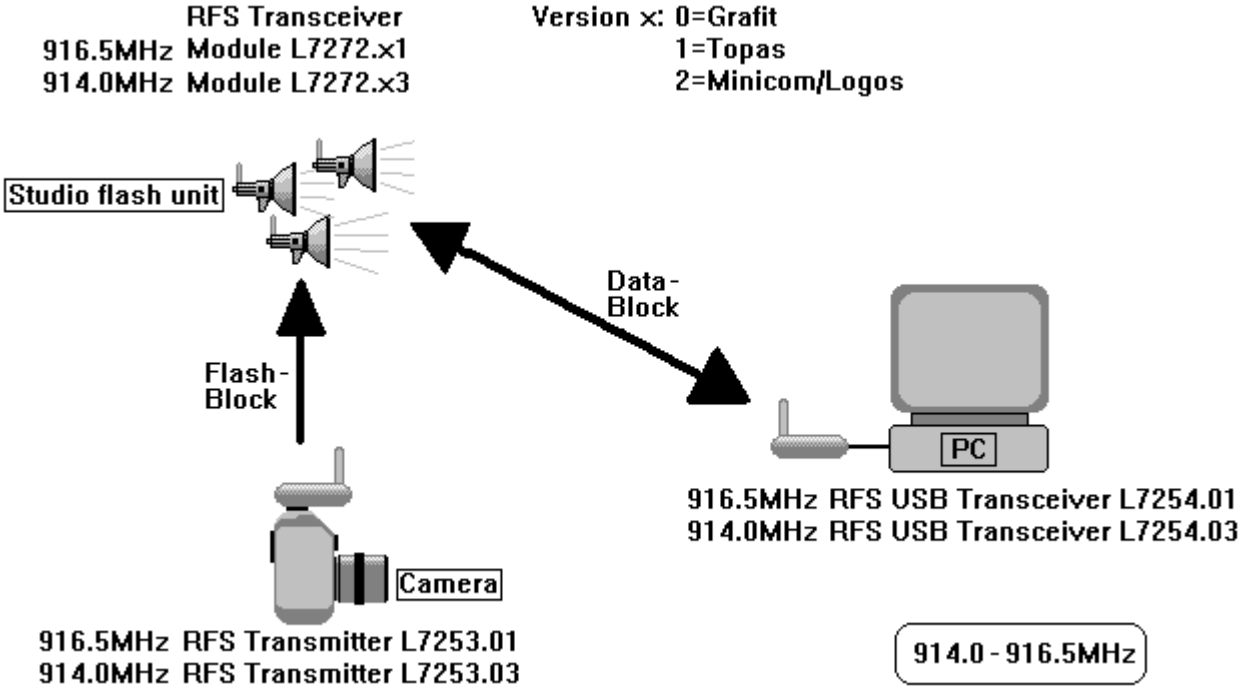
User Manual
Functional Description

Radio System for Studio Flash Equipment

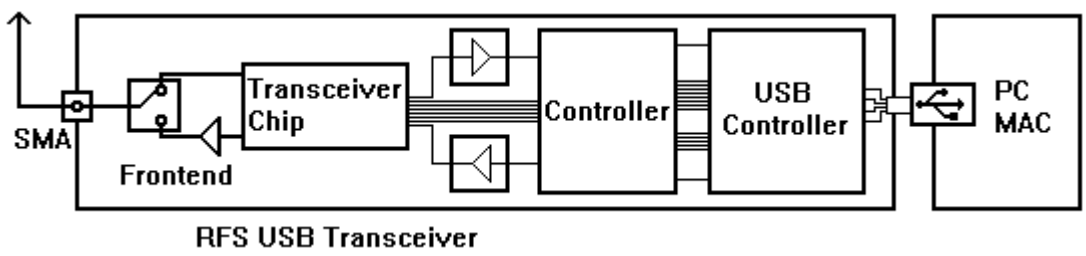
916.5MHz: RFS USB Transceiver L7254.01
914.0MHz: RFS USB Transceiver L7254.03

Bron Elektronik AG, 4123 Allschwil, Switzerland

The application concerns the data transmission from an operator console (MAC/PC) to the flash units of a Photo Studio, in both directions, as well as the transmission of a flash trigger signal from the camera to all of the flash units.



The RFS USB transceiver is plugged in the PC/MAC. The power supply is supplied from USB Hup.



RFS USB Transceiver specifications (typical):

- Output power: 12dBm
- Frequency: 914.0-916.5MHz
- Modulation: ASK
- Data rate / Data format: 38.4 kBaud → 76.8kBit in Manchester
- Transmission time flash triggering: 0.625ms – 0.833ms
- Transmission time data-block: 1.9ms – 10.4ms
- Size: 80mm x 55mm x 30mm
- Operating voltage / current: RF 3V / 2mA
- Operating voltage / current: USB: 5V / 25mA
- Operating current USB Suspend: 100µA
- RF input impedance 50 ohms
- Antenna: Helical SMA
- USB specification: USB 2.0
- LED: Communication indicator
- Switches: „test“ transmit flash block
  „+“ and „-„ transmit data block
- Sync connector: transmit flash block

Transmission format

Data format: MSB first

Flash-block:

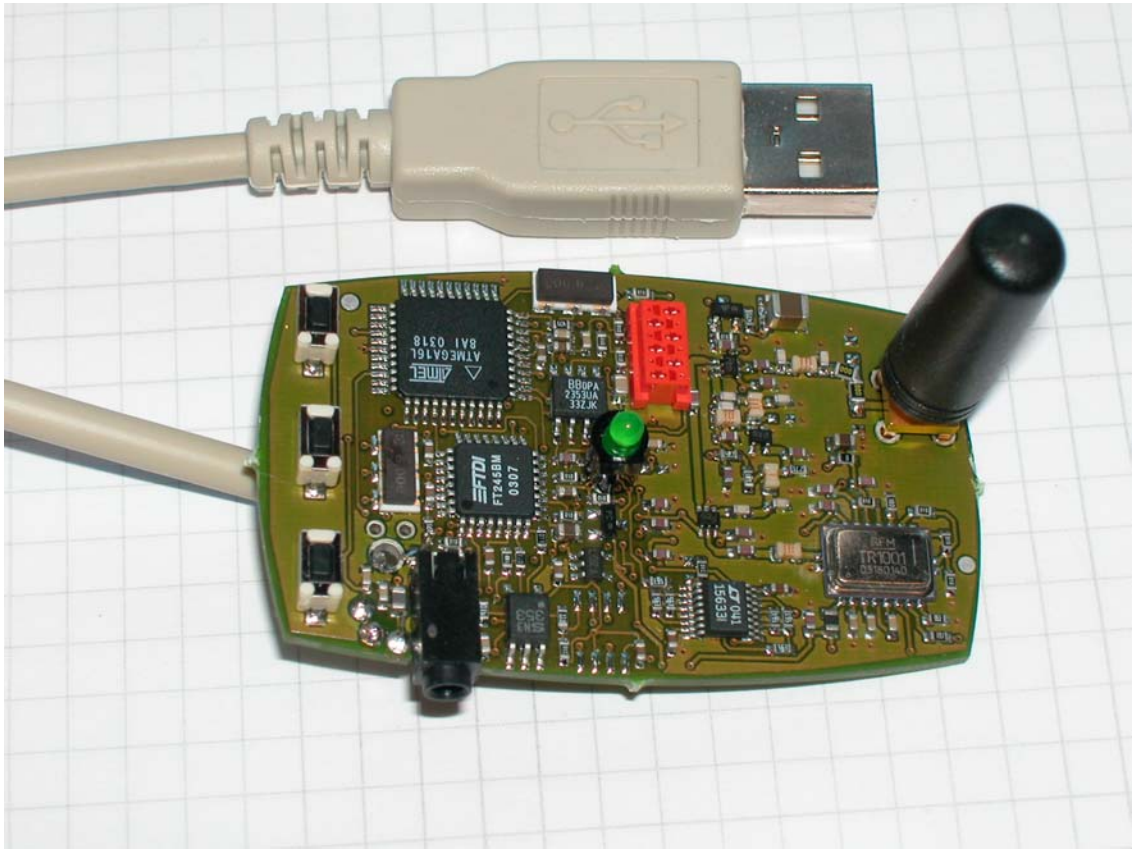
- **Preamble** **11100110 01100110** optimisation of DC-balance
- **Start symbol „Flash“:** **01110001 11010110** Manchester modified
- **ID (Studio no.)** **01010101 01010110** → ID=1 (Manchester)

Data-block:

- **Preamble:** **11100110 01100110** optimisation of DC-balance
- **Start symbol „Data“:** **01110001 11011001** Manchester modified
- **Block number:** **...** each new block receives a new block number, but not a repetition.
- **Byte count:** **...**
- **Start info:** **01011010 01011001**
- **Studio ID:** **01010101 01010110** → ID=1 (Manchester)
- **Unit ID:** **...**
- **n data** **... ... ...** max. 50 Byte
- **Check sum:** **...**
- **End Symbol „Data“:** **01110110 00100110** Manchester modified

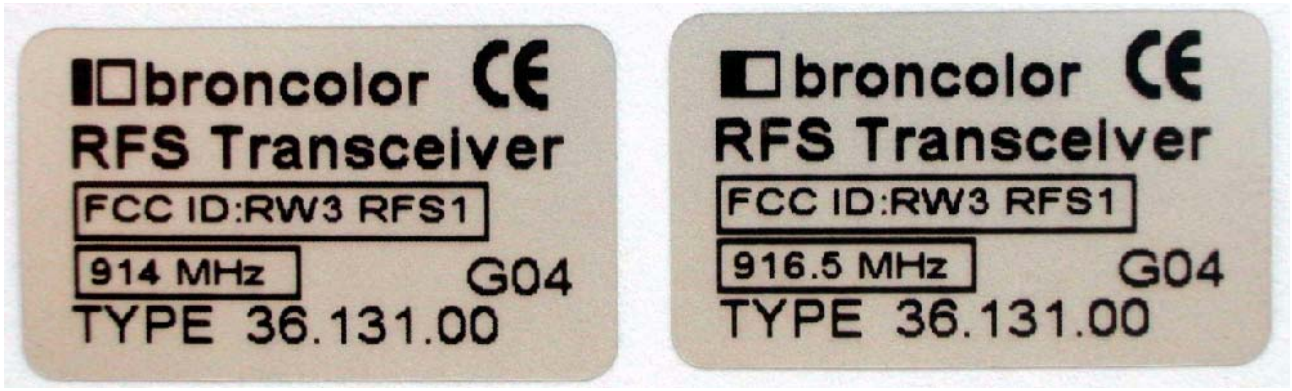
A dual directional data transmission only takes place when the setting on the flash units or the operator console (MAC/PC) is adjusted. This reduces the probability of a collision with a flash-block. A correctly transmitted data-block is confirmed with an ACK. An unconfirmed data-block is repeated.

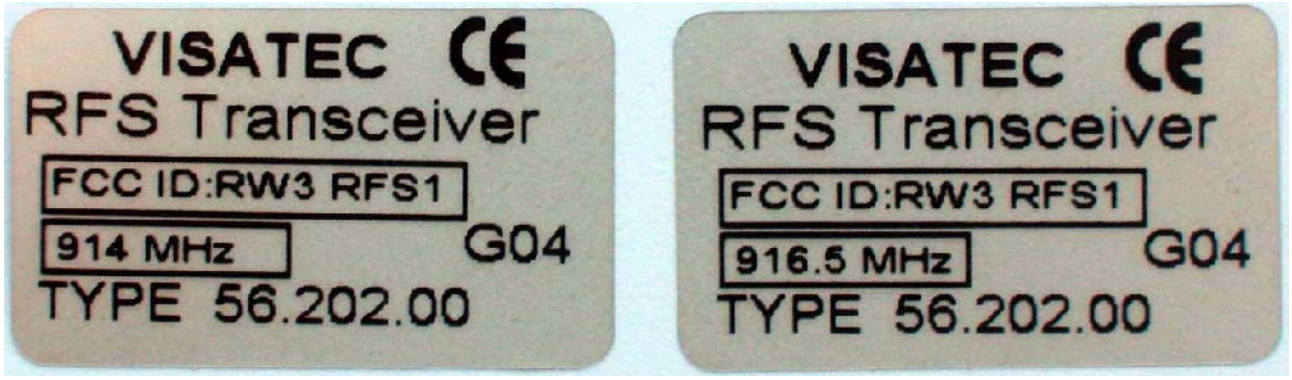
A flash-block is not repeated.


ATMEL
ATMEGA161
8A1 0318
RFM
TR1001
0318014S


test
broncolor
RFS

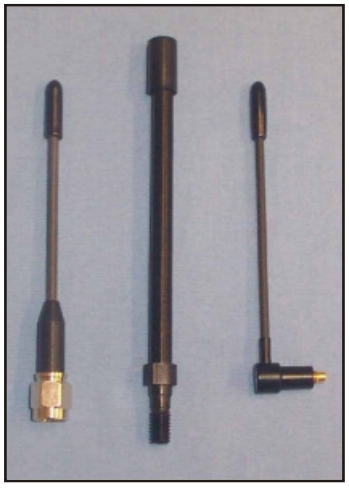

30
broncolor
RFS Transceiver
FCC ID:RW3 RFS
916.5 MHz
F10
TYPE 36.131.00
17.8
7


broncolor
RFS Transceiver
FCC ID:RW3 RFS1
914 MHz
G04
TYPE 36.131.00
broncolor
RFS Transceiver
FCC ID:RW3 RFS1
916.5 MHz
G04
TYPE 36.131.00


VISATEC
RFS Transceiver
FCC ID:RW3 RFS1
914 MHz
G04
TYPE 56.202.00
VISATEC
RFS Transceiver
FCC ID:RW3 RFS1
916.5 MHz
G04
TYPE 56.202.00

1/4 wave Device Antennas

MOBILE MARK®
COMMUNICATIONS ANTENNAS



Full 1/4 models in straight and right angle

Helical stub models with various connectors

For 800 & 900 MHz Applications

- Models for Cellular, CDPD, ISM, GSM, Mobitex and Skytel applications
- Quarterwave styles in flexible whip, helical stubs with hard radome
- Sleek profile, with a variety of connector styles
- Customization available for OEM applications

Quarterwave antennas provide performance for products with the minimum of size. Full length quarterwave design provide the maximum efficiency, while loaded helical stub antennas provide minimum size.

The full length models use a flexible whip, whereas the helical antenna use a hard radome. Overall performance of quarterwave antennas does depend on the ground plane provided by the radio system or the mounting configuration. Quarterwave antennas are broadband compared to other designs and can effectively be used in most apllications. For OEM applications, performance can often be maximized with a one time factory adjustment.

Connector styles available are TNC, SMA, MMCX or a thread ferrule assembly. The thread ferrule provides the most economical solution, but does require a special mechanical configuration for mounting and feeding the RF signal. Special connectors are also available, please consult factory.

Models with "-925 designators also overlap the ISM 902-928 band and are now in lieu of the "-915" models.

Model Numbers - Straight Antennas

Model	Frequency	Style	Connector
PSTG0-900MM	824-894MHz	Full 1/4	10-32
PSTG0-900MX	824-894MHz	Helical	4mm x .5
PSTG0-900HS	824-894MHz	Helical	SMA
PSTG0-900SE	824-894MHz	Full 1/4	SMA
PSTG0-900TE	824-894MHz	Full 1/4	TNC
PSTG0-925MM	870-960MHz	Full 1/4	10-32
PSTG0-925MX	870-960MHz	Helical	4mm x .5
PSTG0-925HS	870-960MHz	Helical	SMA
PSTG0-925SE	870-960MHz	Full 1/4	SMA
PSTG0-925TE	870-960MHz	Full 1/4	TNC

Model Numbers - Right Angle Antennas

Model	Frequency	Style	Connector
MDM-900OP	824-894MHz	Full 1/4	MMCX
MDM-925OP	870-960MHz	Full 1/4	MMCX

Frequency Guide

-900 Models	For US Cellular (Analog & Digital), CDPD
-925 Models	For EU Cellular, ISM, Mobitex and Skytel

Special configurations available upon request. Please consult factory for details/availability.

Specifications

Frequency:	See above
Gain:	0dBi max for ¼ wave
Bandwidth @ 2:1 SWR:	See frequency range above
Impedance:	50 ohm nominal
Maximum Power:	10 watts
Connector:	See above, special connectors also available, please consult factory for details.

Whip Length:	
¼ wave	95mm (3.75") maximum, varies slightly based on frequency.
¼ wave, helical	32mm (1.25") maximum
Whip Material	
¼ wave	Rubber jacket/flexible cable
¼ wave, helical	ABS radome, helical radiator

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Tel: +44 1543 878343 Fax: +44 1543 871714 E-mail: enquiries@mobilemarkeurope.co.uk
Visit our web page : www.mobilemark.com

Operating instructions

b r o n c o l o r
Radio Frequency System (RFS)

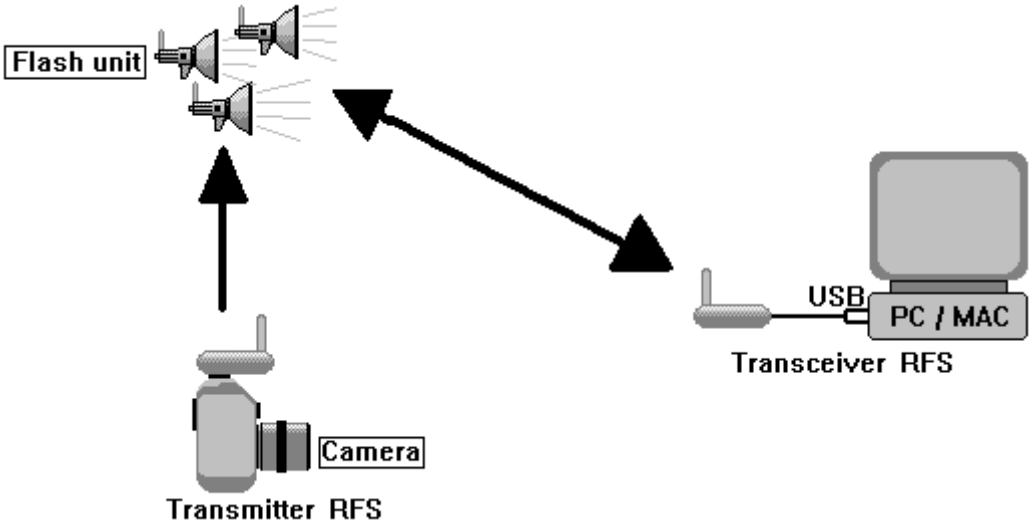
Before use

We are very pleased you have chosen a broncolor Radio Frequency System RFS unit which is a high-quality product in every respect. If used properly, it will render you many years of good service. Please read the information contained in these operating instructions carefully. They contain important details on the use, safety and maintenance of the appliance. Keep these operating instructions in a safe place and pass them on to further users if necessary.

With the broncolor Radio Frequency System you can trigger, and operate by remote control broncolor units which are equipped with an integrated RFS interface. The RFS units should be used only for professional shooting and should be operated exclusively by trained staff.

1. Radio Frequency System (RFS)

The radio frequency system broncolor RFS consists of the following elements:



1.1 Flash unit

Broncolor power packs or compact units with integrated RFS interface. For remote control, respectively flash triggering of the unit by radio from the transmitter RFS or transceiver RFS from a PC or Macintosh computer. For on-screen control, up to four lighting situations can be stored in memory. Each RFS unit is assigned with an individual unit address and a studio workstation (remote control channel) for the purpose of remote control, respectively flash triggering via radio. Due to the digitally coded channels it is possible to shoot in the same room from several workstations independently, without any interference between the flash units.

Attention: Although this radio frequency system offers the choice between 10 different radio channels, the number of effectively available channels depends on the connected RFS flash unit.

You will find more instructions in the operating manual of the corresponding flash unit.

1.2 Transmitter RFS

Radio transmitter with 10 digitally coded channels for wireless triggering of broncolor flash units with an integrated RFS interface. It is contained in a plastic housing and has a fixation base for the camera's hot shoe and a sync cable. Synchronization of the flash takes place via the accessory shoe or the sync connector of the camera. The operational distance for power packs outdoors is up to 50 m; in closed rooms up to 30 m, compact units up to 30 m / 20 m. Each data command is shown by the green LED. The radio transmitter is provided with a lithium button cell (approx. 5-year service life) and is permanently operational.

Regulation of power

The transmitter has a test button to trigger the flash as well as two buttons for power regulation of all RFS flash units of the selected workstations. A short press of the buttons energy regulation buttons "up/down" changes the settings by 1/10 f-stop, a long press by 1/1 f-stop.

Technical data

Number of channels:	10
Operational distance outdoors:	up to 30 m / 50 m
Operational distance in closed rooms:	up to 20 m / 30 m
Range:	up to 300 m
Dimensions (L x B x H):	71,5 x 47 x 56,5 mm (incl. antenna and base plate)

Technical data (continued)

Weight:	55 g
Trigger sequence per s:	10
Power supply:	Button cell Li-Mn CR2450, 560mAh, 3V

1.3 Transceiver RFS

Radio transceiver with actually 10 digitally coded channels for wireless remote control and flash triggering of the broncolor RFS flash units from a PC or Macintosh computer. The effective number of available channels depends on the connected flash unit. The transceiver is contained in a plastic housing and has an USB connection cable as well as a sync cable. A base plate is mounted underneath the housing. The computer supplies the unit with power. Therefore there is no need for an additional energy source. The system software is supplied on a data carrier.

The transceiver allows the operation of all unit functions from a PC or Macintosh computer, however the operating controls remain active on the unit front plate. The actual control condition is shown on the computer.

Flash triggering for shooting must take place directly from the camera. With digital camera systems which have a sync connector at the PC or Macintosh computer, flash synchronization can be effected directly via the sync jack on the transceiver RFS; that means there is no need for a separate RFS camera transmitter. The operational distance for power packs outdoors is up to 50 m; in closed rooms up to 30 m, for compact units up to 30 m / 20 m. Each communication between transceiver and flash unit is indicated by the green LED.

Regulation of power

The transceiver has a test button to trigger the flash as well as two buttons for power regulation of all operated RFS flash units. A short press of the energy regulation buttons “up/down” changes the settings by 1/10 f-stop, a long press by 1/1 f-stop.

Technical data

Number of channels	actually 10
Operational distance outdoors:	up to 30 m / 50 m
Operational distance in closed rooms:	up to 20 m / 30 m
Range:	up to 300 m
Dimensions (L x B x H):	80 x 55,5 x 51,5 mm (incl. antenna and base plate)

Technical data (continued)

Weight:	105 g
Trigger sequence per s:	10
Power supply:	from computer

1.4 Requirements for the environment

Apple Macintosh

With operating system OS 8.6, advisable 9.1 or higher, OS X;
USB-port, memory capacity approx. 5 MB

PC

With operating system Microsoft Windows 98 / WinMe / Win2000 / Windows XP;
USB-port, memory capacity approx. 5 MB

2. Startup

2.1 Transmitter RFS

Scope of delivery: 1 transmitter RFS, 1 button cell Li-Mn, and 1 sync cable.

1.) Select the desired studio workstation with the rotary switch at the underside of the transmitter. This number must correspond with the selected studio number of all flash units on this workstation.

2.) Slide the transmitter RFS on the camera shoe and, if necessary, connect the delivered sync cable.

3.) Before the first commissioning or after longer working breaks the RFS system needs to be calibrated. This occurs by pressing the test button, which is situated on the above side of the transmitter.

2.2 Transceiver RFS

Scope of delivery: 1 transceiver, 1 USB connection cable, 1 sync cable and 1 software data carrier. The data carrier includes 4 data files:

- Software driver for RFS (RFS-driver)
- Software WindowsStudio for PC/Windows
- Software macStudioOSX for Macintosh OS X
- Software macStudioClassic for Macintosh OS 8 and 9

In comparison to the versions PC/Windows and Macintosh Classic, the Macintosh software OS X is irreversible.

Installation

a) Insert data carrier with the broncolor software in the computer drive

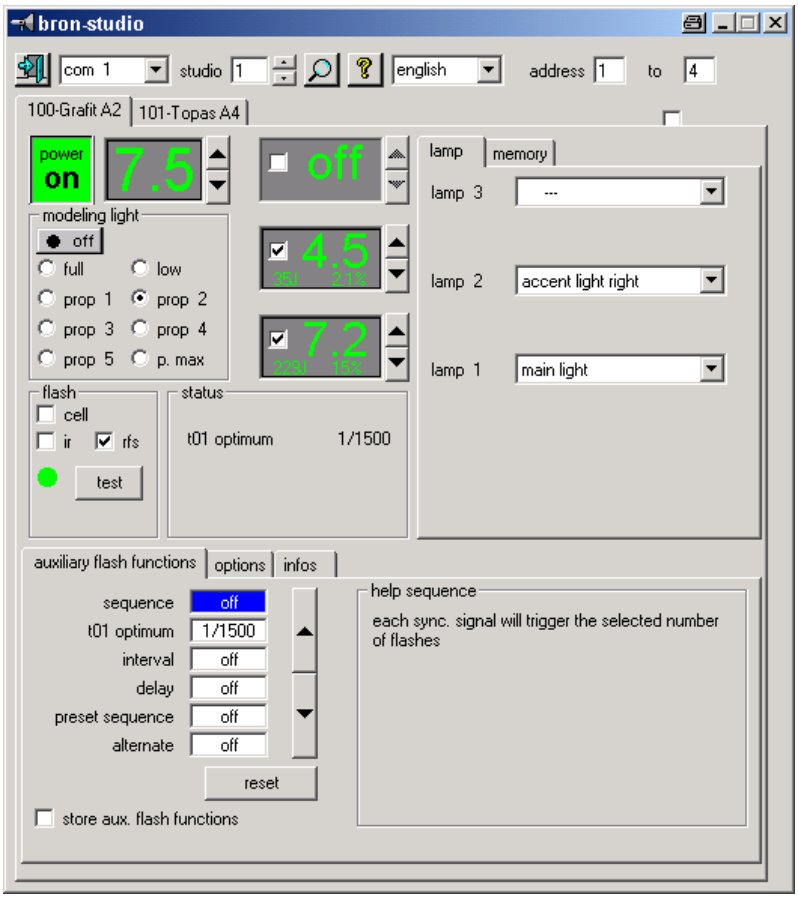
b) Connect the USB connection cable to the USB-port of the computer

c) Install the USB driver from the data carrier in the computer

d) Open data file of the corresponding operating system (Windows or Macintosh OS). Move files *"BronStudio"* and *"BronStudio.xrc"* onto the desktop. Both files must always be stored at the same place so that the software is operational.

e) Open file *"BronStudio"* and select the corresponding USB-port (for example COM 3).

f) Synchronize the address of the flash unit with the *"BronStudio"* software. The same studio channel must be set on all used flash units (for example studio "5") and each unit must be programmed with an individual unit address (1,2,3) (see operating manual of the flash unit).



2.3 Country specific radio frequencies

Please note, that each country defines their allowed or free radio frequencies depending on the specific laws in each country. Therefore all RFS systems are programmed with the specific country radio frequency before delivering. If you think about using the RFS system in an another country, you need to check before, if the required radio frequency is identical.

Standard

EC-standards	73/23, 89/336 und 99/5
ERM	EN 300 220-1,-3
EMC	EN 301 489-1,-3
	EN 60950
	EN 50371
	FCC Part 15 *This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:* *(1) This device may not cause harmful interference and* *(2) This device must accept any interference received, including interference that may cause undesired operation.* *Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.*

Subject to change in the interest of product enhancement.