

2017/01/05

EWBS Receiving Module Communication specifications

v1.00

Century

Revision history

Revision	Date	Changes	Remarks
1.00	2017/01/05	Initial Release.	

1 Serial communication specifications

Asynchronous serial 115,200bps, 8bit, 1 stop bit, no parity, no flow control, signal level TTL.

Half duplex protocol must be sent from the host side first. It will never be sent from the module side first.

First, the host sends a command packet (variable length of packet length 6 to 16 bytes) to the module, in response the module responds with a response packet of almost the same format.

1.1 Command packet format (host -> module)

Header (5Bytes)					Body (0~255Bytes)	Trailer (1Byte)
STX (0x02)	TYPE (0x1D)	CmdCode	Data Size	SUM	Data (Data Size Bytes)	ETX (0x03)

"STX" is start command and fixed value.

"TYPE" specifies 0x1D which means module.

"CmdCode" specifies the command code given to the module.

"DataSize" specifies the length of data (parameter to command) to be sent with this packet.

"Data length" differs for each command and possible to be 0 bytes.

"SUM" is the checksum of the packet.

It is a 2's complement of the value added STX to ETX in full (excluding checksum area).

It judges that the packet is normal if the value is 0 by 8 bits masked from the value added STX to ETX including checksum in full to receive data.

1.2 Response packet format (module -> host)

Header (5Bytes)					Body (0~255Bytes)	Trailer (1Byte)
STX (0x02)	ACK or NAK	CmdCode	Data Size	SUM	Data (Data Size Bytes)	ETX (0x03)

"ACK or NAK" specifies ACK (0x06) in case of command packet receive as normal, and specifies NAK (0x15) in case of error.

"CmdCode" is copied same one of the received command packet.

"DataSize" and "Data" are the same as command packets, but the data length and data varies depends on the command in case of ACK.

1 byte of data (Reason) will be returned in case of NAK.

Data+0: error code (defined for each command)

"SUM" is treated as command packet.

2 Transmission/reception processing on the module side

2.1 Receive normal packets

- Check parameters with each command.
- If an abnormal parameter, return NAK packet.
- If there is no problem, return ACK packet after processing.

3 Processing procedure example on the host side

3.1 Send a command packet. Receive packet header 4 bytes with timeout 100 ms.

- If it can not receive it, it is an error.

3.2 Check the validity of the packet header.

- If the packet header is incorrect, eg, the beginning is not STX, it is an error.

3.3 If the packet header is valid, received "data size in packet header + 2 (SUM + ETX)"

- It is an error if it can not be received.

OK if the checksum is normal.

- * Depending on the command, it takes time to process on the module side, so it may be necessary to take a longer timeout.

4 Module Command Details

* "Transmission data length" and "transmission data" indicate data to be sent to the module in the command packet.

* "Reply data length" "Reply data" indicates data in a response (ACK) packet when the command is normally accepted.

* When offset + 0x82 (W) is written, it indicates that the WORD value (BigEndian: the byte order is opposite to x86 CPU) exists at the byte offset 0x82, 0x83 of the transmission (reception) data area.

* When you write offset + 0x82 (L), it indicates that there is a LONG value (BigEndian:the byte order is opposite to x86 CPU) at byte offsets 0x82,0x83,0x84,0x85 of the transmission (reception) data area.

* When offset + 0x82 (D) is written, it indicates that there is a DWORD value(BigEndian:the byte order is opposite to x86 CPU) at byte offsets 0x82,0x83,0x84,0x85 of the transmission (reception) data area.

* When offset + 0x02 (16) is written, it indicates the area of 16 bytes from the byte offset 0x02 of the transmission (reception) data area.

4.1 Module command code definition

CMD_GET_EWBS_INFO	0x11	Information (Acquired version etc.)
CMD_GET_EWBS_STATUS	0x26	Get status of EWBS signal.
CMD_GET_EWBS_RSSI	0x27	Acquisition of RSSI and CNR value of tuner.
CMD_GET_EWBS_TXT	0x28	Acquisition of EWBS text data.
CMD_GET_AREA_CODE	0x24	Acquisition of area code and reception channel.
CMD_SET_AREA_CODE	0x25	Set area code and receive channel.

Command name	CMD_GET_EWBS_INFO	CmdCode	0x11
Operation	Get the firmware version of the module		
Transmit data length	0		
Transmission data	-		
Reply data length	11Bytes		
Reply data	offset +0x00(8): Identification character string "EWBS_mod" offset +0x08: Version H Example:0x01 offset +0x09: Version M Example:0x03 offset +0x10:Version L Example:0x10 In this case Ver 1.3.16		
Error code	1: Checksum is invalid 2: Command code is invalid 4: Command data length is invalid		
Remarks			

Command name	CMD_GET_EWBS_STATUS	CmdCode	0x26
Operation	Get the reception status of the module.		
Transmit data length	0		
Transmission data	-		
Reply data length	1Byte		
Reply data	offset +0x00: reception status Bit 0: EWBS receive 0: EWBS signal is not received. 1: EWBS signal is being received. Bit 1: availability for sound playback 0: Do not playback sound. 1: Playback sound.		
Error code	1: Checksum is invalid 2: Command code is invalid 4: Command data length is invalid		
Remarks			

Command name	CMD_GET_EWBS_RSSI	CmdCode	0x27
Operation	Acquisition of RSSI and CNR value of tuner		
Transmit data length	0		
Transmission data	-		
Reply data length	8Bytes		
Reply data	offset +0x00(L):RSSI The actual value is RSSI/10 offset +0x04(D):CNR The actual value is CNR/10000		
Error code	1: Checksum is invalid 2: Command code is invalid 4: Command data length is invalid		
Remarks			

Command name	CMD_GET_EWBS_TXT	CmdCode	0x28
Operation	Acquisition of EWBS text data		
Transmit data length	0		
Transmission data	-		
Reply data length	1~121Bytes		
Reply data	offset +0x00: Text data size offset +0x01(120): text data		
Error code	1: Checksum is invalid 2: Command code is invalid 4: Command data length is invalid		
Remarks			

Command name	CMD_SET_AREA_CODE	CmdCode	0x25
Operation	Set area code and receive channel.		
Transmit data length	3Bytes		
Transmission data	offset +0x00(W):Area Code If you do not set the area code, please set 0x0FFF. Values that can be set are 0x0000 to 0x0FFF. offset +0x02 : Receive channel		
Reply data length	0		
Reply data	-		
Error code	1: Checksum is invalid 2: Command code is invalid 4: Command data length is invalid		
Remarks			