



# 3000 series video stream user data format

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#### ***Revision History***

version	Issue date	author	comment
0.9	2005/3/17	Joe Wu	First draft

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# TABLE of CONTENTS

1.1 OVERVIEW .....	5
1.2 MPEG4 SHORT HEADER MODE USER DATA FORMAT.....	6

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## 1.1 Overview

Vivotek embedded some useful information in the video stream so that the developer can use them for advanced features in their software. The information includes digital input states, digital output states, motion detection, etc. This document describes the data format in MPEG4-SHM(Short header mode) video stream.

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## 1.2 MPEG4 short header mode user data format

For MPEG4-SHM, the extra data is inserted after picture start code (PSC) for every image. Each image contains the data as followings. The format is applied to all 3000 series products with double size support.

b21	b20	b19	b18	b17	b16	b15	b14
PSC							
b13	b12	b11	b10	b9	b8	b7	b6
PSC							
b5	b4	b3	b2	b1	b0	b11	b10
PSC						YEAR	
b9	b8	b7	b6	b5	b4	b3	b2
YEAR							
b1	b0	b3	b2	b1	b0	b4	b3
YEAR		MONTH				DAY	
b2	b1	b0	b4	b3	b2	b1	b0
DAY			HOUR				
b5	b4	b3	b2	b1	b0	b5	b4
MINUTE						SECOND	
b3	b2	b1	b0	b7	b6	b5	b4
SECOND				TR			

b3	b2	b1	b0	b0	b2	b1	b0
TR				"1"	VERSION		DO
b2	b1	b0	b0	b12	b11	b10	b9
AW0	AW1	AW2	DI	PTYPE			
b8	b7	b6	b5	b4	b3	b2	b1
PTYPE							
b0	b4	b3	b2	b1	b0	b0	b0
	PQUANT					CPM	PEI
b7	b6	b5	b4	b3	b2	b1	b0
PSPARE(Location text)....							
b7	b6	b5	b4	b3	b2	b1	b0
Text End (0)							
b0	b6	b5	b4	b3	b2	b1	b0
1	PERCENT0(7 bits)+(36 bits)						
b6	b5	b4	b3	b2	b1	b0	b6
PERCENT1(7 bits)+(36 bits)							
b5	b4	b3	b2	b1	b0	b6	b5
PERCENT2(7 bits)+(36 bits)						PERCENT3	
b4	b3	b2	b1	b0	b9	b8	b7
PERCENT3(7 bits)-0000010					Millisecond		
b6	b5	b4	b3	b2	b1	b0	b7
Millisecond (10 bits)							"1"
b6	b5	b4	b3	b2	b1	b0	b8

Nosignal	Extend pic format				Dummy0 (3 bits)-000			
b7	b6	b5	b4	b3	b2	b1	b0	
Dummy1(9 bits)-000000001								
b8	b7	b6	b5	b4	b3	b2	b1	
Dummy2(9 bits)-000000001								
b0								
	.....							

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- ✧ Picture Start Code (PSC)(22 bits)
    - PSC consists of the value 0000 0000 0000 0000 1 00000.
  - ✧ YEAR Code(12 bits)
    - It starts from 1999(0111 1100 1111) till 4095(1111 1111 1111 1111).
  - ✧ MONTH Code(4 bits)
    - Its value includes 1(0001)...12(1100).
  - ✧ DAY Code(5 bits)
    - It consists of the number from 1(0000 1) to 31(1111 1).
  - ✧ HOUR Code(5 bits)
    - It starts from 1(0000 1) to 24(1100 0).
  - ✧ MINUTE Code(6 bits)
    - This field is assigned the number from 1(0000 01) to 60(1111 00). This is the result from adding one to every minute(0-59) in order to avoid the start code emulation.
  - ✧ SECOND Code(6 bits)
    - This number also ranges from 1(0000 01) to 60(1111 00). It also has been applied by the same mechanism above to avoid the start code emulation.
  - ✧ Temporal Reference (TR)(8 bits)
    - This is an 8-bit number which can have 256 possible values in order to correct the decoding and displaying time.
  - ✧ "1" single Code (1 bit)
    - This is a dummy code to avoid the start code emulation.
  - ✧ VERSION Code (2 bits)
    - This value is used for recording the stream version for the database updating and managing.
  - ✧ Digital Output Alert Flag (DO)(1 bit)
    - This bit is used to indicate the DO alert signal.
  - ✧ AW(Alert Window) 0, 1, 2 Code (3 bits)
    - This field is for marking the alert window 0, 1, 2 by user defined. This indicates the movement is over the threshold the user defined.
  - ✧ Digital Input Alert Flag (DI)(1 bit)
    - This bit is used to indicate the DI alert triggered by user defined (H/L). It will add the flexibility except the three alert windows to motion detection with extra devices.
  - ✧ Type Information (PTYPE)(13 bits)
    - The field consists of the properties of each picture. Bit 6 ~ 8 represents the
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PIC format.

PIC Format (PTYPE bit 6 ~ 8)	Value
PIC_FORMAT_QSIF	1
PIC_FORMAT_QCIF	2
PIC_FORMAT_CIF	3
PIC_FORMAT_SIF	4
PIC_FORMAT_QCMOS	5
PIC_FORMAT_CMOS	6
PIC_FORMAT_EXTEND	7

- ✧ Quantizer Information (PQUANT)(5 bits)
  - The quantizer of the picture
- ✧ Continuous Presence Multipoint (CPM)(1 bit)
  - Signal the use of the optional Continuous Presence Multipoint mode
- ✧ Extra Insertion Information (PEI)(1 bit)
  - Signal the presence of the following optional data field
- ✧ Spare Information (PSPARE) (0/8/16... bits)
  - Consisting of 8 bits of location text datas without inserting extra PEIs
- ✧ Text End (TE) (9 bits)
  - 8 sequential "0" bits followed by one "1" bit to signal the text ending.
- ✧ Alert Percentage 0(PERCENT0)(7bits)
  - 1. Alert percentage plus one (+1) for each alert window to avoid start code emulation.
  - 2. Plus another one (+1) to indicate the enable of motion detection and followed by (x1, y1, x2, y2) rectangle axis
  - SUMMARY: "1": no motion detection and no following (x1, y1, x2, y2) rectangle axis; "2": with motion detection and percentage is equal to zero (0). If percent  $\geq 2$ , the real percentage is equal to (percent-2); The range of percent is (1, 101).
- ✧ (x1,y1, x2, y2) rectangle axis(9\*4 bits)
  - x1(the top-left x-axis): the real x1-axis plus one (+1). The range is (1, 352)
  - y1(the top-left y-axis): the real y1-axis plus one (+1). The range is (1, 240)
  - x2(the bottom-right x-axis): the real x2-axis plus one (+1). Range(1, 352)
  - y2(the bottom-right y-axis): the real y2-axis plus one (+1). Range(1, 240)
- ✧ Alert Percentage 1,2(PERCENT 1, 2) field format is the same as above.
- ✧ Alert Percentage 3(PERCENT3)(7bits)

- According to the activation rule for this field, the percent shall be larger than or equal to 2. Therefore we fix this field to 2 (0000010) in order to invoke the following 4\*9 bit-fields.
- ✧ Millisecond (10 bits)
  - The millisecond field is added for better audio/video synchronization. The range is (0, 999).
- ✧ "1" single Code (1 bit)
  - This is a dummy code to avoid the start code emulation.
- ✧ Nosignal (1 bit)
  - Indicate the no video signal status. "1" stands for no signal.
- ✧ Extend PIC format (3 bits) only have meaning when PTYPE bit 6 ~ 8 is PIC\_FORMAT\_EXTEND.

PIC Format Extend	Value
PIC_FORMAT_EXTEND_NTSC_D1	0
PIC_FORMAT_EXTEND_NTSC_HALF_D1	1
PIC_FORMAT_EXTEND_PAL_D1	2
PIC_FORMAT_EXTEND_PAL_HALF_D1	3
PIC_FORMAT_EXTEND_VGA	4

- ✧ Dummy 0, 1, 2 (Dummy0, Dummy1, Dummy2)(3bits, 9bits, 9bits)
  - These dummy bits are filled with constant values as (000), (000000001), (000000001) in order to be compatible with the bit-stream format v0 and avoid the start code violation.