



Rotel RX-1052 RS232 HEX Protocol

Date	Version	Update Description
February 6, 2012	1.00	Original Specification

The RS232 protocol structure for the RX-1052 is detailed below. This is a HEX based communication protocol.

Connection Settings

Units BEFORE serial # 090-6441001 (Black) or 990-1001 (Silver)

Baud Rate	Parity	Valid Data Bits	Stop Bit Value	Handshaking	Data Type
19200	N	8	1	None	String

Units AFTER serial # 090-6441001 (Black) or 990-6441001 (Silver)

Baud Rate	Parity	Valid Data Bits	Stop Bit Value	Handshaking	Data Type
38400	N	8	1	None	String

All commands sent to the attached Rotel device must follow the command structure detailed below, unless specified otherwise. Send only the bytes only, no spaces, delimiter, etc.

Standard Command String Format

Start	Count	Device ID	Type	Key	Checksum
0xFE	0x03	0x61	0x10	0xFF	0xFF

Note: The count byte only includes the ID, Type, and Key bytes; it does not include the Start or Checksum bytes.

Note 2: Do not include any carriage returns or line feeds after the commands

Communication Protocol

Command and response messages are included on the following pages. The standard response string of the unit mirrors the data that would be available on the front panel of the unit. Any change to the status of the front display on the unit will prompt a feedback string mirroring that change.

Note that the spaces shown between hex bytes below are for clarity only; do not include spaces in the actual command sent to the unit.

Meta Encoding

The start byte for all command and response strings is FE. To keep the device from encountering the start byte FE in any position other than as the start byte, any occurrence of the bytes FD or FE in a command string must be converted to either FD 00 (for FD), or FD 01 (for FE). This will allow the string to pass while masking any occurrence of the byte FE except as the start byte. Commands that have Meta Encoding applied will be highlighted in red.

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Table 1 - Type 10 Primary Commands

RX-1052 HEX	Command Description
POWER & VOLUME COMMANDS	
FE 03 61 10 0A 7E	Power Toggle
FE 03 61 10 4A BE	Power Off
FE 03 61 10 4B BF	Power On
FE 03 61 10 0B 7F	Volume Up
FE 03 61 10 0C 80	Volume Down
FE 03 61 10 1E 92	Mute Toggle
FE 03 61 10 71 E5	Power Off All Zones
SOURCE SELECTION COMMANDS	
FE 03 61 10 02 76	Source CD
FE 03 61 10 03 77	Source Tuner
FE 03 61 10 04 78	Source Tape
FE 03 61 10 05 79	Source Video 1
FE 03 61 10 06 7A	Source Video 2
FE 03 61 10 07 7B	Source Video 3
FE 03 61 10 08 7C	Source Video 4
FE 03 61 10 35 A9	Source Phono
STONE CONTROL COMMANDS	
FE 03 61 10 0D 81	Treble Up
FE 03 61 10 0E 82	Treble Down
FE 03 61 10 0F 83	Bass Up
FE 03 61 10 10 84	Bass Down
FE 03 61 10 67 DB	Tone Control Select
FRONT PANEL SOURCE LABEL COMMANDS	
FE 03 61 10 19 8D	Character Enter
FE 03 61 10 1A 8E	Next Character
FE 03 61 10 1B 8F	Previous Character
FE 03 61 10 18 8C	Source Label Change
TUNER COMMANDS	
FE 03 61 10 28 9C	Tune Up

RX-1052 HEX	Command Description
FE 03 61 10 29 9D	Tune Down
FE 03 61 10 6F E3	Preset Up
FE 03 61 10 70 E4	Preset Down
FE 03 61 10 72 E6	Frequency Up
FE 03 61 10 73 E7	Frequency Down
FE 03 61 10 27 9B	Memory
FE 03 61 10 24 98	Band Toggle
FE 03 61 10 56 CA	AM
FE 03 61 10 55 C9	FM
FE 03 61 10 20 94	Tune / Preset
FE 03 61 10 69 DD	Tuning Mode Select
FE 03 61 10 6A DE	Preset Mode Select
FE 03 61 10 25 99	Frequency Direct
FE 03 61 10 21 95	Preset Scan
FE 03 61 10 26 9A	FM Mono
NUMERIC KEY COMMANDS	
FE 03 61 10 2A 9E	Number 1
FE 03 61 10 2B 9F	Number 2
FE 03 61 10 2C A0	Number 3
FE 03 61 10 2D A1	Number 4
FE 03 61 10 2E A2	Number 5
FE 03 61 10 2F A3	Number 6
FE 03 61 10 30 A4	Number 7
FE 03 61 10 31 A5	Number 8
FE 03 61 10 32 A6	Number 9
FE 03 61 10 33 A7	Number 0
OTHER COMMANDS	
FE 03 61 10 17 8B	Record Function Select
FE 03 61 10 23 97	Zone 2 / Main
FE 03 61 10 50 C4	Speaker A Toggle
FE 03 61 10 51 C5	Speaker B Toggle
FE 03 61 10 52 C6	Front Display On/Off
FE 03 61 10 FF 73	Display Refresh
FE 03 61 10 6E E2	Party Mode Toggle

Table 2 - Type 14 Main Zone Commands

NOTE: These commands are duplicate functions of the primary commands in the table above bearing the same name, but are discrete for the main zone only. For multi-zone installation applications, it is recommended that the below commands be used where applicable rather than the type 10 commands to avoid zone conflicts.

RX-1052 HEX	Command Description
MAIN ZONE POWER & VOLUME COMMANDS	
FE 03 61 14 0A 82	Main Zone Power Toggle
FE 03 61 14 4A C2	Main Zone Power Off
FE 03 61 14 4B C3	Main Zone Power On
FE 03 61 14 0B 83	Main Zone Volume Up
FE 03 61 14 0C 84	Main Zone Volume Down
FE 03 61 14 1E 96	Main Zone Mute Toggle
FE 03 61 14 6C E4	Main Zone Mute On
FE 03 61 14 6D E5	Main Zone Mute Off
MAIN ZONE SOURCE SELECTION COMMANDS	
FE 03 61 14 02 7A	Main Zone Source CD
FE 03 61 14 03 7B	Main Zone Source Tuner
FE 03 61 14 04 7C	Main Zone Source Tape
FE 03 61 14 05 7D	Main Zone Source Video 1
FE 03 61 14 06 7E	Main Zone Source Video 2
FE 03 61 14 07 7F	Main Zone Source Video 3
FE 03 61 14 08 80	Main Zone Source Video 4
FE 03 61 14 35 AD	Main Zone Source Phono

Table 3 - Type 15 Record Source Commands

RX-1052 HEX	Command Description
RECORD SOURCE SELECTION COMMANDS	
FE 03 61 15 02 7B	Record Source CD
FE 03 61 15 03 7C	Record Source Tuner
FE 03 61 15 04 7D	Record Source Tape
FE 03 61 15 05 7E	Record Source Video 1
FE 03 61 15 06 7F	Record Source Video 2
FE 03 61 15 07 80	Record Source Video 3
FE 03 61 15 08 81	Record Source Video 4
FE 03 61 15 35 AE	Record Source Phono
FE 03 61 15 6B E4	Record Follow Main Zone Source

Table 4 - Type 16 Zone 2 Commands

RX-1052 HEX	Command Description
ZONE 2 POWER & VOLUME COMMANDS	
FE 03 61 16 0A 84	Zone 2 Power Toggle
FE 03 61 16 4A C4	Zone 2 Power Off
FE 03 61 16 4B C5	Zone 2 Power On
FE 03 61 16 00 7A	Zone 2 Volume Up
FE 03 61 16 01 7B	Zone 2 Volume Down
FE 03 61 16 1E 98	Zone 2 Mute Toggle
FE 03 61 16 6C E6	Zone 2 Mute On
FE 03 61 16 6D E7	Zone 2 Mute Off
FE 03 61 16 71 EB	Power Off All Zones
ZONE 2 SOURCE SELECTION COMMANDS	
FE 03 61 16 02 7C	Zone 2 Source CD
FE 03 61 16 03 7D	Zone 2 Source Tuner
FE 03 61 16 04 7E	Zone 2 Source Tape
FE 03 61 16 05 7F	Zone 2 Source Video 1
FE 03 61 16 06 80	Zone 2 Source Video 2
FE 03 61 16 07 81	Zone 2 Source Video 3
FE 03 61 16 08 82	Zone 2 Source Video 4
FE 03 61 16 35 AF	Zone 2 Source Video 5
FE 03 61 16 6B E5	Zone 2 Follow Main Zone Source
ZONE 2 TUNER COMMANDS	
FE 03 61 16 28 A2	Zone 2 Tune Up
FE 03 61 16 29 A3	Zone 2 Tune Down
FE 03 61 16 6F E9	Zone 2 Preset Up
FE 03 61 16 70 EA	Zone 2 Preset Down
FE 03 61 16 72 EC	Zone 2 Frequency Up
FE 03 61 16 73 ED	Zone 2 Frequency Down
FE 03 61 16 24 9E	Zone 2 Band Toggle
FE 03 61 16 56 D0	Zone 2 AM
FE 03 61 16 55 CF	Zone 2 FM
FE 03 61 16 20 9A	Zone 2 Tune / Preset
FE 03 61 16 69 E3	Zone 2 Tuning Mode Select
FE 03 61 16 6A E4	Zone 2 Preset Mode Select
FE 03 61 16 21 9B	Zone 2 Preset Scan
FE 03 61 16 26 A0	Zone 2 FM Mono
ZONE 2 NUMERIC KEY COMMANDS	
FE 03 61 16 2A A4	Zone 2 Number 1
FE 03 61 16 2B A5	Zone 2 Number 2
FE 03 61 16 2C A6	Zone 2 Number 3
FE 03 61 16 2D A7	Zone 2 Number 4

RX-1052 HEX	Command Description
FE 03 61 16 2E A8	Zone 2 Number 5
FE 03 61 16 2F A9	Zone 2 Number 6
FE 03 61 16 30 AA	Zone 2 Number 7
FE 03 61 16 31 AB	Zone 2 Number 8
FE 03 61 16 32 AC	Zone 2 Number 9
FE 03 61 16 33 AD	Zone 2 Number 0
ZONE 2 OTHER COMMANDS	
FE 03 61 16 6E E8	Party Mode Toggle

Table 5 - Type 17 Zone 3 Commands

RX-1052 HEX	Command Description
ZONE 3 POWER & VOLUME COMMANDS	
FE 03 61 17 0A 85	Zone 3 Power Toggle
FE 03 61 17 4A C5	Zone 3 Power Off
FE 03 61 17 4B C6	Zone 3 Power On
FE 03 61 17 00 7B	Zone 3 Volume Up
FE 03 61 17 01 7C	Zone 3 Volume Down
FE 03 61 17 1E 99	Zone 3 Mute Toggle
FE 03 61 17 6C E7	Zone 3 Mute On
FE 03 61 17 6D E8	Zone 3 Mute Off
FE 03 61 17 71 EC	Power Off All Zones
ZONE 3 SOURCE SELECTION COMMANDS	
FE 03 61 17 02 7D	Zone 3 Source CD
FE 03 61 17 03 7E	Zone 3 Source Tuner
FE 03 61 17 04 7F	Zone 3 Source Tape
FE 03 61 17 05 80	Zone 3 Source Video 1
FE 03 61 17 06 81	Zone 3 Source Video 2
FE 03 61 17 07 82	Zone 3 Source Video 3
FE 03 61 17 08 83	Zone 3 Source Video 4
FE 03 61 17 35 B0	Zone 3 Source Phono
FE 03 61 17 6B E6	Zone 3 Follow Main Zone Source
ZONE 3 TUNER COMMANDS	
FE 03 61 17 28 A3	Zone 3 Tune Up
FE 03 61 17 29 A4	Zone 3 Tune Down
FE 03 61 17 6F EA	Zone 3 Preset Up
FE 03 61 17 70 EB	Zone 3 Preset Down
FE 03 61 17 72 ED	Zone 3 Frequency Up
FE 03 61 17 73 EE	Zone 3 Frequency Down
FE 03 61 17 24 9F	Zone 3 Band Toggle
FE 03 61 17 56 D1	Zone 3 AM
FE 03 61 17 55 D0	Zone 3 FM
FE 03 61 17 20 9B	Zone 3 Tune / Preset

RX-1052 HEX	Command Description
FE 03 61 17 69 E4	Zone 3 Tuning Mode Select
FE 03 61 17 6A E5	Zone 3 Preset Mode Select
FE 03 61 17 21 9C	Zone 3 Preset Scan
FE 03 61 17 26 A1	Zone 3 FM Mono
ZONE 3 NUMERIC KEY COMMANDS	
FE 03 61 17 2A A5	Zone 3 Number 1
FE 03 61 17 2B A6	Zone 3 Number 2
FE 03 61 17 2C A7	Zone 3 Number 3
FE 03 61 17 2D A8	Zone 3 Number 4
FE 03 61 17 2E A9	Zone 3 Number 5
FE 03 61 17 2F AA	Zone 3 Number 6
FE 03 61 17 30 AB	Zone 3 Number 7
FE 03 61 17 31 AC	Zone 3 Number 8
FE 03 61 17 32 AD	Zone 3 Number 9
FE 03 61 17 33 AE	Zone 3 Number 0
ZONE 3 OTHER COMMANDS	
FE 03 61 17 6E E9	Party Mode Toggle

Table 6 - Type 18 Zone 4 Commands

RX-1052 HEX	Command Description
ZONE 4 POWER & VOLUME COMMANDS	
FE 03 61 18 0A 86	Zone 4 Power Toggle
FE 03 61 18 4A C6	Zone 4 Power Off
FE 03 61 18 4B C7	Zone 4 Power On
FE 03 61 18 00 7C	Zone 4 Volume Up
FE 03 61 18 01 7D	Zone 4 Volume Down
FE 03 61 18 1E 9A	Zone 4 Mute Toggle
FE 03 61 18 6C E8	Zone 4 Mute On
FE 03 61 18 6D E9	Zone 4 Mute Off
FE 03 61 18 71 ED	Power Off All Zones
ZONE 4 SOURCE SELECTION COMMANDS	
FE 03 61 18 02 7E	Zone 4 Source CD
FE 03 61 18 03 7F	Zone 4 Source Tuner
FE 03 61 18 04 80	Zone 4 Source Tape
FE 03 61 18 05 81	Zone 4 Source Video 1
FE 03 61 18 06 82	Zone 4 Source Video 2
FE 03 61 18 07 83	Zone 4 Source Video 3
FE 03 61 18 08 84	Zone 4 Source Video 4
FE 03 61 18 35 B1	Zone 4 Source Phono
FE 03 61 18 6B E7	Zone 4 Follow Main Zone Source
ZONE 4 TUNER COMMANDS	
FE 03 61 18 28 A4	Zone 4 Tune Up

RX-1052 HEX	Command Description
FE 03 61 18 29 A5	Zone 4 Tune Down
FE 03 61 18 6F EB	Zone 4 Preset Up
FE 03 61 18 70 EC	Zone 4 Preset Down
FE 03 61 18 72 EE	Zone 4 Frequency Up
FE 03 61 18 73 EF	Zone 4 Frequency Down
FE 03 61 18 24 A0	Zone 4 Band Toggle
FE 03 61 18 56 D2	Zone 4 AM
FE 03 61 18 55 D1	Zone 4 FM
FE 03 61 18 20 9C	Zone 4 Tune / Preset
FE 03 61 18 69 E5	Zone 4 Tuning Mode Select
FE 03 61 18 6A E6	Zone 4 Preset Mode Select
FE 03 61 18 21 9D	Zone 4 Preset Scan
FE 03 61 18 26 A2	Zone 4 FM Mono
ZONE 4 NUMERIC KEY COMMANDS	
FE 03 61 18 2A A6	Zone 4 Number 1
FE 03 61 18 2B A7	Zone 4 Number 2
FE 03 61 18 2C A8	Zone 4 Number 3
FE 03 61 18 2D A9	Zone 4 Number 4
FE 03 61 18 2E AA	Zone 4 Number 5
FE 03 61 18 2F AB	Zone 4 Number 6
FE 03 61 18 30 AC	Zone 4 Number 7
FE 03 61 18 31 AD	Zone 4 Number 8
FE 03 61 18 32 AE	Zone 4 Number 9
FE 03 61 18 33 AF	Zone 4 Number 0
ZONE 4 OTHER COMMANDS	
FE 03 61 18 6E EA	Party Mode Toggle

Table 7 - Type 30 Volume Direct Commands

NOTE: Volume direct commands range from hex 00 – 60; below is a sample of the commands available.

RX-1052 HEX	Command Description
VOLUME DIRECT COMMANDS	
FE 03 61 30 00 94	Volume Min
FE 03 61 30 01 95	Volume 1
FE 03 61 30 02 96	Volume 2
FE 03 61 30 03 97	Volume 3
FE 03 61 30 04 98	Volume 4
FE 03 61 30 05 99	Volume 5
FE 03 61 30 06 9A	Volume 6
FE 03 61 30 07 9B	Volume 7
FE 03 61 30 08 9C	Volume 8
FE 03 61 30 09 9D	Volume 9

RX-1052 HEX	Command Description
FE 03 61 30 0A 9E	Volume 10
FE 03 61 30 0B 9F	Volume 11
FE 03 61 30 0C A0	Volume 12
FE 03 61 30 0D A1	Volume 13
FE 03 61 30 0E A2	Volume 14
FE 03 61 30 0F A3	Volume 15
FE 03 61 30 10 A4	Volume 16
FE 03 61 30 20 B4	Volume 32
FE 03 61 30 30 C4	Volume 48
FE 03 61 30 40 D4	Volume 64
FE 03 61 30 50 E4	Volume 80
FE 03 61 30 59 ED	Volume 89

Table 8 - Type 32 Zone 2 Volume Direct Commands

RX-1052 HEX	Command Description
ZONE 2 VOLUME DIRECT COMMANDS	
FE 03 61 32 00 96	Zone 2 Volume Min
FE 03 61 32 01 97	Zone 2 Volume 1
FE 03 61 32 02 98	Zone 2 Volume 2
FE 03 61 32 03 99	Zone 2 Volume 3
FE 03 61 32 04 9A	Zone 2 Volume 4
FE 03 61 32 05 9B	Zone 2 Volume 5
FE 03 61 32 06 9C	Zone 2 Volume 6
FE 03 61 32 07 9D	Zone 2 Volume 7
FE 03 61 32 08 9E	Zone 2 Volume 8
FE 03 61 32 09 9F	Zone 2 Volume 9
FE 03 61 32 0A A0	Zone 2 Volume 10
FE 03 61 32 0B A1	Zone 2 Volume 11
FE 03 61 32 0C A2	Zone 2 Volume 12
FE 03 61 32 0D A3	Zone 2 Volume 13
FE 03 61 32 0E A4	Zone 2 Volume 14
FE 03 61 32 0F A5	Zone 2 Volume 15
FE 03 61 32 10 A6	Zone 2 Volume 16
FE 03 61 32 20 B6	Zone 2 Volume 32
FE 03 61 32 30 C6	Zone 2 Volume 48
FE 03 61 32 40 D6	Zone 2 Volume 64
FE 03 61 32 50 E6	Zone 2 Volume 80
FE 03 61 32 59 EF	Zone 2 Volume 89

Table 9 - Type 33 Zone 3 Volume Direct Commands

RX-1052 HEX	Command Description
ZONE 3 VOLUME DIRECT COMMANDS	
FE 03 61 33 00 97	Zone 3 Volume Min
FE 03 61 33 01 98	Zone 3 Volume 1
FE 03 61 33 02 99	Zone 3 Volume 2
FE 03 61 33 03 9A	Zone 3 Volume 3
FE 03 61 33 04 9B	Zone 3 Volume 4
FE 03 61 33 05 9C	Zone 3 Volume 5
FE 03 61 33 06 9D	Zone 3 Volume 6
FE 03 61 33 07 9E	Zone 3 Volume 7
FE 03 61 33 08 9F	Zone 3 Volume 8
FE 03 61 33 09 A0	Zone 3 Volume 9
FE 03 61 33 0A A1	Zone 3 Volume 10
FE 03 61 33 10 A7	Zone 3 Volume 16
FE 03 61 33 20 B7	Zone 3 Volume 32
FE 03 61 33 30 C7	Zone 3 Volume 48
FE 03 61 33 40 D7	Zone 3 Volume 64
FE 03 61 33 50 E7	Zone 3 Volume 80
FE 03 61 33 59 F0	Zone 3 Volume 89

Table 10 - Type 34 Zone 4 Volume Direct Commands

RX-1052 HEX	Command Description
ZONE 4 VOLUME DIRECT COMMANDS	
FE 03 61 34 00 98	Zone 4 Volume Min
FE 03 61 34 01 99	Zone 4 Volume 1
FE 03 61 34 02 9A	Zone 4 Volume 2
FE 03 61 34 03 9B	Zone 4 Volume 3
FE 03 61 34 04 9C	Zone 4 Volume 4
FE 03 61 34 05 9D	Zone 4 Volume 5
FE 03 61 34 06 9E	Zone 4 Volume 6
FE 03 61 34 07 9F	Zone 4 Volume 7
FE 03 61 34 08 A0	Zone 4 Volume 8
FE 03 61 34 09 A1	Zone 4 Volume 9
FE 03 61 34 0A A2	Zone 4 Volume 10
FE 03 61 34 10 A8	Zone 4 Volume 16
FE 03 61 34 20 B8	Zone 4 Volume 32
FE 03 61 34 30 C8	Zone 4 Volume 48
FE 03 61 34 40 D8	Zone 4 Volume 64
FE 03 61 34 50 E8	Zone 4 Volume 80
FE 03 61 34 59 F1	Zone 4 Volume 89

Section 2: Feedback String Format

Standard Response String Format

Start	Count	ID	Type	Data						Checksum
0xFE	0x12	0x61	0x20	Flag1	...	Flag5	Char1	...	Char11	0xXX

The feedback string is a representation of the display of the unit.

The Flag1 – Flag5 data bytes contain data on which of the various icons on the front display are currently illuminated.

The Char1 - Char11 data bytes contain ASCII data representing the text that appears across the front display. It can contain source input, volume, and tuner frequency data and should be parsed to obtain this information.

The display status uses 2 bits in Flag5 to confirm if the front display is On or Off.

Flag1 – Flag5 Data

	Flag1	Flag2	Flag3	Flag4	Flag5
Bit0	Standby LED		RDS	AM	
Bit1	Zone LED	Tuned	RBDS		
Bit2	Speaker B LED	Stereo			
Bit3	Speaker A LED	AF			
Bit4	Preset	TA	Ant		
Bit5	Memory	TP	FM		
Bit6	Auto	EON	MW		Display Mode0
Bit7		RT	LW		Display Mode1

Display Status

	Display On	Display Off
Display Mode 1	0	1
Display Mode 0	0	0