

CSD3 Servo Drive Protocol

Catalog Number(s): CSD3-xxBXx (ASCII Only), CSD3-xxBX2 Rev. B

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About This Publication

This manual describes protocols required for use of the CSD3 Servo Drive.

Who Should Use This Manual

This manual is intended for engineers and technicians who are directly involved with the use of the CSD3 Drive.

For those who do not have a basic understanding of the CSD3 Servo Drive, please consult with a local OE Max distributor or sales representative before using the product.

References

Description	Manual	Document Number
CSD3 Servo Drive Installation Information	CSD3 Servo Drive Installation Manual	CSD3-IN001B
CSD3 Servo Drive Use Information	CSD3 Plus Servo Drive User Manual (CSD3-xxBX2 Rev. B)	CSD3P-UM001E
Servo Motor Specifications & Cable Information	Servo Motor User Manual	SMOTOR-UM002C

ASCII Protocol

Transmission Frame

Structure

	Checksum Range						
1 Byte	1 Byte	1 Byte	1 Byte	n Bytes	1 Byte	1 Byte	1 Byte
Control Character	ID	Attribute	Command	Data	:	Checksum	Control Character

Control Character

Name	Character	ASCII	Description
Packet Begin	STX	0x02	Indicates the beginning of a packet at the beginning of a message.
Packet End	ETX	0x03	Indicates the end of a packet at the end of a message.
Normal Response	ACK	0x06	Normal reception of a message
Abnormal Response	NAK	0x15	Abnormal reception of a message (Checksum Error)
Parameter Saving Failure	GS	0x1d	A parameter cannot be saved.
Range Over	RS	0x1e	A parameter value is out of range.
Undefined	US	0x1f	Undefined or there is no service available.
Data Separator	&	0x26	Separates one data from the next data.

ID

A value for Pr-0.12 is sent in hexadecimal. Since the default value is 1, the hexadecimal value is 0x01.

Attribute

Name	Character	ASCII	Description
Request	#	0x23	A request from Master to Slave
Response	\$	0x24	A response from Slave to Master

Checksum

The first digit of the result added to an ASCII Hex code within the checksum range is shown in ASCII characters.

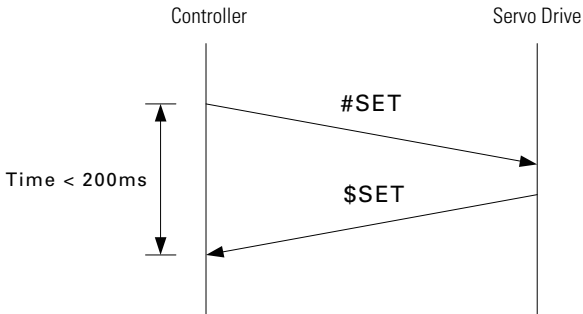
STX	0x01	#	M	D	M	1	2	2	2	:	3	ETX
	0x01	0x23	0x4d	0x44	0x4d	0x31	0x32	0x32	0x32	0x3a		
	Total = 0x203											

Command and Data

Read User Parameter (SET)

STX	ID	#	S	E	T	User Parameter No.	:	BSS	ETX
-----	----	---	---	---	---	--------------------	---	-----	-----

STX	ID	\$	S	E	T	User Parameter Value	:	BSS	ETX
-----	----	----	---	---	---	----------------------	---	-----	-----

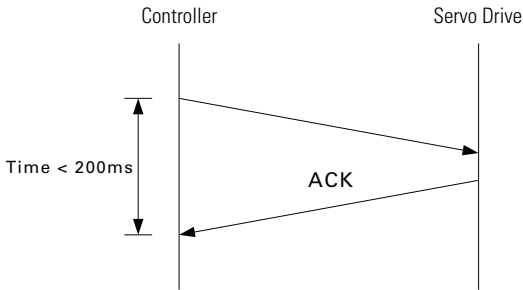


NOTE

- For Pr-2.03, send User Parameter No. = 203.
- A bit logic parameter is transmitted in 4 bytes while other parameters are transmitted in a variable length.

Set User Parameter (STR)

STX	ID	\$	S	T	R	User Parameter No.	User Parameter Value	:	BSS	ETX
-----	----	----	---	---	---	--------------------	----------------------	---	-----	-----



NOTE

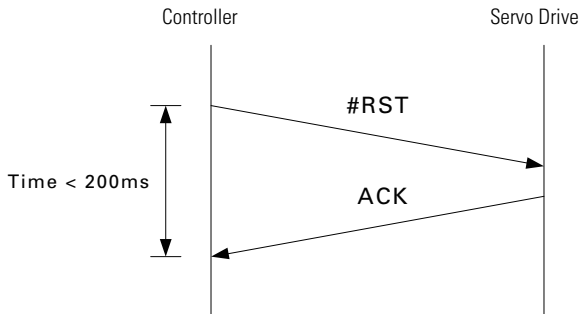
- GS (0x1D) is returned when an attempt is made to set a parameter that may not be changed when server is on.
- RS (0x1E) is returned when the parameter value is out of setting range.
- US (0x1F) is returned when an attempt is made to set an undefined parameter.
- For example, to change a parameter value for Pr-2.03, use 203 for the user parameter no. and assign 4 bytes for the bit-field user parameter value. For other parameters, the number of bytes varies depending on its value. For a negative number, add the '-' symbol before sending a value.
- A user parameter value for the control mode setting parameter Pr-0.00 setting parameter Pr-0.01 should follow the format on the next page.

Parameter	Parameter Name	Set Value	Default
Pr-0.01	Control Mode	1: Position 2: Speed 3: Speed-Position 4: Torque 5: Torque-Position 6: Torque-Speed 8: Contact Speed 9: Contact Speed-Position 10: Contact Speed-Speed 12: Contact Speed-Torque	1

Parameter	Parameter Name	Set Value	Default
Pr-0.01	Motor Setting	MMODE For more information on motor settings, please refer to Input Value for Motor Setting Parameter on page 27.	00041

Reset Alarm (RST)

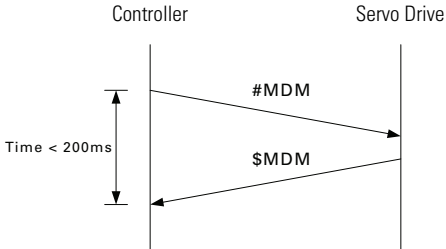
STX	ID	#	R	S	T	:	BSS	ETX
-----	----	---	---	---	---	---	-----	-----



Monitor Variable (MDM)

STX	ID	#	M	D	M	Variable No.	Variable No.	Variable No.	Variable No.	Variable No.	:	BSS	ETX
-----	----	---	---	---	---	-----------------	-----------------	-----------------	-----------------	-----------------	---	-----	-----

STX	ID	\$	M	D	M	Variable Value	&	Variable Value	&	Variable Value	&	Variable Value	&	Variable Value	:	BSS	ETX
-----	----	----	---	---	---	-------------------	---	-------------------	---	-------------------	---	-------------------	---	-------------------	---	-----	-----


NOTE

1 to 5 variable numbers can be requested and the list of variable numbers is as follows:

Variable No.	Description	Variable No.	Description
00	Speed Feedback	11	DC Link Voltage
01	Speed Command	12	Absolute Encoder Multi-revolution Data
02	Speed Error	13	Analog Speed Command Voltage Offset
03	Torque Command	14	Analog Torque Command Voltage Offset
04	Position Feedback	15	I/O Status
05	Position Command	17	Firmware Version
06	Position error	19	Analog Speed Command Voltage
07	Position Command Pulse Frequency	20	Analog Torque Command Voltage
08	Electric Angle	21	Drive Rated Output
09	Mechanical Angle	22	Absolute Encoder 1 Revolution Data
10	Regenerative Load Factor	23	Encoder Feedback

A 3-byte Hex value is returned when there is a request for the I/O status (Variable No. 15). For example, if the received data is 'D01', the I/O status is 0xd01. The I/O for each bit is as follows:

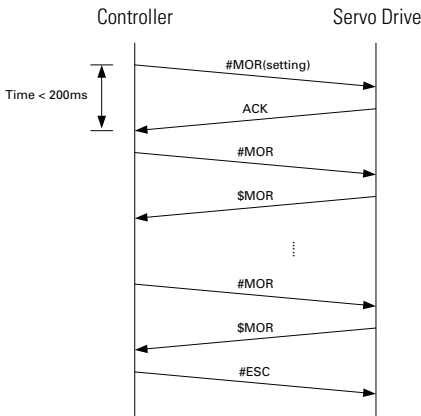
D				0				1			
1	1	0	1	0	0	0	0	0	0	0	1
SALM	DO#3	DO#2	DO#1	ESTOP	DI#7	DI#6	DI#5	DI#4	DI#3	DI#2	DI#1
Alarm	User Output			Emergency Stop	User Input						

Monitor Variable Roll (MOR)

STX	ID	#	M	O	R	Sampling Time	Variable No.	Variable No.	:	BSS	ETX
-----	----	---	---	---	---	---------------	--------------	--------------	---	-----	-----

STX	ID	#	M	O	R	:	BSS	ETX
-----	----	---	---	---	---	---	-----	-----

STX	ID	\$	M	O	R	Variable Value &	Variable Value &	Variable Value &	Variable Value	:	BSS	ETX
-----	----	----	---	---	---	------------------	------------------	------------------	-------	----------------	---	-----	-----



NOTE

- If the roll monitoring setting packet is received for the first time, the servo analyzes the packet and sends ACK. Then, if MOR: is received, sampling data is transmitted.
- The unit of sampling time is [ms] and it can be set between 01 and 99 [ms]. If a data request is made after setting roll monitoring, all data accumulated in the Ring Buffer are transmitted at once.
- If a data request is made again before the next sampling, the servo drive sends ACK.
- Because the amount of sampling data that the servo drive can store is limited by sampling time * 100 [ms], another data request should be made within this time frame.
- Send ESC to stop data sampling by the servo drive.

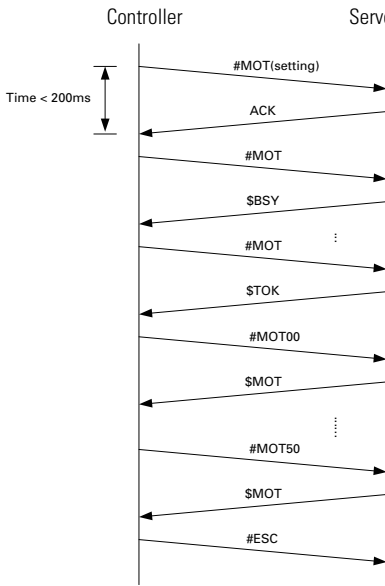
Monitor Trigger (MOT)

STX	ID	#	M	O	T	ch1	ch2	trig.ch	tdiv	num	t.e	t.p	trig.level	:	BSS	ETX
-----	----	---	---	---	---	-----	-----	---------	------	-----	-----	-----	------------	---	-----	-----

STX	ID	#	M	O	T	:	BSS	ETX
-----	----	---	---	---	---	---	-----	-----

STX	ID	#	M	O	T	DataNo.	:	BSS	ETX
-----	----	---	---	---	---	---------	---	-----	-----

STX	ID	\$	M	O	T	Data1	&	Data2	&	Data3	&	Data10	:	BSS	ETX
-----	----	----	---	---	---	-------	---	-------	---	-------	---	-------	--------	---	-----	-----



Ch1, Ch2	Data to receive (00-09). The details for 00-09 are the same as for Monitor Variable (MDM).																																																																																										
trig.ch:	Trigger channel (00-09, 101-112). The details for 00-09 are the same as in the above. 101-108: DI#1-DI#7, Emergency 109-112: DO#1-DO#3, ServoAlarm																																																																																										
tdiv:	Trigger division (1-99). The servo drive performs data sampling every Set Value * 200 [ms].																																																																																										
num:	The number of data (1-50). The servo drive samples Set Value * 10 data Ex.) To obtain 200 sampling data in 1 [ms], set tdiv=5 and num=20.																																																																																										
t.e:	Trigger edge (1, 2). 1: Positive edge 2: Negative edge																																																																																										
t.p:	Trigger position (1-9). The trigger point in the entire data. <table border="1" style="margin: 10px auto; width: 100px; height: 100px;"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																																																																																										
trig.level	Trigger level. The point where a trigger channel is triggered.																																																																																										

NOTE

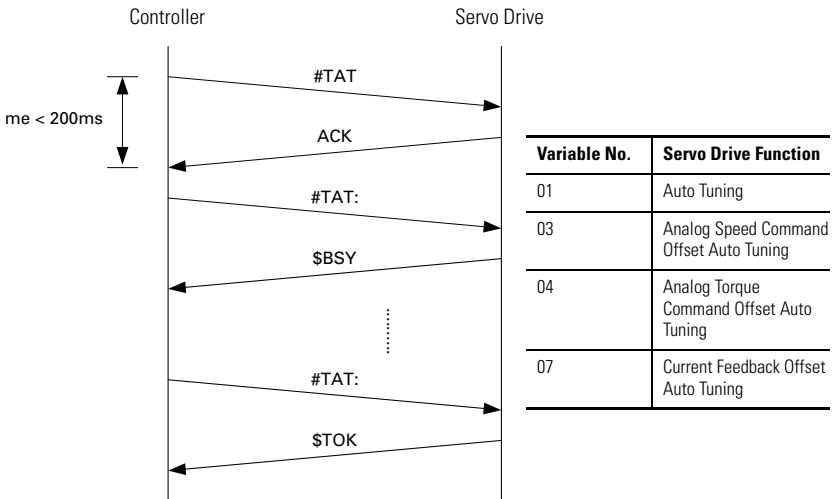
- If the trigger monitoring setting packet is received for the first time, the servo analyzes the packet and sends ACK. Then, if MOT: is received, the servo drive can send BSY or TOK based on the trigger status. Therefore, make a data request after TOK is received.
- To obtain sampling data in 1 [ms] unit before (50 [ms]) and after (200[m]) the trigger point after triggering speed feedback at 100 rpm in the section where speed command and speed feed are decelerated, send MOT 01 00 000 05 25 2 2 100.
- Because the servo transmits 10 data at a time, if num is set to 10, MOT00-MOT09: should be requested to receive all trigger data.

Automatic Task (TAT)

STX	ID	#	T	A	T	Variable No.	:	BSS	ETX
-----	----	---	---	---	---	--------------	---	-----	-----

STX	ID	\$	T	O	K	:	BSS	ETX
-----	----	----	---	---	---	---	-----	-----

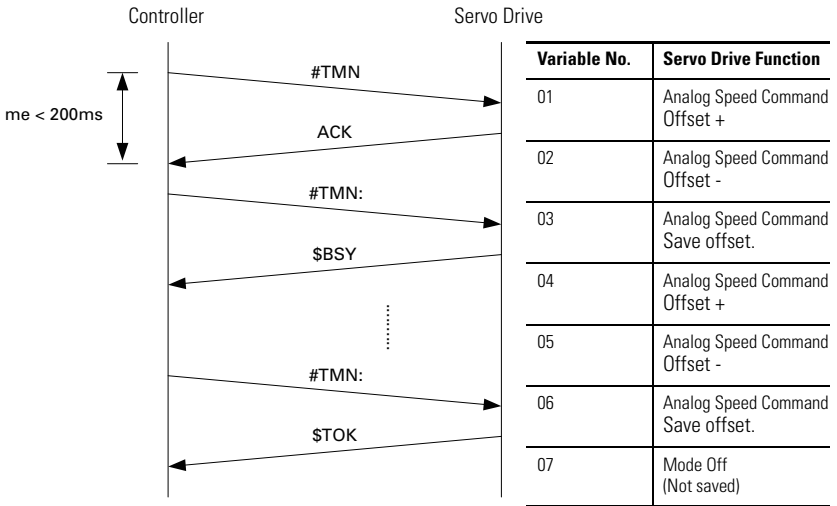
STX	ID	\$	B	S	Y	:	BSS	ETX
-----	----	----	---	---	---	---	-----	-----



When a controller sends TAT command to the servo drive, the servo drive receives the packet and returns ACK immediately. To ensure that the servo drive completed a task as instructed, the controller sends TAT: to check if TOK is returned. If BSY is returned, the instructed task is still in progress.

Manual Task (TMN)

STX	ID	#	T	M	N	Variable No.	:	BSS	ETX
-----	----	---	---	---	---	--------------	---	-----	-----

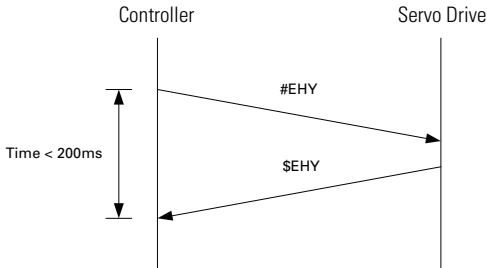


When a controller sends TMN command to the servo drive, the servo drive executes the command after receiving the packet and returns ACK. However, to ensure that data is stored in flash memory after issuing a task (TMN03 and TMN06), that is, to ensure that the tasks are successfully completed, the controller sends TMN: to check if TOK is returned. If BSY is returned, the instructed task is still in progress.

Read Alarm Log (EHY)

	ID	#	E	H	Y	Alarm No.	:	BSS	ETX
--	----	---	---	---	---	-----------	---	-----	-----

STX	ID	\$	E	H	Y	E	Alarm Code	Alarm Character	:	BSS	ETX
-----	----	----	---	---	---	---	------------	-----------------	---	-----	-----



STX	ID	#	E	H	Y	*	:	BSS	ETX
-----	----	---	---	---	---	---	---	-----	-----

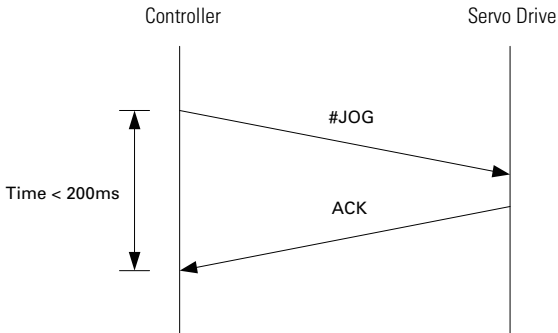
STX	ID	\$	E	H	Y	Code 1	&	Code 2	&	Code 8	:	BSS	ETX
-----	----	----	---	---	---	--------	---	--------	---	-------	--------	---	-----	-----

- The alarm number can be set between 01 and 08, and 01 has a log for the most recent alarm. For an alarm character, please refer to CSD3P Servo Drive User Manual (CSD3P-UM001).
- Send * instead of an alarm number to receive all alarm logs. In this case, the servo drive does not transmit an alarm character.

Trial Run (JOG)

STX	ID	#	J	O	G	0	:	BSS	ETX
-----	----	---	---	---	---	---	---	-----	-----

STX	ID	#	J	O	G	+/-	:	BSS	ETX
-----	----	---	---	---	---	-----	---	-----	-----

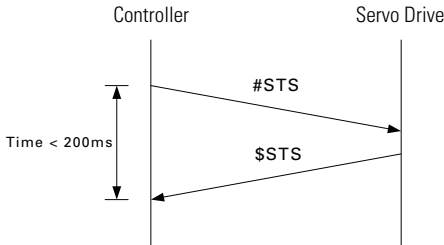


- Use JOG0 to enter Jog Mode for the first time (Do not use SVRON) Use JOG+ or JOG- to run the drive forward or backward.
- Send SVROF to exit Jog Mode.
- To maintain Jog Mode, JOG (0, +, -) should be sent within every 500 [ms].

Request Status (STS)

STX	ID	#	S	T	S	:	BSS	ETX
-----	----	---	---	---	---	---	-----	-----

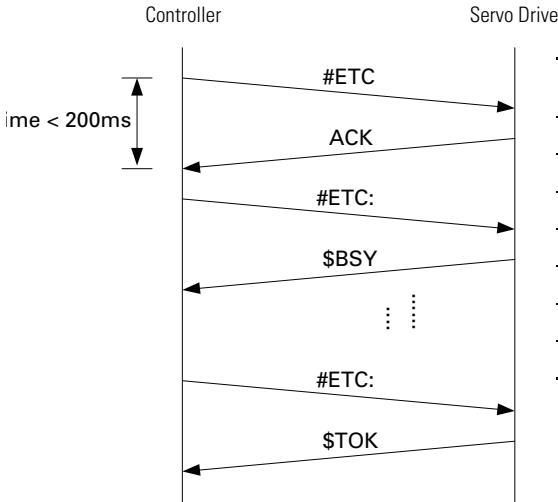
STX	ID	\$	S	T	S	Control	ss1	ss2	Servo Status	Alarm Character	:	BSS	ETX
-----	----	----	---	---	---	---------	-----	-----	--------------	-----------------	---	-----	-----



Control Mode	P (Position), S (Speed), T (Torque), C (Contact)
ss1:	1 (Speed or Positioning Complete) 0 (Speed or Positioning Incomplete)
ss2:	1 (Above the set speed) 0 (Under the set speed)
Servo Status:	E00-E99 (For alarm) W00-W99 (For warning) B-B (Servo off) RUN (Running) POT (Forward rotation not allowed) NOT (Backward rotation not allowed)
Alarm Character:	For alarm, it is transmitted in 5 bytes, and for warning, it is transmitted in 3 bytes. For more information, please refer to CSD3 Servo Drive User Manual (CSD3P-UM001).

Other Function (ETC)

STX	ID	#	E	T	C	Variable No.	:	BSS	ETX
-----	----	---	---	---	---	--------------	---	-----	-----

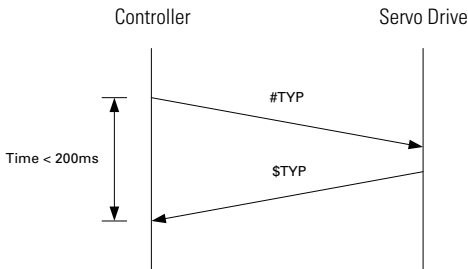


Variable No.	Servo Drive Function
09	Clear Alarm History
10	Reset Absolute Encoder
11	Store the 2nd Gain
12	Initialize User Parameter
13	Test Run
14	Update Program
16	Reboot Drive

Check Motor Type (TYP)

STX	ID	#	T	Y	P	:	BSS	ETX
-----	----	---	---	---	---	---	-----	-----

STX	ID	S	T	Y	P	Motor Type	-	Motor Capacity	-	Encoder Type	:	BSS	ETX
-----	----	---	---	---	---	------------	---	----------------	---	--------------	---	-----	-----



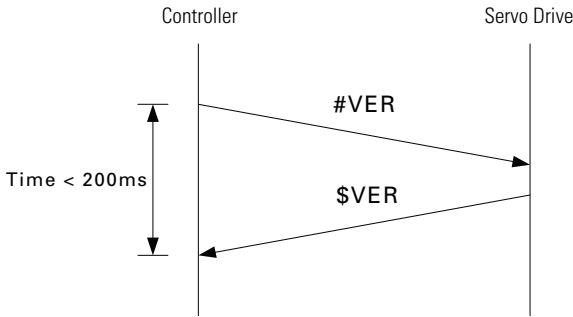
Motor Type	-, R, T, S, D, H, K, Q, Z RS, RD, RH, RF, RK, RQ, RZ
Motor Capacity:	A3, A5, 01-15
Encoder Type:	S, B, A, D, C, K, L, H, J, M, Q, F

For more information, please refer to CSD3 Servo Drive User Manual (CSD3P-UM001).

Check Firmware Version (VER)

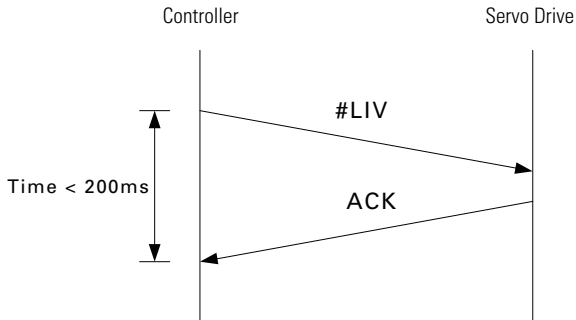
STX	ID	#	V	E	R	:	BSS	ETX
-----	----	---	---	---	---	---	-----	-----

STX	ID	\$	V	E	R		1	.	2	3	:	BSS	ETX
-----	----	----	---	---	---	--	---	---	---	---	---	-----	-----



Check Comm Connection Status (LIV)

STX	ID	#	L	I	V	:	BSS	ETX
-----	----	---	---	---	---	---	-----	-----

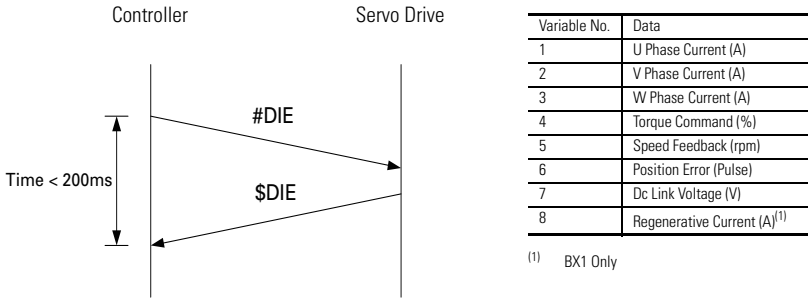


- If ACK is not returned from the servo drive, there may be an error in the communication line.

Request Alarm Details (DIE)

STX	ID	#	D	I	E	Variable No.	Data No.	:	BSS	ETX
-----	----	---	---	---	---	--------------	----------	---	-----	-----

STX	ID	\$	D	I	E	Data 1	&	Data 2	&	Data 3	&	Data n	:	BSS	ETX
-----	----	----	---	---	---	--------	---	--------	---	--------	---	-------	--------	---	-----	-----



NOTE

CSD3 stores data for 8 important variables in its memory for 15 ms before and after a servo alarm occurs. Use DIE command to read these data.

Send the data number as 00 to receive all data for variable no. 2. That is, send 'DIE0200:'.

When data set for 8 variables are stored in 30 buffers, to receive a specific set of data for 8 variables that is stored in the same buffer no., send 'DIE00BufferNumber:'. For example, to receive, upon servo alarm, all data for 8 variables that are stored in the first buffer, send 'DIE0001:'. To receive all data for 8 variables that are stored in the last buffer, send 'DIE0030:'.

Modbus-RTU Protocol

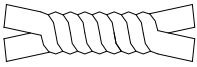
Any parameter can be read and written through Modbus-RTU in either RS232 or RS485 communication.

Network Wiring

RS232

CN3	PC
11	2
12	3
1	5

RS485

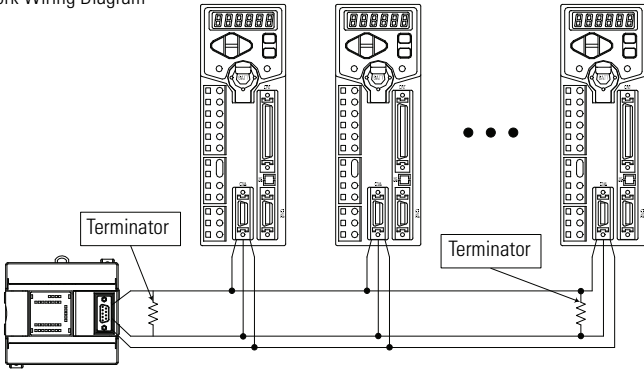
CN3	Twisted Pair	Function
14		SD
15		SD+
1		GND

Cable Shield should be connected to the ground plates.

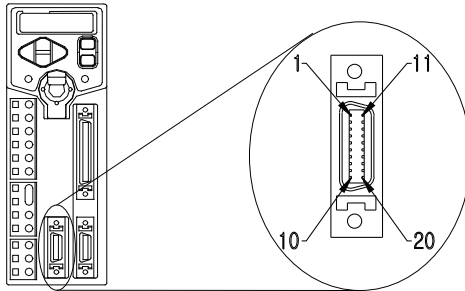
IMPORTANT

SD signal lines should be in twisted pair connection.

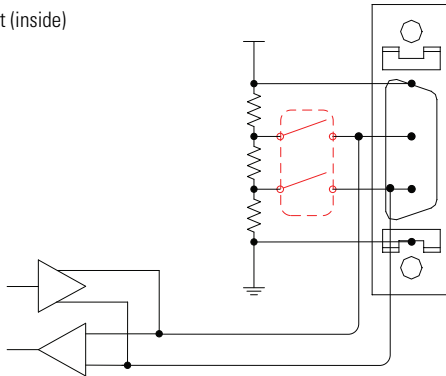
Network Wiring Diagram



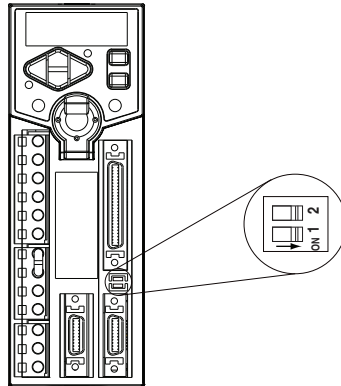
Configuration of 20-pin CN3 Connector



CN3 Connector Circuit (inside)



Connecting Terminator



Terminators are required at both ends of a RS485 network cable. CSD3 Plus Servo Drive has built-in terminator for RS485. To use a terminator for RS485 communication, set the two dip switches located between the I/O cable and the encoder cable from left to right to make the resistor internally connected.

Up to 600 m is supported in the network. A repeater should be used when there are more than 32 nodes.

The internal terminator is 220 Ohm. Use 1/4W or higher 120Ohm resistor if you are going to use an external resistor for termination.

IMPORTANT

Make sure to firmly connect the terminator. If not, there may be communication errors. If you are going to use an external resistor for termination, make sure to turn off the internal terminator ON/OFF switch.

Comm Parameter Settings

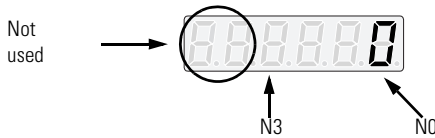
Parameter	Description
Pr-0.12	Comm Node Address Setting
Pr-0.14.N0	Comm Baud Rate Setting (RS232)
Pr-0.14.N1	Comm Baud Rate Setting (RS485)
Pr-0.14.N2	Comm Format Settings
Pr-0.14.N3	Comm Protocol Setting

Pr-0.12 : No. of Node Addresses Setting

Comm Protocol	The Max Number of Nodes
Modbus_RTU	1-247
RAK_ASCII	

Pr-0.14 (Protocol, Format, Baudrate)

The following figure illustrates 7-segment displays. For Pr-0.14, the first two 7-segment displays are not used.



Pr-0.14.N3 (Protocol)

Set Value	Protocol
0 (Default)	RAK_ASC
1	Modbus_RTU

Pr-0.14.N2 (Format)

Set Value	Data Bit	Parity Bit	Stop Bit
1 (Default)	8	N	1
2	8	E	1
3	8	O	1
4	8	N	2
5	8	E	2
6	8	O	2

Pr-0.14.N1 (RS485_Baudrate) and Pr-0.14.N0 (RS232_Baudrate)

Set Value	Speed (bps)
1	9600
2 (RS485 Default)	14400
3	19200

4	38400
5	56000
6 (RS232 Default)	57600

Because comm ports for RS232 and RS485 are physically different from each other, you will need a different cable depending on whether you choose to use RS232 or RS485, the speed for the corresponding method is applied.

Modbus Function Code

CSD3 Plus Servo Drive supports only a portion of the Modbus Function Codes.

Function Code	Command
03 (0x03)	Read Holding Register
06 (0x06)	Write Single Register
16 (0x10)	Write Multiple Register

When the function code 16 (0x10) is used to write values into a large number of registers, it may take 15-30 seconds until all values are applied.

IMPORTANT

Write the parameters that affect other parameters first, and then write the parameters which are affected by other parameters next.

When the function Code 06, or 16 is used to write a value and if the value is out of the range, i.e. its max. or min., an exception code is returned together with a response packet. In addition, for the bit-based data, the above statement applies to each of the data. For example, when the min. value of Para[0][14] is 0x0000 and max. value is 0x1666, Exception Code=03 is returned if the input value is 0x0999 and a normal response is returned if the input value is 0x1111.

IMPORTANT

When the Function Code 16 is used to write many values into many parameters at the same time, writing happens from Para[5][14] to Para[0][00] in order. And also make sure to check the values are all correct. If one of them is incorrect, all the values are not written into the parameters.

The register number for Modbus devices may begin with 0 or 1. Because this is determined by the master of Modbus, the register number should be added by '1' as needed.

No. of a parameter is equal to the number obtained when '3000' is subtracted from a Modbus address. Modbus address. For example, if 3000 is subtracted

from address 3014, the result is 014, which represents the parameter number for Pr-0.14. The memory map for Modbus is as follows:

Modbus Address (Dec)	Parameter Group	Description
3000-3014	Group 0	System Parameters
3100-3115	Group 1	Control Gain Parameters
3200-3213	Group 2	Speed Parameters
3300-3306	Group 3	Position Parameters
3400-3406	Group 4	Torque Parameters
3500-3514	Group 5	Additional Function Parameters

Because data for motor setting parameter (Pr-0.01) and tolerable position & speed error setting parameter (Pr-5.09) have a length of more than 2 bytes, an address for each of these is processed as an exception as shown below. However, If parameter Pr-0.01 or Pr-5.09 is involved when multiple registers are read (03) or written (16), it is always shown as 0x0000 during read, and a new value is not overwritten during write, while the existing value is kept. A servo error can also read through a specific address.

Read Servo Error (03)

Address = Decimal (Hexadecimal)	Hexadecimal	Description
4000 (FA0h)	00	No Error
	10	Servo Drive Internal Circuit Failure
	11	Motor Driving Component Failure
	12	Overcurrent
	13	Regenerative Overcurrent

Address = Decimal (Hexadecimal)	Hexadecimal	Description
4000 (FA0h)	14	Phase Current Offset Error
	20	Motor Cable Failure
	21	Torque Instantaneous Overload
	22	Torque Consecutive Overload
	23	Regenerative Overload
	24	Heating Plate Overheat
	30	Encoder Type Setting Error
	31	Encoder Cable Disconnected
	32	Absolute Encoder Communication Failure
	33	Absolute Encoder Internal Low Voltage
	34	Absolute Encoder Power Outage Overspeed
	35	Absolute Multi-resolution Data Error
	36	Serial Absolute Encoder Parameter Error
	40	Excessive Main Power Voltage
	41	Low Main Power Voltage
	42	Instantaneous Power Outage Error
	50	Overspeed
	51	Position error Overflow
	52	Excessive Position Command Pulse
	53	Emergency Stop
	54	CPU Failure
	55	Motor Uncontrollable
	60	Serial Communication Failure
	61	Parameter Checksum Error
	62	Parameter Setting Range Error
	63	Parameter Breakdown
64	Phase Current Measurement Error	
70	Servo Drive Capacity Error	
71	Motor Encoder Setting Combination Error	

Read (03) / Write (06) Motor Setting Parameter (Pr-0.01)

Address = Decimal (Hexadecimal)	Value (Hex)
4100 (1004h)	0x0001-0xFF15F

Parameter	Description
Pr-0.01.N5	Not used
Pr-0.01.N4~3	Motor Type Setting
Pr-0.01.N2~1	Capacity Setting
Pr-0.01.N0	Encoder Setting

Input Value for Motor Setting Parameter

Motor Type	Value (Hex)	Capacity (W)	Value (Hex)	Encoder	Value (Hex)
CSM	00	30	A3	Tamagawa 15-wire 2048PPR INC	0
CSMR	10	50	A5	Tamagawa 9-wire 2048PPR INC	1
CSMT	11	80	A8	Tamagawa 11-bit Compact ABS	2
CSMS	20	100	01	Tamagawa 15-wire 2500PPR INC	3
CSMD	21	200	02	Tamagawa 15-wire 2000PPR INC	4
CSMH	22	300	03	Tamagawa 15-wire 5000PPR INC	5
CSMK	24	400	04	Tamagawa 17-bit Serial ABS	6
CSMQ	25	500	05	Tamagawa 17-bit Serial INC	7
CSMZ	26	600	06	Panasonic 11-wire 2500PPR INC	8
RSMS	30	800	08	Komotek 15-wire 5000PPR INC	9
RSMD	31	900	09	Komotek 15-wire 6000PPR INC	a
RSMH	32	1000	10	Komotek/Panasonic 11-bit Full/Compact ABS	b
RSMF	33	1200	12	Komotek 9-wire 2500PPR INC	c
RSMK	34	1500	15	Komotek/Panasonic 15-wire 10000PPR INC	d
RSM L	35			Komotek 17-bit Serial ABS	e
RSMQ	38			Komotek 17-bit Serial INC	f
RSMZ	39				

Read (03) / Write (06) Tolerable Position & Speed Error Setting Parameter (Pr-5.09)

Address = Decimal (Hexadecimal)	Value (Dec)
4101 (1005h)	0 - 99999

Exception Code

CSD3 Plus Servo Drive uses only a portion of exception codes in Modbus specifications. The following table shows exception codes used in the CSD3P Servo Drive.

Exception Code	Error	Description	Error Code
01	Function Error	The Query Reception function code is not valid for the slave.	0x81
02	Data Address Error	The Query Reception data address is not valid for the slave.	0x82
03	Data Value Error	The value of query data field is not valid for the slave.	0x83
07	CRC Value Error	The Query Reception CRC value is invalid.	0x87
12	Frame Error	The byte length of the Query Reception frame exceeds the limit.	0x8C

알에스오토메이션주식회사

www.rsautomation.co.kr

경기도 평택시 진위면 청호리 진위산업단지 32-1-1 블록 알에스오토메이션빌딩 # 451-862
T 031-685-9300, F 031-685-9500

부산 지사 부산광역시 사상구 괴법동 578 산업용품유통상가 27동 203호 #617-726
T 051-319-2890, F 051-319-2894

대구 지사 대구광역시 북구 산격2동 1665번지 전기재료관 다동 223호 #702-717
T 053-944-7783, F 053-944-7784

광주 지사 광주광역시 광산구 우산동 1589-1 광주무역회관 10층 #506-721
T 062-945-8408, F 062-945-8670

알에스오토메이션 서비스센터

전국 어디서나 1588-5298

동탄 센터 경기도 화성시 동탄면 정계리 401-12번지 # 445-811
T 031-373-3744, F 031-372-6446

안양 센터 안양시 동안구 호계2동 894번지 피카빌딩 2층 #431-836
T 031-455-8686, F 031-455-8656

광주 센터 광주광역시 광산구 우산동 1589-1 광주무역회관 10층 #506-721
T 062-945-8665, F 062-945-8664

부산 센터 부산광역시 사상구 괴법동 578 산업용품유통상가 27동 103호 #617-726
T 051-319-1802/3, F 051-319-1834

RS Automation Co., Ltd.

www.oemax.com

RS Automation Building, 32-1-1 Block, Jinwi Industrial Complex, Cheongho-ri, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, Korea, zip code : 451-862

T 82-31-685-9300, F 82-31-685-9500

RS Automation Global Business Support
rsagbs@rsautomation.co.kr

韩国京畿道平泽市振威面清湖里振威工业园32-1-1区RS自动化大厦 邮编: 451-862

T 82-31-685-9300, F 82-31-685-9500

RS自动化全球商户支持
rsagbs@rsautomation.co.kr