Industriefunkuhren

hopf Elektronik GmbH

Technical Manual

Frequency Output Board

Model 7530 with System 6842

ENGLISH

Version: 02.01 – 20.08.2007

Valid for Devices 7530 with FIRMWARE Version: **02.xx**

hopf Elektronik GmbH
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Version number (Firmware / Manual)

THE FIRST TWO DIGITS OF THE VERSION NUMBER OF THE TECHNICAL MANUAL AND THE FIRST TWO DIGITS OF THE FIRMWARE VERSION MUST **COMPLY WITH EACH OTHER**. THEY INDICATE THE FUNCTIONAL CORRELATION BETWEEN DEVICE AND TECHNICAL MANUAL.

THE DIGITS AFTER THE POINT IN THE VERSION NUMBER INDICATE CORRECTIONS IN THE FIRMWARE / MANUAL THAT ARE OF NO SIGNIFICANCE FOR THE FUNCTION.

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Symbols and Characters

Operational Reliability

Disregard may cause damages to persons or material.

Functionality

Disregard may impact function of system/device.

Information

Notes and Information.

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Safety regulations

The safety regulations and observance of the technical data serve to ensure trouble-free operation of the device and protection of persons and material. It is therefore of utmost importance to observe and compliance with these regulations.

If these are not complied with, then no claims may be made under the terms of the warranty. No liability will be assumed for any ensuing damage.

Safety of the device

This device has been manufactured in accordance with the latest technological standards and approved safety regulations

The device should only be put into operation by trained and qualified staff. Care must be taken that all cable connections are laid and fixed in position correctly. The device should only be operated with the voltage supply indicated on the identification label.

The device should only be operated by qualified staff or employees who have received specific instruction.

If a device must be opened for repair, this should only be carried out by employees with appropriate qualifications or by ***hopf*** Elektronik GmbH.

Before a device is opened or a fuse is changed all power supplies must be disconnected.

If there are reasons to believe that the operational safety can no longer be guaranteed the device must be taken out of service and labelled accordingly.

The safety may be impaired when the device does not operate properly or if it is obviously damaged.

CE-Conformity

This device fulfils the requirements of the EU directive 89/336/EWG "Electromagnetic compatibility" and 73/23/EWG "Low voltage equipment".

Therefore the device bears the CE identification marking (CE = Communautés Européennes = European communities)

The CE indicates to the controlling bodies that the product complies with the requirements of the EU directive - especially with regard to protection of health and safety for the operator and the user - and may be released for sale within the common markets.

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1 General

The board 7530 is used to produce 1 Hz and 10 MHz in steps of 1 Hz. The accuracy of the frequency is controlled by the pps-pulse of the GPS receiver in the system 7001 GPS or in the system 6842.

2 Settings

The frequency is set by means of the key-pad of the base system.

In general the configuration is based on the according manual. Below nothing but the entry of those values which are found under **"SET"** or **"SHOW"** is described.

2.1 Base System 6842

2.1.1 Setting the Frequency

The frequency is set under the SET-menu starting with the following picture

SET FREQUENCY
Y/N

After entering **"Y"**es the following is displayed.

FREQUENCY
>

The frequency must be entered in steps of 1Hz. The entry must have 8 digits. E.g. the entry for 3 Hz would look as follows:

FREQUENCY
>00.000.003< Hz

A point is set after every third digit as an optical support and after the 8th entry a limiting arrow is set plus the abbreviation for Hertz

The frequency is taken over by pressing the **"ENT"** key and stored in a fail-safe memory.

The stored value of the frequency can be checked by means of the **"SHOW"-** item in the menu.

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2.1.2 Setting the Delay Times

The frequency is put out only if the whole system is running radio synchronously. To give the system a certain amount of time to adjust the frequency it is possible to delay the turn-on point of time. The **"DELAY ON"** sets the period between the first radio synchronisation and the output of the frequency. After the voltage supply is switched on the oven stabilised crystal on the circuit board needs some minutes to warm up. During this period the accuracy of the frequency does not reach the stated standard. The turn-on time should be delayed by at least 10 minutes.

When the system is no longer running radio synchronously the frequency continues on the last controlled level of accuracy for some time. The **"DELAY /OFF"** function sets the time which may pass between the loss of synchronisation and the switching off of the frequency. The time cannot exceed 254 minutes. The setting of 255 minutes delay time is the only exception. In this case the output of the frequency stays switched on all the time.

Both times are set in one operation.

Selection picture

SET FREQUENCY
OUTPUT DELAY Y/N

After entering **"Y"**es the entry picture is shown

DELAY ON / OFF
>

Both times can be entered here subsequently. The entry must have 3 digits (e.g. the turn-on delay 30 minutes, switch-off delay 2 minutes):

DELAY ON / OFF
>030 / 002

The delay times are taken over when **"ENT"** is pressed and they are stored in a fail-safe memory.

The stored values can be checked under the **"SHOW"-** item in the menu.

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3 Frequency Output

The sinus frequency is put out at the BNC connector in the front panel.

The amplitude is set at 2 Vss at 50 Ω. The amplitude can be altered slightly at the potentiometer above the BNC connector .

The zero passage of the rising sine-wave oscillation is synchronised with the GPS high precision radio operation for frequencies between 1Hz – 9.999kHz.

The phase jitter ranges between 1 - 99 Hz ca. 0,1 % and between

100 - 9999 Hz ca. 0,01 % of the peak-to-valley value.

The frequency is not put out unless the system has been radio synchronous at least once.

4 Accuracy

The sine-wave oscillation is produced by a DDS modulator at a 32bit phase accumulator. The basic frequency is produced by an oven stabilised crystal generator whose accuracy ranges around $\pm 5 * 10^{-10}$.

This accuracy can only be transferred complete to the output frequency if the dividing factor for the phase accumulator does not show a rest.

There is a special arrangement for frequencies over 1 MHz. All the settings of frequencies which do not show a rest when divided by 1000 are compared directly to the GPS second marker and can be adjusted to an accuracy of $\pm 5*10^{-10.}$

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5 Technical Data

Voltage supply	+ 5V DC / 0.5A
Temperature range	0 - 50°C
Warm-up time OCXO	5 min. at 25°C
Turn-on accuracy	± 1 x 10^{-7}
Operating accuracy after 15 min	± 5 x 10^{-9} /100 sec.
When controlled by satellite after 45 min	± 5 x 10^{-9} /100 sec.
When controlled by satellite after 240 min	< ± 5 x 10^{-10} /100 sec.
Long-term accuracy	
When constantly controlled by satellite	± 1 x 10^{-11} /day
Frequency output	
Amplitude	2 Vss Sinus
Output impedance	50Ω
Time delay switch-on	0 - 255 min.
Time delay switch-off	0 - 255 min.

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