

ZS-6322 Series
RS-232C/DIO Adapter

User's Manual



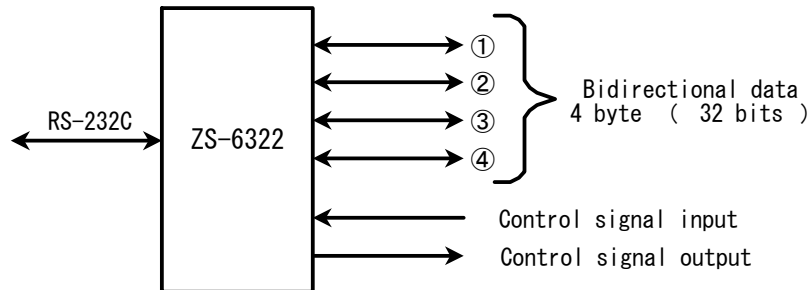
Zip code: 183-0027
2-13-37, Honmachi, Fuchu, Tokyo, Japan
TEL: +81-(0)42-368-2126
FAX: +81-(0)42-364-0067
URL <http://www.zenisu.co.jp/>

◆ Table of Contents ◆

1.Outline	3
2.Feature.....	3
3.Specification	3
3.1.Operation environment	3
3.2.RS-232C.....	3
3.3.Digital I/O port.....	4
3.4.Product specification	4
3.5.Appearance	4
4.RS-232C interface.....	5
4.1.RS-232C signal.....	5
4.2.RS-232C cable	5
5.Switch.....	6
6.Operation.....	7
6.1.Transfer data method	7
6.2.Control signal.....	8
6.3.I/O operation	9
6.4.Command	10
6.4.1. R command	10
6.4.2. W command	10
6.4.3. T command	11
6.4.4. C command	11
6.4.5. D command.....	11
6.4.6. P command	11
6.4.7. L command	12
6.4.8. U command.....	12
6.4.9. B command.....	12
7.Connector	13
8.Warranty.....	14

1.Outline

ZS-6322 is a unit that communicates digital I/O signals and RS-232C. It is possible to be connected to PC with RS-232C interface, and equipment control and data collection of BCD output measuring the equipment can be done.



2.Feature

- ① It is possible to be easily measurement controlled with a laptop computer.
- ② There are 4 ports (8 bits/port) for digital I/O signals, and input and output can be selected for each port.
- ③ In addition to data, control lines are prepared so that it can be synchronized with external device.

3.Specification

3.1.Operation environment

- Equipment with RS-232C port.

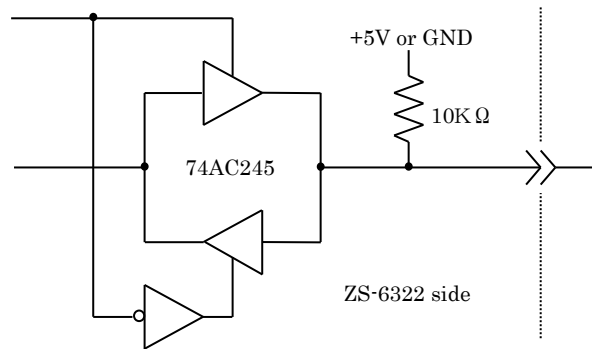
3.2.RS-232C

- Communication method: Full duplex communication method
- Synchronization method: Asynchronous method
- Communication method: 2400, 4800, 9600, 19200
- Handshake: Hard-wire method
- Character bitlength: 7, 8
- Parity: None, odd number, even number
- Stop bit length: 1, 2
- DTE/DCE: DTE specification
- Logic : ON(space) +3V to +12V
- Wiring form OFF(mark) -3V to -12V

3.3. Digital I/O port

- Port: 4 port(8 bit/port)
- I/O level: Fan-in=1, Fan-out=10

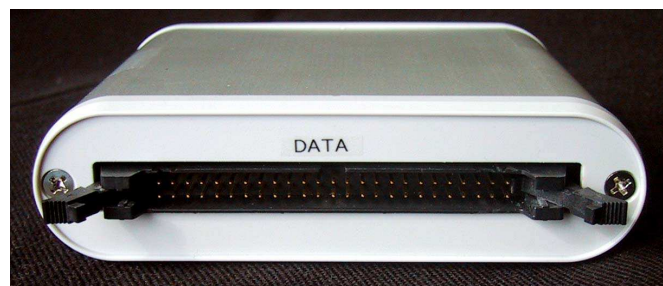
Pull-up resistor 10KΩ, it is possible to be pull-down.



3.4. Product specification

Model	ZS-6322P	ZS-6322S
Feature	Printed circuit boarded type	Small case built-in type
Data connector	50 core flat cable	50 core flat cable
Power supply	DC4.75V to 5.25V 100mA or less	DC4.75V to 5.25V 100mA or less
Environment	Temperature: 0°C to 50°C Humidity: 85% or less	Temperature: 0°C to 50°C Humidity: 85% or less
Storage Temp	-20°C to 80°C	-20°C to 80°C
Size	150 × 100 × 30H	150 × 100 × 30H
Accessory	Data connector FAS-5001-2101-0BF DC power cable	Data connector FAS-5001-2101-0BF

3.5. Appearance



4.RS-232C interface

4.1.RS-232C signal

Signal	Connector PIN No	Function
TXD	3	Transmission data.
RXD	2	Received data.
CTS	8	It is an input signal to receive permission of data transmission. Transmission data can be controlled by this signal.
RTS	7	It is an output signal indicating whether data I/O is possible or not.
GND	5	It becomes the reference voltage(0V) of all signals.

Connector: DELC-J9PAF-23L6E or equivalent.

4.2.RS-232C cable

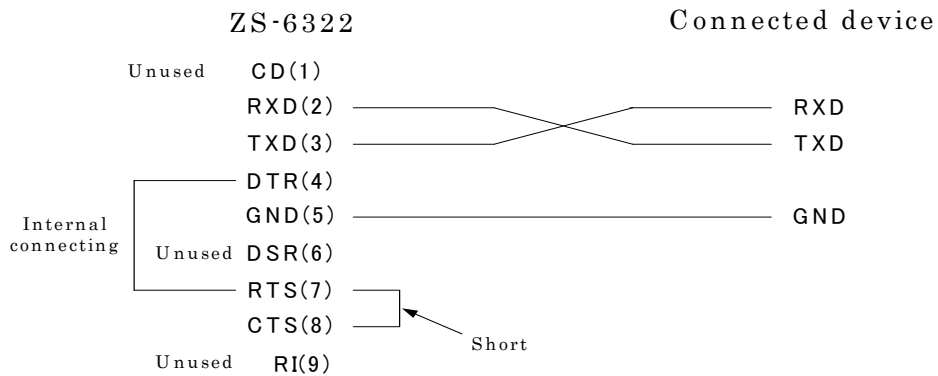
The following products can be used for the ZS-6322B cable.

Dsub-9p female - Dsub-9p female

KR-ECLK or equivalent

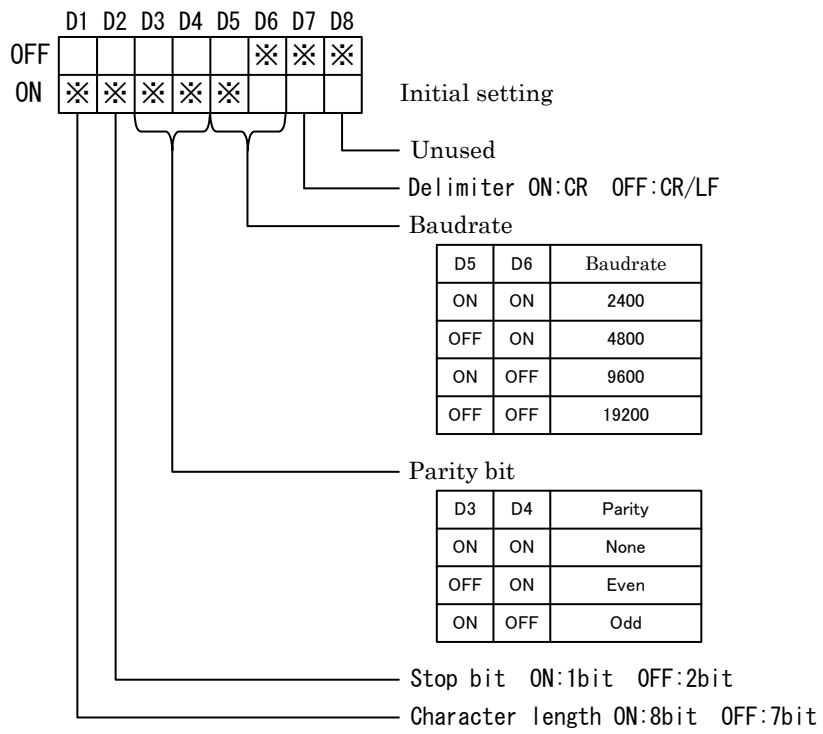
KR-LK or equivalent

Note) When communicating with only TXD, RXD, please wire as follows.



5.Switch

Set protocol of RS-232C.



6.Operation

6.1.Transmission data method

- ① Communication of ZS-6322 is performed with the COM port. When making a program, check the “Port (COM and LPT)” filed in the device manager of each OS and open it according to the displayed COM number.

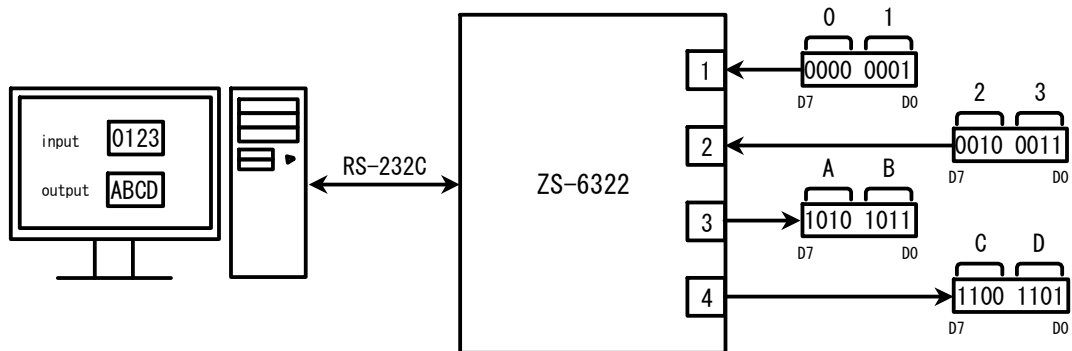
- ② Data code

Data is transferred in ASCII code, and one character is converted to 4-bit binary code.

4 bit-binary data				RS-232C data
8	4	2	1	HEX
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	0	0	0	8
1	0	0	1	9
1	0	1	0	A
1	0	1	1	B
1	1	0	0	C
1	1	0	1	D
1	1	1	0	E
1	1	1	1	F

- ③ The data sent from the PC is transferred sequentially from the smaller numbers of the port set for output. Port numbers set for input are sequentially taken from smaller numbers and sent to the PC. The data of each port is set or taken in 4 bits.
- e.g) When ports 1 and 2 are input and port 3 and 4 are set to output.

Order to send to PC	Port data	Order to send to ZS-6322	Port data
1	Port_1 D7 to D4	1	Port_3 D7 to D4
2	Port_1 D3 to D0	2	Port_3 D3 to D0
3	Port_2 D7 to D4	3	Port_4 D7 to D4
4	Port_2 D3 to D0	4	Port_4 D3 to D0



6.2. Control signal

A control signal is prepared so that it can be synchronized with the connected equipment.

Signal	Direction	Description
STB	OUT	The adapter completes reception of all data from the PC and outputs a pulse signal after outputting to the port. External devices can use this signal for Latch-Clock etc. as necessary.
TRG	OUT	Pulse signal is output to the external device by "T" command.
CLR	OUT	Pulse signal is output to the external device by "C" command. It is possible to be used for resetting external devices.
LAH	IN	When the latch circuit is enabled, latch input data with this signal. Input a signal with a pulse width of 500μs or more.

Note) The pulse width of the output can be set by command.

The pulse width is 10μs, 100μs, 1ms, 10ms, 100ms.

6.3.I/O operation

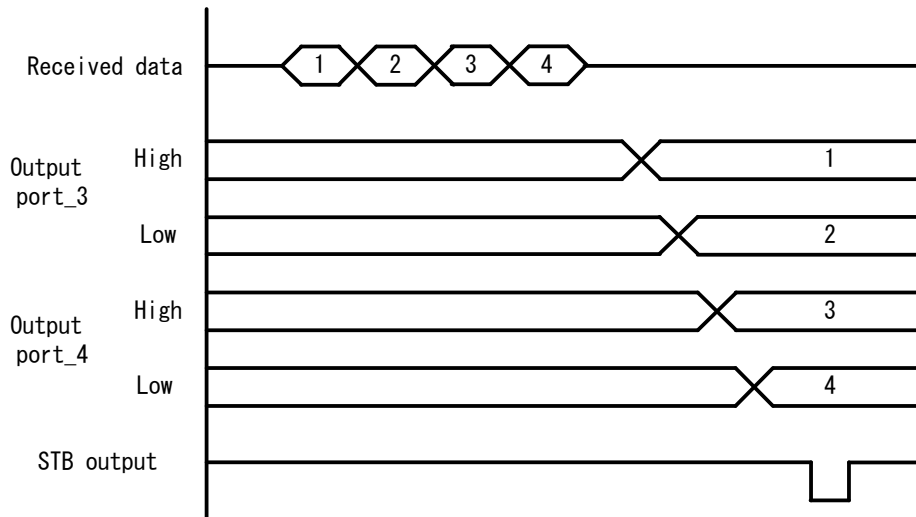
① Output data from PC to port.

➤ Continuous output

Data is set in 4 bits to the port set as output, after receiving data from the PC. The STB pulse is output after setting the data to the output port.

Note) If data is sent more than amount of data that is set on the output port, extra data will be discarded.

If data is sent less than amount of data that is set on the output port, the data sent last time will remain in the space.



➤ Pulse output

Data is set 4 bits to the port set as output after receiving data from the PC. The output port data is output for the specified pulse width.

② Send data input from port to PC.

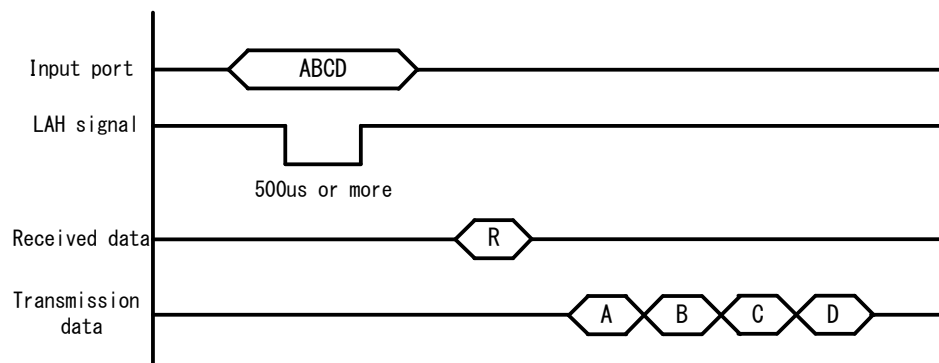
➤ Without latch

When the ZS-6322 receives the “R” command from the PC, it takes in the data from the input port at that time and sends it to the PC.

➤ With latch

Data from the input port is taken when the LAH input is Low.

When the ZS-6322 receives the “R” command from the PC, it sends the captured data to the PC.



6.4.Command

ZS-6322 recognizes and controls the first byte of data as a control command. Be sure to add a delimiter(CR+LF) to the end of the data string and transmit. If there is a character string other than the command at the beginning of the data, NG will be sent as return value.

Command	Function
R	Data is read from all ports as input.
W	Data is written to the port set as output.
T	Pulse is output from the TRG signal.
C	Pulse is output from the CLR signal.
D	Configure port I/O setting.
P	Set the pulse width of the control signal.
L	Set the presence/absence of latch circuit.
U	Set the output signal.
B	Execute positive/negative logic setting of port.

6.4.1. R command

- Function
Data is read from all ports set as input. For example, if the number of input ports is set to 4, 8bytes of data will be sent from ZS-6322 when “R” command is executed.
- Format
R CR LF
- Return value
xxxx····CR LF: Data as same as the number set for the input port will be sent.
“x” is an ASCII code from 0 to F.
NG CR LF: There is no input port.

6.4.2. W command

- Function
Data is written to the port set as output. For example, if the number of output ports is set to 4, 8byte data is added after “W” command and it is sent to ZS-6322. If data is transmitted less than 8 bytes, the data will be newly changed for the transmitted data and the previous data will be remained in the space. If more than 8 bytes are transmitted, it will be discarded.
- Format
Wxxxx····CR LF: Write output data to the output port after “W”.
“x” is ASCII code from 0 to F.
- Return value
OK CR LF: Data output is completed to the output port.
NG CR LF: No output port, data character error.

6.4.3. T command

- Function
Pulse is output to the control signal "TRG".
- Format
T CR LF
- Return value
OK CR LF: Pulse output is completed.
NG CR LF: Pulse output error

6.4.4. C command

- Function
Pulse is output to the control signal "CLR".
- Format
C CR LF
- Return value
OK CR LF: Pulse output is completed.
NG CR LF: Pulse output error.

6.4.5. D command

- Function
I/O setting of 4 ports is executed.
All ports are set to input when turn on the power of ZS-6322.
- Format
Dxxxx CR LF: Set in the order of port_1, port_2, port_3, and port_4 after "D".
"x" is "I" for IN for input, "O" for OUT for output.
- Return value
OK CR LF: Setting is completed.
NG CR LF: I/O setting error, data character error.

6.4.6. P command

- Function
The pulse width of the control signals "STB" "TRG" "CLR" can be selected from 10µs, 100µs, 1ms, 10ms, 100ms.
When powering on the ZS - 6322, it is set to 10µs.
- Format
Px CR LF: "x" is number. The assignment of number is as follows.
0 : 10µs, 1 : 100µs, 2 : 1ms, 3 : 10ms, 4 : 100ms
- Return value
OK CR LF: Setting is completed.
NG CR LF: Setting error, data character error

6.4.7. L command

- Function
It is possible to set the presence or absence of the latch circuit when inputting data.
When turning on the power of the ZS-6322, it is set absence of the latch circuit.
- Format
Lx CR LF: “x” is number. 0 : absence, 1 : presence
- Return value
OK CR LF: Setting is completed.
NG CR LF: Setting error, character data error

6.4.8. U command

- Function
Set the signal at the time of data output.
It is set to continuous output when turning on the power of ZS-6322.
Set the pulse width at pulse output, use the “P” command.
- Format
Ux CR LF: “x” is a number. 0 : continuous output, 1 : pulse output
- Return value
OK CR LF: Setting is completed.
NG CR LF: Setting error, character data error

6.4.9. B command

- Function
Execute positive/negative logic setting of the 4 ports.
When ZS-6322 is powered on, all ports are set to positive logic.
This command should be executed when the port setting is input.
- Function
Bx CR LF: “x” is a number. 0 : positive logic, 1 : negative logic
- Return value
OK CR LF: Setting is completed.
NG CR LF: Setting error, character data error

7.Connector

Data connector FAP-5001-1202-0BF

DATA (CN1)

I/O	SIGNAL	PIN		SIGNAL	I/O
PORT ①	D0	1	2	D0	PORT ②
	D1	3	4	D1	
	D2	5	6	D2	
	D3	7	8	D3	
	D4	9	10	D4	
	D5	11	12	D5	
	D6	13	14	D6	
	D7	15	16	D7	
PORT ③	D0	17	18	D0	PORT ④
	D1	19	20	D1	
	D2	21	22	D2	
	D3	23	24	D3	
	D4	25	26	D4	
	D5	27	28	D5	
	D6	29	30	D6	
	D7	31	32	D7	
IN	LAH	33	34	(NC)	
OUT	STB	35	36	(NC)	
OUT	TRG	37	38	(NC)	
OUT	CLR	39	40	(NC)	
	(NC)	41	42	GND	
	(NC)	43	44	GND	
	(NC)	45	46	GND	
	(NC)	47	48	GND	
	(NC)	49	50	GND	

Note) I/O indicates the direction of the digital signal between ZS-6322 and I/O device.

IN : ZS-6322 ← External device

OUT : ZS-6322 → External device

PORT : Bidirectional data bus

It is possible to switch between IN and OUT with PC.

8. Warranty

If it fails during normal use, we will repair it free of charge as described in this warranty as below.

- 1) During the warranty period which is one year from the date of purchase, we will repair it free of charge in case of malfunction in accordance with instruction manual.
- 2) It will be charged for extra in the following case, even during warranty period.
 - Incorrect usage or failure or damage caused by carelessness.
 - Failure or damage caused by improper repair or remodeling.
 - Failure or damage caused by external factors such as fire, earthquake, other natural disasters, abnormal voltage and so on.
 - Replacement of consumable parts.
 - Change of power supply and voltage.
- 3) This warranty provision is effective only in Japan