROR output	Normal in Short, ERROR in the Open	Open collector output
7	−OT input	Normal in Short, OT in the Open	
8	＋OT input	Normal in Short, OT in the Open	
9	JOG＋ input	Jog starts at Short, stop in the Open	Short is ERROR and stop at the same time
10	JOG− input	Jog starts at Short, stop in the Open	
11	Speed set L input	H=0, L=0 ⇒ Speed 7 H=0, L=1 ⇒ Speed 14	0：Open 1：Short
12	Speed set H input	H =1, L =0 ⇒ Speed 39 H =1, L =1 ⇒ Speed 47	
13	Disabled		
14	Output common		

Connecter used is equivalent to **10214-52A2PL** by Sumitomo 3M
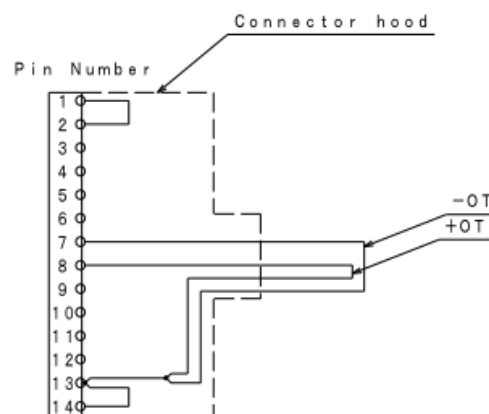
I/O connector wiring diagram
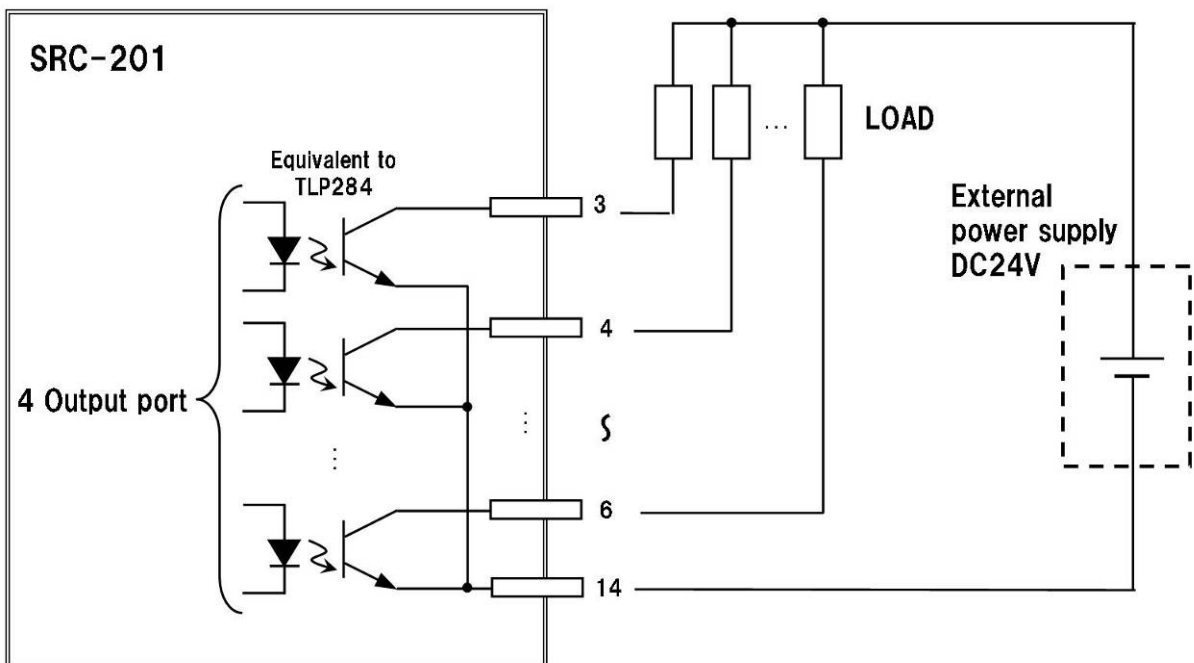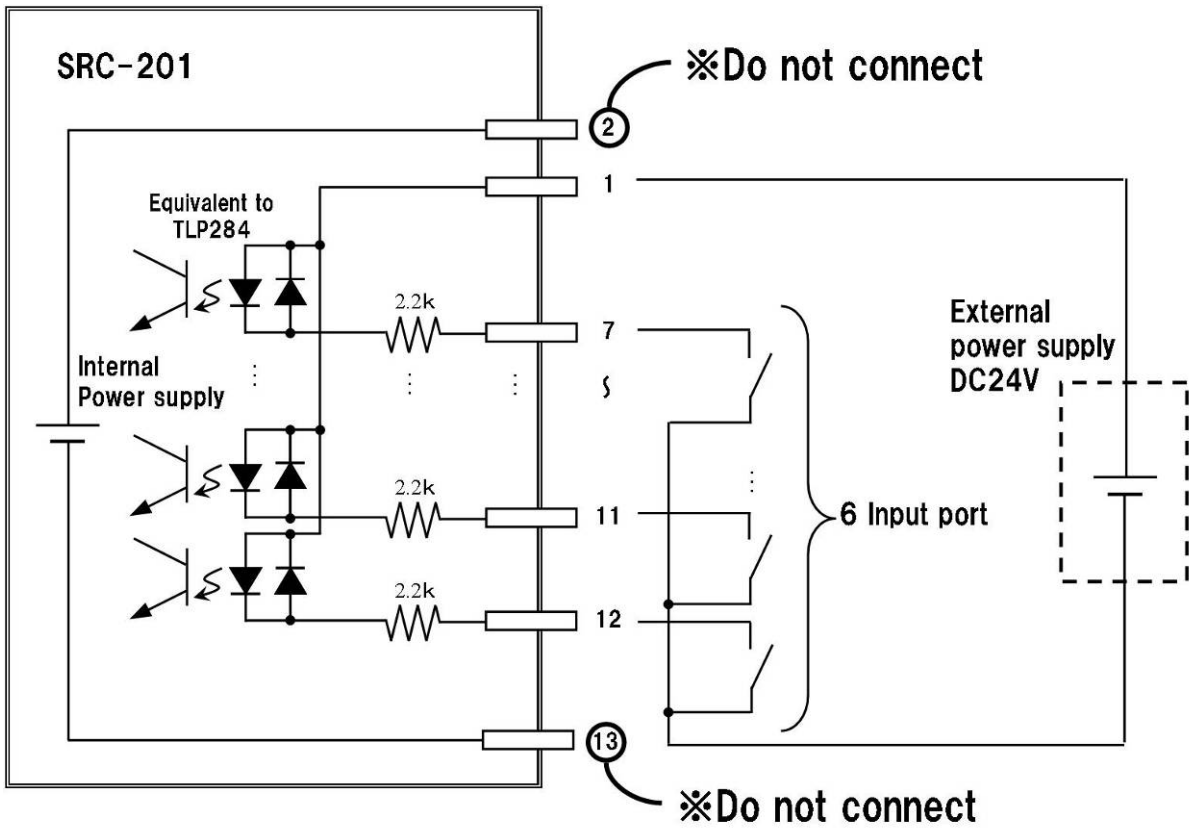
I/O port Connection Example

13. SRC-201 Connecting Order for I/O Control

Connect SRC-201 to PC.

①Please make sure that power has been set off.

②Connect actuator of your choice to motor connecter of this actuator.

③Connect I/O jump connector to I/O connector of this product.

④Connect AC adapter to power terminal of this product.

⑤Switch to I/O interface selector switch on the front panel.

⑥Power this product on by setting power switch to ON.

RUN LED and STOP LED on front panel will light simultaneously when powered on, then they will light-out after approximately a second.

※Check AC adapter connection if LED is not lit.

※ If the STOP LED is lit, please check the connection of I/O jump connector.

14. Command list for I/O Control

Commands that can be used in the I/O control are as following table. Please refer to Chapter 3 "9.Commands" for details of commands.

Command	String	Details
Electric Origin setting command	R:	Set current coordinates to electric (logical) origin.
Status check command	Q:	Respond status such as coordinate values, etc.
Status check command 2	!:	Respond B(Busy) or R(Ready).
Software Version	?:V	Return software version number.
Speed check command	?:S	Return the speed setting

※Attention 1   Command may not be accepted while front panel operation is ongoing.

※Attention 2   Operation stops automatically at stroke end by overload detection. Speed settings enabling overload detection ranges from 16 to 48. However, note that overload detection may not work depending on conditions such as operations by micromotion knob or M command, low-speed operation or electric signal level, etc.

※Attention 3   Also, when the actuator reached at stroke end, it is mostly mechanically locked, and overload may be falsely detected when recovering from stroke end. When recovering from stroke end, make operation at maximum speed.

Chapter 6. Specifications

15. Specifications

(1)General Specifications

Source voltage	DC6V
AC adapter	AC100 to 240V (50/60Hz)
Apparent power	30VA
Operating temperature	5 to 40℃
Storage temperature	－20 to 60℃
Ambient humidity	20 to 80%RH (No condensation)
Exterior Dimensions	(W)84.5×(D)96.7×(H)43.7mm (Excluding projections)
Weight	0.38kg (Excluding AC adapter or cable weights)

(2)Performance

Number of axis controlled:	1 axis
Life of the Micromotion Knob	15,000 turns
External I / O Control	6 Input, 4 Output
Interface:	RS232C, USB Interface
Communication Parameter	
・Baud rate	38400bps
・Data bits	8bits
・Parity	None
・Stop Bit	1bit
・Flow Control	None
・Delimiters	CR+LF

16. Connector Pin Assignment

16-1.MOTOR connecter

Number	Name	Number	Name
1	Motor ＋	3	Motor －
2	Motor ＋	4	Motor －

Connecter used is equivalent to **TCS7147-012177** by Hosiden Corporation

16-2.USB mini-B connector

Number	Name
1	＋5V
2	－Data
3	＋Data
4	NC
5	GND

Connecter used is equivalent to **DX2R005HN2** by JAE

16-3. I/O connector

☞ Please refer to page 23 for I/O connector signal

16-4. RS232C connector

Number	Name
1	NC
2	OUT
3	IN
4	NC
5	GND
6	NC
7	Connected to 8 pin
8	Connected to 7 pin
9	NC

Connecter used is equivalent to **XM3B-0942-502L** by Omron

17. Outlines

Copyright 2014, SIGMA-KOKI Co.,Ltd