



EXPLORE THE CLIMATE

K8 specification

Version 1.05

Document history

Rev	Chapter	Description of modification / changes	Date
1.00		Initial release.	21/04/2014
1.01	1, 3	Add document history. Add Curvature cross enable bit.	26/05/2014
1.02	2.1, 3.1, 3.2	Add Polarized and BRDF 12 filters Photometer.	29/07/2014
1.03	3.1	Update Setting length.	03/06/2019
1.04	2.1, 3.1, 3.2	Update record ID list. Update instrument type list.	19/11/2019
1.05	2.1	Add customized record ID.	04/02/2020

2 Record format

Each record is saved as follow:

Offset	Length	Encryption	Information
0	1	Bit 7: Reserved (must be 0). Bit 0..6: Record ID	See 1.1 Record ID.
1	1	Record Length N (LSB)	
2	1	9..13: Record Length N (MSB) 14: Reserved 15: DCP	DCP bit indicates if the current scenario can be send through DCP.
3	4	Date / time	See 1.2 Date / time structure.
7...n	N-10	Record payload	
N-3	1	0xFE	End marker.
N-2	1	Record Length N (LSB)	
N-1	1	9..13: Record Length N (MSB) 14: Reserved 15: DCP	DCP bit indicates if the current scenario can be send through DCP.

Each data is recorded LSB first

Data could be scenario data, settings...

EXPLORE THE CLIMATE

2.1. Record ID

Record Id	Name	File extension
0x00	Status	*.STA
0x01	Sun	*.SUN
0x02	Sky	*.SKY
0x03	Moon	*.LUN
0x04	3 Sun	*.NSU
0x05	3 Sun + debug	*.DSU
0x06	3 Moon	*.NLU
0x07	3 Moon + debug	*.DLU
0x08	Black	*.BLK
0x09	Principal Plane	*.PP1
0x0A	Right Almucantar	*.ALR
0x0B	Left Almucantar	*.ALL
0x0C	Deprecated	Deprecated
0x0D	Deprecated	Deprecated
0x0E	Cross	*.CSU
0x0F	Cross Moon	*.CLU
0x10	Deprecated	Deprecated
0x11	Sol Radiance Cone	*.CON
0x12	Polarized Principal Plane	*.PPP
0x13	Polarized Right Almucantar	*.APR
0x14	Polarized Left Almucantar	*.APL
0x15	Deprecated	Deprecated
0x16	Deprecated	Deprecated
0x17	Prism sea	*.PRS
0x18	Polarized SUN	*.PSU
0x19	Polarized LUN	*.PLU
0x1A	Deprecated	Deprecated
0x1B	Deprecated	Deprecated
0x1C	Right Hybrid	*.HYR
0x1D	Left Hybrid	*.HYL
0x1E	Polarized Right Hybrid	*.HPR
0x1F	Polarized Left Hybrid	*.HPL
0x20	Curvature Cross SUN	*.CCS
0x21	Polarized Sol Radiance Cone	*.COP

EXPLORE THE CLIMATE

0x7B	Photometer short identifier	
0x7C	Photometer full identifier + settings	
0xFD	Empty record	
Customized record ID		
0xE0	Generic record ID	
0xE1	CIMEL record ID	
0xE2	AERONET record ID	
0xE3	AGORA LAB record ID	
0xE4-0xF0	Reserved for customized record ID	

2.2. Date / time structure

The date / time are stored on 4 bytes and the structure is:

```
typedef union
{
    unsigned long val;
    struct
    {
        unsigned char seconds    :6;    // 00 - 59
        unsigned char minutes    :6;    // 00 - 59
        unsigned char hours      :5;    // 00 - 23
        unsigned char days       :5;    // 01 - 31
        unsigned char months     :4;    // 01 - 12
        unsigned char years      :6;    // 00 - 63
    };
}compact_date_t;
```

I.e. The date “28/04/14 12:25:39” is coded in 32 bits: 0x3938C667

3 Record payload description

3.1. Full identifier and settings record (0x7C)

Offset	Length (bytes)	Field description
0x00	6	Full identifier.
0x06	Record payload Length - 6	Settings. This record is different depending of the firmware version.

3.1.1. Full identifier

3.1.1.1. Firmware version 1.x.x

Offset	Field description
0x00	Product type: - 0x81: Photometer.
0x01	Device type: - 0x00: TS9 photometer. - 0x01: TU9 photometer. - 0x02: TP9 photometer - 0x03: TU12 photometer. - 0x04: TV12 photometer. - 0x05: TUP9 photometer.
0x02	Software major version: 1
0x03	Software minor version.

0x04	Hardware major version.
0x05	Hardware minor version.

3.1.1.2. Firmware version 2.x.x

Offset	Field description
0x00	Product type: - 0x81: Photometer.
0x01	Device type: - 0x00: TS9 photometer. - 0x01: TU9 photometer. - 0x02: TP9 photometer - 0x03: TU12 photometer. - 0x04: TV12 photometer. - 0x05: TUP9 photometer.
0x02	Software major version: 2 or more
0x03	Software minor version.
0x04	Software correction version.
0x05	Hardware major version.

3.2. Short identifier record (0x7B)

Offset	Field description
0x00	Product type: - 0x81: Photometer.
0x01	Device type: - 0x00: TS9 photometer. - 0x01: TU9 photometer. - 0x02: TP9 photometer - 0x03: TU12 photometer. - 0x04: TV12 photometer. - 0x05: TUP9 photometer.
0x02	Software major version.
0x03	Head number.