EarthData Logger – GFZ-GIPP Extensions

PC and PDA Programs

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EarthData Logger SetUp and Monitoring software, developed at the Geophysical Instrument Pool Potsdam (GIPP) of the GeoForschungszentrum Potsdam (GFZ), for PC and PDA systems.

Valid for EarthData Logger firmware Version 2.24 and 3.00 (May 2005 upward)

!! The SetUp file is NOT compatible to versions lower than 2.24 !!

1.   GIPP SetUp Conventions

1.1.   SetUp file

The GIPP-type SetUp file is generated by the GIPP SetUp Generator **`edl_set.exe`**. It consists of the header (SetUp Name, Time and Date), a plain text section for human SetUp check, and a parameter set section. The parameter set is stored as array pointer values. Only edited recording windows will appear.

All related DOS, PDA, and LINUX programs (transfer, editing, conversion) process only header and parameter section. An example you find under Appendix A.

The parameter **max. pc_cycle** is added by **`edl_set.exe`** to guarantee an in-time wake-up of the internal PC board.

1.2.   Default ini-files

The amount of activated (SetUp-) functions, as well as function values, changes from version to version. So the program system considers both.

Firstly, the conversion from GIPP-type SetUp into the EDL ini-file **`recorder.ini`** bases on a default called **`recorder.000`**. Additionally to absolutely necessary functions, it contains GIPP-type special settings. Also name conventions (**channel_ .. _id**=…) are preset by GIPP.

Secondly, any conversion program changes only functions named in the default. It doesn't invent other functions, also when they are part of the parameter set section of the converter.

Beyond **`recorder.000`** presets, the the parameter **pc_cycle_shorten** can be edited in another ini-file: **`shorttmp.dat.`** It is used by **`edl_set.exe,`** and It contains the amount of minutes the PC cycle has to be shortened, e.g. for additional time the hard disk needs to be heated. GIPP default value is '10', sufficient for temperatures down to minus 15 degree.

An example you find under Appendix B.

1.2.1. GIPP Header

This section is added to the top of the original EarthData ini-file. It contains the related entries from '***.set**' ; date and time are of the last change of this SetUp file.

Section '[gipp]':

```
setup_name=
setup_date=
setup_time=
```

1.2.2. Default Restrictions

The default file `recorder.000` contains only those functions which can be processed by the related EarthData version. GIPP adds a version entry to the ini-file header.

For program safety purposes, there are no entries for the following functions:

Section '[recorder]':
The default file does not contain entries of calibration windows.

Section '[timer]':
The default file does not contain time window entries, in order to avoid data drops by remaining or corrupted windows.

1.2.3. Default Entries by SetUp

These default entries at **recorder.000** are similar to default values, used by the SetUp program **set_edl.exe** (see 2.1.).

1.2.4. Default Entries beyond SetUp

The following lists GIPP default entries which are not touched by the SetUp programs.

Section '[recorder]':

```
;-----------------------------
; First chars of data filenames
;-----------------------------
location_identifier=11          dummy entry, to be replaced by MiniSEED entry
network_code=nn                              - " -

;--------------------
; Status logs
;--------------------
messagelog_size=10000
day_logs=1                      log files stored in related daily directories

;--------------------
; Data record modes
;--------------------
file_align=1                    data file starts at full hour
disk_full=50                    remaining space at full hard disk (EarthData default)

;--------------------
; PC modes
;--------------------
pc_off_time_override=0          PC cycle time is calculated by EDL; the SetUp program
                                only interferes when the cycle interval exceeds 6 hours
longflush_timeout=60            PC timeout[min] after turned on by Long FLUSH
                                (overrun by MODEM pin K, and by always_on=1)
always_on=0                     PC always on (=1 : overruns timeout setting)
```

2.   PC Programs (DOS)

2.1.   Installation and Handling

2.1.1. Program Overview

SetUp:

edl_set.exe	generates GIPP-type SetUp
edl_ini.exe	converts GIPP-type SetUp into EarthData **recorder.ini**
edlsetup.bat	keeps name of recently edited SetUp
recorder.000	source for finally edited **recorder.ini**
shorttmp.dat	source for setting parameter **pc_cycle_shorten** of **recorder.ini**

Serial Connect to EDL (Socket 'MODEM'):

edl_conn.bat   automated login to EDL via kermit protocol;
    followed by kermit command line, to start (and to end in kermit terminal mode)
        connect.txt   EDL Linux Prompt
        download.txt   upload (recent) recorder.ini to EDL

edl_view.exe   automated login to EDL and request/display of
           current SetUp, EDL status, and GPS status

Serial Connect to Digitizer (Socket 'ETHERNET'):

edl_head.exe   shows Digitizer status, and GPS status

 PC/LapTop Versions

edlbdisp.exe   shows Digitizer Time Series plus
           broadband seismometer mass position (voltage)

edlbfilt.exe   shows Digitizer Time Series
           filtered by 2nd order Highpass @ 1 Hz, plus
           broadband seismometer mass position (voltage)

 HP-200 Versions

edl2nois.exe   shows Digitizer Time Series;
           display after storing given amount of seconds (slow PC);
           reduces and resets digitizer output Baud rate if necessary

edl2filt.exe   shows Digitizer Time Series;
           display after storing given amount of seconds (slow PC)
           filtered by 2nd order Highpass @ 1 Hz;
           reduces and resets digitizer output Baud rate if necessary

edl2mass.exe   shows broadband seismometer mass position (voltage)

portretu.exe   scans and resets digitizer output Baud rate in case that
           Baud rate return/change failed, e.g. during **edl2nois.exe**

All display programs - except edl_head.exe - need graphics support (see installation).

Miscellaneous:

      edl_powr.exe   EDL power consumption (battery life) and optimal CPU power cycle versus sampling rate and environmental temperature

      edl4plot.exe   plots EarthData legacy format (full 4 Byte dynamics)

2.1.2. Installation

Programs:
All programs named above reside in one directory, e.g. C:\EDL (just a proposal).
Within the same drive, and necessaryly in the root, there have to exist

- \KERM230**mskermit.exe**   (v 3.15 or higher)

- \NORTON**nc.***   (NORTON Commander, v 3.0 or higher)
     the EDL specific NORTON Menu resides in the EDL directory

Add to **autoexec.bat** the following lines (also useful for WINxx)

```
break on
cd \edl
\norton\nc
```

Now the PC bootes to EDL directory, and the EDL menu appears.

Graphics:
The following files are necessary, and they can be added either to EDL directory or to an own directory (in the second case, don't forget to add the path to **autoexec.bat** via **append**)

- **egavga.bgi** and/or **cga.bgi**   (PC resp. PalmTop; no problem to install both)

- **litt.chr** and **sans.chr**

2.1.3. EDL Menu

PC Menu

```
           Menu                                      Function

.   EDL DIGITIZER Port   .
------------------------
M:   : DIGITIZER Monitor                 edlbdisp.exe / edlbfilt.exe
.
H:   : Status Monitor                    edl_head.exe
.
R:   : RESET Digitiser Port              portretu.exe
.
.
.     EDL MODEM Port     .
------------------------
V:   : VIEW EDL Status                   edl_view.exe
.
C:   : CONNECT only                      edl_conn.bat connect.txt
.
A:   : ACCESS                            mskermit c
.
XXXXXXXXXXXXXXXXXXXXXXXXX
U:   : UPLOAD recorder.ini to EDL        edl_conn.bat download.txt
.
.
.       EDL SetUp        .
------------------------
S:   : SetUp EDL Params                  edl_set.exe
.
O:   : SHOW Current SetUp                edlsetup.bat o
.
P:   : EDL Power Calculator              edl_powr.exe
.
.
X:   EXIT
     cd \
```

HP-200 Menu (or other low speed PC, port speed reduced to 38 kBaud)

```
           Menu                                      Function

.   EDL DIGITIZER Port   .
------------------------
M:   : DIGITIZER Monitor              edl2disp.exe 38 / edl2filt.exe 38
.
B:   : BB Mass Position               edl2mass.exe 38
.
H:   : Status Monitor                 edl_head.exe 38
.
R:   : RESET Port              portretu.exe 38
.
.
.
continued as above
```

2.1.4. EDL Menu Functions

The EDL Menu covers all functions, from SetUp handling and transfer up to EDL monitoring. All functions are one-key commands; a reduced menu for pure field use is also available (e.g. <V>, <U>, <O>, <M>).

EDL DIGITIZER Port:

This is the access to the EDL Digitizer via serial line. The DOS PC has to be connected to EDL socket 'ETHERNET', which also contains the digitizer RS232 output.

<M> DIGITIZER Monitor
- starts the Digitizer Monitor **edlbdisp.exe** (fast PCs) or **edl2nois.exe** (slow PCs) resp. **edlbfilt.exe** or **edl2filt.exe**
- displays time series from digitizer output (see 2.3.1. resp 2.3.2.)

<B> BB Mass Position
 - starts the Digitizer Monitor **edl2mass.exe** (just for slow PCs as HP-200)

<H> Status Monitor
 - starts the Status Monitor **edl_head.exe**

<R> RESET Digitizer Port
- starts Digitizer Port Check **portretu.exe**, to reset digitizer Baud rate to default 115200 Baud (emergency key when Baud rate return at slow PC failed; see 2.3.3.)

EDL MODEM Port:

These functions need the access to the EDL PC-board via serial line:
 - The PDA has to be connected to EDL socket 'MODEM';
 - The EDL PC-board has to be turned on; EDL LINUX booting lasts about 60 seconds.

The LINUX counterparts of the access functions you find under 5.1.1.

All access menu functions will
 - start KERMIT protocol at PC (COM1:)
 - login to EDL LINUX automatically
        (For system safety, when there is a current login active, it logs out before.)

 - open terminal mode

Depending on pressed key, then certain command lines are sent to EDL:

<V> VIEW EDL Status
 - executes **edl_view.exe**
        - changes to EDL directory where GIPP programs reside (/usr/local/gipp)
        - reads and displays
                main SetUp parameters (from **/data/config/recorder.ini**)
                hard disk status, GPS status, EDL status, recording status

<C>   CONNECT only
 - executes kermit text file **connect.txt**
- changes to EDL root directory
- the LINUX prompt appears

<A>   ACCESS
 - opens terminal mode (emergency key, when a program is still active at the login)

<U>   UPLOAD recorder.ini to EDL
 - executes kermit text file **download.txt**
- changes to EDL directory where GIPP programs reside (/usr/local/gipp)
- starts transfer of EarthData ini-file from PC to EDL (**recorder.ini**)
- starts script **reconfig** to restart digitizer for the new ini-file (see 5.1.1)

A guiding sheet 'EarthData Logger Operation' based on this menu is also available.

EDL SetUp:

All these functions run off-line, and need no connection to the EDL.

<S>   SETUP EDL Params
 - starts the SetUp Generator **edl_set.exe** (see 2.2.1.)
-    starts on request the SetUp Converter **edl_ini.exe** to convert this SetUp into **recorder.ini**

<O>   SHOW Current SetUp
  - shows the recently saved SetUp

<P>   EDL Power Calculator
-    starts the Power Calculator **edl_powr.exe** (see 2.4.1.)
-    calculates EDL power consumption / battery life, and the optimal CPU power cycle

2.2.   PC SetUp Programs

2.2.1. SetUp Generator 'edl_set.exe'

Characteristics:

 - Choice of preselected SetUp parameters
 - Source code: Turbo Pascal
 - Output file: **`*.set`**   (GIPP-type parameter set, see 1.1. and Appendix A)
 - Output file: **`edlsetup.bat`**   (name of recently edited **`*.set`**)

Program Start:

 - EDL Menu **\<S\>**   **or**
 - command line, typing `edl_set`

The program scans for GIPP-type SetUp files (**`*.set`**). A window pops up for choosing a new SetUp or an available older one.

Command Line Parameter:

 - parameter 1   SetUp file name **`xxx.set`**

Function Keys:

TAB / SHIFT TAB	next / previous parameter field	
UP / DOWN / LEFT / RIGHT	next / previous parameter within the field	)*
PAGE UP / PAGE DOWN	select parameter value	)*
CTRL PAGE UP / CTRL PAGE DOWN	select parameter value in steps of 10	)*
ESC	escape **and**	
Y	save **`*.set`** **and**	)*
F10	convert **`*.set`** into **`recorder.ini`**	)*
or N	escape without saving	

NOTE: In case of

 - choosing an old SetUp   **or**
 - command line **`edl_set`** with parameter **`xxx.set`**   **or**
 - EDL Menu **\<O\>**   (opens the recently edited SetUp)

the shown SetUp is locked, you can select parameter fields only (safety option, no access to function keys marked by)*****). For editing you have to unlock the SetUp by **\<CTRL+L\>**; in order to keep the old SetUp, it is recommended to change the SetUp name.

Parameter Fields:

The two bottom lines show parameter help and all parameter values which can be selected. Any new SetUp starts with default values. The listing below marks default with bold letters.

File Name

8 characters; the suffix `.set` is added by the program.

Record Modes

| - Mode | **Conti** | contiuous record, independent on opened time windows |
| | Timed | continuous reord within given time windows |

- Data	**MiniSeed lt**	MiniSEED format, little endian, compressed by Steim 1
	ASCII	ASCII, not compressed
	Legacy	the true digitizer output, 4 byte, not compressed
	MiniSeed bg	MiniSEED format, big endian, compressed by Steim 1

Except the old EarthData Format 'Legacy', all formats use the upper three bytes of the digitizer output only.

| - File | **30** | data file length in minutes |

While editing the sampling rates, the program checks the file length versus EarthData digitizer restrictions, and it reduces this parameter if necessary.

| - Disk | **WRITE ONCE** | Recording stops at Disk Full |
| | RING BUFFER | Recording continues and overwrites oldest files |

Sampling Rates

| Str1 | **100** | sampling rate in sample per second, primary data stream |
| Str2 | **0** | …, secondary data stream |

'**0**' means no sampling at that channel.

The variety of the secondary stream sampling rate depends on the primary one. Thus, at any change of the primary sample rate, the program resets the secondary value to zero (required for 6-channel recorders only, nevertheless the program does it for the 3-channel version too).

Gain	**1**	LSB = 1 microVolt	(Legacy format:	3.902 nanoVolt)
	10	LSB = 0.1 microVolt	(Legacy format:	0.3902 nanoVolt)
	0.4	LSB = 2.5 microVolt	(Legacy format:	9.7656 nanoVolt)

NOTE: Gain 0.4 is only available at certain recorders. At conversion into `recorder.ini,` the conversion program checks the related GIPP written digitizer entry. On negative check, the gain is reset to gain 1.

GPS Modes

Mode   **CONTI GPS**   GPS always on
                        CYCLE 1 h   GPS turns on in cycles of 1 up to 24 hours

When 'CYCLE' is selected, the program calculates the necessary ON-duration (estimated time to lock GPS, plus a certain time to lock PLL). The GPS receiver itself doesn't turn off before GPS lock. The default cycle value reduces power consumption by about 120 milliWatt, or 6% at 3*100sps.

Pos   **+00N +000E**   GPS Initial Position

Clock   **GPS Lock**   2D/3D lock necessary for Clock Correction
                        1-Sat Lock   single satellite sufficient for Clock Correction

The built-in GPS receiver can run a true single satellite mode. At a fix location - after 2D/3D lock - the receiver calculates the exact time via the ephemeris data of one satellite.

Log   **PLL > 10 mic**   logs PLL differences > 10 microSec; 3-50 kB/day
                        PLL Change   logs PLL each second; > 1,3 MB/day
                        PLL Data   logs GPS string and PLL each second; 11MB/day

PLL logs the difference between GPS time and internal clock time [microseconds]. The GPS string contains time, position and GPS health/status.

Aux Channels

Aux1 … Aux4   **OFF**   external input from socket 'AUXILIARY'
                                      At broadband seismometers Aux1 to Aux3 are assigned to mass positions X, Y and Z
TRec   **OFF**   Recorder inside temperature [C]
TDisk   **OFF**   Hard Disk inside temperature [C]
Ubatt   **OFF**   Battery Voltage minus 0.3 V at both power inputs
IBatt   **OFF**   Recorder Input Current [mA]

Auxiliary channels are recorded at 1 sample per second.

Calibration

CalOut   **OFF**   analog signal output (max. ±10,000 milliVolt) at 'CH. 1-3'
                    STEP   constant voltage (out of window: OFF)
                    SIN   sinus (program sets frequency to 1 Hz)
                    SWEEP   sweep, once in a time window (sets 0.1 .. 10 Hz)

TTLOut   **OFF**   TTL output: 3.5 V at 'AUXILIARY' (out of window: OFF)

OpCOut   **OFF**   Open-Collector output: LOW resistance at 'AUXILIARY'
                                        (out of window : HIGH Resistance)

Time window explanation see under item **Window** below. The only difference: the duration of calibration windows is resolved downto seconds.

Window

This window only pops up when Record Mode is set to 'TIMED'. As a second safety measure, window 1 is set to immediate start of continuous recording at default, and all other windows are closed. The program doesn't cover EarthData options for reverse windows.

1   **CONTI**   **immediately**
      PowerOn   **01-JAN-2003 00:00** Start Date and Time (in hour:minute)

                              000:24:00   **NO**   Duration in day:hour:minute
                                                            NO repetition

                                          YES **00:24:00**   Repetition Interval
                                                            in day:hour:minute

NOTE: At window OFF time, also digitizer, GPS, and PC board are completely turned off (power consumption about 5 milliAmp). Thus, at window START TIME the digitizer takes another two minutes up to the first correct recording (PC board booting, digitizer SetUp, filter delay…); for sampling rates below 5 sps this delay increases up to 14 minutes (at 1 sps).

            BURST   **01-JAN-2003 00:00** Start ... (see above)

In BURST mode, the secondary data stream (Str2) is continuously recorded, and the primary stream (Str1) is recorded within time windows only.

The program manages up to 99 windows. Window-ON times are connected by logical OR.

NOTE: Overlapping of PowerOn and BURST windows will cause data drops (V 2.17 ff)

Program EXIT:

The program is left by **<ESC>**. A locked SetUp is left immediately. At a new or an unlocked SetUp the program asks whether the SetUp is to save. After saving, the current SetUp can be immediately converted into the EarthData **recorder.ini** by typing **<F10>** (recommended !!).

2.2.2. SetUp Converter 'edl_ini.exe'

Characteristics:

- Converts GIPP SetUp **`*.set`** into EDL **`recorder.ini`**
- Source code: Turbo Pascal
- Input file: **`edlsetup.bat`**   to find ordered SetUp (**`*.set`**)
- Input file: **`recorder.000`**   (GIPP default ini-file)
- Input file: **`shorttmp.dat`**   (PC cycle shorten value; if none, default '10'))
- Output file: **`recorder.ini`**   (EDL ini-file)

Program Start:

- Exiting SetUp program **`edl_set.exe`**   with **<Y>** (save) and **<F10>**, see above;   **or**
- EDL Menu **<&>**   **or**
- command line, typing `edl_ini`

or
- command line   **`edlsetup i`**

In all cases it reads the name of the GIPP-type SetUp file (**`*.set`**) from **`edlsetup.bat`**

Command Line Parameter:

- parameter 1   SetUp file name **`xxx.set`**

There are no output messages except input files are missing.

2.3.   PC Digitizer Monitor

These programs access the EDL digitizer output directly via serial line. The DOS PC has to be connected to EDL socket 'ETHERNET', which also contains the digitizer RS232 output.

2.3.1. Continuous Time Series Monitor 'edlbdisp.exe' / 'edlbfilt.exe'

Characteristics:

- Plots digitizer output time series (second by second)
- Amplitude shown in true Input Voltage, independent on preamplifier settings
- **edlbfilt.exe** only: real-time 2nd order High Pass (default @ 1 Hz)
- Plots Mass Position voltage (broadband seismometers only)
- Source code: Turbo Pascal

Program Start:

- EDL Menu **<M>**   **or**
- command line, typing `edlbdisp` / `edlbfilt`

- parameter 1   channels to display ($<$ = digitizer activated channels)
- parameter 2   plot length on screen [seconds]
- parameter 3   **edlbfilt.exe** only: High Pass corner frequency

Function Keys:

UP / DOWN   increase / decrease Amplitude
+ / -   zoom In / Out
SPACE   freeze screen
ESC   escape

Output Messages:

- Overall Data rate too high   data rate exceeds baud rate (no way out)

NOTE: for slow PCs, use **edl2nois.exe** (see below)

2.3.2. Buffered Time Series Monitor 'edl2nois.exe' / 'edl2filt.exe'

Characteristics:

- Plots digitizer output time series after storing a certain series length [seconds]
- Signals duration of acquisition (continuously beeping)
- Amplitude shown in true Input Voltage, independent on preamplifier settings
- **edl2filt.exe** only: real-time 2nd order High Pass (default @ 1 Hz)
- Source code: Turbo Pascal

Program Start:

- EDL Menu **<M>**   **or**
- command line, typing **`edl2nois / edl2filt`**

Command Line Parameters:

- parameter 1   Baud rate (9600 .. 115200 Baud);
                          first two digits sufficient, e.g. **`edl2nois 38`** for HP-200
- parameter 2   channels to display ($<$ = digitizer activated channels)
- parameter 3   acquisition length [seconds]
- parameter 4   **edl2filt.exe** only: High Pass corner frequency

Function Keys:

UP / DOWN   increase / decrease Amplitude
+ / -   zoom In / Out
LEFT / RIGHT   shifts 50% of the plotted time series left / right
SPACE   hide / show vertical second marks
ESC   escape

Output Messages:

- Overall Data rate too high   data rate exceeds baud rate (no way out)

2.3.3. Mass Position Monitor 'edl2dmass.exe'

<u>Characteristics:</u>

- Displays voltage of auxiliary channels Aux1 to Aux3
      (e.g. broadband seismometer mass position)
- Source code: Turbo Pascal

<u>Program Start:</u>

- EDL Menu **<B>**   **or**
- command line, typing **edl2mass**

<u>Command Line Parameters:</u>

- parameter 1   Baud rate (9600 .. 115200 Baud);
                       first two digits sufficient, e.g. **edl2mass 38** for HP-200

<u>Function Keys:</u>

  ESC   escape

<u>Output Messages:</u>

- Overall Data rate too high   data rate exceeds baud rate (no way out)

2.3.4. Digitizer Status Monitor

<u>Characteristics:</u>

- Displays Digitizer status including GPS status
- Source code: Turbo Pascal

<u>Program Start:</u>

- EDL Menu **<H>**   **or**
- command line, typing **edl_head**

<u>Command Line Parameters:</u>

- parameter 1   Baud rate (9600 .. 115200 Baud);
                       first two digits sufficient, e.g. **edl2mass 38** for HP-200

<u>Function Keys:</u>

  ESC   escape

2.3.5. Digitizer Baud Rate Reset 'portretu.exe'

<u>Characteristics:</u>

 - Scans digitizer output Baud rate from 115200 Baud downto 110 Baud
 - Resets digitizer output Baud rate to default 115200 Baud
 - Source code: Turbo Pascal

<u>Program Start:</u>

 - EDL Menu **<R>**   **or**
 - command line, typing `portretu`

<u>Command Line Parameters:</u>

 - parameter 1   Baud rate (9600 .. 115200 Baud), first two digits sufficient;
                        skips Baud rate scan

<u>Function Key:</u>

ESC   escape

NOTE: Removing power from EDL sets the digitizer to default 115200 Baud.

2.4.   EDL Status Monitor

The PC has to be connected to EDL socket 'MODEM'; the PC board has to be activated
before.

<u>Characteristics:</u>
 - Automated login to Linux prompt
 - Reads and displays
        current SetUp parameters,
        EDL status (recording status, power, and hard disk status)
        GPS status

 - Source code: Turbo Pascal

<u>Program Start:</u>

 - EDL Menu <V>   **or**
 - command line, typing **`edl_view`**

<u>Command Line Parameters:</u>

 - parameter 1   Baud rate (9600 .. 115200 Baud);
                        first two digits sufficient, e.g. **`edl_view 38`** for HP-200

<u>Function Keys:</u>

 ESC   escape

2.5.   Service Programs

2.5.1. EDL Power Calculator ‚edl_powr.exe'

<u>Characteristics:</u>

 - Calculates power consumption (battery life) and hard disk capacity [days:hours]
 - Calculates optimal CPU power cycle versus sampling rate and environmental temperature
 - Source code: Turbo Pascal

<u>Program Start:</u>

 - EDL Menu **<P>**   **or**
 - command line, typing `edl_powr`

<u>Function Keys:</u>

TAB / SHIFT TAB   next / former parameter
ENTER / BACKSPACE   increase / decrease parameter value
ESC   escape

2.5.2. EDL Legacy Format Reader 'edl4plot.exe'

<u>Characteristics:</u>

 - plots EarthData legacy format (4 byte word)
 - Source code: Turbo Pascal
 - Input file: ***.m0*x***   (***x*** gives the acquired channel number)

<u>Program Start:</u>

- command line, typing `edl4plot`

The program scans for legacy-type data files (`*.m0`***x***). A window pops up for selecting one.

<u>Command Line Parameters:</u>

 - parameter 1   Input file name ***.m0*x***

<u>Function Keys:</u>

 UP / DOWN   increase / decrease Amplitude
 + / -   zoom In / Out
 LEFT / RIGHT   shifts 50% of the plotted time series left / right
 SPACE   hide / show vertical second marks
 ESC   escape

3.   PC Programs (Windows xx)

3.1.   EDL SetUp & Upload 'EDL_SetUp'

The program is fully compatible to the DOS programs `'edlsetup.exe'` and `'edl_ini.exe'` and to their input and output files.

The Windows PC (COMx: selectable) has to be connected to EDL socket 'MODEM'; the EDL PC board has to be activated before.

Characteristics:

- Choice of preselected SetUp parameters
- Output file: `*.set`   (GIPP-type parameter set, see 1.1. and Appendix A)
- Output file: `edlsetup.bat`   (name of recently edited `*.set`)

- Converts GIPP SetUp `*.set` into EDL `recorder.ini`
- Input file: `edlsetup.bat`   to find ordered SetUp (`*.set`)
- Input file: `recorder.000`   (GIPP default ini-file)
- Input file: `shorttmp.dat`   (PC cycle shorten value; if none, default '10'))
- Output file: `recorder.ini`   (EDL ini-file)

- Automated login to Linux prompt
- Upload of `'recorder.ini'` to EDL

- Calculation of Power Consumption (Battery Span) of Record Duration (Hard Disk Span)

- Source code: Delphi (Pascal)

3.2.   EDL Access

The program performs the same function as the DOS program `'edl_view.exe'`.

The Windows PC (COMx: selectable) has to be connected to EDL socket 'MODEM'; the EDL PC board has to be activated before.

Characteristics:

- Automated login to Linux prompt
- Display of current Setup Parameters
- Realtime display of GPS status and of Recorder Status
  (incl. hard disk, temperature, clock drift)

- Source code: Delphi (Pascal)

4.   PDA Programs (Win mobile)

GIPP does no more support Palm-OS, instead it turned to WinCE and followers.

4.1.   Installation and Handling

4.1.1. Program Overview

EDL DIGITIZER Port:

PocketMon	shows Digitizer Time Series	**or**
	filtered Digitizer Time Series and Mass Position voltage	**or**
	Digitizer status (incl. GPS)	

EDL MODEM Port:

PocketAccess	shows current SetUp, EDL status, and GPS status
	(functions similar to PC program **edl_view.exe)**

Parameter SetUp and SetUp transfer run via DOS programs using the DOS Emulator
PocketDOS

4.1.2. Installation

PDA Hardware:

All programs need access to an RS232 compatible port.
For the DOS emulated programs the cable should connect RTS/CTS as well as DSR/DTR.

Installation:

All programs given below have to be installed on PDA.
The installation should be done via PC ActiveSync.

4.1.3. DOS Emulator

PDA Operating System:

The emulator is tested under
    PocketPC 2002   (Fujitsu-Siemens Pocket LOOX)
    Windows Mobile 5.0 (HP iPAQ rx1950, Fujitsu-Siemens LOOX N560)

Installation:

 - install PocketDOS (shareware; http://www.pocketdos.com)

 - copy all DOS programs to PDA (same as in 2.2.; e.g. to Memory Card root)
    Don't forget the graphics drivers !!

-    start PocketDOS

- start NORTON Commander, the drives are
    - A: `\DOS` und `autoexec.bat` (that drive exists within the emulator only)
    - C: Memory Card   (system prompts here)
    - D: PocketPC Memory   (or Drive C:\, when no Memory Card available)

- copy   `autoexec.bat`   to C:\ or to D:\   and exit PocketDOS
- edit   `autoexec.bat`   via PC (ActiveSync)
        add to `autoexec.bat` the lines
    ```
    cd edl
    c:\norton\nc.exe
    SETCOM COM1: COM1:
    ```
    (resp. `\norton\ncs.exe`)

- start PocketDOS
- start Norton Commander
- copy   `autoexec.bat`   to A:\

The demo version of PocketDos is sufficient for running all EDL related DOS programs, except the real time ones (e.g. Time Series Monitor). On the other hand, an advertising screen appears, each 6 minutes interrupting the DOS shell for 15 seconds.

Start:

 - start PocketDOS
       NORTON Commander appears; continue similar to **chapter 2**.

Settings:

DOS window and port settings can be changed via the WinCE button (upper right at the DOS keyboard)

 - Settings → Display → Orientation
     - Portrait   displays half the screen only
     - Landscape   90° rotated, displays full DOS screen (letters are rather tiny)

 - Settings → Communications → COM1: (or COM2:)
       starts the port wizard

4.2. WinCE Programs

4.2.1. Digitizer Monitor ‚PocketMon'

The PDA has to be connected to EDL socket 'ETHERNET', which also contains the digitizer RS232 output.

Characteristics:
- Plots digitizer output time series continuously   (Screen 1)
       Amplitude shown in true Input Voltage, independent on preamplifier settings

- Filters time series up to 100 sps   (Screen 2)
       2nd order Butterworth HighPass @ 1 Hz
- Writes Mass Position Voltage   (Screen 2)

- Writes System and GPS Messages   (Screen 3)
       Battery [V] and PLL [µS]; Last Lock, LAT, LON,   (standard header)
       GPS Status   (enhanced header)

       At program start it tries to activate the digitizer's enhanced header

- Source code: WinCE

Function Keys (touch screen)

++ / --	increase / decrease Amplitude
<< / >>	zoom In / Out
any position	Escape Menu

Rocker Box:

up / down	increase / decrease Amplitude
left / right	zoom In / Out
O	Toggle Screen 1 to 3

Output Message:
-     S-rate too high
       Overall Sampling exceeds 3000 sps

4.2.2. EDL Status Monitor ‚PocketAccess'

The PDA has to be connected to EDL socket 'MODEM'; the PC board has to be activated before.

‼ The cable should connect RTS/CTS as well as DSR/DTR ‼

Characteristics:
 - Automated login to Linux prompt
 - Reads and displays
        current SetUp parameters,   (all screens)
        EDL status (recorder and hard disk status) (Screen 1)
        GPS status   (Screen 2)

 - Source code: WinCE

Function Keys (touch screen)

any position   Escape Menu

Rocker Box:

O   Toggle Screen 1 to 2

5. EDL Counterparts

Valid for EarthData firmware Version 2.24 upward

5.1. Installation

5.1.1. Program Overview

 - Shell Scripts - Monitor
      edlinfo   gets EDL No., IP and gain type from GIPP Digitizer entry
                    (by Ch. Lendl)
      get_no   writes EDL No., IP, gain type and HD No. to file **edl_no**;
                    writes HD Status to file **disk.dat**;
                    copies current **recorder.ini** to `/usr/local/gipp/`

- Shell Scripts – Insert new SetUp
      reconfig   calls **edlinfo**, writes EDL No. and gain type to **edl_no**
                    calls **edl_num**   (see below)
                    calls **recorder stop**   (stop digitizer before changing SetUp)

                    copies changed **recorder.ini** to `/data/config/`
                    calls **recorder start**   (starts digitizer)
                    (Stop/Start are performed just to link config messages to standard output)

- Programs - EarthData origin
      bmon   **amon,** reduced to single data output (Digitizer Status Monitor)

5.1.2. Installation Notes

<p align="center">!! DON'T FORGET: <code>chmod 755</code> !!</p>

Program Changes:

      See notes by Christof Lendl.

Full Version (December 2008):

```
/sbin/edlinfo          (Ch. Lendl)

/usr/bin/kermit

/usr/local/gipp/bmon
/usr/local/gipp/edl_num
/usr/local/gipp/get_no
/usr/local/gipp/reconfig
```


5.2.   EDL Counterpart Programs

5.2.1. Entry of EDL S/N 'edl_num'

Characteristics:

- writes EDL GIPP-No. into **`recorder.ini`**
- checks gain type, removes parameter VeryLow Gain from **`recorder.ini`** if necessary
- Source code: FreePascal
- Input file: **`edl_no`**

5.2.2. Status Monitor 'bmon'

Characteristics:

- the original EarthData monitor program **`amon`** is changed for one-time output
- Source code: C   (by Earth Data, see EarthData Manual)

Appendix A

GIPP-type SetUp file, example '`3_20sps.set`'

This file is valid for **EarthData firmware V 2.14** and higher

(GPS Initial Position settings added)

```
3X20_SPS
21-AUG-2003
08:43

;record_mode ;data_type       ;file_length      ;disk_mode; max. pc_cycle
 CONTI        MiniSEED lt     30 min            WRITE ONCE 863 min

;prim_srate  ;sec_srate  ;gain
   20           0          1
   20           0          1
   20           0          1
    0           0          1
    0           0          1
    0           0          1

;gps_mode     ;gps_LAT   ;gps_LON    ;clock_mode    ;log_mode
 GPS CONTI    53°N         13°E       1-Sat Lock     PLL >10mic

;Aux1    ;Aux2    ;Aux3    ;Aux4    ;TRec    ;TDisk   ;UBatt   ;IBatt
 OFF      OFF      OFF      OFF      OFF      OFF      ON       OFF

;Cali_Type    START                 DURATION     REPEAT INTERVAL   Signal mVolt
 CalOut ON    01-JAN-2003  00:00   00:00:00:30  NO    00:24:00   SWEEP  5000
 TTLOut OFF
 OPCOut OFF

;w_type   START                 DURATION    REPEAT INTERVAL
 CONTI    immediately

;;----------------------------------------------------------------
;;params pointer
;;rec_mode 1  1  30  1  863
;;s_rates  6  0  1  6  0  1  6  0  1  1  0  1  1  0  1  1  0  1
;;gps_mode 1  53  13  2  4
;;aux_mode 1  1  1  1  1  1  2  1
;;CalOut   2  1  1  2003  0  0  0  0  0  30  2  0  24  0  3  150
;;TTLOut   1  1  1  2003  0  0  0  0  0  10  1  0  24  0
;;OPCOut   1  1  1  2003  0  0  0  0  0  10  1  0  24  0
;;window   2  0  1  2003  0  0  0  24  0  0  1  0  24  0
;;end
```

Appendix B

GIPP Default file 'recorder.000'

This file is valid for EarthData firmware Version 2.13 and higher. For general view, all functions with GIPP spezial settings - GIPP default - are printed *in italics*, all functions which are set by the GIPP SetUp programs are printed **bold**.

)* marks parameters which are not part of earlier EarthData firmware versions; for use in these early versions they have to be hidden by a leading ';'

NOTE: The comments right hand to the functions are **NOT** part of this default file!

```
;*******************************************************
; Seismic Acquisition initialisation section          *
; Note. Spaces are not allowed before the equal (=)    *
;*******************************************************
; Version  EarthData V 2.24

[gipp]
;-----------------
;Project Info
;-----------------
setup_name=
setup_date=
setup_time=

;--------------------
; Infile section name
;--------------------
[recorder]

;-----------------------------
; First chars of data filenames
;-----------------------------
station_long_identifier=gipp        changed at first EDL Power Up
station_short_identifier=gipp            - " -
location_identifier=11              dummy entry, to be replaced by MiniSEED entry
network_code=nn                          - " -

;------------------
; Long channel names
;------------------
channel_0_long_id=pri0
channel_1_long_id=pri1
channel_2_long_id=pri2
channel_3_long_id=pri3
channel_4_long_id=pri4
channel_5_long_id=pri5

channel_6_long_id=sec0
channel_7_long_id=sec1
channel_8_long_id=sec2
channel_9_long_id=sec3
channel_10_long_id=sec4
```

```
channel_11_long_id=sec5
channel_12_long_id=gps

channel_13_long_id=EDLTemp
channel_14_long_id=diskTemp
channel_15_long_id=battI
channel_16_long_id=battV1
channel_17_long_id=battV2
channel_18_long_id=aux1
channel_19_long_id=aux2
channel_20_long_id=aux3
channel_21_long_id=aux4


;-------------------
; Short channel names
;-------------------
channel_0_short_id=p0
channel_1_short_id=p1
channel_2_short_id=p2
channel_3_short_id=p3
channel_4_short_id=p4
channel_5_short_id=p5

channel_6_short_id=s0
channel_7_short_id=s1
channel_8_short_id=s2
channel_9_short_id=s3
channel_10_short_id=s4
channel_11_short_id=s5

channel_13_short_id=aTp
channel_14_short_id=dTp
channel_15_short_id=bI
channel_16_short_id=bV1
channel_17_short_id=bV2
channel_18_short_id=au1
channel_19_short_id=au2
channel_20_short_id=au3
channel_21_short_id=au4


;------------------------------------------
; Channel sample rates in samples per second
;------------------------------------------
```

channel_0_samplerate=100   primary data stream
channel_1_samplerate=100
channel_2_samplerate=100
channel_3_samplerate=0
channel_4_samplerate=0
channel_5_samplerate=0

channel_6_samplerate=0   secondary data stream
channel_7_samplerate=0
channel_8_samplerate=0
channel_9_samplerate=0
channel_10_samplerate=0
channel_11_samplerate=0

channel_13_samplerate=0   auxiliary channels
channel_14_samplerate=0
channel_15_samplerate=0

```
channel_16_samplerate=0
channel_17_samplerate=0
channel_18_samplerate=0
channel_19_samplerate=0
channel_20_samplerate=0
channel_21_samplerate=0

;--------------------
; Channel gain
;--------------------
channel_0_high_gain=0
channel_1_high_gain=0
channel_2_high_gain=0
channel_3_high_gain=0
channel_4_high_gain=0
channel_5_high_gain=0

channel_0_very_low_gain=0
channel_1_very_low_gain=0
channel_2_very_low_gain=0
channel_3_very_low_gain=0
channel_4_very_low_gain=0
channel_5_very_low_gain=0
```

)* only at certain recorders
)*   -"-
)*   -"-
)*   -"-
)*   -"-
)*   -"-

```
;--------------------
; Channel data format
;--------------------
channel_0_format=mini_seed
channel_1_format=mini_seed
channel_2_format=mini_seed
channel_3_format=mini_seed
channel_4_format=mini_seed
channel_5_format=mini_seed
```

primary stream format

```
channel_6_format=mini_seed
channel_7_format=mini_seed
channel_8_format=mini_seed
channel_9_format=mini_seed
channel_10_format=mini_seed
channel_11_format=mini_seed
```

secondary stream format

```
channel_12_format=gps4
```

GPS log, logs PLL > 10 microSec only

```
;--------------------
; Status logs
;--------------------
messagelog_size=10000
day_logs=1
```

log files stored in related daily directories

```
;--------------------
; Data record modes
;--------------------
endian=little
mseed_filesize=30
file_align=1
disk_full=50
delete_old_data=0
```

)* byte order, little = IBM, big = Motorola
data file length in minutes
data file starts at full hour
50 MB remain at disk full (ED proposal)
)* record stops at disk full

```
;--------------------
; PC modes
;--------------------
```
pc_off_time_override=0   )* PC cycle time is calculated by EDL;
the GIPP SetUp program only interferes when the cycle
interval exceeds 6:40 hours,
and sets *pc_off_time_override=360*

pc_off_time_shorten=10   PC cycle is shorted by 10 minutes
longflush_timeout=60   )* PC timeout[min] after turned on by Long FLUSH
(overrun by MODEM pin K and/or pin A,
and by *always_on=1*)
always_on=0   )* PC always on (=1 ; overruns timeout setting)

```
;--------------------
; GPS
;--------------------
```
gps_low_power=0,0   )* GPS continuously running
single_satellite=0   )* single satellite mode (=1)
gps_string=>SIP+00+000+0000<   )*GPS Initial Position or any TAIP string

```
;--------------------
; Window Timer section
;--------------------
```
[timer]   windows added by GIPP SetUp program

Appendix C

GIPP Cycle Shorten file 'shorttmp.dat'

This file is used by the GIPP program **edl_ini.**exe to check and finally to set the PC Cycle Shorten parameter:

```
    10
    Value above sets Minutes to shorten the PC cycle of the EDL
```