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Com4point
for Data Transfer
User Manual
Version 1.0

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Content

1 Menu

The program *com4point* is developed especially for data transfer between the resistivity meter *4point* and a host computer. The meter must be connected to the PC via the serial interface (RS232).

Data transfer is possible
- from the meter to the PC (e.g. measurement data) and
- from the PC to the instrument (e.g. parameter sets)

After starting the program *com4point* you will see on the screen:
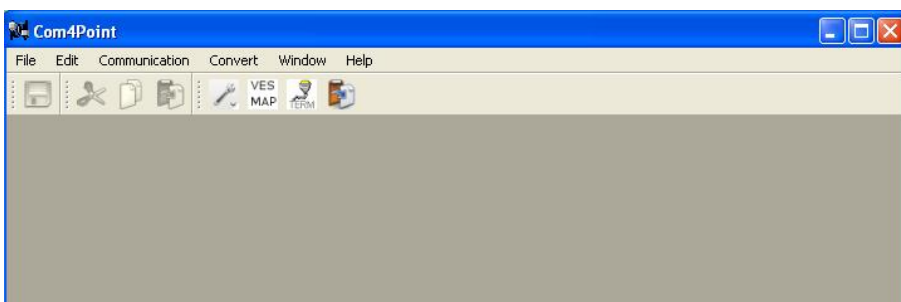

Fig. 1.1: Main window of *com4point*

ICON BAR:

Save data:

SAVE

Edit a data set with:

CUT

COPY

PASTE

Data transfer:

SETTINGS, set parameters for data transfer

VES
MAP   RECEIVE VES or MAPPING data

TERM   TERMINAL, transfer of Monitoring or Tomography data

Data conversion

 CONVERT, VES data are converted to IPIWIN format

1.1   File

Click ´File` in the menu bar and you have the options

- SAVE data and
- EXIT *com4point* .

1.2   Edit

This menu item allows you to edit your data sets with

- CUT
- COPY or
- PASTE .

1.3   Communication

1.3.1   Settings

Under ´Settings` the parameters for data transfer are set.

You can select

- the transfer mode (ASCII or binary)
- the baud rate (transfer rate) and
- the port (serial interface COM 1 to COM 10)
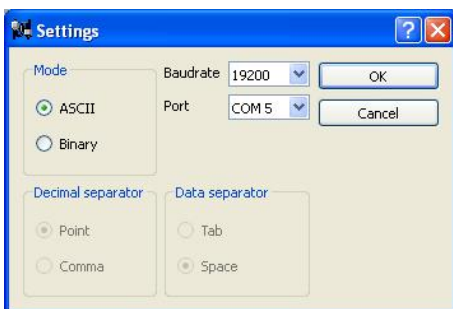

Fig. 1.2: ´Settings` – Set transfer parameters

If data transfer is performed in ASCII mode, decimal and data separators are to be set on the meter. If data transfer is performed in binary mode (Mapping or VES data), the measurement data

are converted into ASCII format on the PC. In this case you have to set the separators in the *com4point* menu `Settings`.

Note: Make sure, that the interface parameters `Mode` and `Baudrate` of the program *com4point* and the resistivity meter match (see Operating instructions of *4point light hp*, ´Settings` ´Communication` ´Serial`)!!

1.3.2   Receive VES/Mapping

The menu item ´Receive VES/MAPPING` is specially designed for the transfer of VES or Mapping data from the instrument to the PC

Transfer in ASCII or binary format is possible. The required parameters are set under `Settings` (see chapter 1.3.1). For large data sets choose the binary format, because the transfer rate is much higher than in ASCII mode.
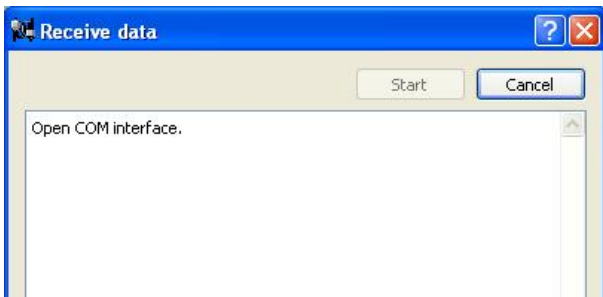
Fig. 1.3: ´Receive data`

First, you have to **activate the receive mode on the host computer** with the ´Start` button. If the PC is ready to receive you see on the screen:
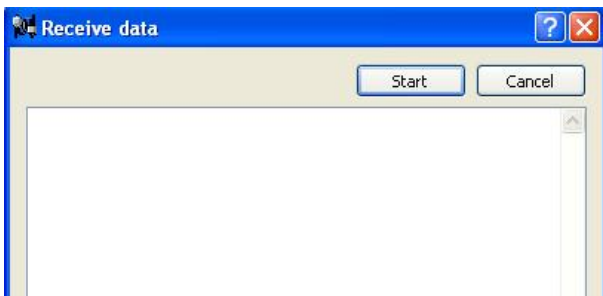
Fig. 1.4: ´Receive data` – PC is ready to receive Mapping and/or VES data

Start the data transfer on the instrument in menu ´VES` resp. ´Mapping` ´Output` ´Single file` or ´All files`.

VES OUTPUT	
Single File	a single file is transmitted
All Files	all measured files are transmitted

Fig. 1.5: Example: VES data transfer to the PC

1.3.2.1   Transfer of a Single File

- Selection of ´**Single File`** **in VES mode** shows:

```
    VES OUTPUT
SCHLUMB HALF-SCHLUMB
WENNER DIPOL-DIPOL
POLE-POLE
```
VES measuring modes

Fig. 1.6: Data transfer – Select acquisition mode

Select the data acquisition mode (e.g. `Schlumb`) and then the number of the desired file:

```
SCHLUMBERGER
File No: 0      (0..99)
Rec: 3
17.12.2009  09:26:26
```
file number (select with <UP>/<DOWN>)
number of measured records
date/time of file creation

Fig. 1.7: Output of a single file – Schlumberger mode

Data transfer is started with <RET>.

- Selection of ´**Single File`** **in Mapping mode** shows:

```
Standard mapping
File No: 0      (0..99)
Rec: 3
17.12.2009  09:26:26
```
file number (select with <UP>/<DOWN>)
number of measured records
date/time of creation of this file

Fig. 1.8: Data transfer of a single file

Select the desired file number and start the data transfer with <RET>.

- Selection of ´**Single File`** **in Multimapping mode** shows:

```
Multi-Mapping
File No: 0      (0..99)


17.12.2009  09:26:26
```
file number (select with <UP>/<DOWN>)

date/time of the creation of this file

Fig. 1.9: Data transfer of a single file

Select the desired file number and start the data transfer with <RET>.

1.3.2.2   Transfer of All Files

Select ´All Files`. The data transfer to the host starts immediately.

If data transfer has finished, you will see on the PC screen:
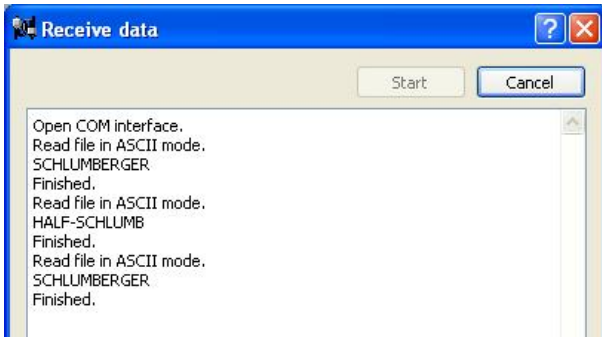
Fig. 1.10: ´Receive data` – data transfer is finished

Leave the dialog with ´Cancel`.
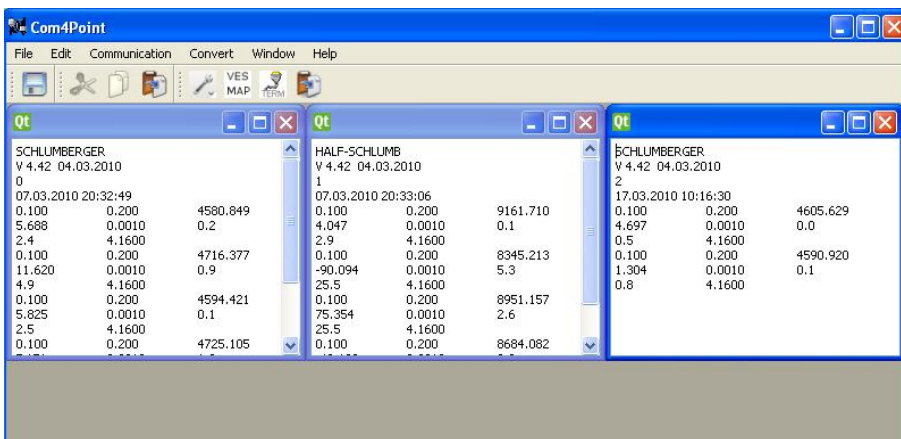
Fig. 1.11: Measurement files in separate windows

Each file is shown in a separate window. You have to save the files one by one under the menu item ´File` ´Save`(see chapter 1.1). You can edit or process the stored data (ASCII format) with an editor or an evaluation program

1.3.3   Terminal

For data exchange between the host computer and the instrument as it is required for monitoring and tomography measurements, use the menu ´Terminal`

It is possible to

- **upload parameter files** from the host computer to the meter and
- to **download measurement data** to the PC

Select ´Terminal` and you will see:

Fig. 1.12: ´Terminal` – Transfer of Monitoring and Tomography data

1.3.3.1   Transferring Parameter Sets from the Host to the Instrument

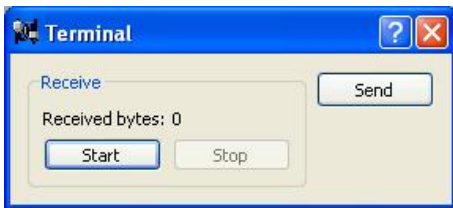For transfer of parameter sets the instrument must be ready to receive. Select the option ´Load` in the Tomography or Monitoring menu resp. and assign a number to the parameter set you wish to load.

```
Receive Parameter
Parameter set: 2


Empty!
```

select a number for the parameter set with <UP>/<DOWN>

memory must be empty!

Fig. 1.13: Load parameter

Note: The instrument can save 10 different parameter sets. You have to number them (0 to 9). If the number is already in use, you have to select another one. To receive new data the selected parameter set has to be empty. Old data cannot be overwritten.

Confirm your changes with <RET>. **Now the meter is ready to receive!**

```
Receive Parameter
Parameter set: 2
Ready for data....
```

the meter waits for a parameter set
to be downloaded via its serial interface*

Fig. 1.14: Load parameter vial serial interface

*!!!Take care that the COM settings ´Mode` and `Baudrate` in both the meter and the PC are identical (see Chapter 1.3.1 ´Communication` ´Settings` and *4point light hp* Operating Instructions ´Settings` ´Communication` ´Serial`)!!!
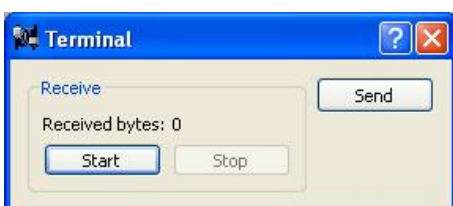
Switch to the **PC**:

Fig. 1.15: ´Terminal` – Transfer of parameter sets with ´Send`

Press ´Send` in the program *com4point* and select the parameter set you wish to send. Start data transfer with ´Open` on the PC.

If the data transfer was successful, **the meter shows**:

```
Receive Parameter
Parameter set: 2
Header ok.....
Finshed!   150 sets
```
number of electrode combinations

Fig. 1.16: Data transfer is finished

Press <RET> or <ESC> on the meter to continue.

Examples for the structure of parameter sets can be found in the appendix.

1.3.3.2   Upload Measurement Data to the Host

To upload measurement data from the instrument to the host computer select the option ´Receive` `Start` in the menu item ´Terminal` of the program *com4point*. **Now your PC is ready to receive**.
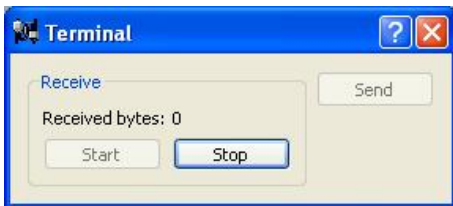
Fig. 1.17: ´Terminal` – PC is ready to receive (the button ´Start` is deactivated)

Start the data transfer **on the meter** by selecting ´Output` in the Tomography or Monitoring mode

```
Output monitoring
File: 3


13.10.2008  15:04:05
```
select file number with <UP>/<DOWN>

date / time of file creation

Fig. 1.18: Monitoring ´Output` – select a file number

Select a file number and start the data transfer with <RET>. Pressing <ESC> cancels the action.

During data transfer the **display of the meter** shows:

```
Output monitoring
Please wait...
```

Fig. 1.19: Monitoring ´Output` – data transfer is running

On your PC screen you can follow the received bytes. As soon as this value remains constant, transfer has finished.
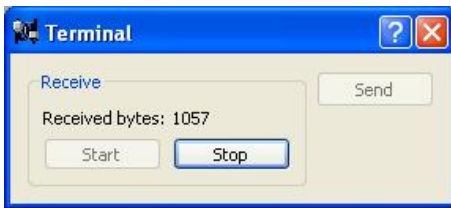
Fig. 1.20: ´Terminal` – Data transfer has finished

Click ´Stop` and save the data under a relevant name on your PC

1.4   Convert

The menu ´Convert` allows the conversion of VES data from ASCII to IPIWIN format
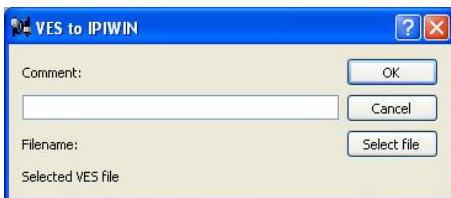
Fig. 1.21: ´Convert` – Convert VES data to IPIWIN format

- type a short comment into the comment line
- press ´Select file` and choose the file to be converted
- start conversion with `OK`

The program saves the converted file (extension .dtg) in the same directory as the source file.

An example of a converted file can be found in the appendix.

1.5   Window

Each file is opened in a separate window. The menu item ´Window` allows the arrangement of these windows. The windows can be

- tiled (´tile`)
- cascaded (´cascade`)
- passed through step by step (´next` or ´previous`)
- closed individually or collectively (´close` / ´close all`)

2 Data Transfer – Brief Instruction

2.1 Data Transfer to the PC

- Start the program *com4point* **on your PC**
- Switch on the **resistivity meter**
- **Set** the **necessary parameters** for data transfer **on the meter** under ´Settings` `Communication` ´Serial`: the **baud rate** and (if data transfer is carried out in ASCII mode) the **separators** (point/comma, TAB/space). For further details see the *4point light hp* Operating Instructions. **Note:** *com4point* also allows you to transfer Mapping and VES data in binary format. Especially for large mapping arrays this might be advantageous because the rate of transfer in binary mode is much higher than in ASCII mode.
- Make sure that the **required parameters** (transfer mode, baud rate) **of the program *com4point* and the meter match**. Select the correct COM port on the PC. If binary mode is chosen, decimal and data separators are to be set on the PC.

2.1.1 Transfer of VES or Mapping Data

- **Activate the receive mode on your PC** under ´Communication` ´Receive VES/Mapping` with ´Start`.
- **Start transfer** of the selected file **on the meter** under the menu item ´Output` in the according measuring mode (VES, Mapping, Multimapping)

2.1.2 Transfer of Monitoring or Tomography Data

- **Activate the receive mode on your PC** under ´Communication` `Terminal` with ´Start`.
- **Start transfer** of the selected file **on the meter** under the menu item `Output` in the according measuring mode (Tomography, Monitoring).

2.2 Data Transfer to the Instrument

2.2.1 Transfer of Parameter Sets

- Start the program *com4point* on your PC
- Switch on the meter
- **Set** the **necessary parameters** for data transfer **on the meter** under ´Settings` `Communication` ´Serial`: **the baud rate** and **the separators** (point/comma, TAB/space). For further details see the *4point light hp* Operating Instructions. **Note:** Make sure that the serial interface settings of the meter and the program *com4point* match.
- Select ´Load` in the according measuring mode (Tomography or Monitoring) **on the meter**, Assign a number for the parameter set to be loaded and activate the receive mode with <RET>.
- **Start data transfer on the PC** in the program *com4point* under ´Communication` `Terminal` ´Send`.

3 Appendix

3.1 Examples of Parameter Files

3.1.1   Monitoring – Parameter List

```
S                                     * start
test data                             * commentary string (max. 20 characters)
1                                     * frequency (siehe Fehler! Verweisquelle konnte nicht
gefunden werden.)
0.123                                 * min. voltage [mV]
99                                    * max. number of averages (0..99)
3.5                                   * error limit [%]
0                                     * type of measurement (see Tab. 3.2)
1.000                                 * electrode separation [m]
0.000                                 * profile position of first electrode [m]
1 12                                  * first and last electrode used
1 20 1 21 40 1 51 75 0                * chain segment electrode numbers used/unused
1 4 2 3                               * electrode configurations (A,B,M,N)
2 5 3 4
3 6 4 5
4 7 5 6
5 8 6 7
6 9 7 8
7 10 8 9
8 11 9 10
9 12 10 11
1 7 3 5
2 8 4 6
3 9 5 7
4 10 6 8
5 11 7 9
6 12 8 10
1 10 4 7
2 11 5 8
3 12 6 9
E                                     * end of parameter set
```

Fig. 3.1: Parameter list ´Monitoring`

3.1.2   Tomography – Parameter List

```
S                       * start
test data               * comment
1                       * frequency code (see Tab. 3.1)
0.123                   * min. Voltage [mV]
99                      * max. number of averages (1..99)
3.5                     * error limit [%]
0                       * type of measurement (see Tab. 3.2)
1.000                   * electrode separation [m]
0.000                   * profile position of first electrode [m]
1 12                    * first and last electrode used
1 20 1 21 40 1 51 75 0  * chain segment electrode numbers used/unused
1 4 2 3                 * electrode combinations
```

```
2 5 3 4
3 6 4 5
4 7 5 6
5 8 6 7
6 9 7 8
7 10 8 9
8 11 9 10
9 12 10 11
1 7 3 5
2 8 4 6
3 9 5 7
4 10 6 8
5 11 7 9
6 12 8 10
1 10 4 7
2 11 5 8
3 12 6 9
E                               * end
```

Fig. 3.2: Parameter list ´Tomography`

Code	Frequency [Hz]
0	0.26
1	0.52
2	1.04
3	2.08
4	4.16
5	8.33
6	12.5
7	25
8	0.31
9	0.62
10	1.25
11	2.5
12	5
13	10
14	15
15	30

Tab. 3.1: Frequency code

Code	Type of measurement
1	Schlumberger
2	Pole-Dipole (Half Schlumberger)
3	Wenner
4	Dipole-Dipole
5	Pole-Pole

Tab. 3.2: Type of measurement

3.2   Example for conversion from ASCII to IPIWIN

The following VES file (in ASCII format) is to be converted to IPIWIN:

```
DATA                                            COMMENT

Schlumberger                                    * type of measurement
V3.37 20.10.2005                                * software verion/date
0                                               * file number
03.11.2007                                      * date of file creation
0.1  1.000  101.9  0.01  1.000  0.0  0.0  8.3300    * VES data (see Tab. 3.3)
0.1  2.000  121.8  0.01  1.000  0.0  0.0  8.3300
0.1  4.000  181.0  0.01  1.000  0.0  0.0  8.3300
0.5  4.000  201.0  0.01  1.000  0.0  0.0  8.3300
0.5  6.000  250.4  0.01  1.000  0.0  0.0  8.3300
0.5  8.000  301.6  0.01  1.000  0.0  0.0  8.3300
```

VES-Data	Comment
0.1	A/2 [m]
1.000	L/2 [m]
101.9	rhos [Ohm*m]
0.01	phi [mrad]
1.0000	I [mA]
0.0	error rhos [%]
0.0	error phi [mrad]
8.3300	frequency [Hz]

Tab. 3.3: VES data set – examples and comment

The IPIWIN format looks like this:

```
Schlumberger                                    *line 1
03.11.2007                                      *line 2
1 0 5 1 0 _S                                    'line 3
3                                               *line 4
0.1 0.5                                          *line 5
1.0 2.0 4.0 6.0 8.0                              *line 6
Kommentar xyz                                   *line 7
5                                               *line 8
101.9 121.8 181.4 201.5 251.3 301.9             *line 9
```

line 1: type of measurement
line 2: date of file creation
line 3: five integers
   integer 1: always 1
   integer 2: always 0
   integer 3: number of **different** values for L/2 (second column of the original data)
   integer 4: number of overlaps during a measurement, an overlap is defined as a value for L/2 which is used with more than one value for A/2.
   integer 5: always 0
   ,_S' is always added with a blank
line 4: line number of L/2 in the original data where the overlap starts (here in line 3, because value 4 for L/2 is used in two measurements with different A/2). **Note:** Identical values of L/2 only count once, if used in measurements with different A/2. In case of several overlaps, line 4 shows a list of integers separated by blanks. The numbers indicate, where you find the overlaps.
line 5: values for A/2
line 6: values for L/2
line 7: commentary line
line 8: integer – number of different values for L/2 (like integer 3 in line 3)
line 9: values of RhoS