X2-Series

Manual 2.0

As of November 2016



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PREAMBLE

Dear Explo Customer,

Please read through these sets of instructions carefully, before using your devices. It contains many Informations which are to help you getting to know your system.

We ask you to follow the safety and usage notes carefully.

Should you have any questions, or any confusions arise during the usage of the devices, which cannot be answered by this manual, please do not hesitate to contact us either by phone or mail.

A lot of fun with your new ignition system wishes you,

Your Explo Team



INDEX OVERVIEW

The following manual describes the bidirectional transmitters TX2-70K and TX2-Stage, as well as the receivers RX2-70K and RX2-30K, and is split into these chapters.

General Overview of the Explo X2-Series
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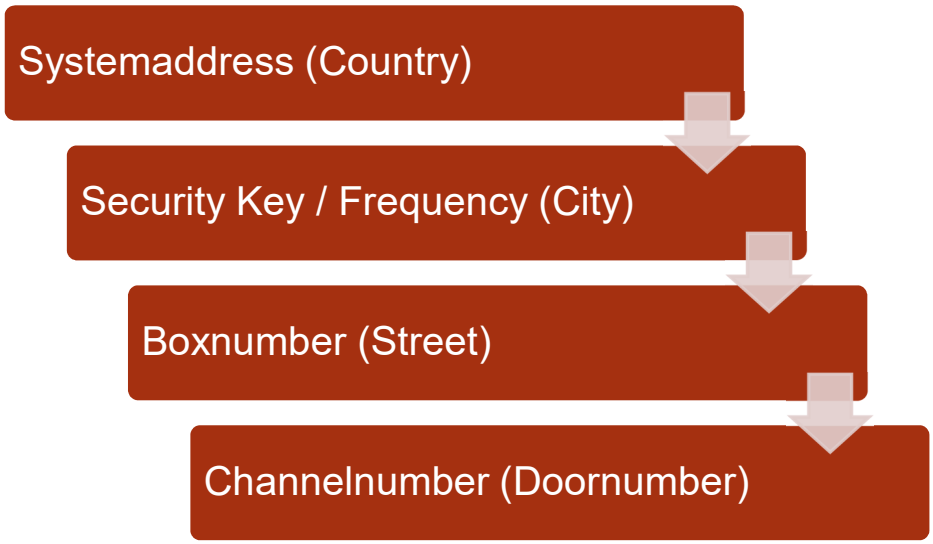
1 GENERAL OVERVIEW OF THE EXPLO-IGNITION SYSTEM

This part of the manual is meant to teach you some basic words of the Explo X2-series, and give you a better understanding into the function and usage of the ignition system.

1.1 FUNCTION OF THE IGNITION SYSTEM

To provide the user of the system with the maximum security and pinpoint every ignition channel exactly, the X2 system features multiple settings that encode the address of every device.

Generally you can imagine the addressing of an ignition channel the same way as with a house, which is why below you can find the comparison of both:



1.1.1 SYSTEMADDRESS

The systemaddress is the basic encryption and is individual for every customer. Generally, receivers can only be controlled by transmitter which feature the same systemaddress.

The systemaddress is being assigned by the manufacturer and cannot be changed on the transmitter by the customer, however it is possible to learn a receiver onto a transmitter, allowing you to use receivers with that transmitter. This has the benefit that no other Explo user can access your systemaddress, but it still allows you to borrow receivers from eachother.

1.1.2 SECURITY KEY / FREQUENCY

The second stage of the encryption are the Security Key and the Frequency. The security key is a three-digit number, which is used in addition to the systemaddress to encrypt the system. Just like with the systemaddress, only transmitters and receivers featuring the same security key can communicate with eachother. A subsystem should always be created if the same ignition system is used at two different locations, that aren't more than 20km apart.

Contrary to the systemaddress, the security key can be freely changed by the customer. This allows the customer to break up his system into subsystems, and fire two shows close to eachother without interfering with oneanother.

The frequency of the ignition system can be slightly altered at the X2-series. This has the same benefits as the security key (creating subsystems), but can also be used to avoid certain frequencies, should the main frequency be used by other devices. Please note that also here only devices with the

same frequency can communicate with eachother. Important: When changing the frequency, a new security key is being used automatically.

1.1.3 BOXNUMBER

The boxnumber is primarily used next to the channelnumber to address a specific ignition channel. Every receiver can be set to a boxnumber of 1-99, with which he can be directly controlled. Boxnumbers can be assigned mutliple times, should multiple receivers need to ignite at the same time.

1.1.4 CHANNELNUMBER

The last part of addressing an ignition is made via the channelnumber. It defines the exact ignition channel on a receiver and an effect on effectdevices. Every ignition channel of a receiver features its own, individual channelnumber.

Summed up: By using box-and channelnumber the actual ignition is being made, be it in automated shows, or manual ignitions. However, systemaddress, security key and frequency of the transmitter and receiver must be the same.

1.2 DIFFERENCE OF DEVICENUMBER / BOXNUMBER

Next to the boxnumber decribed above, the X2-series also uses a so called Devicenumber, to identify a receiver. After saving a receiver onto your transmitter, it is assigned an individual devicenumber. It is given once in the devicelist, and is used to identify every receiver during tests and when loading AutoShow ignitions.

The boxnumber however is used to transmit ignitions. This means multiple receivers can have the same boxnumber, but not the same devicenumber.

2 TRANSMITTER TX2-70K AND TX2-STAGE

2.1 COMPONENTS OF TRANSMITTERS

2.1.1 OVERVIEW TX2-70K FRONT PANEL





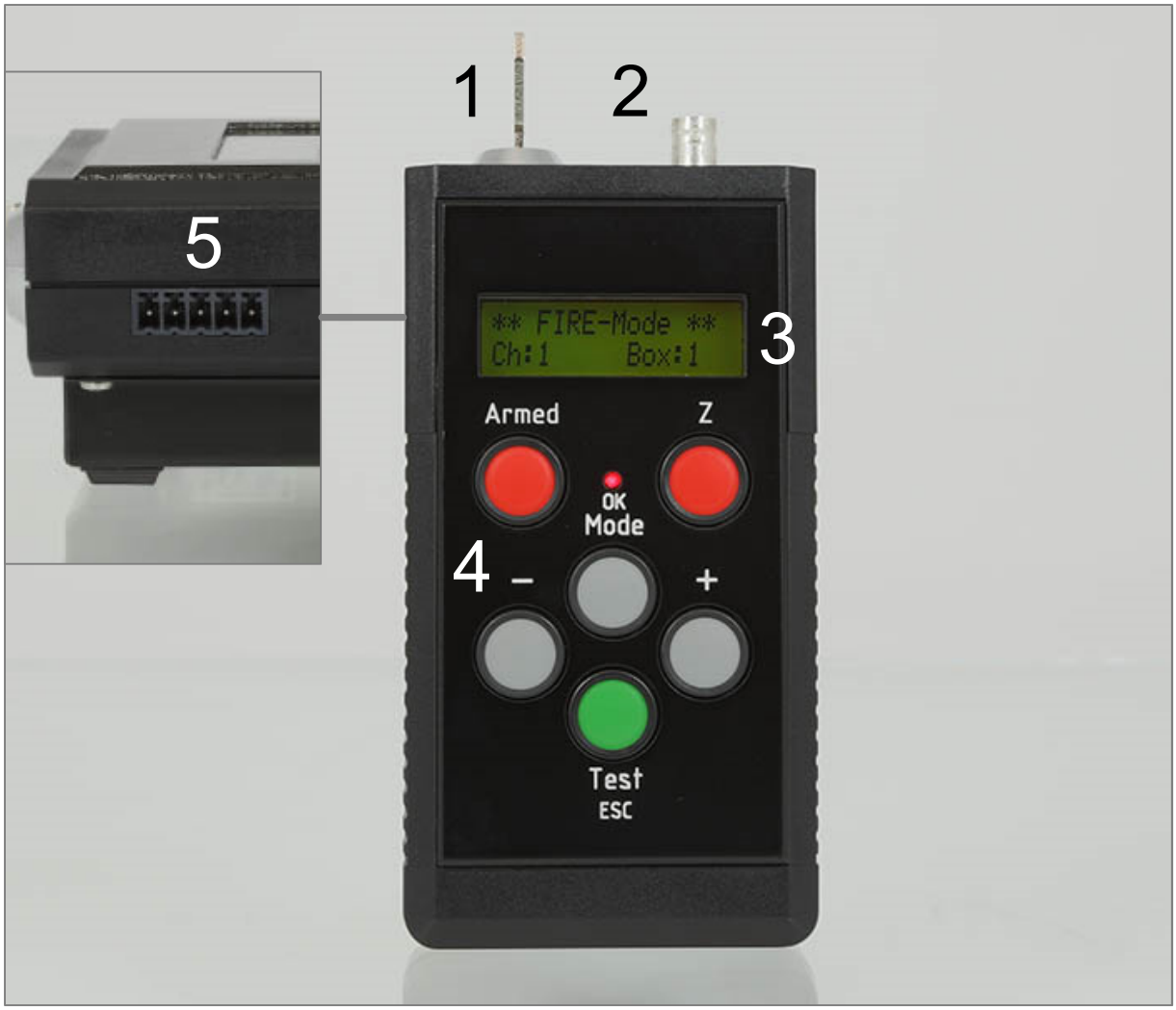
Components of the TX2-70K Front panel	
1	Connector for the goose neck lamp
2	Display
3	Fuse holder and key switch
4	Spare buttons
5	Usage buttons
6	New built of the TX2-70K

2.1.2 OVERVIEW TX2-70K SIDE PANEL



Components of the TX2-70K side panel	
1	Programing- and charging socket
2	FSK-Time Code-Interface
3	BNC-Antenna socket
4	RS232-Interface

2.1.3 OVERVIEW OF THETX2-STAGE



Components of the TX2-Stage	
1	Key switch
2	BNC-Antenna socket
3	Display
4	Usage buttons and armed button
5	Programing- and charging socket

2.1.4 DESCRIPTION OF COMPONENTS

2.1.4.1 CONNECTOR FOR THE GOOSE NECK LAMP (TX2-70K)

This XLR-socket allows you to connect the goose neck mapl included with the TX2-70K. It is used to light your work space near the TX2-70K, and will only be lit when the device is switched on.

2.1.4.2 DISPLAY

All relevant data, like the menu structure and results of receiver tests are shown in the display. It features a backgroundlight and will activate after the transmitter has been switched on.

2.1.4.3 FUSE HOLDER AND KEY SWITCH (TX2-70K)

The three-step key switch of the TX2-70K is used to switch the device on, turn it armed, or switch it off. A built in fuse holder features a microfuse (10A delay fuse).

2.1.4.4 KEY SWITCH (TX2-STAGE)

The two-step key switch of the TX2-Stage is used to switch the device on and off. Turning it armed is done via a separate button.

2.1.4.5 SPARE BUTTONS

The spare buttons of the TX2-70K can be programed with various commands, which can be executed at any time by pressing the corresponding button (even during a running AutoShow). This allows you to start single ignitions, or sequences, or (de)activate predefined ignition groups or devices.

2.1.4.6 USAGE BUTTONS

The transmitter is controlled with the usage buttons. They are used to navigate through the menu, to change certain settings and to send ignition or test signals.

2.1.4.7 ARMED BUTTON (TX2-STAGE)

The TX2-Stage features an additional armed button. By pressing and holding it, the TX2-Stage will enter armed mode. Pressing and holding it again will disarm the transmitter.

2.1.4.8 PROGRAMING- AND CHARGING SOCKET

On the side panel of the TX2-70K you can find two completely identical 7pole sockets, which are used as charging or programing sockets. They allow you to connect the bootloadercable for software updates, upload an automated show and to connect it to your computer (PC-Mode).

Pins TX2-70K	
Pin 1	GND
Pin 2	RX
Pin 3	TX
Pin 4	Battery 1
Pin 5	Battery 2
Pin 6	Not connected
Pin 7	External Trigger

At the TX2-Stage, you can find the programing and charging socket on the side. It is a 5pole socket.

Pins TX2-Stage	
Pin 1	Battery
Pin 2	ON-Pin
Pin 3	GND
Pin 4	RX
Pin 5	TX

2.1.4.9 BNC-ANTENNA SOCKET

An antenna socket in the BNC standard is used to connect the antenna included with the transmitter. The TX2-70K features an additional cover for the socket, to protect it from moisture or dirt.

2.1.4.10 FSK-TIMECODE-INTERFACE (TX2-70K)

This socket is used to connect a FSK-Timecode, and synchronize your explo system with other devices / systems.

2.1.4.11 RS232-INTERFACE (TX2-70K)

The RS232-Interface can be used alternatively to the programing socket for data transmissions for shows and the control via the PC. This needs a separate cable, not included in the delivery.

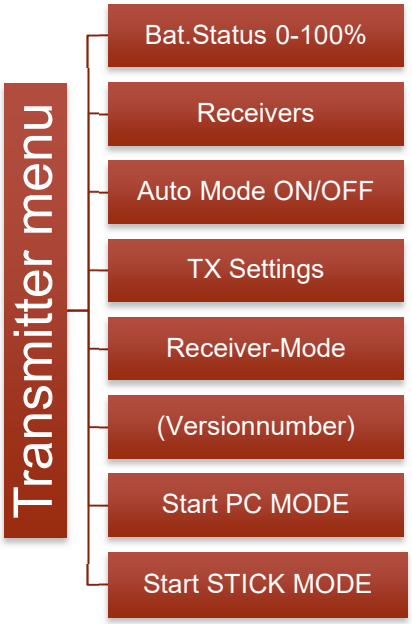
2.1.4.12 NEW BUILT TX2-70K

The new built of the TX2-70K uses a Wip-switch to turn the device on and off, as well as a two-step key switch to turn it armed, instead of the three-step key switch. This has the added benefit of allowing you to remove the key, to prevent someone from switching the devices armed, but still being able to switch the transmitter into test mode.

2.2 TRANSMITTERMENU

By pressing the Mode / OK button, the menu of the transmitter can be opened.

2.2.1 MAIN MENU



2.2.1.1 BAT.STATUS

This shows the status of the internal battery in steps of 0-100%. The battery should be charged before and after every show, as well as every three months during storage.

2.2.1.2 RECEIVERS

Here you can find all receivers learned onto the transmitter. Learning receivers onto the transmitter is essential for the large scale tests and automated shows. This submenu allows you to add new receivers, delete them, or edit them.

2.2.1.3 AUTO MODE

Here you can edit all settings for the automated ignition mode (Auto Mode), as well as the semi automatic ignition mode (Step-by-Step, SbS-Mode), as well as activate or deactivate those modes.

2.2.1.4 TX SETTINGS

This allows you to change the basic settings of the transmitter, and load them onto other transmitters (cloning).

2.2.1.5 RECEIVER-MODE

Allows you to put the receivers into different modes, like test, armed, sleep, off or locked.

2.2.1.6 VERSIONNUMBER

Shows the current software version of the device. If there is a "+PC" at the end of the versionnumber, the transmitter has been unlocked for use with the PC-Mode.

2.2.1.7 START PC MODUS

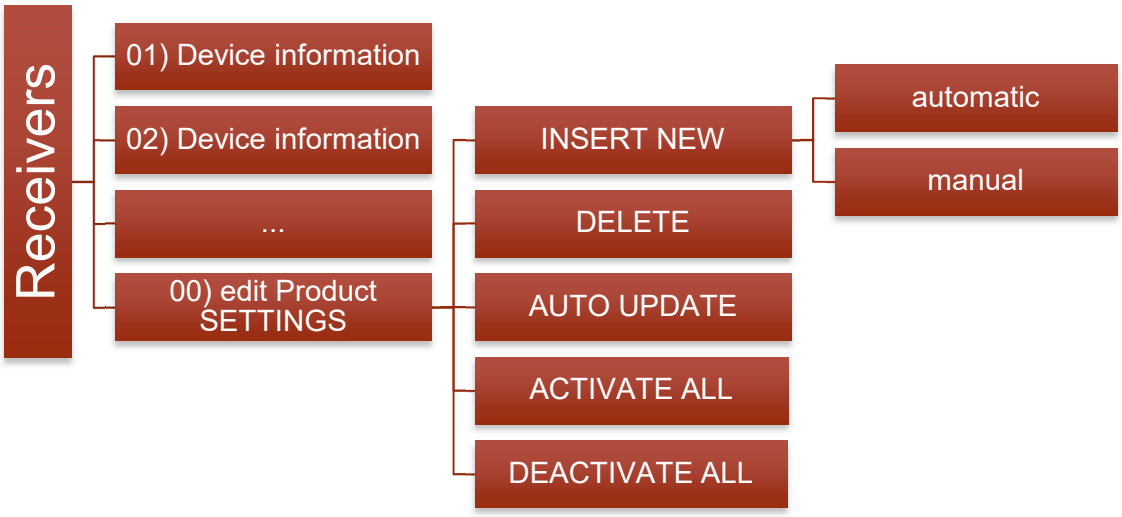
This menu item starts the PC-Mode. It must be started manually after the transmitter has been connected to the PC. Informations about the PC-Mode you can find in the ShowCreator manual.

2.2.1.8 START STICK MODE

This menu item starts a mode in which the transmitter works like an Explo Stick. Should this mode be active, the transmitter can be used instead of an Expli Stick in conjunction with the AutoShow X2 Software.

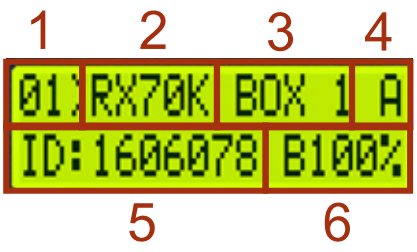
This menu item is only available after entering the correct unlocking code. This code can be asked for from us after buying an Explo Stick.

2.2.2 SUBMENU RECEIVERS



2.2.2.1 DEVICE INFORMATION

The device information is a list of all receivers loaded onto the transmitter. It shows th individual ID-number of the device, as well as their type. Should the receiver be switched on while you are looking at the informations, it will also show the current boxnumber and the batterystatus.



Device information	
1	Internal device number
2	Device type
3	Boxnumber of the device
4	Device group
5	ID-Number of the device
6	Batterystatus in %

INTERNAL DEVICENUMBER

The internal devicenumber is used to sort devices (during tests and in the devicelist).

DEVICE TYPE

Shows the type of receiver. For a correct display of the testresults it is important to enter the correct device type.When you learn devices onto the transmitter automatically, the right device type will be added automatically.

The following device types are currently being supported:

Device type			
RX70K	RX2-70K, RX2-30K Splitt	**RXDMX**	RX2-DMX-Modul
RX30K	RX2-30K	**EXPLO**	Custom made
RXMP3	RX2-MP3-Player	**RXWAV**	RX2-WAVE-Player
MASTM	RX2-Mastermodule	**FLAME**	Power Flame
RX-5K	RX2-5K	**BUHNE**	Custom made
RX-1K	RX2-1K	**RX-PD**	Custom made
RX20K	RX2-20K	**RXCON**	Custom made
RX-HV	RX2-1K HV	**RXOLD**	RX1-70K
MODUL	Custom made	**RXLIQ**	X2 Wave Flamer
RXGAS	RX2-1K Gas		

BOXNUMBER OF THE DEVICE

This shows the boxnumber of the receiver. It can be changed at any time in the device informations. It is needed to assign ignition commands to a receiver. Boxnumber can be assigned multiple times, contrary to the ID-number (if two or more receivers are supposed to make the same ignitions at the same time).

Boxnumber can be assigned from 1-99.

DEVICE GROUP

One or more devices can be added to a device group (capital letters A-Z), to activate or deactivate them if needed. For example, devices in a certain location can be switched off should the audience be too close to an effect, or a device can be added to a running show, if another fails.

The device group is not to be confused with the Ignition group, with which single or multiple channels can be activated or deactivated, but not entire device.

ID-NUMBER OF THE DEVICE

The ID-number is a number individual to every receiver. It is used to identify a device and is thusly only assigned once.

BATTERYSTATUS

Should the receiver be switched on, you can see the current batterystatus in percent (%). We generally recommend charging all your devices before the show to 100%.

2.2.2.2 EDIT PRODUCT SETTINGS

This menu item allows you to add new devices to the list (insert new) or delete entries (delete). All devices can also be updated with an automatic update (auto update) or be activated (activate all) or deactivated (deactivate all).

INSERT NEW

This command allows you to add new receivers to the device list. It works either by manually typing the ID-number, or automatically learning the device to the transmitter. We recommend the automatic adding, since this will also transmit the device type next to the ID. Furthermore, the transmitter adds its systemaddress, security key, radio power and frequency onto the receiver.

AUTOMATIC ADDING

After selecting**Insert New >automatic**the following screen appears:

Step	Transmitter	Receiver (RX2-70K, RX2-30K)
1	switch ♪1 ON then press OK	
2		Switch ON.
3		waiting 9
4	Press Mode / OK.	
5	ID:1608014 RX70K Save in List?	Wait for request
6	Press Mode / OK.	
7	FINISH 1)RX70K 1608014	prog success



Immediately afterwards, the next receiver can be added. Please note that in the receiversettings, **radioprog** is set to **ON.**

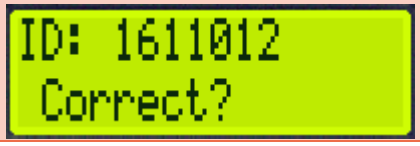
If the receiver is already saved onto the transmitter, the following error screen will appear after step 4:



Hint: When adding a receiver the second time, it will still adopt the transmitters settings. This can be used if a receiver has been lent away, an should be learned onto the transmitter again, even though it is already in the device list.

MANUALADDING

After selecting**Insert New >manual**the following screen appears:

Step	Transmitter
1	
2	Using Mode / OK and Plus / Minus enter the ID-number of the receiver.
3	
4	Confirm by pressingTest / ESC.
5	
6	Press Mode / OK.
7	
8	Using Plus / Minus select the type and confirm with Mode / OK.
9	

If the receiver is already in the device list, an error message will appear after step 4.

DELETE

This menu item is used to delete the receiver that is in the last slot of the device list, or delete the complete device list.

DELETING THE LAST ENTRY

After selecting**Delete**the following screen appears, where # is the number of the last entry:

Step	Transmitter
1	
2	Confirm with Mode / OK to delete last entry.
3	

DELETE ALL ENTRIES FROM THE DEVICE LIST

After selecting**Delete**the following screen appears, where # is the number of the last entry:

Step	Transmitter
1	
2	Press Plus and Minus simultaniously.
3	
4	Confirm with Mode / OK to delete all entries.
5	

ADDING OR DELETING AT A CERTAIN DEVICE

To add a new devices at a certain point in the list, or delete a certain device, simply press and hold the Plus button for about five seconds at the preferred place, to open the submenu to add or delete devices.

When deleting, the device will be deleted at which you have pressed the Plus button.

When adding, the new device will be added to the place at which you pressed the Plus button. The device that was already in the list and all others following behind, will be pushed one number back.

AUTO UPDATE

The automatic update is used if you wish to automatically activate or deactivate all devices in the list, no matter whether they are switched on or off, and renumber them according to the devicelist. This option should only be used when preparing the system, not directly before the show, in order to prevent unwanted deactivation of devices.

This option is especially helpful if you have a lot of entries, and want to quickly activate or deactivate them. Receivers you wish to use must be switched on, all others switched off. The automatic update will activate all switched on devices needed for the show, all others will be deactivated.

After selecting **Auto Update**the following screen will appear:

Step	Transmitter	Information
1		
2	Confirm with Mode / OK.	
3		
4	Wait.	
5		Switched on devices are activated, others are deactivated.
6	Wait.	
7		After testing all devices, the refreshed devicelist is shown.

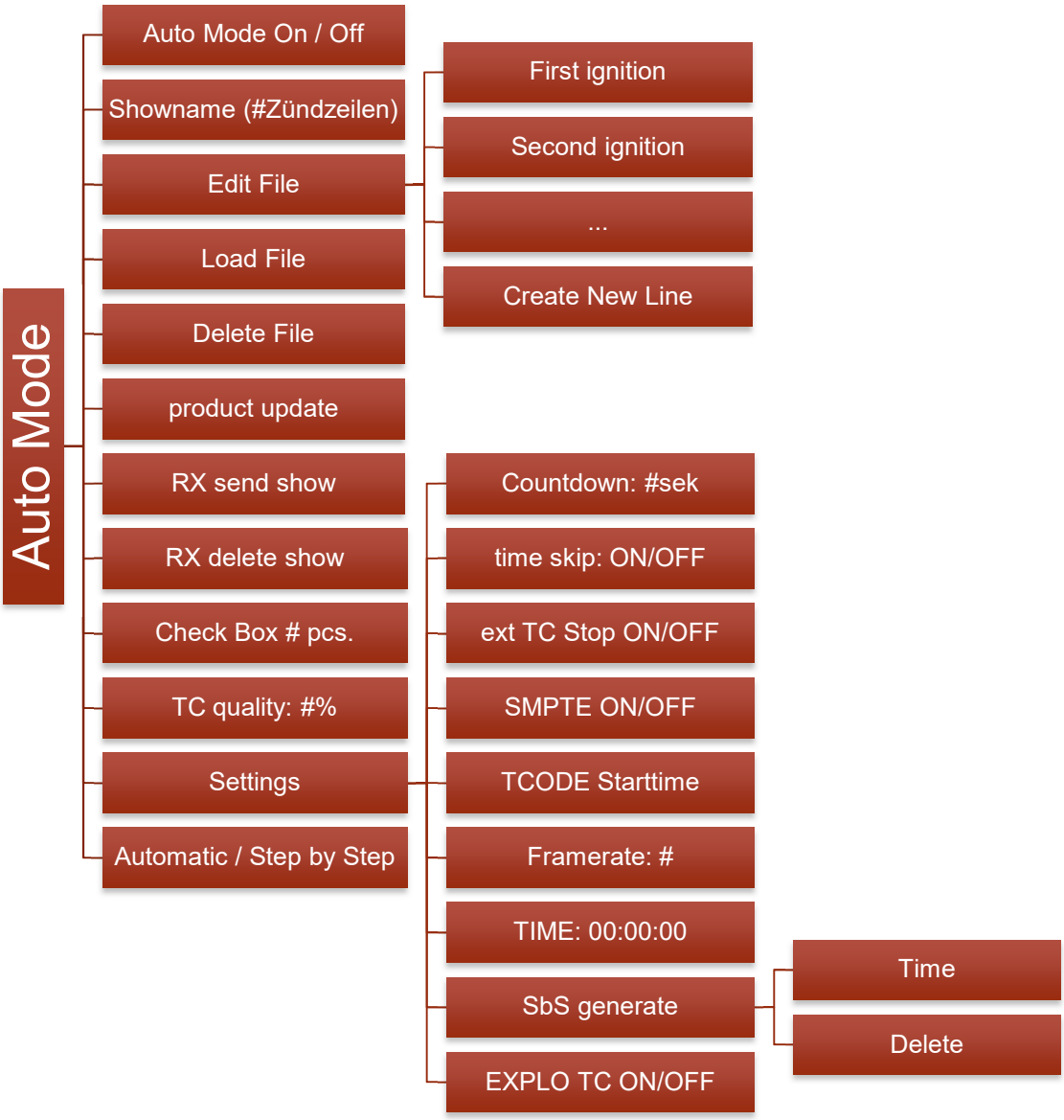
ACTIVATE ALL

This command allows you to activate all devices in the list. Simply execute**Activate all**with Mode / OK.

DEACTIVATE ALL

This command allows you to deactivate all devices in the list. Simply execute**Deactivate all**with Mode / OK.

2.2.3 SUBMENU AUTO MODE



2.2.3.1 AUTO MODE ON / OFF

Here you can switch the automatic mode on or off. When on, no manual ignitions can be made (except for the spare buttons). Activating this setting is neccessary for the automatic mode (Auto Mode) as well as the semiautomatic mode (SbS Mode).

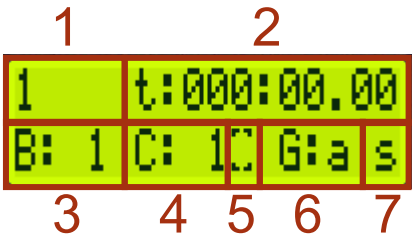
2.2.3.2 SHOWNAME

Shows the Name of the show currently saved onto the transmitter. The number in the brackets shows the complete number of ignitions made in the show.

2.2.3.3 EDIT FILE

This menu item allows you to edit the single ignitions of a saved show, or add new ones. To edit an ignition, scroll to it using Plus and Minus, and selecting with Mode / OK.

They are shown as follows:



Setup of ignitions	
1	Line
2	Ignition time
3	Boxnumber
4	Channelnumber
5	Special field
6	Ignition group
7	StepbyStep

LINE

This is a continuous number of lines. They are numbered according to the ignition time from 1 to x, where x is the total number of lines in the show.

The maximum number of possible lines that can be saved onto a transmitter is 8000. The storage of the receivers is limited to 200. With effectdevices, this numer is at least 420. The line number is given by the system, and cannot be edited.

IGNITION TIME

Shows the actual ignition time of a line. It is build up as follows:



Build up ignition time	
1	Minutes
2	Seconds
3	Hundredth of a second

The ignition time can be freely edited. A minimal line distance between two lines is not neccessary with the X2 series. The total length of the show may not be longer than 100 minutes. The ignition time can not be set higher or lower than the times of the lines next to it.

BOXNUMBER

The boxnumber of the ignition. This can be set from 1-99, or A. A will ignite the set channel on all boxes (except for effect devices and RX2-Wave-Player).

CHANNELNUMBER



The channelnumber of the ignition. This can be freely set from 1-70.

SPECIAL FIELD

Here you can set whether a certain line should ignite or not. This is espcially useful, if you wish to deactivate certain ignitions shortly before a show. Changing and transmitting the show anew onto all receivers and the transmitter is most times not feasible.

Special field	
	Channel will ignite
	Channel won't ignite

IGNITION GROUP

An ignition group (lowercase letters a-z) can be assigned to one or more lines, to activate or deactivate them before or during an automated show. For example, spare lines can be defined, that will only be activated once the corresponding ignition group has been added. Activation and deactivation of ignition groups is only usable for automatic or semiautomatic shows. Manual ignitions of the deactivated box and channelnumbers can still be made.

The ignition group is not to be confused with the device group, where whole devices can be activated or deactivated.

STEP BY STEP (SBS)

Should an s be placed in this field, the ignition channel will become part of an SbS-sequence, with all near lines that also have been defined as a SbS-sequence. The end will be made by the first following channel, that does not have an s.

The SbS field has no implications on a fully automatic show.

StepbyStep	
	No SbS-sequence.
	Part of a SbS-sequence.

EDITING A LINE

To edit a line, the following steps must be taken:

Step	Transmitter	Information
1		Open menu item Edit File.
2		Select the line you wish to edit using Plus and Minus.
3		Using Mode / OK open the panel for edits.
4		Using Plus / Minus select the section you wish to edit, and confirm with Mode / OK.
5		Edit with Plus / Minus and confirm with Mode / OK.
6	Press Test / ESC.	
7		Confirm changes with Mode / OK or cancel with Test / ESC.

The following can be edited:

Editable fields of a line	
Ignition time	Cannot be higher or lower than ignition times in the lines next to it.
Boxnumber	Set from 1-99, or as A . A commands all boxes (except for effect devices).
Channelnumber	Set from 1-70.
Special field	When empty, the channel will ignite, with an X it won't.
Ignition group	Set from a-z.
StepbyStep	Should you enter a s, the channel will become part of a SbS-sequence.

ADDING A NEW LINE

To add a new line at the end of a show, the following steps must be taken:

Step	Transmitter	Information
1		Open menu item Edit File .
2		Using Plus, go to the last line.
3	Press Plus.	
4		Confirm with Mode / OK.
5	Press Mode / Ok.	
6		Edit the time difference to the previous ignition with Plus / Minus and confirm with Mode / OK.
7	Press Mode / OK.	
8		Edit box and channelnumber if needed with Plus / Minus and confirm with Mode / OK.
9	Press Mode / OK.	
10		New line will be shown, and can be edited if needed.

2.2.3.4 LOAD FILE

This menu item allows you to load a show onto the transmitter. A detailed description can be found in the corresponding chapter about preparing your devices for a show.

2.2.3.5 DELETE FILE

When selecting this menu item, the show will be deleted from the transmitter. To delete the show from the receiver however, the menu item **RX delete show** must be used.

Deleted show files can't be restored, and must be loaded onto the transmitter anew, if needed.

2.2.3.6 PRODUCT UPDATE

This option starts an Auto Update, where devices switched on will be activated, and all others be deactivated. This option should only be used when preparing the system, and not drectly before the show, to prevent the wrong devices from being deactivated.

This option is especially helpful if you have a lot of devices in your device list, and wish to activate or deactivate them quickly.

After selecting **Product Update**the following appears:

Step	Transmitter	Information
1		
2	Confirm with Mode / OK.	
3		
4	Wait.	
5		Switched on devices are activated, others are deactivated.

2.2.3.7 RX SEND SHOW

This menu item is used to transmit a show from the transmitter onto the receivers. It is neccessary that the correct show has been loaded onto the transmitter, and all boxes need are switched on. Detailed information about preparing your devices for a show transmission can be found in the corresponding chapter.

The show file is transmitted as follows:

Step	Transmitter	Information
1	Menue: Auto Mode RX send show	Switch on all receivers used in the show, and start the menu item RX send show.
2	♪1 1/# is testing x	It is checked which devices are switched on.
3	Show (#) Send Box >all< ?	Here you can select whether a certain or all boxes should be programed.
4	#/# Boxes found start? OK/ESC	Shows you how many of the boxes used in the show have been found.
5	prog. error OK? # Boxes missing	Should a box be missing, this error screen appears, which can be ignored using Mode / OK.
6	Delete all boxes before program?	Asks if you wish to delete the boxes before programing. Confirm with OK.
7	SEND DELETE	Boxes are being deleted.
8	Programming # from #	Device # of # is being programed.
9	Saving	Saving.
10	Update and Test all # Receivers	After the transmission, a test is offered. It should be taken.

2.2.3.8 RX DELETE SHOW

This comand can be used, to erase the saved Show-file on all receivers that are turned on.

2.2.3.9 CHECKBOX

Here you can see the Checksums of each individual Box. You can switch between the Boxnumbers by using plus (+) and minus (-).
The Receivers Checksum and its Boxnumbers Checksum have to be the same, otherwise you will encounter an error.

2.2.3.10 TC QUALITY

Here you can see the quality of the external FSKTime Codey from 0-100%. Reading of a TC by the Explo TC Modem. When reading a Timecode from the explo TC Modem, instead the time of the read timecode is shown

2.2.3.11 SETTINGS

Here you can choose different Settings about the automatic and semiautomatic Mode.

COUNTDOWN

Here you can set a Countdown of 2-30 seconds in intervalls of seconds. This Countdown starts before the actual show and is used as a security measure, so that you can stop the ignition in case the Show has been started accidentally.

The Countdown can also be set to FSK. This equates to being set to OFF (no Countdown) and has to be used if you use a TC.

TIME SKIP

If this Option is activated (ON), you can push the Ignition-Button during an ongoing Show to instantly skip to the following ignition.If the automatic Show is shot via Box/Channel, this function can be used. If synchronised via the internal Explo Time Code function, this Option cannot be used anymore. Important: If time is skipped, it won't skip the used Audio-Player. Using this function with Musicfireworks is therefore not advised.

EXT. TC STOP

If this Option is activated (ON), the show will stop automatically if the external Time Code malfunctions and will only continue once the TC-Signal returns. If the external Time Code Stop is deactivated (OFF), the System will synchronize internally even if the TC malfunctions (the Show does not stop).This function should not be used, as it can in some instances lead to the stop of show if the TC malfunctions.

SMPTE

Here you can activate the SMPTE-Mode (ON) or deactivate it (OFF). This is used with external Modems (e.g. Alpermann+Velte) but not with the Explo TC Modem. If the SMPTE-Mode is activated, no external FSK-Timer Code can be read.

TCODE STARTTIME

Here you can set the Starttime of the TC-Signals, to synchronise the signal with the receiver. It is selected at what time of the external Time Code the Show is supposed to start.

The Time Code Starttime is being changed as followed:

Step	Transmitter	Information
1	Menue: Settings TCODE Starttime	Select TCODE starting time.
2	starttime +1 = ignitiontime +1	Note: every additional second moves the show a second back.
3	HH MM SS + 00:00:00.00	Here you can set the starting time using Plus, Minus and Mode / OK. (0 to 24 hours)
4	Press Test / ESC.	
5	Save Changes? OK / ESC	Confirm changes with Mode / OK, or cancel with Test /ESC.

FRAMERATE

Here you can change the framerate of the SMPTE TC Signals from 24fps to 25fps or 30fps. When starting the Show the Framerate will automatically be increased to 30fps, if possible. This Option is only important if the Alpermann+Velte Modem is used.

TIME

Here the time of the external TC-Signal is displayed (Minutes: Seconds: Hundredth of a Second).

SBS GENERATE

Under SbS Generate you can choose between two Commands.

Delete deletes all files that are defined SbS-Entries in Show-Files.This means that all the Shows Ignitionchannels have to be triggered manually if the SbS-Modus is used.

With Time, the time between ignitions can be set, up to which the channels defined as SbS are grouped together as a SbS sequence. Should you enter 1 second, all channels within 1 second will be grouped as a sequence. Channels that are further apart won't be grouped together.

EXPLO TC

This Menu item is needed for the use of the Explo SMPTE/MIDI Time Code Modems. This Menu can be set to either OFF, READ or SEND depending on it's use.

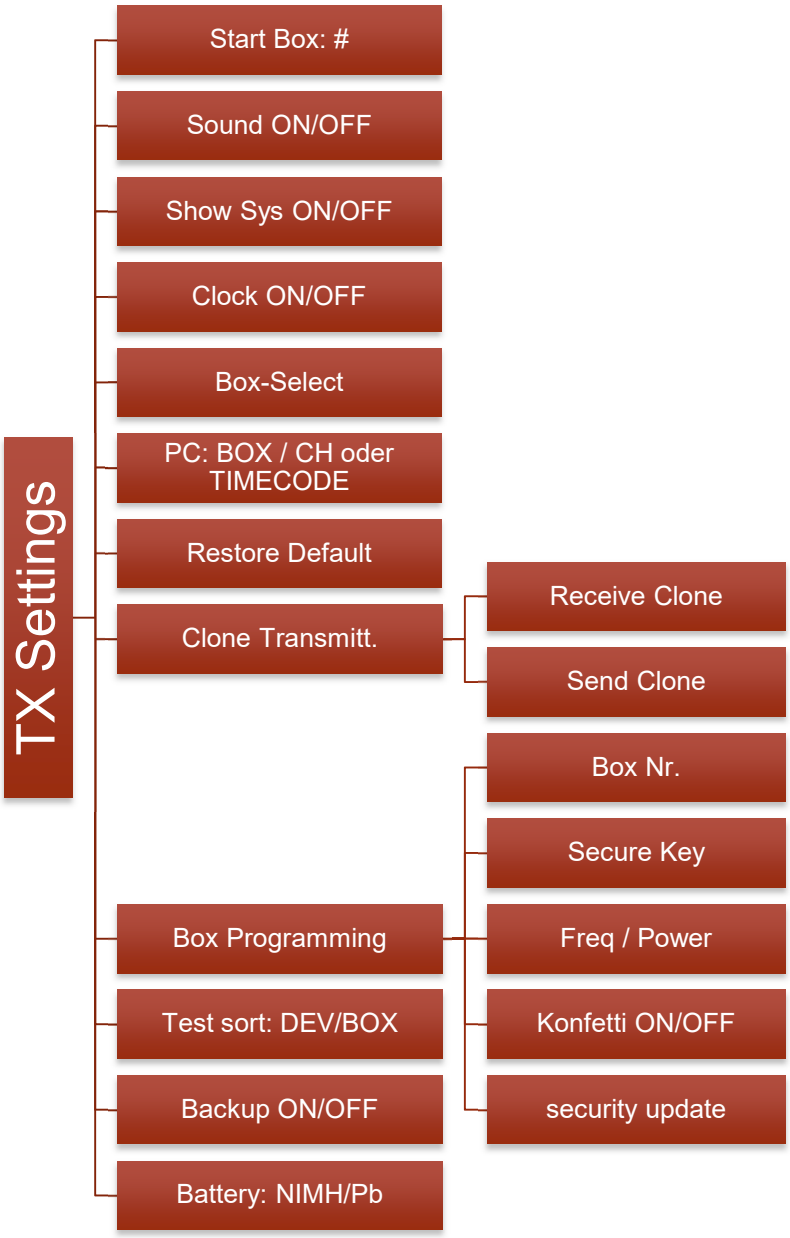
Backup-Mode (Preparation)	
OFF	Explo TC Modem won't be used. This option must be taken if you are using FSK, or another SMPTE TC Modem
READ	If you are using the Explo TC Modem to read either SMPTE or MIDI Timecodes, use this option.
SEND	Use this option if you wish to send MIDI Timecodes via the Explo TC Modem.

2.2.3.12 AUTOMATIC / STEP BY STEP

Here you can switch between the automatic Mode (Automode) and semiautomatic Mode (Step-by-Step-Mode). In Automode all ignitions will be automatically launched according to the set ignitiontime. In SbS-Mode every launch has to be made manually, except if they are part of a SbS-Sequence.



2.2.4 SUBMENUTX SETTINGS



2.2.4.1 START BOX

The Startbox shows which Boxnumbers the Receiver uses after it's turned armed of the Standard-Boxnummer. It can be set to Box:1-99 or to Box:all. With Box:all all Boxnumbers are being affected at the same time. The exception of this are Effectdevices and Audio-Players. These are not responding to Box:all for security reasons.

If, for example, Boxnumber 5 is being set, the Receiver will prepare, after it's turned armed Box:5/Channel:1, first. The Boxnumber can be changed any time during the Armed mode.

The Startbox only concerns the manual Launchmode and has no effect on the automatic or semiautomatic Shows. The Standardsetting is Box:1.

2.2.4.2 SOUND

Here the Buttonsounds can be turnd on or off. The Standardsetting is ON.

2.2.4.3 SHOW SYS

Here you can set if the systemaddress of the Receiver should be shown or hidden during the time the system is switched on. If this Menu item is turned OFF, the systemaddress will be shown as xxx. The Standardsetting is: ON

2.2.4.4 CLOCK

Here you can set a clock that will start during the manual Launchmode.This clock can ease the manual launch, if specific Ignitiontimes have to be set roughly. The standartsetting is OFF.

2.2.4.5 BOX SELECT

Here you can set after which Channelnumber, when launched manually, it will skip to the next Boxnumber. By default 70 channels are selected for all Boxnumbers. That means, that after the launch of 70 channels, the next Boxnumber starts with Channel 1. Sometimes only small Receivers (e.g. RX2-30K with 30 Channels) are used on one Boxnumber. Here you can set the corresponding Boxnumber to 30 Channels, so that, after only 30 Channels, the next Boxnumber is automatically selected.

Box Select	
OFF	Skip after 70 channels.
RX-70K	Skip after 70 channels.
RX-30K	Skip after 30 channels.
RX-20K	Skip after 20 channels.
RX-5K	Skip after 5 channels.
RX-1K	Skip after one channel.

2.2.4.6 PC (BOX/CH OR TIMECODE)

Here you can set if the Receiver should launch in PC-Mode via Box and Channelnumber or if you want to use an internal Time Code.

The internal Time Code should basically always be used, since it can process the launchtime a lot faster, since there is no dependance on the broadcastingspeed of the Radiomodule. Furthermore you can set a Timeout with the Time Code-Synchronisation. That's the adjustable period of Time, the Receiver will automatically continue to launch, when it doesn't receive a Synchronizationsignal from the Transmitter.

When using the Time Codes, you must also transfer the the Show to the Receiver, if you're using PC-Mode

2.2.4.7 RESTORE DEFAULT

This Menuitem is used to reset the Transmitter-Settings to their default state.

The Systemaddress and the Show-File are not changed. After the reset, the transmitter has to be restartet.

2.2.4.8 CLONE TRANSMITTER

This Menuitem enables the quick copying of all Transmittersettings, as well as the Device-List and the Show-Files onto a second Transmitter. The Systemadress however is not being transfered for security reasons.



Before the cloning, both Transmitters have to be connected via a TX-programming cable (see picture to the right)to each other. The cable is being connected to the TX2-70K via the 7 pole data socket and to the TX2-Stage via the 5pole data socket.

To Clone the Senders you have to do the following steps in the Transmittermenu:

Step	Transmitter 1	Transmitter 2 (Clone)
1	Menue: Clone Send Clone	Menue: Clone Receive Clone
2	Press Mode / OK.	Press Mode / OK.
3	Clone System? Press Plus	waiting for Data
4	Press Plus.	
5	Clone System? Press Minus	
6	Press Minus.	
7	Clone System? Press OK to send	
8	Press Mode / OK.	
9	P1:OK P2:OK P3:OK P4:OK	P1:OK P2:OK P3:OK P4:OK
10		Wait about 5 seconds

11		Please restart the transmitter
		Restart.

If there is an error at Step 9, it's possible that there is a connectivity problem between Transmitter 1 and 2. It's imperative that you check if the TX-Programmingcable is correctly connected to both Transmitters.

2.2.4.9 BOX PROGRAMMING

Here you can change and transfer the Security Key, the Frequency and Power of the Transmitter to the Receiver.

A Receiver can be directly programmed via the use of the TX-programmingcable and a Transmitter. The exception is the security update, where Frequency, Power and Security key can be transferred wirelessly.

BOX PROGRAMMING

To transfer the data from the Transmitter to the Receiver, they have to only be connected via a cable and have to be turned on.

Following that, the desired setting in the **Box programming** menu has to be selected and be transferred via Mode/OK.

All Settings of the **Box programming** can be changed directly on the Receiver without the use of a TX-programming cable.

The following settings can be changed from the Transmitter via programmingcable.

Setting	Changeable area	Function
Box Nr.	1-99	Sets the receivers boxnumber.
Secure Key	0-255	Sets the receivers Security Key. (Standard is 139).
Freq	1-23	Frequency is the subfrequency of the radio module (Standard 6).
Power	1-10	Power sets the radio modules ouput (Standard 10).
Konfetti	OFF / 0,1-9,9 Seconds	Turns the receivers confettimode on (ignition duration in seconds) or off.

SECURITY UPDATE

The **security update** can be performed with all Receivers that have the same Systemaddress as the Transmitter. With the help of the security update you can easily transfer the Security Key, Power and Frequency of the transmitter to the Receivers. (The data saved in the **Box programming** is the one being transferred.)

Step	Transmitter	Receiver
1	Menue: Box Prog. security update	
2	Press Mode / OK.	
3	start sending? OK / ESC	
4	Press Mode / OK.	
5	KEY:### FREQ:# switch on	Switch on receiver.
6		waiting 8
7		Wait till the below screen appears.
8		KEY:### POW:## Freq:#
9		Switch on the next receiver.

2.2.4.10 TEST SORT

Here you can select if the testresults of the Receiver should be sorted via Box or Device number.

Test sort	
DEV	Sort results by device number.
BOX	Sort results by boxnumber.

2.2.4.11 BACKUP

If the Backup-Function is activated (ON), the transmitter will serve as a Backup-transmitter. This can serve as a security measure in case the Main transmitter fails.

When in Backup-Mode the transmitter can start the Autoshow in Testmode (however it won't send launchsignals). Furthermore, this mode prevents the automatic question whether you want to disarm the devices when disarming the transmitter. Thus, it is recommended to activate the backup mode of the main transmitter too, to prevent an accidental disarming of the devices.

The following steps are recommended to use the backup transmitter effectively:

Backup-Mode (Preparation)	
1	Load Show-File onto main and backup transmitter (same File!)
2	Activate Backup-Mode on both.
3	Activate AutoMod on both.

Backup-Mode (Showstart)	
1	Switch main transmitter to armed and backup to test.
2	When starting the show, start both simultaniously (Hint: external trigger).

Backup-Mode (Behaviour during show failing)	
1	Switch backup transmitter armed. Don't panic!
2	Set main transmitter to Test mode.

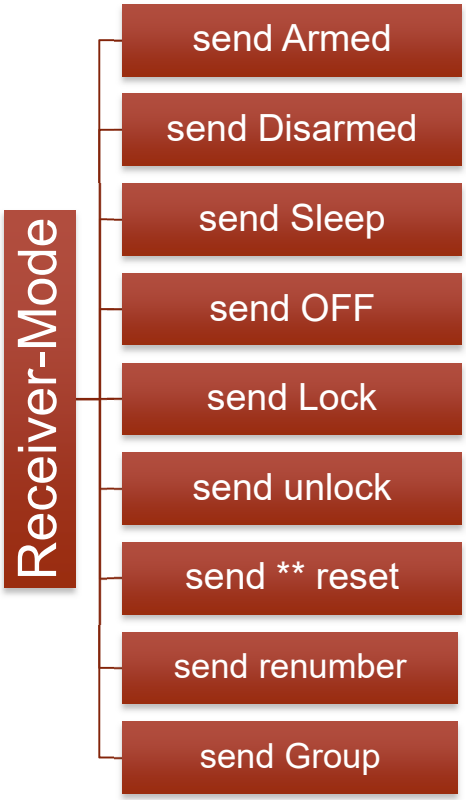
2.2.4.12 BATTERY

Here you can set whether the device uses an internal NiMH battery of lead gel battery. The correct setting is neccessary to show the correct voltage of the battery.

Most X2 devices have an internal NiMH battery. This is indicated by the small sticker reading NiMH on the sidepanel.

Battery	
NiMH	Nickel-Metallhydrid-battery.
Pb	Lead-Gel-battery.

2.2.5 SUBMENU RECEIVER-MODE



2.2.5.1 SEND ARMED

Allows you to turn all receivers armed.

2.2.5.2 SEND DISARMED

Allows you to set all receivers into testmode from armed mode.

2.2.5.3 SEND SLEEP

This allows you to set the receivers into sleep mode. It is a power saving alternative to the testmode. Receivers can be set directly to armed or test mode by sending the corresponding signal.

2.2.5.4 SEND OFF

Allows you to switch all receivers off via radio. They must be switched on manually afterwards.

2.2.5.5 SEND LOCK

When selecting this, all settings of the receivers are locked, and cannot be edited anymore. With the WAV-Player, the complete menu is locked. The lock can be released by "send unlock". Alternatively, when opening the receivermenu, you can unlock the device by entering the correct code in the appearing screen.

2.2.5.6 SEND UNLOCK:

This selection unlocks all switched on and locked receivers.

2.2.5.7 SEND ** RESET:

When selecting this function, the screen of all launched channels in the ohm-measurement is reset at all on devices. (see more in the receiver description)

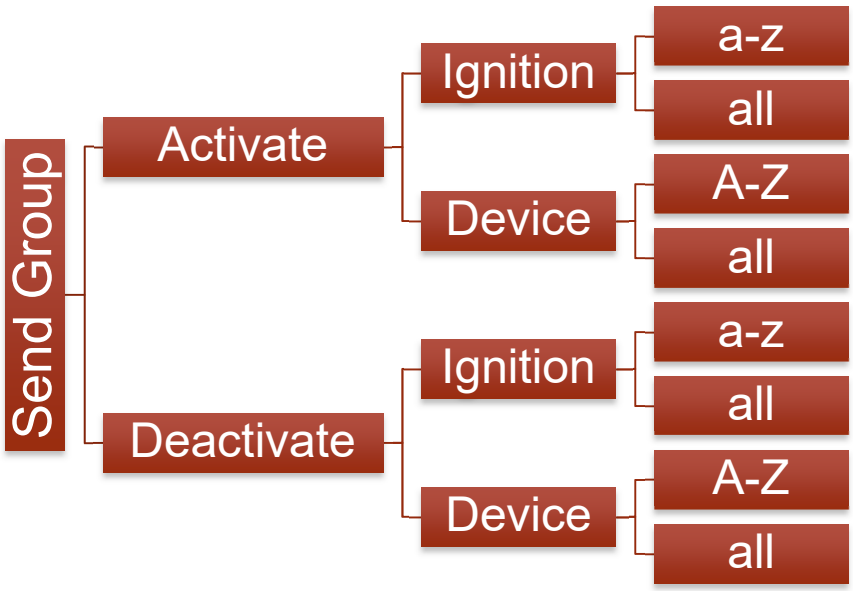
2.2.5.8 SEND RENUMBER:

Allows you to send the current numbering as saved on the transmitter to all receivers that are switched on.

This function may also be used to create a new devicelist in conjunction with the AutoShow software and Explo Stick.

2.2.5.9 SEND GROUP

Allows you to activate and deactivate device groups and ignition groups. It is set up as follows:



First you must define the preferred groups. This happens in the Show software, or afterwards by editing lines. Device groups can be changed in the devicelist.

Activation or deactivation can be done in groups or individually (Letters a-z, or A-Z) or all groups together (command: all)

3 RECEIVERS RX2-70K AND RX2-30K

3.1 COMPONENTS OF THE RECEIVERS

3.1.1 OVERVIEW RX2-70K FRONT PANEL



Components of the RX2-70K Front panel	
1	Display and buttons
2	Fuse holder and key switch
3	Ignition clamps

3.1.2 OVERVIEW RX2-70K SIDE PANEL



Components of the RX2-70K side panel	
1	Programing- and charging socket
2	Activation-button
3	BNC-Antenna socket
4	Signal LED

3.1.3 OVERVIEW RX2-30K FRONT PANEL



Components of the RX2-30K Front panel	
1	Display and buttons
2	Fuse holder and key switch
3	Ignition clamps

3.1.4 OVERVIEW RX2-30K SIDE PANEL



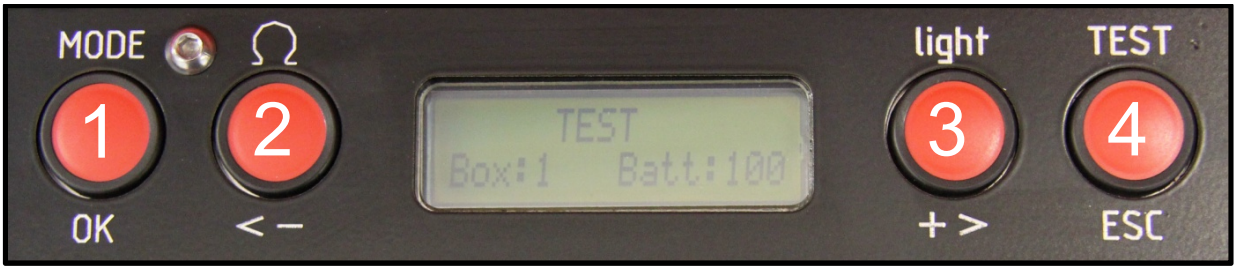
	Components of the RX2-30K side panel
1	Programming and charging socket
2	Activation button
3	BNC-Antenna socket
4	Signal LED

3.1.5 DESCRIPTION OF COMPONENTS

3.1.5.1 DISPLAY AND BUTTONS

The display shows the receiver status, as well as the menu structure of the receiver. It features a background light, and is activated when switching on the receiver.

The buttons have the following commands:



Button commands on the receiver	
1 MODE/OK	Should this button be pressed for about 1 second, you will enter the receiver menu. In the menu, you can use it as a confirmation button when editing settings.
2 OHM/MINUS	When in test mode, this button is used to make an Ohm-measurement. In the menu, it is used to navigate and edit settings as a Minus button.
3 LICHT/PLUS	When in test mode, this button can switch the background light of the display on or off. Within the menu, it is used to navigate and edit as a Plus button.
4 TEST/ESC	This button is used to send a test signal. Within the menu and when editing, it can be used as a cancel, or go back button.

3.1.5.2 FUSE HOLDER AND KEY SWITCH

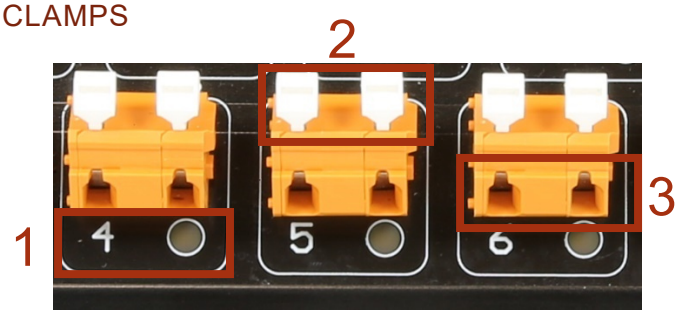
The key switch is used to disconnect the power from the internal electronics. Contrary to the older versions of explo devices, it is not used by itself to switch on the devices. To connect the power, the key must be turned a quarter clockwise. To activate the device, you also need to push the activation button on the side panel.

The fuse holder features a 10A fuse.

3.1.5.3 ACTIVATION BUTTON

This button is used to activate the device (only if the key switch is also turned to "ON"). The small red LED near the button is lit as soon as the device is switched on, and will flash shortly if the receiver gets a signal.

3.1.5.4 IGNITION CLAMPS



Clamp build up	
1	Channel number and connection LED
2	Push-Button.
3	Ignition clamp opening.

CHANNEL NUMBER AND CONNECTION LED

Shows the standard number of the channel. The channelnumbers can be freely edited, and thus mustn't always be in the correct order.

The connection LED shows whether the corresponding clamp has a connectivity (LED lit). Should it not be lit, even though an igniter is connected, you should do an Ohm-measurements test.

PUSH-BUTTON

The push button is used to open the clamp. It must be pushed when you wish to connect ignition cables. The white push button can be gotten as a spare part, and be exchanged without any soldering work.

IGNITION CLAMP OPENING

Here you can connect your igniters. It is recommended to not remove too much of the cables isolation, to prevent a short circuiting via touching of the cables.

3.1.5.5 PROGRAMMING- AND CHARGING SOCKET

The side panel features two identical 7pole sockets, which can be used as programming or charging sockets. They allow you to connect the bootloader cable for software updates, or charging the internal battery.

Pins on the receiver	
Pin 1	GND
Pin 2	RX
Pin 3	TX
Pin 4	Battery 1
Pin 5	Battery 2
Pin 6	Not conencted
Pin 7	Not connected

3.1.5.6 BNC-ANTENNA SOCKET

An antenna socket in the BNC standard, to connect the antenna delivered with the device. The receivers also feature a covering for the socket to prevent moisture or dirt from entering.

3.1.5.7 SIGNAL LED

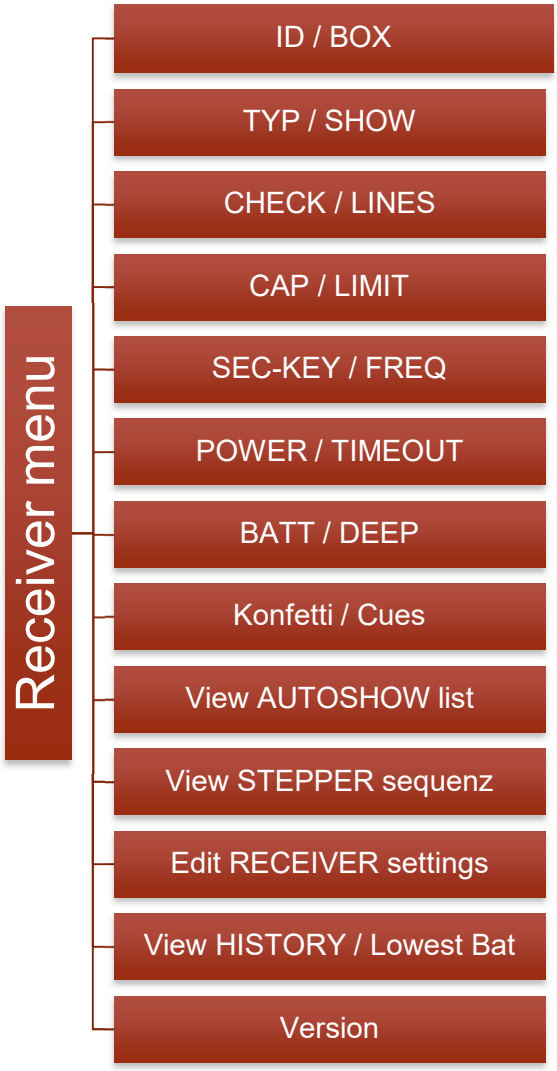
This LED shows you after the devices activation, multiple informations by different ways of flashing. It is mainly used as an optical feedback about the receiving of test or ignition signals.

Status LED during starting	
5x fast flashing	This receivers has changed channels.
1x long flash	A steppsequence has been programmed.
#x short flashing	The number of flashes (#) shows the boxnumber.

3.2 RECEIVER MENU

By pushing and holding the Mode / OK button, you can open the menu.

3.2.1 MAIN MENU



In the main menu, you can view the most important informations about the receiver, as well as open the submenus.

3.2.1.1 ID / BOX

Shows the individual ID number of the receiver (line one) as well as its boxnumber (line two).

3.2.1.2 TYPE / SHOW

Shows the receivers type (line one) and the name of the show saved onto it (line two).

3.2.1.3 CHECK / LINES

Shows the checksum (line one) and the number of ignitions used in the show (line two).

3.2.1.4 CAP / LIMIT

Shows the total capacity of the capacitor in volt (line one), as well as the set upper limit for the ohm measurement (line two).

3.2.1.5 SEC KEY / FREQ

Shows the set security key (line one) and frequency (line two).

3.2.1.6 POWER / TIMEOUT

Shows the set output power (line one) and duration the show will continue without a synchronizationsignal from the transmitter (line 2).

3.2.1.7 BATT / DEEP

Shows the battery charge in volt (line one) and the number of deep discharges of the battery (line two). Deep discharges can damage the battery and provide trouble for the power supply.

3.2.1.8 KONFETTI / CUES

Shows whether confettimode is activated (line one) and which channels are set to it (line two).

3.2.1.9 VIEW AUTOSHOW LIST

Shows all ignitions relevant to the receiver.

3.2.1.10 VIEW STEPPER SEQUENCE

Shows all channels of the receiver, and lets you edit them (box or channel changing). You can also create stepper sequences manually.

3.2.1.11 EDIT RECEIVER SETTINGS

Allows you to change multiple settings of the receiver.

3.2.1.12 VIEW HISTORY / LOWEST BAT

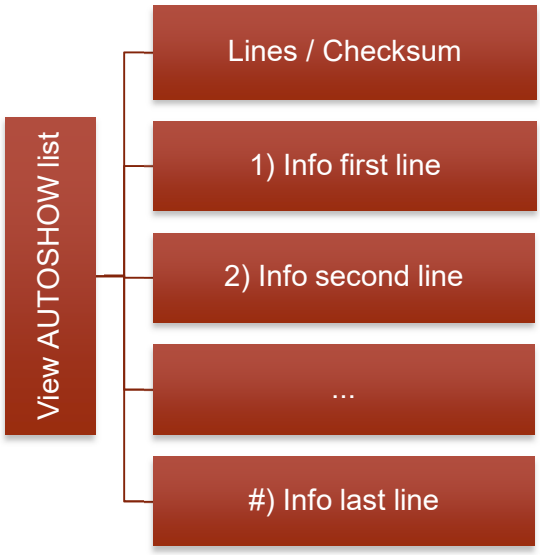
Shows the ignition and battery history of the receiver. Shows the number of signals received in a show, and the battery status during the show.

3.2.1.13 VERSION

Shows the receivers software version.



3.2.2 SUBMENU VIEW AUTOSHOW LIST

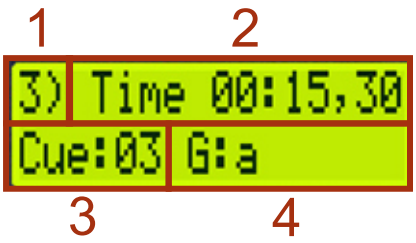


3.2.2.1 LINES / CHECKSUM

Shows the total number of lines used on this receiver. The checksum must be checked against the checksum on the receiver to find potential problems.

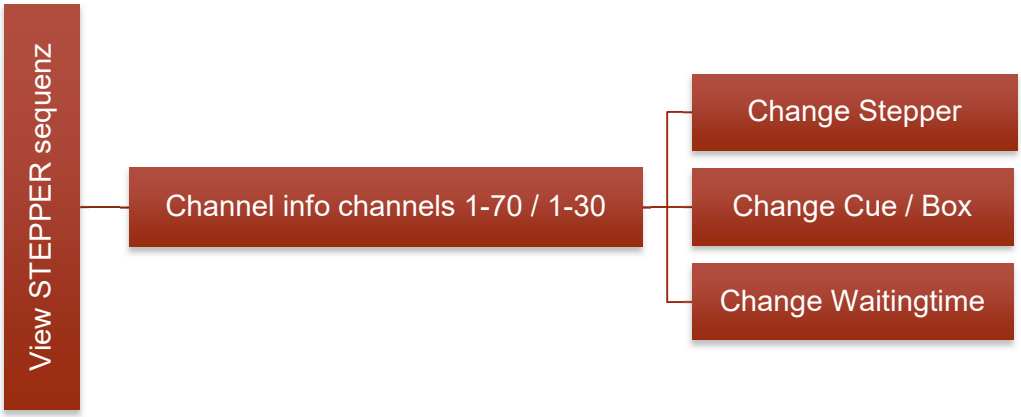
3.2.2.2 INFO OF THE LINES

Shows all lines saved to the receiver in chronological order.



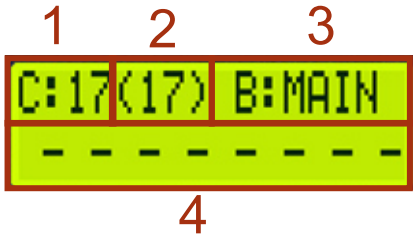
Line build up	
1	Line number
2	Ignition time
3	Channelnumber of ignition
4	Ignition group

3.2.3 SUBMENU VIEW STEPPER SEQUENZ



3.2.3.1 CHANNEL INFO

Shows all 30 or 70 channels of the receiver, and theor most important informations.



Channel information	
1	Standard channelnumber
2	Programmed channelnumber
3	Boxnumber
4	Special programming

STANDARD CHANNELNUMBER

This is the standard set number of the channel, and is the same as the numbering on the front panel. The channels are 1-30 (RX2-30K) or 1-70 (RX2-70K). The channel info is sorted by the standard numbering, since it is non editable.

PROGRAMMED CHANNELNUMBER

This is the channelnumber assigned to the clamp. It can differ from the standard channelnumber and be set from 1-70. The ignitions are made according to this number. Should you set channalnumber 18 for clamp 17, then clamp 17 would ignite when you send the signal for channel 18.

BOXNUMBER

Is the boxnumber assigned to a channel. Standard is MAIN, the boxnumber of the receiver. Can be set from 1-99. Important: the channel will only react to the set boxnumber, or Box:ALL.

Shows if a waiting time (Wait) or a stepper (Stepp) has been programmed on the channel.

3.2.3.2 CHANGE STEPPER

Allows you to enter a steppsequence from a starting channel to a certain ending channel. Important: the sequence can only be started by igniting the starting channel, and won't react to manual ignitions of the channels in between or the ending channel.

Important: This function is only applicable for manual ignitions with the transmitter, and is automatically deactivated when using the AutoShow.

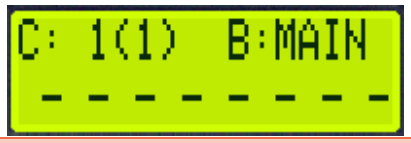
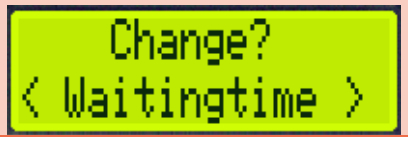
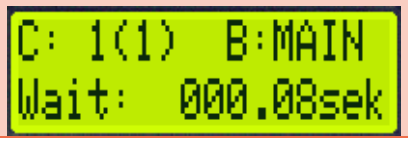
Step	Receiver	Information
1	View STEPPER sequenz	Select View STEPPER sequenz.
2	C: 1(1) B:MAIN - - - - - - - -	Select the preferred starting channel with Plus and Minus and confirm with Mode/OK.
3	Change? < Stepper >	Using Plus and Minus select Change: Stepper and confirm with Mode/OK.
4	Start: 1 to ■ time: 000.00sek	Now select the ending channel with Plus and Minus.
5	Start: 1 to 2 time: 000■06sek	Now select the stepptime between channels in steps of 20ms.
6	C: 1(1) B:MAIN Stepp: 000.06sek	After confirming, the stepp settings will be shown.

Steppsequences can be deleted in the **edit RECEIVER settings** menu with the **Delete**-command.

3.2.3.3 CHANGE WAITINGTIME

Allows you to add a waitingtime to a channel. This is an ignition delay. Should you set a waitingtime of two seconds, this channel will ignite 2 seconds after the initial ignition command.

Important: This function is only applicable for manual ignitions with the transmitter, and is automatically deactivated when using the AutoShow.

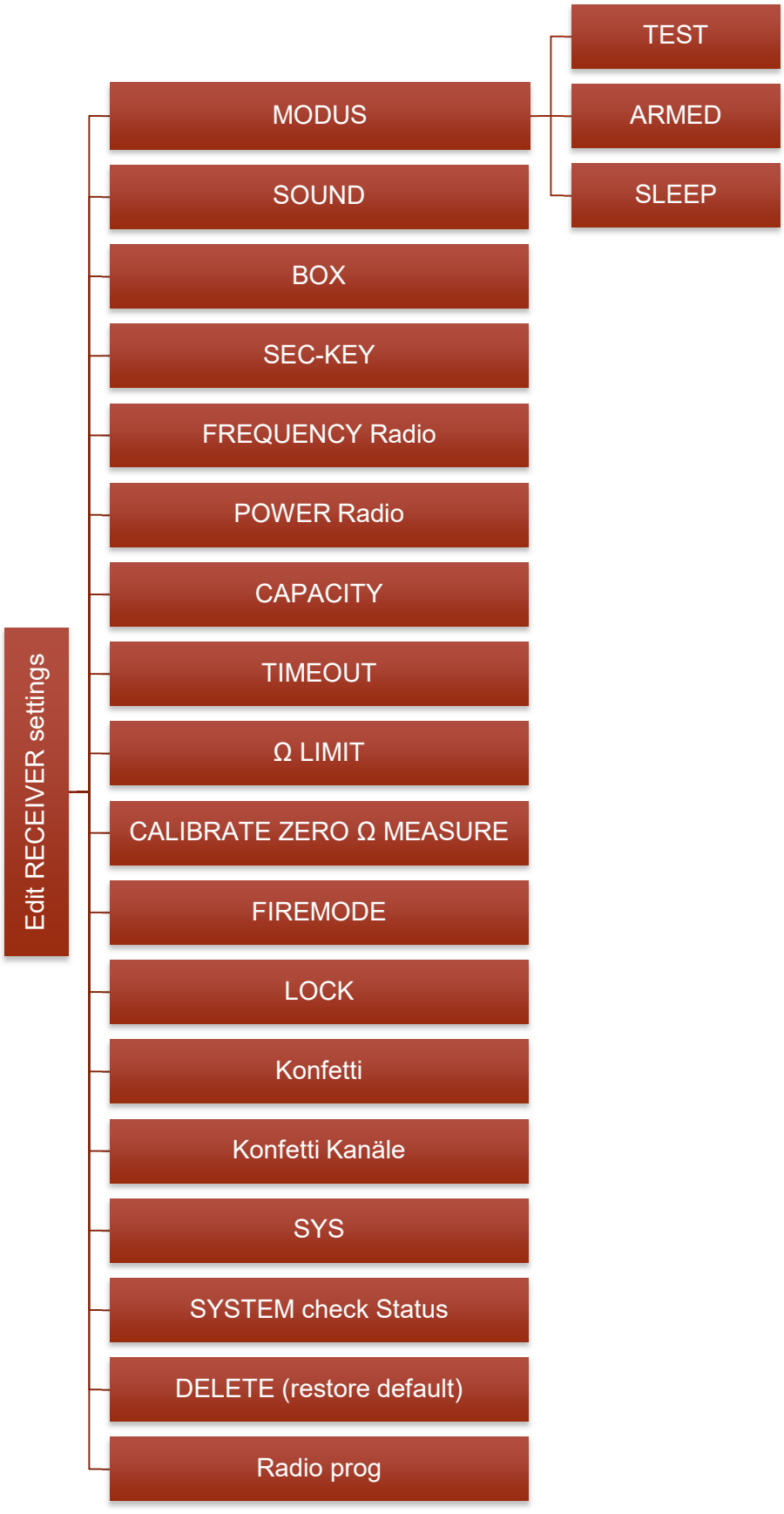
Step	Receiver	Information
1		Select View STEPPER sequenz.
2		Select the preferred channel with Plus and Minus and confirm with Mode/OK..
3		Using Plus and Minus select Change: Waitingtime and confirm with Mode/OK.
4		Now you can set the delay in steps of 20ms using Plus and Minus.
5		After confirming, the waitingtime will be shown.

Waitingtimes can be deleted in the **edit RECEIVER settings** menu with the **Delete**-command..

3.2.3.4 SPECIAL CASE WAITINGTIME AND STEPPER TOGETHER

If needed, a stepper can be set with a delay before. Simply add the preferred delay to the steppers starting channel. You can check your input by checking the corresponding special field of the sequences. When looking at the ending channel, the delay should be visible.

3.2.4 SUBMENU EDIT RECEIVER SETTINGS



3.2.4.1 MODUS

Allows you to set the receiver into Test-, armed- or sleep mode.

3.2.4.2 SOUND

All acoustic signals of the receiver can be turned on or off here.

3.2.4.3 BOX

Allows you to set the boxnumber from 1-99.

3.2.4.4 SEC-KEY

Allows you to change the security key (Standard 139)

3.2.4.5 FREQUENCY RADIO

Allows you to change the radio modules frequency (Standard 6)

3.2.4.6 POWER RADIO

Allows you to set the radio modules output power (Standard 10)

3.2.4.7 CAPACITY

Allows you to set the voltage (30V to 80V) the capacitor will charge to. (Standard 80V)

3.2.4.8 TIMEOUT

Allows you to change the time in seconds, after which the receiver will stop with its internal synchronization after it has stopped receiving synchronization signals from the transmitter.

The value can be set from 6-99 seconds, or infinity. If infinity is selected, the receiver will run its course through to the shows end. However, you can interrupt the show anytime via radio.

3.2.4.9 Ω LIMIT

Allows you to set at which threshold in Ohm during the resistance measurements a channel will be valued as too high. It can be set from 10Ω to 90Ω (Standard 80Ω)

3.2.4.10 CALIBRATE ZERO Ω MEASURE

This menu item is used to make zero measurement. It defines what value will be regarded as 0Ω. This option should only be used by the customer after feedback from the manufacturer.

3.2.4.11 FIREMODE

Allows you to set the receiver into the manual firing mode. This makes it possible to ignite channels directly from the receiver. Careful: This mode should only be used if a large enough safety distance to the effects connected to the receiver is ensured.

3.2.4.12 LOCK

Allows you to lock the receiver menu and set the code to unlock.

3.2.4.13 KONFETTI

Allows you to activate the confettimode. This allows you to change the ignition duration up to three seconds. If the confettimode is activated, it will also carry over into the manual firing mode.

3.2.4.14 KONFETTI CHANNELS

Allows you to set which channels are affected by the confettimode. All others will use the standard ignition duration.

3.2.4.15 SYS

Allows you to change the systemaddress of the receiver.

3.2.4.16 SYSTEM CHECK STATUS

Allows you to make a check of the system.

3.2.4.17 DELETE (RESTORE DEFAULT)

Allows you to reset all switched channels or boxnumbers, confettimode and the saved show on the receiver.

3.2.4.18 RADIO PROG

Allows you to turn the receivers radio programming on or off. If it is switched off, the receiver can't be learned onto the transmitter automatically anymore.

3.3 ERRORCODES OF THE RECEIVERS

The RX2-30K and RX2-70K feature an errocode system for certain failings. They will be shown on the display as ER with an up to three digit number. The generation is done via a binary system. Every errortype has a numerical value. Since multiple errors can occur, the generated errorcode can be a sum of more single codes.

The following values are possible:

Errorcode	
1	ARMED / TEST switching
2	Safety circuitry
4	Capacitor charging
8	Capacitor discharging
16	Systemtest made?
32	Short circuit on lines
64	Short cicuit on case
128	Defect Plus-Line

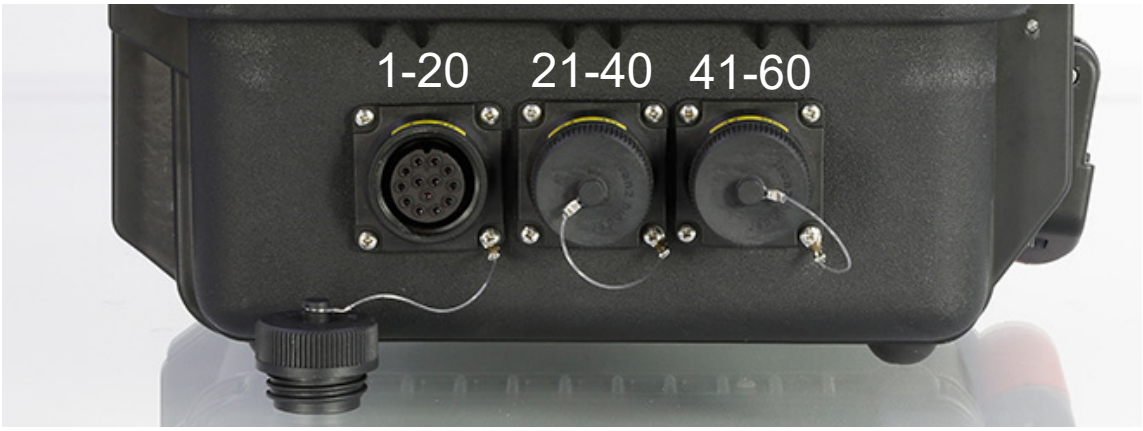
3.4 USAGE OF SPLITBOXES

The Splitbox SP2-20K is used to reel out the channels of a receiver from the deivce itself. Up to 60 channels can be drawn to the splittboxes, using so calles splittbox cables. They can be produced in multiple langth (standard 25m) and the splittboxes be cascaded.

By using multiple splittboxes and cables, impressive distances can be achieved. The ignition energy comes from the receiver. However, the splittbox features an integrated battery in order to power the connectivity LEDs at its clamps.

The cables themselves can only be connected to receivers that feature the right connectors. Generally, all RX2-70Ks and RX2-30Ks can be fitted with the connectors. 3 connectors are built into the devices. This means a total of 60 channels, that can be ignited via the splittboxes. In the case of the RX2-30K, this means an extension of up to 70 channels in total.

Next to the bridging of distances between the receiver and the firing position, the use of a splittbox can also mean the ignition of multiple effects at the same time, without needing to use a receiver for each location. The ignitions of the splittbox are always made parallely to the ignitions on the same channel of the receiver. Should channel 11 be ignited on the receiver, the same channel will ignite on the splittbox. Note that every line is subject to the same ohm resistance threshold as the receiver. Always take into account the line resistance of the cable itself. Below you can find the standard connection of the splittbox connectors.



3.5 SPECIAL SYMBOLS RECEIVERDISPLAY

According to the programming made on the receiver, the following symbols can appear in the upper right corner:

Special symbols	
K	Confettimode activated
A	AutoShow saved
S	Steppsequence saved
C	Changed channels on the receiver

4 GUIDELINE TO USAGE OF THE DEVICES

This guideline will show you how to best create a show, and fire it using the explo X2-system.



4.1 CONEPT CREATION

When creating a basic concept, the following should be taken into account:

1.) How long should the show be?
2.) Will it be a musical firework? If so, what music will I use?
3.) How many, and which effects do I wish to use?
4.) How does my firing location look? Where can I set up my receivers?
5.) Resulting from point 3 and 4: How many receivers, with how many channels will I need?
6.) Must I synchronize the show with other systems (eg.: external Timecode)?
7.) Am I doing two shows on the same day in close locations? (In this case, subsystems should be created using the security key or the frequency)

Many of these things are of course dependent on the client, and will thusly be known from the start. It is important to clarify these things before starting to programm the show, since that is the most arduous and longest part, and the hardest to change afterwards.

4.2 PROGRAMMING THE SHOW

Only read through this part if you wish to programm a fully automated show. If you wish to launch manually, skip the following chapters up to **Testing of show and receivers**.Programming the show will take the longest. Using a suitable software (eg.: Explo ShowCreator or AutoShow) you can create an automatic or semiautomatic show.Special care must be taken to place your ignitions at the right times, for the right look of the show. When beginning to create your show, you should set how many boxes will be used, and which devices they represent. In the showcreator or AutoShow boxes can be defines effectdevices, in order to get special options for the selected devices.

Some important things to note when creating a show:

Programming a show	
Boxnumber	Can be set from 1-99. Box:0 commands all available boxes (except effect devices. Can't be entered when creating an automatic show for the X2 series). Ideally, every receiver should have its own boxnumber, unless the should be controlled parallely.
Channelnumber	According to the type of receiver, the channels 1-70 can be assigned. Effectdevices have channels assigned to predefined sequences. Please consult that devices manual.
Ignition distance	With the X2 series, the minimal time between ignitions is 0. This is thanks to an internal timecode synchronization. An exception are ignitions made on the same device. A time of 0 seconds can be set, but will only be achieved if the ignitions are on the same line or row (channel 1-10, or 3 and 13 for example), and will be ignited with a difference of 10ms per line. For effect devices, the time is dependent on the opening time of the effect. Please consult that devices manual.
Stepp distance	The minimal distance between other ignitions should be 10ms.
Ignition groups	By defining ignition groups, groups can be easily activated or deactivated, even during a show. Effectdevice use the ignition group to set the opening time of predefined sequences.

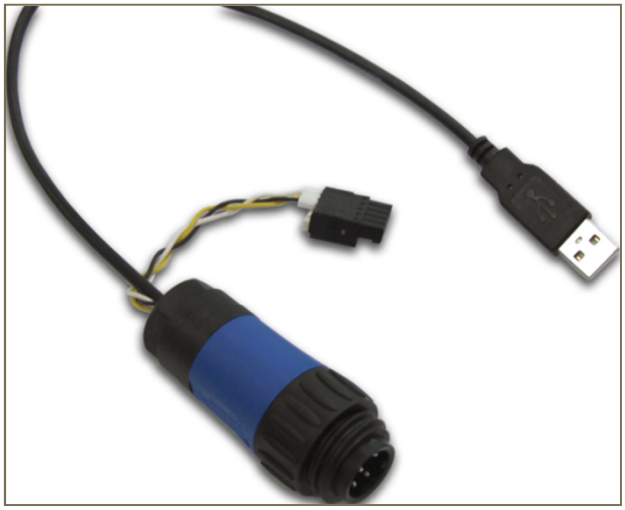


While programming, the show should already be checked for wrongly addressed channels or boxnumbers.

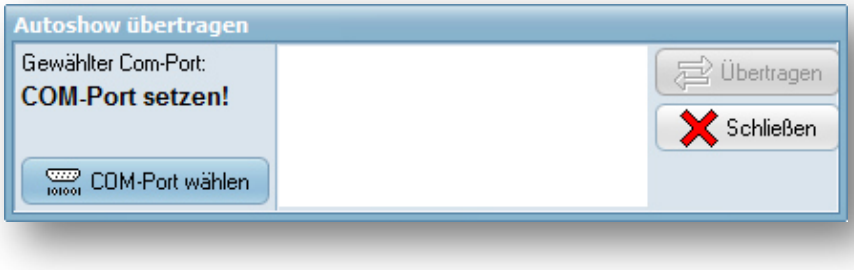
4.3 LOADING THE SHOW ONTO THE TRANSMITTER

After checking the show, it can be loaded onto the transmitter. Simply open the show with the explo AutoShow Software (for the X2 series). You can find the software and all needed drivers on our homepage. Follow these steps to load the show:

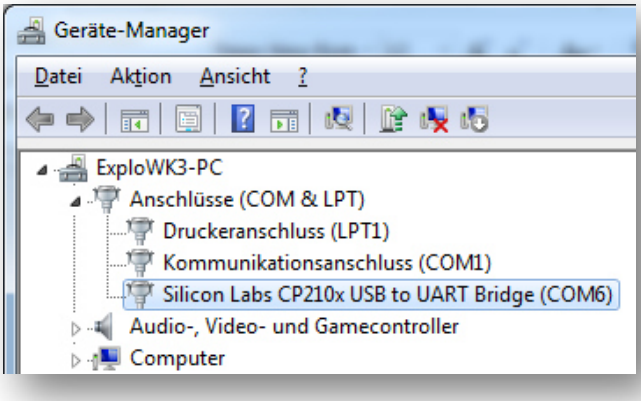
1.) The transmitter is connected to the PC / Notebook via the Bootloader cable, seen below.



2.) After connecting both, you can set the COM port under the selection "Select COM-Port" after clicking "Transmit Autoshow".



Should you be uncertain as to which Port must be chosen, open the Windows device manager. At "COM&LPT connections" you can find the connected cable, if the driver has been installed successfully. The used COM port can be found in the brackets next to it. After setting the COM port, you can close the transmission window again.



3.) After setting the COM port, switch on the transmitter, and set "Auto Mode" from "OFF" to "ON" in the menu. Now select "Load File". The transmitter display should now read "connect PC or press OK".

4.) You can now select "Transmit show" in the AutoShow software. The transmitter display should now read "PC connected, waiting...".

5.) Now you can begin the actual transmission by clicking "Transmit".

6.) If successful, the transmitter should now read „Finished, disconnect PC“. Now you can disconnect the transmitter from the PC.

4.4 SENDING THE SHOW TO THE RECEIVERS

The X2-series uses an internal Time Code , which allows the transmitter and receiver to synchronize. This means that the show-file must be loaded onto all receivers. The receiver only gets time synchronization signals from the transmitter during the show, and runs through its saved show. This has the benefit that much faster ignitions and simultanious ignitions on multiple boxes are possible.

To transmit the show from the transmitter to the receivers, the following steps must be taken:

1.) First, ensure the correct show is on the transmitter.

2.) On the transmitter, under "receivers" you can set the boxnumbers. This assigns boxnumbers to the devices used. Unused devices can be set to DEACT (deactivated). Take care that all boxes used in the show are assigned, since otherwise an error will occur.

3.) Now the show can be sent to the receivers, which must still be switched on. Select "AutoMode" > "RX send show". you can select whether all boxes or only a single box should be transmit. This allows you to programm a single box afterwards. If a box is missing, an error will be shown. It can be skipped by pressing the Plus button if you want. If no error is encountered, follow the steps shown on the transmitter display, and do the test recommended at the end.

Important: The show will also be sent to devices taht are switched on, but are deactivated in the receiver list, if their boxnumber is used in the show.

4.5 TESTING THE SHOW AND RECEIVERS

After transmitting the show, its function as well as the one of the receivers should be checked. This should prevent faulty programming and errors. Every error encountered beforehand saves valuable time during the setup or the day of the show! To test the programming and the devices, you should do the test that is recommended after transmitting the show.

Step	Transmitter	Information
1		Shown after loading the show onto the receivers. Confirm using Test/ESC.
2		Afterwards, you will see how many used receivers have gotten the testsignal, and whether they have loaded the correct show. Should an error occur in the second line, or a receiver not have received the signal, the faulty devices must be checked.
3a		The second result window will show how many of the used boxes are available on how many receivers, and if that value is correct.
3b		Should a box be missing, or a box too much be found, it will be shown in the second result window.
4		Once the second window has been checked, you can select the detail window by pressing Plus. Check the boxnumber, and whether PRG is written in the upper right corner. This means a correctly programmed show. If an ERR is shown, then no, or the wrong show has been saved on the receiver (show must be sent anew). Check all devices. The second detail window is relevant after setup and connecting all igniters.

After checking that all receivers have been programmed correctly, you should do a dry test run. Switch on all receivers, and start the show. Detailed information can be found in the chapter **Starting the show.** Test the music too at the same time. If you are using a music receiver like the RX2-Wave Player, audio boxes should be connected.

Do a complete run of the show, and observe the receivers. Are the ignitions made synchronized to the music?

Afterwards, you can check the ignition history of the receivers. Have all channels ignited during the show?

4.6 TRANSPORTING THE DEVICES

Before transport, all devices should be fully charged. This can often be problematic at the firing site. When using the NiMH chargers, please unplug them once after connecting them to a new device.

If all batteries are charged, you can get the device ready for transport. Depending on the size of the show, take note of which devices you will use. Also check if all antennas are inside the devices, and whether all needed accessories (Chargers, spare batteries, covers, etc.) are packed.

For safety, you can take a Notebook or Windows Tablet with you, with all important show programms, drivers and software updates, or at least an USB stick with the installation data and show file.

The devices should be proofed against damaging while being transported in a vehicle. And no, we have not built airbags into the devices.

4.7 SETUP OF DEVICES AT THE FIRING SITE

The setup at the show location is of course variable, and strongly dependant on terrain, indoor or outdoor use, weather and time plan with larger events (just to name a few).

We can't and won't give a detailed step by step manual on how to set up, but we can offer some hints.

1.) Never connect igniters on switched on devices.
2.) Positioning of the devices has probably be done beforehand. However check the radio connectivity between the transmitter and receivers, and whether it could be impaired. Under the section Tipps & Tricks, you can find a single chapter dedicated to this important topic! Please take note of thse hints during setup, to prevent bad things from happening during the show.
3.) Create a plan with all frequencies in use at the location (also note Wireless DMX). This allows you to spot jamming frequencies beforehand.
4.) Strong appliances near receivers or transmitters should be taken into account. Strong floodlights, or stroboscobes can cause interferences.
5.) When connecting igniters, don't strip too much of the isolation, to prevent the two wires from cuasing a short circuit.
6.) During outdoor use: Position receivers in a way, that rain doesn't make them drown in a puddle. Place them in slightly elevated positions. The devices are proofed against rain and water, but not watertight. Entering water must be able to escape through the bottom.
7.) When closing the lid of the RX2-70K or the outdoorcase of the RX2-30K, take care not to pinch the cable for the magnetic antenna or the igniters. To run cables outwards, use the runways to both sides of the device.

4.8 TESTING BEFORE THE SHOW

One of the most important steps is the testing of the devices before the show. With a large test, you can see if all used lines are really able to ignite (resistance measurement) and whether the radio connectivity between the devices is stable.

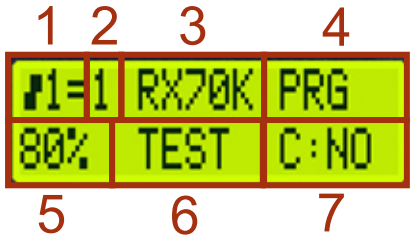
For this, a large test is made. If an automated show is used, the AutoMode should already be set to "ON". If you fire manually, set it to "OFF". All receivers should now be activated. To start the test, press and hold Test/ESC in the test mode of the transmitter, until the following screen appears:



Step	Transmitter	Information
1	Update and Test all # Receivers	By pressing Test/ESC, the test is started.
2	#/# signals ok All Prog OK	Afterwards, you can see how many of the receivers used in the show have gotten the test signal, and whether the correct show is loaded. Should an error be shown in the second line, you should find the faulty receiver, and check it for problems.
3a	1 Boxes in show on 1 devices OK	The second screen shows how many of the boxes used in the show are available, and whether this result is okay.
3b	0 Boxes too much 1 Boxes missing	Should a bix be missing, or a box be too much, this will be shown in the second screen.
4	▮1=1 RX70K PRG 80% TEST C:NO	Once the second screen has been checked, you can use the Plus button check the detail windows of the receivers.

4.8.1 DESCRIPTION OF IGNITION DEVICES DEATIL SCREEN 1

This screen can show multiple, general informations. It is build up the same way with most receivers, whereas detail screen 2 is a special screen, varying from receiver to receiver. The following description is only true for the RX2-30K and the RX2-70K. By pressing the Test/ESC button shortly, you can refresh this screen. The informations will be gotten directly from the receiver.



Detail screen 1	
1	Device number
2	Boxnumber
3	Device type
4	Programming
5	Battery
6	Mode
7	Capacitor

4.8.1.1 DEVICE NUMBER

The device number of the receiver, according to its number in the transmitters devicelist.

4.8.1.2 BOXNNUMBER

The receivers boxnumber.

4.8.1.3 DEVICE TYPE

The receivers device type.

4.8.1.4 PROGRAMMING

Shows whether the correct show has been saved on the receiver. PRG means that it is. If an ERR is in its stead, the wrong show has been saved on the receiver. You should definitely execute an "RX send show" command again.

4.8.1.5 BATTERY

Shows the batterystatus in percent.

4.8.1.6 MODE

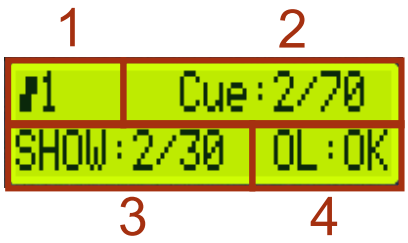
Shows the mode that the receiver is currently in.

4.8.1.7 CAPACITOR

Shows the capacitors status. NO means it is discharged, OK means it is fully charged.

4.8.2 DESCRIPTION OF IGNITION DEVICES SCREEN 2

This screen shows receiverspecific infos. For example with the RX2-30K and RX2-70K, you can get feedback about their lines and resistance measurements. With the RX2-Wave Player, you can test the different functions of the player, and with the RX2-1K Gas you can set different settings about the number of devices used. By pressing and holding the Test/ESC button, this window can be refreshed.



Detail screen 2	
1	Device number
2	Number of used lines
3	Number of lines used in the show
4	Ohm-measurement

4.8.2.1 DEVICE NUMBER

The device number of the receiver, according to its number in the transmitters devicelist.

4.8.2.2 NUMBER OF USED LINES

Shows the number of lines connected on the receiver.

4.8.2.3 NUMBER OF LINES USED IN THE SHOW

Shows the total number of connected lines, that are also used in the show. This can be lower that the number shown in point 2. This would mean that not all lines used in the show have an igniter connected to them. This could be traced back to spare channels.

4.8.2.4 OHM-MEASUREMENT

Shows whether one ore more lines on the receiver exceed the set ohm limit. If you can see OL:OK, then the threshold has not been exceeded. Should it have been exceeded, the number of lines where this has occured will be shown. For example OL:5 would mean the threshold has been exceeded on 5 channels. In this case, an ohm test for the device should be made, to identify the channels. If the ohm value is too high, a channel might not ignite.

4.8.3 ELABORATE TESTS

The detail screens offer an overview over the most important test results of the receivers. Sometimes it is neccessary to have a closer look.

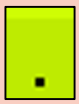
You can make specialised range tests or detailed resistance measurements then.

4.8.3.1 RANGE TEST

The range test can be done by pressing an holding Test/ESC in detail screen 1.

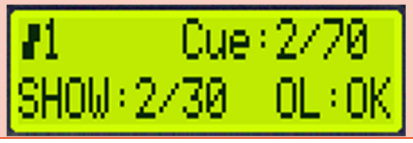
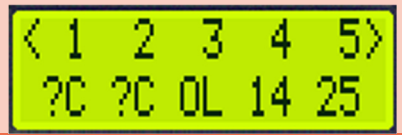
Step	Transmitter	Information
1		Press and hold Test/ESC to start the rangetest.
2		Rangetest is made. 10 signals are sent.
3		Evaluating the results. Shows how many of the signals have been received and been sent back.

A total of 10 signals are being sent, with weakening intensity. Each is done doubly. The first signal is ent with full power, the tenth with the lowest. Should even one of the first three signals not have been received by the receiver (Symbol "x"), the radio connectivity must be checked, since there is a danger of radio disconnects during the show.

Evaluation of rangetest symbols	
	Signal is sent and evaluated.
	The first signal has been received and been sent back successfully.
	Only the second signal has been received and sent back.
	The receiver did not receive any signal. Check the connectivity. Afterwards, this symbol might change to one of the following ones after a new test.
	The first signal has been received, but there was no feedback. Check the receivers antenna and replace it if neccessary.
	The second signal has been received, but there was no feedback. Check the receivers antenna and replace it if neccessary.

4.8.3.2 DETAILED OHM MEASUREMENT

The detailed ohm measurement can be shown by pressing the Test/ESC button in detail screen 2.

Step	Transmitter	Information
1		Press Test/ESC in this detail screen.
2		Ohm measurements are being sent to the transmitter.
3		The upper line are the channels, the lower the results. Using Plus and Minus you can navigate the channels.

Evaluation of Ohm measurement	
OL	Threshold set in the receiver has been exceeded.
NC	No connection at the clamp.

?C	No connection at the clamp, however this channel is used in the show, so it should be connected.
Number	If a number is shown, this is the resistance value.
1↓	Connectivity is given, however the value is below one.
XX	If XX is shown, a defect at the plus line has ocurred. In this case, please contact the manufacturer.
******	This channel has been ignited since the device was last switched on.
xL	Igniter connected, but the channel has been deactivated in the AutoShow (won't ignite)!
dL	Igniter connected, but the ignition group of the channel has been deactivated (won't ignite)!
DL	Igniter connected, but the device group of the channel has been deactivated (won't ignite)!
xC	No igniter connected and the channel has been deactivated in the AutoShow (won't ignite)!
dC	No igniter connected and the device group of the channel has been deactivated (won't ignite)!
DC	No igniter connected and the device group of the channel has been deactivated (won't ignite)!
ER	A non defined error has ocurred at the channel.

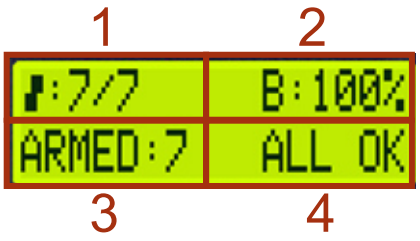
4.9 STARTING THE SHOW

4.9.1 TESTING IN ARMED-MODE

In armed mode, a quick test should be made. Simply press and hold the Test/ESC button after the device has been turned armed. This test should be done with automated and manual shows.

Step	Transmitter	Information
1	** FIRE-Mode ** Ch:1 Box:1	Press and hold the Test/ESC button until the test starts.
2	testing .	Devices are tested.
3	:7/7 B:100% ARMED:7 ALL OK	Showing the testresults.

The testresults show the most important informations in short version.



Testresults	
1	Number of/activated devices.
2	Lowest battery
3	Armed devices.
4	Errors.

4.9.1.1 NUMBER OF/ACTIVATED DEVICES

The first number is the number of all devices that have made a successful connection to the transmitter. The second number after the slash, shows how many should be available.

4.9.1.2 LOWEST BATTERY

Shows the lowest battery of all devices tested in percent.

4.9.1.3 ARMED DEVICES

Shows the number of armed devices. Should always be the same as the total number of devices.

4.9.1.4 ERRORS

Should an error occur, ERR is shown with the number of errors. (ERR 8 means a total of 8 errors has ocurred on all devices)

The following will be shown as an error:

1.) Line Error (Problems at one or multiple clamps, like a short circuit)
2.) Prog Error (Wrong or missing AutoShow on one or more devices)
3.) System Error (Systeminternal error on a receiver)
4.) A device is not armed.
5.) A device deactivated on the transmitter is switched on.

Important: Resistance measurement will not be refreshed in armed mode. The values shown will be taken from the last measurement taken, and might be old. Should an error ocurr, it is recommended to do another test in the testmode of the transmitter, to check whether a Line Error or Prog Error has happened.

4.9.2 IGNITING A SHOW MANUALLY

During manual ignitions, the channels will be ignited manually via button pressing of the Ignite button.

4.9.2.1 PREPARATION

To make manual ignitions, the AutoMode of the transmitter must be turned off.

In test mode, no ignition signals can be sent. The transmitter must first be switched to armed mode. This is done on the TX2-70K by turning the key switch a quarter clockwise, and by pressing and holding the ARMED button on the TX2-Stage. When doing so, all receivers will also turn armed.

4.9.2.2 SELECTING BOX/CHANNEL AND IGNITE

If not set diefferntly in the menu, the transmitter will start in armed mode at Box:1 and Channel:1. Should you wish to use another channel or Box, you can do the following:

Boxnumber: In armed mode, press Mode/OK, and change the Boxnumber using Plus/Minus.

Channelnumber: In armes mode, press Plus/Minus up to the preferred channel.

Important: By pressing the Ignite button, you will always ignite the Box and channelnumber shown on the display. In the example below, you would ignite channel 1, on box 1.

Display on the transmitter during manual ignition (Armed-Mode):



Manual ignitions	
1	Channel to be ignited.
2	Box to be ignited.

4.9.3 IGNITING A FULLY AUTOMATED SHOW

When igniting a fully automatic show, the show loaded onto the transmitter and receiver before will be started by pressing the Ignite button.

4.9.3.1 PREPARATION

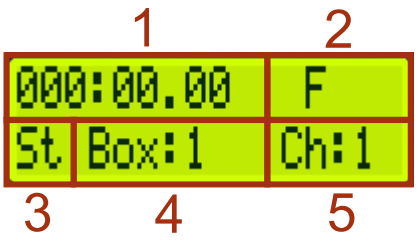
To start an automatic show, you must activate the AutoMode, have the show file on the transmitter and all receivers. The ignition mode in the AutoMode menu must be set to "automatic" and not to "StepbyStep".

In test mode, no ignition signals can be sent. The transmitter must first be switched to armed mode. This is done on the TX2-70K by turning the key switch a quarter clockwise, and by pressing and holding the ARMED button on the TX2-Stage. When doing so, all receivers will also turn armed.

4.9.3.2 STARTING THE SHOW

To start the show, press the Ignite button in armed mode. The show, or if set the countdown will start automatically now.

Display on the transmitter in automatic ignition mode (Armed-Mode):



Automatic Show	
1	Countdown before Show/Showtime.
2	Testmode / Armed mode.
3	Countdown to next ignition.
4	Boxnumber of next ignition.
5	Channel of next ignition.

COUNTDOWN BEFORE SHOW / SHOWTIME

If set, the countdown before the showstart is shown. During the running show, the time of it so far can be seen.

TESTMODE / ARMED MODE

Shows the current mode of the transmitter. F is for Armed (Fire mode), T is for Test mode.

COUNTDOWN TO NEXT IGNITION

Shows a countdown to the next ignition. Before the shows starts, this will read St.

BOXNUMBER OF NEXT IGNITION

Shows the boxnumber the next ignition will be made on.

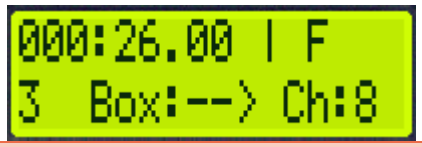
CHANNEL OF NEXT IGNITION

Shows the next channel an ignition will be made on.

4.9.3.3 INTERFERRING IN A RUNNING SHOW

Various buttons can be used to interfere in a running show, such as pausing it, resetting or skipping channels.

The following buttons can be used:

Button	Transmitter	Information
Minus		Pause the show. Pressing it again will resume the show. Pressing it longer will reset the show.
Plus		The next channel will be skip. Can be canceled by pressing again.
Ignite	The next channel willimmediately ignite. Skips the internal timecode.When using an RX2-Wave Player, an audible skip can be heard. To skip the time to next ignition with the Ignite button, Time skip must be set to ON in the AutoMode.	
Test	Pressing will send an abort signal to all receivers. During a running show, this has little effect, since an ignition signal will be sent before each ignition, which will restart the receivers. Can however be used during a pause, to pause all other devices that have not yet received the pause signal.	

4.9.3.4 END OF THE SHOW

After the end of the show, the display will show the following:



To restart, you must either restart the transmitter, or press and hold the Minus bitton for about 5 seconds.

4.9.4 IGNITING A SEMIAUTOMATIC SHOW

For a semiautomatic show, an automatic show is loaded onto the devices, but every single ignition must be done manually. An exception are sequences created beforehand into a SbS-sequence.

4.9.4.1 PREPARATION

To start a semiautomatic show, the AutoMode and the SbS-mode nust be activated, and the show file be loaded onto all used devices.

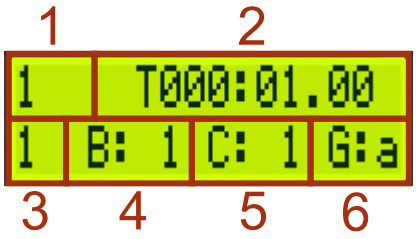
In test mode, no ignition signals can be sent. The transmitter must first be switched to armed mode. This is done on the TX2-70K by turning the key switch a quarter clockwise, and by pressing and holding the ARMED button on the TX2-Stage. When doing so, all receivers will also turn armed.

4.9.4.2 STARTING THE SHOW

To activate, every single ignition or sequence must be started manually by pressing the Ignite button. After an ignition, the programm automatically selects the next ignition. Theoretically you can switch between single ignitions and sequences using the Plus and Minus buttons. This should however only be done in extreme cases.

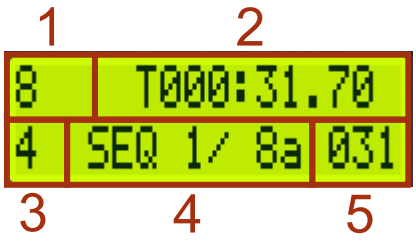
Important: Sequences in the SbS mode will only be made for the duration set at the effect device itself for these. Further, ignitions made at the same time will only be made together, if they have been grouped as a squence. If not, they will ignite in the same order they are saved, each after a manual ignition signal.

Display on the transmitter in semiautomatic ignition mode (Single ignition):



Automatic show	
1	Number ignition / Sequence.
2	Showtime according to AutoShow.
3	Number of ignitions in sequence.
4	Boxnumber of next ignition.
5	Channel of next ignition.
6	Ignition group.

Display on transmitter in semiautomatic ignition mode (Sequence):



Automatic Show	
1	Number ignition / Sequence.
2	Showtime according to AutoShow.
3	Number of ignitions in sequence.
4	Box-/Channel first ignition and ignition group of sequence.
5	Countdown to end of sequence.

4.9.5 IGNITING AN AUTOMATIC SHOW (USING TIME CODE)

Automated shows can synchronized using an external Time Code (FSK, SMPTE or MIDI). While the FSK-TC can be plugged directly into the transmitter, a special module is needed for SMPTE and MIDI (eg.: Explo SMPTE/MIDI TC Modem).

4.9.5.1 PREPARATION

To start an automated show, the AutoMode must be activated, and a show file be loaded onto all devices. The ignition mode must be set to "automatic" and not "StepbyStep".

Further the correct settings must be selected at AutoMode - Settings. Please read the corresponding chapter of this manual.

TC-giver / TC-Modem must be connected to the transmitter. For the correct setup and use of the Explo TC Modem, read through its instructions.

In test mode, no ignition signals can be sent. The transmitter must first be switched to armed mode. This is done on the TX2-70K by turning the key switch a quarter clockwise, and by pressing and holding the ARMED button on the TX2-Stage. When doing so, all receivers will also turn armed.

4.9.5.2 STARTING THE SHOW

As soon as the transmitter receives the correct TC, the show will start. It will be synchronized to the external TC.

4.9.6 USING THE SPARE BUTTONS

The spare buttons are separate buttons on the TX2-70K, that can be set with different functions, and be used during manual ignitions or a running AutoShow. In the PC Mode they serve no use.

The following functions are available:

- Igniting a Box and channel
- Activate / deactivate a device or ignition group
- Starting the AutoShow at a certain time
- Assigning a sequence (only with a saved AutoShow)

4.9.6.1 ASSIGNING A FUNCTION

The spare buttons are normally set to ignite the channels 61 to 70 on Box 1. To reprogramm, press it in Test-Mode.

After that, it will show the currently assigned function. The upper line will tell you the current name of the spare function:

Functions of spare buttons	
CUE	Allows you to set a certain channel and box to be ignited.
AUTOMODE	Allows you to set a certain time in the AutoShow. When pressed, the show will jump to the time entered. A show must be saved on the transmitter, and the AutoMode set to ON.
deact. G	Lets you set a device group (capital letter) or ignition group (lowercase letter) that should be deactivated when pressed.
act. G	Lets you set a device group (capital letter) or ignition group (lowercase letter) that should be activated when pressed.
SEQUENCE	Sets a sequence (start and end), that will ignite when pressed. A show must be saved on the transmitter, and the AutoMode set to ON.

4.9.6.2 USING THE SPARE FUNCTIONS (ONLY TX2-70K)

IGNITING A BOX AND CHANNEL

The main function of a spare button is to ignite a certain box and channel at any time. Allows you to ignite a spare effect during a show, if another fails to launch.

Can also be useful at smaller manually ignited fireworks to ignite certain channels immediately.

ACTIVATE/DEACTIVATE DEVICE- OR IGNITIONGROUPS

This function allows you activate or deactivate certain Device- or ignition groups that have been defined beforehand, during a running show. Can be useful to deactivate certain positions if needed.

STARTING AN AUTOSHOWS AT A CERTAIN TIME

Allows you to start an AutoShow at a predefined time. Time is entered in Minutes, seconds and hundredth of a second.

Only available in amred mode if the AutoMode has been set to ON beforehand.

Can be used to start a show, or jump to a certain point during a show.

IGNITING A SEQUENCE

Allows you to ignite a certain sequence, after it has been defined in a show beforehand. It will automaticall ignite all channels from the starting one, to the end channel.

Both a show must be loaded, and Automode be activated.

4.9.7 MANUAL IGNITION USING EASY-MODE (ONLY TX2-70K)

The Easy-Mode is a special Mode of the transmitter TX2-70K. It can be used to easily ignite all Box- and channelnumbers manually using the spare buttons. This is a large benefit for stageshows, since it is possible to ignite certain channels without needing to switch a lot.

4.9.7.1 PREPARATION

To activate, you must press Plus and Test/ESC while you switch on the transmitter. You will be asked whether you wish to activate the Easy Mode. Confirm with Mode/OK. The following screen should appear:



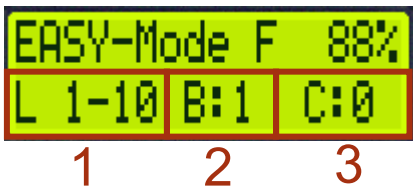
The menu is now locked, but you can send easy and detailed test signals, using Test/ESC.

4.9.7.2 DEACTIVATING THE EASY MODES

To deactivate, press Plus and Test/ESC while you switch on the transmitter. Decline the query with Test/ESC.

4.9.7.3 IGNTING IN EASY-MODUS

After switching to armed mode, ignitions can only be made using the spare buttons. The following should be seen on the display:



Easy-Mode (Armed Mode)	
1	Active channels
2	Active box
3	Last ignition.

ACTIVE CHANNELS

Shows which channels are currently ignitable using the spare buttons.1-10 means that the spare buttons will ignite channels 1-10. Plus and Minus allwos you to switch between rows. Channels that have already been ignited, will be indicated by the button being no longer lit.

Channels can be ignited multiple times, if needed.

ACTIVE BOX

Shows on which box ignitions will be made. can be changed by pressing Mode(OK and selecting with Plus/Minus.

LAST IGNITION

Shows the channel ignited last.

5 OTHER

5.1 SAFETY NOTES

The system may only be used to ignite pyrotechnical effects, and be used only by trained pyrotechnicians. The generals safety guidelines regarding pyrotechnics are to be adhered.

After the device is switched on, no persons may linger in the dangerous vicinity of the effects connected to the system. Works on the system may only be done when it is switched off. During the show, the safety distances to the system and effects must be kept. Works on the system during use is strictly prohibited.

During the setup of the system, it is recommended to proof the receivers against activation (eg.: removing the key). Under no circumstances may a transmitter be left unsupervised, unless it has been proofed against unauthorized use.

5.2 HINTS & TRICKS

5.2.1 RADIO CONNECTIVITY:

A good radio connectivity is an essential part of a trouble free usage of a radio controlled system. Taking note of these few hints can improve the connection between transmitter and receiver drastically.

5.2.1.1 ABOUT RADIO WAVES:

Radio waves are electromagnetic waves that expand with near lightspeed (~300.000km/s).

Radiowaves are unhindered in a vacuum and air, but can be reflected by metal or be absorbed by natural materials like wood or water.

5.2.1.2 POSITIONING YOUR DEVICES:

Ideally, you should place the transmitter and receiver in a way that no objects are placed between them, and you have free line of sight. You should especially take heed not to have any metallic objects, as well as mountains between them.

Theoretically it is possible to receive signals even behind these objects, since radio waves can reach their destination indirectly by breaking or reflecting off of objects. The maximum range can however only be achieved by a free line of sight.

Transmitter and receiver must not be covered by metalls, since these can shield against radio waves. Ideally, the devices should be placed in an elevated position, like a table. Should the devices be placed on water, with a raft for example, we recommend using magnetic antennas, and placing these about a meter above the water level.

5.2.1.3 DIRECTIONAL ANTENNAS

Thanks to their emmission, the antennas (should the devices be placed at the same height) should be upright, since the emit signals from their sides the strongest. If the transmitter and receivers are placed at a different height, the antennas should be placed in a way that they are parallel to eachother.

If possible, the usage of a Grounplane-Antenna (transmitter) and Magnetic antennas (receiver) is recommended, since they can drastically improve the radio range. the magnetic antennas of the receivers should be placed on top of a 15x 15cm metallic plate. During rain or thaw, especially with wet or salty sea air, it is best to connect the antenna before placing the receiver in the field, since otherwise there is a possibility of water entering the BNC socket. After usage in wet conditions, we recommend allowing your devices to dry, especially the antenna and BNC socket. Ideally using compressed air.

The antennas can be damaged by physical means, like bending or pulling on them too strongly. Should this happen, a short circuit within the antenna can occur. In this case, the antenna needs to be replaced immediately, since it won't function properly anymore. You can check for such an error, by measuring for a connection between the inner pin of the antenna, and the outer rim.

5.2.2 CARE AND STORAGE OF DEVICES

5.2.2.1 CHARGING THE DEVICES

All devices should be charged before and after each show, as well as every three months during storage at room temperature. For NiMH batteries, only use a NiMH charger, and an optimate charger for lead-gel batteries.

After charging a receiver, NiMH chargers should be disconnected shortly.



5.2.2.2 CLEANING THE DEVICES

After use, all devices should be cleaned thoroughly. Ideally by doing the following:

1.) Remove all igniter pieces from the clamps. (Please use the Push button!)
2.) Cleaning the devices with pressurized air. Especially the charging and antenna socket, as well as the clamps should be blown out.
3.) Afterwards, put back all accessories.

5.2.2.3 STORING THE DEVICES

All devices should be stored with the rubber feet placed down. This should enable water to flow out. Ideally the devices should be stored at room temperature.

5.3 TECHNICAL DATA

Here you can find the technical data for transmitters and receivers::

Transmitter TX2-Stage	
Measurements	85 x 170 x 50 mm
Weight	300g
Case	Plastic Case
Radio range	400m
Stand-By	24 hours
Power supply	1x NiMH-Battery 12VDC

Transmitter TX2-70K	
Measurements	335 x 290 x 155 mm
Weight	4.600 g
Case	HPRC-Case
Radio range	800 m
Stand-By-Zeit	16 Hours
Power supply	2x NiMH-Battery 12VDC

Receiver RX2-70K	
Measurements	335 x 290 x 155 mm
Channels	70
Ignition energy	30-80 V / 4 x 330 µF
Weight	4.700 g
Case	HPRC-Case
Radio range	800 m
Stand-By-Zeit	70 Hours
Power supply	2x NiMH-Battery 12VDC

Receiver RX2-30K	
Measurements	335 x 290 x 155 mm
Channels	30
Ignition energy	30-80 V / 4 x 330 µF
Weight	2.500 g
Case	Stainless steel-Case
Radio range	800 m
Stand-By-Zeit	70 Hours
Power supply	2x NiMH-Battery 12VDC

Konformitätserklärung gemäß dem Gesetz über Funkanlagen und Telekommunikationseinrichtungen (FTEG) und der Richtlinie 1999/5EG (R&TTE)

Declaration of Conformity appropriate to the law of radio and telecom terminal equipment (FTEG) and Directive 1999/5/EC (R&TTE)

Hersteller / Verantwortliche Person: *Manufacturer / responsibleperson:*	Explo Zündtechnik, Völkermarkterstraße 240, 9020 Klagenfurt am Wörthersee, Österreich (AUT)
Erklärt, dass das Produkt: *Declaresthattheproduct:*	Funkzündanlage *Radio controlled ignition system*
Type: *Type:*	TX2-70M, TX2-70K, TX2-Stage (TX2-Bühne), RX2-70K, RX2-30K, RX2-20K
Verwendungszweck: *Intendedpurpose:*	Sender und Empfänger unseres Zündsystems *Transmitters (TX) and Receivers (RX) of ourignitionsystem*
Geräteklasse: *Equipment class:*	1

bei bestimmungsgemäßer Verwendung den grundlegenden Anforderungen des § 3 und den übrigen einschlägigen Bestimmungen des FTEG (Artikel 3 der R&TTE) entsprechen.
are complying with the essential requirements of § 3 and the other relevant provisions of the FTEG (Article 3 of the R&TTE Directive), when used for its intended purpose.

Einhaltung der grundlegenden Anforderungen durch (verwendete Standards/Spezifikationen):
Means of proving conformity with the essential requirements (standards/specifications used):

Gesundheit und Sicherheit gemäß §3(1)1, (Artikel 3(1)a)
Health and safety requirements pursuant to

Angewandte Normen:
Standards applied:
2006/95/EC (Low Voltage Directive)
EN 60950-1:2006 / A1:2010+A2:2013+A11:2009+A12:2011
EN 62479:2010

Schutzanforderungen in Bezug auf elektromagnetische Verträglichkeit § 3(1)2, (Artikel 3(1) b)
Protectionrequirementsconcerningelectromagneticcompatibility

Angewandte Normen:
Standards applied:
2004/108/EG (EMC Directive)
EN 301489-1 v1.9.2 (2011-09)
EN 301489-3 v1.4.1 (2002-08)

Maßnahmen zur effizienten Nutzung des Funkfrequenzspektrums § 3(2) (Artikel 3(2))
Measures for the efficient use of the radio frequency spectrum

Angewandte Normen:
Standards applied:
1995/5/EG (R&TTE Directive)
EN 300220-1 v2.4.1 (2012-01)
EN 300220-2 v2.4.1 (2012-05)



Klagenfurt a.W., am 27.01.2015 — Harald Kulterer, Inhaber Explo Zündtechnik

Ort, Datum *Place, date* — **Name und Unterschrift** *Name andsignature*