
WAVECOM Decoder

W61PC/LAN Specifications

V6.8.11

By WAVECOM ELEKTRONIK AG



WAVECOM[®]
NACHRICHTENTECHNIK

PUBLISHED BY
WAVECOM ELEKTRONIK AG
Hammerstrasse 8
CH-8180 Buelach
Switzerland

Phone +41-44-872 70 60
Fax +41-44-872 70 66
Email: info@wavecom.ch
Internet: http://www.wavecom.ch

© by WAVECOM ELEKTRONIK AG. All rights reserved.

Reproduction in whole or in part in any form is prohibited without written consent of the copyright owner.

The publication of information in this document does not imply freedom from patent or other protective rights of WAVECOM ELEKTRONIK AG or others.

All brand names in this document are trademarks or registered trademarks of their owners.

Specifications are subject to change without further notice

Printed: Monday, March 29, 2010, 16:17:50

Contents

W61 Specification	1
HF-Protocols	1
VHF/UHF-Protocols	3
SAT-Protocols.....	4
FAX and Modem Protocols.....	5
List of Alphabet	5
Demodulator	6
Analysis Functions	6
General Software Characteristics	7
Hardware.....	7
W61-CL (HF Classifier Option)	9
W61-SAT (INMARSAT Option)	9
W-CLOVER-2000 (Option).....	9
W-CLOVER-2 (Option)	9
W-PACTOR-III (Option)	10
W-CODAN-9001 (Option).....	10
Ordering Information	10
Index	11

W61 Specification

List of Abbreviations, Remarks	
CC	CodeCheck
CL	HF-Classifer
*	Currently being developed
xxx	New in List
	Parameters depend on the selected protocol. The full parameter ranges can only be used, when working with the source code
	Specifications may be changed without prior notice

HF-Protocols

HF-Protocols (will be expanded in the future)	CL	CC
ALE-400	✓	✓
ALF-RDS	✓	
ALIS		✓
ALIS-2		
ARQ6-90	✓	✓
ARQ6-98		✓
ARQ-E	✓	✓
ARQ-E3	✓	✓
ARQ-M2-242	✓	✓
ARQ-M2-342	✓	✓
ARQ-M4-242	✓	✓
ARQ-M4-342	✓	✓
ARQ-N	✓	✓
ASCII	✓	✓
AUM-13		
AUTOSPEC	✓	✓
BAUDOT	✓	✓
BULG-ASCII	✓	
CHU		
CIS-11	✓	✓
CIS-12 (HEX output)		
CIS-14	✓	✓
CIS-36		
CIS-36-50	✓	
CIS-50-50	✓	
CLOVER-2000 (Option, ARQ, all CRC's)	✓	
CLOVER-2 (Option, ARQ, all CRC's)	✓	
CODAN (SELCAL)	✓	✓
CODAN-9001 (Option)		
COQUELET-13	✓	

HF-Protocols (will be expanded in the future)	CL	CC
COQUELET-8	✓	
COQUELET-80	✓	
CV-786	✓	
CW-MORSE	✓	
DCS SELCAL		✓
DGPS	✓	✓
DUP-ARQ	✓	✓
DUP-ARQ-2	✓	✓
DUP-FEC-2	✓	✓
EFR	✓	
FEC-A	✓	✓
FELDHELL		
FM-HELL		
GMDSS/DSC-HF	✓	
G-TOR	✓	✓
GW-FSK	✓	✓
GW-PSK	✓	
HC-ARQ	✓	✓
HF-ACARS (HF DL)		
HNG-FEC	✓	✓
ICAO-SELCAL (ANNEX 10)		
MD-674	✓	
MFSK-16	✓	
MFSK-20		
MFSK-8	✓	
MIL-188-110-16TONE (-110A/B App. A)	✓	
MIL-188-110-39TONE (-110A/B App. B)		
MIL-188-110A, Serial Tones, 75-4800 bps	✓	
MIL-188-110B (App. C), STANAG 4539		
MIL-188-110B, 3200-12800 bps		
MIL-188-141A (ALE)	✓	
MIL-188-141B (BW0, BW1 BW4 data)		
MIL-188-141B (BW2 & BW3 id only)		
MIL-M-55529 NB/WB	✓	
OLIVIA	✓	
PACKET-300/600	✓	✓
PACTOR (all CRC's)	✓	✓
PACTOR-FEC (all CRC's)	✓	✓
PACTOR-II (all CRC's)	✓	
PACTOR-II-FEC (all CRC's)	✓	
PACTOR-III (Option, all CRC's)	✓	
PICCOLO-MK12	✓	
PICCOLO-MK6	✓	
POL-ARQ	✓	✓
PRESS-FAX		
PSK-10		

HF-Protocols (will be expanded in the future)	CL	CC
PSK-125F	✓	
PSK-220F	✓	
PSK-31 (BPSK, QPSK)	✓	
PSK-63 (BPSK, QPSK) and FLARC extension	✓	
PSK-125 (BPSK, QPSK) and FLARC extension	✓	
PSK-250 (BPSK, QPSK) and FLARC extension	✓	
PSK-31-FEC	✓	
PSK-63F	✓	
PSK-AM	✓	
ROBUST-PACKET		
RUM-FEC	✓	✓
SI-ARQ	✓	
SI-AUTO	✓	
SI-FEC	✓	✓
SITOR-ARQ	✓	✓
SITOR-AUTO	✓	✓
SITOR-FEC	✓	✓
SP-14		
SPREAD-11	✓	✓
SPREAD-21	✓	✓
SPREAD-51	✓	✓
SSTV Automatic		
SSTV Martin 1, 2, 3 & 4		
SSTV Robot 8s, 12s, 24s & 36s		
SSTV SC-1 16 & 32s		
SSTV SC-1 8s, 16s & 32s		
SSTV Scottie 1, 2, 3 & 4		
SSTV Wraase SC-1 24s, 48s & 96s		
SSTV Wraase SC-2 20s, 60s, 120s & 180s		
STANAG 4285 75-3600 bps	✓	
STANAG 4415 75 bps (NATO ROBUST)		
STANAG 4481-FSK (KG-84)	✓	
STANAG 4481-PSK		
STANAG 4529 75-1800 bps		
STANAG 4539 3200-12800 bps		
STANAG 5065-FSK		✓
SWED-ARQ	✓	✓
TWINPLEX ARQ		
VISEL		
WEATHER-FAX		

VHF/UHF-Protocols

VHF/UHF-Protocols (will be expanded in the future)	CC
ACARS	
AIS	
ASCII	✓

VHF/UHF-Protocols (will be expanded in the future)	CC
ATIS (Selcal Digital)	
BIIS	
CCITT (Selcal Analog)	
CTCSS (Selcal Analog)	
DCS SELCAL	✓
DGPS	✓
DMR (Digital Mobile Radio)	
DTMF (Selcal Analog)	
DZVEI (Selcal Analog)	
EEA (Selcal Analog)	
EIA (Selcal Analog)	
ERMES	
EURO (Selcal Analog)	
FLEX	✓
FMS-BOS (Selcal Digital)	
GMDSS/DSC-VHF/UHF	
GOLAY	✓
MOBITEX-1200 (with partial OVLS extension)	
MOBITEX-8000	
MODAT (Selcal Analog)	
MPT-1327	
NATEL (Selcal Analog)	
NMT-450	
NWR-SAME	
PACKET-1200	✓
PACKET-9600	
PCCIR (Selcal Analog)	
PDZVEI (Selcal Analog)	
POCSAG	✓
PZVEI (Selcal Analog)	✓
SKYPER (POCSAG)	
VDEW (Selcal Analog)	
VDL-M2	
ZVEI-1 (Selcal Analog)	
ZVEI-2 (Selcal Analog)	
ZVEI-3 (Selcal Analog)	
ZVEI-VDEW (Selcal Digital)	

SAT-Protocols

SAT Protocols (will be expanded in the future)
AMSAT-P3-D
METEOSAT
NOAA-GEOSAT
ORBCOMM
SAT-AERO (Aero-I), Beta Version

SAT Protocols (will be expanded in the future)
SAT-A-TELEX
SAT-B/M/mM (Inmarsat™, return)*
SAT-B-C-TFC (Inmarsat™, C-Band return fixed ch)
SAT-B-Data (Inmarsat™, forward)
SAT-B-FAX (Inmarsat™, forward)
SAT-B-TEL (Inmarsat™, forward)
SAT-B-TELEX-MM (Inmarsat™, forward)
SAT-B-TELEX-SM (Inmarsat™, forward)
SAT-C-EGC (Inmarsat™, Enhanced Group Calls)
SAT-C-TDM (Inmarsat™)
SAT-C-TDMA (Inmarsat™)
SAT-M-DATA (Inmarsat™, forward)
SAT-M-FAX (Inmarsat™, forward)
SAT-mM-DATA(Inmarsat™, forward)
SAT-mM-FAX(Inmarsat™, forward)
SAT-mM-TEL (Inmarsat™, forward) ask
SAT-M-TEL (Inmarsat™, forward)

FAX and Modem Protocols

FAX and Modem Protocols
FAX-G3 T4 / T6 / JPEG / JBIG T.30 protocol with ECMM
FAX-G3-V.17
FAX-G3-V.27ter
FAX-G3-V.29
FAX-G3-V.34hdx
BELL103
BELL212A
V.21
V.22 / V22bis
V.23

List of Alphabet

List of Alphabets
Chinese (7Bit ASCII)
HEX
ITA-1 Latin
ITA-2 Baghdad70 Arabic
ITA-2 Baghdad80 Arabic
ITA-2 Cyrillic
ITA-2 Danish-Norwegian
ITA-2 Hebrew
ITA-2 Latin
ITA-2 Latin Transparent
ITA-2 Swedish
ITA-2 TASS Cyrillic

List of Alphabets
ITA-2 Third Shift Cyrillic
ITA-2 Third Shift Greek
ITA-5 Bulgarian
ITA-5 Danish-Norwegian
ITA-5 French
ITA-5 German
ITA-5 Swedish
ITA-5 US
Morse Arabic
Morse Cyrillic
Morse Greek
Morse Hebrew
Morse Latin
Morse Scandinavian
Morse Spanish
User defined 5-bit Alphabets based on UNICODE

Demodulator

Demodulators (Biterror rate within 3 dB of theory (white Gaussian noise, non fading channel))
AM for METEOSAT and NOAA-GEOASAT FAX transmissions
BPSK, 10-12000 symbols/s
BR6028 Modem, 7 FDM channels S 85 Hz, Pilot-Tone 561 Hz
CTCSS
CW Morse, 10-500 WPM, Center freq. 0.5 kHz-3.5 kHz, BW 100 Hz-1.2 kHz
DPSK, DBPSK, DQPSK, D8PSK, D16PSK, 10-12000 symbols/s
DTMF
DXPSK, dual carrier adaptive modulation, 2DPSK-D16PSK, 100 baud
FFSK, 10-12000 Baud, Shift 50 Hz-16 kHz
FSK, 10-2400 Baud, Shift 50 Hz-3.5 kHz, Center freq. 0.5 kHz-3.5 kHz
GFSK, 10-12000 Baud, Shift 50 Hz-16 kHz
Mark-Space FSK, 10-300 Baud, Shift 50 Hz-3.5 kHz, Center freq. 0.5 kHz-3.5 kHz
MFSK, Tone length 4-1000 ms / max. 64 Tones, Shift 50 Hz-3.5 kHz
OQPSK, 10-12000 symbols/s
QPSK, 10-12000 symbols/s
Software AM/ FM Demodulator for IF Inputs
FAX-G3-V.17, FAX-G3-V.27ter, FAX-G3-V.29, FAX-G3-V.34hdx, BELL103, BELL212A, V.21, V.22 / V22bis, V.23

Analysis Functions

Analysis Functions
Autocorrelation up to 200'000 bits
Automatic Analysis & Decoding Software for all data and FAX-G3 modulations
Automatic CRC recognition of all PACTOR-II and PACTRO-II-FEC systems
Bit correlation analysis. Raw FSK analysis: Graphical display of demodulated data on a raster time line. For visual recognition of character and block lengths.
Bit length analysis. Graphical display of demodulated data, with automatic calculation of bit length with bit pattern display

Analysis Functions
Code check for FSK codes
FSK analysis
Manual measurement of the frequency shift(s) with movable cursors
MFSK analysis for HF: Graphical display of MFSK tones with histogram.
Oscilloscope, real time, resolution up to 200 us/div
Phase Plane Display, HF, VHF/UHF Indirect BPSK, QPSK, OQPSK DPSK, 25-2400 Baud
Phase Plane Display, VHF/UHF Direct BPSK, DPSK, QPSK, OQPSK, 100-12000 Baud
Real-time FFT. averaging: 1-64 values, bandwidth 0.5, 1, 2, 4, 24, 48 kHz & 96 kHz and adjustable cursors, 20 frames/sec
Sonagram, real time display with cursor functions and history (full scrolling)
Sonagram and FFT tuning display
Symbol rate HF, VHF/UHF Indirect, Analysis 30-4000 baud
Symbol rate VHF/UHF Direct, Analysis 30-24000 baud
VHF/UHF Selcal analysis: Graphical display of FSK data for Selcal signal analysis.
Waterfall, real time display with cursor functions

General Software Characteristics

General Software Characteristics
ALARM MONITOR, automatic detected text-string saving to HD or LAN, SMS output
Automatic insertion of time stamps
Bitstream: raw, synchronized FSK bitstream available through remote control interface.
Bitstream: raw, synchronized none adaptive PSK bitstream available through remote control interface.
File formats: TXT, BMP, Unicode, WAVECOM (with timestamps)
FSK baudrate history display with full graphical recall / averaging and cursor functions
FSK shift history display with graphical recall/averaging, cursor functions
Message type for most MIL-STD and STANAG protocols (sync/async, data bits, parity bits , stop bits, MSB/LSB, ITA2/ITA5(ASCII)/HEX/STANAG5066
Pass-band tuning and FFT/sonagram display in most protocols
SERIAL LINK, serial data output over COM1-16 with
Sound card input, 16bit, 48 kHz, Stereo
STANAG5066 parser in MIL-STD and STANAG protocols
TCP/IP direct data (IQ and PCM) interface for streaming and digital receivers (PXGF, IP-CONF)
TCP/IP Remote Control with WAVECOM GUI, full functionality over LAN/Internet (encrypted and speed optimized)
Unlimited scroll back buffers for text and graphic
Up to 8 decoders/computer
USB-License-Dongle
Virtual Audio Cable (VAC) support
WAV files playback and decoding, loop mode
XML Remote Control (API for C++ and C#, XML over TCP/IP)

Hardware

Card Inputs	AFIF#1-3	IF70	EXT-DEM
Connector	SMA female	SMA female	Mini-DIN
Frequency range	50 Hz to 25 MHz	52.5 MHz to 87.5 MHz (SAW Filter)	Max. 12 kBit/s
Bandwidth	5 kHz to 500 kHz	5 kHz to 500 kHz	

Card Inputs	AFIF#1-3	IF70	EXT-DEM
Frequency raster DDS	1.0 Hz	1.0 Hz	
Signal level	2 mVrms to 0.5 Vrms 20 mVrms to 2.5 Vrms (with 20 dB attenuator)	20 mVrms to 2.5 Vrms	TTL up to RS-232C [0 V, +5 V] to [-12 V, +12 V]
Input impedance	> 1 kOhm	50 Ohm	>100 kOhm
Pin-out			2, 7 GND 5 EXT-MOD
Remarks			V1 Data Internal Synchronization

Hardware	W61PC	W61LAN-MK2
Concept	Half length board	Small Computer System
Dimensions (LxWxH mm)	168x106x22	268x195x107
Weight in kg	0.2	5.6
PCI bus, 32 bit	rev. 2.2 or above	-
Power requirement, (typ, values)	1.0A@+3.3V 0.4A@+12V	12-30V (max. 120 W)
AC Power supply	-	100-240V AC 2A 50/60 Hz
Operating temperature range	0° C to 50°C	0° C to 40°C, free airflow
Case temperature range		0° C to 55°C
Storing temperature range	0° C to 70°C	0° C to 70°C
Relative humidity (non-condensing)	<95 %	10-90 %
Sound card input: maximum sampling rate	48 kHz	48 kHz
External Demodulator Input	✓	✓
Wideband AF/IF Input, 50 Hz-25 MHz, tunable, requires filtered AF/IF signal output, Input impedance >1 kOhm	3	3
70 MHz, Wideband IF Input, 52.5 MHz-87.5 MHz, tunable, Input impedance >50 Ohm	1	1
AF / IF / HF Connectors	SMA	SMA
A/D Converter	14 bit	14 bit
Dynamic range	> 60 dB	> 60 dB
Direct digital synthesis DDS	FPGA	FPGA
DDS frequency resolution	< 1 Hz	< 1 Hz
DDC, (digital down conversion) with 96 db dynamic range	+	+
MTBF	>20'000	NA
Conformity	EN 55022:2004 class B, EN55024:2003, EN6100- 6-2:2005, EN 6100-4-3: 1000-2700 MHz, EN 50371:2002	CE
OS	Tested with Windows XP,VISTA, English	Windows XP, English
CPU	min. P4,1.6 GHz	Intel CoreDuo Mobile T2500/2GHz
Memory	min. 512 MB	DDR2-RAM 2, 1 GB PC800 CL6
Harddisk	min. 20 GB	120 GB, 5400, 8MB, 24h/7d
LAN	-	2 x 10MB/100MB/1GB
Serial ports	-	3 x RS232, 1 x RS232/422/485
USB	-	2 x USB 2.0 Front, 4 x USB 2.0 Back

Hardware	W61PC	W61LAN-MK2
Audio	-	1x Mic-In, 1x Speaker-Out
Video	min. 800x600	1 x VGA, 1 x DVI
Keyboard/Mouse	Computer	2 x PS/2 or USB
Sound card sampling rate precision (if AF/IF is not used)	<100 ppm, <20ppm recommended	<100 ppm, <20ppm recommended

W61-CL (HF Classifier Option)

W61CL Classifier Option (each option requires a separate license)	
Classification bandwidth	4 kHz or 8 kHz
Classification sample time	1.6 or 3.2 sec
Classified signals	CW FSK-2: Modulation index: 0.5-20; Shift: 25-2000 Hz; Speed 25-2500 Baud F7B: Shift: 25-2000 Hz; Speed 25-300 Baud MFSK: Max. 34 carriers, 25-300 Baud PSK2/4/8/16, A&B: speed 25-2400 Baud; S/N=16 db OQPSK: speed 25-2400 Baud OFDM: shift>25Hz; max. 500 channels; subcarrier spacing/symbol rate range 1.1-2.5 Accuracy: FSK speed: 0.3 % FSK center frequency: 2% of Speed PSK-Speed: 0.2 % PSK Center Frequency: 0.15 % of Speed Sensitivity of classification FSK-2: m=0.8: 100-2400 Baud, S/N=12 dB FSK-2: m=0.8: 50-100 Baud, S/N=15 dB PSK2/4: 100-2400 Baud S/N=14 dB PSK8: 100-2400 Baud S/N=16 dB
Operating	Display of classified signals in FFT Continuous mode for HF-classifier (CCC) Integrated classifier-code-check

W61-SAT (INMARSAT Option)

SAT INMARSAT Option (each option requires a separate license)	
SAT-A /B/C/M/mM, details see protocol table	
Single channel INMARSAT C/B/M/mM Monitoring System, with FAX/Voice/Data File-Recording, FAX-Viewer for B/M/mM, B Voice-Playback. External receiver and interface required.	

W-CLOVER-2000 (Option)

CLOVER-2000 Option (each option requires a separate license)	
System	Half-duplex ARQ
AFC	±400 Hz, with max. single step ±10 Hz
Speed	62.5 Baud
Modulation	PSK2A, PSK4A, PSK8A, PSK16A, ASK2PSK8, ASK4PSK16, 2DPSK2A; 8 tones
Alphabet	ITA-5

W-CLOVER-2 (Option)

CLOVER-2 Option (each option requires a separate license)	
System	Half-duplex ARQ

CLOVER-2 Option (each option requires a separate license)

AFC	±200 Hz, with max. single step ±15 Hz
Speed	31.25 Baud
Modulation	PSK2A, PSK4A, PSK8A, PSK16A, ASK2PSK8, ASK4PSK16, 2DPSK2A; 4 tones
Alphabet	ITA-5

W-FACTOR-III (Option)

FACTOR-III Option (each option requires a separate license)

System	Half-duplex synchronous ARQ
AFC	±50Hz
Speed	100.0 Baud
Modulation	DBPSK, DQPSK; 2, 6, 14, 16, or 18 tones
Alphabet	ITA-5 with block coding, CRC is displayed

W-CODAN-9001 (Option)

CODAN-9001 Option (each option requires a separate license)

System	Half-duplex asynchronous adaptive ARQ
AFC	±9 Hz
Speed	16 x 75 Baud
Modulation	Differential PSK4A; 16 tones
Alphabet	RAW DATA, TEXT DATA (CODAN data compression in preparation)

Ordering Information

Ordering Information

Documentation	English User Manual
Online Help	English
Software	Installation CD with latest software version and WAV signal samples
Updates	Software update by CD or Internet http://www.wavecom.ch
Source Code	As an option, only available to official government bodies only, against a written certificate
Warranty	2 years
CE Label	✓

Index

A

Analysis Functions 6

D

Demodulator 6

F

FAX and Modem Protocols 5

G

General Software Characteristics 7

H

Hardware 7

HF-Protocols 1

L

List of Alphabet 5

O

Ordering Information 10

S

SAT-Protocols 4

V

VHF/UHF-Protocols 3

W

W61 Specification 1

W61-CL (HF Classifier Option) 9

W61-SAT (INMARSAT Option) 9

W-CLOVER-2 (Option) 9

W-CLOVER-2000 (Option) 9

W-CODAN-9001 (Option) 10

W-PACTOR-III (Option) 10