SR5001

RS-232C Control Specification

Category	:	***A/V Receiver***
Document Version	:	***1.0***
Author(s)	:	***Marantz America, Inc.***
Date	:	**2006/08/18**
Number of Page	:	**20**

Table of Contents

1. Introduction

1-1. Purpose

This document was written as a reference specification of products that are controled by the host controller.

1-2. Scope

This document would be using by software or hardware engineers for production of the product.

1-3. Abbreviations

Abbreviation	Description

1-4. References

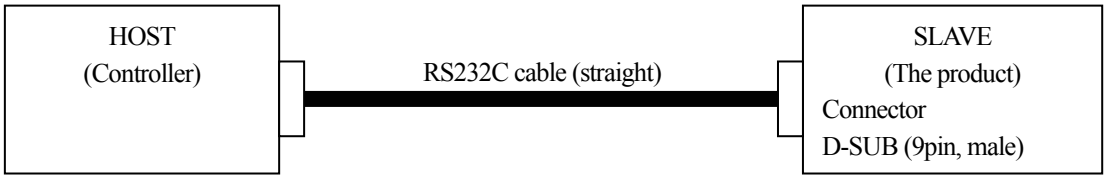
- Hardware Software Interface Specification ver. 1.02 / author: N.Sakamoto
-

2. Global Description

2-1. Overview

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

2-2. Block Diagram

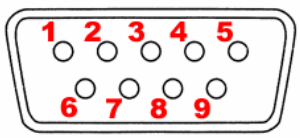


*** The product connector is using D-SUB 9pin male.**

*** RS232C cable must use D-SUB 9pin female to connect the products.**

2-3. Interface connection specification of the product

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



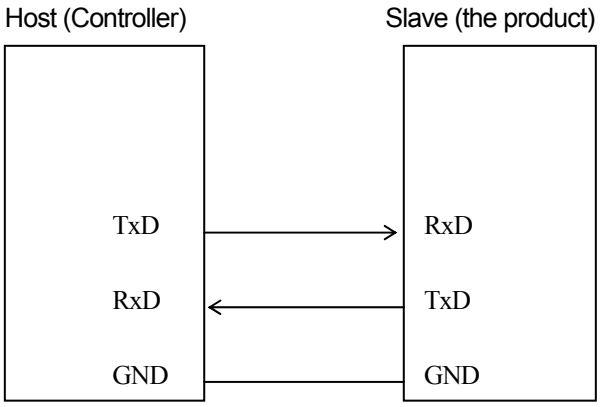
2-4. Assumptions and Dependencies

3. Detailed Description

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

3-1. Connection format

3-1-1. Physical connection

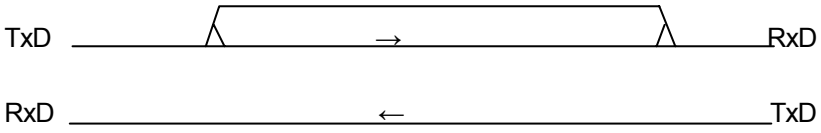


Serial setting <RS232C basic

Baud Rate	: 9600bps
Data Bits	: 8bit
Parity	: None
Stop bit	: 1bit
Handshaking	: None

3-1-1-1. Data transmission sequence from Host to Slave

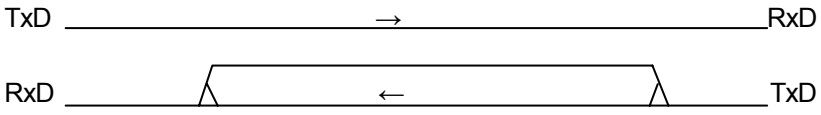
Host (Controller) Slave (The product)



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

3-1-1-2. Data transmission sequence from Slave to Host

Host (Controller) Slave (The product)



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

3-2. Transmission data format

3-2-1. Transmission data format from Host to Slave

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

3-2-1-1. Form1: Command

Command is a data that requests some status change.

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

start	command	end
'@'	"xxx:"+"..."	0Dh

3-2-1-2. 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
'@'	"xxx:?"+"..."	0Dh

3-2-2. Transmission data format from Slave to Host

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

3-2-2-1. Form1: ACK/NAK

ACK is a reply data from Slave when Slave got 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 got 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

3-2-2-2. 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 send to Host data when a Slave's status is changed.

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

start	status	end
'@'	"xxx:"+"..."	0Dh

3-3. The transaction sequences and the regulations

3-3-1. 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. (If the auto status feedback is enabled.)

3-3-2. The transaction regulations

The transactions have some kinds of regulation.

* An answer (ACK, NAK or Status answer) transmittion 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 waitinng 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.

3-3-3. Specification of Auto status feedback

There are some specific regulations about Auto status feedback.

* The product status has segmented into **four layers of 1, 2, 3 and 4**.

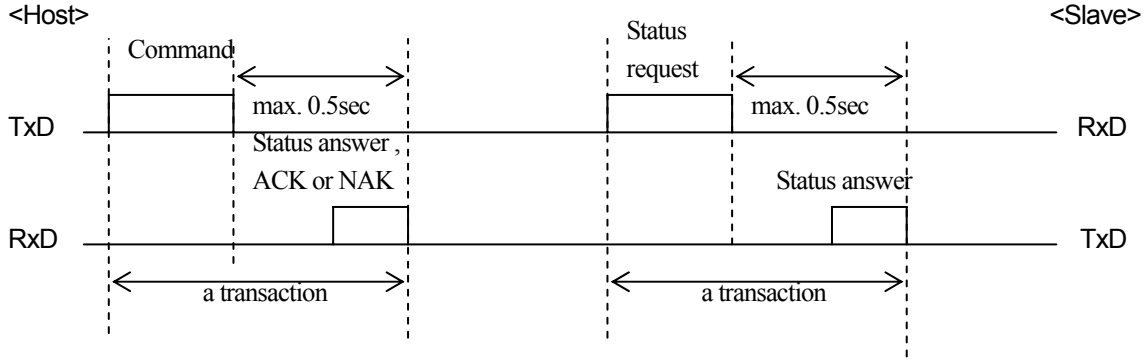
* The status of layer 1 are assigned most kindly status to Host. (The statuses of layer 2 are assigned kindly status, the statuses of layer 3 are not so need status to Host and the statuses of layer 4 are probably no wished statuses.)

* Each layer status can control transmit enable or disable by Host command. (The product default would be all disables.)

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

* The product defined and segmentationed layers are takeing in status list.

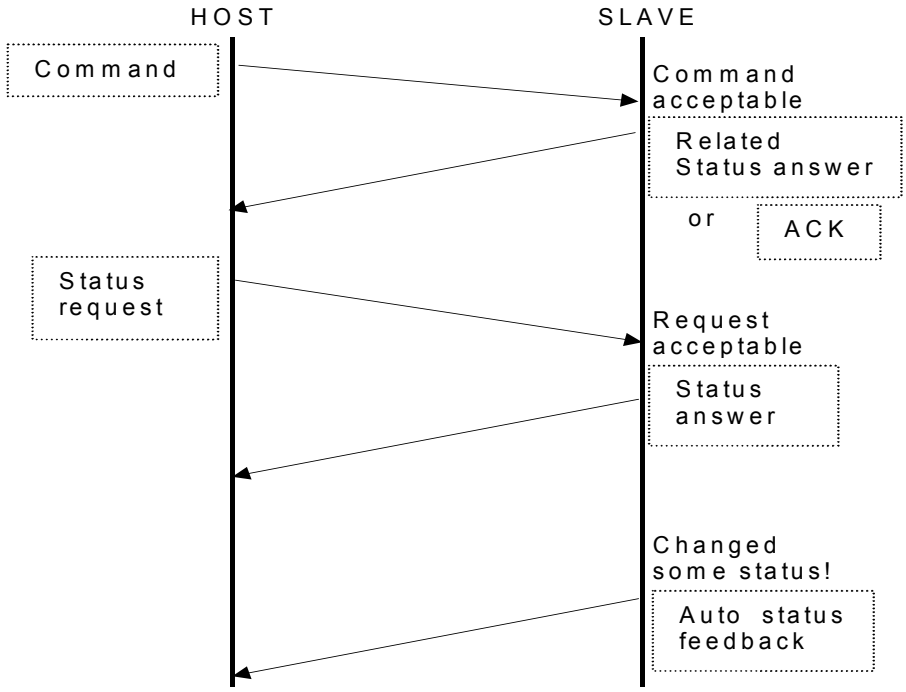
3-3-4. Example of the transactions



Example of the transactions

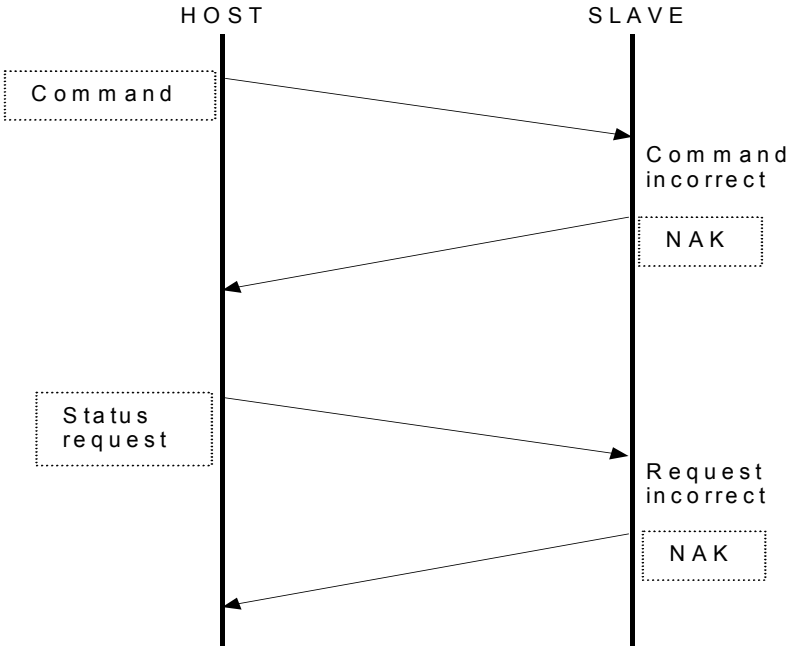
3-3-5. Examples of the handshaking flowchart

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



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

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



4. Recommendations of Command, Status and Layer definition

- All Commands, Statuses and Layers will be defined other specific document.
- **[MANDATORY]** The product **MUST** have Commands and the Statuses same as a remote controller buttons (IR controller) of the product.
- All Commands are required working by discreate as ON/OFF commands. (It means that do not support TOGGLE command only.)
- All Commands and Statuses are defined same chharacter size except ACK/NAK on the product. (Recommended character length : 3~6 characters)
- It permits attaching 0x0A character to a reply characters from the product. In this case, must suppose that the object is followed altogether.
- Recommend to supports numbers or values direct setting command, if it has variable numbers or values.

5. Definitions of Command, Status and Layer

This section is told how to define “Command”, “Status” and “Layer” of this product.

5-1. Normal Command list

5-1-1. Main function contents

Command			Reply from Slave
POWER	TOGGLE	“PWR:0”	“PWR:1” “PWR:2”
	OFF	“PWR:1”	
	ON	“PWR:2”	
AUDIO ATT	TOGGLE	“ATT:0”	“ATT:0”(None) “ATT:1”(OFF) “ATT:2”(ON)
	OFF	“ATT:1”	
	ON	“ATT:2”	
AUDIO MUTE	TOGGLE	“AMT:0”	“AMT:1” “AMT:2”
	OFF	“AMT:1”	
	ON	“AMT:2”	
VIDEO MUTE	TOGGLE	“VMT:0”	“VMT:1” “VMT:2”
	OFF	“VMT:1”	
	ON	“VMT:2”	
VOLUME	VALUE	“VOL:0xxx”	“VOL:xxx” xxx = Vol. value as +18 ~ -99, 0db = ”VOL: 00”, -∞ = “VOL:-ZZ”
	UP	“VOL:1”	
	DOWN	“VOL:2”	
TONE BASS	VALUE	“TOB:0xxx”	“TOB:xxx” xxx = vol. value as +6 ~-6
	UP	“TOB:1”	
	DOWN	“TOB:2”	
TONE TREBLE	VALUE	“TOT:0xxx”	“TOT:xxx” xxx = vol. value as +6 ~-6
	UP	“TOT:1”	
	DOWN	“TOT:2”	
SOURCE Select	TV	“SRC:1”	“SRC:va”, (v ,a= ‘0’ – ‘I’) (v = video, a = audio.) v = 0 (V-OFF) a = N (7.1CH)
	DVD	“SRC:2”	
	VCR1	“SRC:3”	
	DSS/VCR2	“SRC:5”	
	AUX1	“SRC:9”	
	AUX2	“SRC:A”	
	CD	“SRC:C”	
	CD-R	“SRC:D”	
	TAPE	“SRC:E”	
	TUNER	“SRC:F”	
	FM	“SRC:G”	
	AM	“SRC:H”	
	XM	“SRC:J”	
7.1 Channel Input	TOGGLE	“71C:0”	“71C:1” (OFF) “71C:2” (ON)
	OFF	“71C:1”	
	ON	“71C:2”	

5-1-2. Display and Menu contents

Command			Reply from Slave
SLEEP	VALUE	"SLP:0xx"	"SPL:xx"
	OFF	"SLP:1"	"SPL:00"
MENU	TOGGLE	"MNU:0"	"MNU:1"(non-Menu mode) "MNU:2"(on Menu mode)
	OFF(EXIT)	"MNU:1"	
	ON	"MNU:2"	
	ENTER	"MNU:3"	
CURSOR	UP	"CUR:1"	ACK
	DOWN	"CUR:2"	
	LEFT	"CUR:3"	
	RIGHT	"CUR:4"	

Command			Reply from Slave
DC TRG.	TRG. 1 OFF	"DCT:11" (DC TRG. 1 OFF)	"DCT:a" (a = 1:OFF, 2:ON), a = TRG.1
	TRG. 1 ON	"DCT:12" (DC TRG. 1 ON)	

Command			Reply from Slave
Simple Setup	TOGGLE	"SSU:0"	"SSU:1"(non-Setup mode), "SSU:2"(on Setupmode)
	OFF(EXIT)	"SSU:1"	
	ON	"SSU:2"	
	ENTER	"SSU:3"	
CURSOR (same as Menu Cursor)	UP	"CUR:1"	ACK
	DOWN	"CUR:2"	
	LEFT	"CUR:3"	
	RIGHT	"CUR:4"	

5-1-3. Surround contents

Command			Reply from Slave
Surr. Mode	AUTO	“SUR:00”	“SUR:x“ (x = ‘0’ ~’Z’)
	STEREO	“SUR:01”	
	DOLBY	“SUR:02”	
	PL2xMOVIE	“SUR:03”	
	PL2 MOVIE	“SUR:04”	
	PL2xMUSIC	“SUR:05”	
	PL2 MUSIC	“SUR:06”	
	PL2xGAME	“SUR:07”	
	PL2 GAME	“SUR:08”	
	Dolby PROLOGIC	“SUR:09”	
	EX/ES	“SUR:0A”	
	VIRTUAL 6.1	“SUR:0B”	
	DTS ES	“SUR:0E”	
	NEO6 CINEMA	“SUR:0F”	
	NEO6 MUSIC	“SUR:0G”	
	Multi Ch. STEREO	“SUR:0H”	
	CS CINEMA	“SUR:0I”	
	CS MUSIC	“SUR:0J”	
	CS MONO	“SUR:0K”	
	VIRTUAL	“SUR:0L”	
	DTS	“SUR:0M”	
	DD+ PL2x MOVIE	“SUR:0O”	
	DD+ PL2x MUSIC	“SUR:0P”	
	SOURCE DIRECT	“SUR:0T”	
	PURE DIRECT	“SUR:0U”	
	UP	“SUR:1”	
	DOWN	“SUR:2”	

Command			Reply from Slave
Test Tone (Force start/stop Test Tone with Auto mode)	TOGGLE	"TTO:0"	"TTO:1xy" (OFF), "TTO:2xy" (ON, x= auto(0)/manual(1), y= ch.)
	OFF	"TTO:1"	
	ON	"TTO:2"	
	NEXT	"TTO:3"	
	PREV	"TTO:4"	
Night Mode	TOGGLE	"NGT:0"	"NGT:1"(OFF), "NGT:2"(ON)
	OFF	"NGT:1"	
	ON	"NGT:2"	
Dolby Headphone Mode	BYPASS	"DHM:0"	"DHM:x" x = Dolby Headphone mode
	DH1	"DHM:1"	
		(+PL2 MOVIE) "DHM:2"	
		(+PL2 MUSIC) "DHM:3"	

Command			Reply from Slave
Lip Sync.	VALUE	"LIP:0xxx" (xxx = value) xxx = 000 (OFF), xxx = 010,020,...190,200 (ms)	"LIP:xxx" (xxx = Lip Sync. value) xxx = 000 (OFF), xxx = 010,020,...190.200 ms
	UP	"LIP:1"	
	DOWN	"LIP:2"	

5-1-4. Tuner contents

Command			Reply from Slave

Tuner Frequency	VALUE	"TFQ:0xxxxx" (xxxx = freq.)	"TFQ:xxxxx"
			(xxxxx = Frequency)
			if (xxxxx < 00256) band = XM;
			else if (xxxxx < 02000) band=AM;
			else band=FM;
			(ex."08750" = FM87.50MHz)
			***Auto-UP/DOWN dose not operate in XM**
			***XM can be selected When Band is XM.**

	UP	"TFQ:1"	
	DOWN	"TFQ:2"	
	Auto-UP	"TFQ:3"	
	Auto-DOWN	"TFQ:4"	
Tuner Preset	VALUE	"TPR:0ww"	"TPR:ww" (ww = current preset nr.) (ww = 01 ~ ??)
	UP	"TPR:1"	
	DOWN	"TPR:2"	
	P-Scan start	"TPR:3"	
	P-Scan stop	"TPR:4"	
Tuner mode	TOGGLE	"TMD:0"	"TMD:0"(-), "TMD:1" (MONO), "TMD:2" (AUTO)
	OFF(MONO)	"TMD:1"	
	ON(AUTO)	"TMD:2"	
Tuner MEMO	-	"MEM:0"	ACK
CLEAR	-	"CLR:0"	ACK
Tuner Numeric keys	Key0, Key1, Key2, Key3, Key4, Key5, Key6, Key7, Key8, Key9	"NUM:0" "NUM:1" "NUM:2" "NUM:3" "NUM:4" "NUM:5" "NUM:6" "NUM:7" "NUM:8" "NUM:9"	ACK

5-1-5. XM Contents

Command			Reply from Slave
XM DispMode	TOGGLE	"XDP:0"	"XDP:1"(NORMAL) "XDP:2"(ART/SNG) "XDP:3"(CATEGORY) "XDP:4"(STATUS)
	NORMAL	"XDP:1"	
	ART/SNG	"XDP:2"	
	CATEGORY	"XDP:3"	
	STATUS	"XDP:4"	
XM Category	VALUE	"CAT:0xx"	"CAT:yxx" y= 1(un search), 2(in search) xx= Category No. 00(none), 01 to 32
	CH. UP	"CAT:1"	
	CH. DOWN	"CAT:2"	
	CAT. NEXT	"CAT:3"	
	CAT. PREV	"CAT:4"	

5-1-6. Multi Room contents

Command			Reply from Slave
Multi Room POWER	TOGGLE	"MPW:0"	"MPW:1", "MPW:2"
	OFF	"MPW:1"	
	ON	"MPW:2"	
Multi Room AUDIO MUTE	TOGGLE	"MAM:0"	"MAM:1", "MAM:2"
	OFF	"MAM:1"	
	ON	"MAM:2"	
Multi Room VOLUME	VALUE	"MVL:0xxx"	"MVL:xxx" xxx = vol. value as +90 ~-90
	UP	"MVL:1"	
	DOWN	"MVL:2"	
Multi Room VOLUME SET			"MVS:1", "MVS:2"
	VARIABLE	"MVS:1"	
	FIXED	"MVS:2"	
Multi Room SOURCE Select	TV	"MSC:1"	"MSC:va", (v ,a= '0' – 'l') (v = video, a = audio.)
	DVD	"MSC:2"	
	VCR1	"MSC:3"	
	DSS/VCR2	"MSC:5"	
	AUX1	"MSC:9"	
	AUX2	"MSC:A"	
	CD	"MSC:C"	
	CD-R	"MSC:D"	
	TAPE	"MSC:E"	
	TUNER	"MSC:F"	
	FM	"MSC:G"	
	AM	"MSC:H"	
	XM	"MSC:J"	
Multi Room SLEEP	VALUE	"MSL:0xx" ("xx" = min)	"MSL:xx" (xx = min)
	OFF	"MSL:1"	"MSL:00"
Multi Room Tuner Frequency	VALUE	"MTF:0xxxx" (xxxxx = freq.)	"MTF:xxxxx" (xxxxx = Frequency) if (xxxxx < 00256) band = XM; else if (xxxxx < 02000) band=AM; else band=FM; (ex."08750" = FM87.50MHz) *Auto-UP/DOWN dose not operate in XM *XM can be selected When Band is XM.
	UP	"MTF:1"	
	DOWN	"MTF:2"	
	Auto-UP	"MTF:3"	
	Auto-DOWN	"MTF:4"	
Multi Room Tuner Preset	VALUE	"MTP:0ww" (ww = preset nr.)	"MTP:ww" (ww = current preset nr.) (ww = 01 ~??)
	UP	"MTP:1"	
	DOWN	"MTP:2"	
	SCAN Start	"MTP:3"	
	SCAN Stop	"MTP:4"	
Multi Room Tuner mode	TOGGLE	"MTM:0"	"MTM:0"(-), "MTM:1"(MONO), "MTM:2"(AUTO)
	OFF(MONO)	"MTM:1"	
	ON(AUTO)	"MTM:2"	

Command			Reply from Slave
Multi Room Speaker	TOGGLE	"MSP:0"	"MSP:1", "MSP:2"
	OFF	"MSP:1"	
	ON	"MSP:2"	
Multi Room Speaker VOLUME	VALUE	"MSV:0xxx"	"MSV:xxx" xxx = vol. value as +90 ~-90
	UP	"MSV:1"	
	DOWN	"MSV:2"	
	VARIABLE	"MSS:1"	
	FIXED	"MSS:2"	
Multi Room Speaker AUDIO MUTE	TOGGLE	"MSM:0"	"MSM:1", "MSM:2"
	OFF	"MSM:1"	
	ON	"MSM:2"	

5-2. Specific Commands

Command from Host		Reply from Slave
Auto status feedback (The product default is all auto status feedback disabled.)	"AST:x" (x = '0' ~ 'F') bit 3 : Layer 4 (1 = Enable, 0 = Disable) bit 2 : Layer 3 (1 = Enable, 0 = Disable) bit 1 : Layer 2 (1 = Enable, 0 = Disable) bit 0 : Layer 1 (1 = Enable, 0 = Disable)	same as command define

5-3. Status request and Status answer list

5-3-1. Normal Status request and Status (answer and feedback) list

Status request		Status answer and feedback	
POWER	"PWR:?"	OFF	"PWR:1"
		ON	"PWR:2"
AUDIO ATT	"ATT:?"	OFF	"ATT:1"
		ON	"ATT:2"
AUDIO MUTE	"AMT:?"	OFF	"AMT:1"
		ON	"AMT:2"
VIDEO MUTE	"VMT:?"	OFF	"VMT:1"
		ON	"VMT:2"
VOLUME	"VOL:?"	Volume value = xxx	"VOL:xxx"
TONE BASS	"TOB:?"	Bass value = xxx	"TOB:xxx"
TONE TREBLE	"TOT:?"	Treble value = xxx	"TOT:xxx"
SOURCE Select	"SRC:?"	Video+Audio source (v ,a= '0' – 'F') (v = video, a = audio.)	"SRC:va"
Multi Channel	"71C:?"	OFF	"71C:1"
		ON	"71C:2"

Status request		Status answer and feedback	
SLEEP	"SLP:?"	Sleep time (xx = 00 ~ 99)	"SLP:xx"
MENU	"MNU:?"	OFF	"MNU:1"
		ON	"MNU:2"

Status request		Status answer and feedback	
Simple Setup	"SSU:?"	OFF	"SSU:1"
		ON	"SSU:2"

Status request		Status answer and feedback	
Digital Signal Format	"SIG:?"	x = '0' : No detect '1' : D DIGITAL AC-3 '2' : D DIGITAL SURROUND '3' : D DIGITAL SURR. EX '4' : DTS '5' : DTS ES DISCREATE '6' : DTS ES MATRIX '7' : AAC '8' : MPEG '9' : MLP 'A' : PCM 'B' : HDCD 'C' : DSD 'D' : reserved 'E' : reserved 'F' : OTHER	"SIG:x" x = signal

Status request		Status answer and feedback	
Lip Sync.	"LIP:?"	Lip Sync. : xxx = 000 (OFF) xxx =010 ~200 (ms)	"LIP:xxx"

Status request		Status answer and feedback	
DOLBY HEADPHONE Mode	"DHM:? "	BYPASS	"DHM:0"
		DH1	"DHM:1"
		DH1 + PL2 MOVIE	"DHM:2"
		DH1 + PL2 MUSIC	"DHM:3"

Status request		Status answer and feedback	
Night Mode	"NGT:?"	OFF	"NGT:1"
		ON	"NGT:2"*1

Status request		Status answer and feedback	
XM Ch Name	"CHN:?"	Channel Name	"CHN:********" *=10Byte If data is shorter than 10, Space is padded.
XM Artist Name	"ARN:?"	Artist Name	"ARN:********" *=16Byte If data is shorter than 16, Space is padded.
XM Song Title	"SON:?"	Song Title	"SON:********" *=16Byte If data is shorter than 16, Space is padded.
XM Category Name	"CTN:?"	Category Name	"CAT:********" *=8Byte If data is shorter than 8, Space is padded.
XM Signal Status	"SST:?"	Antenna Status	"SST:*" 0= CHECK ANTENNA 1= STRONG 2= MARGINAL 3= WEAK 4= NO

Status request		Status answer and feedback	

Tuner Frequency	"TFQ:?"	xxxxx = frequency
		if (xxxxx < 00256) band = XM;
		else if (xxxxx < 02000) band=AM;
		else band=FM;
			"TFQ:xxxxx"

Tuner Preset	"TPR:?"	xx = preset number (01 ~ ??)	"TPR:xx"
Tuner Mode	"TMD:?"	- (None)	"TMD:0"
		OFF (MONO)	"TMD:1"
		ON (AUTO)	"TMD:2"

Status request		Status answer and feedback	
Multi Room POWER	"MPW:?"	OFF	"MPW:1"
		ON	"MPW:2"
Multi Room AUDIO MUTE	"MAM:?"	OFF	"MAM:1"
		ON	"MAM:2"
Multi Room VOLUME	"MVL:?"	Volume value = xxx	"MVL:xxx"
Multi Room Volume Set	"MVS:?"	VARIABLE	"MVS:1"
		FIXED	"MVS:2"
Multi Room SOURCE Select	"MSC:?"	Video+Audio source (v ,a= '0' – 'F') (v = video, a = audio.)	"MSC:va"
Multi Room SLEEP	"MSL:?"	Sleep time min : xx = '00' ~ '99'	"MSL:xx"

Status request		Status answer and feedback	
Multi Room SPEAKER	"MSP:?"	OFF	"MSP:1"
		ON	"MSP:2"
Multi Room Speaker VOLUME	"MSV:?"	Volume value = xxx	"MSV:xxx"
Multi Room Speaker Volume Set	"MSS:?"	VARIABLE	"MSS:1"
		FIXED	"MSS:2"
Multi Room Speaker AUDIO MUTE	"MSM:?"	OFF	"MSM:1"

Status request		Status answer and feedback	

Multi Room Tuner Frequency	"MTF:?"	xxxxx = frequency
		if (xxxxx < 00256) band = XM;
		else if (xxxxx < 02000) band=AM;
		else band=FM;
			"MTF:xxxxx"

Multi Room Tuner Preset	"MTP:?"	xx = preset number (01 ~ ??)	"MTP:xx"
Multi Room Tuner Mode	"MTM:?"	- (None)	"MTM:0"
		OFF (MONO)	"MTM:1"
		ON (AUTO)	"MTM:2"

5-3-2. Layer of the statuses

Status		Layer
POWER	“PWR:”	1
AUDIO ATT	“ATT:”	3
AUDIO MUTE	“AMT:”	1
VIDEO MUTE	“VMT:”	1
VOLUME	“VOL:”	1
TONE BASS	“TOB:”	1
TONE TREBLE	“TOT:”	1
SOURCE Select	“SRC:”	1
Multi Channel	“71C :”	1
SLEEP	“SLP:”	2
MENU	“MNU:”	4
Simple Setup	“SSU:”	4
Status		Layer
Surr. Mode	“SUR:”	2
Dolby Headphone Mode	“DHM:”	3
Test Tone	“TTO:”	1
Night Mode	“NGT:”	3
Signal Format	“SIG:?”	4
Lip Sync.	“LIP:?”	4
Status		Layer
Tuner Frequency	“TFQ:”	3
Tuner Preset	“TPR:”	2
Tuner Mode	“TMD:”	2
Status		Layer
XM Display mode	“XDP:”	1
XM Category Search	“CAT:”	1
XM Category Name	“CTN:”	1
XM Channel Name	“CHN:”	4
XM Artist Name	“ARN:”	4
XM Song Title	“SON:”	4
XM Signal Status	“SST:”	1
Status		Layer
Multi Room POWER	“MPW:”	1
Multi Room AUDIO MUTE	“MAM:”	1
Multi Room VOLUME	“MVL:”	1
Multi Room Volume Set	“MVS:”	2
Multi Room SOURCE Select	“MSC:”	1
Multi Room SLEEP	“MSL:”	2
Multi Room Tuner Frequency	“MTF:”	3
Multi Room Tuner Preset	“MTP:”	2
Multi Room Tuner Mode	“MTM:”	2
Multi Room SPEAKER	“MSP:”	2
Multi Room Speaker VOLUME	“MSV:”	1
Multi Room Speaker Volume Set	“MSS:”	2
Multi Room Speaker A-MUTE	“MSM:”	1

6. Revision history

Ver.	Date	Owner	Change description
1.0	08/18/06	Marantz America, Inc.	Issued Revision1.0