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TarCom 01 datalogger

1. Applications

The TarCom is used as datalogger and PC interface for all Tarom and PowerTarom systemmanagers. It stores up to 8000 data sets with all the systemparameters as voltage, currents, state of charge and system status. Additionally you can use the analog input of the TarCom to trace radiation data. The alarm output switches exactly at the limits predefined by the user. A detailed system analysis can be done with the included PC-program.

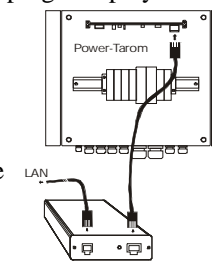
All necessary cables are included, the complete installation is just plug and play.

2. Installation

a. cabling

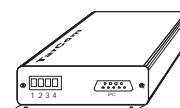
Connect the TarCom-Logger with the Tarom-Regulator via the attached patch cable. The green LED at the logger will blink once every minute to indicate the correct data transfer from the Tarom regulator.

See chapter 'Ethernet operation' for connection to your network.

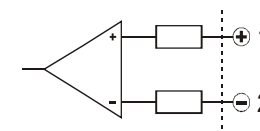


connecting the TarCom logger with the PowerTarom

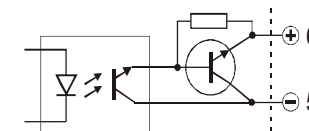
b. terminals



terminals: sensor and alrm



analog input, 0..150 mV



potential free alarm contact

The sensor input and alarm output terminals are on the green plug as indicated.

The high impedance analog input can be used to attach a radiation sensor to the data logger. Any voltage source from 0 .. 150 mV can be logged together with the Tarom regulator data. The input range is calibrated in our factory but you can readjust these range via the PC program under menu options/calibration.

The potential free alarm relays inside the TarCom is realized by an opto coupler and a transistor with the collector on terminal 6 (+) and the emitter on terminal 5 (-). The transistor is able to switch maximal 50V and 50 mA.

The alarm switches only when the TarCom logger receives data from the Tarom regulator (ca. each minute).

3. PC-program

a. installation

The program setup for *TarCom* for windows is done from the included Diskette. The program runs under windows 98 and newer. The installation is completely automatic, just double click on the setup icon in the diskette directory.

To start the program double click the TarCom icon on your desktop.

Use the menu file/interface/automatic to connect the TarCom program with the logger.

Pressing the F1 key any time will help you by using this software.

b. overview

TarCom for windows offers you a lot of features to get most of your data logger.

Choose menu help/contents to get the first help screen. Use all the links to read more about these topics:

- configure the data storage parameters
- configure the alarm settings
- read, edit and visualize the data from the TarCom datalogger
- store all the logger data on the hard drive or on a diskette
- export the data to an excel sheet
- continuously display the system data on the PC in an extra window

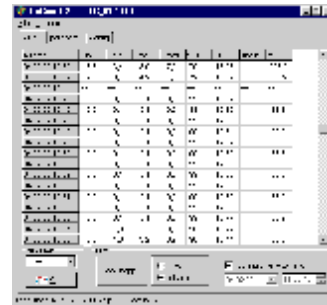
c. data table

All collected data from the logger is displayed in a table. These data sets can be stored to a file, exported to an EXCEL sheet or visualized in a chart (see below).

To reduce the shown data you can reduce the displayed amount of sets by calculating averaged values over a chosen period of time.

To find the minimum or maximum values of each column all sets can be sorted in an ascending or descending order.

After selecting subsets of rows you can copy them to the clipboard or delete them.



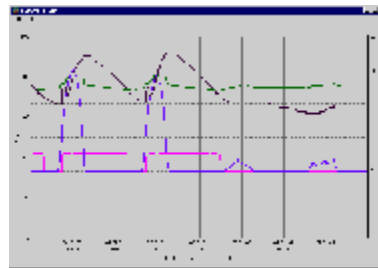
Data table

d. charts

To visualize all your collected data the program offers a powerful charting possibility. Displays the actual data table in a line chart. You can modify the chart in several ways:

- resize the whole chart window
- switch on or off every serie: the 4 currents, 2 voltages, SOC and status information. See menu view/ view lines.
- you can shift the time axis by clicking the right mouse button and pull it in any direction.
- you can zoom in by clicking

the left mouse button on the top left and pulling to the bottom right point of the zooming rectangle. Unzoom by drawing a rectangle down to up or with the view menu unzoom.



data visualization

- click with the left mouse button on a colored line: the data table of the main window shows you the corresponding data set.
- you can copy the chart to the clipboard, in a file or print it.
- the scaling can be modified by the user or automatic, see view/scaling
- pressing the D,W,M key will limit the chart to a single day, week or month.

e. logging parameters

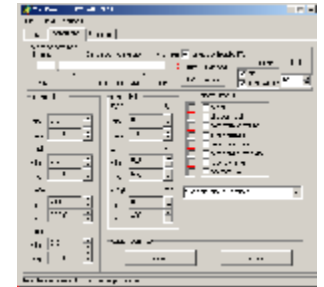
Please check after the installation whether you have predefined the right time between single data storage (logging frequency).

To check the actual parameter setting of the TarCom logger click on the get logger parameters button.

For demonstration use you can switch on the direct output option. In this mode all the TarCom data will be transmitted directly to the PC. This will happen every minute. The internal data logging is not stopped in this mode. If you need the alarm signalization just pick out one predefined alarm example and modify only the necessary parameters. All irrelevant limits have a gray background.

Click the “store” button to transfer all changed parameters to the logger.

The option “direct output to PC” can be used to store all incoming data on the hard disk. The number of data sets can be defined by you, each new files can get an individual name with a date and time stamp.



f. system analysis

A quick but detailed overview of your solar system can be done by this diagram. The efficiency of your module output and the usage of your battery can be seen at a glance. The maximum load current and the duration of any deep discharge protection is mentioned, too.

The current flow from the module on the left side goes to the battery (charging current I in), directly to the load output or could be discarded in the case the battery charging is limited.

This analysis can be done with the complete data set or only a distinct selection in the data table.

Click menu view\system analysis to start.



system analysis

4. Ethernet configuration

Requirements: To run the ethernet module you need Windows NT, 2000, or XP as operating system. The local area network (LAN) with TCP/IP must be running prior

to this installation. Some function will only work if you are logged in as administrator.

The TarCom ethernet logger can be used in a local area network (LAN) far away from the PC with the TarCom.exe program running.

The ethernet module in your TarCom logger communicates via its individual IP-address with the remotely running TarCom program.

1.. You need a running Windows network under Windows XP/NT/2000.

2. Open your TarCom program and change to the "Ethernet" tab. (Make sure that this tab is activated under menu options/settings/ethernet)

3. Connect your TarCom ethernet module to your LAN network:

At first you have to define an individual IP-address for your TarCom ethernet module. Use the private range numbers like 192.168.0.x or 10.10.x.y . Replace x/y by a number between 0..255. The default address is 192.168.0.77, Port 1234 .

4. The IP-address has to be stored in the TarCom ETN under "new IP settings".

If you know the actually active IP address of the module (see the factory label) you can do this using the "via LAN" button. Or you attach a serial cable (included) to your PC and the TarCom ETN, switch to "RS232 configuration" and do the new settings via the serial interface. Don't forget to switch to "ethernet operation" after configuration.

5. The IP-address has to be linked to the MAC number of your ethernet module (see the label on the TarCom case)

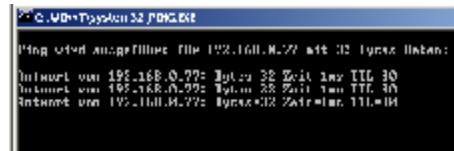
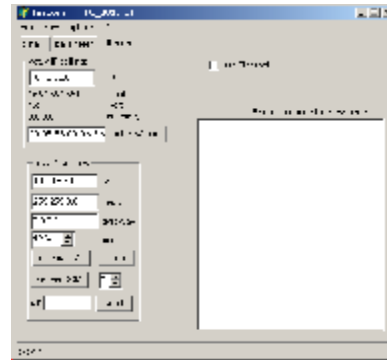
- Connect your TarCom module with the Tarom regulator and check whether the green LED blinks once during start.

- Plug in the ethernet connection cable between TarCom and your network router.

- Press button "set MAC address". A new window opens and informs you about the connection. The PC calls the TarCom module via ARP.EXE and PING.EXE and reports the answers. Check if there are no error messages in this screen.

6. Activate the communication between your PC and the logger by checking the box "use ethernet". After the logger activation you can use the TarCom program as usually.

7. All settings will stay permanently in your windows system, even after a restart.



PING.EXE

8. Operation

a. data collection

The logger records all important system parameters and an additional analog input:

system parameter	range	resolution
relative time	0..255 min	1 sec
total charge current	0 .. +300A	0.1A
load current	0 .. +300A	0.1A
battery current	-300 .. +300A	0.1A
solar module current	0 .. +300A	0.1A
state of charge	0 .. 99%	1 %
battery voltage	0 .. 65.5V	0.01V
status flags	Night, load Disconnect, over-Temperature, Over-voltage, Low voltage, over-Current load, no Module	on/off
analog input	0 .. 150mV	0.1mV

After connection to the Tarom regulator the logger starts to collect data. The Tarom sends each minute the actual system values to the logger. Depending on the defined logging frequency all values collected during one period are used to calculate the average which will be stored. Only the status flags (night, overload ..) will not be averaged. If they occur at least once during the collecting period they will stay on until the end of this period.

If all 8176 data sets are completely used, the TarCom logger overwrites the oldest data again (circular storage). With this method you have always the newest data of the actual logging period available.

interval	logging capacity
2 min	11 days
4 min	22 days
8 min	1.5 month
16 min	3 months
32 min	6 months
64 min	1 year
128 min	2 years
256 min	4 years

b. alarm programming

The TarCom logger checks every minute whether the system parameters are within the alarm limits predefined by the user. Via the PC program all possible ranges are as

follows:

parameter	possible range
Load current	min/max: 0 .. +300A
Charge current	min/max: 0 .. +300A
Battery current	min/max: -300 .. +300A
Module curren	min/max: 0 .. +300A
Battery voltage	min/max: 0V .. 65.5V
SOC, state of charge	min/max: 0..99%
analog input	min/max: 0 .. 150mV
Status: night, load disconnected, low/over voltage, over load,over temp., over current module, no module.	to be checked or ignored

If one or more of this parameter is outside the given ranges the alarm contact will be closed. If one or more of the status flags is on and the user checked the equivalent box the alarm will be set, too. If you are observing the actual system data with the direct output option on the PC will display the alarm message, too.

If you want to check only one value you have to set the limits for all other parameters to the min/max value.

Example: You want to be alarmed if the voltage runs under 11 Volt or over 15 Volt. Open in the TarCom program the parameter page and set the voltage range to this values, set all current values to min. -320 and max +320A, set the SOC min/max to 0/99, the analog input min/max to 0/5000 and disable all status checkboxes. Store the parameters to the logger.

9. Warranty

The manufacturer will remove all construction and material faults that occur during the warranty time of two years and that do not impair the proper functioning of the device. Guarantee is effected by either rectification or replacement This does not include the costs involved in exchanging, dispatching or re-installing. Any further claims against the manufacturer arising from this obligation, particularly compensation claims due to losses in sales, reimbursement payments as well as indirect damages are excluded if not forced by law.

10. Technical data

system voltages via Tarom regulator	12, 24, 48V
min./max. battery voltage	8 V / 65V
logging intervals	2, 4, 8, 16 .. 256 min
memory size	8176 data sets
own consumption	40mA @ 12V
sensor input range	0 ..150 mV
max. current alarm relays	50mA, 50V
ambient temperature	-15...+50°C
protection	IP 22
case	aluminium
dimensions, weight	130 x 80 x 30 mm, 180 g

TarCom ethernet shipment list:

- TarCom data logger incl. plug for terminals 1..4 (green)
- patch cable (black) (TarCom -> Tarom regulator)
- adapter RJ45-6 to RJ45-8 (ethernet module -> LAN)
- serial cable for RS232
- diskette with TarCom for windows driver software
- this manual

TarCom type overview:

- TarCom 01 data logger
- TarCom RM data logger with modem for phone line
- TarCom GSM data logger with GSM-modem Dual Band 900/1800 MHz (not for the 1900 MHz band in USA/Canada)