Firmware Release Note

Equipment : RWC2010C, Digital Radio Tester

Revision History

Version	Date	Description
Version 1.079	17 Aug.2026	1. Fixed an issue where the SCIdS information being transmitted during the DAB reconfiguration process was sent as the currently broadcasting information instead of the updated information to be changed. 2. Added OE_SCIDS to the Switching variable in DAB OTHER_ENSEMBLE Announcement mode, allowing users to configure it. 3. Fixed an issue where spurious signals were generated in the lower band when the bandwidth was set to 18 kHz or 20 kHz in DRM30 mode.
Version 1.078	03 Aug.2026	1. When the DAB SUBCH_ID default value was changed to be one greater than the component number and allow user modification, the update was not applied to FIG 0/19, causing an incorrect SUBCH_ID to be transmitted in FIG 0/19. This has been fixed.
Version 1.077	30 July.2026	1. Fixed an issue where setting ILS to International in the DAB AF configuration could cause a FIB overflow due to the increased length of FIG 0/6. 2. Previously, audio analyzer level measurements below -80 dBu were clamped and displayed as -80 dBu. This limit has been removed to allow lower values to be displayed.
Version 1.076	17 July.2026	1. Corrected the DAB Extended Label character flag to be added to the first segment only, as it was previously being applied to all segments.
Version 1.075	16 July.2026	1. Changed the PID input range for FM RDS from 1~0xFFFF to 0~0xFFFF. 2. Fixed an issue where the character flag information was not being transmitted when TEXT_CONTROL of DAB Extended Label was set to OFF.
Version 1.074	04 June.2026	1. When MDI files contained private-use tags, the MDI frame length could exceed the maximum frame length defined in the DRM Spec. This has been resolved by increasing the

		RWC2010X frame length limit to accommodate MDI files that include private-use data.
Version 1.073	02 June.2026	1. In the FM RDS EON test, the Target Channel's Program Type now automatically changes to match EON_PTY when EON_SWITCH is turned ON, and reverts to its original value when EON_SWITCH is turned OFF. 2. Previously, Group 14B was transmitted only 3 times when EON_SWITCH was turned ON, and not transmitted at all when turned OFF. In this version, Group 14B is now transmitted continuously while EON_SWITCH is ON, and when EON_SWITCH is turned OFF, it sets EON_TA to OFF and EON_PTY to 0 (default), then transmits Group 14B 5 times before stopping.
Version 1.072	21 May.2026	1. In DAB, when the Ensemble and Service ECC values differ, the Service ECC is transmitted via FIG0/9. Fixed a bug where the Number of Services field in the Extended field was set one less than the actual count.
Version 1.071	15 May.2026	1. Fixed an issue where some protocol values were not updated when changing the DRM Spectrum BW. 2. There was an issue with the flatness of the FM pre-emphasis filter that caused signal attenuation of more than 1 dB at high audio frequencies. The pre-emphasis filter flatness has been improved to 0.1 dB. 3. Modified the label display to automatically switch to HEX edit mode when content contains non-ASCII characters that cannot be displayed on the 2010C.
Version 1.070	16 Apr.2026	1. Previously, during FW upgrade, the system performed a CRC check after download, wrote to flash memory, and terminated. In this case, if the downloaded data became corrupted during the write process, the system could fail to boot properly. The process has been improved to perform an additional CRC check after writing to flash memory. If the written binary is corrupted, the system now automatically switches to Emergency upgrade mode. 2. Modified the audio analyzer input calibration methodology. The calibration method has been changed from manual variable configuration to using audio calibration files. 3. The Programme Type FIG (FIG0/17) was simplified in the latest DAB Spec (V2.1.1). Therefore, the FIG0/17 structure

		of RWC2010C has been updated to comply with the latest specification.
Version 1.069	08 Apr 2026	1. Previously, the DAB Extended Label text control value was always transmitted. This has been improved to allow enabling/disabling text control for compatibility with legacy devices following older specifications 2. The DAB FIG 0/9 Ext flag was previously always set to 1. This has been improved so that the Ext flag is now set to 0 when the Service ECC matches the Ensemble ECC.
Version 1.068	03 Apr 2026	1. Previously, it was possible to set the Primary component to OFF in DAB mode. However, since this is not permitted by the specification, the system has been modified to prevent the Primary component from being set to OFF. 2. Modified the default subch_id values in DAB mode to be assigned sequentially starting from 1. 3. In Ver1.065, when adding EWS functionality and enabling UTC in FIG0/10, a bug occurred where the FIG type was incorrectly set, preventing FIG0/10 from being transmitted. This has been fixed. 4. When content file names are long, the file name is now displayed in the range window so it can be viewed in full.
Version 1.067	19 Mar 2026	1. Previously, when transmitting PAD data along with DAB MP2 audio, the X-PAD length was fixed to a user-specified value and written over the end of the audio frame. This could encroach on the audio region and cause audio dropouts. The system has been improved to automatically detect audio files newly encoded by RedwoodComm and set X-PAD to variable mode, enabling PAD transmission without invading the audio region.
Version 1.066	07 Mar 2026	1. Corrected a bug in the AF CRC calculation performed during MDI transmission. Previously, Unknown Tags were excluded from the CRC calculation, causing incorrect CRC values to be generated.
Version 1.065	13 Jan 2026	1. EWS functionality has been added to the DAB Functional test. The EWS test requires time synchronization and transmission of different types of FIG 0/15 signals depending

		on the situation, so it has been implemented to support scenario-based testing.
Version 1.064	06 Jan 2026	1. Resolved a bug in ETI playback where large sub-channel size changes during reconfiguration caused discontinuities in time interleaving. 2. Resolved MDI playback failure occurring when a service contains two or more streams.
Version 1.063	05 Jan 2026	1. When the RDS EON switch was set to ON, TP was automatically changed to OFF, but this has been improved to maintain the current setting.
Version 1.062	12 Dec 2025	1. Fixed the bug where MDI files failed to play correctly if the content included two or more streams and the length of Part A was non-zero (UEP). 2. In the DAB PAD channel settings, we have implemented new variables that enable the user to directly set the toggle bit for DLS and the toggle bit for PAD commands.
Version 1.061	08 Dec 2025	1. Fixed the bug where MDI files would not play correctly if the length of Part A of the content was not zero (UEP). 2. In DAB, the variables ASCTY, DSCTY, and UATY (APP_TYPE) were previously automatically set when configuring the DAB Component type and could not be modified by the user. We have now improved the system to allow user modification of these variables for the purpose of abnormal testing.
Version 1.060	11 Nov 2025	1. Improved the firmware to allow the PC application program to manage and read the internal file list of the RWC2010C more efficiently.
Version 1.059	7 Nov 2025	1. Modified the Save/Recall memory structure because the increasing number of DAB variables was causing a memory overflow issue. **Please note that upgrading to this new version will reset all previously saved parameters**
Version 1.058	17 Oct 2025	1. Added the Low-Pass Filter (LPF) function to the Audio Analyzer. 2. Improved the resolution of the Audio Analyzer's audio level measurement from 1 mV to 0.01 mV.

		3. Enhanced the system so that RDS now supports up to four simultaneous Tag information entries, an increase from the previous limit of two. 4. Added variables that allow the user to set the item toggle bit and item running bit when transmitting RDS Tag information. 5. The names for the Save/Recall function were previously fixed as SAVE_0X, but we have now improved this to allow the names to be changed (user-editable).
Version 1.057	17 Sep 2025	1. Simplified the DAB Announcement Switching variable from three settings (OFF, Activate, Deactivate) to two (OFF, ON). When Announcement Switching is changed to OFF, it transmits the Announcement Stop information (FIG0/19) for 2 seconds before stopping completely.
Version 1.056	10 Sep 2025	1. Fixed the bug in FM RDS mode where enabling EON_SWITCH would cause uninitialized, random RDS Group information to be transmitted. 2. Fixed a bug in DAB mode where the Component Label was not being transmitted if the secondary component numbers were added not sequentially
Version 1.055	04 Sep 2025	1. Added an improved remote command that allows special characters to be used when setting DLS and Text for both DAB and DRM.
Version 1.054	22 Aug 2025	1. Reference Clock (Ref Clock) Stability: We improved the RWC2010C so that when the Ref Clock is set to EXT, it will now switch to INT after a 3-second delay if there's no external input. Previously, it would switch back to INT too quickly. 2. External AMP Data Download: We fixed an issue where the content progress bar information was not being sent to the PC program after downloading external AMP data. 3. Stereo FM Phase Offset: We added the AUDIO_PH_OFFSET variable to Stereo FM. This allows users to adjust the phase difference between the Left and Right audio signals when their frequencies are identical. 4. We improved the transmission behavior for FIG0/19 during DAB Announcement switching. Previously, when set to Activate, FIG0/19 was transmitted for 5 seconds and then stopped. When set to Deactivate, it was transmitted for 2

		seconds and then stopped. The system is now improved to transmit FIG0/19 quickly for the initial 5 or 2 seconds, and then continue transmitting it once per second afterward. 5. DAB Alternative Frequency Test Item: The DAB_TO_DAB and SRV_TO_DAB test items have been combined into a single item called AF_DAB. If the OTHER_EID variable within the AF_DAB test is the same as the EID of the currently transmitting Ensemble, this corresponds to the former DAB_TO_DAB test.
Version 1.053	1 Aug 2025	1. When selecting a DAB+ file, the corresponding information (sampling frequency, SBR, PS, surround, etc.) is displayed on the screen, and the BSP is automatically configured. 2. It has been improved by adding the EPG_BEARER variable when transmitting SPI (EPG) via the Packet Data channel in DAB. This improvement clarifies which service the EPG data currently being transmitted corresponds to.
Version 1.052	10 July 2025	1. Added dBu to the Audio Analyzer's measurement parameters. 2. In DAB mode, the 'Label' variables have been updated to be managed by the reconfiguration process. Therefore, it is now possible to test changes to these variables by enabling the reconfiguration procedure. 3. Fixed a bug in DAB mode where the 'EEP Level' variable was incorrectly set to display-only when reconfiguration was enabled. This variable is related to the reconfiguration process and should remain editable based on the DAB Component mode. 4. The UDP Event Port number has been changed to 52010. 5. Previously, when the DAB component type was changed to a 'data channel', the EEP BPS was automatically initialized to 32kbps. This initialization process has now been removed in order to preserve the existing setting. 6. Previously, the DAB TX MODE could be configured to modes 1, 2, 3, or 4. However, the official DAB Specification has been updated to permit only TX MODE 1. In accordance with this change, the TX MODE on the RWC2010C is now fixed to 1, and the corresponding configuration setting has been removed.

Version 1.051	05 June.2025	1. Fixed an issue where the RWC2010C would stop working when frequently switching between DAB, DRM, FM, and AM modes using the remote control for long periods. 2. Added DI (Decoder Identification) variable to FM RDS mode. It indicates different operating modes to switch individual decoders on or off and to indicate if PTY codes in the transmission are dynamically switched. 3. Added the DLS_CLEAR_CMD variable to the DAB PAD DLS channel to allow clearing the DLS displayed on the terminal. 4. Fixed an issue where changes to modulation parameters such as robustness mode, spectrum mode, etc. were not properly applied when changing MDI files in MDI mode. 5. Fixed an issue where Data channel files would not play in DRM mode.
Version 1.050	05 May.2025	1. In FM stereo mode, the FM deviation value of the CW tone was set to the value obtained by subtracting the pilot signal energy from the set value, but the FM deviation value of the CW tone has been improved to maintain the set value. 2. Added START_CU_MODE variable to allow selection of whether to automatically or manually sort Start CU values of each component in DAB. 3. Changing the sampling frequency has improved the problem of sound quality deterioration due to a sampling frequency mismatch when transmitting Wave files in FM mode. 4. The number of files displayed for each type was limited to 32, but has been increased to 256. 5. The problem where the Continuity index of MOT_Header does not increase and remains fixed when transmitting SLS Data has been fixed. 6. Fixed an issue where the PNG file size was set incorrectly in MOT_Header when transmitting SLS data. 7. Fixed an issue where the Service component size information on the DAB INFO screen was not updated correctly. 8. Fixed an issue where the length information of the MOT Header was set incorrectly when transmitting SLS data to the PAD channel in DAB.

		9. When Announcement Switching is executed in DAB mode, FIG0/19 and FIG0/26 were continuously sent to indicate the start and end of the Announcement, but this was modified to send only 5 seconds for the start and 2 seconds for the end. 10. In DAB mode, FIG0/5, FIG0/9, FIG0/10, FIG0/18, FIG0/25, FIG1/0, FIG2/0, FIG1/1, FIG1/4, FIG1/5, FIG2/1, FIG2/4 and FIG2/5 were transmitted as fast as possible, but the transmission rate was improved to once per second on average. 11. Fixed a bug where the transmission ID between the MOT directory and the MOT body did not match when transmitting EPG data in DAB mode. 12. SPI and EPG were separated on the DAB data channel but were integrated into SPI. 13. Added variables to allow editing of short/medium/long names of EPG programs on the DAB SPI Data channel. 14. In the SLS data channel of DAB, there may be an issue where the MOT header is omitted and the MOT Body is transmitted when changing the content. Therefore, the SLS transmission scenario has been improved to reset and transmit again from the MOT header. 15. There may be an issue with SLS in DAB where the tester hangs when changing contents. This has been fixed. 16. In DAB mode, BWS and TPEG, which are no longer used in the data channel types, have been removed. 17. Fixed a bug where the XPAD_DATA_LEN parameter was not applied in DAB mode. It was always fixed as 4 bytes. 18. Changes the sampling frequency of the audio input AUX port to improve EXT audio mode quality. 19. Added parameters to adjust RDS level and phase in FM mode. 20. Added External Audio input function to FM/AM. This function modulates and transmits audio input through the audio input AUX port on the rear panel to FM or AM in real-time. 21. Fixed the bug where the Number of Objects value was set incorrectly in the MOT Header data for EPG in DAB. 22. Fixed a bug where only the PRBS data stream ID was transmitted when connecting audio stream and PRBS data stream to a service simultaneously in DRM.

Version 1.040	05 Oct.2024	1. Added remote command to set SLS content on the DAB PAD channel. - CONF:DAB:COMPONENT:PAD_SLS_CONTENTS - READ:DAB:COMPONENT:PAD_SLS_CONTENTS? 2. FM Filter performance has been improved to remove spurious noise. 3. It is improved to sync the audio phase when the left and right audio signal frequencies of FM Stereo are the same. 4. For abnormal testing, the ASCTY, DSCTY, and APP_TYPE parameters are changed to editable. 5. In the announcement test, when AN_SWITHC_TYPE is ALARM, the cluster ID was fixed to 255, but has been changed to allow editing for abnormal testing. 6. In the announcement test, the ABNORMAL type is added to the AN_SWITHC_TYPE parameter to send two ASw flags (0 and 1). 7. Added left/right audio separation measurement function to the audio analyzer. 8. Added remote command to read audio separation result. - READ:AUDIO:SEPARATE_L? - READ:AUDIO:SEPARATE_R? 9. Added parameter to determine whether to check AF CRC or not when transmitting MDI file 10. Added remote command for MDI CRC Check - CONF:ETI:CONFIG:AF_CRC_CHECK - READ:ETI:CONFIG:AF_CRC_CHECK? 11. SFN (Single Frequency Network) function was added to ETI/MDI mode. To test SFN, two RWC2010Cs are required, and the two units are connected with a data cable to provide the function of synchronizing in 0.1us units. 12. The START_CU parameter has been added to DAB mode to allow users to change the start CU of a component. 13. In DAB, a bug slowed down the FIG1/1 and FIG1/4 transmission rates as the number of services in the ensemble increased, and this has been improved. 14. The Ethernet connection protocol has been improved to allow users to select between TCP and UDP.

		15. SI FIG ratio information has been added to the DAB INFO screen. 16. When selecting DAB PAD as DLS, DRC was always turned on, but a parameter that can turn DRC ON/OFF was added. 17. The function to extract content files stored in RWC2010C to a PC has been added. 18. It fixed the bug where MDI files saved as short interleaving were not transmitted. 19. The AM band's lowest frequency was changed from 150 kHz to 149 kHz. 20. Added encrypted ETI/MDI file transfer function. 21. The ECC (Extended Country Code) parameter has been added to the DAB Service to improve the ability to be set independently from Ensemble ECC. 22. There was an issue where the remote control would occasionally stop working when using the UART port. It has been resolved. 23. There was a problem where the length information of the label variable was not saved when saving and recalling settings, so the label was not transmitted properly. 24. LCD operation stability was improved by changing the LCD Clock from 30MHz to 32MHz.
Version 1.030	30 Jan.2024	1. When transmitting content, the method changed from infinitely repeated reading from EMMC memory to transmitting by reading it only once and copying it to DDR memory. 2. Fixed a content structure memory overflow bug that could cause unstable behaviour when transmitting RDS content. 3. Displays the L-Band frequency range when the L-Band option is ON. 4. Added the ability to download up to 5 EXT AMP cal data and select them in the GUI. 5. Fixed the bug where the contents value was out of range after reset. 6. The FPGA DLL Clock was improved because it was unlocked very occasionally.
Version 1.020	30 Oct.2023	1. The EON_PTY parameter is added to signal to the receiver the start of a programme item carrying a NEWS, WEATHER or ALARM announcement in FM RDS.

		2. The DLS character set parameter was not initialized in DAB mode. The DLS function might not work correctly. 3. Add the remote commands to read audio analyzer waveform data. - READ:AUDIO:SCOPE_WAVE_L? - READ:AUDIO:SCOPE_WAVE_R? - READ:AUDIO:SPECTRUM_WAVE_L? - READ:AUDIO:SPECTRUM_WAVE_R? 4. Packet BER pattern data was changed to be the same as that of the R&S equipment. 5. To prevent audio interruption when changing the mp2 content file, initialization of related system parameters is minimized. 6. In FM Wave mode, audio distortion occurred due to an audio buffer index error, so this was improved.
Version 1.010	10 Aug.2023	1. In DRM mode, the OFDM window function was incorrectly applied, creating a spurious signal in the spectrum. This bus is fixed. 2. There was an issue with editing the dBuV power parameter. This bug has been fixed. 3. Fixed an issue where the signal was disconnected during DRM+ transmission. 4. Added quasi-peak detector function to Audio Analyzer. 5. Added Path_loss Parameter. 6. Added PKT_BER mode for DAB components. It sends packet data in an all-zero or all-one pattern. 7. One normal label on/off and one extended label on/off parameters are applied to all services and service components. It is separated into all services and service components for independent control. 8. Add remote command for announcement support parameter. [CONF:DAB:FUNCTION:AN_SUPPORT, READ:DAB:FUNCTION:AN_SUPPORT?] 9. Added "FREQ_RANGE_EXT" parameter to the system screen to allow settings outside frequency specifications. 10. Change the name of the "POWER" parameter to "POWER [EXT AMP ON]" when the external AMP setting is ON. 11. Added the UTF_16 encoding parameter for the LABEL, DLS and TEXT.

		12. Added parameter for remote command delimiter option to select delimiter among LF, LR, LF+LR. 13. Fix the bug in "CONF:SETUP:TESTER_MODE" remote command. It couldn't change between AM and FM modes 14. There was a memory overflow problem when adding more than 30 services to DAB Ensemble, so it was fixed. 15. The DLS tag information in DAB was set to an invalid value. It is Fixed. 16. The EON_AF parameter is set to an incorrect value in FM RDS. It is fixed. 17. There was a problem that the magnitude of the OFDM symbol changes during DRM+ transmission, so it was corrected.