

FLUKE 54000 SERIES:

Model Name	Product Description
54100 Models	
54100M01/nnn	Fluke 54100 Multi-standard Video Pattern Generator, including: <ul style="list-style-type: none"> • PAL, NTSC and SECAM standards • Teletext + WSS • PDC + VPS • Closed Caption • RGB + YC + YcrCb • IEEE + RS-232
54100M02/nnn	Fluke 54100 Multi-standard Video Pattern Generator, including: <ul style="list-style-type: none"> • PAL, NTSC and SECAM standards • Closed Caption • RGB + Y/C + YCrCb • IEEE + RS-232
54100PN1/nnn	Fluke 54100 Dual-standard Video Pattern Generator, including: <ul style="list-style-type: none"> • PAL and NTSC • Teletext + WSS • PDC + VPS • RGB + YC + YcrCb • IEEE + RS-232
54100P01/nnn	Fluke 54100 Single-standard Video Pattern Generator, including: <ul style="list-style-type: none"> • PAL standard • Teletext + WSS • PDC + VPS • RGB + YC + YcrCb • IEEE + RS-232
54100N01/nnn	Fluke 54100 Single-Standard Video Pattern Generator, including: <ul style="list-style-type: none"> • NTSC standard • Closed Caption • RGB + Y/C + YCrCb • IEEE + RS-232
54200 Models	

54200M01/nnn	<p>Fluke 54200 Multi-standard Video and TV Signal Generator, including:</p> <ul style="list-style-type: none"> • PAL, NTSC and SECAM standards • RF Carrier Generator and Modulator • Analog stereo sound • NICAM sound • BTSC sound • Teletext + WSS • PDC + VPS • Closed Caption • RGB + Y/C + YCrCb • IEEE + RS-232
54200M02/nnn	<p>Fluke 54200 Multi-standard Video and TV Signal Generator, including:</p> <ul style="list-style-type: none"> • PAL, NTSC and SECAM standards • RF Carrier Generator and Modulator • Analog stereo sound • NICAM sound • BTSC sound • RGB + Y/C + YCrCb • IEEE + RS-232
54200M03/nnn	<p>Fluke 54200 Multi-standard Video and TV Signal Generator including:</p> <ul style="list-style-type: none"> • PAL, NTSC and SECAM standards • RF Carrier Generator and Modulator • Analog stereo sound • RGB + Y/C + YCrCb • IEEE + RS-232
54200PN1/nnn	<p>Fluke 54200 Dual-standard Video and TV Signal Generator, including:</p> <ul style="list-style-type: none"> • PAL and NTSC standards • RF Carrier Generator and Modulator • Analog stereo sound • Teletext + WSS • PDC + VPS • RGB + Y/C + YCrCb • IEEE + RS-232

54200P01/nnn	Fluke 54200 Single-standard Video and TV Signal Generator, including: <ul style="list-style-type: none"> • PAL standard • RF Carrier Generator and Modulator • Analog stereo sound • NICAM sound • Teletext + WSS • PDC + VPS • RGB + Y/C + YCrCb • IEEE + RS-232
54200N01/nnn	Fluke 54200 Single-standard Video and TV Signal Generator, including: <ul style="list-style-type: none"> • NTSC standard • RF Carrier Generator and Modulator • Analog stereo sound • BTSC sound • Closed Caption • RGB + Y/C + YCrCb • IEEE + RS-232

• **Introduction**

Video Standards	PAL, NTSC, SECAM in 4:3 & 16:9 Aspect Ratios in accordance with recommendations of the CCIR, EBU, FCC, ITU and EIA analog television standards.
Sound System (54200 only)	Analog, NICAM digital and BTSC stereo sound systems
Data Services	Teletext, WSS, PDC, VPS and Closed Caption

Video and RF Output

<p>CVBS Video</p>	<p>Voltage (V_{pp} into 75Ω): 1V (nominal setting)</p> <p>Setting range: 0 to 1.5V</p> <p>Tolerance of setting: 10 mV or 5%, whichever is greater, 5 mV or 2%, whichever is greater, at reference temperature</p> <p>Step size: 1%, 10 mV for internal video</p> <p>Resolution: 10 mV</p> <p>Impedance: 75Ω</p> <p>Polarity: Positive/negative, selectable</p> <p>Coupling: DC</p> <p>Luminance/chrominance timing difference: ≤ 40 ns</p> <p>Connector: VIDEO OUT, BNC front, EURO AV OUT, EURO AV connector rear</p> <p>Max. external voltage: ±9V</p>
<p>CVBS SYNC, LINE SYNC and Field Synchronization</p>	<p>Voltage (V_{pp} into 75 Ω): 2V</p> <p>Tolerance: 0.3V</p> <p>Impedance: 75Ω</p> <p>Polarity: Negative</p> <p>Coupling: DC</p> <p>Connectors: SYNC OUT; COMP, LINE, Field. BNCs on rear of instrument</p> <p>Max. external voltage: ±4V</p>

<p>EURO AV Control Voltages</p>	<p>Aspect Ratio: Pin 8: Automatically or Off</p> <p>OFF: 0V to +2V</p> <p>Ratio 4:3 +9.5V to +12V</p> <p>Ratio 16:9 +4.5V to +7V</p> <p>Impedance: 850Ω</p> <p>Fast Blanking: Pin 16, Automatically or Off</p> <p>RGB ON: +1V to +3V</p> <p>RGB OFF: 0V to +0.4V</p> <p>Impedance: 75Ω</p> <p>Max. external voltage: ±9V</p>
<p>Terrestrial RF Carrier (54200 Only)</p>	<p>Frequency: 32 to 900 MHz</p> <p>Tolerance: 10 kHz</p> <p>Resolution: 50 kHz</p> <p>Spectral purity: Harmonics, intermodulation products and spurious -60 dBc inside actual TV channel -30 dBc outside actual TV channel</p> <p>Voltage (Vrms into 75Ω): 100 mV for high range 10 mV for low range</p> <p>Attenuation: 0 to 80 dB for high range 0 to 60 dB for low range</p> <p>Readout: mV, dBμV</p> <p>Resolution: 0.01 mV for level ≤ 10 mV 0.1 mV for level > 10 mV 1 dB for dBμV indication</p> <p>Tolerance: 3 dB</p> <p>Flatness: ≤ ±2 dB for 32 MHz to 900 MHz</p> <p>Impedance: 75Ω</p> <p>Modulation: Internal, external</p> <p>Connector: RF OUT, BNC front</p> <p>Max. external voltage: ±7V</p>

Video Modulation	Double sideband AM, internal/external switchable
Polarity	All systems except L: Negative SECAM L: Positive
RF sync level	Residual Carrier Low: All TV systems except L: 100% SECAM L: 10% Residual Carrier High: All TV systems except L: 100% SECAM L: 20% **
RF 100% white level	Residual Carrier Low: All TV systems except L: 10%* SECAM L: 100% Residual Carrier High: All TV systems except L: 20% SECAM L: 100%
Group delay pre-correction	Reference: Related to CCIR Rep. 624-4, 1990 Types: 2 different types or off, automatically switched with the respective TV system.
Characteristics	B, G, N: Closely matches CCIR B, G (type A) PAL M, NTSC M: Closely matches CCIR M/PAL, M/NTSC

*Not available for NICAM sound

**only available with NICAM sound

Video and RF Inputs

Video In	<p>Voltage (Vpp): 1V (nominal)</p> <p>Setting range: 100% fixed for video modulation 0 to 150% for video outputs</p> <p>Tolerance of setting: 10 mV or 5%, whichever is greater, 5 mV or 2%, whichever is greater, at reference temperature</p> <p>Step size: 1%</p> <p>Superimposed dc component: -2V to +2V</p> <p>Max. voltage (Vpp + dc): -5V to +5V</p> <p>Impedance: 75Ω</p> <p>Polarity: Positive</p> <p>Coupling: DC</p> <p>Connector: VIDEO IN: BNC on front, EURO AV IN: EURO AV connector on rear plate</p>
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<p>Video Synchronization</p>	<p>Reference: CCIR Rep. 624-4, 1990 ANSI/SMPTE 170M-1994</p> <p>System: 625 lines (50 Hz) 525 lines (59.94 Hz)</p> <p>Line frequency: 15.625 kHz for 625 line systems 15.734265 kHz for 525 line systems</p> <p>Tolerance: 3 ppm for +5 to +45° C 1 ppm at reference temperature</p> <p>Aging: ≤ 2 ppm per year</p> <p>Level: 43% for 625 line systems 40 IRE for 525 line systems</p> <p>Tolerance: 3% for 625 line systems 3 IRE for 525 line systems</p>
<p>Luminance</p>	<p>Reference: CCIR Rep. 624-4, 1990 ANSI/SMPTE 170M-1994</p> <p>Blanking level: 0% (0 IRE)</p> <p>Black level: 0% for 625 line systems +7.5 IRE for 525 line</p> <p>White level: 100% (100 IRE)</p> <p>Tolerance: 2% for 625 line systems at reference temperature 2 IRE for 525 line systems at reference temperature</p>

Chrominance	<p>Reference: CCIR Rep. 624-4, 1990 ANSI/SMPTE 170M-1994</p> <p>System: PAL B, D, G, I, K, M, N NTSC M NTSC with 4.433619 MHz subcarrier SECAM B,D,G,K,K1,L</p> <p>Carrier frequency: 4.433619 MHz for PAL B, D, G, I, K and NTSC 4.43 3.575611 MHz for PAL M 3.582056 MHz for PAL N 3.579545 MHz for NTSC M 4.406250 MHz and 4.250000 MHz for SECAM</p> <p>Tolerance: 3 ppm for +5 to +45° C 1 ppm at reference temperature</p> <p>Aging: ≤ 2 ppm per year</p> <p>Phase tolerance (PAL/NTSC): 2°, 1° at reference temperature</p> <p>Freq. deviation (SECAM) Δf_{ob} (75% blue): +230 kHz Tolerance: 4 kHz Δf_{ob} (75% red): -280 kHz Tolerance: 5 kHz</p> <p>Level: 100% (nominal setting)</p> <p>Tolerance: 5% (PAL/NTSC) 10% (SECAM) 2% (PAL/NTSC) at reference temperature for nominal setting</p> <p>Setting range: 0% to 150%</p> <p>Tolerance of setting: 1 step or 5%, whichever is greater</p> <p>Resolution: 1%</p>
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Patterns

Reference	<p>ITU Rec. 471-1/1994 and SMPTE EG27-1994 for Color Bar SMPTE EG1-1990 for SMPTE Color Bar CCIR Rec. 473-5, 1990 and CCIR Rec. R26-1981 for IRS 17 CCIR Rec. 473-5, 1990 for Multiburst CCIR Rep. 1221 for PLUGE</p>
Aspect ratio	4:3, 16:9

Circle	Centered circle with 4 additional corner circles in 16:9 mode
Center Cross	With border castellations (overscan indication selectable at 2% or 3%)
White	0, 5, 10 to 100% (5% steps) for 625 line systems 7.5, 15 to 100 IRE (5 IRE steps) for 525 line systems
Purity	Red, green, blue, cyan, magenta, yellow, white, black (100/0/75/0 for 625 line systems and 100/7.5/75/7.5 for 525 line systems)
Dots	17x13 dots in 4:3 mode, 23x13 dots in 16:9 mode With center indication
Crosshatch	18x14 lines in 4:3 mode, 24x14 lines in 16:9 mode With center indication, selectable 'top-left' indication and chroma
Checkerboard	12x9 squares in 4:3 mode, 16x9 squares in 16:9 mode
PLUGE	-1.6, 0, +1.6, 100% for 625 line systems 4.8, 7.5, 10.7, 100 IRE for 525 line systems
Grayscale	10 steps linear staircase (11 levels)
VCR	VCR Test (2 types) Resolution Test (2 types) Writing Current
Multiburst	0.5, 1.0, 2.0, 4.0, 4.8, 5.8 MHz for 625 line systems 0.5, 1.0, 2.0, 3.0, 3.58, 4.2 MHz for 525 line systems With time intervals
Digital Scan	ADC Check (2 types) including linear ramp intensity signal Moving Block Progressive Scan Check (3 types)
Color Bar	75/0/75/0, 100/0/75/0, 75/0/100/25, 100/0/100/25 for 625 line systems 75/7.5/75/7.5 100/7.5/75/7.5 for 525 line systems SMPTE Color Bar Horizontal Color Bar (75/0/75/0 for 625 line systems and 75/7.5/75/7.5 for 525 line systems)
DEM	Demodulator Test (2 types)
Color Temperature	3 different sizes with adjustable levels for center and border

Diverse	<ul style="list-style-type: none"> • EHT Test (Reference rectangle with switching white/black window) • Full field 'IRS 17', (in 625 line systems, reference line 17 can be selected separately) • sin x/x-pattern for bandwidth tests
Pattern combination	<ul style="list-style-type: none"> • Circle with every other pattern (except Progressive Scan 3) or combination • Center Cross / Crosshatch / Dots / Purity • Grayscale / White / Multiburst / Color Bar

Sound Outputs (54200 Only)

Sound Carrier	<p>Voltage (V_{pp} into 50Ω): 142 mV for mono carrier and system B, G 200 mV for mono carrier and system D, I, K, K1, L, M, N 63.2 mV for stereo and NICAM B, G, D, I, K carrier (sound carrier 2) 28.3 mV for NICAM L carrier (sound carrier 2)</p> <p>Setting range: for mono carrier (depends on sound carrier 1 level setting): 112.5 mV to 356 mV at -15 dBc to -5 dBc sound carrier level</p> <p>Resolution: 1 dB</p> <p>Setting range: for stereo and NICAM carrier: 63.2 mV at -20 dBc sound carrier level 35.6 mV at -25 dBc sound carrier level 28.3 mV at -27 dBc sound carrier level</p> <p>Tolerance: ±2 dB</p> <p>Impedance: 50Ω</p> <p>Connector: SOUND IF OUT, BNC rear</p>
Audio and Euro AV	<p>Voltage (V_{rms} in open circuit): 500 mV, 278 mV at 12 kHz intern in NICAM mode</p> <p>Tolerance: 5%</p> <p>Impedance: 600Ω</p> <p>Connector: AUDIO OUT, Cinch rear: EURO AV OUT, EURO AV connector rear</p>

BTSC MPX and FM Stereo Pilot	<p>Impedance: 600Ω</p> <p>Connector: MTS/PILOT OUT, BNC rear</p> <p>Voltage (V_{rms} open circuit): Nominal</p> <p>BTSC mode: BTSC baseband signal</p> <p>Main channel: 500 mV, at 13.5 kHz deviation incl. 75μs pre-emphasis</p> <p>Pilot carrier: 185 mV, equivalent to ±5 kHz deviation of sound carrier</p> <p>SAP carrier: 555 mV, equivalent to ±15 kHz deviation of sound carrier</p> <p>Tolerance: 5%</p> <p>Stereo/ Dual mode for sound system: Germany, A2</p> <p>Pilot signal: 90 mV</p> <p>Tolerance: 5%</p> <p>Stereo/Dual Mode for Sound System: Mk</p> <p>Pilot signal: 180 mV</p>
NICAM Data and NICAM Clock	<p>Frequency: 728 kHz</p> <p>Tolerance: 3 ppm for +5 to +45° C 1 ppm at reference temperature</p> <p>Aging: ≤ 2 ppm per year</p> <p>Voltage (V_{pp} into 50Ω): 1V</p> <p>Tolerance: 10%</p> <p>Impedance: 50Ω</p> <p>Connector: NICAM OUT DATA, BNC rear NICAM OUT CLOCK, BNC rear</p>

Sound Inputs

Audio, Euro AV and MTS Multiplex	<p>Voltage (Vrms): 500 mV (nominal)</p> <p>Modulation bandwidth: 40 Hz to 15 kHz</p> <p>Impedance: 0.1 MΩ</p> <p>Connector: AUDIO IN, Cinch rear, EURO AV IN, EURO AV connector rear, MTS IN, BNC rear</p> <p>Max. external voltage: ±40V</p>
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Mono Sound

Sound Carrier	<p>Frequency: 4.5 MHz for system M, N 5.5 MHz for system B, G 6.0 MHz for system I 6.5 MHz for system D, K, K1, L</p> <p>Tolerance: 3 ppm for +5 to +45° C 1 ppm at reference temperature</p> <p>Aging: ≤ 2 ppm per year</p> <p>Level: -13 dBc for system B, G -10 dBc for system D, I, K, K1, L, M, N</p> <p>Tolerance: 2 dB at reference temperature</p> <p>Setting range: -5 dBc to -15 dBc</p> <p>Tolerance: 2 dB at reference temperature</p> <p>Resolution: 1 dB</p>
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Modulation	<p>Frequency: 0.5, 1.0, 3.0 kHz: for system B, D, G, I, K, K1, L (S1 Modulation) or off 0.3, 1.0, 3.0 kHz: for system M and N (S1 Modulation) or off 0.5, 1.0, 3.0 kHz: (S3 Modulation) or as NICAM for system NICAM B/G, NICAM DK, DC, I, L or off</p> <p>Type: FM for system B, D, G, I, K, K1, M, N AM for system L</p> <p>Deviation: 27 kHz for system B, D, G, I, K, K1 (pre-emphasis off), 13.5 kHz for system M, N (pre-emphasis off)</p> <p>Tolerance: 5%</p> <p>Pre-emphasis (FM): 50 μs for system B, D, G, I, K, K1 or off 75 μs for system M, N or off</p> <p>Modulation depth: 54% for system L</p> <p>Tolerance: 5%</p>
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Stereo/Dual Sound

Sound Carrier 1	<p>Data: As Mono</p> <p>Modulation matrix: Stereo (L+R)/2</p> <p>Dual: CH1 (S1 Modulation)</p>
Sound Carrier 2	<p>Frequency: 5.7421875 MHz for system B, G 6.2578125 MHz for system D, K (A2) 4.724 MHz for system Mk</p> <p>Tolerance: 3 ppm for +5 to +45° C 1 ppm at reference temperature</p> <p>Aging: \leq 2 ppm per year</p> <p>Level: -20 dBc</p> <p>Tolerance: 3 dB at reference temperature:</p> <p>Setting range: -20, -25, -27 dBc</p> <p>Tolerance: 3 dB at reference temperature</p>

Modulation	<p>Frequency: 0.5, 1.0, 3.0 kHz for system B, D, G, K or off 0.3, 1.0, 3.0 kHz for system Mk or off</p> <p>Type: FM</p> <p>Deviation: 27 kHz for system B, D, G, K (pre-emphasis off) 13.5 kHz for system Mk (pre-emphasis off)</p> <p>Tolerance: 5%</p> <p>Pre-emphasis: 50 μs for system B, D, G, K or off 75 μs for system Mk or off</p> <p>Modulation matrix: Stereo: L for systems B, D, G, K L-R for system Mk Dual: CH2 (S2 Modulation)</p>
Identification/Sub-carrier	<p>Reference: CCIR Rec. 707</p> <p>Pilot carrier frequency: $3.5 \times f_H$</p> <p>Identification frequency: $f_H/133$ for stereo and system B, D, G, K $f_H/105$ for stereo and system Mk $f_H/57$ for dual</p> <p>Tolerance: 3 ppm for +5 to +45°C 1 ppm at reference temperature</p> <p>Aging: ≤ 2 ppm per year</p> <p>Type: AM</p> <p>Modulation depth: 50%</p> <p>Tolerance: 5%</p>

NICAM stereo

Sound Carrier 1	<p>Data: As MONO SOUND CARRIER</p> <p>Modulation matrix: Mono: As NICAM (S1 Modulation), Independent (S3 Modulation) Stereo: (L+R)/2 Dual: CH1 (S1 Modulation)</p>
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<p>Sound Carrier 2</p>	<p>Frequency: 5.85 MHz for system B, D, G, K, L 6.875 MHz for system D, K (for China) 6.552 MHz for system I</p> <p>Tolerance: 3 ppm for +5 to +45° C 1 ppm at reference temperature</p> <p>Aging: ≤ 2 ppm per year</p> <p>Level: -20 dBc for system B, D, G, I, K -27 dBc for system L</p> <p>Tolerance: 3 dB at reference temperature</p> <p>Setting range: -20, -25, -27 dBc</p>
<p>Modulation</p>	<p>Reference: NICAM-728, CCITT Rec J17</p> <p>Frequency: 0.5, 1.0, 1.5, 3.0 kHz for channel 1 (S1 Modulation) or off 1.0, 1.5, 3.0, 12 kHz for channel 2 (S2 Modulation) or off Test 1: Demodulator pattern Test 2: Decoder pattern Test 3: Un-modulated carrier</p> <p>Type: QPSK</p> <p>Mode: Mono, Dual, Stereo, Test</p> <p>Bit-rate: 728 kbits/s</p> <p>Tolerance: 3 ppm for +5 to +45° C 1 ppm at reference temperature</p> <p>Aging: ≤ 2 ppm per year</p> <p>Level: High, low</p> <p>RSSF: On, off</p>

BTSC Stereo Sound

Sound Carrier	<p>Frequency: 4.5 MHz for system M</p> <p>Tolerance: 3 ppm for +5 to +45° C 1 ppm at reference temperature</p> <p>Aging: ≤ 2 ppm per year</p> <p>Level: -10 dBc</p> <p>Tolerance: 2 dB at reference temperature</p> <p>Setting range: -5 to 15 dBc</p> <p>Tolerance: 2 dB at reference temperature</p> <p>Resolution: 1 dB</p>
Modulation	<p>Frequency: 0.3, 1.0, 3.0 kHz for channel 1 (S1 Modulation) or off 1.0, 3.0 kHz for channel 2 (S2 Modulation) or off 3.1 kHz and 8.0 kHz in Test modes 5.0 kHz for SAP (0.3 and 1.0 kHz in Test modes) or unmodulated or off</p> <p>Type: FM with BTSC base band</p> <p>Base band: Main channel (L+R) Pilot sub carrier Stereo sub channel (L-R, BTSC compressed) SAP sub channel (SAP signal, BTSC compressed)</p> <p>Stereo sub channel: Subcarrier AM modulated with suppressed carrier by BTSC compressed L-R signal</p> <p>SAP sub channel: Subcarrier FM modulated by SAP signal</p> <p>Mode: Mono, Stereo, SAP</p> <p>Deviation: 13.5 kHz (with de-emphasis on) 15 kHz by SAP 5 kHz by pilot</p> <p>Tolerance: 5%</p> <p>Pre-emphasis: 75 μs</p>

Identification	<p>Pilot subcarrier frequency: f_H</p> <p>Stereo subcarrier frequency: $2 \times f_H$</p> <p>SAP subcarrier frequency: $5 \times f_H$</p> <p>Tolerance subcarrier: 3 ppm for +5 to +45° C 1 ppm at reference temperature</p> <p>Aging: ≤ 2 ppm per year</p>
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Digital Services

Wide Screen Signaling (WSS)	<p>Reference: ETSI, ETS 300 294, November 1994 PAL plus System Description, Revision 3.0, January 1994 Rec. ITU-R BT. 1119</p> <p>TV systems: 625 line systems</p> <p>Data line: 23 (field 1)</p> <p>Signaling method: Bi-phase coding, NRZ-L</p> <p>Clock frequency: 5 MHz</p> <p>Tolerance: 3 ppm for +5 to +45° C 1 ppm at reference temperature</p> <p>Aging: ≤ 2 ppm per year</p> <p>Level: 0.5 V for '1' at 0.7 V maximum video level Black level for '0'</p> <p>Tolerance: 5% for '1' 3% of sync amplitude for '0'</p>
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<p>Teletext DIDON ANTIOPE (CCIR System A)</p>	<p>Reference: CCIR Rec. 653-1 CCIR Doc. 11/345-E</p> <p>TV systems: 625 line systems</p> <p>Data line: 20, 21, 333, 334</p> <p>Signaling method: Binary NRZ</p> <p>Clock frequency: 6.203125 MHz</p> <p>Tolerance: 3 ppm for +5 to +45° C 1 ppm at reference temperature</p> <p>Aging: ≤ 2 ppm per year</p> <p>Level: 7/3 of sync amplitude for '1' Black level for '0'</p> <p>Tolerance: 0 to - 10% for '1' 3% of sync amplitude for '0'</p>
<p>Teletext UK (CCIR System B)</p>	<p>Reference: CCIR Rec. 653-1 CCIR Doc. 11/282-E</p> <p>System: 625 line systems</p> <p>Data line: 13, 14, 20, 21, 326, 327, 333, 334 for 8 line mode 20, 21, 333, 334 for 4 line mode</p> <p>Signaling method: Binary NRZ</p> <p>Clock frequency: 6.9375 MHz</p> <p>Tolerance: 3 ppm for +5 to +45° C 1 ppm at reference temperature</p> <p>Aging: ≤ 2 ppm per year</p> <p>Level: 66% of the difference between black level and peak white level for '1'; Black level for '0'</p> <p>Tolerance: 6% for '1' 2% of the difference between black level and peak white level for '0'</p>

<p>PDC</p>	<p>Reference: EBU SPB 459 Revision 2 Specification of the Domestic Video Program Delivery Control System February 1992</p> <p>System: TELETEXT UK (CCIR system B)</p> <p>Programming: All parameters</p> <p>Labeling: Single, multi</p>
<p>VPS</p>	<p>Reference: Technische Richtlinie ARD/ZDF Nr. 8 R 2 Video Program System (VPS); EBU SPB 459 Revision 2 Specification of the Domestic Video Program Delivery Control System February 1992</p> <p>TV systems: 625 line systems</p> <p>Data line: 16</p> <p>Signaling method: Bi-phase modulation</p> <p>Clock frequency: 5.0 MHz</p> <p>Tolerance: 3 ppm for +5 to +45° C 1 ppm at reference temperature</p> <p>Aging: ≤ 2 ppm per year</p> <p>Level: 0.5 V for '1' at 0.7 V maximum video level Black level for '0'</p> <p>Tolerance: 5% for '1' 3% of sync amplitude for '0'</p> <p>Programming: All parameters</p>

Closed Caption	<p>Reference: FCC 47 CFR Part 15 Report No E-7709-C Draft EIA-608</p> <p>System: 525 line systems 625 line systems</p> <p>Data line: 21 (field 1 and field 2)</p> <p>Signaling Method: Binary NRZ</p> <p>Clock frequency: 503.4965 kHz for 525 line systems 500 kHz for 625 line systems</p> <p>Tolerance: 3 ppm for +5 to +45° C 1 ppm at reference temperature</p> <p>Aging: ≤ 2 ppm per year</p> <p>Level: 50 IRE (50%) for '1' 0 IRE (0%) for '0'</p> <p>Tolerance: 5 IRE (5%) for '1' 1 IRE (1%) for '0'</p> <p>Operation mode: CC1 to CC4 T1 to T4</p>
EDS Data (V-chip)	<p>Basic EDS-data test capability supported. Four CC-data packets each include EDS-data. Codes included: 'rating G', 'ratingX', 'ratingTV-Y' and 'rating TV-MA'.</p>

RGB, Y/C (S-VHS/HI-8), YCrCb Outputs

RGB outputs	<p>Voltage (Vpp into 75Ω): 700 mV</p> <p>Tolerance: 5% 2% at reference temperature</p> <p>Impedance: 75Ω</p> <p>Polarity: Positive</p> <p>Coupling: DC</p> <p>Blanking level: 0V</p> <p>Offset: ± 200 mV</p> <p>Synchronization: Selectable in R, G, B or Off (only for BNC outputs)</p> <p>Connector: RGB OUT, BNC rear; EURO AV OUT, EURO AV connector rear</p> <p>Max. external voltage: ±9V</p>
Y/C Outputs	<p>Luminance signal amplitude (Vpp into 75Ω): 1V (including sync)</p> <p>Tolerance: 5% 2% at reference temperature</p> <p>Coupling: DC</p> <p>Blanking level: 0V</p> <p>Offset: ± 200 mV</p> <p>Chrominance signal level: 100%, same as chrominance part of CVBS signal</p> <p>Tolerance: 5% 2% at reference temperature</p> <p>Coupling: AC</p> <p>Impedance: 75Ω</p> <p>Connector: Y/C OUT, 4-pin S connector, EURO AV OUT, EURO AV connector rear</p> <p>Max. external voltage: ±9V</p>

YCrCb Outputs	<p>Voltage Y (Vpp into 75 Ω): 1 V (including Sync)</p> <p>Voltage CrCb (Vpp into 75 Ω): 0.7 V</p> <p>Tolerance: 5% 2% at reference temperature</p> <p>Impedance: 75Ω</p> <p>Coupling: DC</p> <p>Blanking level: 0V</p> <p>Offset: ± 200 mV</p> <p>Connector: Y/ Cr/ Cb OUT, BNCs rear</p> <p>Max. external voltage: ±9V</p>
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IEEE and RS-232 Interface

IEEE-488 Interface	<p>Allows selection and control of all functions</p> <p>Reference: ANSI/IEEE Std. 488-1987</p> <p>Compatibility: IEEE-488.2- 1987</p> <p>Interface functions: AH1, SH1, L4, T6, RL1, SR1, DC1, E2</p> <p>Connector: Amphenol rear (RFI/EMI shielded)</p>
RS-232 Interface	<p>Allows selection and control of all functions</p> <p>Baud rate: 110, 150, 300, 600, 1200, 2400, 4800, 9600, or 19200</p> <p>Data bits: 7 or 8</p> <p>Stop bits: 1 2 for 110 Baud</p> <p>Parity check: Odd, even or none (none for 8 data bits only)</p> <p>Handshake: Software, hardware</p> <p>Connector: 9 pin D-type rear (male)</p>

General Specifications

Environmental Conditions	<p>Environment: Laboratory equipment Class 5 (MIL-T-28800D)</p> <p>Warming-up time: 30 min</p> <p>Recalibration interval: 12 months</p> <p>Temperature: +22 to +24°C for reference temperature 0 to +50°C for operating -20 to +71°C for non-operating</p> <p>Reliability: MTBF = 20,000 hours</p> <p>Humidity, altitude, vibration and shock: MIL-T-28800D (Class 5)</p> <p>Safety: EN 61010-1 +/A2, Class I IEC 1010-1 +A1 +A2, Class I CAN/CSA-C22.2 No 1010.1, Class I</p> <p>EMC emission: EN 55011, Group 1, Class B VDE 0875, Part 11, Group 1, Class B CISPR 11, Group 1, Class B FCC Part 15J Class A</p> <p>EMC immunity: EN 50082-1 (Generic)</p> <p>RF EM field: IEC 801-3/84 (27-500 MHz, 3V/m)</p> <p>Electrostatic discharge: IEC 801-2/84 (±8 kV air discharge)</p> <p>Fast transient: IEC 801-4/88 (0.5 kV signal/ control lines, 1 kV mains)</p>
RF EM field	ENV 50140 (80-1000 MHz, 3V/m)
Electrostatic discharge	IEC 1000-4-2 (±8 kV air discharge), (±4 kV contact discharge)
Magnetic Field	IEC 61000-4-8 (50 Hz, 3 A/m)
Power Requirements	<p>Line voltage operating: 90 to 264V</p> <p>Line frequency: 47.5 to 63 Hz</p> <p>Power consumption: 60W</p>

Dimensions and Weight

Width: 323 mm (12.72 in)

Height:

147 mm (5.79 in)

132.5 mm (5.22 in) without feet (\approx 3HE)

Depth: 417 mm (16.42 in)

Weight:

Net 9.8 kg (21.6 lb.)

Shipping 11.4 kg (25.1 lb.)