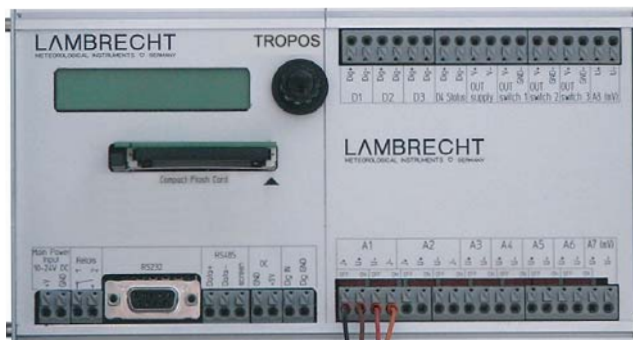


TROPOS-124



TROPOS-112



TROPOS-100



Contents

- 1 Introduction
- 2 Functional description
- 3 Components and scope of delivery
- 4 Commissioning of TROPOS
 - 4.1 Configuration of TROPOS
 - 4.2 Operation via push-/ rotary switch
 - 4.3 The menu items
 - 4.4 Wiring of the TROPOS ports
- 5 Measurement and evaluation
 - 5.1 The CF card
 - 5.2 Data transfer and evaluation
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- 7 Dimensional and connection drawings
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- 11 Warranty
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1 Introduction

- TROPOS is a modular, sophisticated, electronic data logger for data acquisition and processing of meteorological measurement values.
- TROPOS is available in 3 different versions:
 - TROPOS-100 · to connect one precipitation sensor
 - TROPOS-112 · to connect up to 1+12 sensors
 - TROPOS-124 · to connect up to 1+24 sensors
- TROPOS can be supplied by mains voltage or by solar energy equipment.
- TROPOS is designed for hat rail or switchboard mounting.
- TROPOS is qualified for use in a temperature range of -30...+60 °C. The flexible structure enables a high number of measuring ranges namely voltages up to max. ± 5 V, currents up to ± 20 mA, resistors up to 5 kΩ as well as frequencies up to 4 kHz. The inputs are protected against temporary voltage peaks up to max. 30 V.
- TROPOS can be extended by different optional modules or modems concerning data transfer, evaluation or saving.

2 Functional description

The sensors, which are connected to TROPOS, collect the measured data within a certain time period according to their purpose of application. This data are transferred to TROPOS as electric signals. There the data are processed.

The realtime values can be shown in the LC display of TROPOS and saved on the Compact Flash Card (CF card).

Average and extreme values (e.g. wind peaks) can also be saved on the CF card.

A ring buffer about 1 year is available on the CF card.

The data transfer is processed individually by means of the CF card or via RS 232 interface to a PC or laptop.

Optional items can be used, e.g. RS 485, GSM-, telephone- or radio modems.

3 Components and scope of delivery

The following components are included in the scope of delivery of TROPOS:

Description	Id-No.
1 TROPOS basic device:	
TROPOS-100	00.95666.100 000 or
TROPOS-112	00.95666.500 000 or
TROPOS-124	00.95666.600 000

1 CF card with extended operating temperature range = industrial standard (is included in the CD box)

1 Connecting cable

1 Null modem adapter (orange marked)

1 CD with the configuration- and data readout software „TROPOS-Commander“ wiring and connection drawings (pdf)



Please, first check the completeness of delivery and do not connect TROPOS to the power supply yet!

Depending on the order TROPOS can be already configured and mounted into the housing. In this case the chapter configuration and wiring can be skipped.

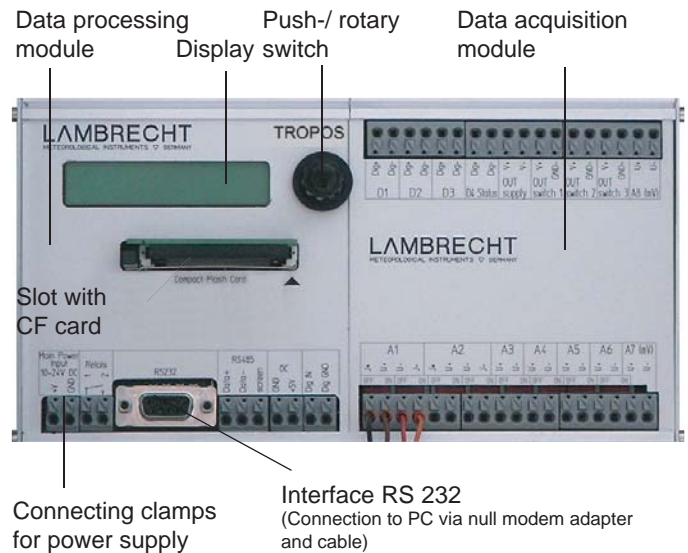


Figure 1: Front view of TROPOS-112

4 Commissioning of TROPOS



Attention! Warranty losing!

Don't wire during connected power supply!

An incorrect handling can destroy TROPOS and the warranty claim would be lost!

4.1 Configuration of TROPOS

The configuration of TROPOS is carried out by means of the delivered software "TROPOS-Commander" via the interface RS 232 connection between TROPOS and PC.

The software is released for the operating systems Windows 7 up to Windows 10.

Procedure

- Switch on your PC or laptop.
- Insert the delivered CD "TROPOS-Commander" into an appropriate drive and wait for the self start-up. Follow the installation instructions. It is recommended to accept the suggested storage directory, in order to find the saved data later on quickly and to make the support easier.
- When the installation of the software "TROPOS-Commander" is completed, the program can be started by the new icon on your desktop or via the Windows function "Start => Programs => Wilh. Lambrecht GmbH => TROPOS_CMD".

* The serial number is affixed at the outside of the TROPOS housing and also stored at the hardware inside.

4. Now all necessary wiring activities at TROPOS have to be carried out, without the connection of the power supply, that is without putting the plug into the socket. For this steps see the following article and **the chapter 4.4, pages 5+6.**

Correct cable connection

The wire end sleeves have to be pressed on the insulated ends of the sensor cables. The wire end sleeves (cross-section 0.5...1.5 mm²) should provide a smooth outside surface to disconnect the cable easily.

Normally a lower pressure is enough to insert the wire ends into the connecting clamps. If it is needed, the pusher can be pressed to plug in the wire end sleeves without resistance.

Only a lower pressure on the pusher is enough to unplug the cables. Therefore the cable end has to be pressed in first during pressing the pusher, before the cable can be unplugged.



The wire end sleeves can be stuck because of self-locking. In this case don't keep pulling! The connection will become even more tight. Push the cable down into the jack while pressing the pusher down too. Then remove the cable while still holding the pusher down.

The shielding has to be connected with the potential equalisation panel of the used switchboard, see also figures 2+3.

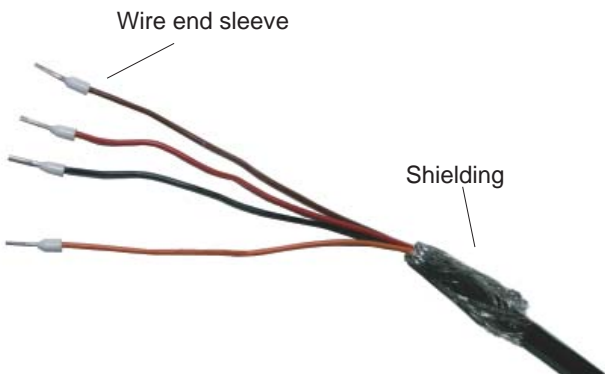


Figure 2: Wire end sleeves for wiring at TROPOS

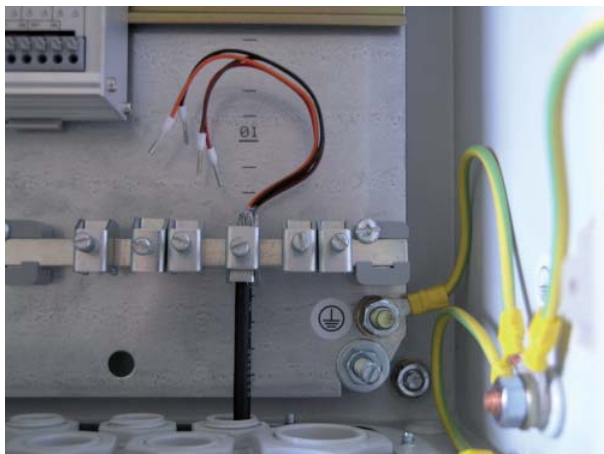


Figure 3: Wire end sleeves and ground connection

5. TROPOS has to be connected to a COM interface of your PC by means of the delivered connecting cable + null modem adapter (TROPOS-sided).

6. Now the power supply of TROPOS may be switched on. TROPOS turns on automatically and the LCD gets active. The LCD turns off automatically when there are no further activities at the push-/ rotary switch for some times. TROPOS is still active but in the standby mode.

Please, from now don't make any wiring operations!

7. You have to deal with the software "TROPOS-Commander" again.

8. Choose your language and click "Close". "TROPOS Commander" has to be started again.

9. The first communication between PC and TROPOS should be carried out by the function **Request CFG**. Thus you get the information whether TROPOS and PC are able to communicate together or which deviations have been occurred. Check first the right choice of the COM interface, if required.

Choose the menu item „Setup/ TROPOS configuration“ and start the on-line help via the F1 key on your keyboard. Follow the instructions and hints.

10. All further settings and operations are described in the on-line help.

Recommendation:



If a new configuration or a reconfiguration of TROPOS is necessary, you should keep ready your delivery note. Thus a quick finding of the sensors, which have to be connected, is possible by their "ID-No".

An overview about the available sensor inputs exists in the software "TROPOS-Commander" under the menu item „Setup/ TROPOS configuration/ Measuring channels“.

There is a selective list, from which the correct sensor can be chosen per each channel.

If a combined sensor should be chosen, that is a sensor with more than one output, the right choice of parameter is important.

Example: Humidity Temperature Sensor (8093):

E...00.8093.000000_Humidity_0-1V

E...00.8093.000000_Temperature_PT100.



4.2 Operation via push- / rotary switch

- When TROPOS is connected to the supply voltage (after finish of all wiring operations), the system starts automatically. This indication appears in the display for a few seconds:

TROPOS V 1.xx
System init...
- Afterwards the adjusted date and time appear in the display.

TROPOS 23.03.16
20:58:00
- The display turns off and TROPOS changes into the standby mode after a while without operations at the push-/ rotary switch. TROPOS is still working in the background.
- The display turns on when the push-/ rotary switch is pressed again. Date and time are shown.
- The below mentioned menu items appear one after another in the display when rotating the push-/ rotary switch (*menu mode*):
 - turn right, clockwise = to go ahead;
 - turn left, anticlockwise = to go back.
- Depending on the active menu item in the display a further pressing of the push-/ rotary switch can be cause the changing into the *edit mode* or the changing into a submenu (see also chapter 4.3, the several menu items).

The edit mode: The clockwise rotation of the push-/ rotary switch by one step changes the value behind the blinking rectangle (cursor function) about +1. The anticlockwise rotation by one step changes this value about -1. By the next pressing the switch the cursor goes ahead to the next digit. By the rotation of the switch again the value of this digit is changed in the same way. When the last digit is reached, the *edit mode* can be finished by pressing the switch again. The last adjusted values are saved.

4.3 The menu items

All menu items of menu appear by rotation of the push-/ rotary switch within an infinite loop:

- TROPOS, Date, Time
- Date
- Time
- Realtime Values
- ID Number
- Change Battery (Attention!)
- Change CF (Attention!)
- Display Off

TROPOS, Date, Time

The indication of date and time appear automatically in the LCD of TROPOS.

TROPOS 23.03.16
20:58:00

Date

The date is adjustable in the format DD.MM.YY.

Date
23.03.16

After pressing the switch, it is changing into the *edit mode* (see above chapter 4.2, point 6).

Edit Date
■ 3.03.16

By the next rotation of the switch the menu item **Date** ends and the next menu item **Time** appears ... and so on.

Time

The time is adjustable in the format hh:mm:ss, similarly to the adjustment of the date.

Time
20:58:00

Edit Time
■ 0:58:00

Realtime Values

At this menu item pressing the switch effects the changing into a submenu.

Realtime Values
Press Key

Depending on the configured (in „TROPOS-Commander“) and connected (on TROPOS) sensors the first measured value appears in the display.

Wind speed
0.5 m/s

*Example:
realtime value of
wind speed*

By rotation of the switch the list of the realtime values of the connected sensors is scrolled up or down. By pressing the switch the submenu is left.

ID Number

The station number can be shown and changed like above mentioned.

ID Number
0001



The station number is used to identify the collected values in the PC evaluation software. The default is „0001“. This number should only, but always then be changed, if more than one TROPOS system are working in a RS 485 data bus system. The admissible range is 1 to 9999.

Change Battery

A replacement of the battery is only allowed, when this menu item is activated and the indication „Ready“ appears in the display, as submenu after pressing the switch.

Change Battery
Press Key

Change Battery
Ready



If this is ignored, data losses occur in rarely cases.

Change CF-Card

The CF card may only be removed when this menu item is activated and „Remove CF“ appears in the display, as submenu after pressing the switch. All writing procedures have been finished.

Change CF
Press Key

Change CF
Remove CF...

To remove the CF card the button left-hand beside the slot has to be pressed.

The indication „Insert CF“ gives the order to insert a new CF card into the slot. The values of the next 15 minutes can be saved at the RAM before data losses occur (see also chapter 5.1).

Change CF
Insert CF...



**Do not insert the card into the slot forcibly!
Do not cant!**



In one of two possibilities the card must be inserted easily.

After insertion of the CF card this indication appears again after a short while:

Change CF
Press Key

To finish this menu item the switch has to be rotated.

Display Off

TROPOS can be switched from the *on-line mode* into the *standby mode* by pressing the push-/ rotary switch when this indication appears in the display:

Display off
Press Key

TROPOS keeps in the *standby mode* until the push-/ rotary switch is moved again.

Further indications

TROPOS is busy with saving and processing of data or settings when these kinds of indications appear.

Data Transfer
Wait...

TROPOS is blocked in these times for operations by the push-/ rotary switch.

Data Process
Wait...

4.4 Wiring of the TROPOS ports



Attention! Warranty losing!

Don't wire during connected power supply!

The supply voltage of TROPOS should be switched off before the next steps can be carried out.

An incorrect handling can destroy TROPOS and the warranty claim would be lost!

Notes for the correct cable connection are readable in the chapter 4.1.



You must pay attention to the correct wiring. Current- and measuring inputs (or supply- and signal inputs) must not be interchanged.

TROPOS or the sensors can be destroyed by incorrect handling. In this case the claim of warranty must be rejected!

At delivery TROPOS is unwired normally, if there was no other order.

Provided that the wiring operations of the power supply and the sensors have been finished according to the chapter 4.1 „**Configuration of TROPOS**“, the details are described in the following text.

The software configuration content has to be adjusted accordingly.

The wiring drawings of the factory-adjusted sensors are available after software installation on your hard disk in the directory: TROPOS_SEN_DOC.

An overview about the necessary documents can be shown and printed out within “TROPOS-Commander” under the menu item „Setup/ TROPOS configuration“ by the button **Print**.

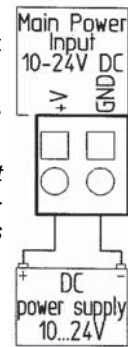
A schematic diagram about the inputs and outputs at TROPOS are shown in the **chapter 7, page 9**.

1) Connection of the power supply

• The “+” pole from a DC power supply unit has to be connected to (V+) port.

• The “-” pole from a DC power supply unit has to be connected to (GND) port.

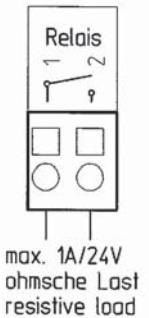
The DC voltage must be smoothed but not stabilised. The input is protected against incorrect polarity and temporary voltage peaks of approx. 30 V.



2) Connection of the relay

• The relay switches current of 1 A at max. 24 V with resistive loads.

• Avoid inductive loads to prevent arcing.



3) Connection of the RS485 interface

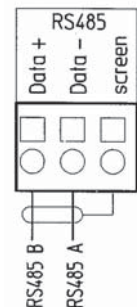
• **Data+** = RS485 B

• **Data-** = RS485 A

• **screen** = shielding of the cable

“screen” is not connected to the ground of the power supply!

• The communication interface RS 485 is an option. It is visible at the front plate of TROPOS in every case, but it is only working when really built-in.

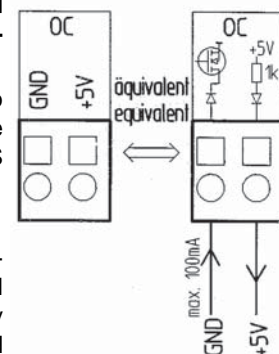


4) OC, Open Collector or Open-Drain output for output of precipitation pulses

• The (GND) port is connected to ground by a transistor switch. This output switches positive voltages up to 24 V to ground.

This output is not protected against overvoltage and overcurrent!

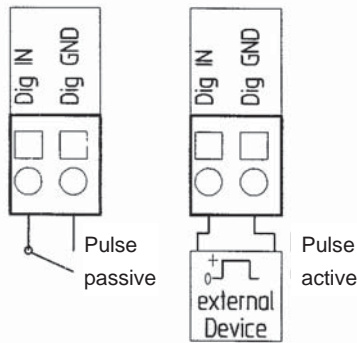
This line (OC/ GND) is used to send signals, together with the ground port of the TROPOS power supply.



• The (+5 V) output is permanently connected to the stabilised operating voltage of +5 V by means of a resistor of 1 kΩ and a polarity protection diode.

5) Connection of the digital input - reed contact for a precipitation sensor

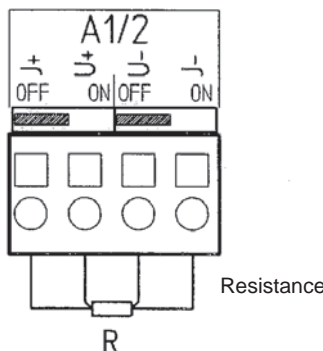
- A voltage of +5 V is permanently applied on the input (**Dig IN**) with a series resistor of 100 kΩ.
- The input (**Dig GND**) is connected to the ground via an inductor. The maximum current at this ground connection may be 100 mA.
- A pulse is counted, when the input (**Dig IN**) is actively or passively tied to ground potential.



Please note that the ports A1... A6 are adjusted by sliding switches to define the correct setting (see Table 1, page 8).

6) A1+A2 Resistive measurement by the 4-wire circuit

- The port (**J+**) is the respective connection to the constant current source of TROPOS. Connect the positive constant current terminal of the measured resistor to this port.
 - The port (**J-**) is connected to the ground potential of TROPOS. There the negative current of the measured resistance has to be applied.
- The ports (**U+**) and (**U-**) are differential measuring inputs.
- The positive voltage of the measured resistance has to be applied to the port (**U+**).
 - The negative voltage of the measured resistance has to be applied to the port (**U-**).

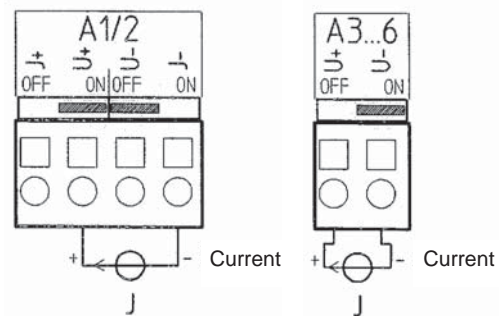


7) A1...A6 Measurement of current

- The currents are measured ground referred („single-ended“).
- The reference ground is the input ground on the ports (**J-**) at the channels **A1** and **A2** as well as the ports (**U-**) at the channels **A3...A8**.
- The „+“ pole of the power source has to be connected to the port (**U+**).
- The „-“ pole of the power source has to be connected to the port (**J-**) at the channels **A1** and **A2** as well as (**U-**) at the channels **A3...A8**.



The measuring resistor of TROPOS is switched on by the sliding switches of each channel. The current is measured as fall of voltage. The measuring resistor is not overload-protected! If the respective switch is not set correctly, the message “SWI-ERR” appears.



8) A1...A8 Measurement of voltage

- The voltages are measured ground referred („single-ended“).
- The reference ground is the input ground on the ports (**J-**) at the channels **A1** and **A2** as well as the ports (**U-**) at the channels **A3...A8**.

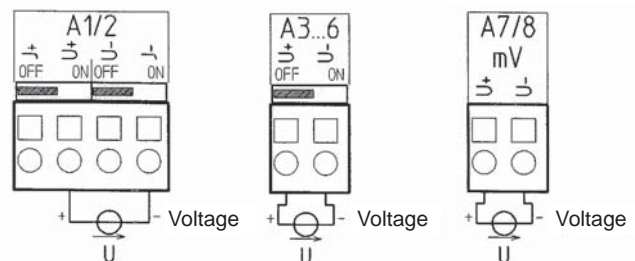


All ground ports have to be connected next to the ground port of TROPOS at one point (star-shaped). In this way measuring errors can be avoided.

Sensors with low output signals should be directly connected to the sensor power supply ports (switchable or permanent) of TROPOS. The same is recommended if there are high demands on the accuracy.



Sensor heatings must be connected at least by a separate ground line or completely separate. Thus the voltage drop of the high current line does not interfere with the signal line.



9) A1...A6 Measurement of voltages over +5 V

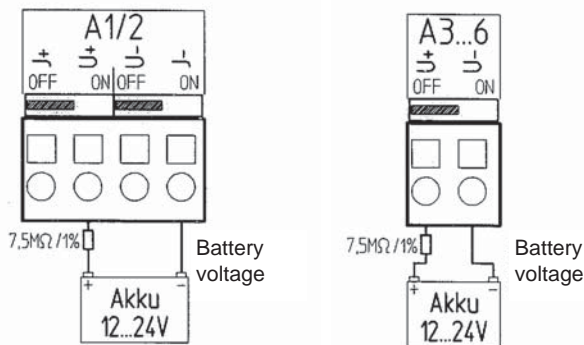
- The voltages up to +5 V can be measured directly.
- The voltages over +5 V can also be measured, e. g. measurement of the battery voltage of 12 V. Therefore an external series-resistor of 7.5 MΩ/ 1% (or closely tolerated) has to be assembled in front of the positive measuring input.

The internal protection diodes will be triggered by voltages over 30 V. Thus measurements of voltages over 30 V are not possible.



Attention:

The „+“ pole of the power supply unit **must not be connected** to the (U-) resp. (J-) ports! This ports are connected to the ground port. A short circuit can be the consequence.

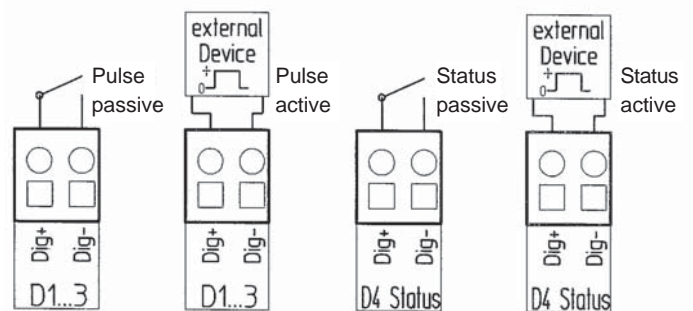


Incorrect polarities must be avoided during checking the battery voltage!

An incorrect handling can destroy TROPOS and the warranty would be lost!

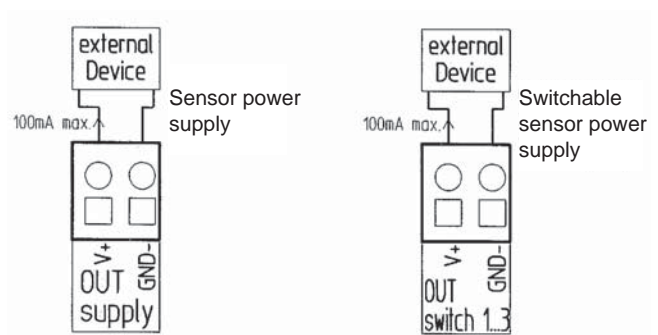
10) D1...D4 Digital measurements of frequencies, pulses or status

- The digital measuring inputs **D1...D4** work ground referred. The switching threshold is set to 2.5 V.
- Frequencies up to 4 kHz, pulses or status are measurable by the digital channels **D1...D3**. The maximum of the guaranteed input frequency is 4 kHz.
- The channel **D4** only measures status information (On/Off).
- An internal pull-up voltage of 4 V through 10 kΩ is present at each input. This makes the connection of sensors with a passive switch to ground easier.



11) switch1...switch3 - switching outputs and OUT supply

- The switching outputs (labelled **switch1...switch3**) switch the positive supply voltage of TROPOS.
- The ground ports next to the **switch** ports are connected to the ground of the supply unit through a choke. The output is protected by a self-resetting, thermal fuse.
- The maximum of the permanent current is 100 mA. The switching periods can be adjusted by the configuration software.
- Voltage is permanently applied at the output **OUT supply**.



Datenlogger / datalogger
TROPOS No. 00.95666.....





12) Channels and tolerances of measuring ranges

A	B	C	D	E	F
A1...A2	5 kΩ	± 4 Ω	0.08 %	-	OFF
A1...A2	2.5 kΩ	± 0.5 Ω	0.05 %	X	OFF
A1...A2	250 Ω	± 0.02 Ω	0.02 %	X	OFF
A1...A6	± 5 V	± 2 mV	0.04 %	-	OFF
A1...A6	± 1 V	± 0.5 mV	0.05 %	X	OFF
A1...A6	± 100 mV	± 0.1 mV	0.10 %	X	OFF
A1...A6	± 50 mV	± 0.02 mV	0.04 %	X	OFF
A7...A8	± 50 mV	± 0.02 mV	0.04 %	-	OFF
A1...A6	± 20 mA	± 0.02 mA	0.10 %	-	ON
D1...D3	4 kHz	± 2 Hz	0.05 %	-	-
D1...D4	status	switching threshold ± 50 mV	-	-	-
A1...A6	+ 10 V*	± 30 mV	0.30 %	-	OFF
A1...A6	+ 30 V**	± 100 mV	0.30 %	-	OFF

Table 1

* with external voltage divider... 1.5 MΩ

** with external voltage divider... 7.5 MΩ

A... Channel

B... Measuring range

C... Accuracy at 23 °C

D... Accuracy in %

E... Open channel recognition

F... Switch ON/ OFF

5 Measurement and evaluation

The measurements are carried out according to the configuration and settings (sensor signals, measuring intervals etc.), which are adjusted by the software "TROPOS-Commander" and transferred to TROPOS via RS 232.

5.1 The CF card

Please note:

Use only CF cards which are released by LAMBRECHT - with extended operating temperature range, industrial standard! The CF card is the central memory and should be removed only shortly (for max. 15 minutes) for data readout! Furthermore the operation without a CF card is an invalid operating mode.

A copy of the active configuration of TROPOS is saved on the CF card. If no configuration have done, the CF card contains the defaults station name **TROPOS** and station number **0001**. This actual configuration can be transferred to the PC via the button **Request CFG** at "TROPOS-Commander".

If you want to change or adjust your configuration of TROPOS by the software "TROPOS-Commander", first you have to save this setting and afterwards you have to transfer it to TROPOS via the button **Send CFG**.



Attention!

The function **Send CFG** may delete all data from the CF card!

Therefore you have to transfer all data from the CF card before using the function **Send CFG**.

The memory of the CF card is sufficient to save data of 1 year at least, if there are no reconfigurations or exchanges of the CF card.

During CF card exchange TROPOS saves the data of approx. 15 minutes on the RAM. Within this time period the CF card should be inserted again, to avoid data losses.

Exchange of the CF card see **chapter 4.3**.

5.2 Data transfer and evaluation

The evaluation of the measured values is beginning by using the software "TROPOS-Commander".

By different functions the measured values and results can be transferred to the PC. There the data are saved into CSV data files. By this way the data are available to processing, e.g. by Excel. The data transfer and evaluation can also be carried out by the software "MeteoWare" (option).

All measured values are saved according to the active configuration on the CF card and also temporary on the RAM of TROPOS. The data transfer is carried out by the software "TROPOS-Commander". At the menu item „Online“ different kinds of transfer functions can be selected, by which the measured values can be transferred.

Further notes are available in the on-line help of the software "TROPOS-Commander". The on-line help can be opened by using the key F1 on your keyboard for the active window.

6 Trouble-shooting

Message: TROPOS does not response.

(This message could appear only after 30...60 s!)

- Checking of the correct connection between TROPOS and PC by interface RS 232.
- Checking of the power supplies of both devices.
- Checking of the correct choice of the COM interface at the PC and the accordance of the baud rates.
- By click on the button **ID?** : Checking of the accordance between the station numbers and station names from TROPOS with the actively chosen configuration in the software "TROPOS-Commander".

The result of a data readout is a blank csv file: Check the settings of date and time in TROPOS, concerning the readout time interval in "TROPOS-Commander".

7 Dimensional and connection drawings

The TROPOS ports:

See also chapter „4.4 Wiring of the TROPOS ports“, page 5 ff.

- The ports named 1...5 are located on the data processing module left-hand, below.
- The ports labelled **A1...A7** are located on the data acquisition module(s) right-hand, below. **A8** is located right-hand, above.
- The digital ports labelled **D1...D3**, Status **D4** and the 4 sensor power supply outputs **OUT** are also located on the data acquisition module(s) right-hand, above.

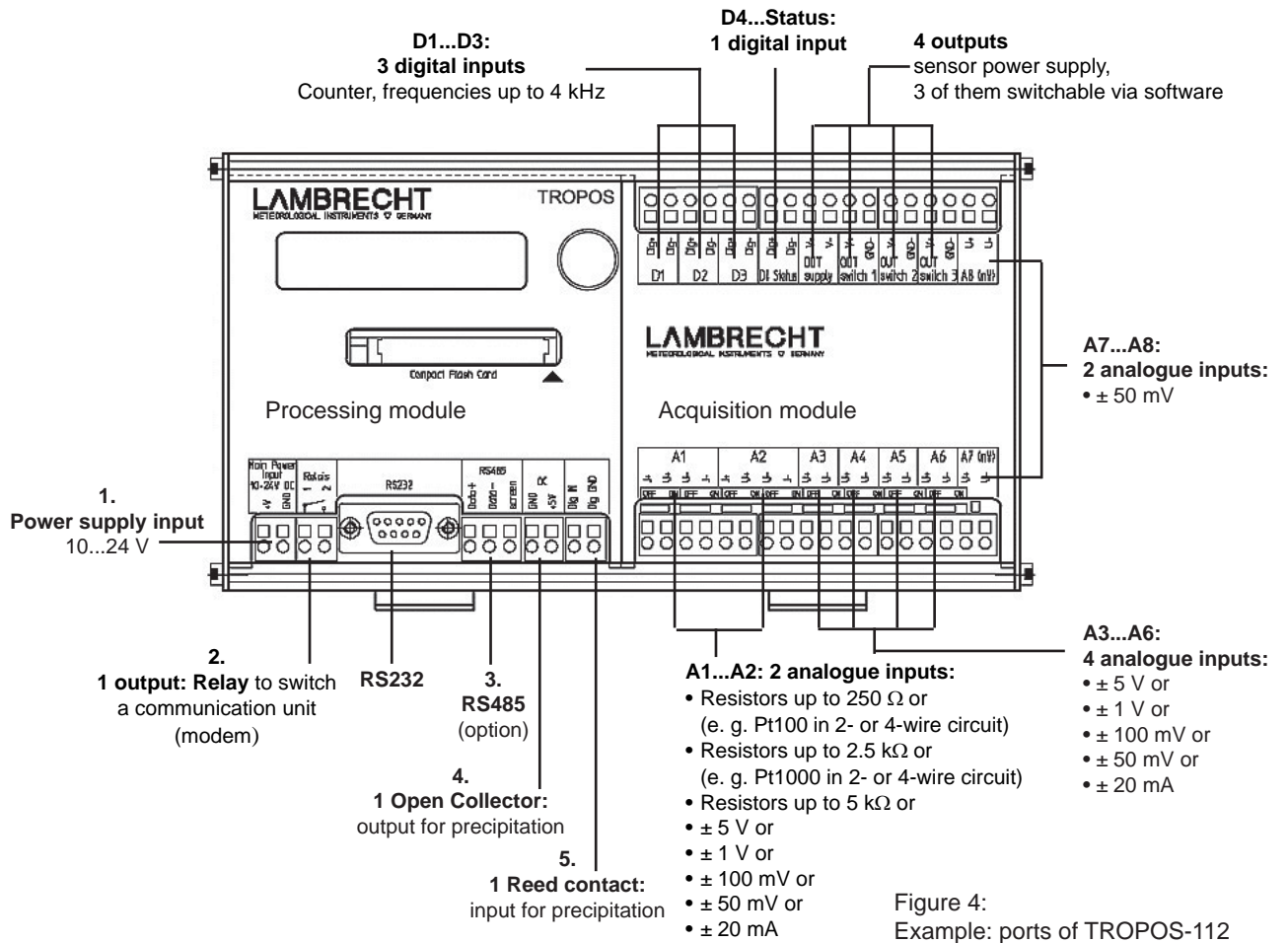
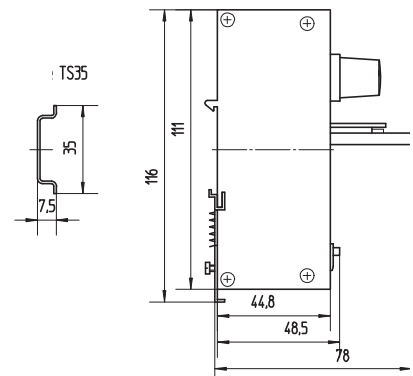
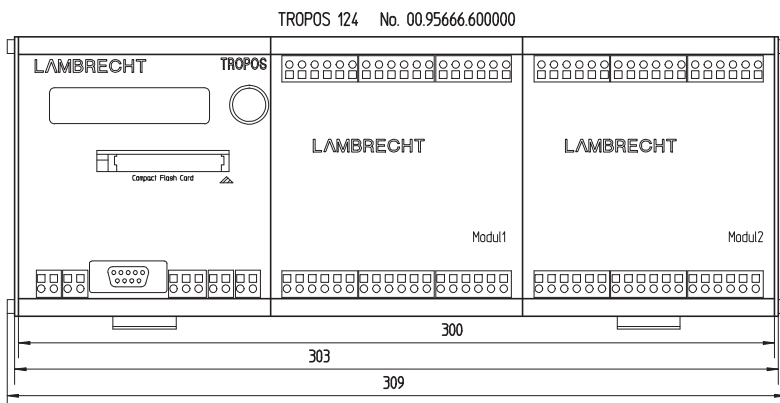
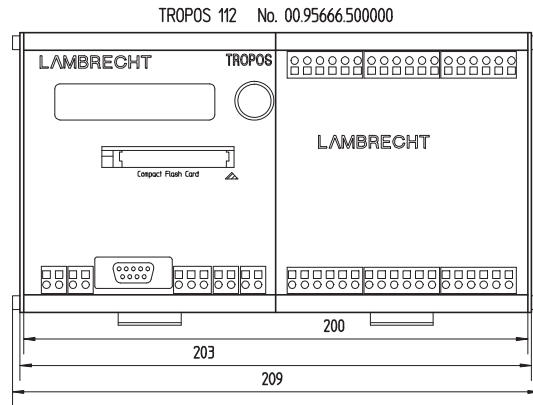
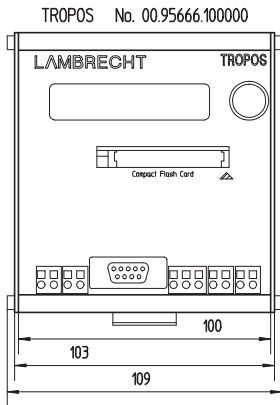


Figure 4:
Example: ports of TROPOS-112



8 TROPOS in the housing (examples)

Example 1: TROPOS-112 with mains voltage (unwired)



Example 2: TROPOS-112 with mains voltage and battery buffered (unwired)



Example 3: TROPOS-112 solar powered (unwired)



Example 4: TROPOS ground connection in the housing



9 TROPOS Module

Depending on order content and purpose the following modules can be connected to TROPOS:

Id-No.

Basis module "power supply"

TROPOS-PS/1 **32.95666.040 010**

Power supply standard (weight ~300 g)

100...240 V_{AC} / 24 V_{DC} / 2.5 A incl. fuses and distributor clamps

Add-on modules "power supply"

TROPOS-LF/OP **32.95666.040 050**

„Protected variety“ Line filter / overvoltage protection

for TROPOS-PS/1 (weight ~400 g)

TROPOS-CC1 **32.95666.040 060**

incl. charge control (weight ~200 g) and battery (weight ~6.5 kg) for

battery buffered operation for 17 Ah

(backup function UPS)

Basis modules "solar supply"

TROPOS-Solar/1 **32.95666.055 010**

Solar panel 20 W +

in the housing TROPOS-H integrated

solar battery for 17 Ah (weight ~6 kg)

TROPOS-Solar/2 **32.95666.055 020**

Solar panel 40 W +

in the housing TROPOS-H integrated

solar battery for 32 Ah (weight ~11 kg)

TROPOS-CC2 **32.95666.040 070**

Charge control (weight ~200 g) integrated in the housing

TROPOS-H for solar operation, using with TROPOS-Solar 1/2

Basis functions of data transfer

Compact Flash Card (CF card) **32.95666.021 000**

for mobile data transfer and for location-independent data evaluation;

range of application -40...+85 °C, industrial standard (1x incl. in the scope of delivery of TROPOS)

Add-on modules for data transfer

TROPOS-RS 485 (not for solar operation) **32.95666.053 000**

Data transfer up to min. 1200 m to a PC, hardware + mounting into TROPOS and software connection

*1) The visible interface RS 485 is usable only, when this position is ordered. The interfaces RS 232 and RS 485 are usable parallel, but not at the same time. A converter RS485/ RS232 is necessary PC-sided. This item is not included in this position.

Options

TROPOS-RS485/OP Overvoltage protection **32.95666.053 010**

Converter RS485/ RS232 (PC-sided) **00.90249.200 000**

Further options

GSM modem quad band **32.95666.057 000**

Incl. antenna with magnetical stand, power cable and mounting materials

Mounting into TROPOS-H^{*2)} or External installation ^{*3)}

Telephone modem **32.95666.051 000**

Incl. mounting materials

for use together with power supply units (not solar). An overvoltage protection for the telephone line is generally recommended, but not included in this position.

Mounting into TROPOS-H^{*2)} or External installation ^{*3)}



Option

Telephone junction box 32.95666.041 010
with overvoltage protection for the modem

Radio modem 32.95666.052 000
for short distances within the license-free frequency range of 868...870 MHz, for transfer distances up to 300 m and with clear visibility up to 3000 m; incl. antenna with 3 m cable and mounting materials
*Mounting into TROPOS-H^{*2)} or External installation ^{*3)}*

Option

Radio modem 32.95666.052 000
for the receiver side, at 24 V connection
for external installation ^{*3)}

Data evaluation

**Add-on module evaluation software
METEOWARE...** 36.09337.000 000
PC evaluation software for 1 station
• Graphic and tabular diagrams

• Data export formats ASCII, Excel, xbase, CSV

Options

- Network versions for up to 999 users (floating license)
- Multi-station version for up to 999 stations
- Wind statistics
- Data transfer as Windows System Service

Accessories

Basis modules of mechanics

TROPOS-H (housing) 32.95666.030 000
Weather proof steel panel housing for mounting of TROPOS and different modules, incl. radiation shelter
Dimensions approx. 380 x 380 x 210 mm, Weight approx. 10 kg (without shelter)

Option

TROPOS-MH 32.95666.032 000
Mast holder for TROPOS-H
for pipe Ø 40...80 mm

Services

Basis modules installations and pre-configuration

TROPOS-Installation 1 97.95666.000 001
Mounting and assembling of TROPOS together with basis module "power supply" into the housing TROPOS-H

TROPOS-Installation 2 97.95666.000 002
Mounting and assembling of TROPOS together with basis module "power supply" with add-on modules or basis module "solar supply" with or without add-on modules into TROPOS-H

TROPOS-Installation 3 97.95666.000 003
Pre-configuration of the TROPOS system
Note: The TROPOS system is basically designed for easy configuration via software by users.

^{*2)} The mounting into TROPOS-H depends on the respective system configuration. If the mounting is possible, the *TROPOS-Installation 2* is necessary.

^{*3)} At external installations additional accessories or assembly works could be necessary (cables, wirings, protective devices etc.). These specific plannings and calculations have to be carry out within the project offer and are not included in this position.

10 Safety instructions

This system is designed according to the state-of-the-art accepted safety regulations. However, please note the following rules:

1. Before setting into operation, please read all appropriate manuals!
2. Please take notice of internal and state-specific guidelines and/or rules for the prevention of accidents (e.g. the professional association). If necessary ask your responsible safety representative.
3. Use the system according to the manual's regulations only.
4. Always leave the manual at hand at the place of work of the system.
5. Use the system in technically correct conditions only! You have to eliminate influences immediately, which impair the security .
6. Use the delivered power supply only!
7. Please note the loss of warranty and non-liability by unauthorized manipulation of the system. You need a written permission of the LAMBRECHT meteo GmbH for changes of system components. These activities must be operated by a qualified technician.
8. Prevent the ingress of liquids into the devices.

11 Warranty

Please note the loss of warranty and non-liability by unauthorised manipulation of the system. You need a written permission from LAMBRECHT meteo GmbH for changes of system components. These activities must be operated by a qualified technician.

The warranty does not cover:

1. Mechanical damages caused by external impacts (e. g. icefall, rockfall, vandalism).
2. Impacts or damages caused by over-voltages or electromagnetic fields which are beyond the standards and specifications in the technical data.
3. Damages caused by improper handling, e. g. by wrong tools, incorrect installation, incorrect electrical installation (false polarity) etc.
4. Damages which are caused by using the device beyond the specified operation conditions.



12 Technical data

TROPOS-112

Id-No. 00.95666.500 000

with a processing module and an acquisition module for up to 1+12 sensors



Range of application: -30...+60°C • 0...100% r. h. • no condensing • battery -20...+60°C

Supply voltage: 10...24 V_{DC} ± 2 V

Power consumption: Depending on the configuration:
~ 0.5 W (12 V) (solar powered)
~ 0.7 W (12 V) (mains powered)

Meas. ranges: Depending on sensors - see Table 1, p. 8

1+12 Signal inputs: (see page 9)

- 1 Reed* Precipitation channel
- 8 analogue 2 of them as Pt 100 · resistor · voltage- or current inputs • 4 of them as voltage- or current inputs • 2 of them as voltage inputs
- 4 digital 3 of them as counter or for frequencies • 1 input for status

6 outputs:

- 4 outputs For sensor power supply • 3 of them switchable via software
- 1 Relay For switching of a communication unit (modem)
- 1 OC* Open Collector for the output of precipitation pulses

Virtual channels: Configurable

Measuring interval: Easy adjustable per channel • 1/ 10/ 30/ 60 s

Average value interval: Easy adjustable 1...60 min

Extreme values: For each average value interval, wind peaks per minute

Ring buffer: For 1 year

Memory: Compact Flash card (CF card)

Display: Easy to read • 2-lines • 16 characters

Operation: Via software "TROPOS-Commander" configurable • via push-/ rotary button easy operated

Data transfer: Mobile and wireless via CF card • With cable via interface RS232 or optional via GSM- • telephone- • radio modem • RS485

Data evaluation: PC evaluation software „MeteoWare ...“ (option)

Data format: LAMBRECHT proprietary, suitable for ASCII export and Excel compatible

Interfaces: RS232 • optional RS 485
Dimensions: See **Dimensional drawings, page 9**
Protection class: IP 23
Weight: Approx. 0.8 kg
Standards: Construction- and Low voltage standards: 72/23 EWG and VDE 0100
Stability DIN EN 61000-6-1
Emitted interference DIN EN 61000-6-4

Varieties

TROPOS-124

Id-No. 00.95666.600 000

like TROPOS-112, but with two acquisition modules for up to 1+24 sensors.



Power consumption depending on the configuration:
~ 0.9 W (12 V) (solar powered)
~ 1.2 W (12 V) (mains powered)

In-/ outputs: 2 acquisition modules, thus 1+ 2x12

Weight: Approx. 1.2 kg

TROPOS-100 - Precipitation-Data logger

Id-No. 00.95666.100 000

like TROPOS-112, but without any acquisition module and its functions and only one processing module.



Power consumption depending on the configuration, e.g.
At 10 minutes average ~ 0.036 W (12 V)

At 1 minute average ~ 0.12 W (12 V)

In-/ outputs* 1 Reed contact for precipitation events • 1 Open Collector

Weight: Approx. 0.4 kg

* These inputs or outputs are located on the data processing module, all others on the respective data acquisition modules.



Quality System certified by DQS according to DIN EN ISO 9001:2008 Reg. No. 003748 QM08