

Using High Definition Television (HDTV) Video Formats in Quantum Data Model 801 Series Video Generators

The following HDTV video signal formats are built into the video format library in firmware versions 3.08x and 3.09x used in Model 801GC, 801GC-ISA, 801GF, 801GF-ISA, 801GL-ISA, 801GX and 801SL video generators. The names shown are as they appear on the format knob list and directory lists.

European and Japanese HDTV Formats:

Name	HDTV_1J	HDTV_2J	HDTV_4J	HDTV_1E	HDTV_2E	HDTV_4E
Line rate (KHz)	33.750	33.750	33.750	31.250	31.250	31.250
Line active (pix)	1920	1920	1920	1920	1920	1872
Line total (pix)	2200	2200	2200	2304	2304	2304
Frame active (lines)	1035	1035	1035	1152	1152	1152
Frame total (lines)	1125	1125	1125	1250	1250	1250
Fields per Frame	2	2	2	2	2	2
Video Type**	2	2	2	2	2	2

SMPTE 274 / 295 / 296 HDTV Formats:

Name	ATV1925 (295M-2)	ATV1950 (295M-1)	ATV1960 (274M-1)	ATV1959 (274M-2)	ATV1930 (274M-3)	ATV1929 (274M-4)	ATV1260 (296M-1)	ATV1259 (296M-2)
Line rate (KHz)	31.250	62.500	67.500	67.432567	33.750	33.716284	45.000	44.955045
Line active (pix)	1920	1920	1920	1920	1920	1920	1280	1280
Line total (pix)	2376	2376	2200	2200	2200	2200	1650	1650
Frame active (lines)	1080	1080	1080	1080	1080	1080	720	720
Frame total (lines)	1250	1250	1125	1125	1125	1125	750	750
Fields per Frame	2	1	1	1	2	2	1	1
Video Type**	7	7	7	7	7	7	7	7

** Explanation of Video Types:

Video type 2 is component video that uses analog Red, Green and Blue video output signals. This video type is available on all current 801 Series Models.

Video types 5 through 8 are analog video signals consisting of a Luminance signal (Y), a Red color difference signal (Pr' or Cr') and a Blue color difference signal (Pb' or Cb'). The Y signal comes out on the Green analog outputs. The Pr' or Cr' signal comes out on the Red analog outputs. The Pb' or Cb' signal comes out on the Blue analog outputs. The difference between the types 5 through 8 is in the equations used to convert the RGB color space to the luminance and color difference signals as shown in the table below.

NOTE: Video types 5 through 8 are only valid on the 801GF and 801GF-ISA Models. You can use the SMPTE 274 / 295 / 296 formats in all models in RGB mode by editing the formats and saving them using a new name.

Video Type	Red Channel Output Signal	Green Channel Output Signal	Blue Channel Output Signal
2 RGB Analog Video	Red	Green	Blue
5 • SMPTE 240M Japanese HDTV	$Pr'=(R-Y')/1.576$	$Y'=(0.212*R)+(0.701*G)+(0.087*B)$	$Pb'=(B-Y')/1.826$
6 • SMPTE 170M or ITU BT.601 NTSC/PAL hybrid	$Cr'=(R-Y')*0.713$	$Y'=(0.299*R)+(0.587*G)+(0.114*B)$	$Cb'=(B-Y')*0.564$
7 • SMPTE RP177 "Improved" version of SMPTE 240M	$Pr'=(R-Y')/1.5748$	$Y'=(0.2126*R)+(0.7152*G)+(0.0722*B)$	$Pb'=(B-Y')/1.8556$
8 • ITU-R BT.709 Almost identical to SMPTE RP177	$Pr'=(R-Y')/1.5750$	$Y'=(0.2125*R)+(0.7154*G)+(0.0721*B)$	$Pb'=(B-Y')/1.8558$

In all color difference models above, R, G, & B vary from 0 to 1.0 (0==0%black, 1.0==100%white) with gamma correction (except for some special test images). The output signals also are scaled by the AVSS (Analog Video Signal Swing) setting as follows:

$$Pr=Pr'*AVSS \quad Y=Y'*AVSS \quad Pb=Pb'*AVSS$$

On the ISA Board models, Analog video comes out of the 15 pin connector with Pin #1=Red, Pin#2=Green and Pin#3=Blue. The Red, Green and Blue BNC connectors can be used for the outputs on the stand alone models. Please refer to the Generator Owner's Manual for the locations of the output signals in the various D-Sub connectors.