FlexMon FM01/02

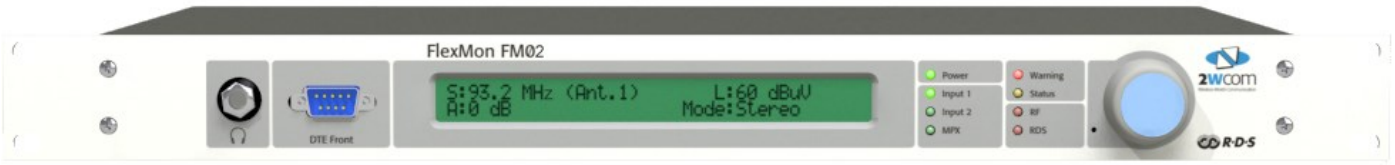
Professional, flexible Monitoring Device

Demodulator

TMC/RT+

RDS Databridge

Alarm Receiver



User Manual

(most examples and pictures based on FlexMon FM02, ARM Version >2.42)

FM01-02 User Manual V02.37

November 2018

Content

1. Symbols in this manual

1.1. References and Hyperlinks in this PDF File

The original text document of this manual uses bookmarks for reference purposes. If you read this manual as a non-print version, please note that this PDF file also contains all bookmarks! So you can navigate through the document via the content overview in your PDF viewing software if you activate "bookmarks view".

All references to pages, sections, figures and tables as well as hyperlinks in the text identify a location within this PDF file. Just click the reference to find the referred passage in the text!

1.2. Warning signs and their meaning

The following warning signals are used in this user manual:

	Warning of general danger location
	Warning of electric shock
	Warning of hot surface
	Warning of fire hazard

1.3. Tags and their meaning

The following signal words are used in the product documentation in order to warn the reader about risks and dangers. The tags described here are always used only in connection with the related product documentation and the related product.

⚠ DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
NOTICE	Describes precautions necessary to protect the equipment.
	**NOTE:** Useful information for the user.

2. Introduction

Description

FlexMon FM01/02 is a professional flexible monitoring rebroadcast receiver that is able to monitor up to 8 programs feeding over two FM inputs and rebroadcast them as an MPX signal over an MPX output (2x MPX outputs in FM01).

It can be brought into operation for example for rebroadcasting radio programs by the broadcast transmitters in the distant areas, where the RF signal is too weak and RDS cannot reach the receiver

The FM01 series are available in four variants:

- FlexMon FM01 Demodulator
- FlexMon FM01 TMC/RT+ Decoder
- FlexMon FM01 RDS Databridge
- FlexMon FM01 Alarm Receiver

The functions of the FlexMon FM01 series are partly built in the other units and some of them have other functions. The main function of **all** devices is to monitor the audio signal from one of the eight configurable FM stations and send alarms via email, SNMP or switching relay contacts. Separate devices are equipped with a wider range of monitoring functions.

The FlexMon FM02 is a follow-up model of the FM01 and can operate as one unit. The functions of the FM01 series are available in the FM02 as extra rights.

The following manual guides you through the operation modules of all FlexMon FM01/02 variants and this is indicated by the corresponding notation in the manual.

Some features can be combined with each other as separate modules and built in on request. Please contact our sales department.

Control

HTTP Web interface

The unit is controlled via a built-in web user interface.

SNMP

Additional monitoring of the device using SNMP is possible. Rudimentary device control, status information and alarm trap generating are available.

LCD and jog wheel

Simple configurations can be made via LCD menu and jog wheel.

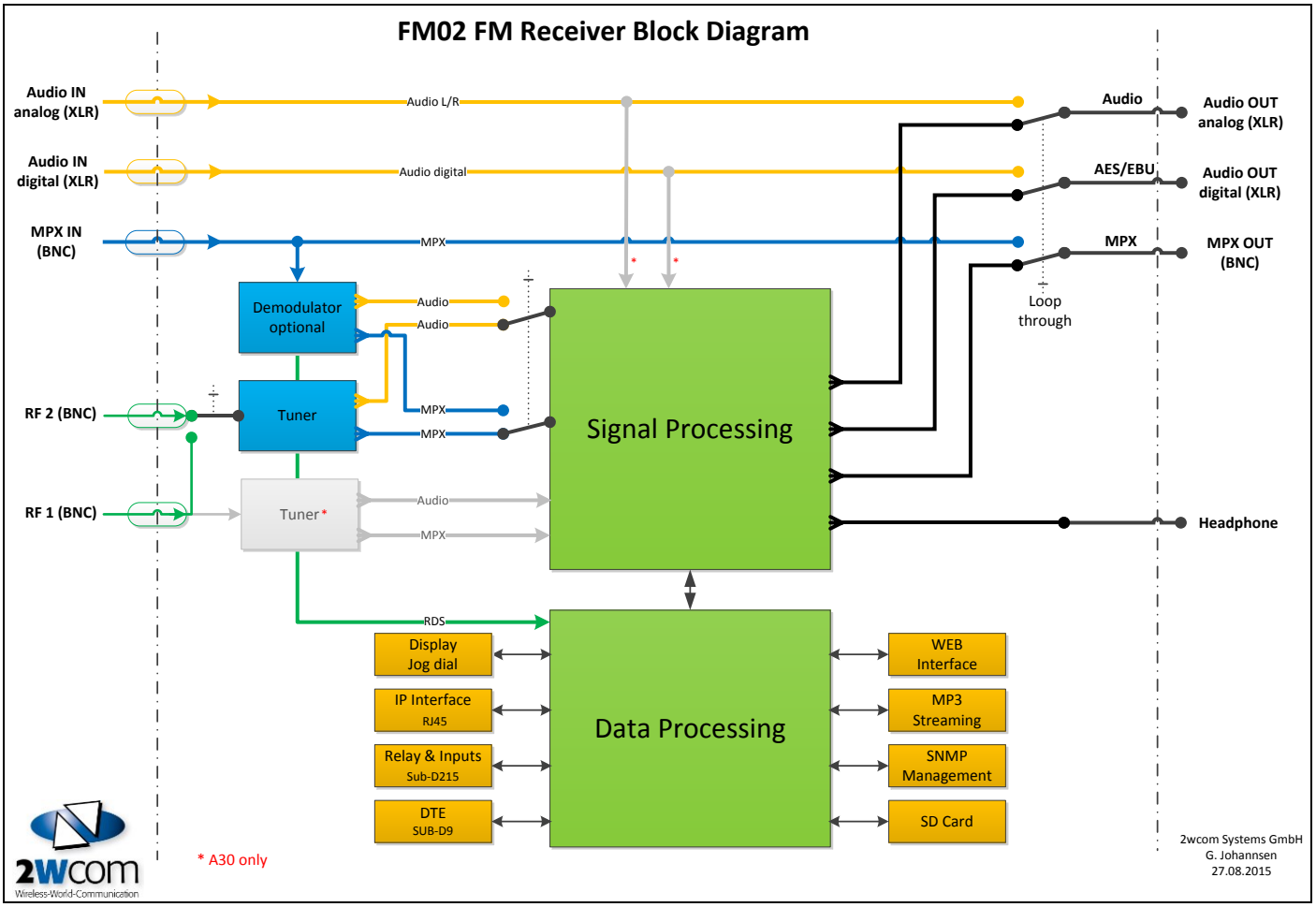
User

Only experienced technical personal or engineers should operate the FlexMon FM01/02 devices. Basic knowledge about FM technology and IP networks is required.

NOTE: Read this user manual carefully before attempting to operate the unit. Save this user manual for future reference – it contains important safety and operating instructions for the device.

2.1. General functions – FlexMon FM01/02 series

All FlexMon FM01/02 series are equipped with RF antenna and MPX inputs and internal FM tuner. You can individually configure up to eight stations and monitor one of them.

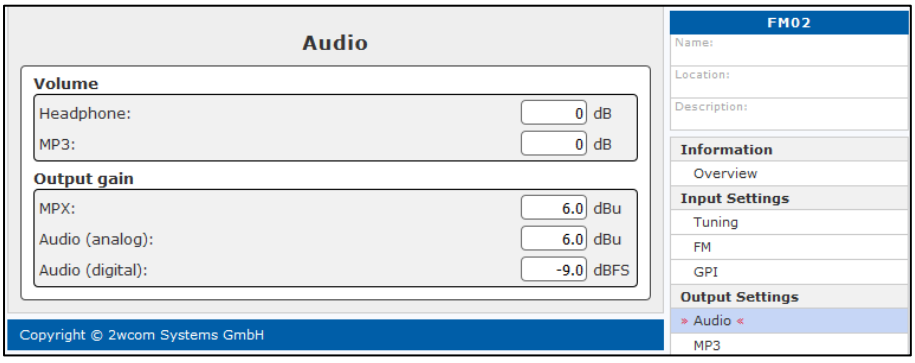


Inputs

- 2x RF antenna inputs for redundant feeding of an RF signal (up to 120dBµ)
- MPX input (“external”/”internal” audio source)

Signal outputs (for option Demodulator)

- 1x MPX signal output (FM01: 2x MPX outputs)
- analog L/R Audio XLR output
- digital audio AES/EBU XLR output
- gain for all outputs configurable



Signal outputs (only for monitoring)

- mono signal output (TMC/RT+ Decoder & RDS Databridge)
- Headphones
- MP3 streaming via TCP/IP and web interface

FM Tuning

- up to 8 programs for monitoring configurable
  (source MPX (only FM01) or antenna 1/2, frequency for FM)
- only one program can be monitored at the same time
- mono/stereo for all programs switchable
- audio level for outputs configurable
  (no audio outputs in the FM01 TMC/RT+ and FM01 Databridge)

FM Monitoring

Configurable for each station:

- FM parameter
  - RF level (hysteresis controlling, no automatic antenna switching)
  - pilot tone (only in the current hardware)
  - MPX power (output level)
- Audio parameter
  - audio level L/R (mono signal, availability of modulation)
- RDS parameter
  - RDS synchronization
  - basis RDS decoding and monitoring of PI, PS, TA, TP, PTY
  - Option TMC/RT+: decoding and monitoring of TMC (Group 8A), ODA (Group 3A)
  - decoding and monitoring of !TA, BER (only in the current hardware)

Configurable only for one station:

- FM station change

Device Monitoring

- device temperature

RDS decoder

- RDS Databridge (extra option)
- Decoding of all RDS data:
  - PI, PS, TA, TP, PTY, MS, CT
- RDS Decoding: RT, ODA-AIDs, BER,
- RDS synchronization
- Inspection of the received RDS data with external PC software **RDS Lab**
- Optional: internal memory (up to 32 Gigabyte) for TMC, RT, RT+, TA logs

Option Audio Demodulator

If the option Demodulator is available, the FM01/02 demodulates audio signal and distributes it from the FM tuner to the audio outputs (analog or digital) and as an MPX signal to the MPX output (2x MPX outputs in FM01).

Option TMC/RT+

If the option TMC/RT+ is available, the FM 01/02 decodes and monitors all RDS parameters including TMC and RT+ massages and outputs them in plain text with **external PC software RDS Lab**. The device is able to monitor one of the maximal eight configurable programs feeding over RF antennas or MPX input (only FM01). Therefore, the device has only a monitoring function and does not output the signal for further distribution, it is sending only alarms.

There is also an option to monitor individual RDS group data. In case of failure of certain RDS groups an alarm will be generated via SNMP, e-mail or relay.

The FM01/02 is particularly suited for operators with main focus to monitor TMC data around the clock and for regional radio stations located in distant areas.

RDS Lab

RDS Lab is an external Windows application, which allows you to see all RDS data together with the FM01/02 in real-time. RDS monitoring over RDS Lab is for FM Tuner available.

You can download RDS Lab directly from the following link:
http://download.2wcom.com/software/RDS_Lab/RDSLab_Current_incl_Tables.zip

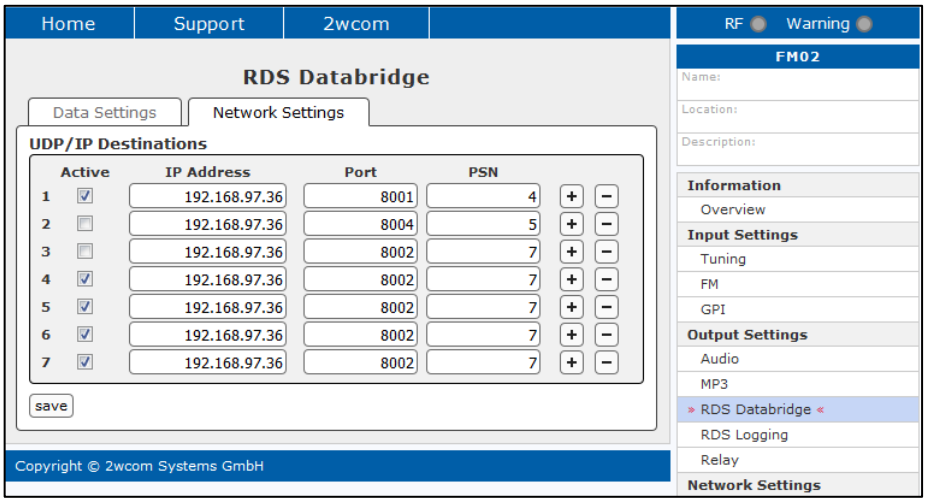
For more information about settings for RDS Lab in the FM01/02 see section 12.6 “RDS Lab” on page 43.

Option RDS Databridge

If the option RDS Databridge is available, the FM01/02 decodes and forwards dynamic RDS data from an off-air received signal to a connected RDS Encoder for retransmission.

The FM01/02 is able to:

- receive the dynamic RDS over an RF antenna or an MPX input (only FM01)
- generate alarm via SNMP, e-mail or relay in case of failure of certain RDS groups
- build UECP commands to feed the received information into a connected RDS encoder via a serial line for retransmission and via TCP/IP for up to 32 destinations



Alarm reporting via

- SNMP traps, email
- serial ASCII text output (RS-232)
- activation of floating relay contacts (6 NO (normally open), 1 CO (change over))
- LED
- alarm log

2.2. Option Alarm Receiver - PTY31 monitoring

Description

If the option PTY31 is available, the FM01/02 monitors an RF or an MPX signal from the **internal source** for **RDS PTY 31**, reserved for alarm identification, as well as for **RDS PTY30**, reserved for testing alarm. The FM01/02 is in normal operation looping through an analog/digital audio or an MPX (only FM01) signal from the **external source**. In alarm case, when a warning message is broadcasting over a monitoring radio program (e.g. a national radio station) and the FM01/02 device identifies PTY 31, a rebroadcasting audio (analog/digital/MPX) signal will be interrupted and will switch over from the **external** to the **internal source,** in order to broadcast the warning message.
The FM01/02 can be brought into operation for example for rebroadcasting radio programs by the broadcast transmitters in dangerous areas, where a quick warning of the population about an emergent situation is necessary.

Functions

Connections for internal source

- 2x RF antennas for redundant feeding of an RF signal
- MPX input [only FM01, Front or Rear]
- Headphones output
- MP3 streaming for monitoring

Connections for external source

- MPX input and output (only FM01, Rear)
- AES/EBU digital audio input and output
- XLR analog L/R audio inputs and outputs
  (FM01: the same XLR connector for AES/EBU and analog L output/input).

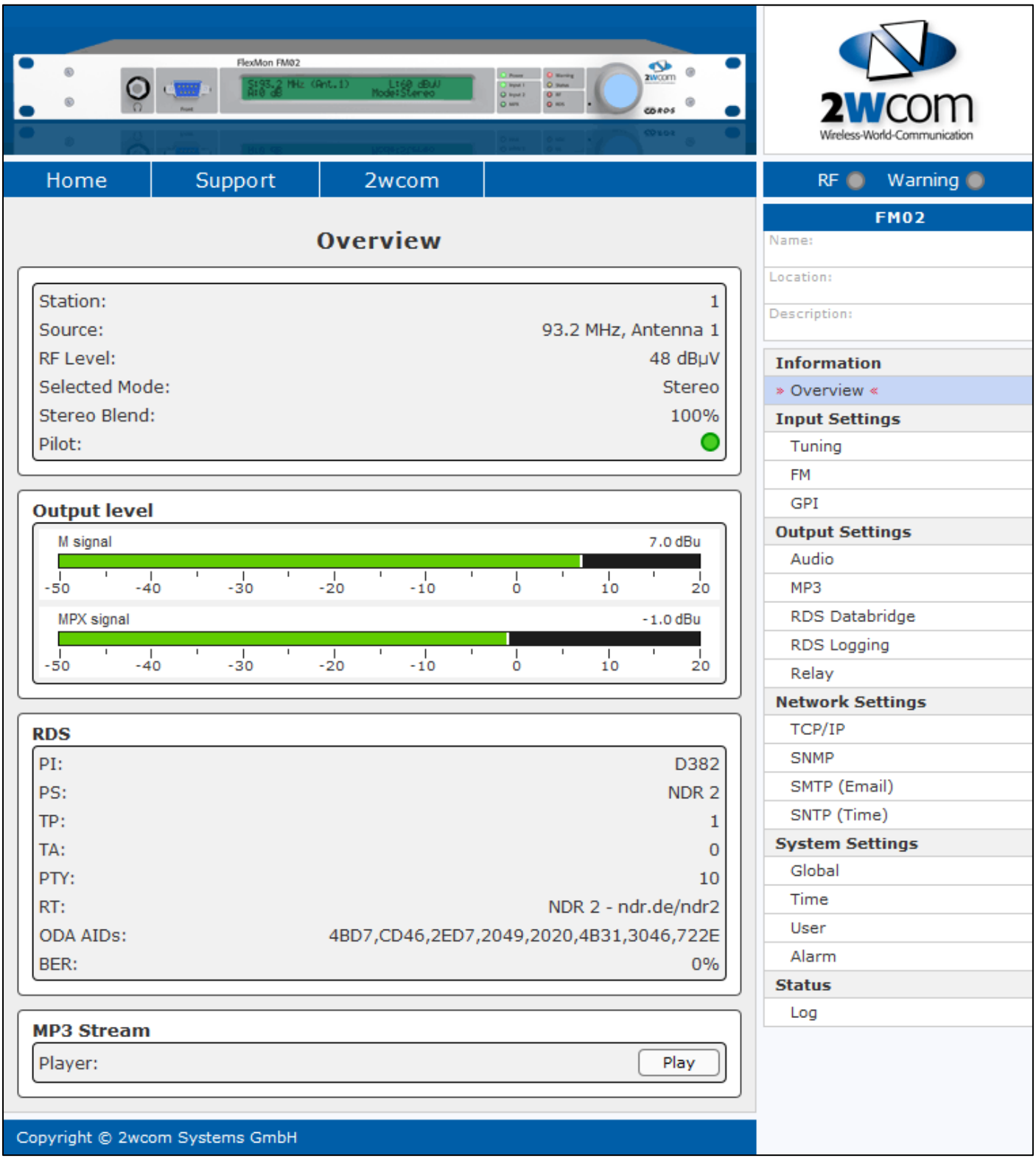
Tuning (internal source)

- the same as described in "General functions" (see Section 2.1)

Monitoring (configurable for each program)

- the same as described in "General functions" (see Section 2.1)
- additionally: RDS PTY30/31 Alarm

2.3. Control over Web interface



3. Safety Instructions

For a secure operation of the device the user should read and hold on all safety instructions mentioned in this manual before the first operation.

⚠ WARNING	Non-compliance with the safety instructions can lead to serious injury.

Any changes on the device or operation of the parts not having been proved and released by the manufacturer can lead to unforeseen damage.

Every improper use of the device and all actions on the device not mentioned in this user manual are regarded as a not allowed misuse outside the statutory limits for liability of the manufacturer.

If you sell the device or give it to another person, attach this user manual to the device.

Never operate the device, if it does not function properly. If the device or its part is out of order, put it out of operation. Never repair the device by yourself. If there are any damages in the device, send it immediately to 2wcom Systems for maintenance or dispose it professionally according to the regional disposal regulations.

Keep the device away from unauthorized persons.

⚠ DANGER	
	**DANGER of electric shock** Plug the device into a grounded power socket only. Never remove the grounding wire/contact. Never open the housing of the device by yourself. Never touch open electrical parts. Dangerously high voltages are present inside the housing. Even after disconnecting the mains supply, dangerously high voltage levels may be present for a certain time. Do not touch the device with wet hands. Never expose the device to liquids. If any liquid comes inside the housing, immediately disconnect the device completely from the power supply. Do not continue operating the device.
	**FIRE HAZARD of overheating or electric shock** Ensure sufficient heat dissipation during operation. Avoid following when installing the device: – non-ventilated environment, for example a narrow shelve or built-in wardrobe; – extremely warm or cold place; – direct sunlight exposure; – too high or too low temperature; – extremely wet or dusty environment.

	Do not operate the device in the presence of flammable gases. Do not cover the ventilation openings of the device to avoid heat accumulation. Do not put objects with open flames such as burning candles on the device. Do not put heavy objects on the supply cord. A damaged cord can lead to fire or electric shock hazards. To disconnect the supply cord, drag always the plug and never the cable to avoid the cord damage.

⚠ WARNING	
	**WARNING of explosive atmosphere** Risk of the explosion hazard. Do **not** use the device in an explosive environment.
	**WARNING of hot surface** The surface of the device can heat up during operation. The device is equipped with a passive cooling system. Do not touch the surface of the device during operation.

NOTICE	
	CAUTION: Risk of equipment damage *Before the first operation:* Check the housing, the front panel, the supply cord and the plug for visible damage (e.g. scratches, cracks, damaged isolation and abrasion) In case of damage, unplug immediately the supply cord. Never operate device with a damaged supply cord. All damaged components must be replaced immediately. *Installation:* Use only a grounded three-wire power supply cord and -plug that complies with the national regulations.

	If necessary, another than the supplied supply cord has to be used, in compliance with the regulations of the country where the device is operated. Make sure that the AC power outlet is next to the device and readily accessible to the user. *Installation of other devices:* External devices which are connected to the device could be damaged by the device or damage the device itself if the output levels exceed the specified limits. *Cleaning:* Do not use corrosive detergents on the device such as benzine, thinner, alcohol or acetone. Clean the surface of the device only with a soft dry cloth.

4. Supplied Parts

- FlexMon FM01/02 Device
- Instruction for user manual download “Link to product data”
- Power supply cord*
- Patch cable
- PC Software to download (RDS Lab optional)
- User manual in PDF format to download; on request by paper

*available for different countries

NOTE: The scope of delivery may deviate in special cases.

5. Manufacturer

2wcom Systems GmbH • Am Sophienhof 8 • 24941 Flensburg • Germany

Phone (+49) 461 – 662830-0 • Fax (+49) 461 – 662830-11

contact@2wcom.com • www.2wcom.com

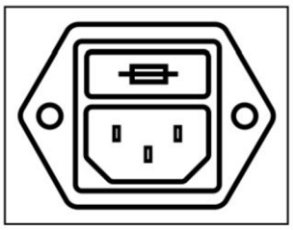
6. Installation

Best setup location

The device should be installed in a 19” rack. Avoid direct sunlight, proximity to radiators and air conditioning, dust, water, and chemicals. Choose a rack location that permits a clear view of the indicators on the device and ensure a sufficient heat dissipation of the device.

Mains supply connection

The device is designed for operation with 100 to 240 V AC, 50 to 60 Hz. Check the corresponding device labeling for compatibility to the domestic line voltage and frequency before connecting the IEC power connector to the mains supply!



No power switch is available; unplug mains supply connector to remove power. Keep the mains supply plug readily accessible to the user.

⚠ WARNING

WARNING
Disconnect mains power plug before you open the housing.
Repair of the equipment must only be carried out by authorized and qualified personnel.
Read also Section „Safety Instructions”.

7. Operation

7.1. Device Control via Web Interface

The device has an integrated web interface. All configurations and operations can be made using a web browser.

To control the device via web interface:

Connection: for network configuration and access to the web interface see Section 10.1.

NOTE: To maintain security, you are automatically logged-out after 15 minutes of no activity.

Navigation: to navigate through the web interface, use only the menu buttons of the web interface and not those of the web browser (i.e. forward and back).

Buttons:

- if you want to save any changes made in the configuration of the device, press the button save;
- if you don't want to save the changes, press the button reset in the input fields of the web interface. Saved changes cannot be reset by this button to a default.

NOTE: Each field has to be saved individually.
If you change data in several fields, you must click save under each field, in order to save all changed data.
Note, that the save button is not displayed in the latest versions of the web interface and appears only, if any changes have been made.
Otherwise, the unsaved field will be reset to the previously saved status.

Numbers: use a decimal point as the decimal separator in numbers in the input fields (i.e. "6.5" for six and a half).

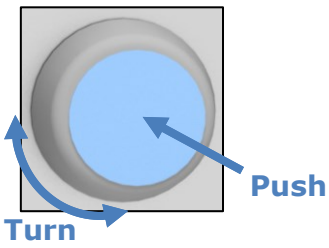
Input fields: After entering a number or text in an input field, you must click on the corresponding save or ok button to activate the changes. Alternatively you can use the ENTER-key of your computer keyboard.

The next sections explain the separate web interface functions. The operation via jog dial and LCD on the device is similar to these descriptions.

7.2. Operation via LCD / jog dial

Some basic functions of the device can also be operated via the LCD/jog wheel at the device.

The possible movements of the jog wheel are:



The display consists of the two main navigation menus:

- Status Overview (turn the jog wheel left or right)
- Configuration Menu (push the jog wheel)

Via display and jog wheel you can:

- configure network settings for the first access to the device over the web user interface
- configure [DTE Front] interface for input/output setup function (Baud, Protocol: Terminal)
- set up tuner (frequency, steps frequency setting, mono/stereo)
- set up FM parameters
- configure gain of the outputs
- set up volume of the headphone and MP3 output
- view the log
- view the tuner status:
    - details of the output signal
    - current RDS information

NOTE: In this user manual, if a certain configuration is possible over the LCD/jog wheel, the corresponding menu path is shown at the end of the section, for example:

`LCD menu: Configuration Menu→Interface→TCP/IP`

After the warmstart/coldstart of the device the display first shows the "Status Overview" menu:

NOTE: If you navigate in the LCD menu, the display remains at the last menu view for 60 seconds and changes then to the "Status Overview" menu.

- To move the cursor in the menu structure, turn the jog wheel.
- To open a menu entry or to confirm a setting, push the jog wheel.
- To select a configurable menu entry, turn the jog wheel.
- To adjust a menu entry, push and then turn the jog wheel.
- To confirm the adjustment, push the jog wheel.
- To return to a previous menu level, activate the menu entry "**→Back**".
- Some settings need a restart of the device to be activated.

8. First Steps

The following section contains instructions for quick start.

✓ You have already unpacked and installed the device in an appropriate place

8.1. Power supply

NOTICE	
	Make sure that the device and the contained cords are compatible to the domestic line voltage and frequency!

If the device is compatible, connect the power supply cord fully to the IEC power connector at the back panel of the device and a mains power outlet.

NOTE: The FM01/02 Alarm Receiver will normally loop through the connected audio input signal (MPX, digital, analog), even in case of no power connection to the device.

⇒ The "Power" LED will then turn on.

8.2. Network configuration

For delivery the device is configured with default settings for the first connection via the IP interface.

To configure the IP settings:

1. Use the jog wheel to select "**Configuration menu**"→**Interface**→**TCP/IP**".
2. Configure settings for your existing IP network (IP address, netmask, gateway etc.; consult the responsible network administrator if applicable).
3. Save the settings by using the jog wheel and reboot the device confirming the reboot question.
4. Connect a network patch cable to the "10/100-Base-T" connector on the back panel of the device and your existing IP network.

⇒ Your device is now connected to network.

8.3. Web interface

The device can be fully operated with an internet browser via the integrated web interface. For this purpose use a computer that is connected to the same IP network that the device is connected to.

To operate the device via the web interface:

1. Start an internet browser (always use an up-to-date version with Java Script activated).
2. Enter the configured IP address in the address bar of the browser. If the IP address has not been changed in step 8.2, please enter the default address in the address bar of the browser: **192.168.14.250**.
3. A login screen with *Username/Password* appears. Use the default accounts:
    i. for a read-only access use "user"/"user"
    ii. for a full access use "admin"/"admin"

⇒ After entering the correct login data (case sensitive), the main FM01/02 page appears.

NOTE: Change the login data as soon as possible to avoid unauthorized access to the device and document the login data in a safe place.
You can change your login data under **System Settings→User.**

8.4. Connecting the device

For audio and RDS monitoring, connect the device as follows:

1. Connect the FM01/02 with the available antenna inputs for feeding an RF signal (internal source).
2. Connect the device with the MPX input/outputs (Front or Rear), if available.
3. Connect the digital/analog inputs/outputs, if applicable.

NOTE: In the FM01/02 Alarm Receiver, the same XLR connectors (IN/OUT) can be used in both modes: as AES/EBU for digital audio and as analog L input/output.

You can set up the mode for the connectors under **Output Settings→PTY31 Alarm** (see section 12.7)**.**

4. Use the headphone output for monitoring the internal source.

8.5. Set up tuner

It is possible, to set up eight individual input settings ("stations"), which you can save and quickly switch over.

To set up one of the eight stations:

1. Select **Input Settings→Tuning** in the web interface menu. The page *Tuning* appears.
2. Choose an activated input for MPX or RF signal in the dropdown menu **Source** for the first station: Antenna 1, Antenna 2, MPX Front (FM01) or MPX Rear.
3. Enter the frequency for Antenna 1/2 input in the field **Frequency**.
4. Activate the configured station for tuning by selecting the corresponding radio button.
5. Click the save button to save the changes or the reset button to restore the last settings.

LCD menu: "Configuration menu"→"Setup"→"Tuning"

⇒ The device is now receiving an internal radio signal and is able to modulate and monitor it.

8.6. Set up alarm

For each station individually, you can set up monitoring of certain audio and RDS parameters which should be measured (see section "Introduction" on page 6). In case of failure, an alarm can be sent over email, SNMP, relay switching and/or will be indicated by a warning LED in the front of the device and/or through an entry in the alarm log.

To set up alarm for the available audio and RDS parameters:

1. Select **System Settings→Alarm** in the web interface to open the monitoring setup page.
2. Choose number "1" in the dropdown menu **Station** to configure monitoring for the first tuner station (see section "Tuner Settings" on page 31).
3. For each parameter default values are already preset. T1 vs. T2 is the time a parameter has to be "bad" vs. "good" before an alarm will be generated vs. retracted.
4. Enable the corresponding checkboxes, to activate the way of the alarm distribution (SNMP, Email, Relay, LED, Alarm log).
5. In the same menu you can set the alarm up for all stations in case of station change or device overheating.
6. Click the save button to save the changes or the reset button to restore the last settings.
7. Under **Information→Alarm status** and **Information→Alarm log** you can see the status of the monitoring parameters and details about the sent alarms.

8.7. Adjust output gains

To adjust the volume level of the available outputs:

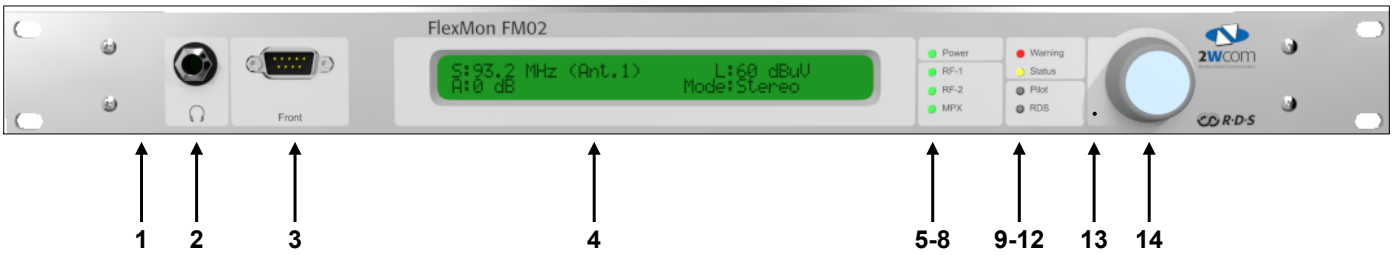
1. Select **Output Settings→Audio** to set up the audio volume of headphone, MPX and audio analog/digital outputs (FM01: also MPX mono boost and mono).
2. Configure the audio volume for the MP3 streaming output in the same menu.

LCD menu: "Configuration menu"→"Setup"→Audio

NOTE: These first steps are only intended for a quick first start and do not cover all device functions. Pease read carefully the entire manual to be able to use all functions of the device.

9. Control Elements and Connectors

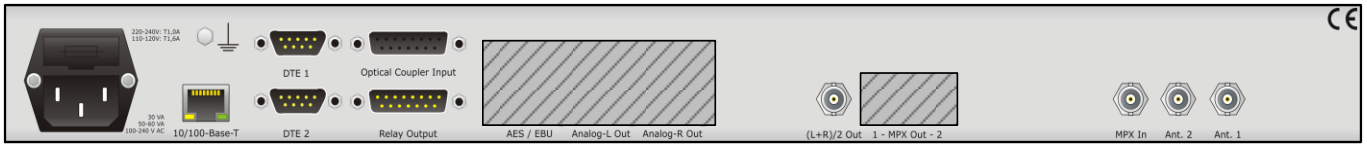
9.1. Front Panel



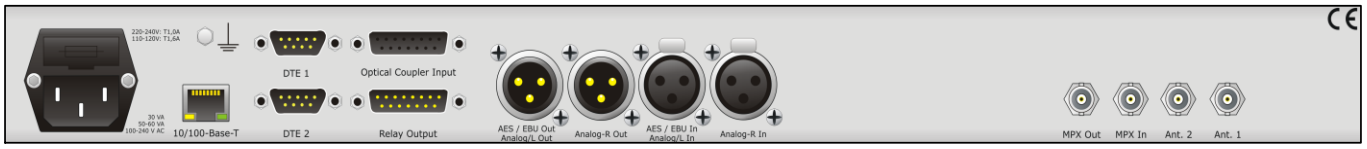
1	[MPX Input]	Only FM01: BNC unbalanced connector; input for an internal/external MPX signal (Front MPX input).
2	Headphones	6.3 mm / 1/4” socket for the connection of headphones; internal audio signal (tuner).
3	[Front]	9 pole D-Sub male connector; Serial RS-232 communication with the remote control software, only for device servicing purposes.
4	LCD screen	Illuminated, Liquid Crystal Display (LCD) with two rows of up to 40 characters.
5	[Power] LED	Activated (green color) if the power supply is ok.
6-7	[RF 1/2] LED	Activated (green color) if the receiver detects an RF signal in the Antenna input 1/2 (internal source).
8	[MPX] LED	Activated (green color) if the receiver detects audio data in the MPX input (internal source).
9	[Warning] LED	LED indicator (red); Flashes during start-up of the TCP/IP module. Continuously lit when device errors arise.
10	[Status] LED	No function.
11	[Pilot] LED FM01: [RF] LED →	LED indicator (red); FM02: lit if no pilot tone has been recognized; lit when measured antenna signal level, minus the selected attenuation is below 20 dBµV or above 60 dBµV. Not active if unit is in MPX-mode.
12	[RDS] LED	LED indicator (red); lit when the receiver detects no RDS in the inputting signal or when RDS synchronization is lost.
13	reset pin hole	Recessed reset button for resetting the device (warmstart).
14	Jog dial	Jog dial for the device operation via the LCD screen on the device. Turn the jog dial to place the cursor on the desired menu entry and push the jog dial to activate the highlighted menu entry.

9.2. Back Panel

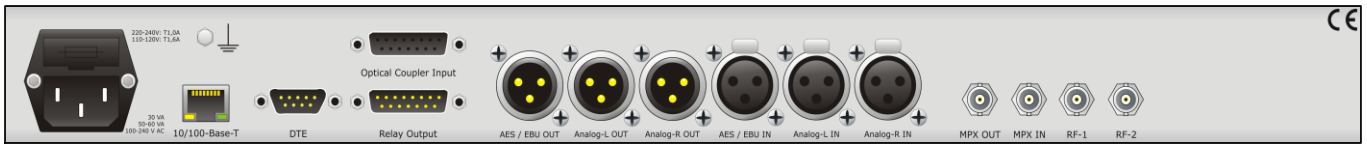
a) 1 2-3 4-5 6-7 8 9 10 11 12-13 14 15-16



b) 1 2-3 4-5 6-7 17-18 19 20-21 22 23 14 15-16



c) 1 2-3 5 6-7 17 18 19 20 21 22 23 14 24-25



[1]

1	IEC power supply connector	Standardized IEC supply connector with integrated fuse holder. Fuse ratings depending on mains supply voltage: 90-260V, 47-63 Hz: T1.6A, time lag type, 5x20 mm, 250 V
2	[Grounding stud]	The stud can be used to connect a grounding system if necessary.

NOTE: The required protection earth (PE) is accomplished via the 3-wire mains supply cord.

3	[10/100-Base-T]	RJ-45 connector for control and monitoring the device via Ethernet. The device can communicate with the IP network and can be configured with an internet browser via the integrated web interface. The LED´s at the socket show the link status (green; active if a physical network connection exists) and the activity status (yellow, active if data communication is active).
4-5	[DTE 1/2]	9 pole D-Sub male connector for the serial RS-232 data communication, e.g. the output of application data of the received signal. Use the supplied serial breakout cable to provide each output with a serial interface.
6	[Remote Control Inputs]	15 pole D-Sub female connector; remote control input, 7 inputs.

[1] a) Housing of the FlexMon FM01 Demodulator, FM01 TMC/RT+ Decoder and FM01 RDS Databridge
b) Housing of the FlexMon FM01 Alarm Receiver
c) Housing of the FlexMon FM02 Professional

7	[Relay Output]	15 pole D-Sub male connector; 7 floating relay contacts; switch contacts of the integrated relays. The relays can be activated by the monitoring function in case of an alarm.
8	[AES/EBU]	Balanced XLR male socket; **FM01/02 Demodulator**: AES/EBU interface for the output of the digital audio signal in the "Professional Format". The sample rate of the signal depends on the received signal. **FM01/02 TMC/RT+ Decoder & RDS Databridge**: no function.
9	[Analog-L Out]	XLR male socket; **FM01/02 Demodulator**: output of the left channel of the analog output number with configurable signal level. **FM01/02 TMC/RT+ Decoder & RDS Databridge**: no function.
10	[Analog-R Out]	XLR male socket; **FM01/02 Demodulator**: output of the right channel of the analog audio signal with configurable signal level. **FM01/02 TMC/RT+ Decoder & RDS Databridge**: no function.
11	[(L+R)/2 Out]	BNC connector, unbalanced; **FM01/02 Demodulator**: MPX output **FM01/02 TMC/RT+ Decoder & RDS Databridge**: only mono signal output.
12-13	[MPX Out 1/2]	2x BNC connectors, unbalanced; **FM01/02 Demodulator**: MPX output **FM01/02 TMC/RT+ Decoder & RDS Databridge**: no function
14	[MPX In]	BNC connector, unbalanced; MPX input for internal FM tuner (internal /external source)
15-16	[Ant. 2/1]	2x BNC connectors, unbalanced; RF input (50 Ω, 87,5-108 MHz).
17	[AES/EBU Out]	Balanced XLR male socket; double function (only FM01): output of the looping through digital/analog-L audio signal (switchable over web interface).
18	[Analog-L Out]	Balanced XLR male socket; output of the looping through analog-L audio signal
19	[Analog-R Out]	Balanced XLR male socket; output of the looping through right channel of the analog audio signal.
20	[AES/EBU In]	Balanced XLR female socket; double function (only FM01): input of the looping through digital/analog-L audio signal (switchable over web interface, for the looping through signal output always the same as input, e.g. AES/EBU In→AES/EBU Out)
21	[Analog/L In]	Balanced XLR female socket; input of the looping through analog-L audio signal

22	[Analog-R In]	Balanced XLR female socket; input of the right channel of the analog audio signal.
23	[MPX Out]	BNC connector, unbalanced; MPX output (for looping through an external signal)
24-25	[RF-1/2]	2x BNC connectors for input of two FM signals; 2x independent FM tuner with internal switch matrix

10. Network Settings

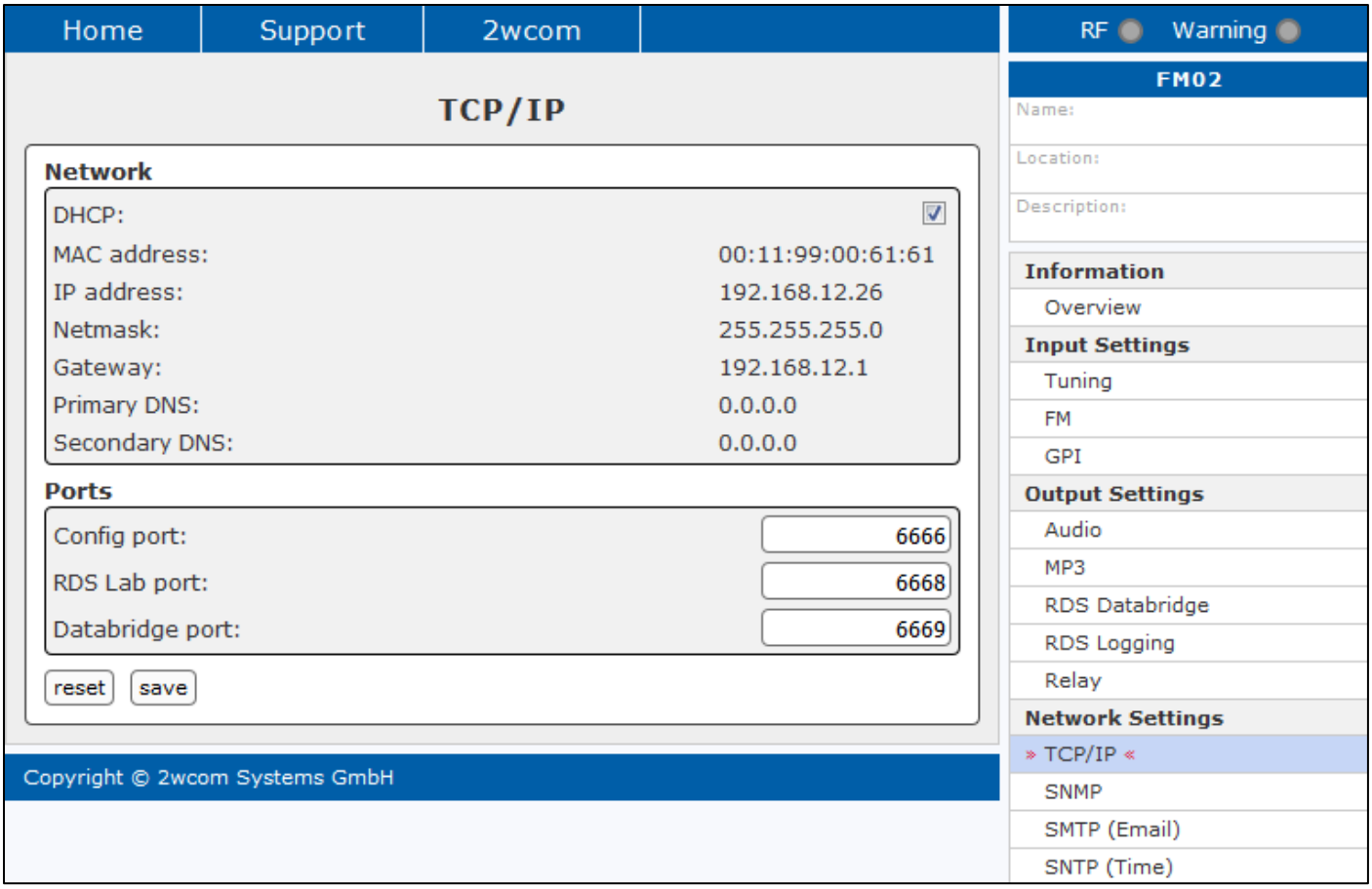
✓ You have already connected the device to the network [10/100-Base-T] and configured the access to the web user interface (see section "First Steps" on page 20).

10.1. TCP/IP: configuration of the Ethernet interfaces

You can configure the Ethernet interface (control/monitoring) of the device under **Network Settings→TCP/IP.**

In block **TCP/IP** the following parameters can be configured or changed:

DHCP	Activate or deactivate the Dynamic Host Configuration Protocol which enables the device to get an IP Address automatically.
IP-address:	Individual address that is necessary to identify hardware in an IP network like the internet or intranet.
Netmask:	Bit mask, which separates an IP address into a network part and a host part.
Gateway:	Address of the local system that is used for the internet access (e.g. the router).
Primary DNS:	IP address of the primary Domain Name Service (DNS) server.
Secondary DNS:	IP address of the secondary Domain Name Service (DNS) server.
Config port	Port number for service or software update and should not be changed.



The necessary address settings above depend on the individual network and should be assigned by the responsible network administrator if applicable.

⇒ Save the settings by clicking the save button.

LCD-menu: "Configuration menu"→"Interface"→"TCP/IP"

10.2. Monitoring function: configuration of SNMP

As part of the monitoring function, the device is capable to send SNMP traps to the defined IP addresses of the SNMP managers. It is also possible to readout device settings via SNMP Get.

This menu item is available under **Network Settings→SNMP** and is used to setup the IP addresses of the SNMP managers (see ***Fig. 1***).

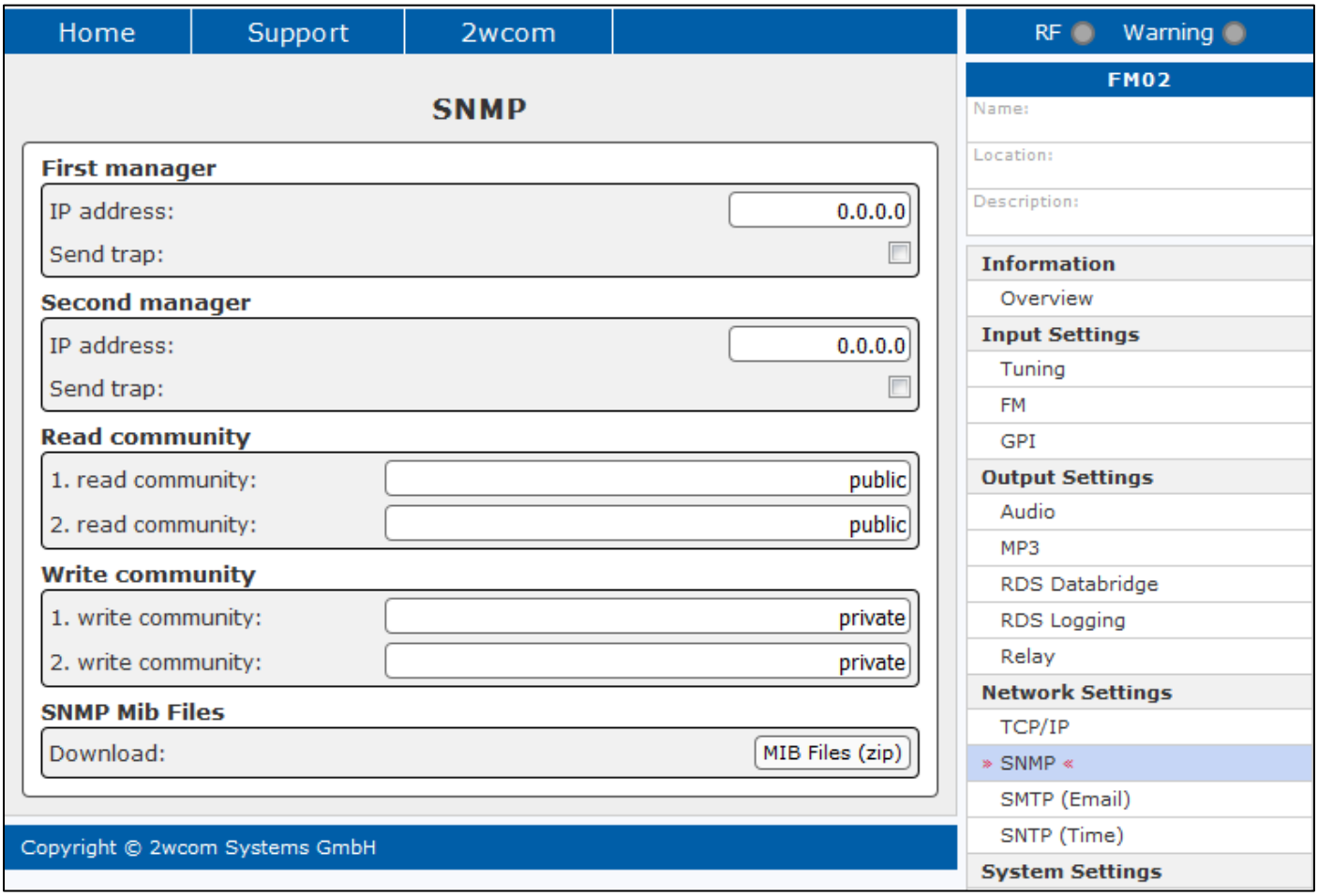


Fig. 1: Network Settings – SNMP.

Additionally, access data (read community / write community) that is necessary for external SNMP requests to device can be configured here.

You can configure or change in this menu the following parameters for SNMP:

First manager: IP address of the first SNMP manager that receives SNMP traps. The trap sending to this address can also be deactivated by a checking "off" at "Send trap:".

Second manager: IP address of the second SNMP manager that receives SNMP traps. The trap sending to this address can also be deactivated by a checking "off" at "Send trap:".

Read community: SNMP access data for the external read SNMP access to the device.

Write community: SNMP access data for the external write SNMP access to the device.

Save the settings by clicking the save button.

NOTE: In order for the SNMP manager tool to operate correctly, it requires the specific MIB files. These MIB files need to be compiled by the SNMP manager tool and are provided on the setup CD or via email.

NOTE: Each activated trap will be sent once at startup for initialization.

You can configure and activate the monitoring functions under **System Settings→Alarm**. More information about alarm settings you can find in section "Monitoring and Alarm Settings" on page 33.

10.3. SMTP settings

This menu item is available under **Network Settings→SMTP** and is used to setup the e-mail address for sending alarm reporting via e-mail. Here you can configure SMTP and enter the e-mail login data for transferring the alarm reports from your e-mail address to a target recipient address (see ***Fig. 2***).

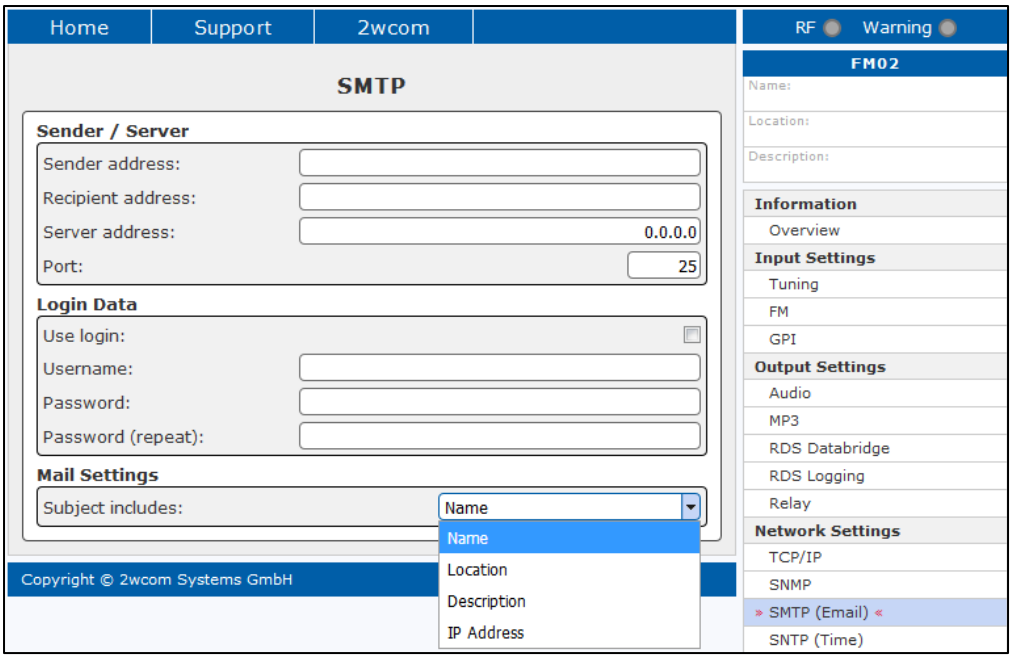


Fig. 2: Network Settings – SMTP

In the "Mail Settings" block you can select the subject of the mail in the dropdown menu "Subject includes:": Location, Description, IP Address.

10.4. SNTP settings: configuration of date and time

This menu item is available under **Network Settings→SNTP** and is used to enable the automatical synchronization of the date and time of the device with an external SNTP server (see ***Fig. 3***).

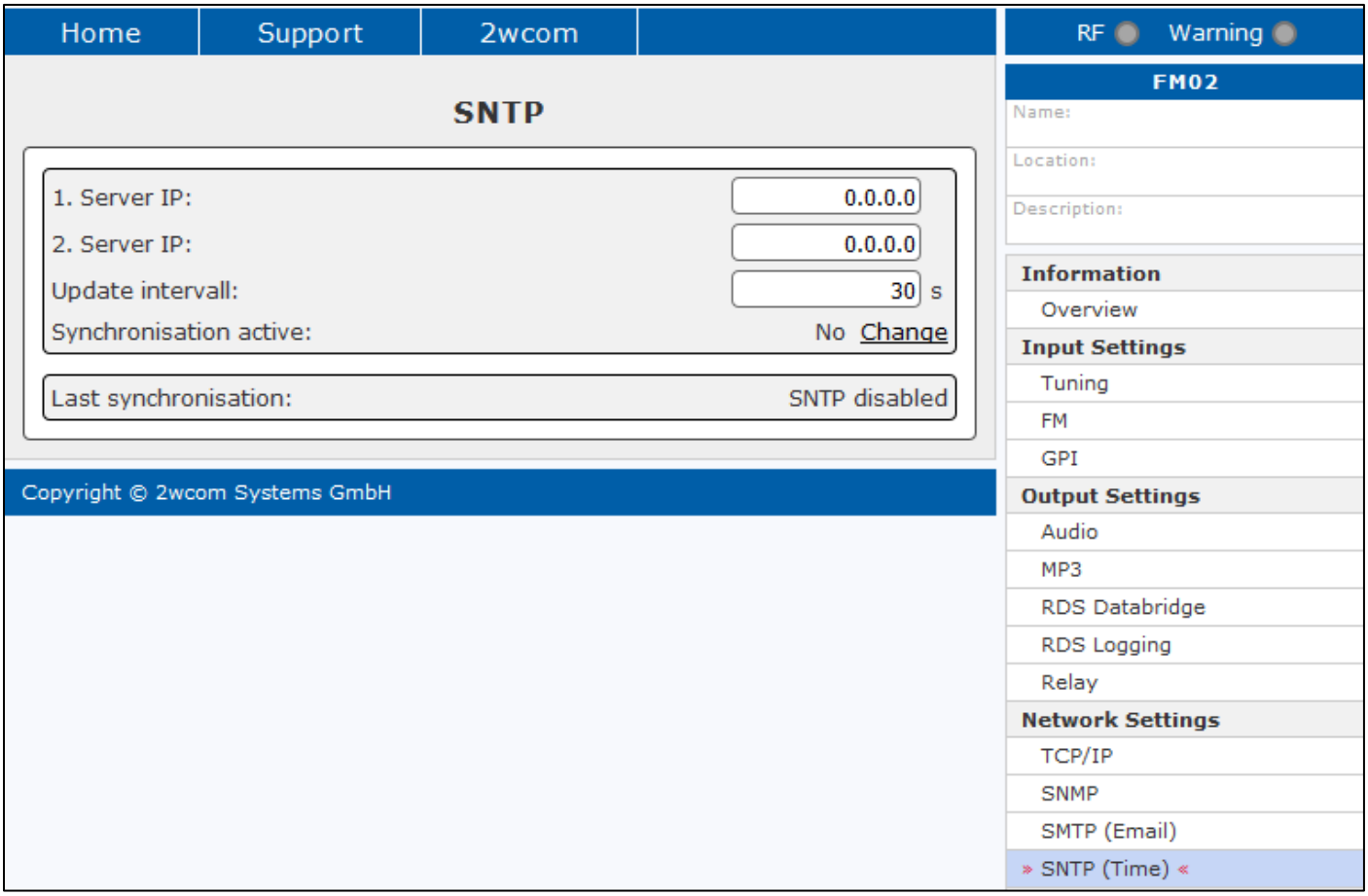


Fig. 3 Network settings - SNTP

In block **Control Interface (10/100Base-T)** the following parameters can be configured or changed:

1. SNTP Server IP	IP address of the first NTP server to be used.
2. SNTP Server IP	IP address of the second NTP server to be used.
Update interval [min. 30 sec]	Time interval for synchronizing the device clock with the NTP server in seconds.
Synchronisation	Selection if the device clock should be synchronized via SNTP or not.
Last synchronisation	Information about the last synchronisation.

⇒ Save the settings by clicking the save button.
⇒ After the configuration of the SNTP server activate SNTP under System **Settings→Time** in the "Synchronisation Settings" block by selecting "SNTP" in the dropdown menu "Source".

11. Tuner Settings

11.1. Input setup

It is possible, to set up eight individual input settings ("stations"), which you can save and quickly switch over.

To set up eight stations:

1. Select **Input Settings→Tuning** in the web interface menu. The page *Tuning* appears.
2. Choose an activated input for the MPX or the RF signal in the dropdown menu **Source** for each station: Antenna 1, Antenna 2, (FM01: MPX Front/Rear) (see ***Fig. 4***).

NOTE: Only one of the RF/MPX inputs can be active at a time.

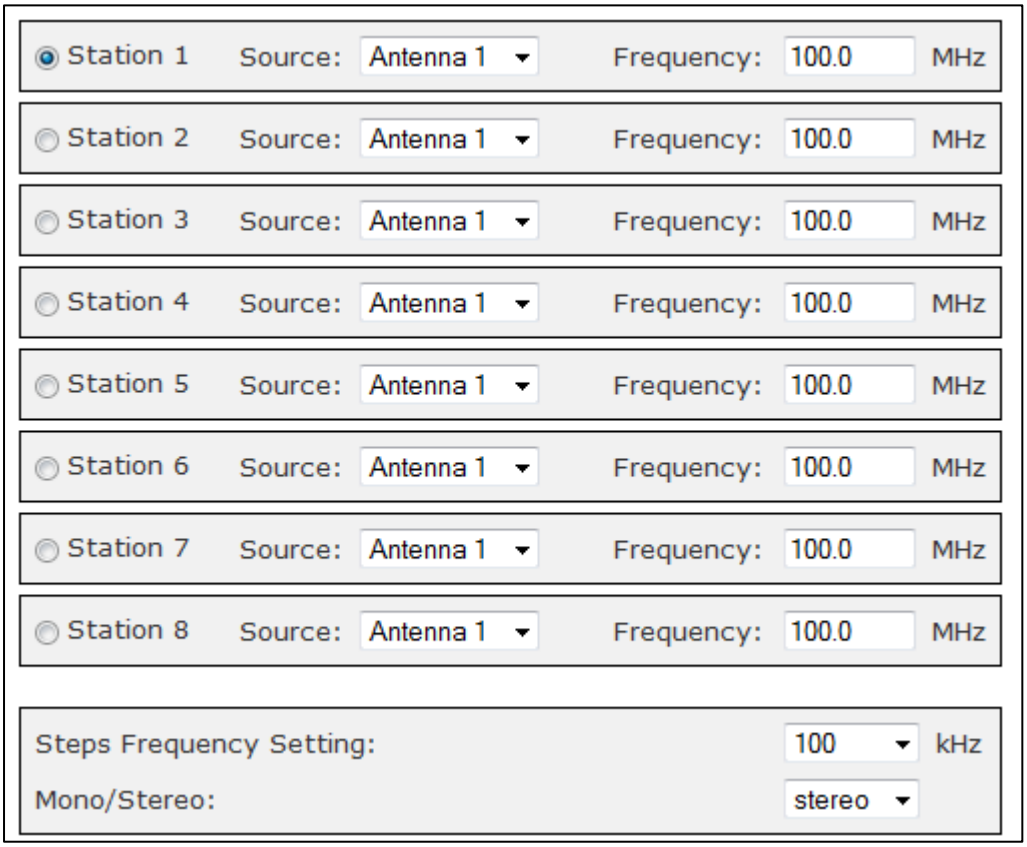


Fig. 4: Tuning inputs setup

3. Enter the frequency for Antenna 1/2 input in the field **Frequency**. The possible intervals for frequency settings are 50 and 100 kHZ. Choose the interval in the dropdown menu **Steps Frequency Setting** at the end of the page (see ***Fig. 5***).
4. In the FM01 you can select the auto attenuation checkbox or enter the value for the attenuation in dB in the field **Attenuation** manually, if the internal source is set up for RF Antenna.

NOTE: The FM01 (not FM02) provides internal attenuators for measurements up to 120 dBµV. The displayed RF level is corrected to compensate the selected attenuation.

The attenuators can be selected automatically or manually. The automatical attenuation activates the required attenuator depending on the RF input level.

Manual attenuation selection is possible in tuner mode if the level at the RF input minus the selected attenuation value is outside the range of 20…60 dBµV. The available attenuation values for manual setup are between 0, 20 and 40 dB.

5. Activate one station for tuning by selecting the corresponding radio button.
6. Click the save button to save the changes or the reset button to restore the last settings.

LCD menu: "Configuration menu"→"Tuning"

11.2. Tuner setup

1. To change the currently active station, select the corresponding radio button under **Input Settings→Tuning.**
2. To switch the internal audio between stereo and mono for all stations, select the corresponding mode in the dropdown menu **Mono/Stereo/Auto** at the end of the **Input Settings→Tuning** page (see ***Fig. 5***).

Fig. 5: Tuning setup

Note: "Auto" mode switches automatically the tuned signal to "mono" if the RF Level reaches the "Stereo Blend Threshold Start" value configured in the "Tuner Settings" block in the same menu.
It switches back to "stereo" if the RF signal reaches the configured "Stereo Blend Threshold End" value.

3. Configure mute threshold (FM02) and stereo blending under **Input Settings→FM**. Enter the values for the RF level that should be reached for stereo blend activation resp. deactivation (see ***Fig. 6***).

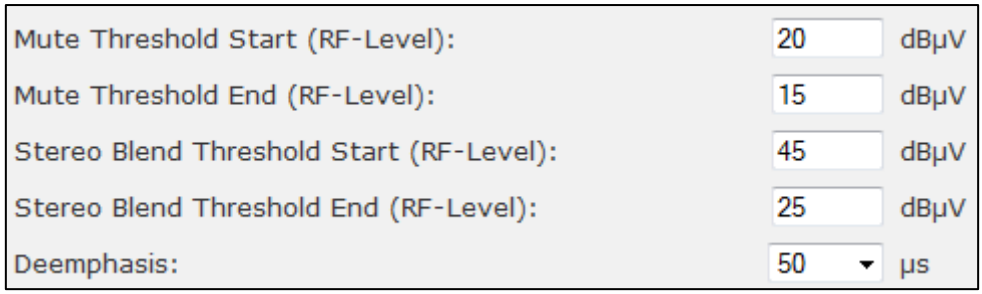


Fig. 6: FM configuration

4. Set up the deemphasis in the same menu. Possible values are 0/50 (FM01 70 µs).
5. Click the save button to save the changes or the reset button to restore the last settings

12. Monitoring and Alarm Settings

12.1. Alarm via relay output

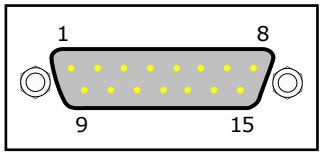


Fig. 7: D-Sub male connector, 15 pole

The FlexMon FM01/02 series are equipped with a 15 pole D-Sub connector with 7 floating relay contacts (Fig. 7).

The relays can be used for indicating the alarm alerts.

Table 1 shows the scheme of the possible relay switch contacts.

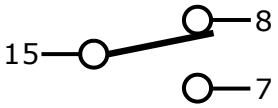
Relay No.	*Switch contacts*	*Switch type*
1	1,9	SPST, NO
2	2,10	SPST, NO
3	3,11	SPST, NO
4	4,12	SPST, NO
5	5,13	SPST, NO
6	6,14	SPST, NO
7		SPDT

Table 1: Pinout relay output – FlexMon FM01/02

NOTICE	
	The relay contacts have a rating of 0.5 A at 125V AC/60V DC. The maximum current is 1 A!

Certain alerts can not only generate SNMP traps but also switch 7 relays. Alarm signaling via relays can be configured under **System Settings → Alarm.**

12.2. Tuner monitoring

The FM01/02 series are equipped with a tuner and are able to monitor one of the eight saved programs.

12.2.1. Set up tuner monitoring

The following parameters for tuner monitoring can be activated in all FlexMon FM01/02 devices:

RF Level	Alarm is set off if the RF level of the internal source falls below the configured value
Audio	Alarm is set off if no audio signal or only a signal noise is available in the internal source
Pilot	Alarm is set off if no pilot tone is available in the internal source

A released alarm is signaled by sending SNMP traps, activating of an available relay and, if configured, of the "Warning" LED on the web user interface page or on the front panel of the device. The alarm can be also indicated by an entry in the alarm log.

More information about the available SNMP traps you can find in Section 10.2.

Set up the monitoring parameters separately for each configured tuner station as follows:

1. Open the page Alarm under **System Settings→Alarm** in the web interface of the FlexMon FM01/02.
2. Choose the configured Tuner Station in the dropdown menu "Station", for which the monitoring should be set up (see Fig. 11).
3. Enable each tuner monitoring function separately in the corresponding checkbox "Enabled", if this parameter should be monitored (see Fig. 8).

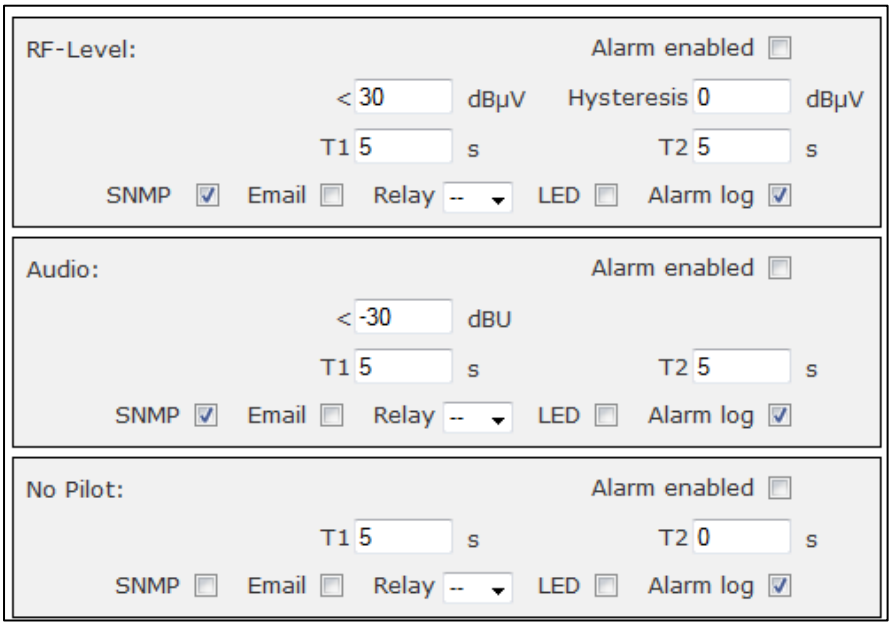


Fig. 8: Alarm settings – monitoring of the internal audio signal

4. Define for each monitoring function the delay time T1 (in seconds) for alarm release. The delay time from this defined value will be regarded by the system as "bad", so that after the delay time T1 an alarm will be set off.
5. Define for each monitoring function the delay time T2 (in seconds) for alarm end, how long a "good" signal for this parameter should be available, before the system switches off the alarm.
6. Enable checkbox "SNMP" if the alarm should be signaled by sending SNMP traps.
7. Enable checkbox "Email" if the alarm should be signaled by sending an email (email configuration under **Network Settings→SMTP**).

8. Enable checkbox "LED" if the alarm should be signaled by the Warning LED on the web user interface page or on the front panel of the device.
9. Enable checkbox "Alarm log" if the alarm should be registered in the alarm log (**Information→Alarm log**)
10. Choose in the dropdown menu "Relay" one of the available relays that should switch to signal the alarm (see section 12.1).
11. In the "RF Level" block, enter the value for the internal RF level, below which the alarm should be set off (dBµV). In the *Hysteresis* field you can set up an additional value for the RF level that should be reached together with the default value of 30 dBµV until the alarm ends.

    Example: if the RF level falls below 30 dBµV for longer than T1 seconds, the alarm will be activated; the alarm will be switched off, if the RF level is again above the threshold (30 dBµV) **plus** the configured hysteresis for T2 seconds, so in total 32 dBµV, when the hysteresis is e.g. 2 dBµV.
12. In the "Audio" block enter the value of the internal audio level (dBU), below that the alarm should be set off.
13. Click the save button to save the changes or the reset button to restore the last settings.

NOTE: Information about error and alarm alerts can be viewed in the *Alarm log* under **Information→Alarm log**.

12.2.2. View the tuner status

You can view the current status of the tuner and of the incoming audio signal at any time on the web user interface page or in the LCD menu of the device.

1. Under **Information→Overview** you can view the current details about the internal audio signal and the status of the tuner (see ***Fig. 9***).

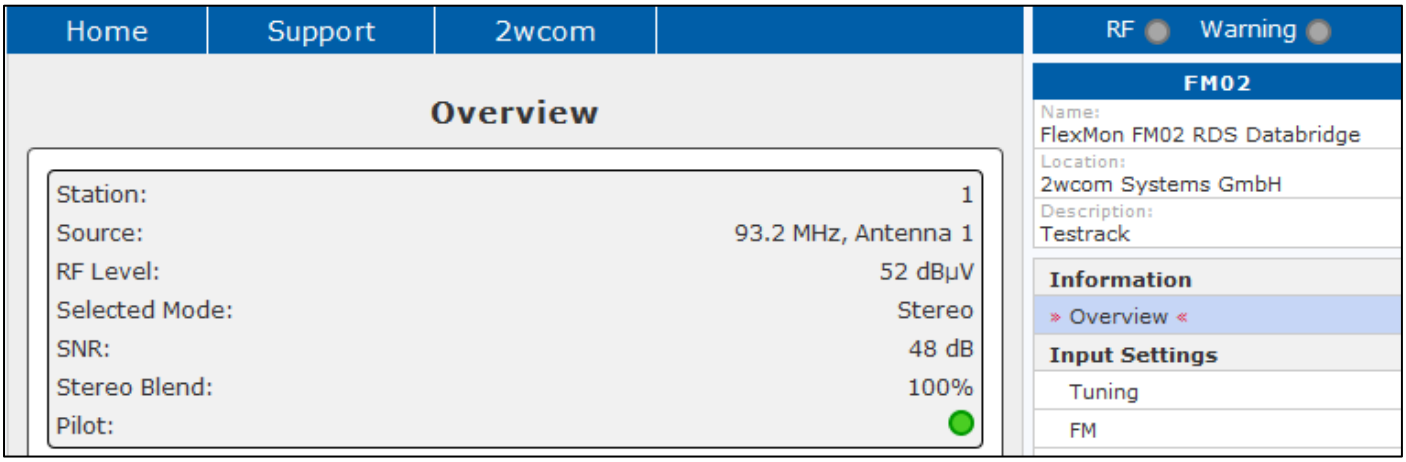


Fig. 9: Tuner status

2. You can also view the current status of some parameters directly on the LC display (S – "Source", .A – "Attenuation", L – "RF Level", Mode)

3. In the same menu under **Information→Overview**, you can see the output level of the mono and of the MPX signal (see ***Fig. 10***).

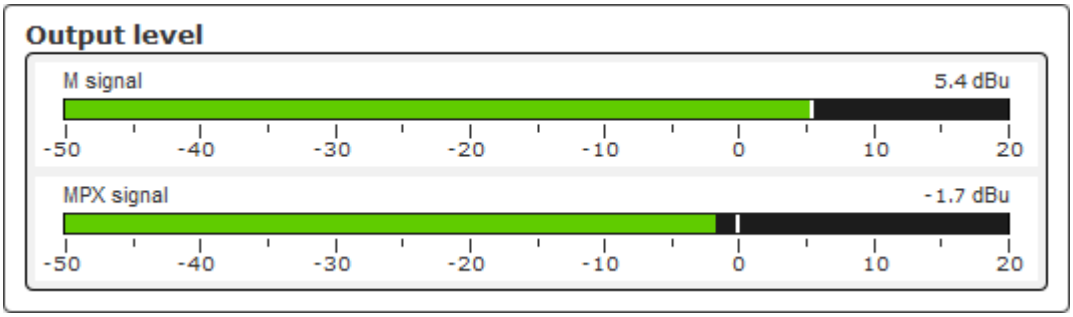


Fig. 10: Output level

NOTE: An MPX output is available only in the FM01/02 Demodulator and Alarm Receiver.

In case of alarm, the corresponding LED in the menu **Information→Alarm status** will flash red (see ***Fig. 28***).

LCD menu: "Status overview menu"

12.3. Basic RDS monitoring

The FM01/02 series are equipped with an RDS decoder and are able to recognize and to monitor the RDS data in the inputting signal: PI, PS, TA, TP, PTY, !TA and RDS synchronization.

12.3.1. Set up basic RDS monitoring

The following RDS alarm functions can be activated in all FlexMon FM01/02 devices:

RDS available	Alarm is set off if no RDS is available in the internal signal
RDS PI	Alarm is set off if no or a false program identification code is detected in the RDS stream
RDS PS	Alarm is set off if no or a false program service name is detected in the RDS stream
RDS synchronization	Alarm is set off if RDS has not been synchronized for a certain time
RDS TA	Alarm is set off if no RDS TA is available
RDS !TA	Alarm is set off if no RDS !TA signal is available
Block Error	Alarm is set off if the block error ratio (BER) of the received RDS blocks exceeds the entered ratio value (one RDS group consists of four blocks).

A released alarm is signaled by sending SNMP traps, activating of an available relay and, if configured, of the "Warning" LED on the web user interface page or on the front panel of the device. The alarm can be also indicated by an entry in the alarm log.

More information about the available SNMP traps you can find in section 10.2.

Set up the monitoring parameters for controlling the RDS signal separately for each configured tuner station as follows:

1. Open the page *Alarm* under **System Settings→Alarm** in the web interface of the FlexMon FM01/02.
2. Choose the configured Tuner Station in the dropdown menu "Station", for which the monitoring should be set up (see ***Fig. 11***).

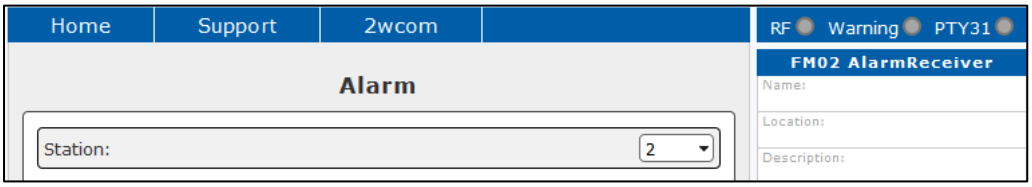


Fig. 11: Station selection for alarm configuration

3. Enable each RDS alarm function separately in the corresponding checkbox "Enabled", if this parameter should be monitored (see ***Fig. 12***).

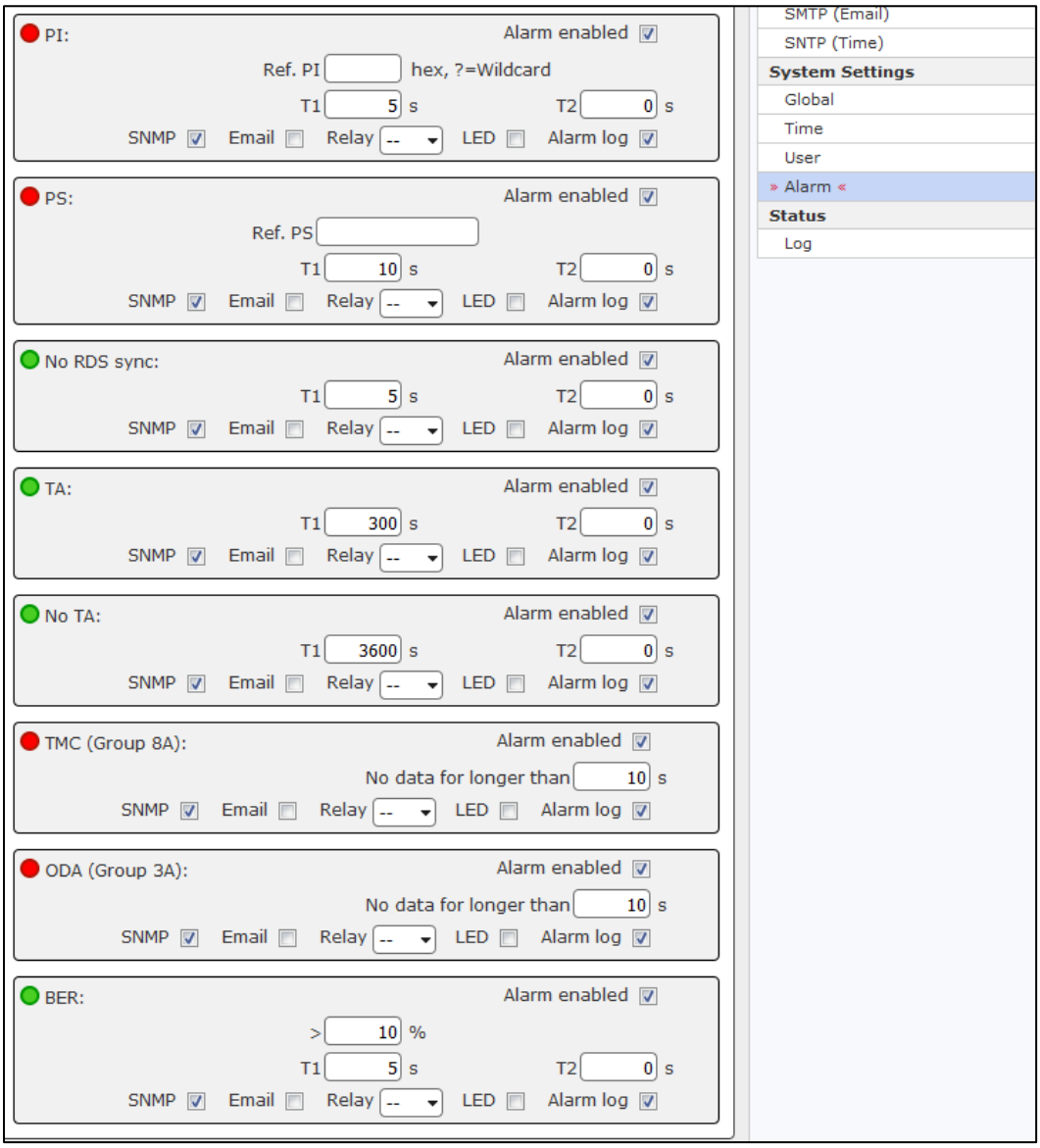


Fig. 12: Alarm settings – indication of the RDS data in the internal signal

4. Define for each monitoring function the delay time *T1* (in seconds) for alarm release. The delay time from this defined value will be regarded by the system as "bad", so that after the delay time *T1* an alarm will be set off.
5. Define for each monitoring function the delay time *T2* (in seconds) for alarm end, how long a "good" signal for this parameter should be available, before the system switches off the alarm.
6. Enable checkbox "SNMP", if the alarm should be signaled by sending SNMP traps.
7. Enable checkbox "Email", if the alarm should be signaled by sending an email (email configuration under **Network Settings→SMTP**).
8. Enable checkbox "LED", if the alarm should be signaled by the Warning LED on the web user interface page or on the front panel of the device.
9. Enable checkbox "Alarm log", if the alarm should be registered in the alarm log (**Information→Alarm log**)
10. Choose in the dropdown menu "Relay" one of the available relays that should switch to signal the alarm (see section 12.1).
11. In the „PI" block enter the correct RDS PI as a four-digit hexadecimal number in the first box 

, to allow the monitoring system to recognize the correct program identification code (PI).
12. In the „ PS" block enter the correct RDS PS in the first box 

, in order to allow the monitoring system to recognize the correct program service name (PS).
13. In the „Block Error" field enter the BER value for the received RDS blocks (percent) above that the alarm should be set off.

    Example: 10% value for BER means that alarm will be set off, if more than 10% of the received RDS blocks contain an incorrigible error.
14. Click the 

button to save the changes or the 

button to restore the last settings.

12.3.2. View the RDS status

You can view the current status of the inputting RDS data at any time on the web user interface page or in the LCD menu of the device.

Under **Information→Overview** you can view the current status of the decoded RDS data of the internal source (see ***Fig. 13***).

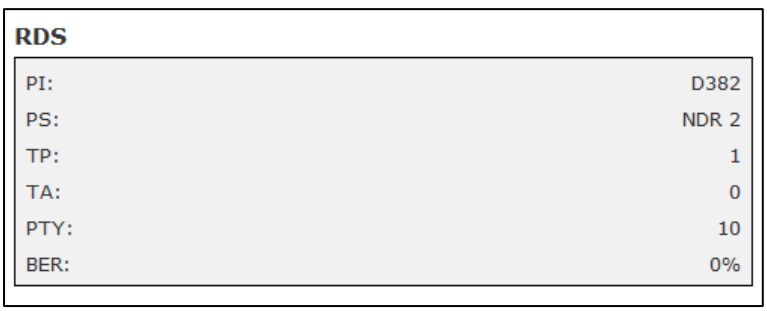


Fig. 13: RDS status

In case of alarm, the LEDs under **System Settings→Alarm** will flash red (***Fig. 28***).

LCD menu: "Status Overview menu"→"RDS"

12.4. Device monitoring

12.4.1. Set up device monitoring

The following parameters and alarms for device monitoring of the FM01/02 series can be activated:

Station change	Alarm is set off if the station changes (the frequency)
Case temperature	Alarm is set off if the device temperature exceeds the entered value

A released alarm is signaled by sending SNMP traps, activating of an available relay and, if configured, of the "Warning" LED on the web user interface page or on the front panel of the device. The alarm can be also indicated by an entry in the alarm log.

More information about the available SNMP traps you can find in section 10.2.

NOTE: The alarm for "station change" can be signaled only by SNMP, Email, Relay and Alarm log, but not by an LED.

Set up the device monitoring parameters independently from the station as follows:

1. Open the page *Alarm* under **System Settings→Alarm** in the web interface of the FlexMon FM01/02.
2. Enable each alarm function separately in the corresponding checkbox "Enabled", if this parameter should be monitored (see ***Fig. 12***).

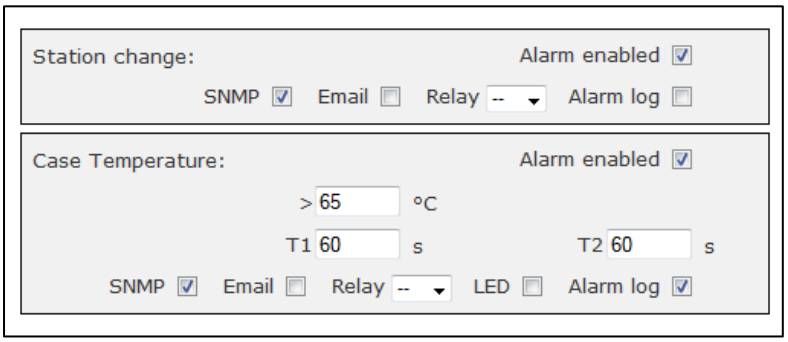


Fig. 14: Alarm settings – device monitoring

3. Define for each monitoring function the delay time *T1* (in seconds) for alarm release. The delay time from this defined value will be regarded by the system as "bad", so that after the delay time *T1* an alarm will be set off.
4. Define for each monitoring function the delay time *T2* (in seconds) for alarm end, how long a "good" signal for this parameter should be available, before the system switches off the alarm.
5. Enable checkbox "SNMP", if the alarm should be signaled by sending SNMP traps.
6. Enable checkbox "Email", if the alarm should be signaled by sending an email (email configuration under **Network Settings→SMTP**).

7. Enable checkbox “LED” (if available), if the alarm should be signaled by the Warning LED on the web user interface page or on the front panel of the device.
8. Enable checkbox “Alarm log”, if the alarm should be registered in the alarm log (**Information→Alarm log**)
9. Choose in the dropdown menu “Relay” one of the available relays that should switch to signal the alarm (see section 12.1).
10. In the „Case Temperature” block enter the value for the maximal allowed device temperature. If the case temperature exceeds the entered temperature for T1 seconds, an alarm will be set off.
11. Click the save button to save the changes or the reset button to restore the last settings.

12.4.2. View the device status

You can view the current status of the device under **System Settings - Global** (see ***Fig. 15***):

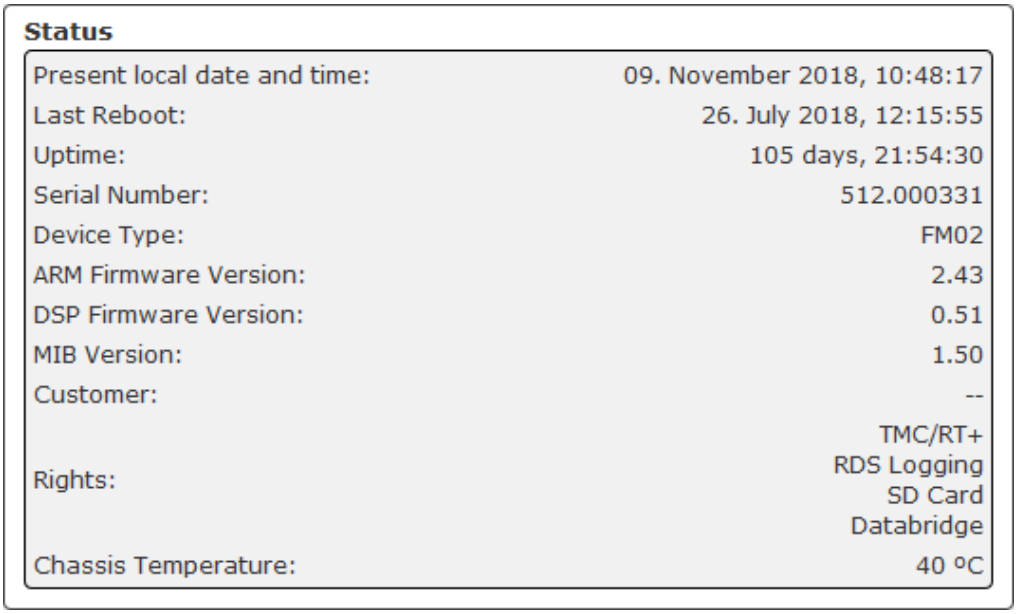


Fig. 15: System Settings - Global

In case of alarm, the corresponding LED in the menu **Information→Alarm status** will flash red (see ***Fig. 28***).

12.5. Set up RDS Databridge

The function of RDS databridge is available **only** in the FlexMon FM01/02 RDS Databridge device (see section “Introduction” on page 6). This function allows inspecting the received RDS data with external PC software RDS Lab, converting the dynamic RDS/RBDS parameters into UECP commands and passing them to a connected RDS Encoder via DTE1 for retransmission.

12.5.1. Special handling for cyclic transfer

Some data can only be transferred after being decoded completely like PI, PS, TA or RT. For each of that RDS data you can configure, if it should be transferred to the connected RDS encoder or not. Normally a UECP command would only be sent to the encoder, if the corresponding RDS data has changed. This should be sufficient in most cases. For safety reasons you may however decide

to specify an **additional time** period in seconds for **cyclic transfer** (see ***Fig. 16***). If the time has elapsed, the FM01/02 will unconditionally send a UECP command with the current RDS data to the encoder. Specifying a value of **zero seconds** (default) will transfer the data only when it changes its value.

12.5.2. Special handling for EON-TA

EON-TA is special in some regards: When an **EON-TA** is decoded, the FM01/02 cannot know the PSN, in which it has to set the TA for EON-TA. This depends on the setup of the connected RDS encoder. It's therefore necessary, that you specify the **PSN**, if EON-TAs should be transferred (see ***Fig. 16***). If you also want **cyclic transfer for EON-TA**, the **PI** of the EON-PSN has to be specified, too, so that the FM01/02 can look up the current state of the EON-TA. Dynamic data like ODA (3A group), Inhouse (6A group) or TMC (8A group) can be 1:1 transferred as raw RDS group data using the Free Format Group (FFG) UECP command. You can individually specify, which raw RDS groups should be transferred.

12.5.3. Special handling for RT+

There's a special handling for RT+: If you are sending RT+ data, there's the problem that the FM01/02 has to receive the RadioText completely at least once before it can generate the corresponding command for the connected RDS encoder. This short delay is bad for the corresponding RT+ data sent in e.g. the 12A group, as the relation between RT and RT+ is only handled by the order in which the information is received. If you enable the **special RT+ handling** (see ***Fig. 16***), the FM01/02 will take care of the retransmission of the RT+ data; it will find the raw RDS group used for the RT+ data via the 3A group information for the RT+ AID and will delay newly received RT+ data until the corresponding RadioText has been received completely and sent to the RDS encoder to keep both in sync. You should omit the **corresponding RDS group** (e.g. 12A) from the direct 1:1 transfer and just enable the **RT+** checkbox (see ***Fig. 16***). The information in the **3A group** should however be enabled for 1:1 transfer.

12.5.4. Set up RDS Databridge parameters

Over the FlexMon RDS Databridge web interface you can individually set up all main parameters for the RDS databridge.

Configure the RDS Databridge parameters as follows:

1. Open the menu *RDS Databridge* under **Output Settings→RDS Databridge→Data Settings**.

2. In the "Transferred decoded RDS data" block enable RDS parameters, that should be transferred. If any parameter is not selected, it will not be transferred (see ***Fig. 16***).

NOTE: The abbreviations of the RDS data are explained below the ***Fig. 16***.

3. Set up the updating time of the signals for each activated RDS parameter in seconds. The value of 0 seconds means that the corresponding RDS parameter will be sent once, if it changes its value.

4. In the "Transfer raw RDS group data" block enable RDS group data that should be transferred.

5. Click the save button to save the changes or the reset button to restore the last settings.

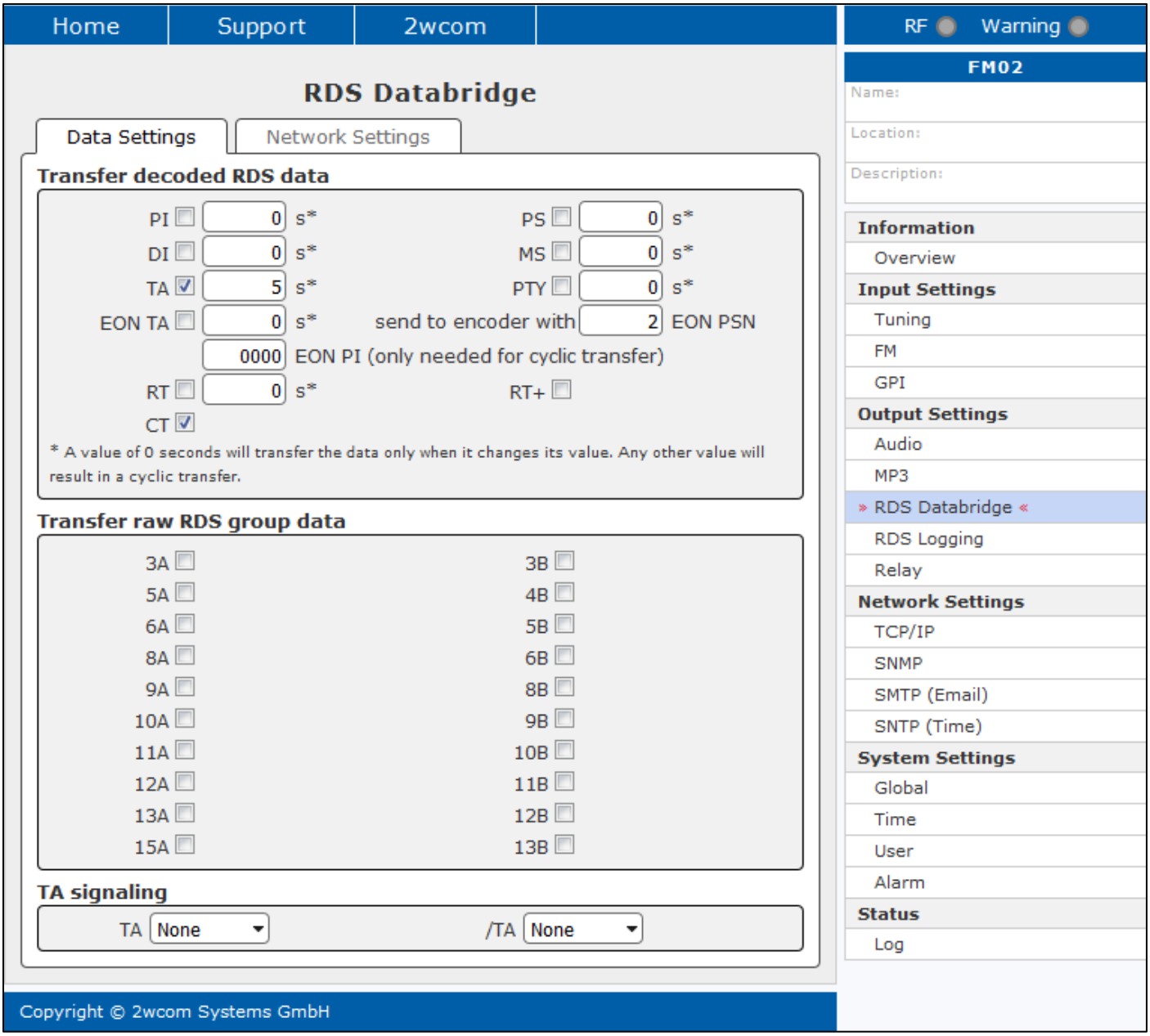


Fig. 16:FM01/02 RDS Databridge –RDS data configuration

CT	Clock time and date
DI	Decoder identification
MS	Music/Speech
PI	Program identification
PS	Program identification
PTY	Program type
RT/RT+	Radiotext
TA	Traffic-announcement identification
TP	Traffic-program identification
EON	Enhanced Other Networks

Configure the Network Settings for RDS Databridge:

1. Open the menu RDS Databridge under **Output Settings→RDS Databridge→Network Settings** (see Fig. 17)

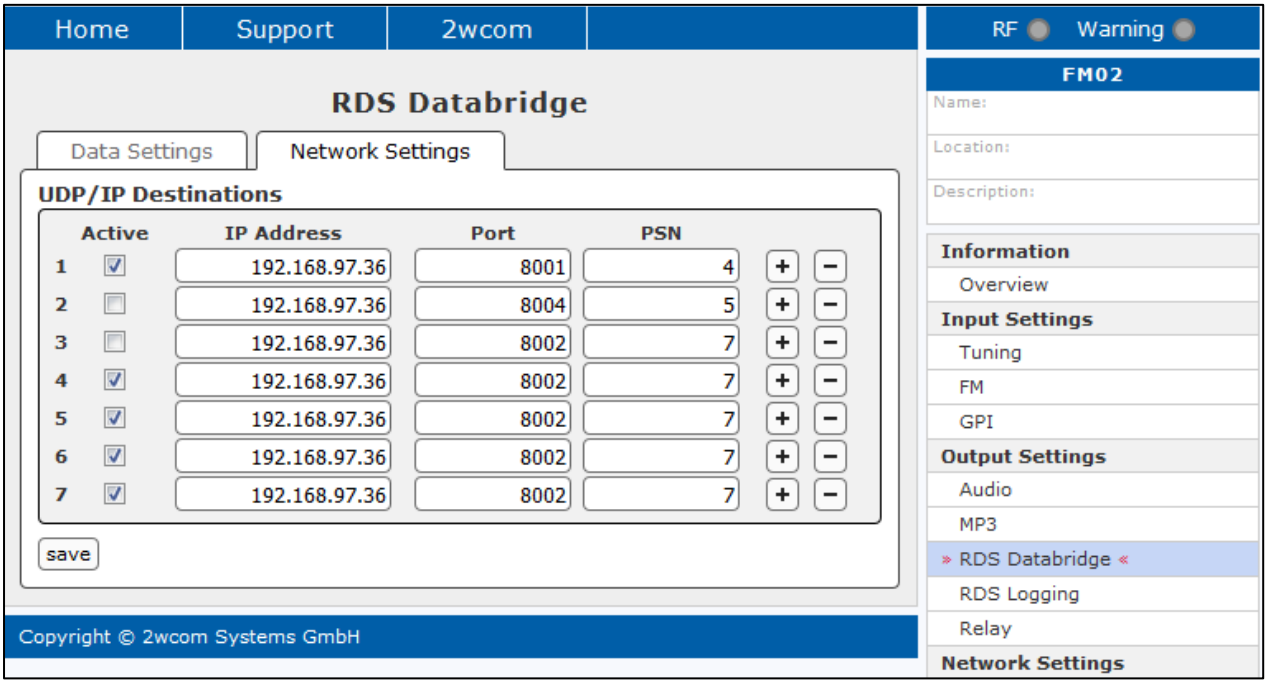


Fig. 17: Network settings for RDS Databridge

2. You can add up to 32 destinations for the RDS encoder.

3. Click the "save" button to save the changes

4. Under **Information→Overview** you can view the status of RDS data transfer (see ***Fig. 18***).

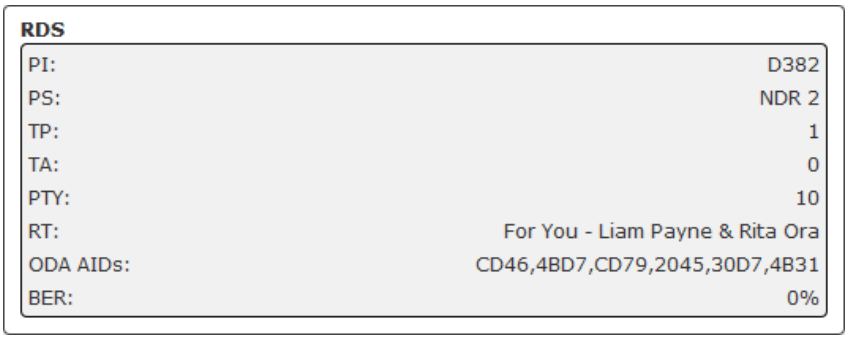


Fig. 18: RDS Databridge – Status of the RDS data transfer

12.6. RDS Lab

RDS Lab is an external Windows application, which will allow you to see all RDS data together with your FM01/02.

You can download **RDS Lab** from directly from the following link:
http://download.2wcom.com/software/RDS_Lab/RDSLab_Current_incl_Tables.zip

It doesn't need to be installed – just **copy the RDS Lab folder** to a location on your hard drive, e.g. "Station Files". When you start RDS Lab, you will see a small dialog named "IO Settings" asking for the connection parameters to your FM01/02. Choose **"TCP/IP connection"** in the combobox at the top and enter the **IP address** of your FM01/02. The port number can be changed on the "TCP/IP" page; its default value is 6668. Click "OK" to start RDS Lab.

For further information about RDS Lab please refer to the manual that can be found in the downloaded folder with the application.

To monitor RDS for Tuner, define the Ports for Tuner under **Network Settings→TCP/IP**, which you should also set in the RDS Lab:

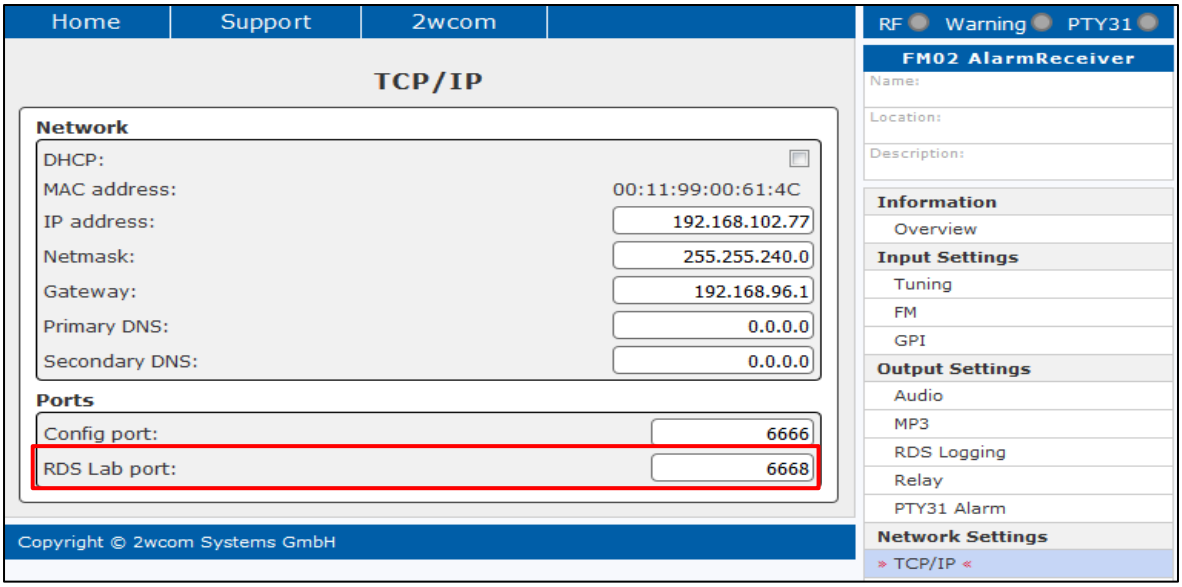


Fig. 19: Port configuration for RDS monitoring

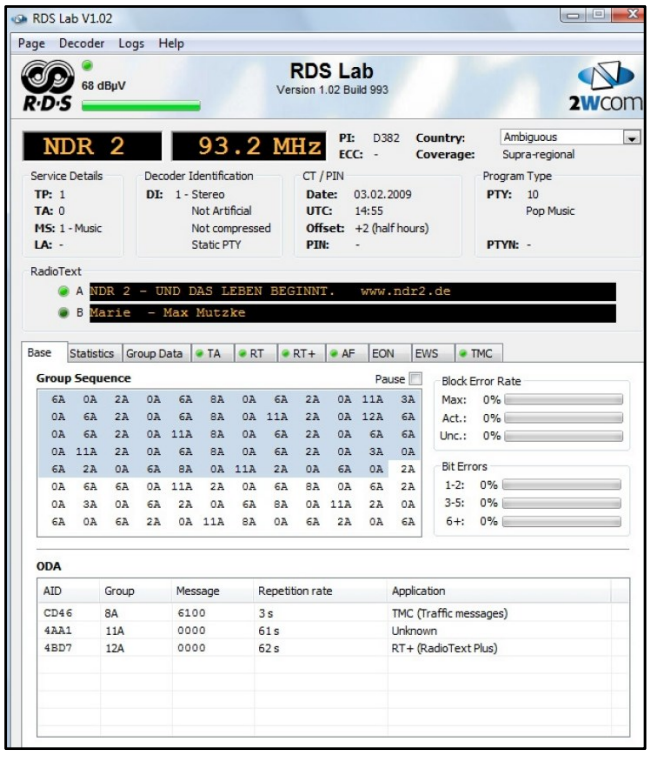


Fig. 20: RDS Lab menu

12.7. Set up PTY31 Alarm monitoring

PTY30 and PTY31 Alarm monitoring is available only in the FlexMon FM01/02 Alarm Receiver.

The FlexMon FM01/02 Alarm Receiver is equipped with an internal and external source. For more information about internal/external source see 2.2.

12.7.1. Operation in mode "PTY31 automatic"

If you activate the RDS PTY31 monitoring, the device will monitor the internal source for all RDS parameters including PTY31 and send alarms, if an error occurs. The signal from the external source is looping through to the corresponding outputs (see ***Fig. 21***). If the device detects a PTY31, the source will be switched over from the external to the internal, in order to broadcast the received alarm (see ***Fig. 22***).

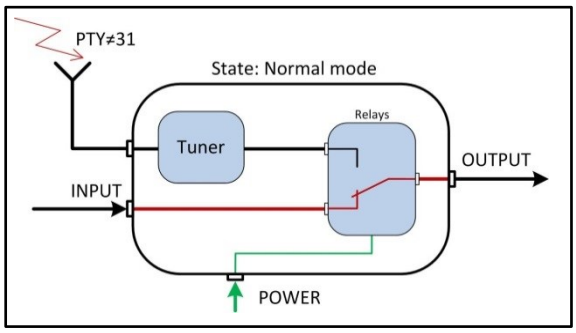


Fig. 21: Loop through-mode

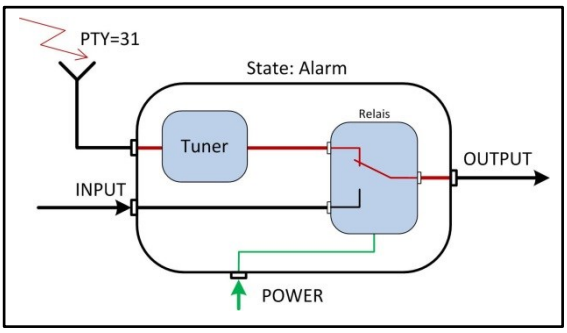


Fig. 22: Alarm-mode

To activate monitoring of RDS PTY31 and to set up the external source:

NOTE: The FM02 is equipped with the timeout function for the PTY31 switchover. To set up this function see section 12.7.3.

1. Choose one of the configured stations under **Input Settings→Tuning**, to specify the internal source and the frequency for RF signal.

2. Choose "PTY31 automatic" in the **Audio/MPX source** dropdown list under **Output Settings → PTY31 Alarm**.

3. To assign the operating mode to the connector with the double-function AES/EBU and Analog L (IN/OUT) for the external source, choose "Digital" or "Analog" in the **Audio type for input/output** dropdown list (only in the FM01).

4. In the **Status Relay** dropdown list choose the Bypass relay No that should be activated in case of switching to PTY31 alarm (see section 13.3).

5. Enter the delay time for automatic switch over to the internal source alarm in the same menu in case of PTY31 (0-5 s. interval is acceptable). Setup over SNMP commands possible.

NOTE: For more information about this function please read section 12.7.2 for FM01 and 12.7.3 for FM02.

6. Click the save button to save the changes or the reset button to restore the last settings.

⇒ The FM01/02 Alarm Receiver is now monitoring the internal source for RDS and particularly for PTY31 Alarm and looping through the external source.

12.7.2. PTY31 switchover in the FM01

In general the status of the alarm in case of failure will be send via an SNMP trap. There are traps for PTY=31 and PTY≠31 available.

All actions for PTY change will be logged in an internal Log-file.

Delay time for automatic switch over

If the FM01 Alarm Receiver detects PTY=31 in mode "PTY31 automatic", the device will switch from "normal state" (external source) into "alarm state" (internal source) as shown in ***Fig. 22***. When the PTY is set to ≠31, the device switches back into "normal state".

Switch over between inputs and outputs in both cases can be manually delayed by setting "Delay time for automatic switch over" under **Output Settings→PTY31 Alarm** [0-5 s] (Setup over SNMP commands possible, see section 13.4).

Example: "Delay time for automatic switch over" - 2 seconds.

Tuner detects PTY=31. It is waiting for 2 seconds, if PTY=31 is still activated, and then switches to internal source (into "alarm state").

Tuner is in "alarm state" and detects PTY≠31. It is waiting for 2 seconds, if PTY≠31 is still valid, and then switches back to external source (into "normal state").

Power failure

In case of a **power failure** during an **active PTY31 alarm**, the switch over relay will be released and the device is switching from alarm program (tuner) back to loop through mode (see ***Fig. 23***).

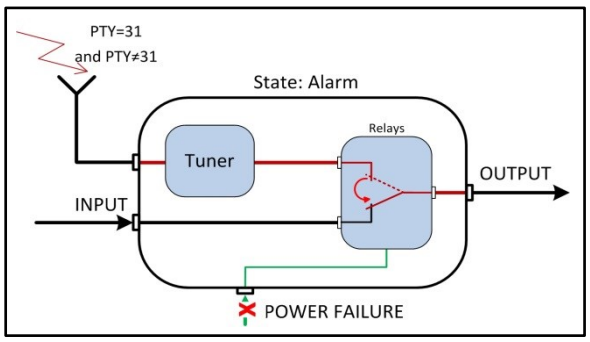


Fig. 23: PTY31 alarm and power failure

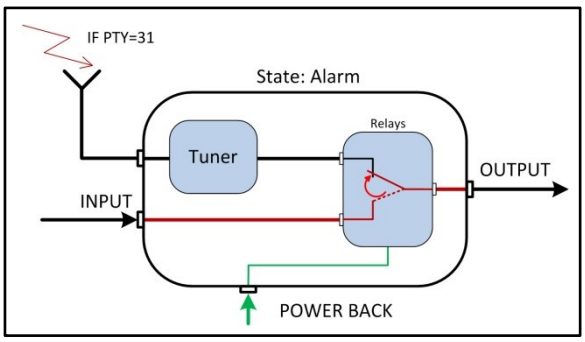


Fig. 24: PTY31 alarm and voltage recovery

If the receiver is after booting up (approx. 10 seconds) again detecting PTY31, the relay is switching to alarm program (tuner), otherwise it stays in the loop through mode (see ***Fig. 24***).

RDS sync failure

In case of an **RDS sync failure** (bad antenna) during an **active PTY31 alarm**, the switch over relay will be released and the device is switching from alarm program (tuner) back to loop through mode (see ***Fig. 25***, left). If the signal is looping through from the external source by the moment of the RDS sync failure, the device **doesn't** switch over to the internal source (tuner) even if PTY31 alarm is active (see ***Fig. 25***, right).

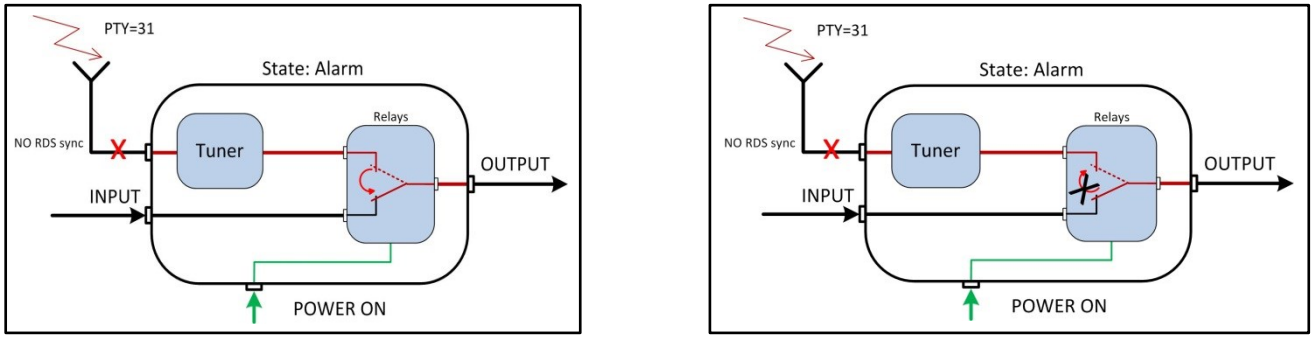
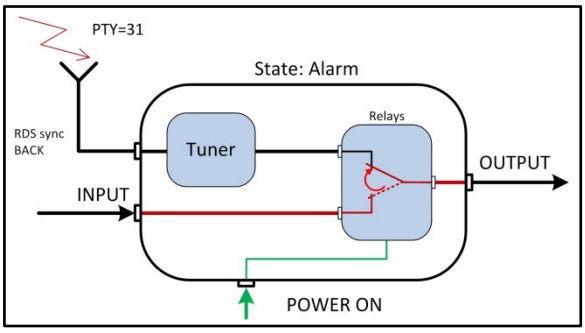


Fig. 25: PTY31 alarm and RDS sync failure



If the RDS sync is good again and is detecting PTY31, the relay is switching to alarm program (tuner), otherwise it stays in the loop through mode (see Fig. 26).

Fig. 26: PTY31 alarm and RDS sync recovery

12.7.3. PTY31 switchover in the FM02

The „normal state" of the FM02 is the loop through mode (external source) as described in section 12.7.1. In case of PTY=31 the device will switch to the internal source (Tuner) into "alarm state"

The FM02 is equipped with a timeout function, which forces the device to stop the "alarm state" (internal source Tuner) and to switch back to "normal state" (external source) after a defined timeout span.

The timeout function and switch delay settings can be configured over the web interface or via SNMP commands (see section 13.4).

You can activate and configure the timeout function under **Output Settings→PTY31 Alarm.**

NOTE: If you set the timeout span to 0s, the timeout function will be disabled. In this case, the FM02 proceeds during the PTY31 switchover in the same way as the FM01 (see section 12.7.2).

Set up the general monitoring parameters for PTY31 under **Output Settings→PTY31 Alarm** as described in section 12.7.1. The following additional parameters can be configured or changed in the same block for FM02 (see ***Fig. 27***):

Delay time for automatic switch over	If timeout function is activated, the delay time for automatic switch over can be set up only for one direction: from "normal state" to "alarm state" (see section 12.7.2). The timeout counter starts only after the delay time counter is over.
Timeout span [0-3600s]:	Countdown for switching from "alarm state" (internal source) back into "normal state" (external source) if PTY=31 is still active after the timeout. "0 sec" disables the timeout function. ">0 sec" enables the function.
RDS sync lost delay [0-5s]:	This parameter is enabled only if the timeout function is active (>0s). **Example**: "RDS sync lost delay" - 5 seconds. Tuner detects PTY=31. After the "Delay time for automatic switch over" (if configured) the device switches to internal source (into "alarm state") and the timeout counter starts. If an RDS sync loss happens before the timeout counter is over, the device is waiting for 5 seconds and switches back to "normal state" (external source). If the RDS sync is back and the timeout counter is still active (still PTY=31), the device switches into "alarm state" and continues the timeout counter. Otherwise the device stays in "normal state".
"Reset over PTY" delay [1-5s]:	If PTY=31 alarm continues longer than the defined timeout period (e.g. >60s), the device can reset the timeout counter. This reset can be activated via SNMP, GPIO or with usage of PTY changes (switch PTY=31→PTY≠31→PTY=31). For the reset over PTY changes you can define in this menu the time period for switching from PTY≠31 back to PTY=31 (if the tuner still detects PTY=31). After the reset the timeout countdown starts again.

⇒ Click the save button to save the changes or the reset button to restore the last settings.

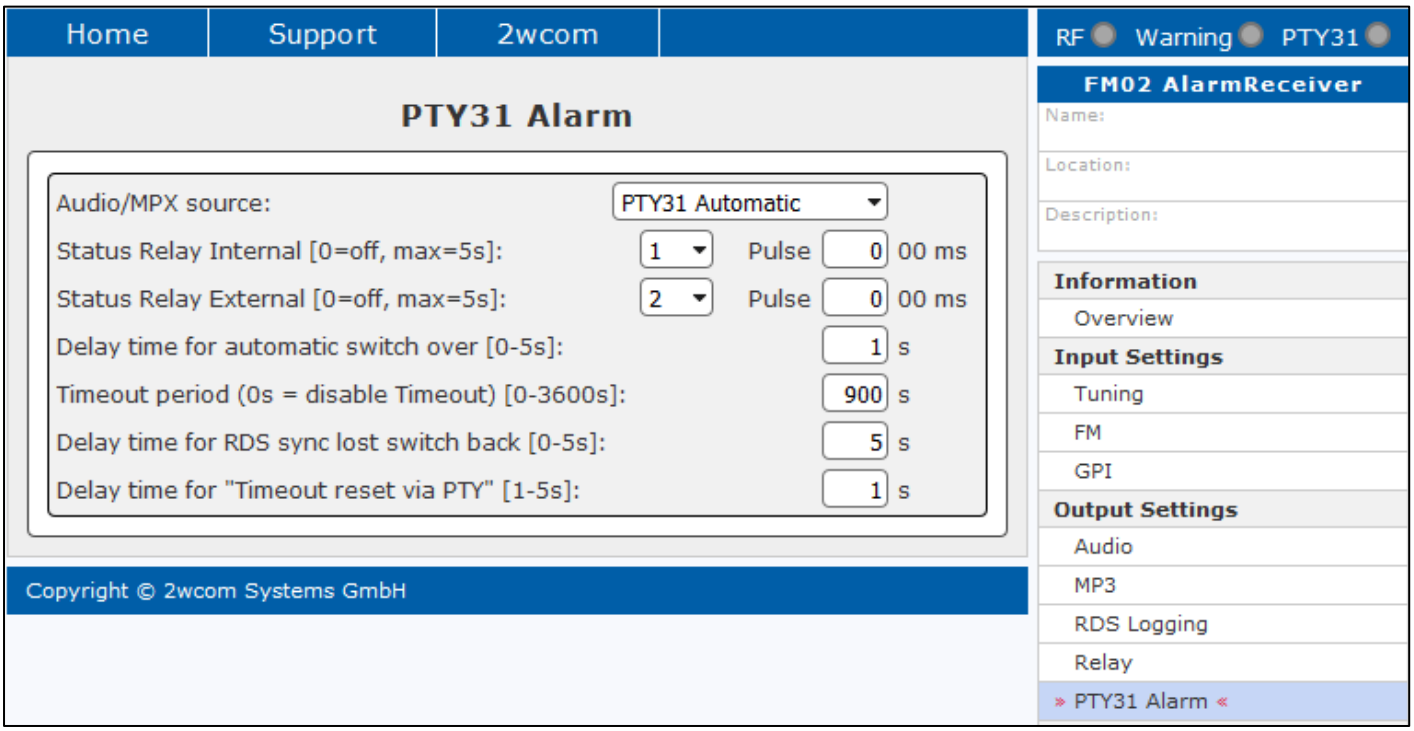


Fig. 27: Configuration of the PTY31 alarm switchover in the FM02

12.7.4. Operation in mode "PTY30"

The FlexMon FM01/02 Alarm Receiver is also able to monitor the RDS PTY30, which is responsible for sending a test alarm. In this mode, the device operates in the same way as in mode "PTY31 automatic".

To configure the monitoring of PTY30, follow the instructions in section 12.7.1 for "Operation in mode PTY31". However, choose "PTY30 automatic" instead of "PTY31 automatic" in Step 2.

12.7.5. Operation without PTY31 monitoring

12.7.5.1. Internal mode

If you deactivate the RDS PTY31 monitoring, the device will go on monitoring the internal source for other RDS data and send alarms. You can set up, which source should be looped through to the outputs: the signal from the internal or the external source.

To deactivate monitoring of the RDS PTY31 and to send the signal from the internal source (Antenna 1/2 or MPX) to the outputs (Analog/Digital/MPX):

1. Choose one of the configured stations under **Input Settings→Tuning**, to specify the internal source and the frequency for RF signal.
2. Choose "Internal" instead of "PTY31 automatic" in the **Audio/MPX source** dropdown list under **Output Settings → PTY31 Alarm**.
3. To assign the operating mode to the connector with the double-function AES/EBU and Analog L (IN/OUT) for the external source, choose "Digital" or "Analog" in the **Audio type for input/output** dropdown list.

4. Click the save button to save the changes or the reset button to restore the last settings.

⇒ The signal from the internal source is now fed to the available outputs (MPX and Analog/Digital).
⇒ The signal from the external source is now not looping through and its connection to the outputs is interrupted.
⇒ The FM01/02 Alarm Receiver is now operating as an FM01/02 Demodulator.

12.7.5.2. External mode

To deactivate monitoring of the RDS PTY31 and to continue looping through of the external source:

1. Choose "External" instead of "PTY31 automatic" in the **Audio/MPX source** dropdown list under **Output Settings → PTY31 Alarm**.

2. To assign the operating mode to the input/output connectors with the double-function AES/EBU and Analog L (IN/OUT) for the external source, choose "Digital" or "Analog" in the **Audio type for input/output** dropdown list.

3. Click the save button to save the changes or the reset button to restore the last settings.

⇒ The external signal is now looping through over the MPX and Analog/Digital connectors.
⇒ The FM01/02 Alarm Receiver is monitoring the internal source for RDS or Audio errors.

12.8. Alarm status

12.8.1. View alarm staus

Under **System Settings → Alarm** you can call up the current information about the monitoring Audio and RDS parameters (see ***Fig. 28***).

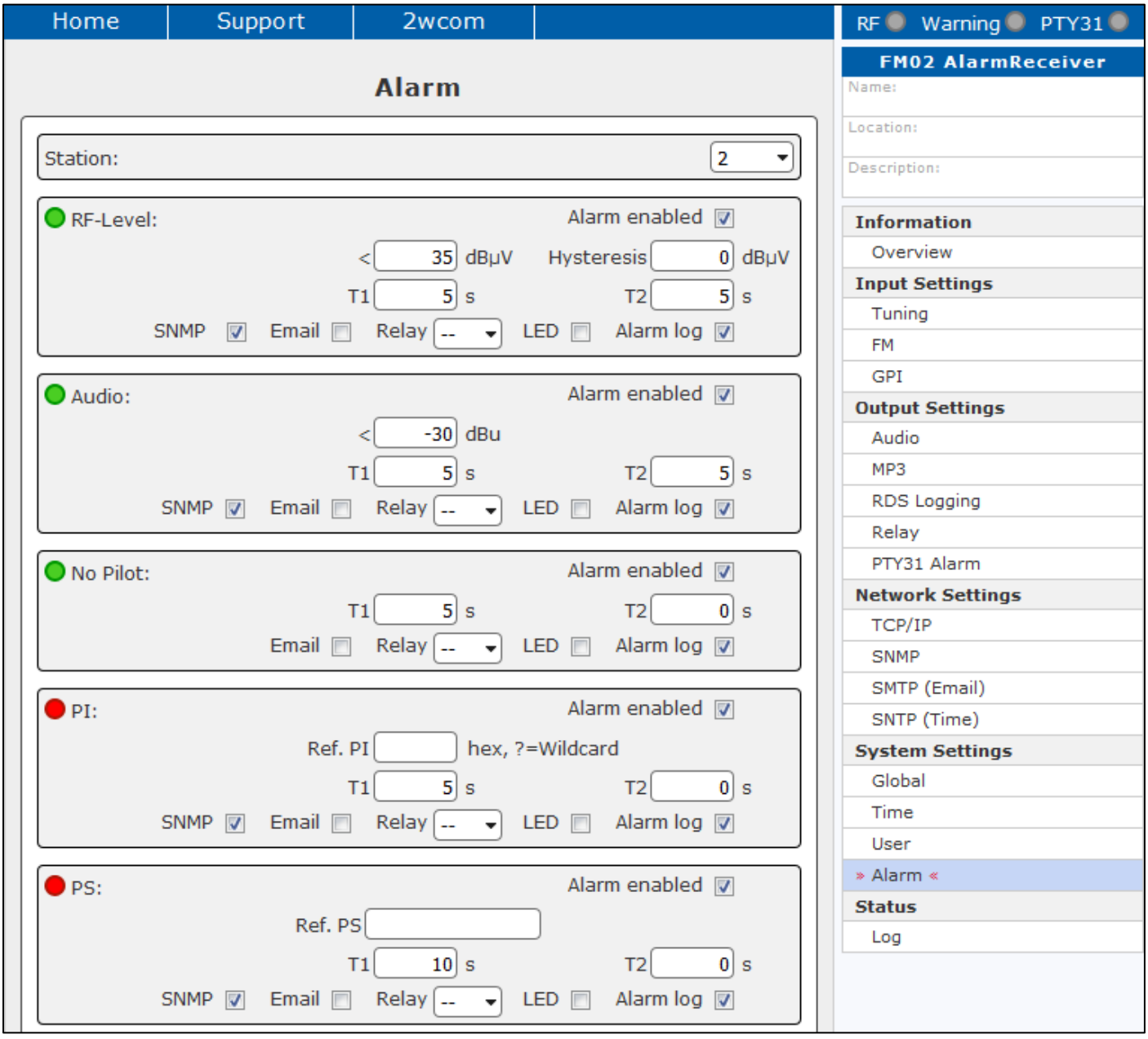


Fig. 28: Alarm Status

The LED color means:

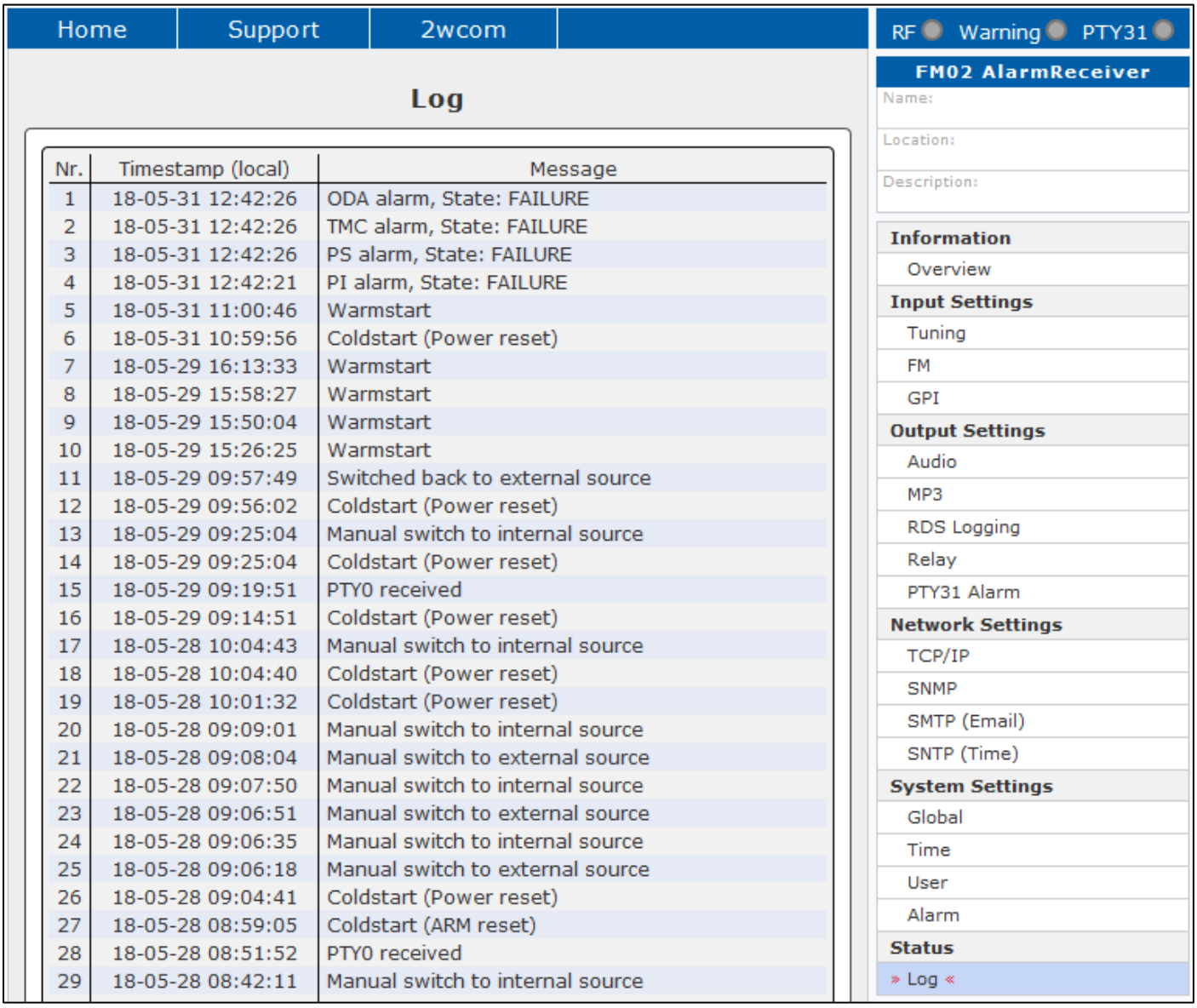
- Monitoring is activated, no alarm is released
- Monitoring is deactivated
- Monitoring is activated, alarm is released

12.8.2. View alarm log

Under **Status→Log** you can call up information about the device operation, data distribution and errors since the last event log deleting. A list with a description of the events with the timestamps is displayed in this menu (see Fig. 29).

To delete the last events click the “delete” button.

To print out the alarm log click the “print” button.



Log

Nr.	Timestamp (local)	Message
1	18-05-31 12:42:26	ODA alarm, State: FAILURE
2	18-05-31 12:42:26	TMC alarm, State: FAILURE
3	18-05-31 12:42:26	PS alarm, State: FAILURE
4	18-05-31 12:42:21	PI alarm, State: FAILURE
5	18-05-31 11:00:46	Warmstart
6	18-05-31 10:59:56	Coldstart (Power reset)
7	18-05-29 16:13:33	Warmstart
8	18-05-29 15:58:27	Warmstart
9	18-05-29 15:50:04	Warmstart
10	18-05-29 15:26:25	Warmstart
11	18-05-29 09:57:49	Switched back to external source
12	18-05-29 09:56:02	Coldstart (Power reset)
13	18-05-29 09:25:04	Manual switch to internal source
14	18-05-29 09:25:04	Coldstart (Power reset)
15	18-05-29 09:19:51	PTY0 received
16	18-05-29 09:14:51	Coldstart (Power reset)
17	18-05-28 10:04:43	Manual switch to internal source
18	18-05-28 10:04:40	Coldstart (Power reset)
19	18-05-28 10:01:32	Coldstart (Power reset)
20	18-05-28 09:09:01	Manual switch to internal source
21	18-05-28 09:08:04	Manual switch to external source
22	18-05-28 09:07:50	Manual switch to internal source
23	18-05-28 09:06:51	Manual switch to external source
24	18-05-28 09:06:35	Manual switch to internal source
25	18-05-28 09:06:18	Manual switch to external source
26	18-05-28 09:04:41	Coldstart (Power reset)
27	18-05-28 08:59:05	Coldstart (ARM reset)
28	18-05-28 08:51:52	PTY0 received
29	18-05-28 08:42:11	Manual switch to internal source

Fig. 29: Status – Event Log

LCD menu: “Configuration menu”→”Log”

13. Remote control via GPI and SNMP

13.1. GPI remote control inputs

The FM01/02 series are equipped with a 15 pole D-Sub connector with 7 inputs (see ***Fig. 30***). The inputs can be used for the remote control of the device.

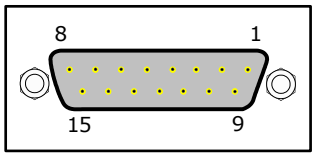


Fig. 30: D-Sub female connector, 15 pole

Table 2 shows the pinout scheme of the connector.

Input No.	*Control Pin No.*
1	1
2	2
3	3
4	4
5	5
6	6
7	7

Table 2: Pinout scheme of the remote control inputs

To actuate an input pull the corresponding control pin electrically to ground (pins 9, 10, 11, 12, 13, 14, 15). The control current is less than 5 mA.

NOTICE	
	Voltage on the inputs must not be negative or exceeding +0.7 V!

13.2. Set up GPI remote control inputs

Over remote control inputs (GPI) in the FM01/02 series you can set up the timeout counter, abort alarm (see section 12.7.3) and change some configurations (see ***Fig. 32***):

- Change station 1-8 for tuner monitoring
- Reset timeout counter (Only when Timeout function is active)
- Abort the alarm (Only when Timeout function is active)
- Set Audio/MPX Source to “Internal”
- Set Audio/MPX Source to “External”
- Set Audio/MPX Source to “PTY31 Automatic”
- Set Audio/MPX Source to “PTY30 Automatic”

NOTE: The last three commands are similar to the Audio/MPX Source command in SNMP (see section 13.4).

Under **Input Settings→GPI** in the user web interface of the FM01/02 series you can individually configure GPI 1-7 inputs and assign to each input one command for remote control (see Fig. 31):

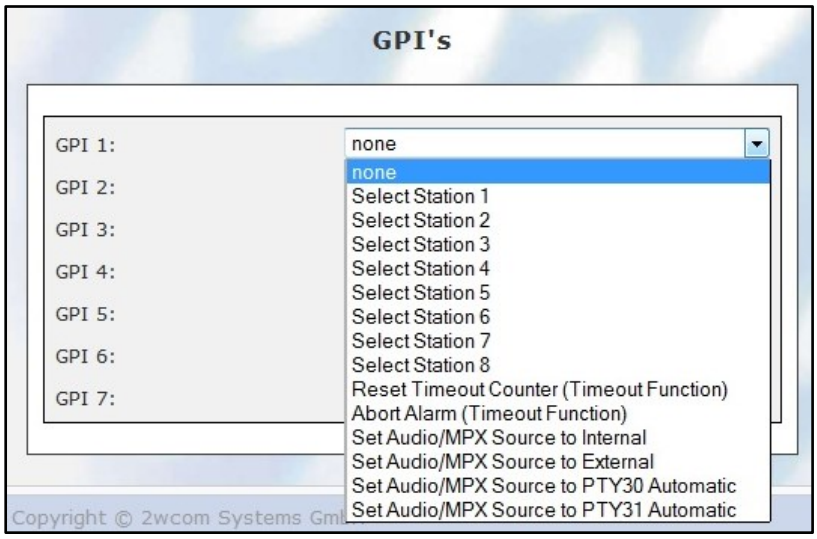


Fig. 31: Configuration of the remote control inputs in the FM01 Alarm Receiver

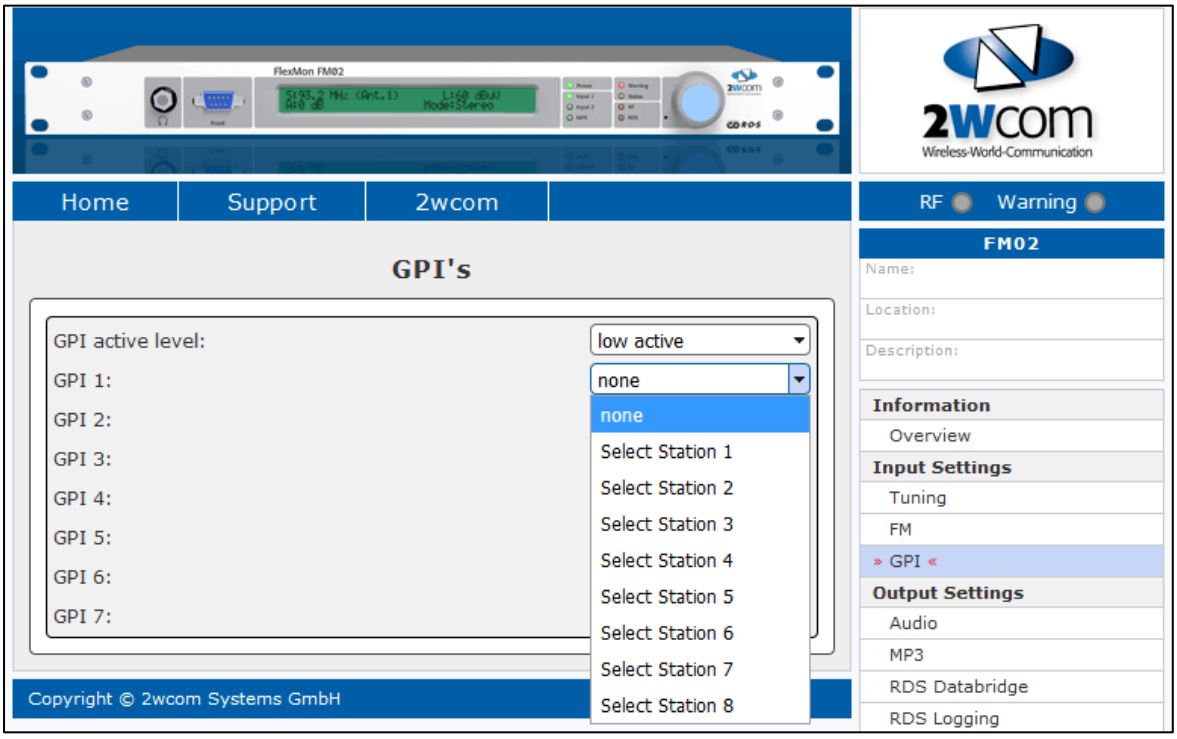


Fig. 32: Configuration of the remote control inputs in the FM02

Click the save button to save the changes or the reset button to restore the last settings

13.3. Set up bypass relay

The current state of the bypass relay (PTY=31; PTY≠31) can be signaled over two relays. You can set up the bypass relays and enter the value for the timeout in the web interface under **Output Settings→PTY31 Alarm** in fields "status relay" (see section 12.7.1 and Fig. 27).

13.4. SNMP commands

You can control the FM01/02 Alarm Receiver by manual commands for switching the device between external and internal source in PTY31 alarm case.

NOTE: The commands are similar to present functions in the web interface under **Output Settings→PTY31 Alarm**. For more information about PTY31 switchover and timeout function please read section 12.7.3.

The following commands can be sent via SNMP for remote control:

SNMP command	Comment
Set delay time for switch position change [sec](0 … 5000 msec)	Max. time between PTY=31(PTY≠31) and automatic switch over into "alarm state" ("normal state") .
Audio/MPX Source	Switch between "Internal", "External" and "PTY31 Automatic".
Set Timeout [sec] (0 … 3600 sec)	Time span after the "alarm state" will hard switch to the "normal state" **NOTE**: The Timeout will also enable the timeout function if the timeout is >0 sec.
Set RDS sync lost delay [sec] (1 … 5 sec) (Only when Timeout function is active)	Max. time between "RDS sync lost" during PTY=31 and switchover into "normal state".
Set PTY reset delay [sec] (1 … 5 sec)	Max. time between PTY≠31 and PTY=31 to reset the timeout counter. **NOTE**: This delay prevents the quick switch back to loop through if timeout counter reset via PTY.
Abort the alarm (Only when Timeout function is active)	Send a "1" to abort the "alarm state"
Reset timeout counter (Only when Timeout function is active)	Send a "1" to reset the counter

Table 3: Commands for remote control via SNMP

The SNMP commands specified in Table 3 require specific MIB files.

NOTE: In order for the SNMP manager tool to operate correctly, it requires the specific MIB files. These MIB files need to be compiled by the SNMP manager tool and are provided as download on the Web interface in the "MIB" block under **Network Settings→SNMP** (see ***Fig. 1*** on page 28) or via email.

The corresponding MIB files you can see in Fig. 33 (in the end of the tree).

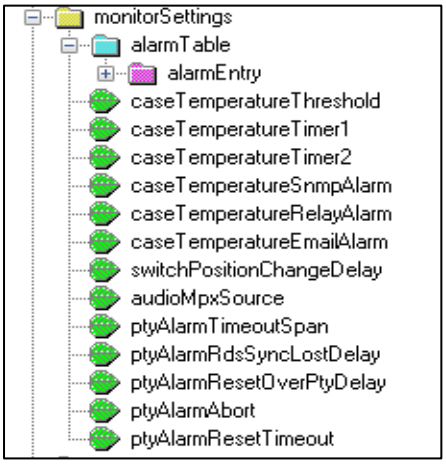


Fig. 33: MIB files overview for SNMP commands

14. Audio Settings

The FlexMon FM01/02 is looping through the external signals MPX and analog/digital audio from the connected inputs to the connected outputs. No further settings are necessary.

14.1. Adjust output gains and volume

You can only set up the volume for available outputs and configure the MPX signal via web interface or jog wheel.

To set up the outputs:

1. Select **Output Settings→Audio** in the web interface menu. The page *Audio* appears.
2. Set up the volume for the headphone output

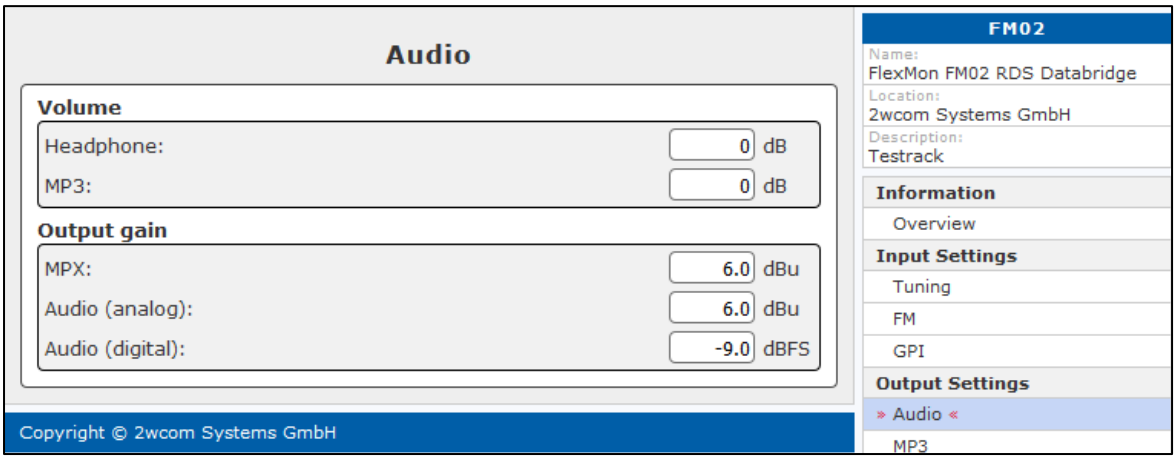


Fig. 34: Audio output settings

3. Configure in the same block the level for MPX and analog/digital Audio. In the FM01 you can additionally configure the "MPX Mono boost" and "Mono" signal.

LCD menu: "Configuration menu"→"Setup"→"Audio"

14.2. MP3 settings

The internal audio source can be monitored via MP3 streaming in all FM01/02 devices.

To monitor the internal source over MP3 streaming, install a media player on the remote PC, for example *WinAmp*. The FM01/02 is equipped with an adjustable bit rate encoder that can encode the audio signal into three different MP3 quality levels. You can manually set up the parameters for MP3 encoding depending on the bandwidth available for data distribution.

Set up MP3 streaming over TCP/IP as follows:

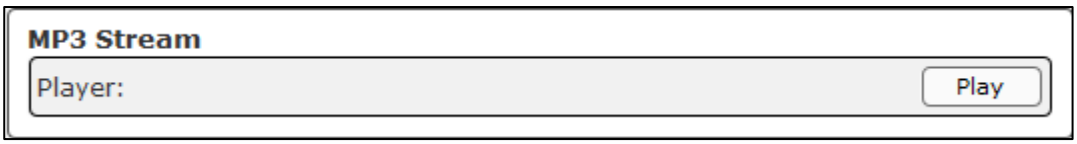
✓ The device should be connected to the available network via the [10/100-Base-T] connector.

1. Start an available media player on your remote PC and enter the URL for streaming "`IP address of the device:streaming port`" (standard port for MP3 streaming is: ARM Version <2.18: `6667` , ARM Version ≥2.18: `8000`, e.g. `http://192.168.12.23:8000`).

NOTICE

In the latest versions of FM01/02 (ARM Firmware ≥2.42) you can directly stream MP3 over the web interface without an external media player.

For MP3 streaming just click the "Play" button in the "MP3 Stream" block at the bottom of the page under **Information→Overview:**



NOTE: Use one of the latest versions of Firefox (recommended) or Internet Explorer etc. Otherwise, it may be that you have to install for example WinAmp.

2. To view or to set up the streaming port, use the menu *MP3* under **Output Settings→MP3** in the web user interface page of the FM01/02 (see Fig. 35).

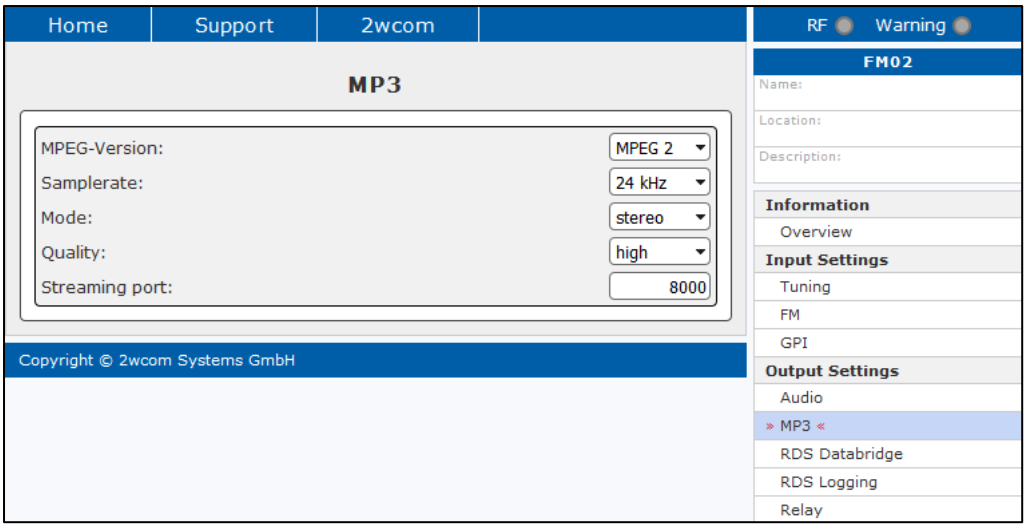


Fig. 35: MP3 streaming settings

3. Choose an MPEG-Version in the dropdown menu **MPEG-Version** (see Fig. 35). Available options are: *MPEG 1, MPEG 2.*

4. Choose a sample rate for the streaming in the dropdown menu **Samplerate** (see Fig. 35). Available options are: *16 KHz/22 KHz/24 KHz*.

5. Choose a stereo or mono audio mode for MP3 streaming in the dropdown menu **Mode** (see Fig. 35).

6. Choose one of three MP3 quality levels *low/middle/high* in the dropdown menu **Quality** (see Fig. 35).

7. Click the "save" button to save the changes or the "reset" button to restore the last settings.

⇒ Your media player is now playing the MP3 data in the configured quality.

15. Global Settings

15.1. View the system information

On the web user interface, you can view general settings of the device and current system information like uptime, serial number, firmware version, the temperature etc.

The device information is displayed under **System Settings → Global** (see Fig. 36).

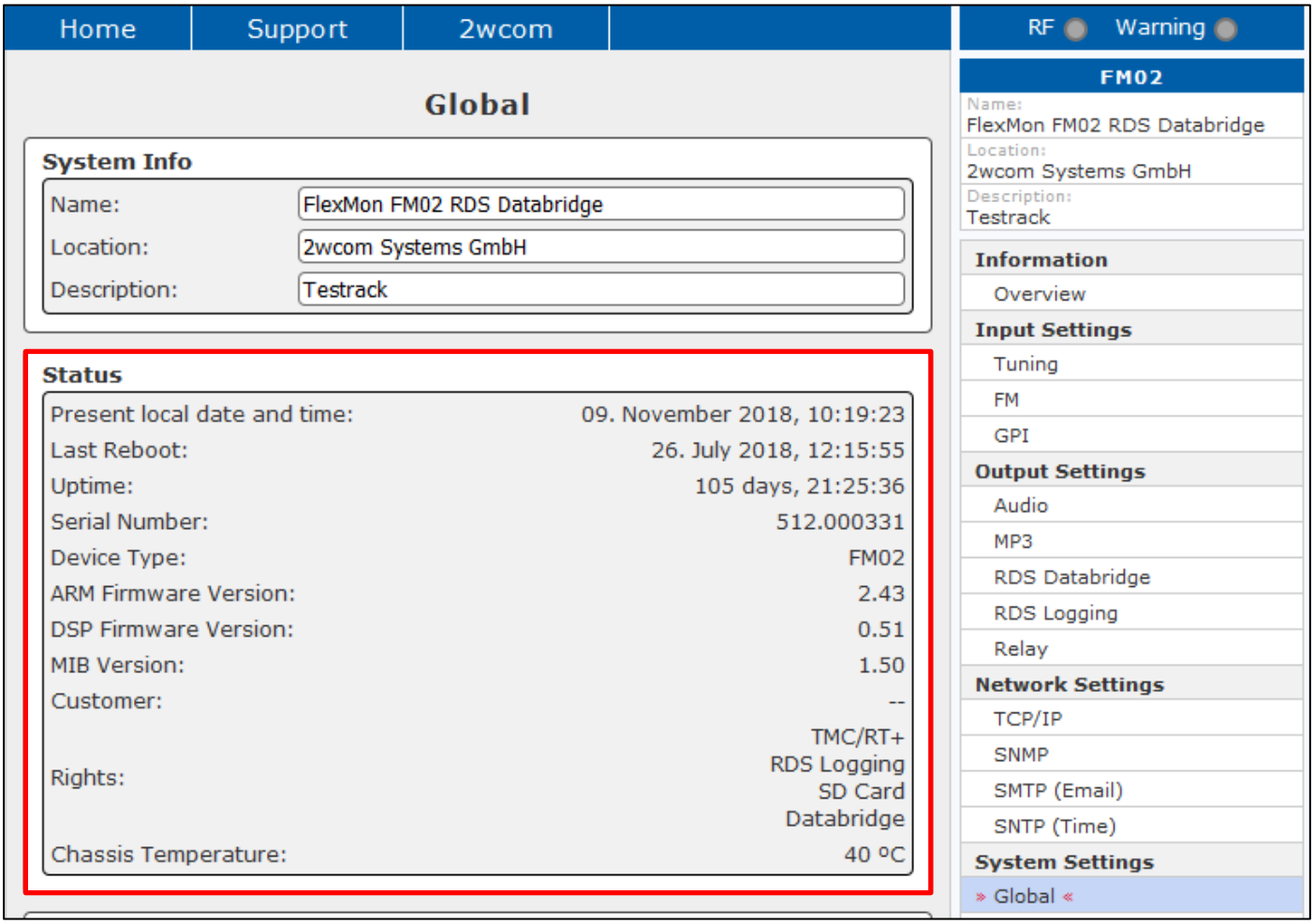


Fig. 36: Information – System

15.2. Enter the device information

To enter the name and description of the device for identification:

1. Open the window *Global* under **System Settings→Global**.
2. Enter the identification information of the device in the **System Info** field (see Fig. 37).

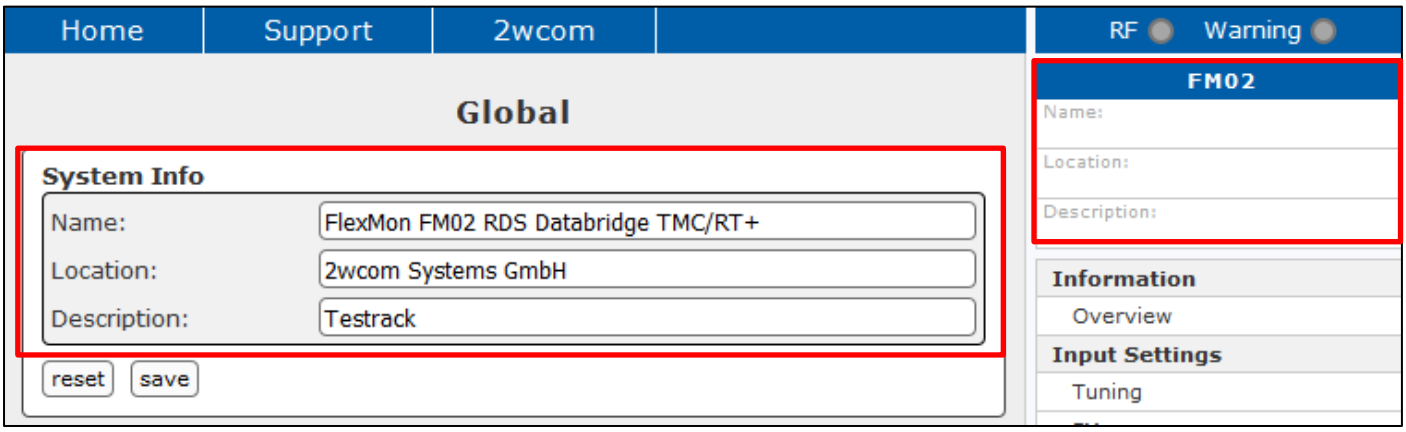


Fig. 37: Global System Settings – System Info

3. Click the "SAVE" button to save the changes or the "RESET" button to restore the last settings.

⇒ The saved information can be viewed over the main menu in the web user interface.

15.3. Set up time

You can set up or change manually the present local time zone and date of the internal clock of the device.

To set up the internal clock of the device:

1. Open the window *Time* under **System Settings→Time**
2. In the **Time and date settings** block set up the internal time in the 24h format and the datum (see Fig. 38).

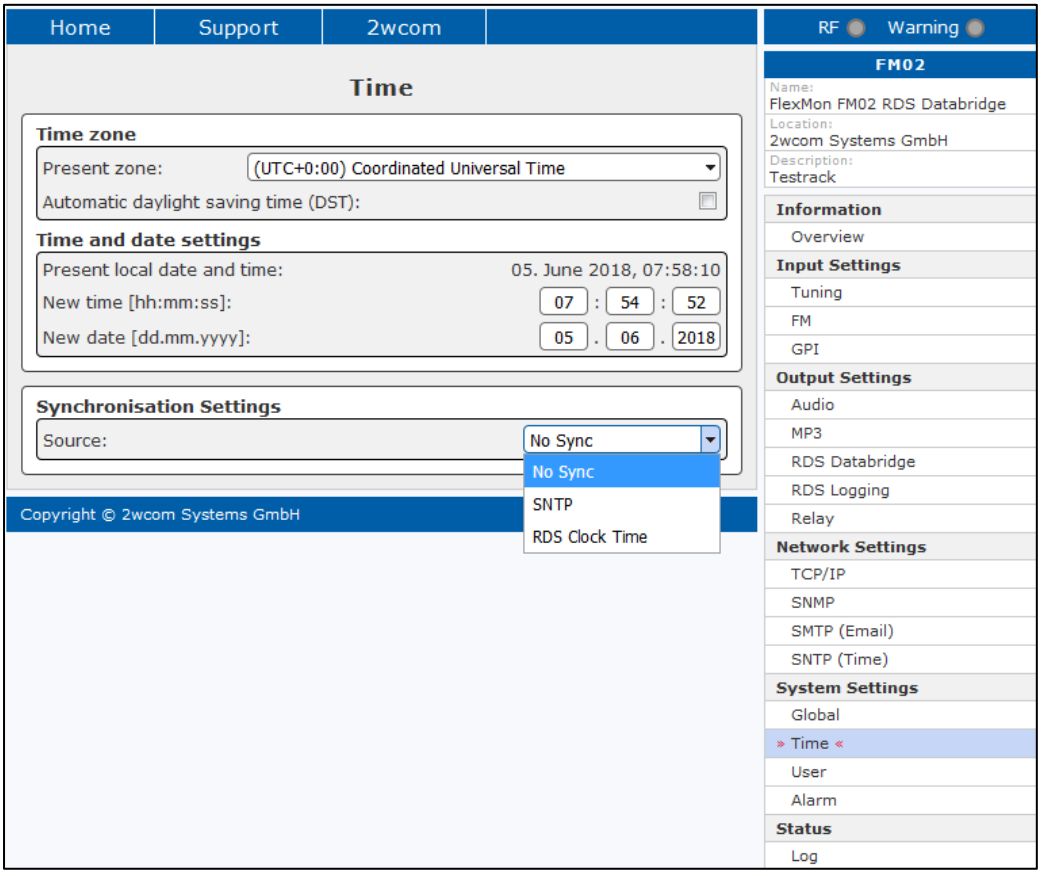


Fig. 38: System Settings - Global

3. Choose the source for synchronization in the "Synchronization Settings" block, if synchronization should be activated.
4. Click the "SAVE" button to save the changes or the "RESET" button to restore the last settings.

⇒ The current time and datum of the internal clock is displayed under "Present local device time and date" in the same **Time and date settings** field (see Fig. 38).

15.4. Configure user accounts

The default accounts are a read-only access (Guest account) and a full access (Admin account). Change the login data for the access after the first login to the web user interface. To change the login data:

1. Open the window *User settings* under **System Settings→User**.
2. Change the login data for the full access in the **Admin account** field and repeat the new password.
3. Click the "SAVE" button to save the changes or the "RESET" button to restore the last settings.
4. Change the login data for the read-only access in the **Guest account** field and repeat the new password.
5. Click the "SAVE" button to save the changes or the "RESET" button to restore the last settings.

NOTE: Consider the sensitive case while entering a new password!

15.5. Restart the device

To restart the device:

1. Open the window *Global* under **System Settings→Global.**
2. In the "Control" block click the "NOW" button in the field "Reboot device" to reboot the device (see Fig. 39).
3. Confirm the system question "Reboot the device now?" by clicking OK button.

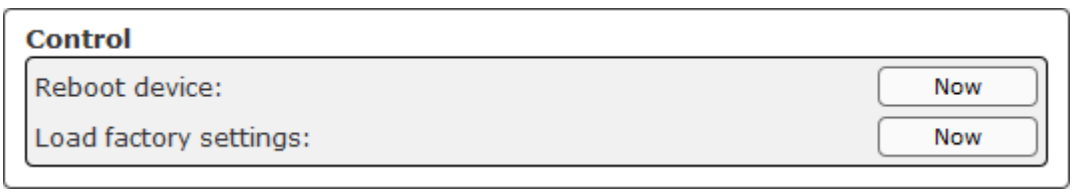


Fig. 39: Restart menu in the web user interface under System Settings – Global

⇒ The device restarts.

15.6. Restore factory settings

NOTICE	
	CAUTION: If you restore factory settings, all saved configurations made earlier by user will be deleted except for the IP address! This applies also for the access accounts!

To reset the device to the factory settings:

1. Open the window *Global Settings* under **System Settings→Global.**
2. Click the "NOW" button in the field "Load factory settings" in the last block of the web page to restore factory settings (see Fig. 39).

16. Troubleshooting

The following chart is designed to help you to correct minor problems with the use of the device prior to contact our service department (report failures by email to *contact@2wcom.com* or fax to +49 461-662830-11). Also be sure to read the entire manual carefully, as this often helps in understanding and fixing typical problems.

Problem	**Possible Cause**	**Solution**
Device does not turn on	• Power cable is improperly connected • Mains supply failure • Blown fuse	• Check supply cord • Make sure that the power plug at the device is fully inserted • Check mains supply • Replace fuse by same type
Device cannot be operated via Ethernet	• Network cable not connected • IP address / TCP port is not known. • A device with the same IP address was connected a few minutes before. Then the ARP table still assigns the old MAC address to the IP address.	• Connect the network cable. • Use the default address 192.168.14.250. If the address was changed and is not known please see page 12. • Usually the ARP table is refreshed automatically after a few minutes by the operation system. For an instant access to the device please reset the ARP table of your computer e.g. by entering "arp –d" in the Windows Command Prompt.

For a request to 2wcom support team, please write the serial number of the device. The sticker with the serial number is normally on the rear side of the device: „S/N xxx.xxxxxx".

17. Maintenance and servicing

Maintenance

No special maintenance is necessary on the device. Dust can be removed with a dry duster. For cleaning use only neutral, non-corrosive detergents applied to a cloth - not the device.

Servicing

The modules of the device are complex and should be serviced only by authorized personnel.

The 2wcom Systems GmbH is equipped with special measurement and repair kits. Therefore a repair by the user is not intended.

Calibration

Due to the design and construction of the device, no calibration is necessary.

18. Index

19. Technical Data

FlexMon FM02 Professional – Technical Details

according to CENELEC EN 60950,
EMV EN55022 and EN55024

Inputs

RF	2 unbalanced, BNC
Impedance	50 Ω
Frequency Range	87.5...108.0 MHz 76.0...90.0 MHz (Japan) 50/100 kHz steps
RF sensitivity (S/N 40 dB, stereo)	35 dBµV
Max. RF input	120 dBµV Selection from RF input (internal FM tuner) or external signal
MPX (optional)	BNC unbalanced, 1x rear
Connector	>10 kΩ
Impedance	
Inputs (passive loop through)	
MPX connector	BNC
AES/EBU connector	XLR
Audio L connector	XLR
Audio R connector	XLR

Measurement FM

RF level	20...120 dBµV
MPX	MPX level

Measurement RDS

RDS decoder	PI, PS, TP, TA, PTY, RT, Optional: ODA AIDs, Content of all group types, TMC , RT+ (via RDS Lab tool)
RDS Block Error Rate	0...100%, resolution 1%

Measurement Audio

Audio	Peak level (L+R)/2

Outputs

Multiplex	1 unbalanced BNC, AC coupled
Impedance	<20 Ω
Level	Max. 15 dBu
Frequency response	20 Hz...95 kHz ±0.1 dB
Signal/Noise ratio (75 kHz deviation)	Typ. 70 dB stereo
Harmonic distortion	Typ. 0.05%
Stereo separation	>48 dB
Analog Audio	L/R balanced XLR
Impedance	<20 Ω
Level	Max. 15 dBu
Frequency response	20 Hz...15 kHz ±0.1 dB
Deemphasis	50 (optional 75 µs)
Signal/Noise ratio (75 kHz deviation)	Typ. 70 dB stereo
Harmonic distortion	Typ. < 0.1%
Stereo separation	>40 dB
Digital Audio	AES/EBU balanced XLR
MP3 stream	MPEG 1/2 Layer 3 output via TCP/IP-interface
Headphone	
Connector	6.35 mm
Impedance	600 Ω

Front panel

LCDisplay	2x 40 characters
Jog wheel	Impulse, ENTER button
8 LED's	Power, RF 1, RF 2, MPX, Warning, Status, RDS, Pilot

Alarm functions

Controlling data	RF level, audio, no pilot, PI, PS, no RDS sync, TA, no TA, Block error, station change, case temp
Control content (RDS group)	received within x sec. / change
Alarm types	Potential free relays, E-mail, SNMP
Alarm report	via serial port or TCP/IP

Interfaces

Remote control input	7 inputs
Connector	15 pole sub-D female
Remote control output	6 standard relays (SPST) 1 change-over relays (SPDT) (for DC: max. 30 V, 1 A, 10 W)
(Messages)	15 pole sub-D male
Data interfaces	1 serial interface for setup data and setup function (RS-232C)
TCP/IP data interface	Input/output setup functions
Connector	RJ45
Type	Full duplex 10/100 BASE-T
Data format	HTTP, SNMP, SNTP, optional: FTP

MP3-Encoder

Type	MPEG 1/2 Layer 3 encoder
Transmission of encoded MP3 data by TCP/IP	Adjustable MPEG Encoder quality in 3 steps Adjustable sample rates for latest Live-stream-Technology Reception of Audio-Live-stream by shoutcast compatible media player like WinAmp or VLC
Internal input	From tuner module

General data

Power consumption	40 VA
Case dimensions	19", 1 HU, 310/424/484 mm
Weight	5 kg
Housing	steel plate (aluminum-zinc coated)
Operating temp. range	0...+45°C
Storage temp. range	-40...+70°C
Power supply	Internal, 90...260 V, 47...63 Hz

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FlexMon FM01 Alarm Receiver – Technical Details

according to CENELEC EN 60950,
EMV EN55022 and EN55024

Inputs

RF	2x unbalanced, BNC
Impedance	50 Ω
Frequency Range	87.5...108.0 MHz 50/100 kHz steps
RF sensitivity (S/N 40 dB, stereo)	20 dBµV
Max. RF input	120 dBµV
Switchable attenuators	20 dB, 40 dB
MPX	Selection from RF (internal FM tuner) input or external signal
Connector	BNC unbalanced, 1x rear, 1x front
Impedance	>10 kΩ
Analog Audio	L/R balanced XLR
Impedance	<20 Ω
Level	+6 dBu, adjustable -6...+6 dB
Frequency response	20 Hz...15 kHz ±0.1 dB
Deemphasis	50 or 75 µs
Signal/Noise ratio (75 kHz deviation)	typ. 70 dB stereo
Harmonic distortion	<0.02 %
Digital Audio	AES/EBU balanced XLR

Outputs

Multiplex	1 unbalanced BNC, AC coupled
Impedance	<20 Ω
Level	+6 dBu, adjustable -6...+6 dB
Frequency response	20 Hz...60 kHz ± 0.2 dB 60 kHz ...76 kHz ±0.5 dB
Signal/Noise ratio (75 kHz deviation)	typ. 70 dB stereo
Harmonic distortion	typ. 0.05%
Stereo separation	>50 dB
Analog Audio	L/R balanced XLR
Impedance	<20 Ω
Level	+6 dBu, adjustable -6...+6 dB
Frequency response	20 Hz...15 kHz ±0.1 dB
Deemphasis	50 or 75 µs
Signal/Noise ratio (75 kHz deviation)	typ. 70 dB stereo
Harmonic distortion	typ. 0.05%
Stereo separation	>40 dB
Digital Audio	AES/EBU balanced XLR
Headphone	
Connector	6.35 mm
Impedance	600 Ω

Measurement functions

FM	RF level, selected mode (stereo/mono), stereo blend, pilot (on/off), output level M signal, output level MPX signal
RDS data	PI, PS, TA, TP, PTY

Alarm functions

Data controlled with alarm	RF level, audio, no pilot, PI, PS, RDS sync, TA, no TA, Block error, TP change, case temp
Alarm types	serial interface, potential free relay contact, SNMP
Alarm report	can be read out via serial port or TCP/IP
Data format	UECP V 6.01 protocol

Front panel

LCDisplay	2x 40 characters
Jog wheel	impulse, ENTER button
8 LED's	Power, Input 1, Input 2, MPX, Warning, Status, RF, RDS

Interfaces

Remote control input	7 opto-isolated inputs (excludes option: 24 relay contacts)
Connector	15 pole sub-D female
Remote control output	6 standard relays (SPST) 1 change-over relays (SPDT) (for DC: max. 30 V, 1 A, 10 W)
(Messages)	26 pole sub-D male
Data interfaces	2 serial interfaces for setup data and setup function (RS-232C)
TCP/IP data interface	input/output setup functions
Connector	RJ45
Type	full duplex 10/100 BASE-T
Data format	HTTP, SNMP, SNTP, optional: FTP

MP3-Encoder

Type	MPEG 1/2 Layer 3 encoder
Transmission of encoded MP3 data by TCP/IP	Adjustable MPEG Encoder quality in 7 steps Adjustable sample rates for latest Live-stream-Technology Reception of Audio-Live-stream by shoutcast compatible media player like WinAmp or VLC

General data

Power consumption	40 VA
Case dimensions	19", 1 HU, 310/424/484 mm
Weight	<4 kg
Housing	steel plate (aluminum-zinc coated)
Operating temp. range	0...+45°C
Storage temp. range	-40...+70°C
Power supply	internal, 90...260 V, 47...63 Hz
Internal input	from tuner module

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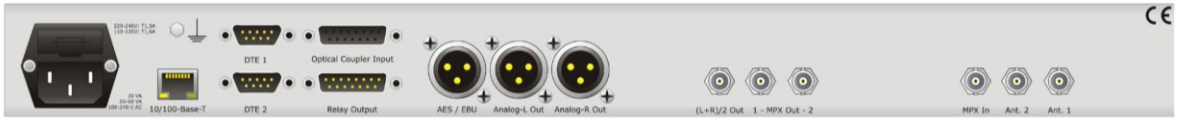

FlexMon FM01 Demodulator – Technical Details

according to CENELEC EN 60950,
EMV EN55022 and EN55024

Inputs

RF	2x unbalanced, BNC
Impedance	50 Ω
Frequency Range	87.5...108.0 MHz 50/100 kHz steps
RF sensitivity (S/N 40 dB, stereo)	20 dBµV
Max. RF input	120 dBµV
Switchable attenuators	20 dB, 40 dB
MPX	Selection from RF (internal FM tuner) input or external signal
Connector	BNC unbalanced, 1x rear,
Impedance	>10 kΩ

Outputs

Multiplex	1 unbalanced BNC, AC coupled
Impedance	<20 Ω
Level	+6 dBu, adjustable -6...+6 dB
Frequency response	20 Hz...60 kHz ±0.2 dB 60 kHz ...76 kHz ±0.5 dB
Signal/Noise ratio (75 kHz deviation)	typ. 70 dB stereo
Harmonic distortion	typ. 0.05%
Stereo separation	>50 dB
Analog Audio	L/R balanced XLR
Impedance	<20 Ω
Level	+6 dBu, adjustable -6...+6 dB
Frequency response	20 Hz...15 kHz ±0.1 dB
Deemphasis	50 or 75 µs
Signal/Noise ratio (75 kHz deviation)	typ. 70 dB stereo
Harmonic distortion	typ. 0.05%
Stereo separation	>40 dB
Digital Audio	AES/EBU balanced XLR
Headphone	
Connector	6.35 mm
Impedance	600 Ω

Measurement functions

FM	RF level, selected mode (stereo/mono), stereo blend, pilot (on/off), output level M signal, output level MPX signal
RDS data	PI, PS, TA, TP, PTY

Alarm functions

Data controlled with alarm	RF level, audio, no pilot, PI, PS, RDS sync, TA, no TA, Block error, TP change, case temp
Alarm types	Serial interface, potential free relay contact, SNMP
Alarm report	can be read out via serial port or TCP/IP
Data format	UECP V 6.01 protocol

Front panel

LCDisplay	2x 40 characters
Jog wheel	Impulse, ENTER button
8 LED's	Power, Input 1, Input 2, MPX, Warning, Status, RF, RDS

Interfaces

Remote control input	7 opto-isolated inputs (excludes option: 24 relay contacts)
Connector	15 pole sub-D female
Remote control output	6 standard relays (SPST) 1 change-over relays (SPDT) (for DC: max. 30 V, 1 A, 10 W)
(Messages)	26 pole sub-D male
Data interfaces	2 serial interface for setup data and setup function (RS-232C)
TCP/IP data interface	Input/output setup functions
Connector	RJ45
Type	Full duplex 10/100 BASE-T
Data format	HTTP, SNMP, SNTP, optional: FTP

MP3-Encoder

Type	MPEG 1/2 Layer 3 encoder
Transmission of encoded MP3 data by TCP/IP	Adjustable MPEG Encoder quality in 3 steps Adjustable sample rates for latest Live-stream-Technology Reception of Audio-Live-stream by shoutcast compatible media player like WinAmp or VLC

General data

Power consumption	40 VA
Case dimensions	19", 1 HU, 310/424/484 mm
Weight	<4 kg
Housing	steel plate (aluminum-zinc coated)
Operating temp. range	0...+45 °C
Storage temp. range	-40...+70 °C
Power supply	Internal, 90...260 V, 47...63 Hz
Internal input	from tuner module

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FlexMon FM01 RDS Databridge – Technical Details

according to CENELEC EN 60950,
EMV EN55022 and EN55024

Inputs

RF	2x unbalanced, BNC
Impedance	50 Ω
Frequency Range	87.5...108.0 MHz 50/100 kHz steps
RF sensitivity (S/N 40 dB, stereo)	20 dBµV
Max. RF input	120 dBµV
Switchable attenuators	20 dB, 40 dB
MPX	Selection from RF (internal FM tuner) input or external signal
Connector	BNC unbalanced, 1x rear
Impedance	>10 kΩ

Measurement functions

RDS decoder	PI, PS, TA, TP, PTY, MS, CT, RT, Group sequence, Content of all group types
RF level	20...120 dBµV resolution 1 dBµV
RDS Block Error Rate	0...100%, resolution 1%

Measurement FM

Audio	Separate measuring of Audio-Deviation (L+R) error <3% Peak level measurement Failure monitoring (L, R, RF, Pilot)

Outputs

Headphone	
Connector	6.35 mm
Impedance	600 Ω

Alarm functions

Data controlled with alarm	RF level, PI, PS, audio modulation, RDS sync
Alarm types	potential free relay contact, E-mail, SNMP
Alarm report	can be read out via web interface

Front panel

LCDisplay	2x 40 characters
Jog wheel	impulse, ENTER button
8 LED's	Power, Input 1, Input 2, MPX, Warning, Status, RF, RDS

Interfaces

Remote control input	7 opto-isolated inputs (excludes option: 24 relay contacts)
Connector	15 pole sub-D female
Remote control output	6 standard relays (SPST) 1 change-over relays (SPDT) (for DC: max. 30 V, 1 A, 10 W)
(Messages)	26 pole sub-D male
Data interfaces	2 serial interface for setup data and setup function (RS-232C)
TCP/IP data interface	input/output setup functions
Connector	RJ45
Type	full duplex 10/100 BASE-T
Data format	HTTP, SNMP, SNTP, optional: FTP

General data

Power consumption	40 VA
Case dimensions	19", 1 HU, 310/424/484 mm
Weight	<4 kg
Housing	steel plate (aluminum-zinc coated)
Operating temp. range	0...+45°C
Storage temp. range	-40...+70°C
Power supply	internal, 90...260 V, 47...63 Hz

MP3-Encoder

Type	MPEG 1/2 Layer 3 encoder
Transmission of encoded MP3 data by TCP/IP	Adjustable MPEG Encoder quality in 7 steps Adjustable sample rates for latest Live-stream-Technology Reception of Audio-Live-stream by shoutcast compatible media player like WinAmp or VLC
Internal input	from tuner module

Version 22.09.2015
These data are subject to modifications and amendments.
Errors excepted

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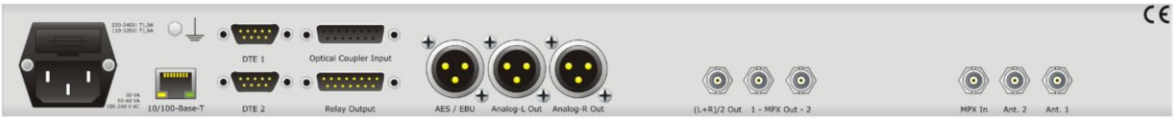

FlexMon FM01 TMC/RT+– Technical Details

according to CENELEC EN 60950,
EMV EN55022 and EN55024

Inputs

RF	2x unbalanced, BNC
Impedance	50 Ω
Frequency Range	87.5...108.0 MHz 50/100 kHz steps
RF sensitivity (S/N 40 dB, stereo)	20 dBµV
Max. RF input	120 dBµV
Switchable attenuators	20 dB, 40 dB
MPX	Selection from RF (internal FM tuner) input or external signal
Connector	BNC unbalanced, 1x rear
Impedance	>10 kΩ

Measurement functions

RDS decoder	PI, PS, TA, TP, PTY, MS, CT, RT, Group sequence, Content of all group types
RF level	20...120 dBµV resolution 1 dBµV
RDS Block Error Rate	0...100%, resolution 1%

Measurement FM

Audio	Failure monitoring (L, R, RF)

Outputs

Headphone	
Connector	6.35 mm
Impedance	600 Ω

Alarm functions

Data controlled with alarm	RF level, PI, PS, audio level, RDS sync
Alarm types	potential free relay contact, E-mail, SNMP
Alarm report	can be read out via web interface

Front panel

LCDisplay	2x 40 characters
Jog wheel	impulse, ENTER button
8 LED's	Power, Input 1, Input 2, MPX, Warning, Status, RF, RDS

Interfaces

Remote control input	7 opto-isolated inputs (excludes option: 24 relay contacts)
Connector	15 pole sub-D female
Remote control output	6 standard relays (SPST) 1 change-over relays (SPDT) (for DC: max. 30 V, 1 A, 10 W)
(Messages)	26 pole sub-D male
optional:	24 floating relay contacts (excludes: 7 opto isolated inputs)
Data interfaces	2 serial interface for setup data and setup function (RS-232C)
TCP/IP data interface	input/output setup functions
Connector	RJ45
Type	full duplex 10/100 BASE-T
Data format	HTTP, SNMP, SNTP, optional: FTP

MP3-Encoder

Type	MPEG 1/2 Layer 3 encoder
Transmission of encoded MP3 data by TCP/IP	Adjustable MPEG Encoder quality in 7 steps Adjustable sample rates for latest Live-stream-Technology Reception of Audio-Live-stream by shoutcast compatible media player like WinAmp or VLC

General data

Power consumption	40 VA
Case dimensions	19", 1 HU, 310/424/484 mm
Weight	<4 kg
Housing	steel plate (aluminum-zinc coated)
Operating temp. range	0...+45°C
Storage temp. range	-40...+70°C
Power supply	internal, 90...260 V, 47...63 Hz
Internal input	from tuner module

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These data are subject to modifications and amendments.
Errors excepted

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