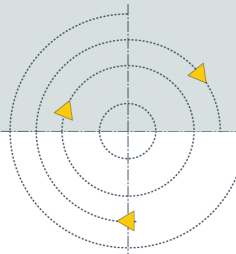


W61PC/LAN and Classifier Specification

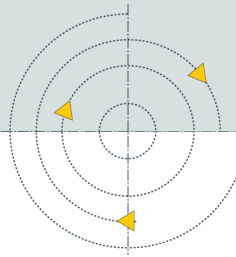
List of Transmission Codes	CL	W51PC	W61
Version	6.3	6.2	6.3
56. GOLAY		✓	✓
57. G-TOR	+	✓	✓
58. G-TOR with different code table	+	✓	✓
59. GW-FSK	+	*	*
60. GW-PSK	+	*	*
61. HC-ARQ	+	✓	✓
62. HF-ACARS (HFDL)	-	✓	✓
63. HNG-FEC	+	✓	✓
64. ICAO-SELCAL (ANNEX 10)		✓	✓
65. INMARSAT™ (see SAT-A/B/C/M/mM)			
66. METEOSAT		✓	✓
67. MFSK-16	±	✓	✓
68. MFSK-20	-	✓	✓
69. MFSK-8	-	✓	✓
70. MIL-188-110A, Serial Tones, 75-4800 bps	+	✓	✓
71. MIL-188-110-16TONE	±	N/A	[*]
72. MIL-188-110B, 3200-12800 bps		*	*
73. MIL-188-110-39TONE	-	*	*
74. MIL-188-141A (ALE)	+	✓	✓
75. MIL-188-141B		[*]	*
76. MPT-1327	+	✓	✓
77. NATEL (Selcal Analog)		✓	✓
78. NMT-450	+	✓	✓
79. NOAA-GEOSAT		✓	✓
80. PACKET-1200	±	✓	✓
81. PACKET-300/600	+	✓	✓
82. PACKET-9600		✓	✓
83. PACTOR 1-8	+	✓	✓
84. PACTOR-II 1-8	±	✓	✓
85. PACTOR-II-FEC 1-8	+	*	*
86. PACTOR-III		N/A	Ask
87. PICCOLO-MK12	±	✓	✓
88. PICCOLO-MK6	±	✓	✓
89. POCSAG		✓	✓
90. POL-ARQ	+	✓	✓
91. PRESS-FAX		✓	✓
92. PSK-10	-	✓	✓
93. PSK-125F	+	✓	✓
94. PSK-31	+	✓	✓
95. PSK-63F	+	✓	✓
96. RUM-FEC	+	✓	✓
97. SAT-A-TELEX		[*]	⊗
98. SAT-B-F (Inmarsat™, forward, TELEX)		*	[⊗]
99. SAT-B-F (Inmarsat™, forward, FAX)		*	⊗
100. SAT-B-F (Inmarsat™, forward, DATA)		*	⊗
101. SAT-B-F (Inmarsat™, forward, VOICE)		*	[⊗]
102. SAT-C-TDMA (Inmarsat™)		*	⊗
103. SAT-C-TDM (Inmarsat™)		*	⊗
104. SAT-M-F (Inmarsat™, forward, DATA)		*	⊗
105. SAT-M-F (Inmarsat™, forward, FAX)		*	⊗
106. SAT-M-F (Inmarsat™, forward, VOICE)		[*]	[⊗]
107. SAT-mM-F (Inmarsat™, forward, DATA)		*	⊗
108. SAT-mM-F (Inmarsat™, forward, FAX)		*	⊗
109. SAT-M/mM-R (Inmarsat™, return, DATA, FAX, VOICE)		Ask	Ask
110. SAT-mM (Inmarsat™, VOICE)		Ask	Ask



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List of Transmission Codes	CL	W51PC	W61
Version	6.3	6.2	6.3
111. SI-ARQ	+	✓	✓
112. SI-AUTO	+	✓	✓
113. SI-FEC	+	✓	✓
114. SITOR-ARQ	+	✓	✓
115. SITOR-AUTO	+	✓	✓
116. SITOR-FEC	+	✓	✓
117. SKYPER (POCSAG)		✓	✓
118. SP-14	-	*	*
119. SPREAD-11	+	✓	✓
120. SPREAD-21	+	✓	✓
121. SPREAD-51	+	✓	✓
122. SSTV Automatic		✓	✓
123. SSTV Martin 1 & 3		✓	✓
124. SSTV Martin 2 & 4		✓	✓
125. SSTV Robot 12s		✓	✓
126. SSTV Robot 24s		✓	✓
127. SSTV Robot 36s		✓	✓
128. SSTV Robot 8s		✓	✓
129. SSTV SC-1 16 & 32s		✓	✓
130. SSTV SC-1 8s		✓	✓
131. SSTV Scottie 1 & 3		✓	✓
132. SSTV Scottie 2 & 4		✓	✓
133. SSTV Wraase SC-1 24 & 48s		✓	✓
134. SSTV Wraase SC-1 48 & 96s		✓	✓
135. SSTV Wraase SC-2 120s		✓	✓
136. SSTV Wraase SC-2 180s		✓	✓
137. SSTV Wraase SC-2 30 & 60s		✓	✓
138. STANAG 4285 75-3600 bps	+	✓	✓
139. STANAG 4415 75 bps (NATO ROBUST)	-	*	*
140. STANAG 4481-PSK		✓	✓
141. STANAG 4529 75-1800 bps	-	✓	✓
142. STANAG 4539 3200-12800 bps		*	*
143. STANAG 5066		[*]	[*]
144. SWED-ARQ	+	✓	✓
145. TWINPLEX ARQ	-	✓	✓
146. VDEW (Selcal Analog)		✓	✓
147. WEATHER-FAX	-	✓	✓
148. ZVEI-1 (Selcal Analog)		✓	✓
149. ZVEI-2 (Selcal Analog)		✓	✓
150. ZVEI-VDEW (Selcal Digital)		✓	✓

Alphabets	W51	W61
Arabic Morse	✓	✓
ARQ1A, 7 bit	✓	✓
Baghdad70 Arabic, 5 bit	✓	✓
Baghdad80 Arabic, 5 bit	✓	✓
Bauer, 10 bit	✓	✓
Cyrillic Morse	✓	✓
Greek Morse	✓	✓
Hebrew Morse	✓	✓
HNG-FEC, 15 bit	✓	✓
ITA-1 Latin, 5 bit	✓	✓
ITA-2 Cyrillic, 5 bit	✓	✓
ITA-2 Danish-Norwegian, 5 bit	✓	✓
ITA-2 Hebrew, 5 bit	✓	✓



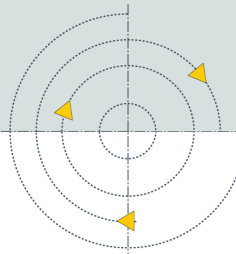
W61PC/LAN and Classifier Specification

ITA-2 Latin Transparent, 5 bit	✓	✓
ITA-2 Latin, 5 bit	✓	✓
ITA-2 Swedish, 5 bit	✓	✓
ITA-5 Bulgarian, 7 bit ASCII	✓	✓
ITA-5 Chinese, 7 bit ASCII	✓	✓
ITA-5 Danish-Norwegian, 7 bit ASCII	✓	✓
ITA-5 French, 7 bit ASCII	✓	✓
ITA-5 German, 7 bit ASCII	✓	✓
ITA-5 Swedish, 7 bit ASCII	✓	✓
ITA-5 US, 7 bit ASCII	✓	✓
Latin Morse	✓	✓
RUM-FEC, 16 bit	✓	✓
SITOR, 7 bit	✓	✓
TASS Cyrillic, 5 bit	✓	✓
Third Shift Cyrillic, 5 bit	✓	✓
Third Shift Greek, 5 bit	✓	✓
User Defined Alphabets	[*]	[*]
WAVECOM UNICODE Font	✓	✓

Demodulators	W51	W61
Additional software AM/ FM Demodulator for IF inputs	✓	✓
Demodulator FSK, 10-2400 Baud, Shift 50 Hz-3.5 kHz, Center freq. 0.5 kHz-3.5 kHz	✓	✓
Demodulator Mark-Space FSK, 10-300 Baud, Shift 50 Hz-3.5 kHz, Center freq. 0.5 kHz-3.5 kHz	✓	✓
Demodulator FFSK, 10-12000 Baud, Shift 50 Hz-16 kHz	✓	✓
Demodulator GFSK, 10-12000 Baud, Shift 50 Hz-16 kHz	✓	✓
Demodulator 4FSK, 10-3250 Baud, Shift 50 Hz-16 kHz	✓	✓
Demodulator MFSK, Tone length 4-1000 ms / max. 64 Tones, Shift 50 Hz-3.5 kHz	✓	✓
Demodulator BR6028 Modem, 7 FDM channels ± 85 Hz, Pilot-Tone 561Hz	✓	✓
Demodulator DPSK, DBPSK, DQPSK, D8PSK, D16PSK, 10-2400 symbols/s	✓	✓
Demodulator DPSK, DBPSK, DQPSK, D8PSK, D16PSK, 10-12000 symbols/s	N/A	✓
Demodulator DXPSK, dual carrier adaptive modulation, 2DPSK-D16PSK, 100 baud	✓	✓
Demodulator BPSK, 10-12000 symbols/s	✓	✓
Demodulator QPSK, 10-12000 symbols/s	✓	✓
Demodulator OQPSK, 10-12000 symbols/s	✓	✓
Demodulator CW Morse, 10-500 WPM, Center freq. 0.5 kHz-3.5 kHz, BW 100Hz-1.2 kHz	✓	✓
Demodulator DTMF	✓	✓
Demodulator CTCSS	✓	✓
Demodulator bit error rate within 3 dB of theory (white Gaussian noise, non fading channel)	✓	✓

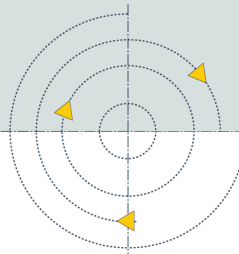
The actual values depend on the selected code. The full parameter ranges can be used when working with the source code.

	Technical Data Software	W51PC	W61PC
ADD	1 channel INMARSAT M/mini-M Monitoring System, with FAX-Viewer	*	*
ADD	1 channel INMARSAT M/mini-M Monitoring System with internal DDC direct from 70 MHz IF	N/A	*
ADD	SERIAL LINK, Serial data output over COM1-16 with	✓	✓
ADD	ALARM MONITOR, Automatic frame detection with 10 programmable strings (up to 50 chr)	✓	✓
ADD	ALARM MONITOR, Automatic detected text-string saving to HD or LAN	✓	✓
ADD	ALARM MONITOR, Automatic SMS messaging to HD or LAN	✓	✓
ADD	SERIAL LINK, Serial data output over COM1-16 with	✓	✓
ANA	Real time Oscilloscope, resolution up to 200 us/div	✓	✓
ANA	FSK, HF Baudrate analysis with graphical display and cursor functions (Baud)	30-1000	30-1000
ANA	FSK, VHF/UHF Direct, Baudrate analysis with graphical display and cursor functions (Baud)	30-12000	30-12000
ANA	FSK, VHF/UHF Indirect, Baudrate analysis with graphical display and cursor functions (Baud)	30-4000	30-4000



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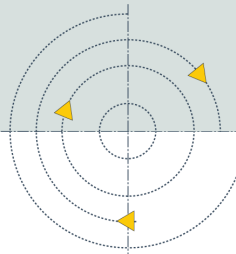
	Technical Data Software	W51PC	W61PC
ANA	FSK Baudrate history display with full graphical recall / averaging and cursor functions	✓	✓
ANA	Shift, HF, VHF/UHF Indirect analysis with graphical display and cursor functions (Hz)	50-3500	50-3500
ANA	Shift, VHF/UHF Direct analysis with graphical display and cursor functions, automatic noise gate (Hz)	50-24000	50-24000
ANA	Shift, VHF/UHF Indirect analysis with graphical display and cursor functions, automatic noise gate (Hz)	50-3500	50-3500
ANA	FSK Shift history display with graphical recall/averaging, cursor functions	✓	✓
ANA	Symbol rate VHF/UHF Direct, measurement and graphical display, cursor functions (baud)	30-24000	30-24000
ANA	Symbol rate HF, VHF/UHF Indirect, measurement and graphical display, cursor functions (baud)	30-4000	30-4000
ANA	Phase Plane Display, HF, VHF/UHF Indirect BPSK, QPSK, OQPSK DPSK. (baud)	10-2400	25-2400
ANA	Phase Plane Display, VHF/UHF Direct BPSK, QPSK, OQPSK (baud)	100-12000	100-12000
ANA	Phase Plane Display, VHF/UHF Direct DPSK. (baud)	100-2400	100-12000
ANA	QAM analysis with eye diagram	[✓]	[✓]
ANA	Manual Measurement of the frequency shift(s) with movable cursors	✓	✓
ANA	Autocorrelation length, maximum no of bits	200'000	200'000
ANA	Autocorrelation, X-Y zoom with continuous numeric display of cursor position	✓	✓
ANA	Bit length analysis. Graphical display of demodulated data, with automatic calculation of bit length analysis with bit pattern display.	✓	✓
ANA	Raw FSK Analysis: Graphical display of demodulated data on a raster time line. For visual recognition of character and block lengths.	✓	✓
ANA	HF MFSK Analysis: Graphical display of MFSK tones with histogram.	✓	✓
ANA	VHF/UHF Selcal analysis: Graphical display of FSK data for Selcal signal analysis.	✓	✓
ANA	Independent FFT display in each mode	[✓]	[✓]
FFT	Real time FFT with adjustable cursors, 20 frames/sec	✓	✓
FFT	FFT bandwidth 500 Hz, 1 kHz, 2 kHz, 4 kHz, 24 kHz, 48 kHz, 96 kHz	✓	✓
FFT	FFT Averaging	1-64	1-64
FFT	FFT, Rectangle, Hamming, Hanning, Blackman	✓	✓
FFT	Real time Waterfall display with cursor functions	✓	✓
FFT	Real time Sonagram display with cursor functions	✓	✓
GUI	Standard Data File Format	TXT, BMP, Unicode	TXT, BMP, Unicode
GUI	WAVECOM Data File Format (with timestamps)	✓	✓
GUI	Split-screen display of sub-channels of TDM systems	✓	✓
GUI	Bit Inversion for 5 bit Alphabets	✓	✓
GUI	Bit Inversion for 5 bit Alphabets	✓	✓
OPR	Automatic insertion of time stamps	✓	✓
OPR	Unlimited scroll back buffers for text and graphic modes	✓	✓
OPR	Automatic tuning of the demodulator to FSK signals	✓	✓
OPR	Automatic code check for FSK (HF/VHF/UHF) modes	✓	✓
OPR	Automatic code check for MIL-STD/STANAG codes	[*]	[*]
OPR	Automatic code check for MFSK codes	[*]	[*]
OPR	Automatic decoding of the detected mode	✓	✓
OPR	Automatic determination of frequency shift	✓	✓
OPR	Automatic determination of FSK center frequency	✓	✓
OPR	Automatic determination of baud/bit rate	✓	✓
OPR	Automatic determination of signal polarity (not all codes)	✓	✓
OPR	Automatic determination of repetition cycle	✓	✓
OPR	Automatic phasing	✓	✓
OPR	Integrated error correction in all FEC and block coding modes	✓	✓
OPR	Continuous measurement of baud rate (IAS) and keying speed	✓	✓
OPR	Automatic noise gate for VHF-UHF-SHF analysis modes	✓	✓
OPR	Automatic demodulator tuning to FSK	✓	✓
OPR	Automatic demodulator tuning to FFSK signals	✓	✓
OPR	Automatic determination of drum speed in fax modes	✓	✓
OPR	Automatic determination of IOC in fax modes	✓	✓



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	Technical Data Software	W51PC	W61PC
OPR	Zoom and phasing function in fax modes	✓	✓
OPR	Automatic recognition of all PACTOR 1-8 systems	✓	✓
OPR	Automatic CRC recognition of all PACTOR-II and PACTRO-II-FEC systems	[✓]	[✓]
OPR	Manual CRC setup of PACTOR-I systems	[✓]	[✓]
OPR	Automatic phasing and synchronization of all block lengths in SWED-ARQ and SI-ARQ	✓	✓
OPR	Automatic phasing of all baud rates in PACTOR and G-TOR modes	✓	✓
OPR	Variable Baudrate for all HF-modes	✓	✓
OPR	Called number and transmission mode display for pager modes	✓	✓
OPR	Automatic Level Setting	N/A	✓
OPT	Multi Channel INMARSAT B/M/mM Monitoring System	Ask	Ask
OPT	Database controlled receiver and decoder control application	Ask	Ask
OPT	Classifier	⊗	⊗
OPT	BitView Tool	N/A	⊗
RCI	DCOM, Remote Control over LAN	✓	N/A
RCI	TCP/IP Remote Control with WAVECOM GUI	✓	✓
RCI	XML Remote Control (with API or TCP/IP Interface, Metadata)	✓	✓
RCI	Bitstream: Raw, synchronized FSK/PSK bitstream available through DCOM/XML interface.	*	*
RCI	Bitstream: MFSK bitstream available through DCOM/XML interface.	N/A	[*]
RCI	Remote Control with WAVECOM GUI, full functionality over LAN/Internet (encrypted and speed optimized)	✓	✓
SYS	OS WINDOWS XP/2000/2003 (tested with English version)	✓	✓
SYS	No Interrupt required	✓	✓
SYS	Minimum computer	1 GHz, PIII	P4, 1.6 GHz
SYS	min. Screen Resolution (SVGA)	800x600	800x600
SYS	max. Screen Resolution	No Limit	No Limit
SYS	Mass storage	PC/LAN	PC/LAN
SYS	Printer Support	✓	✓
SYS	Simultaneous operation of cards in one PC (depends on the mode)	8/4	8/4
SYS	Files limited only by Hard Disk or LAN resources	✓	✓

BitView Tool (Option)		
Signal Source	File Bitstream, Text, Unicode, HEX	File Bitstream Binary Data W61PC IAS bitstream
Synchronization	Preamble	
Binary Modulation	NRZ-I NRZ-M NRS-S Bi-phase L (Manchester)	Bi-phase-M Bi-phase-S DBi-phase-M DBi-phase-S
Bit Manipulation	De-Interleaving Extraction AND/OR/XOR/NOT Bit rotation	Bit Shift Bit Inversion DE-Stuffing (HDLC) Mirroring Cutting
Decoding/Equalizer	Viterbi-Decoding De-Puncturing	Difference Decoding BCH-Decoding
CRC & Polynomial	CRC (1..32) CRC-8 CRC-10	CRC-12 CRC-16 CRC-32 CRC (CCITT)
Channel Decoding	ARQ-E3 SITOR FEC-A Bauer	HNG-FEC RUM-FEC ITA-3 (M.342) ITA-5
Source Decoding (Alphabets)	Latin Third-Shift Greek Cyrillic	Danish-Norwegian German French



W61PC/LAN and Classifier Specification

BitView Tool (Option)		
	Third-shift Cyrillic Hebrew Arabic Bagdad-70 Arabic Bagdad-80 (ATU-80) Bulgarian Swedish	US ASCII Unicode UTF-7 UTF-8
Display Tools	Background color Font Right-to-left Word Wrap Bits per line Highlighting	Alignment Transparent Cut/Copy/Paste Undo/Redo x/- instead of 1/0 Graphic Bit display
Channel Decoding	Bit Statistic Autocorrelation	Signal Duration
User defined functions	C#, sample template	

Classifier (Option)	
Classification Bandwidth, 4kHz	*
Classification Bandwidth, 8 kHz	[*]
Classification Sample Time 1.6 or 3.2 sec	[*]
CW	*
FSK-2, modulation index>0.5, Shift 25-2000 Hz, 25-2500 Baud	*
MFSK 4-34 carriers, 25-300 Baud	*
F7B	*
PSK2/4/8/16, A&B, 30-2400 Baud	*
OQPSK	*
Display of classified signals in FFT	*
Continuous mode for classifier	*
Integrated code check of classified signals	[*]

Technical Data PC Cards	W51PC	W61PC
Mechanical Concept	Half length board 32 bit PCI bus	Half length board 32 bit PCI bus
Weight in kg	0.5	0.2
Dimensions (LxWxH mm) , no panel	195x106x22	168x106x22
Power requirement, (typ. values)	1.20A@+5V 0.21A@+12V 0.01A@-12V	1.0A@+3.3V 0.4A@+12V
Operating Temperature range	0° C to 50°C	0° C to 50°C
Storing Temperature range	0° C to 70°C	0° C to 70°C
Relative humidity (non-condensing)	20-95 %	20-95 %
External Demodulator Input	✓	✓
3-wire serial interface for digital receivers	N/A	✓
I/Q Data Stream Interface (TCP/IP)	N/A	[✓]
AF Input 0.6-16 kHz	1	Wideband AF/IF
IF variable Input, 16 kHz-1.5 MHz	1	Wideband AF/IF
IF 10.7 MHz Input	1	Wideband AF/IF
IF 21.4 MHz Input	1	Wideband AF/IF
Wideband AF/IF Input, 50 Hz-25 MHz	N/A	3
70 MHz, Wideband IF Input, 52.5 MHz-87.5 MHz	N/A	1
AF / IF / HF Connectors	BNC	SMA
A/D Converter	16 bit	14 bit
Dynamic range	> 60 dB	> 60 dB
Direct digital synthesis DDS	AD9831	FPGA

