Ref. No.20081226-1

Panasonic Network Camera

JPEG data FORMAT

VER. 1.00

System Solutions Company
Panasonic Corporation

Revise Record

VER.	Date	Item no.	Comment	Revise trigger
0.11	14 Apr.2008		First release	i-pro camera Version up
1.00	26 Dec.2008	1	Add JPEG format (table2)	
		2.1	Add detail specification of VMD information.	

1. JPEG data format

The JPEG marker used by panasonic camera is shown below.

Table 1: JPEG marker

Marker name		Marker code	
SOI	Start Of Image	FF D8	
APPn	Application segment	FF E0 - FF EF	
DQT	Define Quantization Table	FF DB	
SOF	Start of frame	FF C0	
DHT	Define Huffman Table	FF C4	
SOS	Start Of Scan	FF DA	
EOI	End Of Image	FF D9	
COM	Comment	FF FE	

JPEG image data format is shown below.

[FF D8]
[FF FE]
[Length(byte order): 2byte(Include Length byte)] Additional information (n) .....
[FF D8] JPEG image data (Not include comment field) [FF D9]

Figure 1: JPEG image data format

[Note]

There is a setting (configuration) whether or not a camera attaches additional information to JPEG data. (There is the case that a camera does not add the additional data.)

The JPEG data format has a difference for JPEG quality setting.

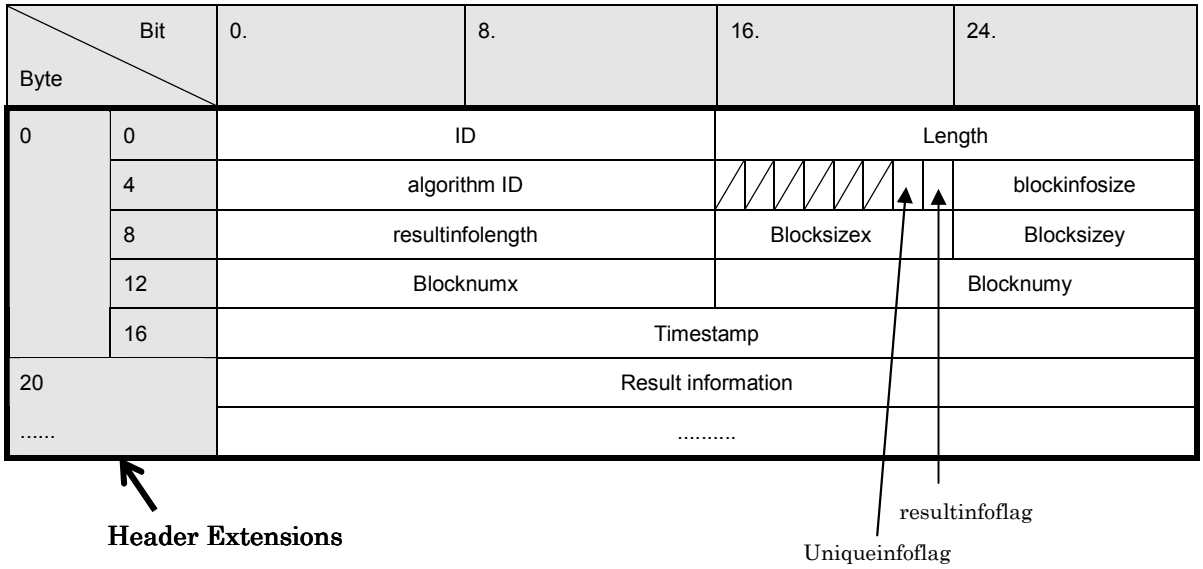
Table 2: JPEG format

Quality setting	Resolution setting		
	1280 x 960 *1	VGA	QVGA
0: SuperFine	4:2:0	4:2:2	4:2:0
1: Fine	4:2:0	4:2:2	4:2:0
2	4:2:0	4:2:2	4:2:0
3	4:2:0	4:2:2	4:2:0
4	4:2:0	4:2:2	4:2:0
5: Normal	4:2:0	4:2:2	4:2:0
6	4:2:0	4:2:2	4:2:0
7	4:2:0	4:2:2	4:2:0
8	4:2:0	4:2:0	4:2:0
9: Low	4:2:0	4:2:0	4:2:0
*1: Supported by NF302/NP304			

2. Additional information

2.1. VMD information

The format of the header extensions about VMD information was described as follows.



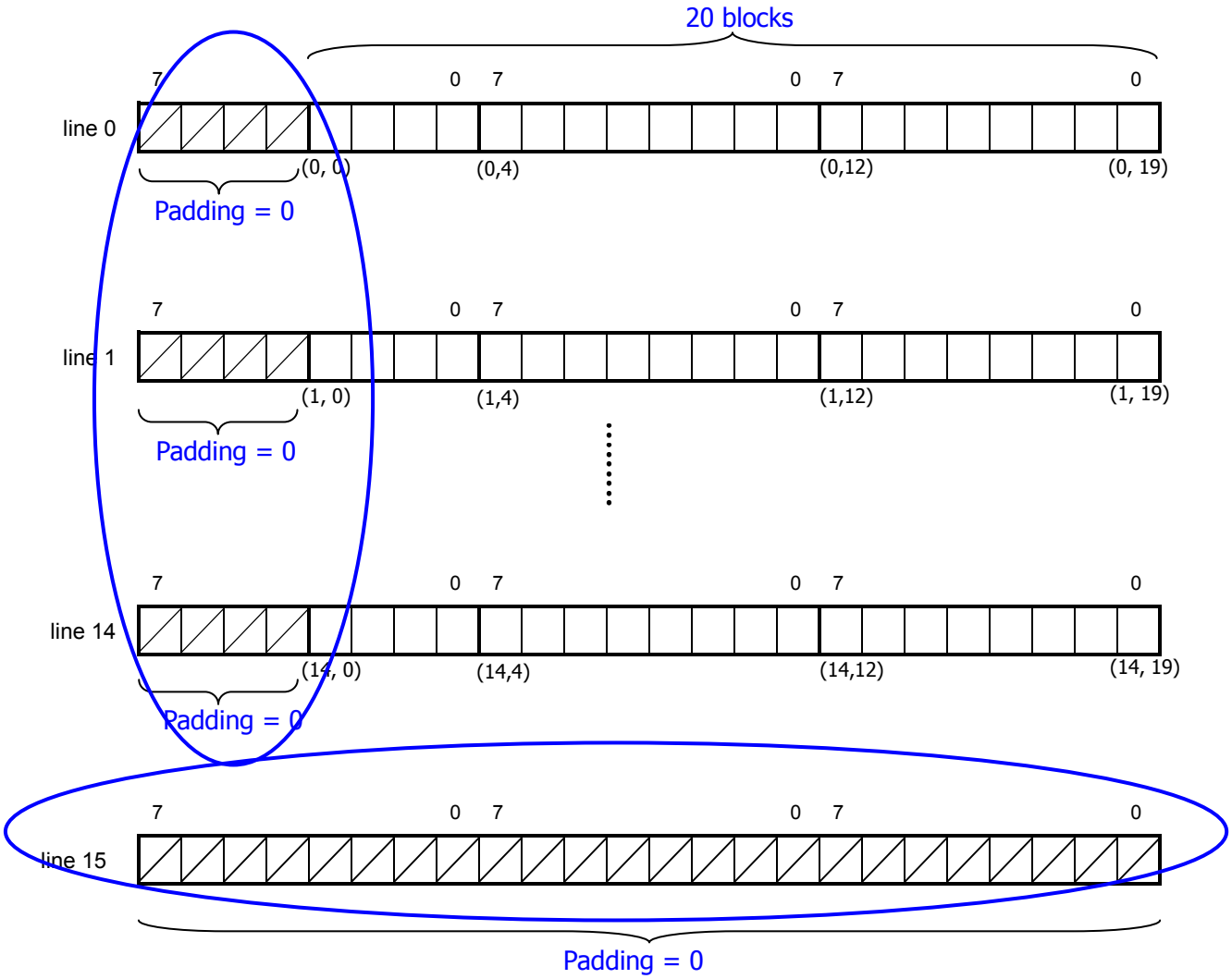
Parameter values

Parameter name	length(Bit)	Values and comments
ID	16	0x0010 (fixed)
Length	16	Total Data length (include ID and Length)　(Unit of byte)
algorithmID(*)	16	Algorithm ID
uniqueinfoflag(*)	1	0 (fix)
blockinfosize(*)	8	1 (fix)
resultinfolength(*)	16	Length of the Result information (Unit of byte)
Blocksizex(*)	8	Block Size (Horizontal)
Blocksizey(*)	8	Block Size (Vertical)
Blocknumx(*)	16	Number of blocks (Horizontal)
Blocknumy(*)	16	Number of blocks (Vertical)
Timestamp(*)	32	Capture time of image
Result information(*)	Variable	VMD information of every block. 0: the block without movement 1: the block with movement ・In every line, the left side is filled by the padding ‘0’. ・When the data length doesn't become every 4 byte, the tail of the data is filled by the padding ‘0’.

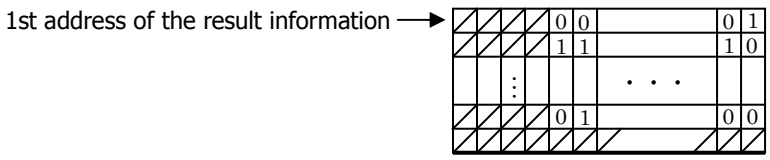
(*) It exists when Extension is true.

Result information format is following.

Ex. Number of blocks: 20 x 15.



Follow is the example of the block information format



Compatibility table of the VMD information parameter

Model number	MPEG-4 setting	Block Size (Horizontal)	Block Size (Vertical)	Number of blocks (Horizontal)	Number of blocks (Vertical)
WV-NP244	VGA	0x20	0x20	0x0014	0x000f
	QVGA	0x10	0x10	0x0014	0x000f
WV-NF282	VGA	0x20	0x20	0x0014	0x000f
	QVGA	0x10	0x10	0x0014	0x000f
WV-NS202A	VGA	0x20	0x20	0x0014	0x000f
	QVGA	0x10	0x10	0x0014	0x000f
WV-NW484	VGA	0x20	0x20	0x0014	0x000f
	QVGA	0x10	0x10	0x0014	0x000f
WV-NS954, WV-NW964	VGA	0x20	0x20	0x0014	0x000f
	QVGA	0x10	0x10	0x0014	0x000f
WV-NF302, WV-NP304	1280x960	0x50	0x50	0x0010	0x000c
	VGA	0x28	0x28	0x0010	0x000c
	QVGA	0x14	0x14	0x0010	0x000c

2.2. Time information (second)

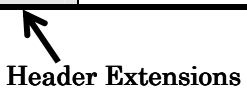
Byte \ Bit		0.	8.	16.	24.
0	0	ID		Length	
	4	Clock			
	8	TimeZoneDirection	TimeZoneHour	Blocksizex	Blocksizey

Header Extensions

Parameter name	length(Bit)	Values and comments
ID	16	0x0011 (fixed)
Length	16	Total Data length (include ID and Length) (Unit of byte)
Clock	32	The career second from 1970
TimeZoneDirection	8	The direction of time zone 0x00 :negative vales 0x01 :positive value
TimeZoneHour	8	Time zone (hour) 0x00: 0hours, 0x01: 1hours, 0x02: 2hours, 0x03: 3hours 0x04: 4hours, 0x05: 5hours, 0x06: 6hours, 0x07: 7hours 0x08: 8hours, 0x09: 9hours, 0x0a: 10hours, 0x0b: 11hours 0x0c: 12hours, 0x0d: 13hours, 0x0e: 14hours, 0x0f: 15hours 0x10: 16hours, 0x11: 17hours, 0x12: 18hours, 0x13: 19hours 0x14: 20hours, 0x15: 21hours, 0x16: 22hours, 0x17: 23hours
TimeZoneMinute	8	Time zone (minute) 0x00: 0minutes, 0x01: 1minutes, 0x02: 2minutes, ... , 0x39: 57minutes, 0x3a: 58minutes, 0x3b: :59minutes
SummerTime	8	0x00 :Not daylight saving time 0x01 :Daylight saving time (Summer time)

2.3. Frame time information (millisecond)

Byte \ Bit		0.	8.	16.	24.
0	0	ID		Length	
	4	FrameTime		Padding	



Parameter name	length(Bit)	Values and comments
ID	16	0x0012 (fixed)
Length	16	Total Data length (include ID and Length) (Unit of byte)
FrameTime	16	Millisecond (Unit of 10 milliseconds) 0x0000: 0 millisecond, 0x0001: 10 milliseconds, ... 0x0062: 980 milliseconds, 0x0063: 990milliseconds
Padding	16	0x0000 (fixed)