

**Industriefunkuhren**



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**Technical Manual**

4-Channel Output Board  
for DCF77 Antenna Simulation (77.5kHz)

**Model 7318/7318RC**

ENGLISH

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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.



### 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 4-Channel Output Board for DCF77 antenna simulation (77.5kHz) is available in two different versions suitable for the use in Systems 6000, 7001 and 7001RC.

## 1.1 Board 7318 – for Systems 6000 and 7001

Board 7318 is a 4-channel output board in euro format with a 3U/4HP front panel suitable for the potential free output of a DCF77 antenna simulation (77.5kHz). The board has been designed for Systems 6000 and 7001.

All **hopf** DCF77 Systems can be synchronized by this board.

- **Connection**  
Connection via four (4) BNC female connectors.
- **Configuration**  
Configuration of the board solely via jumpers on board.
- **Status-LEDs**  
Each output has its individual Status LED indicating used DCF77 pulse for the appropriate output.
- **Amplitude of DCF77 Antenna Simulation (77.5kHz)**  
The amplitude of the DCF77 antenna simulation can be individually adjusted to 3 or 10mV<sub>pp</sub> for each output via jumper on board.
- **Operation of Board**  
The board is directly controlled via the system bus or via two signals connected to the internal VG ledge (a frequency of 77.5kHz and the DCF77 pulse).
- **Selection of DCF77 Pulse for DCF77 Antenna Simulation (77.5kHz)**  
For each output there is a variety of two signal sources for the DCF77 pulse. As a standard the DCF77 pulse available at the system bus is used in order to generate the simulation signal. In case another DCF77 pulse is internally provided (e.g. with a different time basis), it can be connected to the internal VG ledge of board 7318 and selected as signal for the simulation via jumper.

## 1.2 Board 7318RC – for System 7001RC

Boards 7318RC and 7318 are identical in their features, however board 7318RC is designed for use in System 7001RC by providing supplemental "Hot Plug" functionality.



The board **does not** provide any Remote and Management functionality of System 7001RC:

- The board **is not** mapped by System 7001RC.
- The board **is not** monitored by System 7001RC.
- The board is solely configured via jumper (on board).



Board 7318RC may also be used in Systems 6000 and 7001 if required.

## 2 Design / Configuration of Boards 7318 and 7318RC

This chapter describes the layout and the configuration of board via jumper.

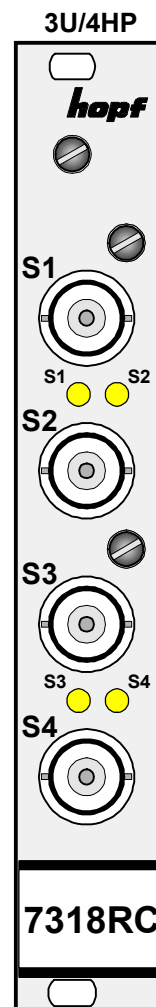
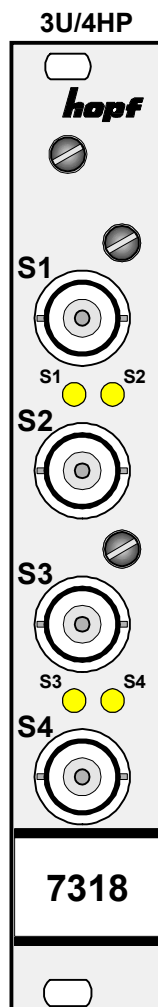
### 2.1 Front Panel of Boards 7318 and 7318RC

On the front panel there are four (4) BNC female connectors for the output of the DCF77 antenna simulation (77.5kHz) and the appropriate Status LEDs for displaying the respectively used DCF77 pulse.

The Status LEDs are flashing from zero until the 58<sup>th</sup> second every second for a duration of 100 and 200msec. respectively. In the 59<sup>th</sup> second they stay dark.



Unless a Status LED is **not** flashing in DCF77 pulse, **no** correct DCF77 antenna simulation (77.5kHz) is given out. Generally in such case the board is supplied with a wrong signal or none instead of the DCF77 pulse.



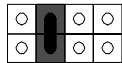


## 2.2 Layout of Board / Configurations-Jumper

This chapter describes the position and function of the jumper.

### 2.2.1 Selection of the DCF77 Pulse

Via the jumper JB1-b (A1) to JB4-b (B2) the source of the DCF77 pulse, that should be used for the generation of the DCF77 antenna simulation (77.5kHz), can be individually selected for each output.



Jumper **closed**

DCF77 pulse from system bus (**default**)



Jumper **opened**

DCF77 pulse from VG ledge Pin C1

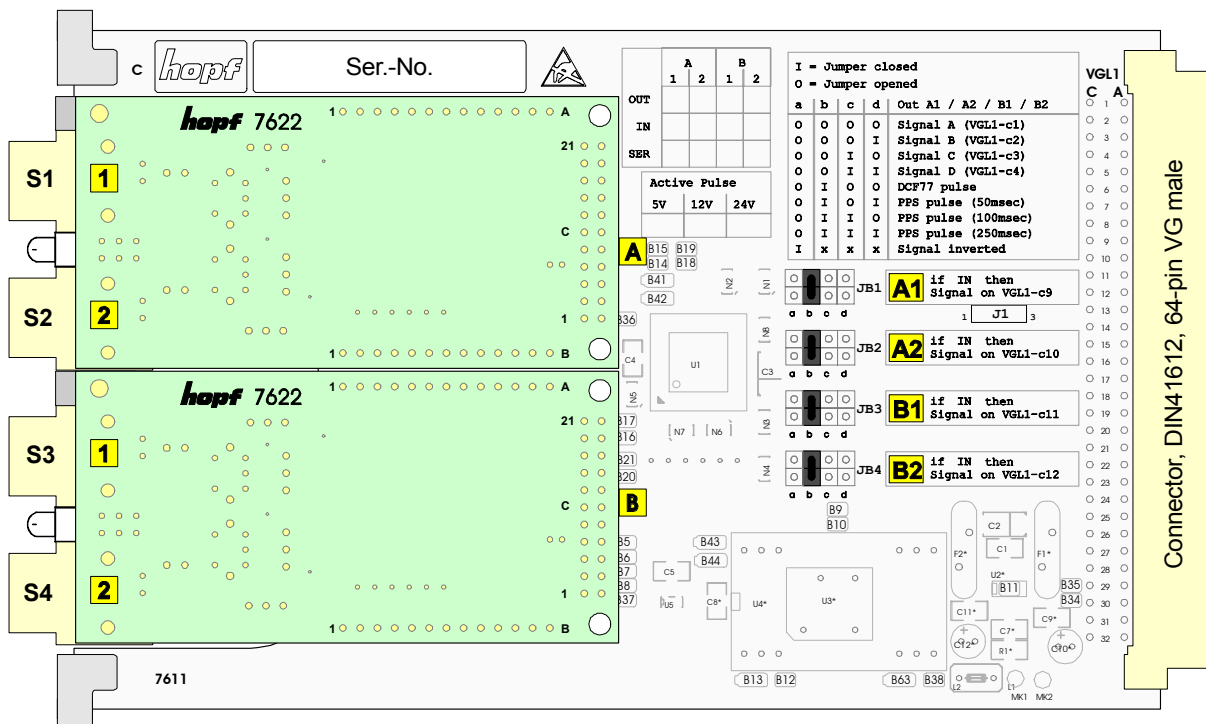
#### Allocation:

JB1-b (A1) = Output S1

JB2-b (A2) = Output S2

JB3-b (B1) = Output S3

JB4-b (B2) = Output S4



Via the Jumper J1 the operating mode of the board can be selected:



Jumper 1-2

for systems 6855 / 7001RC

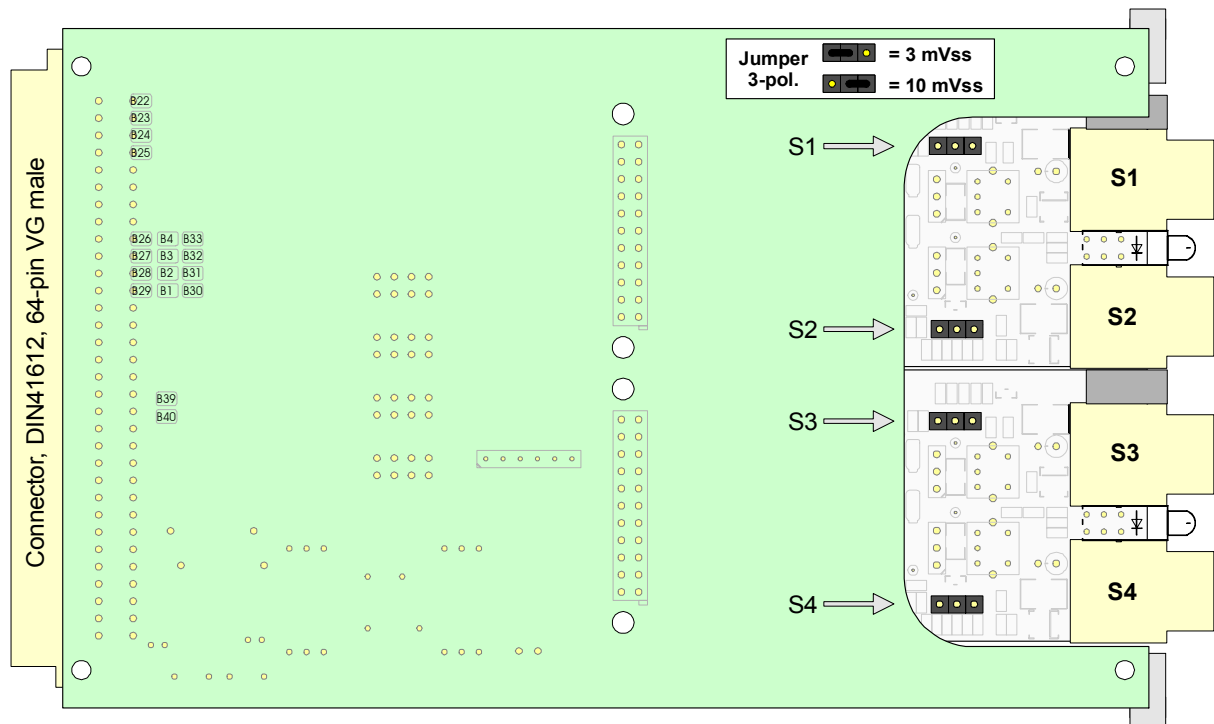
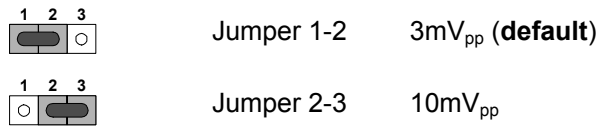


Jumper 2-3

for systems 6842 / 7001

## 2.2.2 Adjustment of the Signal Amplitude

The amplitudes of the DCF77 antenna simulation (77.5kHz) can be adjusted individually for each output via the 3-pol. jumper.



## 3 Maintenance

Boards 7318 and 7318RC are completely maintenance free.

## 4 Technical Data

General Data	
Operation:	Via jumper on board
Protection Class:	None
Power Supply:	5V DC $\pm$ 5% via system bus
Current Consumption:	190mA
Dimensions:	Eurocard 100mm x 160mm, 3U/4HP
MTBF:	> 900,000 hours
Weight:	Approx. 0.18kg

Signal Outputs (via BNC female Connector)	
Output Signal:	DCF77 signal (amplitude-modulated frequency of 77.5kHz)
Signal Amplitude:	<ul style="list-style-type: none"> <li>• 3mV<sub>pp</sub> signal level at 50<math>\Omega</math> or</li> <li>• 10mV<sub>pp</sub> signal level at 50<math>\Omega</math> (configurable via jumper)</li> </ul>
Carrier Frequency:	77.5kHz $\pm$ 25ppm
Accuracy of the Carrier Clip:	$\pm$ 50 $\mu$ sec. on the DCF77 pulse
Output Impedance:	50 $\Omega$ dynamic
Ohm Resistance:	1k $\Omega$
Potential Isolation	500V DC

Environmental Conditions		
Temperature Range:	Operation:	0°C to +55°C
	Storage:	-20°C to +75°C
Humidity:	Max. 90%, non condensed	

CE Standards	
Electrical Properties of Inputs (at VG ledge):	TTL compatible

### Special production:

Modifications can be made to hardware and software in accordance with customer specifications.



The **hopf** company reserves the right to modify hardware and software at any time.