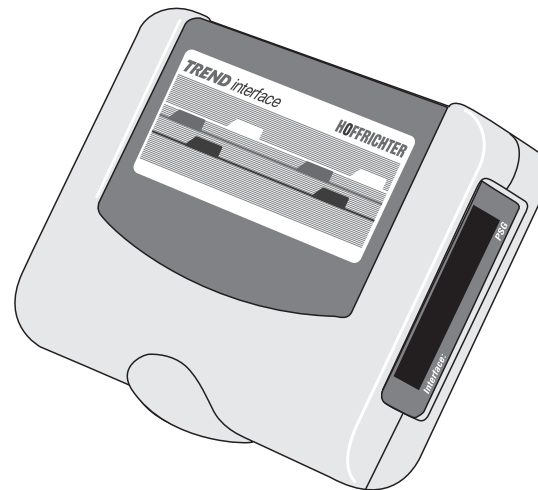


HOFFRICHTER GmbH
Mettenheimer Straße 12/14
19061 Schwerin
Germany
Phone: +49 385 39925-0
Fax: +49 385 39925-25
E-Mail: info@hoffrichter.de
www.hoffrichter.de

HOFFRICHTER
Quality makes the Difference ■■■■

TREND interface



TREND interface-eng-0410-06

Art. no.: 0000 5805

User's Manual
Digital-Analog Converter

DISCLAIMER

HOFFRICHTER GmbH is not liable for consequences in terms of safety, reliability and performance of the product where:

- interventions, modifications, extensions, calibration, repairs and maintenance are carried out by persons not authorized by us,
- other manufacturers' accessories and spare parts are used that have not been approved by us for use on the product,
- the product is used other than as described in the user's manual or
- the hygiene and cleaning instructions described in the user's manual have not been complied with.

Statutory guarantee rights remain unaffected by this.

CONTENTS

Serial Number	2
Conformity	2
Symbols on the Rating Plate	4
Safety Information	5
Intended Use	6
Scope of Delivery	6
Description of Device	7
Connections	8
Indication of the LED	8
Output of SubD 15-pin connector	9
Change of the voltage level	9
Cleaning and Disinfection	20
Safety Information.....	20
Device Surface	20
Technical Data	21
Disclaimer	22

SYMBOLS ON THE RATING PLATE



Observe the warning and safety instructions in the user's manual.



CE conformity declaration



Manufacturer



Follow the user's manual.



Do not dispose of the device in the household waste. Please contact the relevant customer services department to find out how to dispose of the device properly.

TECHNICAL DATA

Specifications and Performance

Dimensions (W x H x D): 115 x 84 x 25 mm

Weight: 110 g

Operating conditions

Operating temperature: 0 °C to + 40 °C

Relative humidity: 10 % to 95 %

Air pressure: 700 to 1060 hPa

Storage conditions: - 10 °C to + 50 °C

(Store in a dry, vibration free position; store device and accessories in their original packing)

Standards

The system complies with the following standards and guidelines:

- EC directive 93/42/EEC
- DIN EN ISO 14971:2000
- DIN EN ISO 14971:A1 2003
- IEC/TR 6051
- UL 1577 Component Recognition Program: 2500 V rms Isolationsspannung
- DIN EN 60747-5-2; VDE 0884-2:2003-01
- DIN EN 60950; VDE 0805:2001-12

The manufacturer reserves the right to make technical changes without notice.

CLEANING AND DISINFECTION

SAFETY INFORMATION

- Do not use any volatile substances, such as solvents, to avoid damaging of the surface. Clean the device only using a soft, dry cloth.
- Do not immerse the device in water or solvent.
- Make sure that no water or other fluids can penetrate into the device through opening or venting slots. This could lead to short circuits, damage, electric shocks and fires.

DEVICE SURFACE

Use a cloth moistened with soap water to clean the external surfaces of the device. Then wipe the device with clear water to remove residual cleaning agent.

The device surfaces should be disinfected at regular intervals and in case of suspected contamination. We recommend Mikrozid® Liquid for disinfecting the external surfaces of the device. Disinfectants which are recognized according to the RKI Guideline can also be used. Before being put into operation, the device should be completely dry.

SAFETY INFORMATION

Please read this user's manual through carefully before using your TREND interface for the first time.

- The housing of the device does not provide any protection against ingress of water.
- Never try to open the housing of TREND interface.
- Never expose the device to rain, moisture or humidity. Malfunctions, damage and electric shocks can occur as a result.
- Never place the TREND interface in the vicinity of other equipment or devices, such as defibrillators, diathermy equipment, mobile phones, microwave equipment, remote controlled toys, etc.

Keep the manual in a safe place close to the device so that you can refer to it immediately if necessary.

- If temperatures fall below -5 °C or rise above $+50\text{ °C}$, proper functioning of TREND interface may be impaired. The system must not be exposed to direct solar radiation.
- Do not use the device if there is visible damage to it. Accidents, fires and electric shocks can occur as a result.
- Make sure that no objects or fluids can penetrate into the device through openings. This could lead to short circuits, damage, electric shocks and fires.

INTENDED USE

TREND interface is intended for conversion of digital signals from the respiration therapy devices of HOFFRICHTER GmbH into analog signals and their transfer to polysomnography systems.

Additional the communication between the respiratory therapy device and a PC with evaluation software or a remote control shall be warranted.

TREND interface is exclusively used in sleep laboratories by medical qualified personnel.

SCOPE OF DELIVERY

Included in delivery:

- TREND interface
- Adaptor RS232/PC or TRENDremote
- RS232 interface cable (connection between TREND interface and CPAP-device)
- Interface cable to the PSG-device e.g.:
 - Compumedics E-Serie
 - Embla S/N 7000
 - Alice
 - Comlab 44
 - Crystal
 - Sapphire / SleepScoutFurther on request.

Signals from point

Range 5 V

Channel	Name	Range (5 V)	Description
0	Mask pressure	0 V = 0 Pa 5 V = 5000 Pa	Therapy pressure in the mask
1	Not used		
2	Not used		
3	Not used		
4	Not used		
5	Not used		

Signals from point

Range 1 V

Channel	Name	Range (1 V)	Description
0	Mask pressure	0V = 0 Pa 1 V = 5000 Pa	Therapy pressure in the mask
1	Not used		
2	Not used		
3	Not used		
4	Not used		
5	Not used		

DESCRIPTION OF DEVICE

To connect the TREND interface to a PSG device an interface cable is required.

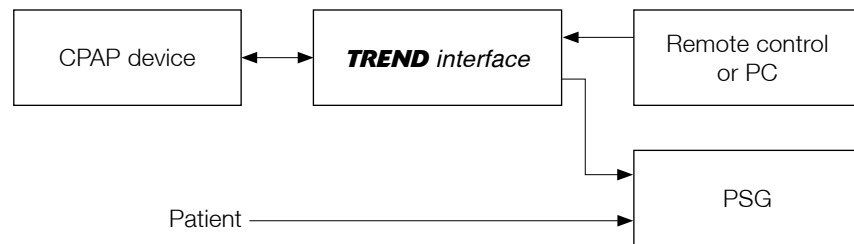
The device converts the digital signals from the respiratory therapy device into analog signals for the PSG system.

For this you first have to connect the TREND interface with the CPAP device. Use the interface cable.

Then connect the PSG device to the TREND interface.

To show the data in the software of the PSG device, some adjustments in the PSG device may be necessary.

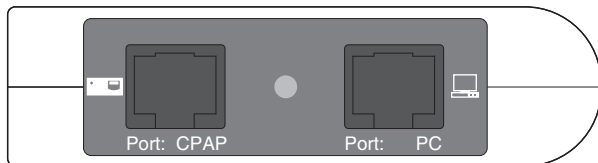
Optional a remote control or a PC can be connected to the device. For this, use the delivered adaptor.



CONNECTIONS

The following connectors are available on the TREND interface:

- RJ45 jack for connection with the respiratory therapy device (Port: CPAP)¹
- SubD 15-Pin for connection with the PSG system (Interface: PSG)
- RJ45 jack for connection with a remote control/PC (Port: PC)¹



¹ galvanically isolated

INDICATION OF THE LED

The LED indicates the following operation conditions:

- Quick flashing ▶ Initialization phase
- On ▶ Device ready
- Flashing ▶ Error while running

Signals from devices in all modes:

TREND II Bilevel, TREND II Bilevel ST20, VECTOR et / ET Bilevel, VECTOR et / ET Bilevel ST20, (i)CARAT et Bilevel, (i)CARAT et Bilevel ST20, PRISMA II, MELODY II

Range 5 V

Channel	Name	Range (5 V)	Description
0	Mask pressure	0 V = 0 Pa 5 V = 5000 Pa	Therapy pressure in the mask
1	Breathing flow	0 V = - 2.5 l/s 5 V = 2.5 l/s	Breathing flow of the patient
2	Leakage flow	0 V = 0 ml/min 5 V = 5000 ml/s	Display of leakage flow
3	Not used		
4	Not used		
5	Not used		

Signals from devices in all modes:

TREND II Bilevel, TREND II Bilevel ST20, VECTOR et / ET Bilevel, VECTOR et / ET Bilevel ST20, (i)CARAT et Bilevel, (i)CARAT et Bilevel ST20, PRISMA II, MELODY II

Range 1 V

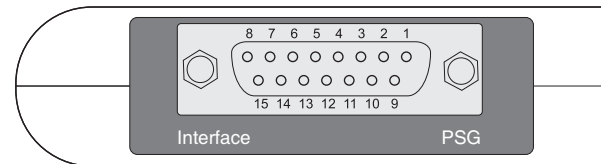
Channel	Name	Range (1 V)	Description
0	Mask pressure	0 V = 0 Pa 1 V = 5000 Pa	Therapy pressure in the mask
1	Breathing flow	0 V = - 2.5 l/s 1 V = 2.5 l/s	Breathing flow of the patient
2	Leakage flow	0 V = 0 ml/min 1 V = 5000 ml/s	Display of leakage flow
3	Not used		
4	Not used		
5	Not used		

OUTPUT OF SUBD 15-PIN CONNECTOR

PIN	Signal
1	Ground
2	Channel 5
3	Channel 4
4	Channel 3
5	Channel 2
6	Channel 1
7	Channel 0
8	Ground
9	Ground
10	Amplification Channel 5
11	Amplification Channel 4
12	Amplification Channel 3
13	Amplification Channel 2
14	Amplification Channel 1
15	Amplification Channel 0

CHANGE OF THE VOLTAGE LEVEL

The output voltage level of the channels zero to five is 0 V to 1 V. This level can be changed to 0 to 5 V by connecting ground and the accordant amplification channel.



Signals from devices in the modes APAP and CPAP:
AutoTREND (from V 1.5xx)

Range 1 V

Channel	Name	Range (1 V)	Description
0	Mask pressure	0V = 0 Pa 1 V = 5000 Pa	Therapy pressure in the mask
1	Breathing flow	0V = - 2.5 l/s 1 V = 2.5 l/s	Breathing flow of the patient
2	Relative breathing volumen	0V = 0 % 1 V = 100 %	Relative breathing volume is defined as breathing volume measured over 10 s, reductions in the signal are hypopnea or apnea
3	Snoring	0V = inactive 1 V = active	Active, when snoring is detected
4	Airway constriction	0V = inactive 1 V = active	Active when raised airway constriction occurs
5	Internal signal	0 - 1023	Signal for the detailed internal evaluation

Signals from devices in the mode FLEXLINE:

AutoTREND (from V. 1.700), TRENDevent, TREND II AUTO, (i)CARAT et AUTO, VECTOR et / ET AUTO, VIVA II AUTO

Signals from devices in the modes FLEXLINE and CPAP:

TREND 210, TREND II CPAP, VECTOR et / ET CPAP, VIVA II CPAP

Range 5 V

Channel	Name	Range (5 V)	Description
0	Mask pressure	0V = 0 Pa 5 V = 5000 Pa	Therapy pressure in the mask
1	Breathing flow	0V = - 2.5 l/s 5 V = 2.5 l/s	Breathing flow of the patient
2	Leckage-Flow	0V = 0 ml/min 5 V = 5000 ml/s	Display of leakage flow
3	Not used		
4	Status FLEXLINE Leakage detected	0V = inactive 2.5 V = active	Active, when leakage is detected
5	Status FLEXLINE Basic pressure Hyperventilation detected	0V to 5V	0V = no status active 1.25 V = Basic pressure 2.50 V = Hyperventilation detected

Signals from devices in the mode FLEXLINE:

AutoTREND (from V. 1.700), TRENDevent, TREND II AUTO, (i)CARAT et AUTO, VECTOR et /ET AUTO, VIVA II AUTO

Signals from devices in the modes FLEXLINE and CPAP:

TREND 210, TREND II CPAP, VECTOR et /ET CPAP, VIVA II CPAP

Range 1 V

Channel	Name	Range (1 V)	Description
0	Mask pressure	0 V = 0 Pa 1 V = 5000 Pa	Therapy pressure in the mask
1	Breathing flow	0 V = - 2.5 l/s 1 V = 2.5 l/s	Breathing flow of the patient
2	Leakage flow	0 V = 0 ml/min 1 V = 5000 ml/s	Display of leakage flow
3	Not used		
4	Status FLEXLINE Leakage detected	0 V = inactive 0.5 V = active	Active, when leakage is detected
5	Status FLEXLINE Basic pressure Hyperventilation detected	0 V to 1 V	0 V = no status active 0.25 V = Basic pressure 0.50 V = Hyperventilation detected

Signals from devices in the modes APAP and CPAP:

AutoTREND (from V 1.5xx)

Range 5 V

Channel	Name	Range (5 V)	Description
0	Mask pressure	0 V = 0 Pa 5 V = 5000 Pa	Therapy pressure in the mask
1	Breathing flow	0 V = - 2.5 l/s 5 V = 2.5 l/s	Breathing flow of the patient
2	Relative breathing volumen	0 V = 0 % 5 V = 100 %	Relative breathing volume is defined as breathing volume measured over 10 s, reductions in the signal are hypopnea or apnea
3	Snoring	0 V = inactive 5 V = active	Active, when snoring is detected
4	Airway constriction	0 V = inactive 5 V = active	Active when raised airway constriction occurs
5	Internal signal	0 - 1023	Signal for the detailed internal evaluation

Signals from devices in the modes APAP and CPAP: AutoTREND (from V 1.700), TRENDevent, TREND II AUTO, (i)CARAT et AUTO, VECTOR et / ET AUTO, VIVA II AUTO

Range 1 V

Channel	Name	Range (1 V)	Description
0	Mask pressure	0V = 0 Pa 1 V = 5000 Pa	Therapy pressure in the mask
1	Breathing flow	0V = - 2,5 l/s 1 V = 2.5 l/s	Breathing flow of the patient
2	Relative breathing volumen	0V = 0 % 1 V = 100 %	Relative breathing volume is defined as breathing volume measured over 10 s, reductions in the signal are hypopnea or apnea
3	Snoring	0V = inactive 1 V = active	Active, when snoring is detected
4	Airway constriction	0V = inactive 1 V = active	Active when raised airway constriction occurs
5	Status APAP	0V to 1 V	0V = no status active 0.06 V = Adaptation phase 0.13 V = Leakage detected 0.25 V = Hyperventilation detected 0.50 V = Mouth expiration detected

Signals from devices in the modes APAP and CPAP: AutoTREND (from V 1.700), TRENDevent, TREND II AUTO, (i)CARAT et AUTO, VECTOR et / ET AUTO, VIVA II AUTO

Range 5 V

Channel	Name	Range (5 V)	Description
0	Mask pressure	0V = 0 Pa 5 V = 5000 Pa	Therapy pressure in the mask
1	Breathing flow	0V = - 2.5 l/s 5 V = 2.5 l/s	Breathing flow of the patient
2	Relative breathing volumen	0V = 0 % 5 V = 100 %	Relative breathing volume is defined as breathing volume measured over 10 s, reductions in the signal are hypopnea or apnea
3	Snoring	0V = inactive 5 V = active	Active, when snoring is detected
4	Airway constriction	0V = inactive 5 V = active	Active when raised airway constriction occurs
5	Status APAP	0V to 5 V	0V = no status active 0.30 V = Adaptation phase 0.60 V = Leakage detected 1.25 V = Hyperventilation detected 2.50 V = Mouth expiration detected