User's Manual

GP-IB／RS-232C Conversion Adapter

ＺＳ－６１４４ＡＦ

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1. Outline

ZS-6144AF is an interface conversion adapter that mediates communication between GP-IB and RS-232C.

ZS-6144AF operates as an interface converter for incorporating devices with RS-232C interface into the GP-IB system, and devices with RS-232C interface can communicate with the GP-IB controller.

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┌──────────────┐           ┌──────────────┐           ┌──────────────┐
│   GP-IB      │  GP-IB    │  ZS-6144AF   │           │  RS-232C     │
│  controller  │ <══════>  │              │ ─────────> │ interface    │
│              │           │              │  RS-232C   │   device     │
│              │           │              │ <───────── │              │
└──────────────┘           └──────────────┘           └──────────────┘
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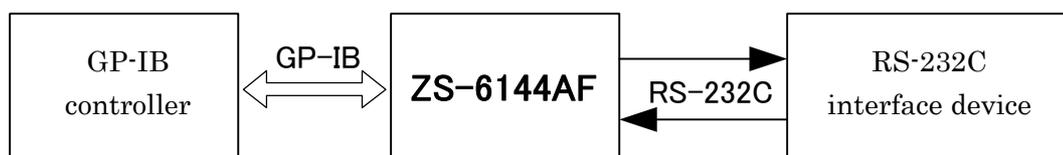
2. Features

 (1) Small size and lightweight
 (2) Bidirectional 16 Kbyte buffer memory
 (3) Processing has been speeded up compared with the conventional ZS-6144F

3. Specifications

3-1 GP-IB
 (1) Compliant with IEEE Std-488
  SHI、AHI、T5、L3、SR1、RL0、PP0、DC0、DT0、CO
 (2) Connecter
  57LE-20240-77C0-D35G-CA

3-2 RS-232C
 (1) Communication method: Full duplex communication method
 (2) Synchronization method: Start-stop synchronization method
 (3) Communication speed: 1200、2400、4800、7200、9600、14400、19200、28800、38400、57600、115200、230400、460800、921600（bps）
 (4) Parity: No parity, odd parity, even parity
 (5) Stop bit length: 1, 2
 (6) Character bit length: 7, 8
 (7) Delimiter: CR, LF, ETX
 (8) Logistic level

Voltage	Data signal	Control signal
+3V to +12V	0 （space）	ON
-3V to -12V	1 （mark）	OFF

（9）RS-232C signal

Signal	Connecter PIN NO	Function
TXD	3	Transmission data from ZS-6144AF.
RXD	2	Received data of ZS-6144AF.
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 output signal indicating whether data input/output is possible to the partner side.
GND	5	All signal becomes 0V.

（10）Connecter: DE-9P-NR or equivalent

3-3 General specifications
（1）Power: DC+5V　500mA 以下
（2）Operation temperature: 0 to 40℃
（3）Size(mm): 82（W）×30（H）×126（D）
（4）Weight: 500g or less
（5）Accessory: DC input cable（AC adapter is optional）

4. Operation

4-1 Operation sequence

ZS-6144AF operates as an interface converter that communicates between the GP-IB controller and the RS-232C interface device.

The RS-232C side is in full duplex communication method and the transfer is performed regardless of the GP-IB side status as a talker or a listener.
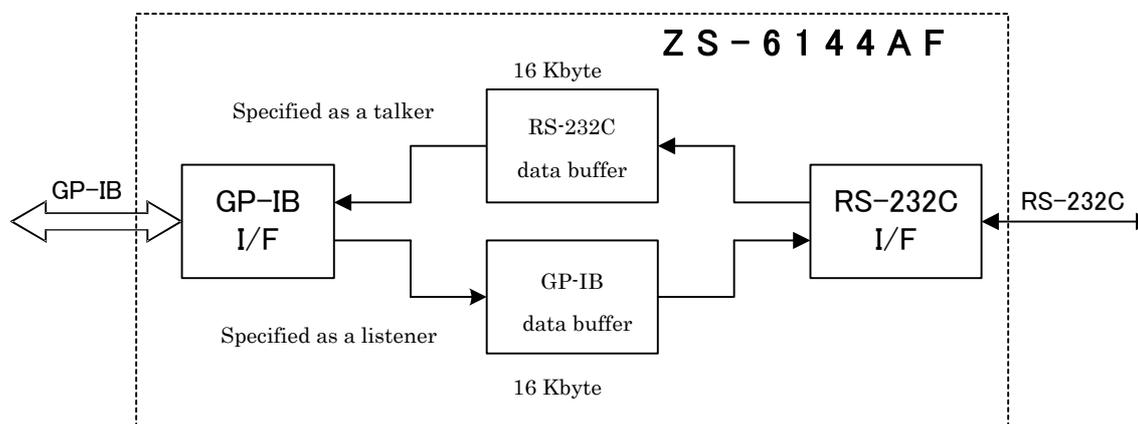
In case of buffer memory is ON.

(1) Talker operation

The data received from the RS-232C is sequentially written the 16 Kbyte buffer memory. When talker is specified, data in the buffer memory is output to the GP-IB side.

When the RS-232C data received buffer memory becomes full, the received data is discarded without being written to the buffer memory.

(2) Listener operation

When the listener is specified, the data received from the GP-IB is written to the 8 Kbyte buffer memory. If the RS-232C side is receivable state, data in the buffer memory is output to the RS-232C side. In this case, it is necessary both CTS and RTS is ON.

GP-IB handshake is stopped when the data reception buffer memory becomes full. When the amount of data becomes 2 Kbytes or less, the handshake restarts.

In case of buffer memory is OFF

It is used when transmission / reception data always needs latest data from the other side.

When buffer memory is turned OFF, delimiters separate the continuous data.

If the data received before receiving the delimiter exceeds16 Kbytes, it discards the data received so far and stores the newly data.

For example, when receiving a delimiter after receiving 18 Kbytes of data, only the last 2 Kbytes are sent from the sender to the receiver.

If the next new data(B) is sent before sending the received data(A) to the partner side, the data(A) is discarded and it is rewritten to the data(B)

Note) Delimiter setting is done with the MODE switch. For the setting of the MODE switch, refer to page 7.

4-2 SRQ

SRQ is generated in the following cases when SRQ function is turned on with DIP switch (SW3).

1) When the amount of data in buffer memory is exceeded by the data from RS-232C.
2) When the amount of data in buffer memory is exceeded by the data from GP-IB.
3) When RS-232C communication error occurs (parity error, framing error, overrun error).

MSB   LSB

RQS

It becomes "1" when 1) occurs
It becomes "1" when 2) occurs
It becomes "1" when 3) occurs

4-3 Flow control of RS-232C

In data transfer with RS-232C, it is possible to perform flow control using X parameter or control line to prevent loss of received data.

（1） Flow control by control line

This mode is effective when the other device can perform flow control by the control line.

When data reception is possible, the RTS signal is turned ON, and RTS signal is turned OFF when the amount of data in buffer memory is exceeded.

RTS is turned OFF, data is output to the GP-IB side. RTS is turned ON again when the amount of data buffer memory is less than 4 K bytes.

（2） Flow control by X parameter

This mode is effective when the other device can perform flow control by X parameter.

① It transmits an X-OFF code(13H) and requests the other device to pause transmission when the amount of data buffer memory is exceeded by the data from the RS-232C interface device.

ZS-6144AF transmits an X-ON(11H) code and requests transmission from the other device when the amount of data in buffer memory becomes 4 Kbytes or less after transmitting the X-OFF code.

② Receiving an X-Off code from the RS-232C stops transmission and restarts transmission when receiving an X-ON code.

4-4 Error message

When an error occurs, operation is stopped and error contents are notified by blinking the LED on the front panel.

Note) Error will be cleared when power is turned on again.

4-5 RS-232C interface operation

<table>
<tr><td></td><td>Flow control by control line</td><td>RTS signal</td><td>Sequence</td></tr>
<tr><td rowspan="2">Transmission</td><td>Enabled</td><td rowspan="2">Always ON</td><td rowspan="2">When CTS is ON, transmission is ready</td></tr>
<tr><td>Disabled</td></tr>
<tr><td rowspan="2">Reception</td><td>Enabled</td><td>It becomes OFF when buffer memoy is ecxeeded</td><td rowspan="2">When the buffer becomes full, the subsequent data is discarded</td></tr>
<tr><td>Disabled</td><td>Always ON</td></tr>
</table>

4-6 How to use

(1) Set the GP-IB address with bits 1 to 5 of the ADR switch(SW3).
(2) Set the protocol of RS-232C with bits 1 to 7 of the MODE switch(SW2) and the baud rate switch(S4).
(3) For the connection of the cable, refer to "5. Connection of RS-232C cable".
(4) Turn on the power to the RS-232C device, ZS-6144AF, GP-IB controller in this order.
(5) The configuration of the equipment should be as below.
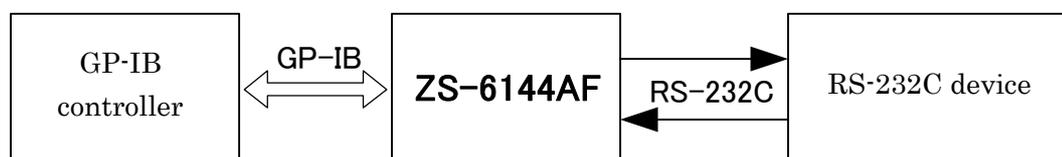


5. Connection of RS-232C cable

Please use Dsub-9pin for the cable of ZS-6144AF.
KR-ECLK, KR-LK or equivalent.

When communicating with only TXD, RXD, please wire as follows. However, the baud rate is up to 57,600 bps.
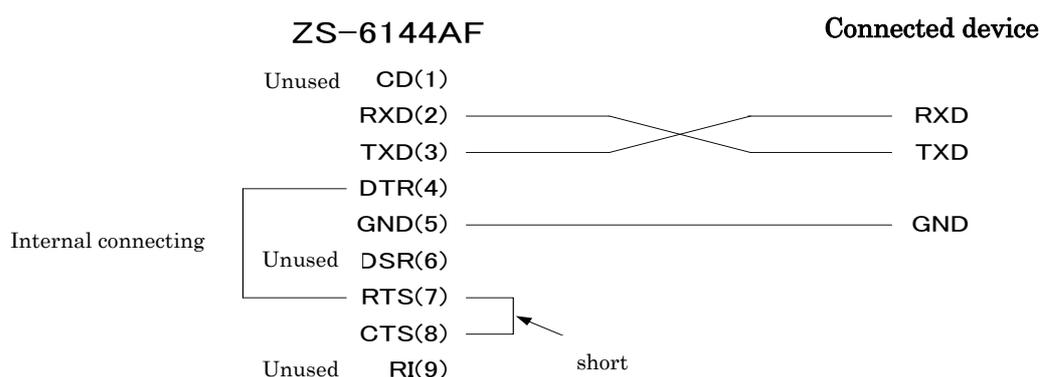
6. Functions

GP-IB address, RS-232C communication protocol, and operation mode are set with the switch on the board. Take the screws at the 4 corners and remove the top cover to make the setting. The LED indicates the communication status of GP-IB and RS-232C.
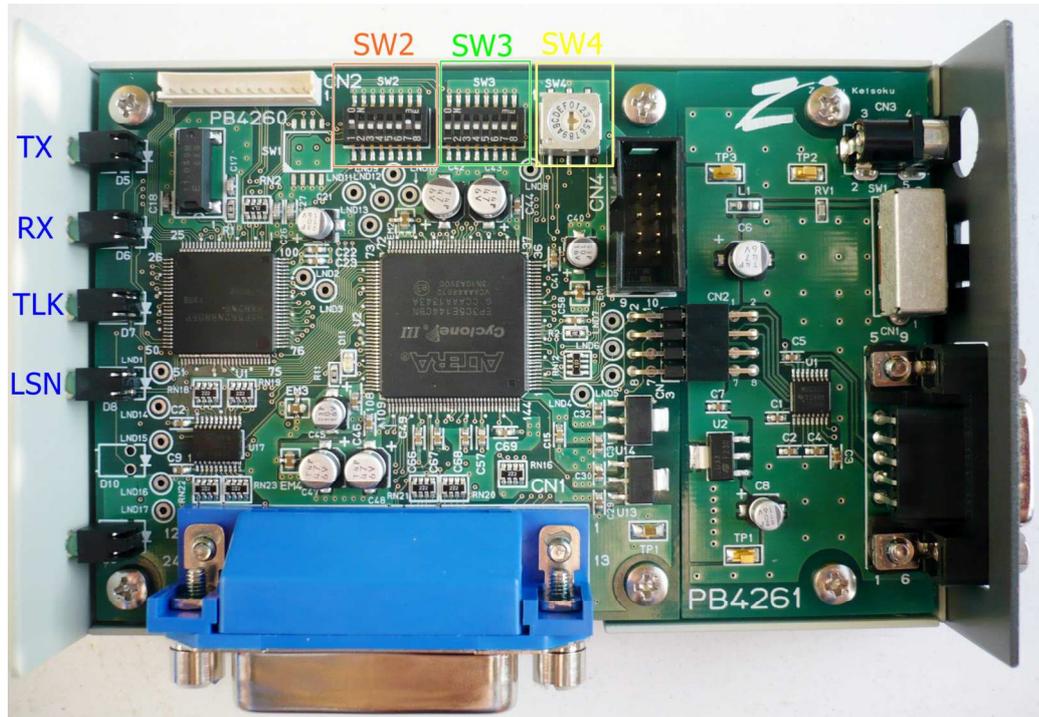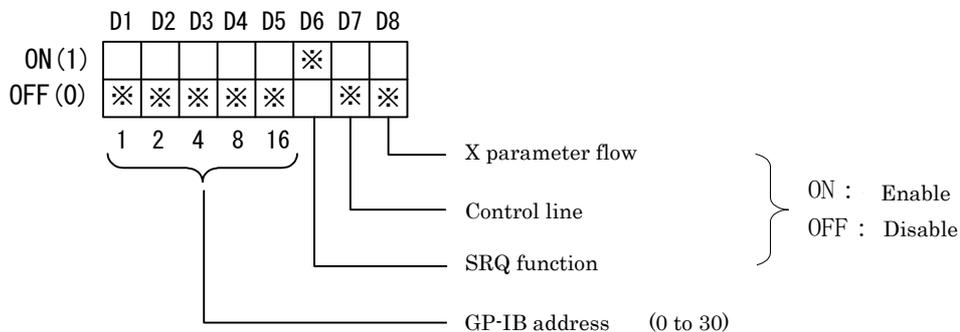

Note) There is a product with SW1(4 bit dip switch) mounted on the left side of SW2, but please use this switch in its initial state.

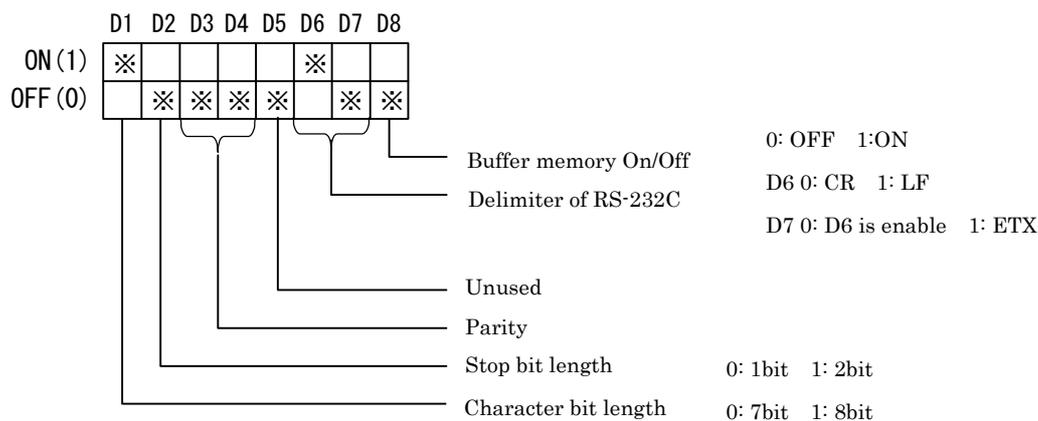## 6-1　ADR switch（SW3）

Specify the GP-IB address and controls.

※ Is initial setting.

Note) Do not set "31" as GP-IB address.

6-2 MODE switch（SW2）

Set the communication protocol of RS-232C.

	D1	D2	D3	D4	D5	D6	D7	D8
ON（1）	※					※		
OFF（0）		※	※	※	※		※	※

Buffer memory On/Off

Delimiter of RS-232C

Unused

Parity

Stop bit length

Character bit length

0: OFF　1:ON

D6 0: CR　1: LF

D7 0: D6 is enable　1: ETX

0: 1bit　1: 2bit

0: 7bit　1: 8bit

Parity bit		
D3	D4	Contents
0	0	None
1	0	Odd parity
1	1	Even parity

6-3 Baud rate switch（S4）　　Initial setting 9600bps

Switch #	Baud rate (bps)	Switch #	Baud rate (bps)
0	1,200	8	38,400
1	2,400	9	57,600
2	4,800	A	115,200
3	7,200	B	230,400
4	9,600	C	460,800
5	14,400	D	921,600
6	19,200	E	Unused
7	28,800	F	Unused

6-4 LED

（1）LED

Name	Contents	
POWER	Usable state	
TX	Data sending to RS-232C	RS-232C error when
RX	Data receiving from RS-232C	flashing simultaneously.
TLK	Data sending to GP-IB	GP-IB error when
LSN	Data receiving from GP-IB	flshing simultaneously.

7. Appearance

Front side
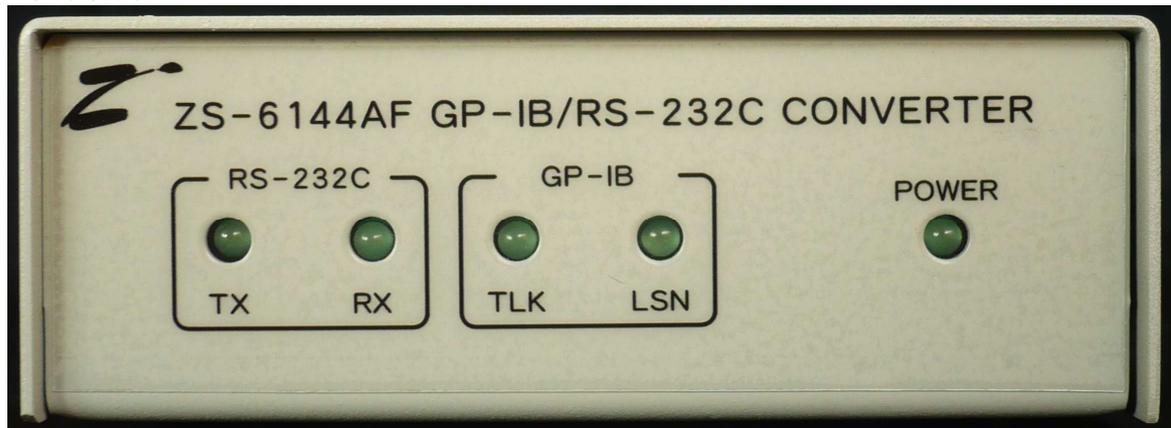
Back side
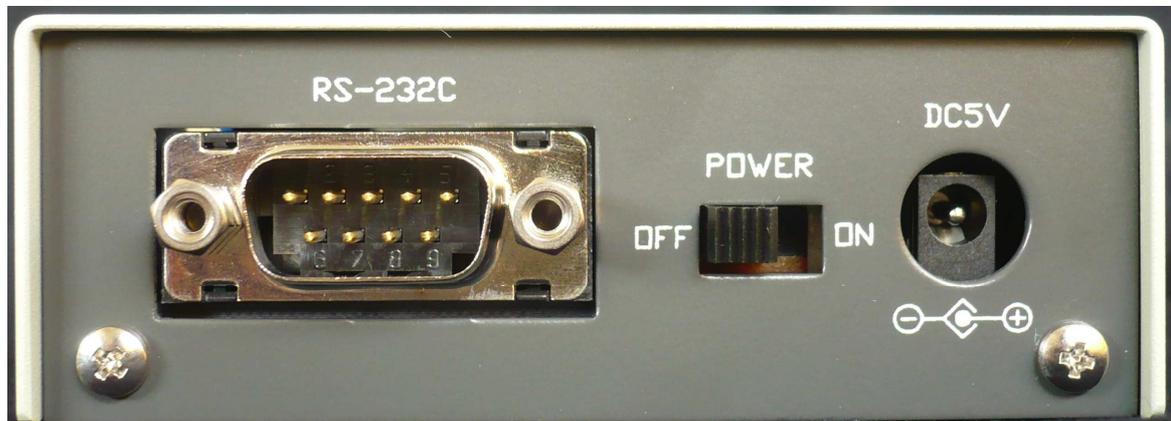
8. Warranty

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.