Operating manual

Data reader

PWBlogg
DCU 4.0

Contents

1 General safety instructions

The power supply of the reader is done by 9V lithium battery or 9V rechargeable battery. Please note the following safety instructions while operating:

- Do not use other batteries as supplied or recommended by manufacturer. Otherwise, the device could be seriously damaged and accidents could happen.

- Do not throw the battery into fire or expose it to great heat, as it can lead to an explosion of the batteries and can cause injuries to persons or material damages.

- If a liquid of the battery reaches your eyes, immediately rinse them with a lot of water and see a doctor.

- When connecting a DCU to a data logger, please pay attention to safety instructions of the respective operating manual of the data logger. **That applies particularly to data loggers which are installed within an Ex-zone!**

- The DCU must not be used within an explosive environment!

2 Data acquisition system PWBlogg

The application of the data acquisition system PWBlogg covers many fields in trade and industry. Amongst other things, this device is deployed when carrying food or slightly perishable goods, at industrial process control or storage and freight room monitoring according to EU guidelines, when recording climate data, building monitoring as well as pipeline construction.

The present operating manual describes how the data reader DCU (which is a part of the system) is operated. The DCU provides functions for gathering data of different types of data loggers as well as evaluation and print functions which are able to evaluate data received on site. Saving those data is done by MMC/SD in a PC-compatible file system. Data can be read on any PC with MMC/SD slot, and evaluated using dedicated software.

2.1 Components of the data reader DCU

The data reader DCU consists of following assemblies:

RS232 interface

Housing with controller

MMC/SD slot

Display

Battery compartment (rear)

Keypad
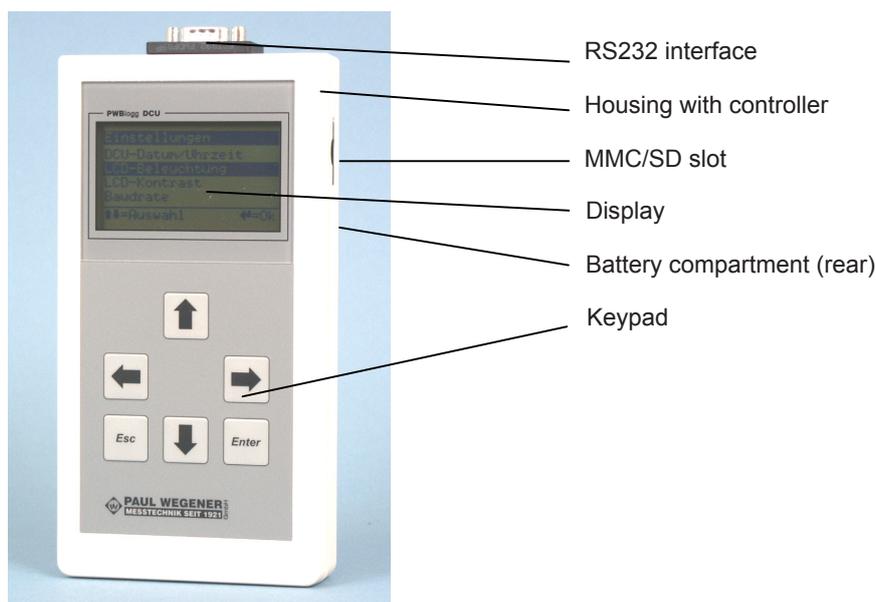
Data reader DCU

Controller
The controller operates all features of the DCU such as selection of data loggers, selection of display and evaluation of keyboard commands, realisation of data management via MMC/SD as well as selection of external peripherals such as PC or printer. The controller administers an internal MMC which is able to save data of a single logger, independent of an inserted MMC/SD in the dedicated slot.

LCD display and keypad
The control of DCU functions is menu-driven by means of LCD and keypad. In addition to the online function for checking current readings, numerous settings can be made directly on the data reader.

Online connection
The communication to data loggers, PC's and printers is done via online connection.

MMC/SD connection
The removable MMC/SD is designed for saving data read from loggers. Data recorded on one or several loggers with MMC/SD slot can be transferred to another MMC/SD for saving there.

Software
The software PWB-Soft is designed for evaluation of measured data on PC. Data can be displayed as table or chart. For this purpose, data collected on MMC/SD are copied to the PC or opened directly from MMC/SD. For data security reasons, we recommend a backup in any case. If logger files are opened by mistake using wrong programs, it can make evaluation with PWB-Soft impossible.

2.2   Operating the DCU

Display function

The DCU can serve as indicator of current values of connected data loggers. Originally conceived for loggers without display, this function is advantageous if measured values of several channels shall be monitored at the same time. Under this function, described as ‚Online', the internal memory of the DCU does not take any data.

Since evaluations are only applied to stored data and only stored data can be written on MultiMediaCard, respective functions are disabled in this operation mode.

Storage functions

The internal memory of the data logger is limited. Over a longer period, data must be read out and stored somewhere else if they shall be kept existing. Data readout can be done in two different ways: On the one hand, data can be transferred via cable to a suitable device (PC, DCU), on the other hand, some logger types allow to write on a MultiMediaCard inside the logger. Hence, a long period of data storage can be bridged in this way without external operator intervention.

Independent of the way of data storage on site, sooner or later data are required on PC for evaluating and archiving. The DCU is able to read data stored in both ways and can store accumulated data of several loggers on one MultiMediaCard for carrying them to the office.

Evaluation functions

Since on-site often an interest about the behaviour of the logged measuring length is taken, the DCU provides evaluation functions which determine extreme values within specific measuring periods. Furthermore, the functions show readings as chart including zoom (spread: time and values) on display and they are able to have it printed out on a battery-operated printer.

3   Operating the data reader DCU

3.1   Key functions

The DCU is operated by 6 keys. Following symbols are used in order to symbolize necessary key operations for the call of single menu functions.

Key	Function
←	Previous menu item, previous channel ...
↑	Previous menu item, previous channel ...
↓	Next menu item, next channel ...
→	Next menu item, next channel ...
Esc	One menu level back, cancel
Enter	Call menu item, confirmation

The keys have basic functions. There are also some variations possible due to the small amount of keys.

Unless otherwise described, following function key assignments apply:

The cursor keys (arrow symbols) control the marks of texts and symbols on display. Long pressing a button leads to repetition.

The ‚Enter' key confirms input and starts execution of a highlighted function.

The ‚Esc' key rejects a preselected function or finishes input which will not become operative. Normally, it leads to the next higher display- or menu level.

Some time-consuming operations such as readout of loggers or establishing views on display can be cancelled that way.

3.2   Menu - structure of the DCU 4.0 (overview)

The DCU is operated by keypad and LCD. Different functions of the DCU are arranged in a menu structure. On the one hand, that makes it easier to retrieve the function desired. On the other hand, it eases upgrading the system according to customer's specifications.

Changing menu levels occurs as described in point ‚Key functions'.

The display switches off after a given time is over. Hence, the DCU will consume a minimum of power only. Activating display again is done by pressing any key and will take about 5 seconds. That period is needed to activate the memory cards again which have also been switched off.

After each activating the display, operation of memory card should be verified in the caption of the status display.

Unlike predecessors, the DCU 4.0 does not change the menu position when switching off. After activating again, operation can be continued except active input fields which wait for confirmation. They are treated as if input has been cancelled.

Several menu items can be deactivated by DCU. Deactivating is not visible on display. Mistakes in the sequence result in getting a message. In case of hardware problems (missing MMC/SD, defect cable etc), no message can be shown. Hence, the affected menu item will not be executable.

Data erasure means that internal data of the current logger to be evaluated are deleted only. Data are recommended to save on MMC/SD first, since they are not deleted there.

Status indicator and main menu
The top menu level is the status indicator. It shows information on data loaded and on current program parameters. A respective main menu item is visible below.

The main menu controls all essential functions and includes following menu items:

1. Open file	Reads files from MMC/SD (original)
2. Connect	Establishes connection to data logger (type recognition)
3. Read out	Reads out data logger
4. Save	Saves data on MMC/SD
5. Evaluation	Extreme values, output chart on display and printer
6. Start/stop	Activating/deactivating measurement
7. Online	Shows performance data of connected logger
8. Parameters	Configuration of connected logger
9. Update	Firmware update at N6 data loggers
10. Restart	Starts measurement
11. Settings	Makes settings on DCU
10. Device ident	Electronic identification of the DCU
11. Delete	Deletes internal memory

Menu items, where editing takes a certain period, display a progress bar. As processing can take long time at some particular functions, the process can be cancelled by ‚Esc'.

4   General information on menus

4.1   Status indicator and main menu

The status indicator is also the highest menu level (main menu). Menu items are shown in the bottom line (single-line). After executing one menu item selected, the main menu is displayed again. Current loaded data remain displayed.

```
■    14.08.13 14:29:11  ▮▯
device            X0002887
readings   14.08.13 09:34
290       -14.08.13 09:39
PWB
▶open file
```

The headline shows important information on DCU such as battery state, time and two symbols on MMC/SD state (internal left, external right). The internal MMC/SD is not accessible, comparable to an HDD of an PC. These symbols indicate even internal MMC/SD malfunctions. The double memory card symbol indicates accurately working MMC/SD, ‚*' means error and ‚-' indicates missing MMC/SD.

The time is indicated by periodically flashing colon.

The real status indicator shows technologically relevant details on data origin (device number), amount of data (data records: values) and receiving period. The short text allows data assignment to real objects.

4.2   MMC and file system of the DCU

For data storage, the DCU uses an MMC/SD card which is supported by almost any up-to-date PC systems. If there is a need to upgrade an existing PC with reading devices, it is uncomplicated and inexpensive in any case via USB adapter.

To enable the operating system of the PC reading and writing on MMC/SD, information about data structure on memory card must be known. This information is written on MMC before using by one operation which is called ‚formatting' and is done on a suitable PC (with MMC/SD slot or reader). Please note that, if applicable, several file systems can be selected depending on type of MMC/SD. The DCU 4.0 is able to read and write an MMC/SD using file system ‚FAT' as well as ‚FAT 32'. The file system ‚FAT 32' is recommended. Cards formatted with ‚NTFS' are not usable on DCU.

The file system facilitates subdirectories in any level depth and long filenames with any extensions.

The filename consists of 8, the file extension of 3 characters. The DCU can process **one** directory level below the root directory. External loaded further directory levels or files with long filenames can not be processed by the DCU. They are either not (directories) or incompletely shown (long filenames). The eligibility of such written MMC/SD for using on the DCU is thereby not restricted.

After long use of the MMC/SD and repeated erasure of files on PC, formatting MMC/SD again can be necessary to be able to continue writing it on DCU. That happens if the DCU messages full MMC/SD, but the PC displays free memory. That is no error, but an effect that is owed to the compromise above mentioned. To prevent that effect, it makes sense to format the MMC/SD always when all data shall be deleted.

4.3   File operation

Combined steps for selecting the target directory on MMC/SD are classified for reading and writing files. They are described as file operation.

If an MMC/SD is recognized on DCU, a list of found directories will appear.

The line „\" refers to the root directory of the MMC/SD. This is only provided when saving data to be able to select the root directory purposefully. So, when loading or opening files, there can already be file names visible instead.

If there are no directories on MMC/SD, the display will change promptly when reading files to show the found ones. Further steps are described under the menu item ‚**open file**'.

When writing files, directories are created on inserted MMC/SD in case a target directory is known. Target directory names are generated of serial numbers of data loggers during reading process done by the DCU. So if a file is read from MMC/SD, the name of the source directory corresponds with the one of the target directory.

This directory will be created if necessary, provided for use if already existing.

5 Features of the main menu

The DCU display automatically switches off itself within all menu levels after 1,5 minutes. Power consumption can be reduced this way. The display can also be switched off in the main menu by long pressing ‚Esc'.

5.1 Menu ‚open file'

This menu item provides access to data saved in files (MMC/SD). If the memory card is inserted, you can select between internal files on DCU and external ones on MMC/SD card.

This menu item also provides the option to delete files. For this purpose the file to be deleted has to be selected and „Esc" has to be pressed long. The highlighted file will be deleted **without callback**! This option is provided for deleting files on the internal card only!
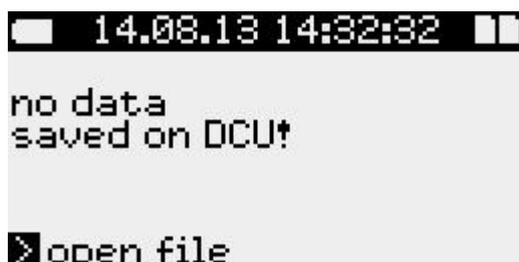
After the source directory on MMC/SD has been selected as described under ‚**File operation**', all files of the directory selected will be displayed. If there are no directories on MMC/SD, the display as described here will appear promptly and the directory selection is not applicable.

A file is selected using arrow keys and opened by ‚Enter'. Only displayed files of a known type can be opened. When opening, data will be transferred into the RAM of the DCU.

```
┌──────────────────────────────────┐
│ ▢          open           ▯▯      │
│ ▪ X5002018                        │
│ ▪ X5005427                        │
│ ▪ X5001907                        │
│ ▪ X0002887                        │
│ � DAT_0000.PWB                 │
└──────────────────────────────────┘
```

[↑]   [↓]   [Enter]

```
┌──────────────────────────────────┐    ┌──────────────────────────────────┐
│ ▢        MMC/SD        ▯▯         │    │ ▢        MMC/SD        ▯▯         │
│ open                              │    │ reading...                        │
│                                   │    │                                   │
│ [████████        ]                │    │ [████████        ]                │
│                                   │    │                                   │
│        please wait                │    │        please wait                │
└──────────────────────────────────┘    └──────────────────────────────────┘
```

The respective progress bar will appear when opening and during subsequent read process. After finishing these processes, the menu *evaluation* will automatically appear. Data can be analysed here.

```
┌──────────────────────────────────┐
│ ▢   14.08.13 14:40:21   ▮▮        │
│ device           X5005427         │
│ readings  07.01.13 05:02          │
│ 253932   -02.07.13 13:13          │
│ Datenlogger 496k                  │
│                                   │
│ ▶ evaluation                      │
└──────────────────────────────────┘
```

5.2   Menu connect

The menu item *connect* identifies the connected data logger type. *Connect* must be done at least once before using the menu items *read*, *online* and *parameters.*

After successful execution, data to be read will be properly interpreted.

When connecting, it will be verified whether DCU time corresponds to the one of the data logger. If there are time differences up to ± 2 min, the DCU will be able to correct the logger time automatically. The option *sync logger-time* in the DCU *settings* must be activated for this purpose. Correcting time requires a respective logger firmware.

Succesful connection will be indicated by output of required logger data. The menu item *read out* will appear:

```
┌──────────────────────────────────┐
│ ▢   14.08.13 14:43:10   ▮▮        │
│ device           X0002887         │
│ readings  14.08.13 09:34          │
│ 18520    -14.08.13 14:42          │
│ PWB                               │
│                                   │
│ ▶ read out                        │
└──────────────────────────────────┘
```

A connection attempt is the preparation for writing new data from a connected data logger. Even a failed connecting attempt deletes data saved on DCU.

5.3   Menu read out

This menu is designed for reading performance data from a connected data logger. Performance data are saved as file on the internal card. Hence, these data are also evaluable without external card. For this purpose, the file created when reading can be opened again later via menu item *open file → intern.*

After starting this menu item, the display will show *connect*. Cable connection between DCU and logger will be verified and current details of the contents of the logger will be read here.

Then the reading process will start. This can be cancelled by ,Esc'. Errors also lead to abort. Elsewise, after reading, data are saved in the internal DCU memory. They can be read on PC or saved on MMC/SD.

All process phases are displayed as messages:

```
┌─────────────────────────┐      ┌─────────────────────────┐
│ ■□      connect      ## │      │ ■□     read out      ▐▌ │
│ connecting...           │      │ read                    │
│                         │      │                         │
│                         │      │     ▐█████▌▐        ▌    │
│  ┌───────────────────┐  │      │  ┌───────────────────┐  │
│  │    please wait    │  │      │  │    please wait    │  │
│  └───────────────────┘  │      │  └───────────────────┘  │
└─────────────────────────┘      └─────────────────────────┘

┌─────────────────────────┐      ┌─────────────────────────┐
│ ■□     read out      ▐▌ │      │ ■□       save        ▐▌ │
│                         │      │ ■ \                     │
│ data read               │      │ ■ X0000000              │
│ successfully            │      │ ■ X5002018              │
│                         │      │ ■ X5005427              │
│  ┌───────────────────┐  │      │ ■ X5001907              │
│  │  press any key... │  │      │                         │
│  └───────────────────┘  │      │                         │
└─────────────────────────┘      └─────────────────────────┘
```
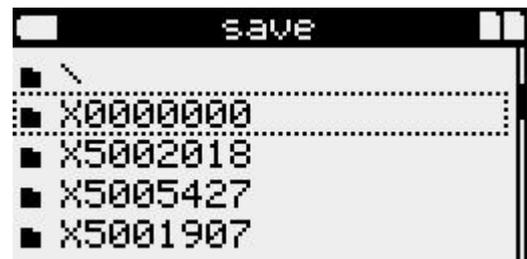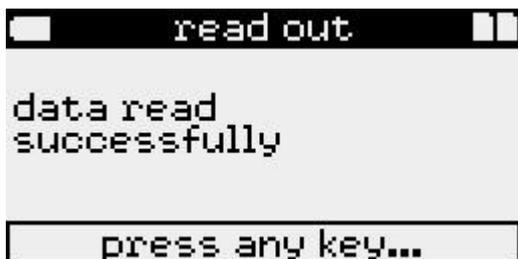
After successful readout, data can be saved at once. If an error is messaged, please check connection to the logger.

Potential error messages (selection):

```
┌─────────────────────────┐      ┌─────────────────────────┐
│ ■□      connect      ▐▌ │      │ ■□      connect      ▐▌ │
│ no logger               │      │ logger unknown!         │
│ found!                  │      │                         │
│                         │      │                         │
│  ┌───────────────────┐  │      │  ┌───────────────────┐  │
│  │  press any key... │  │      │  │  press any key... │  │
│  └───────────────────┘  │      │  └───────────────────┘  │
└─────────────────────────┘      └─────────────────────────┘
```
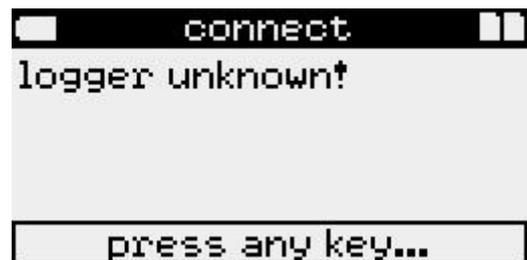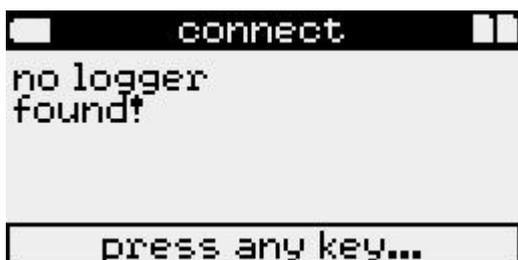
5.4   Menu save

This menu item will appear after successful readout. After saving the file, the data logger can be started via menu item *restart*. This way the system time of the logger will be reset and potential time differences will be corrected.

The memory card is used like a drive for evaluation on PC/laptop. For this purpose, the PC/laptop needs an MMC/SD slot (standard equipment).

Performance data are saved in files and can be read, copied or deleted on PC/laptop.

Data are transferred from internal memory of the DCU to MMC/SD by menu command *save* after reading out the logger (RS232) from an MMC/SD of a data logger. Always one logger can be read before saving on MMC/SD. Just as well, exact one file can be read from MMC/SD 1 of a data logger before saving this file on another MMC/SD 2. For that purpose, a file on MMC/SD 1 will be opened. Subsequently, the MMC/SD 2 will be inserted for saving data (including directory selection).

The file name is automatically created by the reader. It consists of a consecutive number, DAT_0001... to DAT_9999. (Further details under „status indicator and main menu")

Note: If the MMC/SD is removed while saving, it can be damaged!

A progress bar is shown while saving. Therafter, the storage location and the created filename will be shown.

```
┌──────────────────────────┐
│ ■        save        ▯▯  │
├──────────────────────────┤
│ X0002887\DAT_0004.PWB    │
│                          │
│ data written             │
│ successfully             │
│                          │
│ ┌──────────────────────┐ │
│ │    press any key...  │ │
│ └──────────────────────┘ │
└──────────────────────────┘
```

Error messages are shown similarly. If nothing can be written on the memory card even after several attempts (removed, inserted again), that card should be formatted on PC/laptop (backup should be done before).

5.5   Menu evaluation

After writing data from a logger or from a file into the memory of the DCU, the menu *evaluation* will be active.

Evaluation includes functions on displaying extreme values (minimum/maximum), on charts and on output of a connected printer (numerical, chart).

Always one period and one channel is displayed here. The period means the time between measurement start and break (or end of measurement).

```
┌──────────────────────────┐
│ ■       period       ▯▯  │
├──────────────────────────┤
│   14.08.13 09:34:31      │
│ - 14.08.13 14:53:28      │
│   14.08.13 09:34:15      │
│ - 14.08.13 09:34:30      │
└──────────────────────────┘
```

[↑] [↓] [Enter] [Esc]
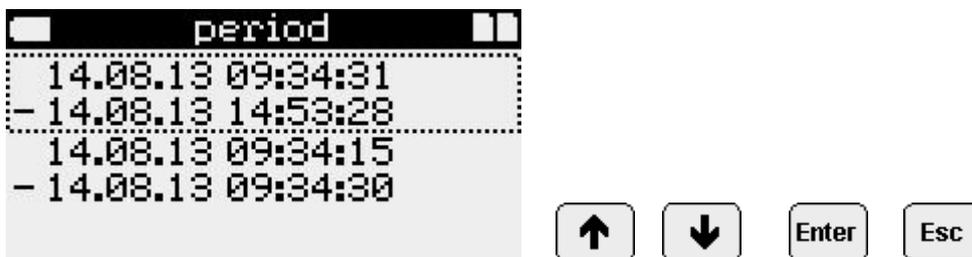
The periods can be shown for selection in two columns. Last data are always on top. The DCU can distinguish 6 periods at most. If data to be evaluated contain more than 5 breaks, the 6th (oldest) period contains all data are up to the end of memory without consideration of further breaks before end of measurement.

After selecting the period, contained data will be read. This process can not be interrupted. If there is only one period, this process is not applicable.

```
┌──────────────────────────┐
│ ■       MMC/SD       ▯▯  │
├──────────────────────────┤
│ read                     │
│                          │
│ ┌──────────────────────┐ │
│ │■                     │ │
│ └──────────────────────┘ │
│                          │
│ ┌──────────────────────┐ │
│ │    please wait       │ │
│ └──────────────────────┘ │
└──────────────────────────┘
```

Then minima/maxima including date and time of occurrence will appear. Active channels can be selected using cursor keys.
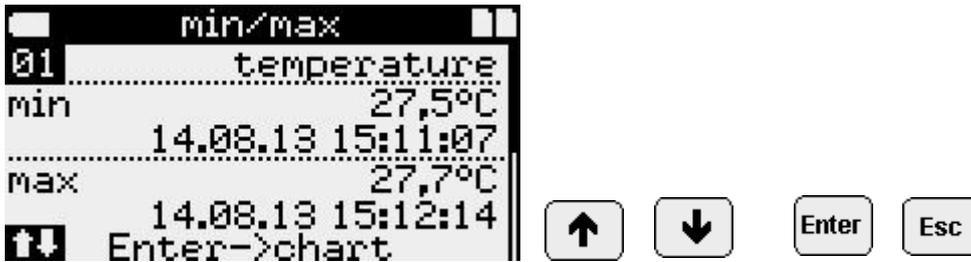
Pressing *Enter* will start the chart.

The chronological sequence of readings for the selected channel is shown as dot sequence. A scale between minimum and maximum of the channel is automatically selected for displaying the reading. Only top and bottom values of the chart are shown.

Always the entire period is displayed. The timeline is dedicatedly scaled and marked.

Once a chart is shown on display, it can be printed out using the connected mini printer (long ‚Enter'). The contents refer to the selected parameters (channel, period). The printout quality is better than the chart display. In addition to higher resolution, the printout provides information on period and extreme values.

The period can be enlarged (multiple) by moving marks in the chart using cursor keys.
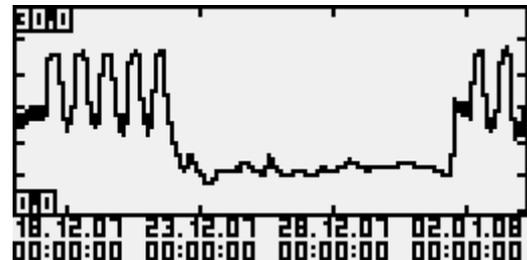
The marked section will be displayed (zoom) after pressing ‚Enter'.

This one can also be printed out. However, these numerical data on minima and maxima are related to the whole period, even if they are currently not visible. The once for the period automatically selected zoom on reading display (y-axis) remains existing for all enlarged periods.

Any chart outputs (LCD/printer) can be cancelled by repeatedly pressing ‚Esc'.

5.6   Start/Stop

The menu item *Start/Stop* activates/deactivates measurement. This is intended for data loggers without own display or on/off-switch. When switching-off, measurement will not really be deactivated, but measurement start will be forwarded by one year. This way the device can be put into power-saving mode for 1 year.

5.7 Menu online

The online display shows current readings from the data logger. This is the only option for loggers without display for live monitoring. Loggers with display, however, allow monitoring several channels at the same time (1 channel on logger, 2 adjacent channels on DCU).

Provided that there is cable connection between logger and DCU, the menu item *connect* must be called at least once.

After selecting the menu *online*, following display will appear:

```
┌──────────────────────┐
│ ■    online    ▯▯    │
│ 01        27,7        │
│ temperature     °C    │
│ 02        2,50        │
│ pressure       bar    │
└──────────────────────┘
```
⬆ ⬇ Esc

Channels can be selected by cursor keys.

The display will not be decativated during ‚online‘! The DCU consumes power at any time. Only if connection is interrupted (RS232 cable unplugged or ‚Esc‘ key presssed), the DCU can switch off.

Data, which are displayed online, are stored in the logger only. After loading from there, they can be saved and evaluated. The DCU does not log these data.

5.8 Menu parameters

This menu item allows reading and altering parameters of connected data loggers. As at any access to connected data loggers, the menu item *connect* must be called earlier.

Data transfer to the logger necessitates restart of measurement. Any data in the logger will be deleted.

If preset parameters shall be shown for the purpose of monitoring only, the parameter menu must be quitted by ‚Esc‘ without selecting *restart* before. Quitting via *restart* deletes existing data even if no parameters have been altered.

Therefore parameters can be protected by password. If no passwort is allocated for the logger, password request does not apply. Even showing paramaters is only possible after entering the password.

```
┌──────────────────────┐
│ ▣    password   ##   │
│ ##_                   │
│                       │
│                       │
│                       │
└──────────────────────┘
```

During entering, only the last letter of the password is visible.

Selecting digits or letters of the password is done using the keys ‚cursor up‘ (^) and ‚cursor down‘ (v). The ‚cursor right‘ key (>) moves to the next digit. ‚Enter‘ quits input, ‚Esc‘ cancelles. When moving the key ‚cursor left‘ (<), the respective last digit will be deleted. Write errors at the beginning of the word necessitate completely new input.

Example parameter input (configuration):

parameters	parameters
start of meas.	storage mode
interval 1	sample mode
interval 2	battery
memory type	short text
storage mode	restart

Selecting individual menu items starts input or choice boxes (see menu item *settings*).

Number and type of parameters are different, depending on logger type. Appropriate information is provided in operating manuals on the software ‚PWB-Soft' or on data loggers.

The parameter record is basically edited as copy. After alterations have been made, they will be confirmed and written back into the logger.

To accept parameters, the menu item *restart* must be selected. A confirmation prompt will appear.

```
parameters

accept changes?



Esc no          yes Enter
```

If that question is confirmed by ‚yes', parameters will be transferred into the logger and the old ones will be deleted there.

Measurement restarts.

Furthermore, at any confirmed configuration procedure, the time of the configuring device (PC, DCU) will be transferred into the one to be configured (logger) without confirmation prompt. Please pay attention to the time of the DCU when setting parameters.

Note: A wrong time in the data logger can inhibit measurement!

5.9   Update

A firmware update to N6 data loggers can be done here. The menu item *update* automatically appears after readout if the data logger can be refreshed. If it does not appear, the firmware is already up-to-date or the device type does not allow any update.

```
update



Esc no          yes Enter
```

5.10 Menu settings

Settings is a submenu where time, printer and DCU can be set. Besides time, all settings are no-nonvolatile and available even after power failure (battery change).

Setting digits is done by arrow keys. The arrow keys left/right are used for selecting a digit. The arrow keys up/down alter a digit. Only valid data and times can be entered. Instead of manual input, the time can also be set by taking from a data logger using *connect*. If there is a power failure (battery change), time will get lost.
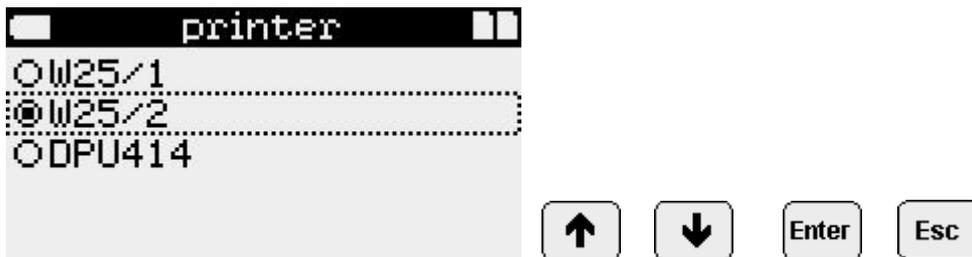
Printer types used with DCU and data loggers can be selected here.
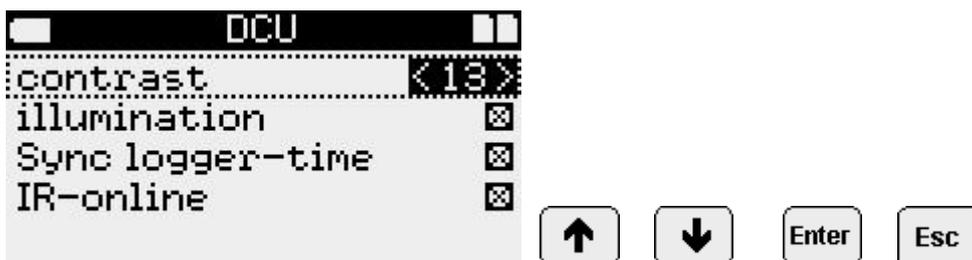
The menu item *DCU* facilitates setting *contrast*, *illumination*, *sync logger-time* and *IR-online*.

Contrast
Settings are made by the arrow keys „to the left" and „to the right".

Illumination
Activating/deactivating is done by the arrow keys „to the left" and „to the right". Even if the illumination is on, the display will not be permanently illuminated. The runtime is 20 seconds after keystroke. Illumination remains active by continuous keypad operation. If battery voltage is too low, activating illumination will be rejected to save power. The activation, however, remains existing. The illumination also goes out in the online display if there is no keystroke. Activating illumination there can be done by „Enter" key.

The LCD illumination discharges the battery. We recommend using it just in exceptional cases. If this operating mode is not needed anymore, illumination should be deactivated at once.

Syncro logger-time

Activating/deactivating is done by the arrow keys „to the left" and „to the right". Being activated, when connecting, the difference between DCU time and logger time will be determined. If there is a time difference within ± 2 min, the logger time will be automatically corrected, provided that this option is activated. Correction is not combined with restart! Correction can only be done when using appropriate firmware (N6 devices as of firmware version 3.0.33.).

IR-online

Activating/deactivating is done by the arrow keys „to the left" and „to the right". If this option is activated, maximum possible reading speed for data loggers with infrared interface will be selected. If this option is deactivated, the general maximum reading speed will be selected..

Settings are saved after leaving the dialog by „Enter".

The time of the DCU 4.0 should preferably be exact to be able to provide an exact logger time when synchronizing or restarting the logger. Therefore, you are recommended to check the time regularly. After DCU restart (e.g. at battery change), hence setting time will be claimed!

5.11   Device ident

The *device ident* identifies the DCU. Long ‚Enter' starts firmware update where applicable (if appropriate files are on MMC).

```
┌──────────────────────────┐
│ ■     DCU 4.0      ■■    │
│ ser. no.                 │
│                 D3333333 │
│..........................│
│ firmware                 │
│                   1.0.78 │
│..........................│
│ built in                 │
│                     2008 │
└──────────────────────────┘
```

5.12   Menu delete

This menu item deletes data of the internal DCU memory.

```
┌──────────────────────────┐
│ ■       DCU       ■■     │
│ delete                   │
│                          │
│                          │
│                          │
│                          │
│ Esc no          yes Enter│
└──────────────────────────┘
```

After confirmation, stored data will be deleted. The menu item *connect* will be shown again.

```
┌──────────────────────────┐
│ ■ 14.08.13 15:27:35 ■■   │
│                          │
│ no data                  │
│ saved on DCU!            │
│                          │
│                          │
│ ▶ connect                │
└──────────────────────────┘
```

6   Data evaluation on PC

To be able to evaluate data on PC/laptop, there are two options of data transmission:

Direct reading of MMC/SD

The MMC/SD of the DCU is connected to the PC by an MMC/SD adapter (e.g. for USB port or parallel port) for data evaluation. The MMC/SD card appears as drive (under Windows™).

The standard Windows™ tools (e.g. ‚explorer' or ‚my computer') allow copying or moving files from MMC/SD to HDD of the PC (usually into the PWBlogg directory or an own subdirectory). Files can be individually opened and evaluated as usual by the software PWB-Soft.

Any files or selected ones on MMC/SD can also be deleted by ‚explorer' or ‚my computer'.

Readout from DCU

The DCU can be connected to the PC using an optionally supplied SUBD 9-pin cable. If there are data in RAM, either by reading a data logger or opening a file, so the DCU operates like a logger. Then the software PWB-Soft can be used for data readout.

Depending on type of the read file, ‚PWB-Soft' identifies the respective data logger type. Shall data of different logger types be evaluated one after the other, so after writing the file into the DCU the command *connect* in ‚PWB-Soft' must be carried out again in case the file comes from a different logger as the last edited one.

If DCU and PC have been disconnected, connecting again is also necessary e.g. for reading data from a logger.

7   Battery change

We recommend a 9V lithium battery or a 9V rechargeable battery. The battery is located in a separate battery compartment. The polarity is specified inside the battery compartment.

8   Specifications

Display	128 x 64 pixel
Battery	9V block or rechargeable
Storage temperature	-20 ... 60°C
Ambient temperature	-10 ... 50°C
RAM	internal MMC/SD (not removable)
MMC/SD	MMC/SD slot (card removable)
RS232	SUBD 9-pin 9600 Bd
Housing	Datec Mobil Box M
Material	ABS
Degree of protection	IP40

9 Troubleshooting

Problem	Measure
No connection	Check: • whether the online cable is firmly connected to DCU and to data logger • whether the LCD of the logger turns on when connected to the DCU
No LCD illumination	Please, check the battery!
MMC/SD error messages	
„Could not read from MMC/SD!"	Check the MMC/SD: • remove and insert it again • pay attention to visible damages
„Data read error!"	The file may be damaged. If necessary, carry out a repair by using common Windows™ tools such as Norton Disc Doctor etc.
„Could not save data!"	An error occured while writing on MMC/SD. Do carry out a surface test (e.g. Windows™ ScanDisk)
„Error reading from MMC/SD!"	An error occured while reading from MMC/SD. The MMC/SD may be damaged. Do retry the operation or try to read the file on PC.
„No MMC/SD found!"	Unknown card format, or no card identified.
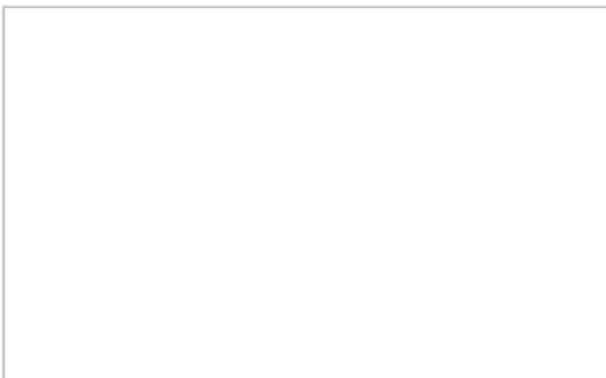
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