

RWC2100F Remote Control Commands

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Remote control Programming

Users can control the RWC2100F remotely through Ethernet or RS232C interface using a comprehensive set of commands. This section provides the necessary information to operate the RWC2100F under Ethernet and RS232C control.

1. Introduction
2. Interface
3. Command List

1. Introduction

The RWC2100F provides a remote control method using string-based control commands. This method is very easy to understand and provides flexible backward compatibility with new versions of FW.

1.1. Command Structure

1.1.1. Command Format

The format of command is like as the below:

```
CMD_TYPE:CATEGORY:FUNCTION <param1> <param2> <param3> EOL
```

CMD_TYPE

CMD_TYPE consist of *configuration* and *read command*

Commands consist of *set commands* and *query commands* (usually simply called commands and queries). Set commands change instrument settings or perform a specific action. Queries cause the RWC2100F to return data and information about its status. Most commands have both a set form and query form. The set form of the command is started with “CONF” and the query form of the command is started with “READ”.

One of examples of the set commands and query commands is shown below respectively:

```
CONF:TX_FM:FREQUENCY 88.7  
READ:TX_FM:FREQUENCY?.
```

CATEGORY

There are five categories such as SYSTEM, FM_TX, AM_TX, FM_RX, and AUDIO.

FUNCTION

The part is a command corresponding to an action. For example, it is a command such as frequency or power.

If it needs parameters, a *space* is used to separate parameters from commands. In the case of commands with more than one parameter, a space is required between the parameters.

EOL (End Of Line)

All commands should be finished with EOL characters such as ‘\n’ or ‘\r’.

1.1.2. Configuration Command Parameter and Response

RWC2100F responds ”ACK” or “NAK” for all configuration commands. If the command and parameters are valid, it responds ACK, and if invalid, it responds NAK.

There are three types of commands with respect to the number of parameters.

Single Parameter

```
CONF:RX:PATHLOSS 0.5\n  
ACK
```

```
CONF:AUDIO:ENABLE YES\nACK
```

Double Parameters

```
CONF:FM_TX:POWER_DBM 1 -15\nACK
```

```
CONF:AM_TX:AUDIO_SOURCE 2 SING_A_SONG.WAV\nACK
```

Triple Parameters

```
CONF:FM_TX:AF_FREQ 2 5 88.7\nACK
```

```
CONF:FM_TX:AF_VARIANT 1 1 91.1\nACK
```

1.1.3. Read Command Parameter and Response

There are three types of read commands with respect to the number of parameters. The response can be text, integer, or double values. But all responses are ASCII formatted

No Parameter

```
*IDN?\nRWC2100F Analog Radio Tester, Ver=1.000, SN=RWC2100000000
```

Single Parameter

```
READ:FM_TX:FREQ? 1\n88.7
```

```
READ:FM_TX:RT_HEADLINE 1\nRedwoodComm
```

Double Parameters

```
READ:FM_TX:ERT_TAG_TYPE? 1 0\nITEM_TITLE
```

```
READ:FM_TX:AF_VARIANT 2 3\n91.1
```

2. Interface

The RWC2100F supports RS232C and Ethernet interfaces on the rear panel for remote control operation. Ethernet is used for high speed and flexible interfaces. But socket programming is required to use Ethernet. RS232C is a slow serial interface, but it does not require any special equipment and is easy to use.

2.1. RS232

2.1.1. RS232 Port Connection of RWC2100F

RWC2100F has a DSUB9 connector for the RS232 interface. Users can use a DSUB9 cross cable defined as the figure 1.

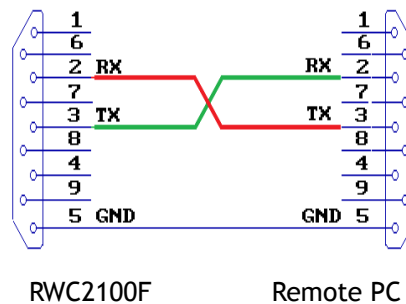


Figure 1. Cable connection of DSUB9 for RS232

2.1.2. Parameters of RS232

All parameters of RS232 of the RWC2100F are fixed as follows.

| Parameter | Range | Description |
|-----------|--------|--------------------|
| BAUD RATE | 115200 | fixed |
| DATA BITS | 8-bit | Length of Data bit |
| PARITY | Off | Error check bit |
| STOP BIT | 1-bit | Stop bit |

2.2. Ethernet Interface

2.2.2 Definition network socket in user application program.

RWC2100F uses the UDP protocol type. If you control with your own PC application or terminal program, you have to define your network protocol as a UDP.

```
Socket Rwc2100fSock;  
String IP_ADDR_RWC2100F = "192.168.0.100";  
LocalAddress = IPAddress.Any;  
LocalIpEndPoint = new IPEndPoint(LocalAddress, Convert.ToInt32(IP_ADDR_RWC2100F));  
Rwc2100fSock = new Socket(LocalAddress.AddressFamily, SocketType.Dgram, ProtocolType.Udp);
```

Example code with C#

2.2.3 The IP setup of the RWC2100F

It supports only IP4 format. It supports both dynamic and static IP address setup. Whenever you toggle the button on the rear panel of RWC2100F, the address type will be toggled between dynamic and static IP address. In dynamic mode, the RWC2100F will get the IP address from your DHCP server. In static mode, it will keep the same IP address that was assigned by DHCP server when in dynamic mode.

2.2.4 Control example using the scripser function of the RWC2100F application

Users can control the RWC2100F remotely using the scripser of RWC2100F PC application program. Controlling with LAN connection rather than RS232 is strongly recommended for more stable operation.

3. Command Tables

3.1. SYSTEM

| Command | <param> Range |
|--------------------------------|-----------------------------------|
| *IDN? | |
| *ALIVE? | |
| *RST | |
| *SAVE <param> | SAVE_00, SAVE_01, ..., SAVE_09 |
| *RECALL <param> | SAVE_00, SAVE_01, ..., SAVE_09 |
| READ:SYSTEM:SERIAL_NUM? | |
| READ:SYSTEM:IP_TYPE? | |
| CONF:SYSTEM:IP_TYPE <param> | DYNAMIC, STATIC |
| READ:SYSTEM:IP_ADDR? | |
| CONF:SYSTEM:IP_ADDR <param> | IP4 format 255.255.255.255 |
| READ:SYSTEM:SW_VERSION? | |
| READ:TESTER_MODE? | |
| EXEC:FDISK:FORMAT | |
| READ:FDISK:FORMAT_STATUS? | |
| READ:FDISK:FREE_SPACE? | |
| READ:FDISK:TOTAL_SIZE? | |
| READ:FDISK:FILE_NUM? | |
| READ:FDISK:FILE_NAME? <param> | 0-(n-1) |
| EXEC:FDISK:FILE_DELETE <param> | 0-(n-1) |
| READ:FDISK:FILE_SIZE? <param> | 0-(n-1) |

3.2. RF_COMMON

| Command | <param1> Range | <param2> Range |
|-------------------------------------|--------------------|-------------------|
| READ:TX:AM_FM_SEL? <param1> | Channel # 1 ~ 3 | |
| CONF:TX:AM_FM_SEL <param1> <param2> | Channel # 1 ~ 3 | AM, FM |
| READ:TX:RF_OUT? <param1> | Channel # 1 ~ 3 | |
| CONF:TX:RF_OUT <param1> <param2> | Channel # 1 ~ 3 | ON, OFF |
| READ:TX:PATHLOSS? <param1> | Channel # 1 ~ 3 | |
| CONF:TX:PATHLOSS <param1> <param2> | Channel # 1 ~ 3 | -60.0 ~ 60.0 |
| READ:RX:PATHLOSS? | | |
| CONF:RX:PATHLOSS <param1> | -60.0 ~ 60.0 | |

3.3. FM_TX

| Command | <param1> Range | <param2> Range | <param3> Range |
|--|--------------------|--|-------------------|
| READ:FM_TX:FREQ? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:FREQ <param1> <param2> | Channel # 1 ~ 3 | 76.0 ~ 107.9 | |
| READ:FM_TX:POWER_UNIT? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:POWER_UNIT <param1> <param2> | Channel # 1 ~ 3 | DBM, DBUV | |
| READ:FM_TX:POWER_DBM? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:POWER_DBM <param1> <param2> | Channel # 1 ~ 3 | -90 ~ 0 | |
| READ:FM_TX:POWER_DBUV? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:POWER_DBUV <param1> <param2> | Channel # 1 ~ 3 | 17 ~ 107 | |
| READ:FM_TX:PID? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:PID <param1> <param2> | Channel # 1 ~ 3 | 0x0001 ~ 0xFFFF | |
| READ:FM_TX:PS_NAME? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:PS_NAME <param1> <param2> | Channel # 1 ~ 3 | String(8B) | |
| READ:FM_TX:RT? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:RT <param1> <param2> | Channel # 1 ~ 3 | OFF, RT, RT+ | |
| READ:FM_TX:TA? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:TA <param1> <param2> | Channel # 1 ~ 3 | ON, OFF | |
| READ:FM_TX:TP? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:TP <param1> <param2> | Channel # 1 ~ 3 | ON, OFF | |
| READ:FM_TX:PRG_TYPE_MODE? | Channel # 1 ~ 3 | | |
| CONF:FM_TX:PRG_TYPE_MODE <param1> <param2> | Channel # 1 ~ 3 | RDS, RBDS | |
| READ:FM_TX:PRG_TYPE? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:PRG_TYPE <param1> <param2> | Channel # 1 ~ 3 | NO_TYPE NEWS CURRENT_AFFAIRS INFORMATION SPORTS EDUCATION DRAMA CULTURE SCIENCE VARIED POP_MUSIC ROCK_MUSIC | |

| | | | EASY_MUSIC LIGHT_CLASSIC SERIOUS_CLASSIC OTHER_MUSIC WEATHER FINANCE CHILDREN SOCIAL_AFFAIRS RELIGION PHONE_IN TRAVEL LEISURE JAZZ_MUSIC COUNTRY_MUSIC NATIONAL_MUSIC OLDIES_MUSIC FOLK_MUSIC DOCUMENTARY ALARM_TEST ALARM |
|--|--------------------|----------------|---|
| READ:FM_TX:PRG_TYPE_NAME? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:PRG_TYPE_NAME <param1> | Channel # 1 ~ 3 | String(8B) | |
| READ:FM_TX:AF_METHOD? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:AF_METHOD <param1> <param2> | Channel # 1 ~ 3 | A, B | |
| READ:FM_TX:AF? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:AF <param1> <param2> | Channel # 1 ~ 3 | OFF, ON | |
| READ:FM_TX:AF_NUM? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:AF_NUM <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 24 | |
| READ:FM_TX:AF_NUM_VARIANT? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:AF_NUM_VARIANT<param1> <param2> | Channel # 1~3 | 0 ~ 12 | |
| READ:FM_TX:AF_FREQ? <param1> <param2> | Channel # 1 ~ 3 | 1 ~ 24 | |
| CONF:FM_TX:AF_FREQ <param1> <param2> <param3> | Channel # 1 ~ 3 | 1 ~ 24 | 87.6 ~ 107.9 |
| READ:FM_TX:AF_VARIANT? <param1> <param2> | Channel # 1 ~ 3 | 1 ~ 12 | |
| CONF:FM_TX:AF_VARIANT <param1> <param2> <param3> | Channel # 1 ~ 3 | 1 ~ 12 | 87.6 ~ 107.9 |
| READ:FM_TX:ECC? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:ECC <param1> <param2> | Channel # 1 ~ 3 | HEX string(1B) | |
| READ:FM_TX:PIN_DAY? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:PIN_DAY <param1> <param2> | Channel # 1 ~ 3 | 1 ~ 31 | |
| READ:FM_TX:PIN_HOUR? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:PIN_HOUR <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 23 | |

| | | | |
|--|--------------------|----------|-----------|
| READ:FM_TX:PIN_MINUTE? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:PIN_MINUTE <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 59 | |
| READ:FM_TX:LANGUAGE? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:LANGUAGE <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 0xFF | |
| READ:FM_TX:RT_CH? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:RT_CH <param1> <param2> | Channel # 1 ~ 3 | 2A, 2B | |
| READ:FM_TX:TMC_GROUP? <param1> <param2> | Channel # 1 ~ 3 | 1 ~ 5 | |
| CONF:FM_TX:TMC_GROUP <param1> <param2> <param3> | Channel # 1 ~ 3 | 1 ~ 5 | ON, OFF |
| READ:FM_TX:TMC_LTN? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:TMC_LTN <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 63 | |
| READ:FM_TX:TMC_MSG_AFI? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:TMC_MSG_AFI <param1> <param2> | Channel # 1 ~ 3 | 0, 1 | |
| READ:FM_TX:TMC_MSG_MODE? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:TMC_MSG_MODE <param1> <param2> | Channel # 1 ~ 3 | 0, 1 | |
| READ:FM_TX:TMC_MSG_I? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:TMC_MSG_I <param1> <param2> | Channel # 1 ~ 3 | 0, 1 | |
| READ:FM_TX:TMC_MSG_N? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:TMC_MSG_N <param1> <param2> | Channel # 1 ~ 3 | 0, 1 | |
| READ:FM_TX:TMC_MSG_R? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:TMC_MSG_R <param1> <param2> | Channel # 1 ~ 3 | 0, 1 | |
| READ:FM_TX:TMC_MSG_U? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:TMC_MSG_U <param1> <param2> | Channel # 1 ~ 3 | 0, 1 | |
| READ:FM_TX:TMC? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:TMC <param1> <param2> | Channel # 1 ~ 3 | ON, OFF | |
| READ:FM_TX:TMC_LOCATION? <param1> <param2> | Channel # 1 ~ 3 | 1 ~ 5 | |
| CONF:FM_TX:TMC_LOCATION <param1> <param2> <param3> | Channel # 1 ~ 3 | 1 ~ 5 | 0 ~ 65535 |
| READ:FM_TX:TMC_EVENT? <param1> <param2> | Channel # 1 ~ 3 | 1 ~ 5 | |
| CONF:FM_TX:TMC_EVENT <param1> <param2> <param3> | Channel # 1 ~ 3 | 1 ~ 5 | 0 ~ 2047 |

| | | | |
|---|--------------------|---------|---|
| READ:FM_TX:TMC_EXTENT? <param1> <param2> | Channel # 1 ~ 3 | 1 ~ 5 | |
| CONF:FM_TX:TMC_EXTENT <param1> <param2> <param3> | Channel # 1 ~ 3 | 1 ~ 5 | 0 ~ 7 |
| READ:FM_TX:TMC_DIVERSION? <param1> <param2> | Channel # 1 ~ 3 | 1 ~ 5 | |
| CONF:FM_TX:TMC_DIVERSION <param1> <param2> <param3> | Channel # 1 ~ 3 | 1 ~ 5 | 0, 1 |
| READ:FM_TX:TMC_DIRECTION? <param1> <param2> | Channel # 1 ~ 3 | 1 ~ 5 | |
| CONF:FM_TX:TMC_DIRECTION <param1> <param2> <param3> | Channel # 1 ~ 3 | 1 ~ 5 | 0, 1 |
| READ:FM_TX:TIME? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:TIME <param1> <param2> | Channel # 1 ~ 3 | ON, OFF | |
| READ:FM_TX:RT_TAG_TYPE? <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 3 | |
| | | | DUMMY ITEM_TITLE ITEM_ALBUM ITEM_TRACKNUMBER ITEM_ARTIST ITEM_COMPOSITION ITEM_MOVEMENT ITEM_CONDUCTOR ITEM_COMPOSER ITEM_BAND ITEM_COMMENT ITEM_GENRE INFO_NEWS INFO_NEWS_LOCAL INFO_STOCKMARKET INFO_SPORT INFO_LOTTERY INFO_HOROSCOPE INFO_DAILY_DIVERSION INFO_HEALTH INFO_EVENT INFO_SCENE INFO_CINEMA INFO_TV INFO_DATE_TIME INFO_WEATHER INFO_TRAFFIC INFO_ALARM INFO_ADVERTISEMENT INFO_URL INFO_OTHER STATIONNAME_SHORT STATIONNAME_LONG PROGRAMME_NOW PROGRAMME_NEXT PROGRAMME_PART PROGRAMME_HOST PROGRAMME_EDITORIAL_STAFF PROGRAMME_FREQUENCY PROGRAMME_HOMEPAGE PROGRAMME_SUBCHANNEL PHONE_HOTLINE PHONE_STUDIO PHONE_OTHER SMS_STUDIO SMS_OTHER EMAIL_HOTLINE EMAIL_STUDIO EMAIL_OTHER MMS_OTHER CHAT CHAT_CENTER VOTE_QUESTION VOTE_CENTRE RFU_1 RFU_2 PRIVATE_1 PRIVATE_2 PRIVATE_3 DESCRIPTOR_PLACE DESCRIPTOR_APPOINTMENT DESCRIPTOR_IDENTIFIER DESCRIPTOR_PURCHASE DESCRIPTOR_GET_DATA |
| CONF:FM_TX:RT_TAG_TYPE <param1> <param2> <param3> | Channel # 1 ~ 3 | 0 ~ 3 | |

| | | | |
|---|--------------------|---|--------|
| READ:FM_TX:RT_TAG_START? <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 3 | |
| CONF:FM_TX:RT_TAG_START <param1> <param2> <param3> | Channel # 1 ~ 3 | 0 ~ 3 | 0 ~ 63 |
| READ:FM_TX:RT_TAG_LENGTH? <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 3 | |
| CONF:FM_TX:RT_TAG_LENGTH <param1> <param2> <param3> | Channel # 1 ~ 3 | 0 ~ 3 | 0 ~ 63 |
| READ:FM_TX:RT_MODE? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:RT_MODE <param1> <param2> | Channel # 1 ~ 3 | OFF, RT, RT+ | |
| READ:FM_TX:EON? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:EON <param1> <param2> | Channel # 1 ~ 3 | ON, OFF | |
| READ:FM_TX:EON_CH? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:EON_CH <param1> <param2> | Channel # 1 ~ 3 | FM_RDS_1, FM_RDS_2, FM_RDS_3 | |
| READ:FM_TX:EON_PTYPE? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:EON_PTYPE <param1> <param2> | Channel # 1 ~ 3 | DEFAULT, NEWS, WEATHER, ALLARM | |
| READ:FM_TX:EON_PID? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:EON_PID <param1> <param2> | Channel # 1 ~ 3 | 0x0001 ~ 0xFFFF | |
| READ:FM_TX:EON_PS_NAME? <param1> | Channel # 1 ~ 3 | | |
| READ:FM_TX:EON_AF? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:EON_AF <param1> <param2> | Channel # 1 ~ 3 | 87.6 ~ 107.9 | |
| READ:FM_TX:EON_SWITCH? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:EON_SWITCH <param1> <param2> | Channel # 1 ~ 3 | ON, OFF | |
| READ:FM_TX:AUDIO_VOLUME? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:AUDIO_VOLUME <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 100 | |
| READ:FM_TX:FM_DEVIATION? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:FM_DEVIATION <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 75 | |
| READ:FM_TX:PILOT_LEVEL_UNIT? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:PILOT_LEVEL_UNIT <param1> <param2> | Channel # 1 ~ 3 | PERCENT, KHZ | |
| READ:FM_TX:PILOT_LEVEL_KHZ? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:PILOT_LEVEL_KHZ <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 15 | |

| | | | |
|--|--------------------|-------------|---|
| READ:FM_TX:PILOT_LEVEL_PERCENT? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:PILOT_LEVEL_PERCENT <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 15 | FILE |
| READ:FM_TX:AUDIO_FREQ? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:AUDIO_FREQ <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 20 | |
| READ:FM_TX:AUDIO_SOURCE? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:AUDIO_SOURCE <param1> <param2> | Channel # 1 ~ 3 | | FILE, TONE_MONO, TONE_STEREO,SWE EP, EXT_AUDIO_IN |
| READ:FM_TX:ALL_FILES? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:ALL_FILES <param1> <param2> | Channel # 1 ~ 3 | ON, OFF | |
| READ:FM_TX:AUDIO_IN_GAIN? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:AUDIO_IN_GAIN <param1> <param2> | Channel # 1 ~ 3 | 0 - 50 | |
| READ:FM_TX:STEREO_MODE? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:STEREO_MODE <param1> <param2> | Channel # 1 ~ 3 | | LEFT_AND_RIGHT, LEFT_ONLY,RIGHT _ONLY |
| READ:FM_TX:AUDIO_FREQ_R? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:AUDIO_FREQ_R <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 20 | |
| READ:FM_TX:AUDIO_FREQ_L? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:AUDIO_FREQ_L <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 20 | |
| READ:FM_TX:SWEEP_START? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:SWEEP_START <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 20 | |
| READ:FM_TX:SWEEP_STOP? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:SWEEP_STOP <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 20 | |
| READ:FM_TX:SWEEP_TIME? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:SWEEP_TIME <param1> <param2> | Channel # 1 ~ 3 | 20 ~ 10000 | |
| READ:FM_TX:RDS_MODE? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:RDS_MODE <param1> <param2> | Channel # 1 ~ 3 | | CONFIG, FILE, OFF |
| READ:FM_TX:PRE_EMPHASIS? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:PRE_EMPHASIS <param1> <param2> | Channel # 1 ~ 3 | OFF, 50, 75 | |

| | | |
|--|--------------------|----------------|
| READ:FM_TX:WAVE_FILE? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:WAVE_FILE <param1> <param2> | Channel # 1 ~ 3 | String |
| READ:FM_TX:WAVE_PROG? <param1> | Channel # 1 ~ 3 | |
| READ:FM_TX:YEAR? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:YEAR <param1> <param2> | Channel # 1 ~ 3 | 1900 ~ 2200 |
| READ:FM_TX:MONTH? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:MONTH <param1> <param2> | Channel # 1 ~ 3 | 1 ~ 12 |
| READ:FM_TX:DAY? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:DAY <param1> <param2> | Channel # 1 ~ 3 | 1 ~ 31 |
| READ:FM_TX:HOURL? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:HOURL <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 23 |
| READ:FM_TX:MINUTE? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:MINUTE <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 59 |
| READ:FM_TX:MODULATION? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:MODULATION <param1> <param2> | Channel # 1 ~ 3 | ON, OFF |
| READ:FM_TX:LTO? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:LTO <param1> <param2> | Channel # 1 ~ 3 | -24 ~ 24 |
| READ:FM_TX:FM_DEVIATION? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:FM_DEVIATION <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 75 |
| READ:FM_TX:RDS_FILE? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:RDS_FILE <param1> <param2> | Channel # 1 ~ 3 | String |
| READ:FM_TX:RDS_DEVIATION? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_RX:RDS_DEVIATION <param1> <param2> | Channel # 1 ~ 3 | 0~90.0 |
| READ:FM_TX:RDS_PROG? <param1> | Channel # 1 ~ 3 | |
| READ:FM_TX:PS_NAME_HEX? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:PS_NAME_HEX <param1> <param2> | Channel # 1 ~ 3 | HEX String(8B) |
| READ:FM_TX:RT_HEX? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:RT_HEX <param1> <param2> | Channel # 1 ~ 3 | HEX String |

| | | |
|---|--------------------|----------------|
| READ:FM_TX:RT_HEADLINE_MODE? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:RT_HEADLINE_MODE <param1> <param2> | Channel # 1 ~ 3 | ON, OFF |
| READ:FM_TX:RT_HEADLINE? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:RT_HEADLINE <param1> <param2> | Channel # 1 ~ 3 | String |
| READ:FM_TX:ENCODING_FLAG? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:ENCODING_FLAG <param1> <param2> | Channel # 1 ~ 3 | UTF_8, UCS_2 |
| READ:FM_TX:RT_HEADLINE_HEX? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:RT_HEADLINE_HEX <param1> <param2> | Channel # 1 ~ 3 | HEX String |
| READ:FM_TX:EON_PS_NAME_HEX? <param1> | Channel # 1 ~ 3 | |
| READ:FM_TX:TEXT_DIRECTION? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:TEXT_DIRECTION <param1> <param2> | Channel # 1 ~ 3 | LTR, RTL |
| READ:FM_TX:M_S? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:M_S <param1> <param2> | Channel # 1 ~ 3 | MUSIC, SPEECH |
| READ:FM_TX:POWER_DBUV? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:POWER_DBUV <param1> <param2> | Channel # 1 ~ 3 | 17~97 |
| READ:FM_TX:ERT_MODE? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:ERT_MODE <param1> <param2> | Channel # 1 ~ 3 | OFF, eRT, eRT+ |
| READ:FM_TX:ERT? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:ERT <param1> <param2> | Channel # 1 ~ 3 | String |
| READ:FM_TX:ERT_HEX? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:ERT_HEX <param1> <param2> | Channel # 1 ~ 3 | HEX String |
| READ:FM_TX:ERT_HEADLINE? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:ERT_HEADLINE <param1> <param2> | Channel # 1 ~ 3 | String |
| READ:FM_TX:ERT_HEADLINE_HEX? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:ERT_HEADLINE_HEX <param1> <param2> | Channel # 1 ~ 3 | HEX String |
| READ:FM_TX:ITEM_RUNNING_BIT? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:ITEM_RUNNING_BIT <param1> <param2> | Channel # 1 ~ 3 | 0, 1 |
| READ:FM_TX:ITEM_TOGGLE_BIT? <param1> | Channel # 1 ~ 3 | |

| | | | |
|--|--------------------|---------|---|
| CONF:FM_TX:ITEM_TOGGLE_BIT <param1> <param2> | Channel # 1 ~ 3 | 0, 1 | |
| READ:FM_TX:ERT_TAG_TYPE? <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 3 | |
| | | | DUMMY ITEM_TITLE ITEM_ALBUM ITEM_TRACKNUMBER ITEM_ARTIST ITEM_COMPOSITION ITEM_MOVEMENT ITEM_CONDUCTOR ITEM_COMPOSER ITEM_BAND ITEM_COMMENT ITEM_GENRE INFO_NEWS INFO_NEWS_LOCAL INFO_STOCKMARKET INFO_SPORT INFO_LOTTERY INFO_HOROSCOPE INFO_DAILY_DIVERSION INFO_HEALTH INFO_EVENT INFO_SCENE INFO_CINEMA INFO_TV INFO_DATE_TIME INFO_WEATHER INFO_TRAFFIC INFO_ALARM INFO_ADVERTISEMENT INFO_URL INFO_OTHER STATIONNAME_SHORT STATIONNAME_LONG PROGRAMME_NOW PROGRAMME_NEXT PROGRAMME_PART PROGRAMME_HOST PROGRAMME_EDITORIAL_STAFF PROGRAMME_FREQUENCY PROGRAMME_HOMEPAGE PROGRAMME_SUBCHANNEL PHONE_HOTLINE PHONE_STUDIO PHONE_OTHER SMS_STUDIO SMS_OTHER EMAIL_HOTLINE EMAIL_STUDIO EMAIL_OTHER MMS_OTHER CHAT CHAT_CENTER VOTE_QUESTION VOTE_CENTRE RFU_1 RFU_2 PRIVATE_1 PRIVATE_2 PRIVATE_3 DESCRIPTOR_PLACE DESCRIPTOR_APPOINTMENT DESCRIPTOR_IDENTIFIER DESCRIPTOR_PURCHASE DESCRIPTOR_GET_DATA |
| CONF:FM_TX:ERT_TAG_TYPE <param1> <param2> <param3> | Channel # 1 ~ 3 | 0 ~ 3 | |
| READ:FM_TX:ERT_TAG_START? <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 3 | |
| CONF:FM_TX:ERT_TAG_START <param1> <param2> <param3> | Channel # 1 ~ 3 | 0 ~ 3 | 0 ~ 63 |
| READ:FM_TX:ERT_TAG_LENGTH? <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 3 | |
| CONF:FM_TX:ERT_TAG_LENGTH <param1> <param2> <param3> | Channel # 1 ~ 3 | 0 ~ 3 | 0 ~ 63 |
| READ:FM_TX:ERT_HEADLINE_MODE? <param1> | Channel # 1 ~ 3 | | |
| CONF:FM_TX:ERT_HEADLINE_MODE <param1> <param2> | Channel # 1 ~ 3 | ON, OFF | |
| READ:FM_TX:DI_COMPRESSED? <param1> | Channel # 1 ~ 3 | | |

| | | |
|---|--------------------|-------------------------------|
| CONF:FM_TX:DI_COMPRESSED <param1> <param2> | Channel # 1 ~ 3 | YES, NO |
| READ:FM_TX:DI_HEAD? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:DI_HEAD <param1> <param2> | Channel # 1 ~ 3 | ARTIFICIAL, NOT_ARTIFICIAL |
| READ:FM_TX:DI_MONO_STEREO? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:DI_MONO_STEREO <param1> <param2> | Channel # 1 ~ 3 | STEREO, MONO |
| READ:FM_TX:DI_PTY? <param1> | Channel # 1 ~ 3 | |
| CONF:FM_TX:DI_PTY <param1> <param2> | Channel # 1 ~ 3 | STATIC, DYNAMIC |

3.4. AM_TX

| Command | <param1> Range | <param2> Range |
|--|--------------------|---------------------------------------|
| READ:AM_TX:FREQ? <param1> | Channel # 1 ~ 3 | |
| CONF:AM_TX:FREQ <param1> <param2> | Channel # 1 ~ 3 | 500 ~ 1710 |
| READ:AM_TX:INDEX? <param1> | Channel # 1 ~ 3 | |
| CONF:AM_TX:INDEX <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 100 |
| READ:AM_TX:AUDIO_FREQ? <param1> | Channel # 1 ~ 3 | |
| CONF:AM_TX:AUDIO_FREQ <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 20 |
| READ:AM_TX:AUDIO_SOURCE? <param1> | Channel # 1 ~ 3 | |
| CONF:AM_TX:AUDIO_SOURCE <param1> <param2> | Channel # 1 ~ 3 | FILE, TONE, SWEEP, EXT_AUDIO_IN |
| READ:AM_TX:AUDIO_IN_GAIN? <param1> | Channel # 1 ~ 3 | |
| CONF:AM_TX:AUDIO_IN_GAIN <param1> <param2> | Channel # 1 ~ 3 | 0 - 50 |
| READ:AM_TX:POWER_UNIT? <param1> | Channel # 1 ~ 3 | |
| CONF:AM_TX:POWER_UNIT <param1> <param2> | Channel # 1 ~ 3 | DBM, DBUV |
| READ:AM_TX:POWER_DBM? <param1> | Channel # 1 ~ 3 | |
| CONF:AM_TX:POWER_DBM <param1> <param2> | Channel # 1 ~ 3 | -90 ~ -10 |
| READ:AM_TX:POWER_DBUV? <param1> | Channel # 1 ~ 3 | |
| CONF:AM_TX:POWER_DBUV <param1> <param2> | Channel # 1 ~ 3 | 17~ 97 |
| READ:AM_TX:SWEEP_START? <param1> | Channel # 1 ~ 3 | |

| | | |
|--|--------------------|------------|
| CONF:AM_TX:SWEEP_START <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 20 |
| READ:AM_TX:SWEEP_STOP? <param1> | Channel # 1 ~ 3 | |
| CONF:AM_TX:SWEEP_STOP <param1> <param2> | Channel # 1 ~ 3 | 0 ~ 20 |
| READ:AM_TX:SWEEP_TIME? <param1> | Channel # 1 ~ 3 | |
| CONF:AM_TX:SWEEP_TIME <param1> <param2> | Channel # 1 ~ 3 | 20 ~ 10000 |
| READ:AM_TX:WAVE_FILE? <param1> | Channel # 1 ~ 3 | |
| CONF:AM_TX:WAVE_FILE <param1> <param2> | Channel # 1 ~ 3 | String |
| READ:AM_TX:WAVE_PROG? <param1> | Channel # 1 ~ 3 | |
| READ:AM_TX:ALL_FILES? <param1> | Channel # 1 ~ 3 | |
| CONF:AM_TX:ALL_FILES <param1> <param2> | Channel # 1 ~ 3 | ON, OFF |
| CONF:AM_TX:CONTENTS_RST <param1> | Channel # 1 ~ 3 | |

3.5. FM_RX

| Command | <param> Range |
|--------------------------------|------------------|
| READ:FM_RX:FREQ? | |
| CONF:FM_RX:FREQ <param> | 76.0 ~ 107.9 |
| READ:FM_RX:ENABLE? | |
| CONF:FM_RX:ENABLE <param> | NO, YES |
| READ:FM_RX:RDS_STATUS? | |
| EXEC:FM_RX:RDS_RESET | |
| READ:FM_RX:RSSI? | |
| READ:FM_RX:SNR? | |
| READ:FM_RX:VOLUME? | |
| CONF:FM_RX:VOLUME <param> | 0 ~ 10 |
| READ:FM_RX:DE_EMPHASIS? | |
| CONF:FM_RX:DE_EMPHASIS <param> | OFF, 50, 75 |

3.6. AUDIO

| Command | <param> Range |
|-------------------------------|------------------|
| READ:AUDIO:ENABLE? | |
| CONF:AUDIO:ENABLE <param> | NO, YES |
| READ:AUDIO:TRIGGER? | |
| CONF:AUDIO:TRIGGER <param> | OFF, LEFT, RIGHT |
| READ:AUDIO:SINAD_L? | |
| READ:AUDIO:SINAD_R? | |
| READ:AUDIO:THDN_L? | |
| READ:AUDIO:THDN_R? | |
| READ:AUDIO:SNR_L? | |
| READ:AUDIO:SNR_R? | |
| READ:AUDIO:FREQ_R? | |
| READ:AUDIO:FREQ_L? | |
| READ:AUDIO:THD_L? | |
| READ:AUDIO:THD_R? | |
| READ:AUDIO:REF_FREQ_L? | |
| CONF:AUDIO:REF_FREQ_L <param> | 0.4 ~ 4 |
| READ:AUDIO:REF_FREQ_R? | |
| CONF:AUDIO:REF_FREQ_R <param> | 0.4 ~ 4 |
| READ:AUDIO:AVG_NUM? | |
| CONF:AUDIO:AVG_NUM <param> | 1 ~ 50 |
| READ:AUDIO:PK_PK_L? | |
| READ:AUDIO:PK_PK_R? | |
| READ:AUDIO:RMS_L? | |
| READ:AUDIO:RMS_R? | |
| READ:AUDIO:DBU_L? | |
| READ:AUDIO:DBU_R? | |

READ:AUDIO:WEIGHTING_FILTER?

CONF:AUDIO:WEIGHTING_FILTER <param> OFF, A_WEIGHT,
C_WEIGHT, CCIR

READ:AUDIO:LPF?

CONF:AUDIO:LPF <param> OFF
1kHz
2kHz
3kHz
4kHz
5kHz
6kHz
7kHz
8kHz
9kHz
10kHz
11kHz
12kHz
13kHz
14kHz
15kHz
16kHz
17kHz
18kHz
19kHz
20kHz

EXEC:AUDIO:AVG_RESET

READ:AUDIO:CURRENT_AVG_NUM?

READ:AUDIO:IN_LEVEL?

READ:AUDIO:SEPARATE_L?

READ:AUDIO:SEPARATE_R?

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