

## Ice-9 Data File Naming and Format

This document describes the naming convention and internal format structure for the Ice-9 raw data files provided by PBO laser strainmeter stations. This document is an adaptation of the general Ice-9 format document provided by Larry Beck (Ice-9 Software) and Duncan C. Agnew (UC San Diego).

### 1 File Name Convention

The names for PBO Ice-9 files have the following structure:

- `YYYYDDD.SSSS.1s.gz`  
A gzipped file of binary data from station `SSSS`, recorded at 1-second intervals, and sampled every second, containing data for year `YYYY` and day of year `DDD`. For example, `2005362.DHL2.1s.gz` contains data from station `DHL2`, sampled once per second, for day `362` of year `2005`.
- `YYYYDDD.CCCC.5m.gz`  
A gzipped file of binary data from station `SSSS`, recorded at 1-second intervals, and sampled every five minutes, containing data for year `YYYY` and day of year `DDD`. For example, `2005362.DHL2.5m.gz` contains data from station `DHL2`, sampled once every five minutes, for day `362` of year `2005`.

### 2 File Format

#### 2.1 Header Records

PBO Ice-9 files begin with a 128-byte descriptive header, containing file-specific information, labels to allow cross-checking of the source of the file, and version and system identification information. All header information is stored in Little Endian (PC) byte order. Table 1 describes the header format.

**Table 1:** PBO Ice-9 Header Format

Byte Offset	Stored Information	
Start	Stop	
1	4	Binary file version number, which identifies the binary file format.
5	8	Header size in bytes.
9	12	End-of-file marker; data at or past this location is not valid.
13	16	Last sample marker, gives the position in bytes of the start of the last valid sample record.
17	20	4-character system ID, used to identify the source of the data.
21	24	Sample interval in seconds.
25	128	Padding bytes.

#### 2.2 Data Records

Each data record consists of a 16-byte record header followed by the data. The record header information and data are stored in Big Endian (Sun/UNIX) byte order.

Table 2 describes the format of the data record header.

The header is followed by  $N$  2-byte integer values, where  $N$  is the number of channels in the record header. The data are stored in counts, with the range  $\pm 10$  Volts being  $-32768$  to  $32767$  counts; the values are stored as 2's-complement 16-bit integers.

**Table 2:** PBO Ice-9 Data Record Header Format

Byte Offset		Stored Information
Start	Stop	
1	4	UNIX UTC time (seconds since 1 January 1970 00:00 UTC, ignoring leap seconds).
5	6	Year
7	8	Day of year (1-365, or 366 in leap years).
9	10	Hour
11	12	Minute
13	14	Second
15	16	Number of channels of data in record