Frequency Synthesizer
F-SCAN3

Firmware Version FSC V2.0x

INSTRUCTION MANUAL

This symbol identifies the equipment as type B

Attention: CONSULT ACCOMPANYING DOCUMENTS

WARNING AND NOTES

> **WARNING: The F-SCAN3 generates frequencies. The use of other accessories than those supplied with the unit – or described here – could cause malfunctions or become a hazard to the user. The warranty would be forfeit.**

> ATTENTION: The unit, all accessories, connectors and cables must be visually inspected for damage frequently. We recommend a yearly functional test by a professional.

> ATTENTION: The device's integrated functions allow biological tests and applications described in the publications of Dr. H. R. CLARK. They are also suitable for applications commonly named after R. R. Rife. **The F-SCAN3 is not a medical device. It is used under the sole responsibility of it's operator WITHOUT LIABILITY TO THE MANUFACTURER.**

Preface

One of our prime objectives as a Swiss company is the development and manufacturing of precise and reliable products based on many years of experience. Some of our products are well known and utilized internationally. As a small company we can react fast to changed customer requirements. May your use of the F-SCAN3 be beneficial.

Introduction

The FREQUENCY SYNTHESIZER F-SCAN3 has been optimized for stationary use. The device is the latest and most advanced member of the F-SCAN product family.

The color touch screen, combined with the latest functional technology, offers a user friendly system with outstanding performance.

The device generates precise sine signals (permanent positive) and square signals (zero – symmetric or permanent positive) and sends them under software control to an output port.

A special feature is the integrated SMART-WAVE. If selected, it will modulate the assigned wave form with a high frequency.

Special accessories, like the UV-Light Adapter or the Flat Magnetic Coil Adapter, can be connected to the PowerPort without a separate amplifier.

The intensity of the square signals delivered can, depending on the application, either be adjusted manually or automatically.

A TIMER can be assigned individually to each frequency or as a global function.

The settings for the special application modes WOBBLE, ENVELOP, and for the signal amplitudes, are also accessible.

The **DIRP**-function (**D**ual **I**ntegration **R**esonance **P**rocedure) can be used to scan automatically for resonance answers to frequencies send to a user. The procedure can be used in the complete frequency band of the device. Graphical edit functions support the analysis of the DIRP – results.

An EAP (electro acupuncture) capability is integrated for diagnostic use by experts. The optional EAP-SET is needed to use this feature.

A broad band application of frequencies (SWEEP) can be selected from an individual touch screen window.

The device provides a significantly larger storage capability than older F-SCAN models. 100 applications of up to 50 frequencies, complete with names and all individual settings, or the complete results of DIRP runs and EAP analysis, can be stored. In addition, up to 460 user defined frequency sets (up to 30 values each) can be saved in the F-SCAN3 memory.

A powerful state of the art 32-bit micro-processor controls all functions.

Customized ChipCard-functions support the data transfer between our products F-SCAN3, F-SCAN MOBILE, F-SCAN COMPACT and the MinDevice.

We are convinced that the touch panel operation will be mastered by all users without problems.

The shipment from the factory includes:

- F-SCAN3
- Plug-in power supply with cord or USB charger for battery version
- Stainless steel electrodes
- Application cable for electrodes
- 2 sets of self-adhesive pad-electrodes
- DIRP sensor
- USB cable
- Instruction manual

Note: DEVICES WITH FIRMWARE VERSION UP TO 1.xx NEED THE INCLUDED STYLUS FOR OPERATION OF THE TOUCH SCREEN.

DEVICES FROM FIRMWARE VERSION V2.xx ARE EQUIPPED WITH A CAPACITIVE TOUCH SCREEN AND CAN BE OPERATED WITH FINGERS ONLY.
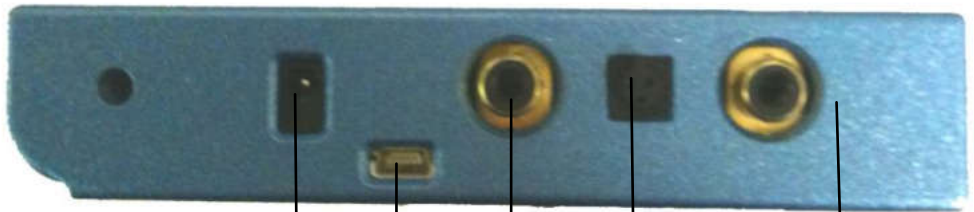
Elements for operation

ON-OFF-button

A brief contact switches the unit ON.

A contact of about 3 seconds switches the unit OFF.

LED flashes each second to confirm operation.

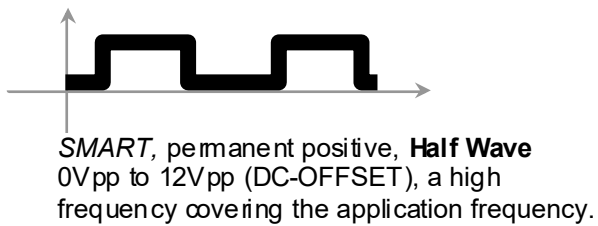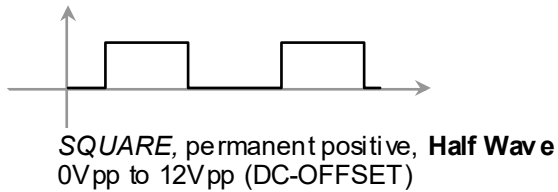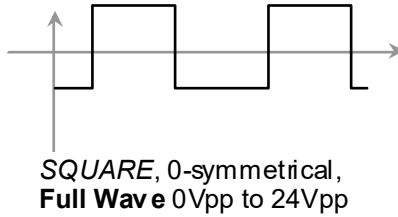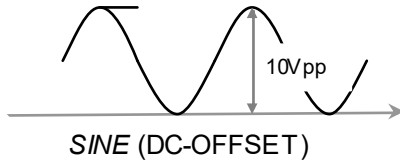Power cord connector if NOT battery version

Mini-USB connector

CINCH 1: Multi-signal output port

CINCH2: PowerPort

If type of device = WIDE, then SINE WAVE up to 15 MHz

Connector for DIRP-sensor

Signal forms delivered to Multi-signal-output port

SINE (DC-OFFSET)

SQUARE, 0-symmetrical,
Full Wave 0Vpp to 24Vpp

SQUARE, permanent positive, **Half Wave**
0Vpp to 12Vpp (DC-OFFSET)

SMART, permanent positive, **Half Wave**
0Vpp to 12Vpp (DC-OFFSET), a high
frequency covering the application frequency.

Factory settings

Language on screen:	**English** or **German**

Application time per frequency: **3:00 Minutes**
(adjustable between 0:30 and 59:59)

Signal strength: **80%** of maximum of 12Vpp
(adjustable +/- in steps of 1%)

Signal form: **AUTO** (Sine, Square Full Wave, Half Wave, SMART and OFF selectable). AUTO = Square Half Wave if lower than 65000 Hz, Sine above 65000 Hz.

Memory of "123" is empty.

Memory of "ABC" is empty and locked.

Connector **CINCH 2**:
Standard version. Connector for the PowerPort. Application parts such like laser pointer or magnetic field electrode must be connected here. No standard application part may be connected. The device id is FTB126.

If device id is FTB127, at this connector ist he WIDE output available with a bandwidth up to 15 MHz. Standard application parts may be connected.

RESET: If device cannot be operated from the touch screen due to unknown reasons, the REWSET button on the rear panel can be pressed shortly to shut down the unit. Use a "tooth pick" or "match" carefully.

Such effects may happen if the battery has not been charged correctly or a data transfer from software was interrupted.

First steps to start F-SCAN3

- Connect the power cord to the device and plug the power supply into a wall outlet with a reading between 100 VAC and 240 VAC.
- Touch the ON-OFF button briefly.

The screen must show the following:
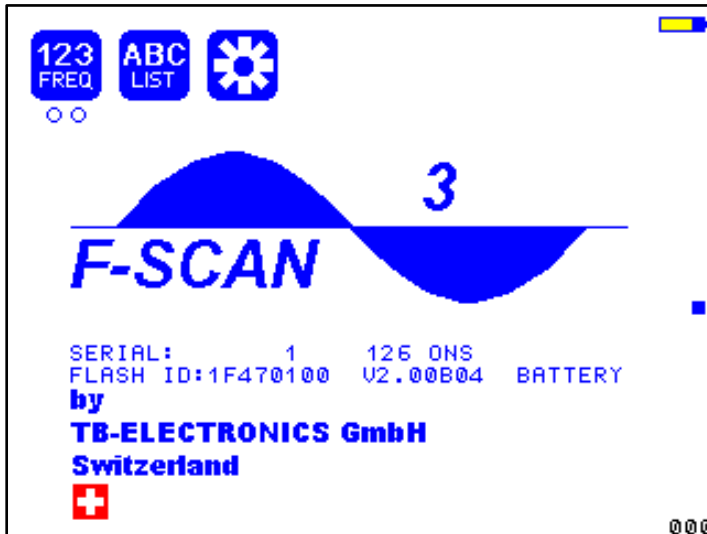
The information displayed means:

- SERIAL: Serial number of device

- ONS: Number of uses

- FLASH ID: identifies the type of internal memory.
              FFFFFFFF would indicate a memory defect. The device must then be checked by a professional.

- V1.00B01   Version of software active in the device.
- BATTERY   Indicates that the device is equipped with a rechargeable battery.

NOTE: FOR DEVICES WITH FIRMWARE VERSION 1.x, we recommend to always use the touch-pen to operate the screen. It sits in its sleeve next to the connectors on the side of the housing. Do not use other objects to avoid damaging the screen. DEVICES WITH FIRMWARE VERSION 2.x MUST BE OPERATED WITH FINGER TIPS ONLY!

The opening screen, as shown above, offers a menu of 3 icons. One has to be selected with the pen to continue the setup of the F-SCAN3 for operation.

Two small circles under the icon "123" indicate, that this icon covers more than one function.

If the icon "ABC-LIST" is not shown on this menu, the function is either not activated or does not hold any entries.


The menu "123"

The F-SCAN3 offers 100 storage positions for programs of between 1 and 50 frequencies. The end of each program is a value of 0 Hertz (Hz).

Each program can be named individually.

A number of parameters can be assigned to each frequency value:

- Run time (TIME)

- Signal form (Auto, Sine, Square Half Wave, Square Full Wave, SMART and OFF)

- WOBBLE (Output swings around the target frequency)

- ENVELOP (Amplitude oscillates between 0Vpp and maximum)

- Amplitude (Signal strength) of Square Wave signals

A touch on the icon "123" opens this menu:

PROGRAM: 1
NAME: PROG 01
1 ERASE
100.00 Hz TT= 27:00
TIME AUTO W0 EN 100
03:00 BBLE VELOP
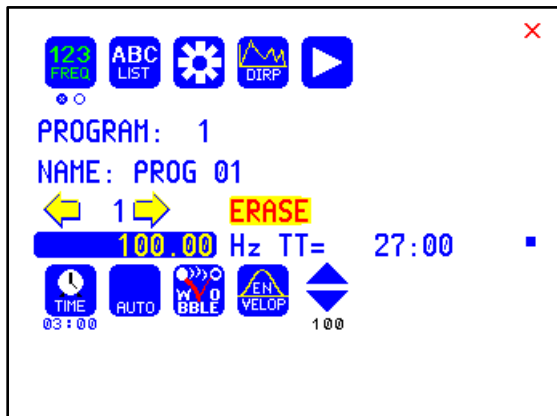
The background of the activated icon, and of the left small circle, turns green.

Displayed are:

- the program number "1"
- the program name "PROG 01"
- the position of the frequency within the program – between 1 and 50 – here "1". The left and right yellow arrows can be touched to move to other frequency values of the program.
- "ERASE" can be touched to eliminate the present frequency of 100.00 Hz from the program.
- the present frequency of "100.00 Hz".
- the total runtime of the program of 27 minutes "TT = 27:00".
- the runtime of the present frequency in minutes : seconds "TIME = 03:00"
- the signal form selected "AUTO".
- the icons "WOBBLE" and "ENVELOP" remain inactive (their background is white).

How to select a program from the menu "123"

A touch on "PROGRAM", or on the name line underneath, opens the submenu to select a program from memory, to edit a program name, or to add or delete a program.
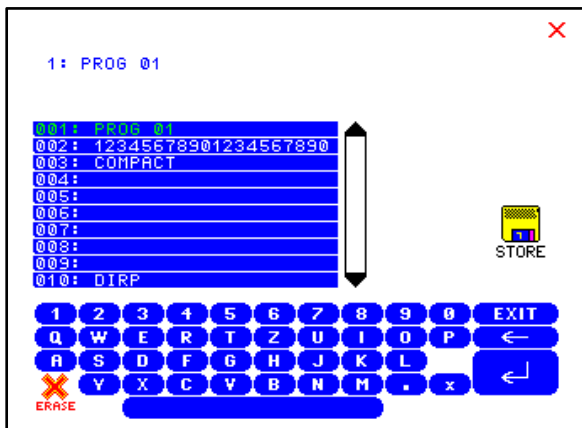
10 names of all programs stored in the memory block of 100 positions are displayed in the blue field. The present program number and name are shown in green in the first line and in blue in the edit line above the blue field. A cursor flashes behind the name there. Missing positions can be reached with the scroll bar.

A touch on the upper or lower arrow displays blocks of adjacent 10 lines of program names.

The alphanumeric keys can be used to change a program name or to add a new one.

If a line in the blue field is touched, its background turns green and name and present position appear in the edit line.

A touch on "STORE" prepares to store the edited or new program name in the memory block. The software requests the input of the storage position and completes the routine afterwards.

A touch on "ERASE" prepares to delete a program name from the memory block. The software requests the input of the storage position and completes the routine afterwards.

A touch on the red cross in the upper right corner, or on EXIT closes this menu.
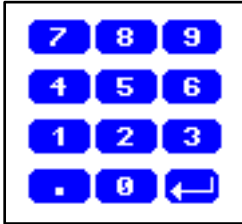
How to input a frequency value

The yellow arrows in the menu "123" are used to select the position (1 to 50) for the new frequency value to be inserted in the opened program.

Next, the present frequency value has to be touched

A numerical key block opens and the new value can be entered.

A touch on the ENTER-key saves the input

The properties of frequencies

Runtime

The factory setting of the runtime per frequency is 3:00 minutes. It can be changed after a touch on the above icon and the input of the minutes and seconds to be applied.

A touch on the ENTER-key saves the input.

Signal form

The signal form delivered to the "OUTPUT PORT" can be switched from AUTO to SINE, SQUARE HALF WAVE (DC-OFFSET), SQUARE FULL WAVE, SMART or OFF with successive touches on this icon. The setting AUTO delivers SQUARE HALF WAVE (DC-OFFSET) signals with frequency values below 65000 Hz and SINE signals with values above 65000 Hz.

WOBBLE

If WOBBLE is activated the software asks for a value to be used to swing the signal above and below the target frequency. A value of 0 deactivates the feature. The background color of the icon changes to green when activated.

ENVELOP

If ENVELOP is activated, and the signal form is SQUARE, the amplitude will oscillate slowly between 0 and the value assigned to the frequency. The background color of the icon changes to green when activated.

Amplitude

If the signal form SQUARE is selected, the signal amplitude to be used can be adjusted with touches on the blue arrows. The maximum value is 100, the minimum value 0. The amplitude value is global and valid for all programs of the "123" section.

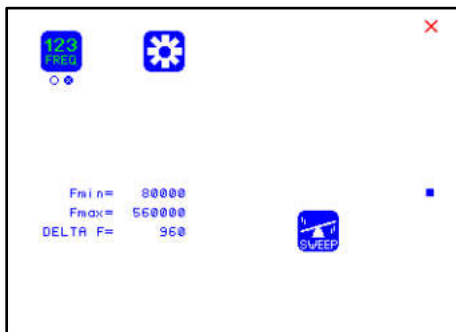**How to start, pause, or stop a program**

Touch the icon ▶ to start a program. The icons

to initiate a pause ⏸ and to

end the program. ⏹ appear on the menu.

The menu SWEEP

A second touch on the icon "123" opens the screen to start the broad band frequency swing "SWEEP". The green background moves from the left small circle under the icon to the right one.

SWEEEP can be used to swing for a limited time (20 minutes) through a broad band of frequencies between a lower limit "Fmin" and an upper limit "Fmax". The step size "DELTA F" from value to value is defined automatically. "Fmin" and "Fmax" can be set in the menue "DIRP", which will be explained later.

The signal form is "AUTO", which means "SQUARE DC-OFFSET" through 65000 Hz and "SINE" above that value.

Touch the icon "SWEEP" to start the procedure. The output moves from "Fmin" up to "Fmax", turns around to move back to "Fmin, and so on, until the time of 20 minutes is up. The activity is simultaneously displayed on the screen.
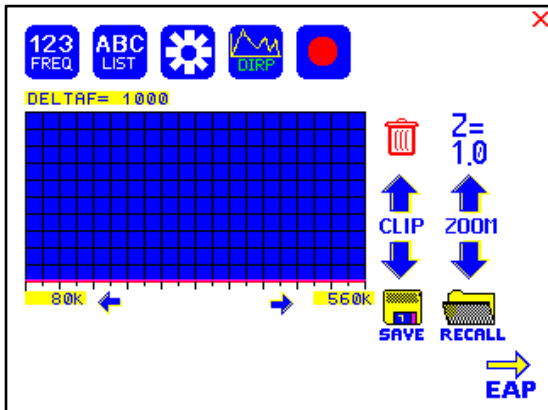
A touch on the icon "SWEEP" stops the procedure at any point.
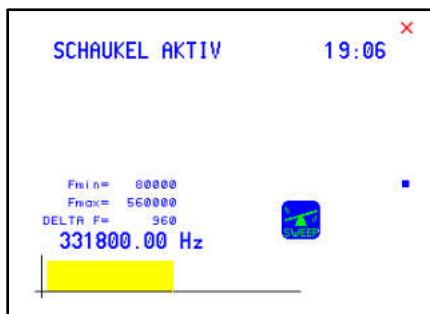
The menu DIRP

A touch on the icon "DIRP" in the menu "123" opens the screen for the automatic resonance analysis "DIRP".
"DIRP" stands for: **D**ual **I**ntegration **R**esonance **P**rocedure

"DIRP" registers resonances to frequencies applied in steps of "DELTA F" within the limits between a lower value "Fmin" and an upper value "Fmax".

SINE signals will be automatically assigned for the analysis.

The analysis is based on two readings:
1. MV = **M**easured **V**alue of a resonance
2. CV = **C**onductivity **V**alue

The Conductivity Value is a personal constant of the individual analyzed. It should read between 5% and 25% as a base for useful results of the analysis. The Measured Values are shown as a yellow line in the graph.

After completing a "DIRP" run, the algorithm calculates the level of a horizontal line (violet) in the graph, called the **C**lipping **L**evel = CL. It separates as close as possible the 10 highest resonance peaks (HITS) of the graph from the rest. If required, the CL line can be moved up or down manually.

80k	touch to set "Fmin" (Range 50 Hz to 2 MHz)
560k	touch to set "Fmax" (Range 50 Hz to 2 MHz)
DELTAF= 1000	touch to set "DELTA F" (range 1Hz to 10000 Hz)
RECALL	touch to recall a previously stored complete "DIRP" analysis from memory after input of its program number.

Example of a "DIRP" analysis recalled from memory:
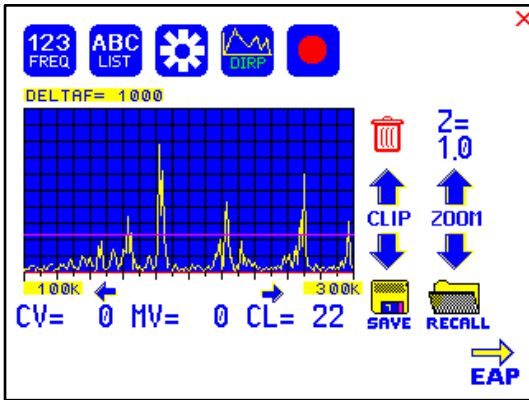
The display on the screen shows all details of the recalled analysis, including the settings for "Fmin", "Fmax", "DELTA F" and the Clipping Level "CL = 22" (the violet line), where it separates 10 HITS (Measured Values of resonances) from the remaining graph.

←	touch to move within the graph in the direction of Fmin to read the CV, MV and CL of individual resonances.
→	touch to move within the graph in the direction of Fmax to read the CV, MV and CL of individual resonances.
⬆ CLIP	touch to move the violet line upward, thereby reducing the number of HITS (MVs) to deal with.
CLIP ⬇	touch to move the violet line downward, thereby increasing the number of HITS (MVs) to deal with.
SAVE	touch to save the DIRP data set back to the active program position. All data changed versus the recalled set overwrites the old data and also overwrites the name of the application with the name "DIRP". This can be easily edited in the "123" program section.
⬆ ZOOM ⬇	touch to zoom the graph in steps vertically from 0.0 to 2.0 to improve the reading. The Clipping level will be recalculated to match the moves. Default setting of zoom is 1.0.
🗑	Clear graph.

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How to prepare for a DIRP and run it

The settings shown on page 18 of this manual can be used to perform a DIRP analysis in the frequency range between 80000 Hz and 560000 Hz:

1.   Attach the DIRP sensor following the instructions shipped with it.

2.   Plug the CINCH connector of the application cable into the device's output and connect the red wire to the cylinder. Hold the cylinder in the left hand.

3.   Touch the icon (RECORD) to start the analysis

4.   Wait until the yellow graph line reaches Fmax and completes the procedure. Touch the icon STOP to end the analysis at any point. During a DIRP procedure, the reaction time of a touch may take up to 1 second.

5.   Touch the icon SAVE to store the complete DIRP results in the active program position. This will overwrite any data previously stored in that position.

EAP (ELECTRO-ACUPUNCTURE) measurements

THE EAP-CAPABILITY IS AN OPTIONAL FEATURE TO BE USED BY WELL TRAINED SPECIALISTS ONLY. THE SOFTWARE NEEDED TO OPERATE EAP REQUIRES A RELEASE CODE FROM THE FACTORY OR A SALES POINT. A STYLUS SET WITH CABLE MUST BE PURCHASED (OPTION "FSADAP31").

The EAP – Stylus is required to touch and measure the Conductivity Value (CV) at the acupuncture points of the lymphatic system. The set of measurements is stored for reference in the active program position (one of the 100 available).

Preparation:

Connect the EAP-cable to the sensor port of the F-SCAN3.
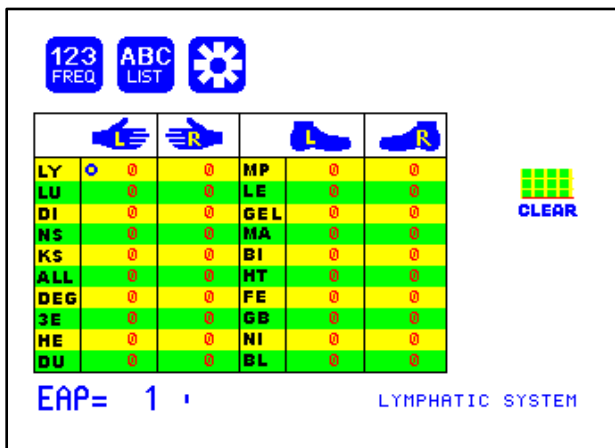
Connect the EAP – Stylus to the red lead of the EAP-cable.

Connect a handheld or foot electrode with the blue lead of the EAP-cable.

Start the F-SCAN3, open the menu "123", touch the icon "DIRP", then touch the icon "EAP" EAP in the lower right corner of the menu.

EAP- functional test

Touch the tip of the EAP – stylus to the handheld or foot electrode to cause an electrical short. The measured value must change to 99 accompanied by an audible signal, if this is activated. The value 99 will be stored in the first line LY (lymph point) under the left hand. The cursor-circle moves to the second line LU (lung). The value 99 must be touched to remove it and to set the cursor-circle back to line one awaiting a real measured value.

How to complete an EAP-table

Starting with the left hand, each acupuncture point must be measured top down. Continue with the right hand, the left and right foot. If the micro-processor identifies a measured value as EAP-like, it appears in the table and the cursor-circle moves on to await the next value. If a point must be re-measured, the previous value disappears after a touch on it.

NOTE: The procedure takes time. The measured value shown under the table block must have returned to 00 before the next point can be measured.

All measured values between 45 and 55 are considered to be within the "NORMAL RANGE". Values below 45, or above 55, will be shown in red in the table.

The menu SETTINGS

123 FREQ ABC LIST ✳

↑💡6   AUTO R   ○ LOOP

🔊4   🕐 GLOBAL

🏴   WOB GLOBAL

        ENVE LOPE GLOBAL

Vin=143

000
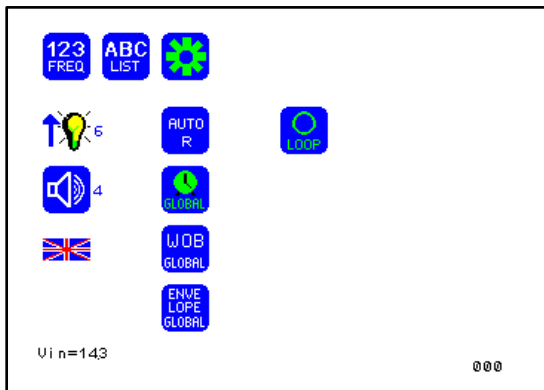
A touch on the ✳ TOOL – icon opens a menu for global settings.

↑💡4   touch the arrow repeatedly to increase the intensity of the background light.

🔊4   touch the icon repeatedly to adjust the speaker volume. The number on its right shows the current level. Zero switches the speaker OFF.

🏳️   touch to switch between languages used in the menus.

AUTO R   A touch on the icon switches this unique function ON or OFF. When switched OFF, the amplitude of SQUARE wave signals will be for all frequencies of a program as assigned during the setup.

When switched ON, the microcontroller calculates the signal strength of SQUARE waves on the base of each frequency value following a physiological algorithm. The results override the original amplitude settings.

🕐 GLOBAL   A touch on the icon switches GLOBAL TIMER ON or OFF. When switched OFF, the timer settings in the "123" menu may be set individually for each frequency.

When switched ON, the timer settings in the "123" menu is for all 50 frequencies of the program the same. The global timer becomes active, when the timer setting in the "123" menu is modified.

WOB GLOBAL   GLOBAL WOOBLE ON or OFF. If enabled the wobble settings will be incurred for all frequencies of a program.

ENVE LOPE GLOBAL — GLOBAL ENVELOPE ON or OFF. If enabled the envelope settings will be incurred for all frequencies of a program.

LOOP — LOOP ON or OFF. If enabled a program which has been started from „123" or „ABC" will loop forever. The only way to Stopp it is with STOP icon.

AUTO POWER OFF
If the text "OFF" is visible inside this button, the AUTO POWER OFF function is disabled. When touching the button, the number of minutes after which the device switches off automatically, will increase in one minute steps. The automatic pow er off function will be restarted if the device is operated or a program is running or the device is under softw are conrtrol.

The remaining time is being displayed in seconds on left/bottom of the screen.

If the device is equipped with a battery, a blue field with green vertical lines is displayed on the bottom of the screen. If the color of the lines turn into yellow or red, the battery charge is poor and it is recommended to use the charger for rechatrge of the battery. The distance betw een two vertical black lines indicate a slot of one hour.

A fully charged battery should be good for 3.5 hours of independent operation.

The charge time for a fully discharged battery is approx. 6 hours.
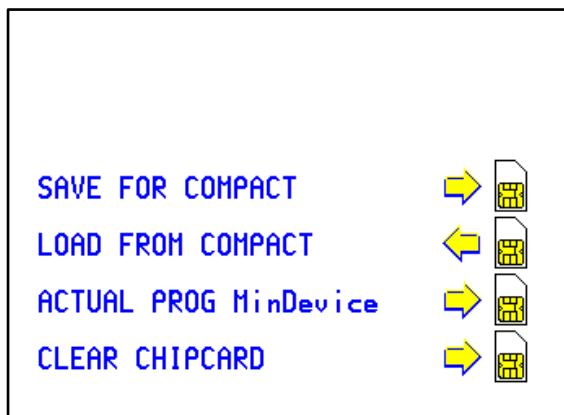
CHIPCARD option

An option to increase independence and flexibility, using two types of ChipCards to transfer data between members of the F-SCAN family, was designed into the F-SCAN3.

Program data consisting of frequency values only can be shared between F-SCAN3, F-SCAN COMPACT and the MinDevice using the ChipCard.

The use of the ChipCard PLUS allows the transfer of all types of program data sets to and from F-SCAN3 and F-SCAN MOBILE.

Insert the ChipCard vertically into the reader on top of the device.

The menu ChipCard opens and offers 4 choices:

- Touch the first line to save all of the 100 program positions, which hold frequencies only, on the ChipCard for use in an F-SCAN COMPACT.

- Touch the second line to overwrite the 100 program positions of the F-SCAN3 with the data from an F-SCAN COMPACT. DIRP- or EAP-data sets previously stored in program positions in the F-SCAN3 will be lost.

- Touch the third line to store the frequency values of the program position presently open in the F-SCAN3 on the ChipCard for use in a MinDevice.

- Touch the fourth line to erase all data from the ChipCard.

Removal of the ChipCard from the reader resets the F-SCAN3 to the menu active when the ChipCard was inserted.

Use of the ChipCard PLUS

The following menu opens when a ChipCard PLUS is inserted into the reader:

- Touch the first line to store the content of the memory with the 100 program positions on the ChipCard PLUS.

- Touch the second line to overwrite the 100 program positions of the F-SCAN3 with the data from the ChipCard PLUS.

- Touch BACKUP ABC LIST to store the ABC list on the ChipCard PLUS.

- Touch RESTORE ABC LIST to copy the ABC list from ChipCard into the device. An already installed ABC list will be overwritten.

How to format, integrate and use programs from other sources

A touch on the icon "ABC" opens the menu to reach and operate frequency programs generated outside the F-SCAN3. Up to 460 sets, of up to 30 frequencies each, can be transferred to the "ABC" memory block using either the software F-SCANT3, or a common terminal program.

As a factory setting the "ABC" function is locked. A release code can be acquired by email from the factory or from an F-SCAN sales point.

The frequency programs must be written with a text editor in the following format:

(PROGRAMM 1)10,100,1000,10000;

(PROGRAMM 2)20,30,40,50,60,100;

The program name (maximum of 20 characters – letters of the alphabet only) must be set in parenthesis. It is followed by 1 to 30 frequency values, separated by comma. The end of the sequence has to be marked by a semicolon " ; ".

A carriage-return-line-feed = 13-10 must separate the program lines.

As soon as the list of frequency programs is generated and transferred to the F-SCAN3, it can be accessed on the unlocked menu "ABC".
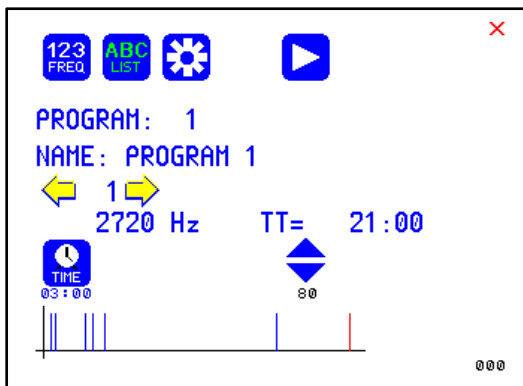
A touch on the icon opens the menu "ABC". The example chosen for this manual shows the program number, the program name and its first frequency. The timer is set for 03:00 minutes, the total time shows 21:00 minutes for a program total of 7 frequencies.

Fewer properties than in the menu "123" can be assigned to individual frequency values here. A change of the timer will be valid for all frequencies stored in the memory block of 460 programs. The amplitude of square signals can be adjusted up or down with touches on the blue arrows.
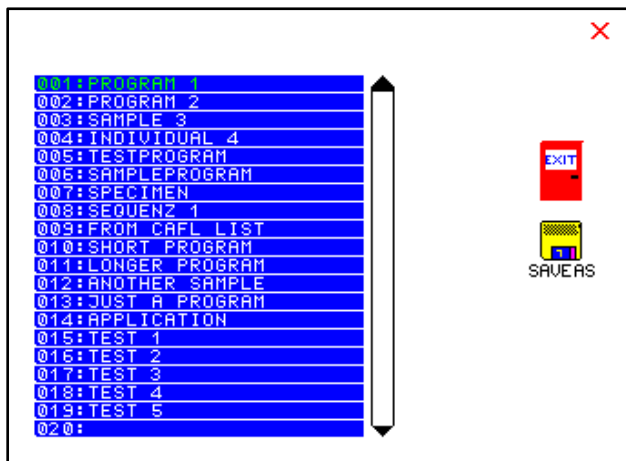
A touch on program or name opens the screen with 20 program lines. A touch on any line opens the program for use. Missing positions can be reached with touches on the up and down arrows of the scroll bar moving always a full page.

Touch this icon to start a program. The icons to

Initiate a pause,

and to stop the program, appear on the screen.

Any program can be copied from the "ABC" memory block of 460 programs to the "123" memory block of 100 programs with a touch on the icon "SAVE AS". The routine requests the input of the position number to copy to. Once saved in the "123" routine the program name can be edited and all property assignments to frequencies offered there are applicable.

The altered program can thus be transferred to other F-SCAN models with the help of the ChipCard.

✕ A touch on the icon "EXIT", or on the red cross in the upper right corner, closes the "ABC" feature.

Technical data

Case	Aluminum
Dimensions	170 mm x 128 mm x 26 mm
Color touch screen	116 mm x 88 mm; 320 x 240 pixel
Min. frequency selectable	0.01Hz
Frequency stability	30 ppm
Memory	100 open positions for up to 50 frequency values including individual properties assigned to each value.
Flash-memory for a list	max. 460 entries of up to 30 frequencies each
Power supply for devices without battery	Plug-in type: 100–240 VAC, 50–60 Hz, Output: 15VDC, 300mA (minimum)
Power supply for devices with battery	Plug-in type: 100–240 VAC, 50–60 Hz, Output: 5VDC, 600mA (minimum)
Multisignal-output port	Sine signal, permanent positive (DC-OFFSET), Amplitude preset to 10Vss Square signal, 0-symmetric (Full wave), Amplitude 0 to 24 Vpp. Square signal, permanent positive (DC-OFFSET), Amplitude 0 to 12Vpp.
Frequency range	Sine 1Hz to 3 MHz, Square guaranteed to 100 kHz. **See list below for typical dependency of amplitude on the frequency value.**
Frequency range output CINCH 2 WIDE	Sine 1 Hz to 15 MHz, 5Vpp

Typical values of amplitudes as function of frequency

Frequency [Hz]	Square 50%	Square 80%	Square 100%	Sine
0.1	3.7Vpp	7.7Vpp	14.2Vpp	14.2Vpp
1	3.7Vpp	7.7Vpp	14.2Vpp	14.2Vpp
10	3.7Vpp	7.7Vpp	14.2Vpp	12.8Vpp
100	3.7Vpp	7.7Vpp	14.2Vpp	12.6Vpp
1000	3.6Vpp	7.4Vpp	14.2Vpp	12.6Vpp
10000	3.6Vpp	7.4Vpp	14.0Vpp	12.6Vpp
100000	3.6Vpp	7.3Vpp	13.4Vpp	12.2Vpp
1000000	3.6Vpp	7.3Vpp	12.2Vpp	10Vpp
2000000	not defined			6.5Vpp
3000000	not defined			4.0Vpp

Changes to improve or simplify the product will be made without prior notice

Declaration of Conformity / Konformitätserklärung

Hiermit erklären wir:/Herewith we declare:

TB-ELECTRONICS GmbH
Poststrasse 4
CH-9443 Widnau

dass das folgende Produkt mit der Bezeichnung/that the following product with the marking

F-SCAN3 Frequency Synthesizer

in alleiniger Verantwortung auf dass sich diese Erklärung bezieht mit der folgenden Norm übereinstimmt:
declare under our sole responsibility to which this declaration relates is in conformity with the following standard:

EMC: 89/336, 92/31, 93/68
Harmonisierte Standards: EN 61326-1
Ratings, characteristics: 5VDC, 300mA

Widnau, 23 - 02 - 2013

rechtsverbindliche Unterschrift/ legally binding Signature