1. “WIN32” Data File Format

Each “WIN32” data file contains a file header section (Table 1) and a data section which consists of one-second blocks (Table 2).

Table 1. Format of a file header section

#	Field Name	Size	Data Type	Description
1	Format ID	8 bit	bit	Fixed at 0x00
2	Version of WIN32 file format	8 bit	bit	Fixed at 0x00
3	Reserved	16 bit	N/A	Reserved (fixed at 0x0000)

A data section follows after the file header. In Hi-net continuous data (1-min WIN32 file), a data section contains one-second blocks for one minute. Each one-second block contains header fields and data blocks for each channel at each station.

Table 2. Format of a data section

	#	Field Name	Size	Data Type	Description
First one-second block					
	Header fields of one-second block				
	4	Start time of data sampling in the one-second data block	64 bit	BCD	Start time of the data sampling is given by a 16-digit number, which consist of 4-digit year (YYYY), 2-digit month (MM), 2-digit day (DD), 2-digit hour (hh), 2-digit minute (mm), 2-digit second (mm), and 2-digit sub-second (xx). Sub-second is fixed at 0 (i.e 0x00). For example, 2000010123595900.
	5	Time length of the one-second block	32 bit	bit	Time length of one-second block. Unit is 0.1 s. This value is fixed at 0x000A (i.e. 10 in decimal number), because the “one-second” block length is always 1 s.
	6	The length of the one-second block	32 bit	bit	Data size from the beginning of the first channel’s data block to the last of the last channel’s data block. (Unit: Octet = Byte). A file header (#1-3) and the header fields of a one-second block (#4-6) are NOT included in this length.
	Data block of the first channel				
	7	Organization ID	8 bit	HEX	Organization ID. For example, 0x01 means NIED.
	8	Network ID in the organization	8 bit	HEX	Network ID in the organization defined in the field #7. For example, 0x01 means Hi-net, if the organization ID is 0x01 (i.e. NIED).
	9	Channel ID in the network	16 bit	HEX	In Hi-net, channel ID number is a unique number to identify the station, component and data type.
	10	Sampling size	4 bit	HEX	Data length of one sample in the field #13. 0: 4 bit 1: 8 bit 2: 16 bit 3: 32 bit
	11	Number of samples	12 bit	bit	Number of samples in the data block of each channel. For example, 0x64 (i.e. 100 in decimal number) in the case of 100 samples/s.

	12	First sampled value [1)]	32 bit	bit	First sampled value given by the length of 4 octets (i.e. 4 bytes)
	13	Second sampled value to the end of the sampled value[1)]		bit	Data is stored as the difference from the previous sampled value (i.e. delta compression). In the case of 100 samples/s, this field stores 99 samples at the interval of 10 ms. Data size of each sampled value is defined in the field of sample size (#10).
	Data block of the second channel (Repeat #7-#13)				
	Data block of the third channel (Repeat #7-#13)				
	…				
	Data block of the last channel (Repeat #7-#13)				
Second one-second block					
Third one-second block					
…					
Last one-second block.					

Note

1) The data size of the first sample in each channel is 32 bit (Field #12). This means that the data size of the first sample is 4 octets (= 4 bytes) for each second. After this field, the sampled data are stored in the field #13 as the differences of sequential value (i.e. delta compression). Suitable data size of one sample in #13 is chosen and given in #10 among 0.5, 1 2, 3, and 4 octets (=bytes) to minimize data size.

2) Number of samples in #13 is usually odd (e.g., 99). When sample size (#10) is 0.5 octets (i.e. 4 bit), one more 4-bit data is required to keep that the length of the data block is always one-octet. Therefore, 0x0 (=0000b) is padded at the end of the field #13 in such case.

2. Schematic Image of the Whole 1-min WIN32 file

The format of a one-minute WIN32 data file is schematically illustrated in the Table 3.

Table 3. Schematic Image of 1-min WIN32 file.

Format ID	Format version	Reserved	
Start time of data Sampling (YYYYMMDDhhmmssxx) (00 s)			
Time length of the one-second block		Data size of one-second block	
Channel block	Channel block	Channel block	…
…	…	Channel block	Channel block
Start time of data sampling (YYYYMMDDhhmmssxx) (01 s)			
Time length of the one-second block		Data size of one-second block	
Channel block	Channel block	Channel block	…
…	…	Channel block	Channel block
….			
Start time of data sampling (YYYYMMDDhhmmssxx) (59 s)			
Time length of the one-second block		Data size of one-second block	
Channel block	Channel block	Channel block	…
…	…	Channel block	Channel block
Start time of data sampling (YYYYMMDDhhmmssxx) (60 s)			
Time length of the one-second block		Data size of one-second block	
Channel block	Channel block	Channel block	…
…	…	Channel block	Channel block
Start time of data sampling (YYYYMMDDhhmmssxx) (61 s)			
Time length of the one-second block		Data size of one-second block	
Channel block	Channel block	Channel block	…
…	…	Channel block	Channel block

Data from 00 s to 59 s are stored.

Data of 60 s and 61 s are stored, when leap seconds exist.