RFT-831

Twin QPSK/AM remodulator

User Manual

1. Purpose of use

RFT-831 is designed for a processing two QPSK modulated satellite signals into standard CCIR channels. RFT-831 is supplied with a A2 stereo/dual/swap dual/multistandard mono modulator, which can be used on the adjacent channels (VSB modulation) from S 2 to E69.

2. Installation

The connections and indications are shown in Fig 1.

1. Control switch to program channel 1 (left) or channel 2 (right). The switch must be set to middle position when programming is ready

2. Channel number (CCIR) or TV standard.

3. Cable-TV S channel

4. Modulator set-up is activated

5. Signal led indicates that receiver is locked to selected transport stream

6. LNB IN

7. USB port is for possible software update

8. RF OUT + DC IN in RFT-800 frame installation

9. DC IN (only in stand-alone installation)

10. DC OUT for next RFT-831 unit (max. 4 units in chain in stand-alone installation)

11. VIDEO/AUDIO connectors for monitoring
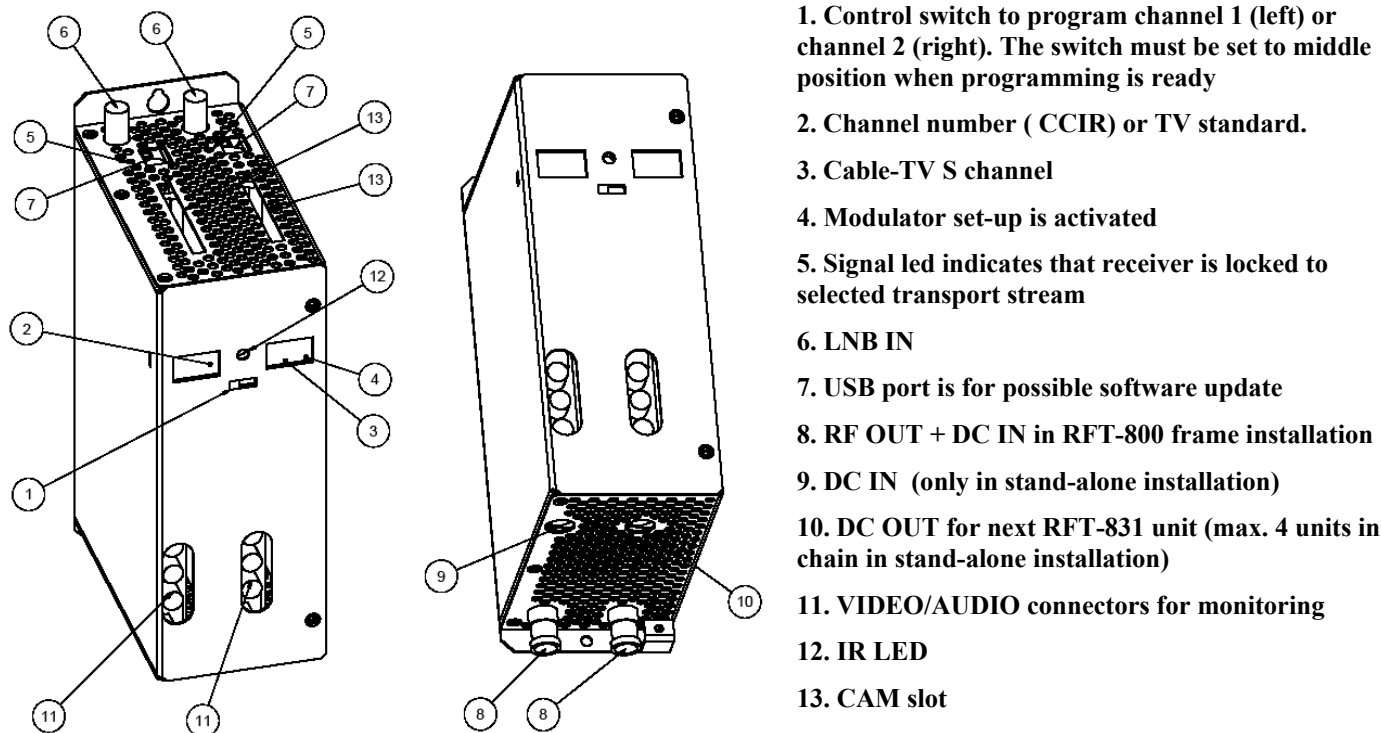
12. IR LED

13. CAM slot

Fig 1.

RFT-831 can be mounted either to RFT-800 frame (RFT-800 User Manual) or stand-alone.

Signals from LNB are fed to IF-connectors (6) at the top of unit.

NOTE! LNB supply voltage must be fed only from one RFT-831 unit to each LNB. For other units must be selected fixed 13 V (Configuration menu/LNB control mode).

When RFT-831 is mounted for RFT-800 frame, the power voltage is supplied through active output combiner. When RFT-831 is mounted stand-alone, power supply is connected to left side of DC connector at the bottom of unit (9). You can loop-through DC from the right side DC connector (10) to next unit with the DC cable. Maximum four RFT-831 units in chain can be supplied with one power supply (RFP-804) in stand-alone installation.

When RFT-831 is mounted for RFT-800 frame, cable to network is connected to active output combiner. When RFT-831 is mounted stand-alone, RF OUT (8) is connected to cable network via external RF combiner.

VIDEO/AUDIO connectors (11) are for monitoring the unit.

NOTE! CA module (13) for smart card must be installed and removed only when power is OFF.

3. Programming

The receivers and modulators are simple to program with the remote control unit (RCU). The main functions of RCU are shown in Fig 2.
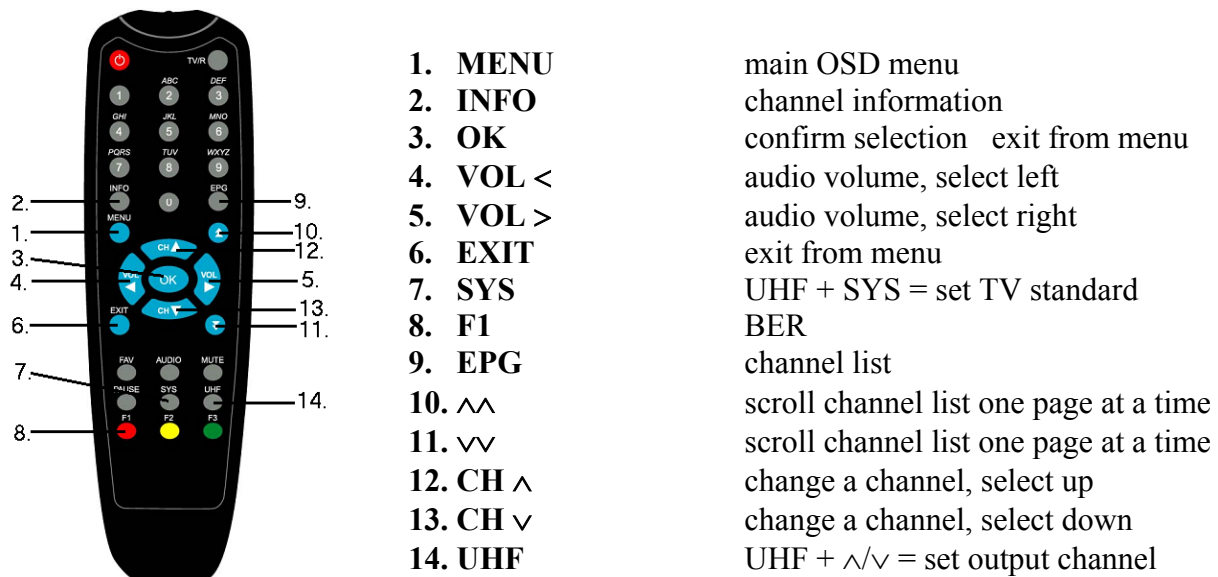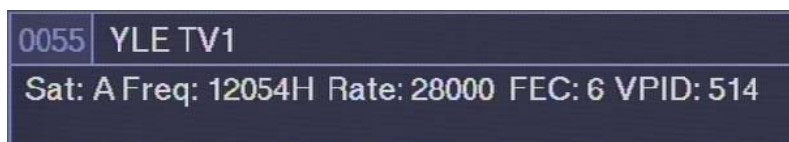

1.	**MENU**	main OSD menu
2.	**INFO**	channel information
3.	**OK**	confirm selection exit from menu
4.	**VOL <**	audio volume, select left
5.	**VOL >**	audio volume, select right
6.	**EXIT**	exit from menu
7.	**SYS**	UHF + SYS = set TV standard
8.	**F1**	BER
9.	**EPG**	channel list
10.	**∧∧**	scroll channel list one page at a time
11.	**∨∨**	scroll channel list one page at a time
12.	**CH ∧**	change a channel, select up
13.	**CH ∨**	change a channel, select down
14.	**UHF**	UHF + ∧/∨ = set output channel

Fig 2.

3.1 Power-up

At power-up this welcome screen is displayed. Receiver and user interface version numbers plus unit serial number are shown.

On front panel display selected output channels (Fig 1. no2) are displayed. The factory set channels are E7 and E8. The display lights up when the unit is powered. The display is switched off after 3 minutes and just two leds are lightning up. The display lights up again by pressing any button of remote controller unit.

Next program info for channel previously selected is displayed and the channel opened, if possible. Info shows satellite number i.e. DiSEqC switch control, transponder frequency, data rate, FEC and channel video PID number. Please note that opening a channel will take longer time when a conditional access module is inserted. It is recommended to use updated smart card. If the channel list is empty, welcome screen will remain displayed.

3.2 First time set-up

When using the unit for the first time, you must first set the modulator output to required channel. After this you can continue set-up using on-screen menus.

To control modulator first slide front panel switch to left or right position to control receiver 1 or 2 respectively. Press UHF key (Fig 2. no 14) on the remote. On selected output channel display a dot is lit on right lower corner (Fig 1. no4). This indicates that modulator set-up is activated. Test pattern and test sound are switched on.

To change output channel press up or down CH keys (Fig 2. no 12 or 13) to scroll thought available channels. Cable TV S-channels are indicated with a dot between digits (Fig 1. no 3). The selectable channels are S02 - S10, 5 - 12, S11 - S41 and 21 – 70 (CCIR).

To change TV standard press SYS key (Fig 2. no 7) repeatedly until required standard name (BG, I, DK, L or MN) is displayed.

To save modulator settings press OK key (Fig 2. no 3). To cancel selection, press EXIT key (Fig 2. no 6). Modulator set-up will be exited and test pattern and test sound will be switched off in both cases.

3.4 Set-up

To start set-up, press Menu key (Fig 2. no 1). Main Menu will be displayed.

```
Main Menu
Channel List
SW Version Info
Configuration
Modulator
Menu Language   English
Exit
```

If channels are already stored, select "Channel List" and press OK.
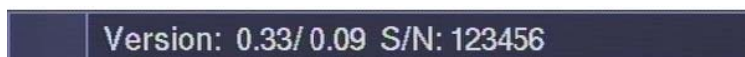
```
Channel List
0051 A:11823HHi Party TV        FTA
0052 A:12054HHi Nelonen         CA
0053 A:12054HHi MTV3            CA
0054 A:12054HHi TV Finland      CA
0055 A:12054HHi YLE TV1         CA
0056 A:12054HHi YLE TV2         CA
0057 A:12054HHi YLE FST         CA
0058 A:12054HHi YLE Extra       CA
0059 A:12054HHi YLE Teema       CA
```

On channel list all stored channels are listed with sequence number, satellite number, transponder frequency and band information. After channel program name on right column channel status is shown. "FTA" stands for free channel available without a Conditional Access module or a viewing card. "CA" stands for Conditional Access channel. To view a CA channel an appropriate Conditional Access Module and a viewing card will be needed. This information is only normative and can be missing in some cases.
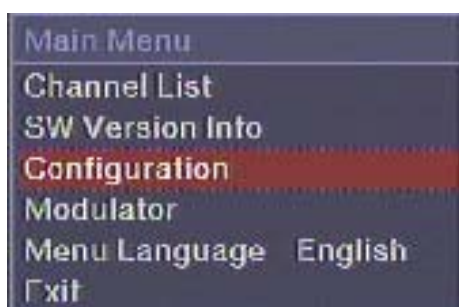
You can scroll the list using up and down arrow keys (Fig 2. no 12 or 13). To scroll one page at a time, use double arrow keys (Fig 2. no 10 or 11). You can use auto repeat by keeping a key pressed.

To select a channel press OK key. Menu will be closed and channel opened, if possible. To exit without selecting any channel press EXIT key.

In main menu, select "SW Version Info" and press OK to display receiver and user interface version numbers plus unit serial number info.

Most of the system set-up is done in Configuration Menu. Select "Configuration" and press OK to enter.

You can select the audio language in two ways. Firstly you can select from preset languages selecting "Audio Language" and using left and right arrow keys (Fig 2. no 4 or 5) to select the language name. Secondly if your language is not among the preset languages you can freely write any 3-character language name. Use double arrow keys (Fig 2. no 10 or 11) to select character position, which will be underlined, and select needed character using up and down keys (Fig 2. no 12 or 13). Use double arrow keys to exit edit with no character underlined.

You can also select subtitle language in a similar manner or you can select OFF to turn off subtitling.

Configuration Menu

Audio Language	fin
Subtitle Language	e i n
Front-end Control Mode	Universal LNB
LNB Control Mode	Normal
Scan Satellite	
Scan Transponder	
Clear Program List	
Add Default Channels	

Front-end control can be adjusted by selecting "Front-end Control Mode" and using left and right arrow keys to select appropriate mode. This mode is used in "Scan Satellite" task as well as in normal operation.

In "LNB Control Mode" you can select normal or fixed control using left and right arrow keys.

All selectable options in Configuration Menu are shown below.

Configuration Menu

Audio Language	ces cze dan eng esp fin fre ger isl nor por slk slo swe
Subtitle Language	OFF ces cze dan eng esp fin fre ger isl nor por slk slo swe
Front-end Control Mode	Low Vertical Low Horizontal High Vertical High Horizontal
LNB Control Mode	Normal Power off
Scan Satellite	Universal LNB Toneburst DiSEqC 1.0
Scan Transponder	DiSEqC 1.0 - A DiSEqC 1.0 - B DiSEqC 1.0 - C
	DiSEqC 1.0 - D
Clear Program List	
Add Default Channels	European

To scan satellites select "Scan Satellite" and press OK key.

Configuration Menu

Audio Language	fin
Subtitle Language	fin
Front-end Control Mode	Low Vertical
LNB Control Mode	Normal
Scan Satellite	
Scan Transponder	
Clear Program List	
Add Default Channels	European

Scanning Satellite
Sat: A Pol: V Freq: 10700 Found: 0

If any of the one band front-end control modes is selected, only that band will be scanned. For low band, frequencies from 10700 to 11700 MHz will be scanned. For high band, frequencies from 11700 to 12700 will be scanned. If "LNB Control Mode" is set to "Normal", appropriate control voltage and 22 kHz control is output to LNB. If "Fixed 13V" is selected then only 13 V will be output. This is useful when splitters are used to feed LNB signal to several receivers.

When "Universal LNB" is selected then all four bands of a universal LNB will be scanned automatically using voltage and 22 kHz control. When "Toneburst" is selected then two universal LNBs will be scanned using toneburst switch control. When "DiSEqC 1.0" is selected then four universal LNBs will be scanned using DiSEqC switch control.

You can monitor the search at lower part of the display.

As satellite search will take considerable amount of time, you can opt to scan only one transponder if you know the parameters. To do this, select "Scan Transponder" and press OK key.

You can adjust transponder frequency using numeric keys, left and right keys or double arrow keys.

You can select Symbol Rate from preset values using left and right arrow keys or select "Auto" to try all these preset values. You can also enter any symbol rate using numeric keys or double arrow keys.

FEC can be set to "Auto" or any fixed value using left and right keys. Polarization is also selected using left and right keys. Sat ID will be used in channel information and to control DiSEqC switch.

When using non-universal LNBs, you can adjust the local oscillator frequency values accordingly.

All selectable options in Scan Transponder Menu are shown below.

To scan the transponder select "Scan" and press OK key.

```
Scan Transponder
Frequency              12054
Symbol Rate            Auto
FEC                    Auto
Polarization           Horizontal
Sat ID                 1
Low LNB Frequency      9750
High LNB Frequency     10600
Scan
```

```
Please wait.
```

To exit menu press EXIT key.

In configuration menu, to clear all channels from channel list select "Clear Program List" and press OK Key.

```
Configuration Menu
Audio Language         fin
Subtitle Language      fin

Front-end Control Mode Universal LNB
LNB Control Mode       Normal
Scan Satellite
Scan Transponder

Clear Program List
Add Default Channels
```

```
Program List Cleared.
```

In "Add Default Channels" menu you can add channel lists of different satellites according to region (European, Nordic or British). Select region with the left or right arrow key and press OK key to confirm region.

Configuration Menu

Audio Language	fin
Subtitle Language	fin
Front-end Control Mode	Low Vertical
LNB Control Mode	Normal
Scan Satellite	
Scan Transponder	
Clear Program List	
Add Default Channels	**European**

Channels Added.

To exit menu press EXIT key. The settings you made will be saved.

User settings saved.

In main menu, to adjust modulator, select "Modulator" and press OK.

Modulator Menu

Output Channel (CCIR)	**24**
TV Standard	BG
Audio	Stereo
Output Attenuation	0
Fine Tune	0.00 (495.25)

You can select output channel using left and right arrow keys. The channel number will be displayed simultaneously on front panel display. The selectable channels are S02 - S10, 5 - 12, S11 - S41 and 21 – 70 (CCIR).

You can select the TV standard using left and right keys and audio output for BG standard. "Mono" is standard audio. "Stereo" and "Dual" use dual tone coding system to transmit two audio channels. "Dual Swap" reverses the main and secondary audio. For standards other than BG only mono can be used.
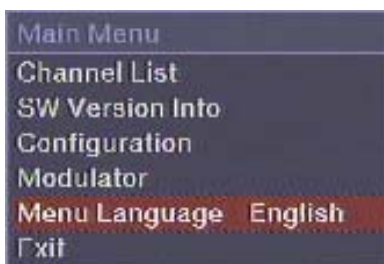
All selectable options in Modulator Menu are shown below.

To adjust modulator output attenuation use left and right arrow keys. You can fine tune output frequency when using different channel grid than CCIR. Adjustment is done using left and right arrow keys in steps of 250 kHz. Adjustment range is +- 4 MHz. You can monitor the adjusted frequency in parenthesis on the same line.

Press EXIT key to exit menu. The settings you made will be saved.

In main menu, to select menu language, select "Menu Language" and press OK.

You can select the menu language using left and right keys

Press EXIT key to exit menu. The settings you made will be saved.

Normal operation

When not using the menu system you can adjust audio volume by pressing left and right VOL keys (Fig 2. no 4 or 5) and change channels using up and down CH keys.

To open the Channel List press EPG key (Fig 2. no9). To see current channel info press INFO key (Fig 2. no2).

You can also monitor satellite signal quality by pressing F1 key (Fig 2. no8)

Press EXIT key to close this display.

When programming is ready, the front panel switch must be slided to center position. This will prevent accidental changes to be made while controlling other units. The display, exept two leds, are swithed off in 6 minutes after programming is finished.

4. Technical specification

Number of channels	2
Tuners	2
Input frequency range	950 - 2150 MHz
Input level	-70 … -25 dBm
Waveform	QPSK (SCPC, MCPC)
Symbol rate	4-45 MS/s
FEC decoder	Automatic
Transport stream	MPEG-2 ISO/IEC 13818
Teletext	Through VBI
Subtitling	DVB or teletext
CI slot	2
Output frequency range	112,25 MHz - 855,25 MHz
Modulation	AM, VSB, A2 stereo, swap dual
Transmission standard	B/G, D/K, I, L, M/N
Output level	85 - 105 dBuV
Spurious products	< 60 dBc
S/N weighted	55 dB
Data interface	2* USB 1
Input connectors	F-female 75 ohm
Output connectors	F-male 75 ohm
Power consumption	16VDC/1,2A
Dimensions	W*H*D 72mm*218mm*129mm
Mounting	RF-800 rack or stand alone