

VS3002

RS-232C Control Specification

Category : *HDMI switcher*

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Table of Contents

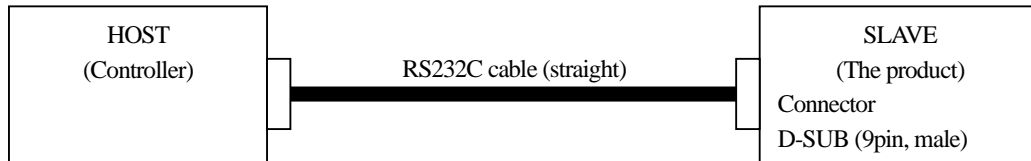
1. Global Description	3
1-1. Overview	3
1-2. Block Diagram	3
1-3. Interface connection specification of the product.....	3
1-4. Assumptions and Dependencies	3
2. Detailed Description	4
2-1. Connection format	4
2-1-1. Physical connection	4
2-1-1-1. Data transmission sequence from Host to Slave.....	4
2-1-1-2. Data transmission sequence from Slave to Host.....	4
2-2. Transmission data format	5
2-2-1. Transmission data format from Host to Slave.....	5
2-2-1-1. Form1: Command	5
2-2-1-2. Form2: Status request	5
2-2-2. Transmission data format from Slave to Host.....	5
2-2-2-1. Form1: ACK/NAK.....	5
2-2-2-2. Form2: Status answer and Auto status feedback	5
2-3. The transaction sequences and the regulations.....	6
2-3-1. The transaction sequences	6
2-3-2. The transaction regulations	6
2-3-3. Specification of Auto status feedback.....	6
2-3-4. Example of the transactions	6
2-3-5. Examples of the handshaking flowchart	7
2-3-5-1. Example of successful handshaking.....	7
2-3-5-2. Examples of handshaking error	7
3. Recommendations of Command, Status and Layer definition	8
4. Definitions of Command, Status and Layer	8
4-1. Normal Commands List.....	8
4-2. Request Commands List.....	9
5. Revision history	10

1. Global Description

1-1. Overview

A Host controller can control or watch out the product as a Slave very easily via the communication cable.

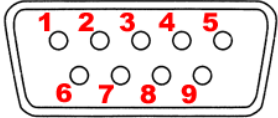
1-2. Block Diagram



* The connector on the product is D-SUB 9pin male type.

* RS232C cable has to be D-SUB 9pin female **straight type** for connecting the products.

1-3. Interface connection specification of the product

uP Interface	Signal name	Connection device	D-Sub Pin	Connector
-	N.C.	-	1	<The product connector> RS232C D-SUB (9pin,male) 
UART	TxD (output)	RS232C	2	
	RxD (input)	Level shift driver	3	
-	N.C.	-	4	
-	GND	GND	5	
-	N.C.	-	6	
-	N.C.	-	7	
-	N.C.	-	8	
-	N.C.	-	9	

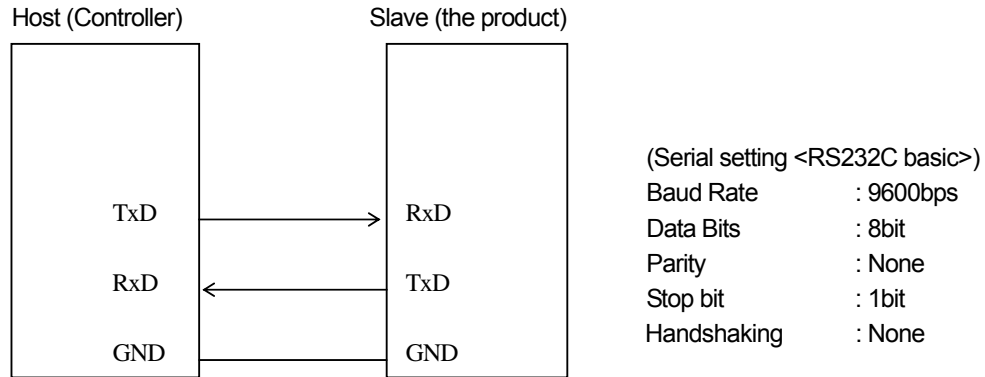
1-4. Assumptions and Dependencies

2. Detailed Description

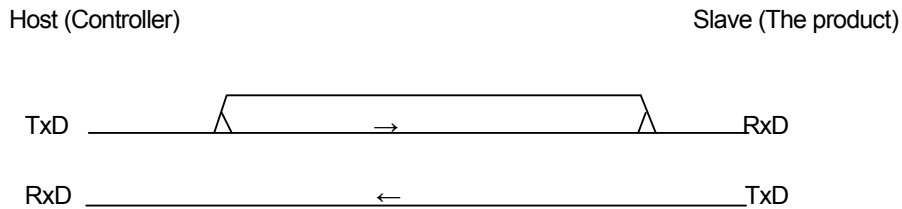
The interface specification between the product and a Host controller is described below.

2-1. Connection format

2-1-1. Physical connection



2-1-1-1. Data transmission sequence from Host to Slave



1. Host starts a data transmission from TxD.
2. Host performs the data transmission of the number of required bytes, and ends a transmission.

2-1-1-2. Data transmission sequence from Slave to Host



1. Slave starts a data transmission from TxD.
2. Slave performs the data transmission of the number of required bytes, and ends a transmission.

2-2. Transmission data format

2-2-1. Transmission data format from Host to Slave

There are two kinds of transmission data form from Host shown below.

2-2-1-1. Form1: Command

Command is a data that requests some status change.

Start character : '@'
 COMMAND : see "Command list"
 End character (CR) : 0Dh

start	command	end
'@'		0Dh

2-2-1-2. Form2: Status request

Status request is a data that requests a answer of some status.

Start character : '@'
 Request status : see "Status request list"
 Request character : '?'
 End character (CR) : 0Dh

start	request status	end
'@'		0Dh

2-2-2. Transmission data format from Slave to Host

There are two kinds of transmission data form from Slave shown below.

2-2-2-1. Form1: ACK/NAK

ACK is a reply data from Slave when Slave received an acceptable command data from Host.
 (ACK is sent to Host when Slave has no related status by the Command.)

Start character : '@', ACK : 06h, End character (CR) : 0Dh

start	ACK	CR
'@'	06h	0Dh

NAK is a reply data from Slave when Slave received an incorrect Command data, Status request data or some other data from Host.

Start character : '@', NAK : 15h, End character (CR) : 0Dh

start	NAK	CR
'@'	15h	0Dh

2-2-2-2. Form2: Status answer and Auto status feedback

Status answers are reply data when Slave got an acceptable Request status or Command data from Host. Auto status feedbacks are sent to Host data when a Slave's status is changed.

Start character : '@'
 Answer character : see "Status list"
 End character (CR) : 0Dh

start	status	end
'@'		0Dh

2-3. The transaction sequences and the regulations

2-3-1. The transaction sequences

The transactions have three kinds of sequence.

*A transaction is a Command from Host then Slave will be an answer by Status answer, ACK or NAK.

*A transaction is a Status request from Host then Slave will be an answer by Status answer or NAK.

*A transaction is Auto status feedback from Slave when a Slave's status changed.

2-3-2. The transaction regulations

The transactions have some kinds of regulation.

* An answer (ACK, NAK or Status answer) transmission by Slave has to finish within 500ms when got a Command or a Status request from Host.

* Host must not transmit an another Command or Status request until "it receives a answer by a previous Command or Status request" or "it passes a term of waiting time from a finishing of previous transmission of a Command or a Status request".

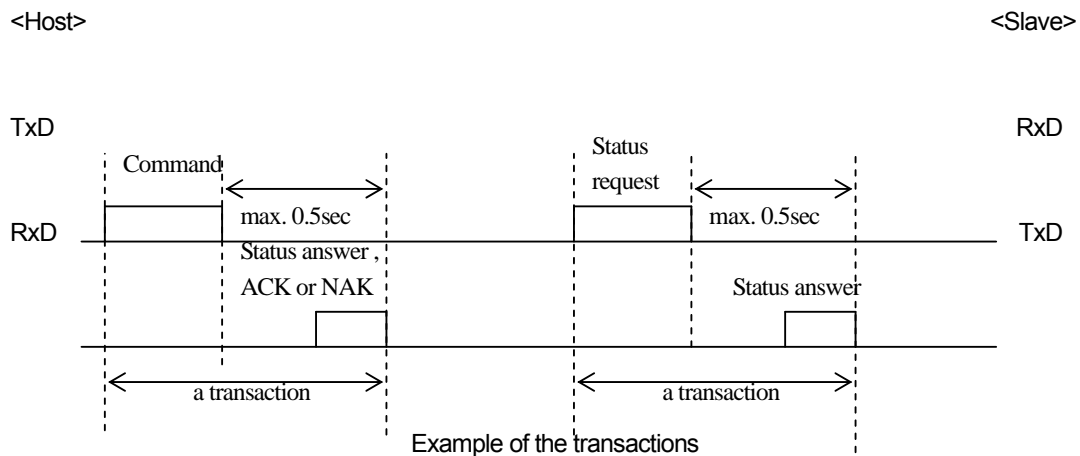
* Slave has to finish a transaction under 500ms when it sends Auto status feedback data.

2-3-3. Specification of Auto status feedback

There are some specific regulations about Auto status feedback.

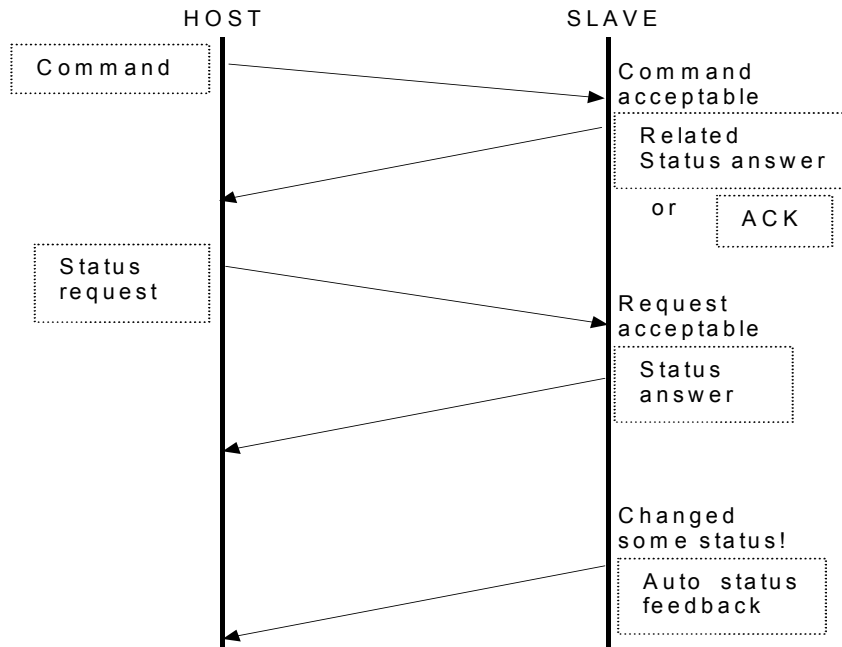
* Slave sends auto status feedback by itself when the status is changed.

2-3-4. Example of the transactions



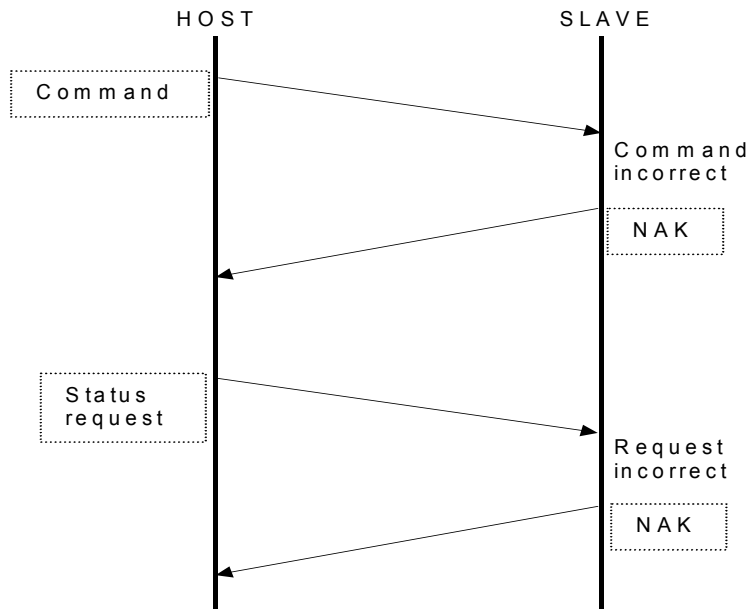
2-3-5. Examples of the handshaking flowchart

2-3-5-1. Example of successful handshaking



The product can reply ACK instead of related status, if the product can not send the related status immediatly.

2-3-5-2. Examples of handshaking error



3. Recommendations of Command, Status and Layer definition

- 'ACK' means that a slave has received an command. If a slave can receive a command properly, the slave sends a Host a Status data.

4. Definitions of Command, Status and Layer

This section describes the definition of "Command", "Status Request" and "Status" commands of this product.

4-1. Normal Commands List

Command		Notes	Reply from VS3002
Power	@PWR:1	Power On	@PWR:1
	@PWR:0	Standby	@PWR:0
Input Select	@INP:A	Auto Input	@INP:A
	@INP:1	Input 1	@INP:1
	@INP:2	Input 2	@INP:2
	@INP:3	Input 3	@INP:3
	@INP:4	Input 4	@INP:4
	@INP:5	Input 5	@INP:5
	@INP:6	Input 6	@INP:6
	@OT1:1	Input 1 to Output 1	@OUT:1 @INP:1
	@OT1:2	Input 2 to Output 1	@OUT:1 @INP:2
	@OT1:3	Input 3 to Output 1	@OUT:1 @INP:3
	@OT1:4	Input 4 to Output 1	@OUT:1 @INP:4
	@OT1:5	Input 5 to Output 1	@OUT:1 @INP:5
	@OT1:6	Input 6 to Output 1	@OUT:1 @INP:6
	@OT2:1	Input 1 to Output 2	@OUT:2 @INP:1
	@OT2:2	Input 2 to Output 2	@OUT:2 @INP:2
	@OT2:3	Input 3 to Output 2	@OUT:2 @INP:3
	@OT2:4	Input 4 to Output 2	@OUT:2 @INP:4
	@OT2:5	Input 5 to Output 2	@OUT:2 @INP:5
@OT2:6	Input 6 to Output 2	@OUT:2 @INP:6	
Output Select	@OUT:1	Output 1	@OUT:1
	@OUT:2	Output 2	@OUT:2
Other	@EMP:1	Output Emphasis On	@EMP:1
	@EMP:0	Output Emphasis Off	@EMP:0
	@FKL:1	Front Key Lock	@FKL:1
	@FKL:0	Front Key Unlock	@FKL:0

4-2. Request Commands List

Request Command		Reply from VS3002
Power	@PWR:?	@PWR:0
		@PWR:1
Input	@INP:?	@INP:1
		@INP:2
		@INP:3
		@INP:4
		@INP:5
		@INP:6
Output	@OUT:?	@OUT:1
		@OUT:2
Output Emphasis	@EMP:?	@EMP:0
		@EMP:1
Front key Lock	@FKL:?	@FKL:0
		@FKL:1

5. Revision history

Rev.	Date	Owner	Change description
1.00	2/1/2008	Marantz America, Inc.	Issued Revision1.0