STABILOCK® 4015

The only Radio Test Set you can hold with one hand and load with the other

Making STABILOCK 4015 dance to your tune

AUTORUN is the capability of STABILOCK 4015 to execute ready test programs or those you write yourself. That's the simple way of describing what is in fact a powerful and very user-friendly tool for effective and precise solutions to your test applications.

Typical AUTORUN applications

- Automation of repetitive measurements
- Logging of measurements
- Go/nogo tester for different radio sets
- Continuous measurements for detecting sporadic faults
- Computer-supported troubleshooting
- Computer-supported adjustments
- Man/machine interaction in native language

AUTORUN programs are set up on the easily learnt BASIC programming language together with IEEE-488 commands. Using AUTORUN, you have full access to every function of STABILOCK 4015. And the best thing about it is that after brief training you can start writing your own programs.
If you prefer to edit your AUTORUN programs on a PC – no problem. **ARE** (software option), a powerful, menu-prompted, PC-based editor comes to your assistance.

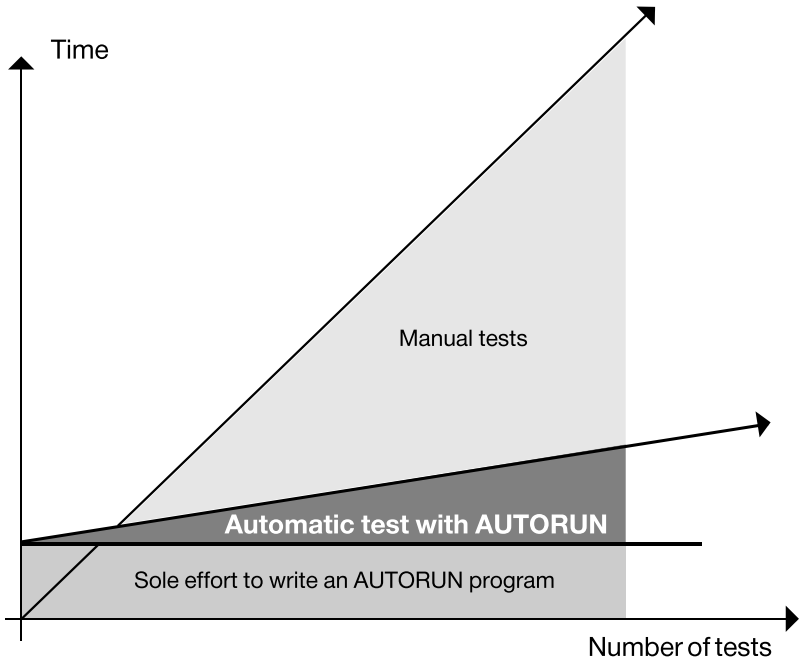
Unlike the case with firmly programmed test sets, AUTORUN offers a maximum degree of flexibility. All kinds of logic decisions are possible and the branches in the program that result from them. Or you can format a report printout the way you want it and insert the name of your company in it too. String processing and output on the RS-232-C interface (option) are just two of the many other features that enable you to get a sure grip on an application.

AUTORUN:
anything else is a waste of time

```
LIST

5140  REM  *** TX DEVIATION MEASUREMENT ***
5150  TX_FM
5160  GENB_OFF
5170  MODAF 1 kHz
5180  GENALEVEL 0.1 V
5190  TXFREQUENCY 888.5125 MHz
5200  A = MDEMODULATION
5210  IF A > 5.20 THEN GOSUB 7810
. . . .
. . . .
7810  PRINT " DEVIATION OUT OF LIMIT "
7820  RETURN
. . . .
```

Example of an AUTORUN program

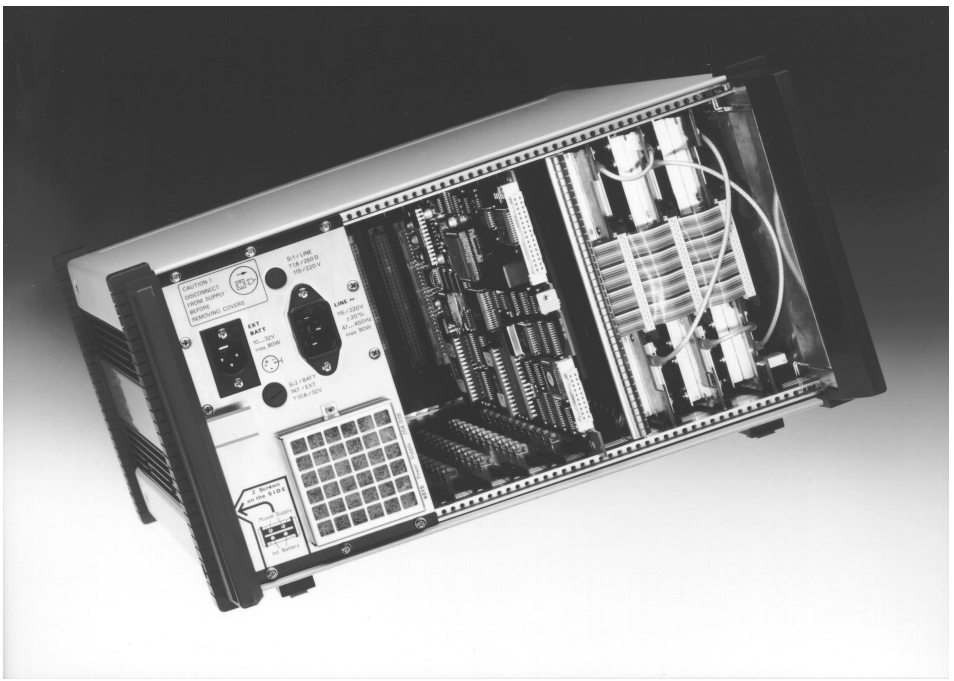


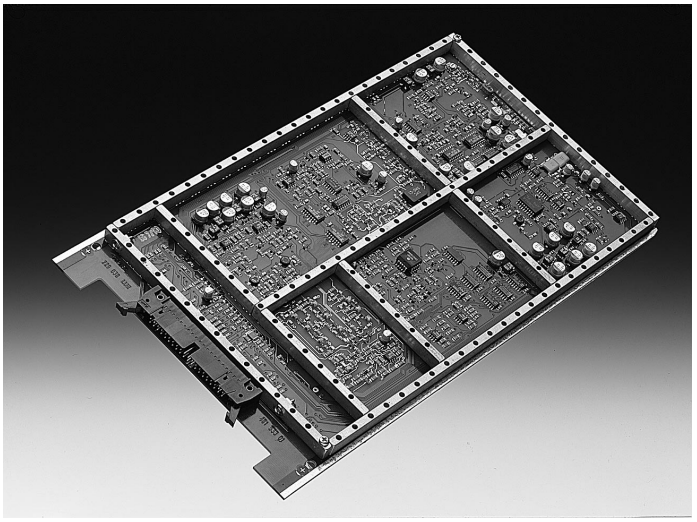
Flexibility and quality have a name: Wavetek.

Communication test sets from Wavetek are renowned for their flexibility. Well-known companies worldwide depend on them, and for good reason: STABILOCK 4015 comes with a future-proof and open hardware and software architecture. We can provide test solutions for close to 30 cellular systems used in over 110 countries worldwide. Our global expertise in cellular testing is a result of over 35 years of RF experience.

To keep costs of ownership as low as possible, a communication test set simply has to work. Precautions have been taken against every imaginable fault:

- high integration with state of the art SMT components,
- active burn-in of all modules,
- automated longterm tests of all specifications with logged verification for every test set,
- tests at extreme temperatures.





Maintenance

And if a defect should occur nevertheless, STABILOCK 4015's integrated selfcheck will diagnose it to find out where the trouble lies. Our service centers keep all modules in stock and can dispatch them to you by air courier. So, modules and subassemblies can be exchanged quickly on the job.
Forget about the subsequent realignment procedures: even after exchange of modules, we guarantee full conformance of all specifications.

STABILOCK 4015 –
designed for the service shop's demands

STABILOCK 4015: Technical Data

Typical Specifications

When we test and qualify our STABILOCKs before we deliver them to you, we get a detailed alignment protocol. We have analysed these protocols and found that the measurement errors of all STABILOCKs out of a long series did not exceed certain values. These values are now called the Typical Specifications. Thus, our Typical Specifications reflect the worst measurement ever received out of a new STABILOCK – and no statistic experiments. This definition is worth comparing it with others.

Why do we then still give Technical Data ?

Technical Data are guaranteed values and the solid base for our unique maintenance concept. You can rely on Technical Data throughout the whole specified range of temperature and humidity. You can rely on them as your STABILOCK gets older. And you can still rely on them, when you exchange whatever subassemblies.
To make the comparison of Typical Specifications and Technical Data as easy as possible, the corresponding value is given in [brackets].

Receiver test (Typical Specifications)		
Level error	(–15 dBm, RX High, f = 1 to 1000 MHz)	< 0.5 dB [≤ 2 dB]
FM setting error	(f_{mod} = 300 Hz to 30 kHz)	≤ 3.5 % [< 10 %]
FM distortion	(f_{mod} = 0.3 to 3 kHz)	< 0.6 % [< 1 %]
AM setting error	(m = 50 %, f_{mod} = 100 Hz to 6 kHz)	≤ 5 % [< 10 %]
AM distortion	(m = 50 %, f_{mod} = 0.3 to 3 kHz)	≤ 0.8 % [< 2 %]
Transmitter test (Typical Specifications)		
RF power measuring error	(1 to 1000 MHz, selective at 5 W)	< 7 % [< 13 %]
RF power measuring error	(800 to 920 MHz, selective at 5 W)	< 6 % [< 13 %]
FM measuring error	(f_{mod} = 0.3 to 3 kHz)	≤ 2.5 % [< 8 %]
AM measuring error	(m > 10 %, f_{mod} = 0.3 to 6 kHz)	≤ 5 % [< 8 %]
AF Generator and Analysis (Typical Specifications)		
AF Generator distortion	(f = 30 Hz to 30 kHz)	< 0.4 % [< 0.6 %]
AF Voltmeter measuring error	(f = 300 Hz to 3 kHz)	≤ 1.5 % [< 5 %]

(All values measured at 20°C and 50 % relative humidity)

Synthesizer

Noise
- Incidental FM, rms, CCITT ≤ 9 Hz rms
- Phase noise, 25 kHz carrier offset
  - < 125 MHz ≤ –97 dBc/Hz
  - 125 to 250 MHz ≤ –112 dBc/Hz
  - 250 to 500 MHz ≤ –107 dBc/Hz
  - 500 to 1000 MHz ≤ –102 dBc/Hz

Spectral purity
- Spurious, 0.2 to 30 kHz offset ≤ –50 dBc
- Harmonics, < 0 dBm unmod. ≤ –20 dBc

Reference oscillator
- Frequency error, ambient temperature 0 to 45 °C ≤ ±0.5 ppm
- Buildup time for < 1 ppm error ≤ 2 min
- Aging/year ≤ ±1 ppm
- Frequency error with option OCXO < ±0.05 ppm

Receiver test

Carrier frequency
- RF frequency range 0.4 to 1000 MHz
- Accuracy as reference oscillator
- Resolution 100 Hz

Output level
- N socket RX/TX, (AM 6 dB less) –130 to –60 dBm
- BNC socket RX HIGH, (AM 6 dB less) –70 to +13 dBm
- Resolution 0.1 dB
- Level error, unmod., > 2 MHz
  - RX/TX socket, > –120 dBm ≤ 2 dB
  - RX HIGH socket, > –60 dBm ≤ 2 dB
- Reflection
  - RX/TX ≤ 1.2 VSWR
  - RX HIGH ≤ 3 VSWR

RX modulation

FM AC modulation
- Frequency deviation (peak) 0 to ±30 kHz
- Modulation-frequency range, 1 dB bandwidth 0.03 to 10 kHz min.
- Modulation-frequency setting range 0.03 to 30 kHz
- Resolution 10 Hz
- Setting error, 0.3 to 6 kHz, deviation ≤ 20 kHz ≤ 10 %
- Distortion, 1 kHz, deviation < 6 kHz ≤ 1 %
- External input 1 MΩ
  - Sensitivity "Fixed" (±5 % error) 10 kHz/V_p
  - Sensitivity "Variable" 0.01 to 10 kHz/mV_p

FM DC modulation
- Frequency offset, < 1 min after calibration
  - 0 to 125 MHz < 500 Hz
  - 125 to 1000 MHz < 1.3 Hz/MHz

Phase modulation
- Phase deviation (peak), < 20 kHz FM deviation 0 to 6 rad
- Modulation-frequency range, 1 dB bandwidth 0.2 to 6 kHz min.
- Modulation-frequency setting range 0.03 to 30 kHz
- Resolution 0.1 rad
- Setting error, 0.3 to 6 kHz (f x rad ≤ 10 kHz) ≤ 10 %
- Distortion, 1 kHz, ≤ 6 rad ≤ 1 %
- External input 1 MΩ
  - Sensitivity "Fixed" (±5 % error) 10 rad/V_p
  - Sensitivity "Variable" 0.01 to 10 rad/mV_p

AM modulation
- RF frequency range useable to 1.5 to 520 MHz, 1000 MHz
- Modulation depth 0 to 90 %
- Modulation-frequency range, 1 dB bandwidth 0.03 to 10 kHz min.
- Modulation-frequency setting range 0.03 to 30 kHz
- Resolution 0.1 %
- Setting error, 1.5 to 520 MHz, f_{mod} 0.1 to 6 kHz, m < 50 % ≤ 10 %
- Distortion, 1 kHz, m < 50 % ≤ 2 %
- External input 1 MΩ
  - Sensitivity "Fixed" (±5 % error) 100 %/V_p
  - Sensitivity "Variable" 0.03 to 33 %/mV_p

Transmitter test

Transmitter test, general

- Automatic tuning on RX/TX socket (Count)
  - < 600 MHz: > 1 mW
  - 600 to 1000 MHz: > 10 mW
- Max. input level
  - continuous: ≤ 50 W
  - shortterm (≤ 1 min): ≤ 150 W
  - Acoustic alarm in case of high temperature
- P_{max} on sockets RX HIGH and TX SENS: 250 mW (no power protection if serial number < 0889000)

Power measurement

- Measurement range
  - RX/TX socket: 0.01 mW to 150 W
  - AM peak: 150 W max.
  - TX SENS socket: −80 to +10 dBm
- Resolution
  - for dBm: 0.1 dB
  - for 1 mW to 150 W: < 1 %
- Measuring error
  - RX/TX socket (P < 50 W): ±0.6 dB + 2 digits
  - TX SENS socket: ±2 dB + 2 digits
  - < 10 min after calibration

Frequency measurement

- RF frequency range: 1.45 to 1000 MHz
- Offset frequency range
  - < 0.5 x IF bandwidth: ≥ ±40/10/5 kHz
- Resolution, selectable (RF and offset frequency): 10 Hz, 1 Hz
- Measuring error (plus reference-oscillator error): ≤ 20 Hz, ≤ 5 Hz (for 1 Hz res.)
- Input sensitivity (offset measurement)
  - RX/TX socket: < −20 dBm
  - TX SENS socket: < −80 dBm

TX modulation measurement

Modulation measurement, general

- Standard IF filter for AM/FM/ΦM: 3 dB bandwidth: 80 ±20 kHz
- Narrowband channel filters, selectable for aural monitoring of FM/ΦM modulation: 6 dB bandwidth: 20/9 kHz min.
- Input level w/o extra measuring error
  - RX/TX socket: 0.1 mW to 150 W
  - TX SENS socket: −60 to +13 dBm
- Squelch, disconnectible. Response threshold: adjustable

FM measurement

- Measurement range: 0 to 30 kHz
- Resolution
  - deviation < 10 kHz: 10 Hz
  - deviation ≥ 10 kHz: 100 Hz
- Measuring error, deviation < 10 kHz, 0.3 to 6 kHz: ≤ 8 % + 1 digit
  - < 10 min after calibration
- Distortion, deviation < 10 kHz: < 1.3 %
- Demodulation output: 600 Ω
  - Sensitivity: approx. 0.2 V_{pp}/kHz
  - 3 dB bandwidth: 0 to approx. 14 kHz
- Sensitivity on TX SENS socket: 10 dB SINAD, CCITT, 3 kHz deviation: ≤ 2 μV

ΦM measurement

- Measurement range, (rad x f_{mod} ≤ 30 kHz): 0 to 10 rad
- Resolution: 0.01 rad
- Measuring error, 0.3 to 6 kHz, rad x f ≤ 10 kHz: ≤ 8 % + 1 digit
  - < 10 min after calibration
- Distortion, deviation < 10 kHz: < 1 %
- Demodulation output: 600 Ω
  - Sensitivity: approx. 0.2 V_{pp}/rad
  - 3 dB bandwidth: approx. 0.12 to 14 kHz
- Sensitivity on TX SENS socket: 10 dB SINAD, CCITT, 3 rad deviation: ≤ 2 μV

AM measurement

- Measurement range: 0 to 100 %
- Resolution: 0.1 %
- Measuring error, m < 50 %, 0.3 to 6 kHz: ≤ 8 % + 1 digit
- Distortion, m < 50 %: < 1 %
- Demodulation output: 600 Ω
  - Sensitivity: dependent on RF level
  - 3 dB bandwidth: 0 to approx. 14 kHz

Spurious-modulation measurement

- Measurement range, for max. measuring error 2 dB, referred to 3 kHz FM, 3 rad, 30 % AM
  - CCITT filter, rms < 500 MHz: 0 to −50 dB
  - CCITT filter, rms ≥ 500 MHz: 0 to −45 dB

AF generators

Variable modulation generator A

- Frequency range: 0.03 to 30 kHz
- Frequency resolution < 10 kHz: 0.1 Hz
  - ≥ 10 kHz: 1 Hz
- Frequency error: ≤ 0.02 %
- Level range, EMF: 0 to 3.8 V_{rms}
- Level resolution < 10 mV: 0.01 mV
  - < 38 mV: 0.1 mV
  - ≥ 38 mV: 1 mV
- Level error 300 Hz to 3 kHz: ≤ 2 % + 2 digits
  - 50 Hz to 10 kHz: ≤ 5 % + 2 digits
- Distortion 30 Hz to 30 kHz (test bandwidth: 100 kHz): ≤ 0.6 %
- Output impedance unbal. 0.3 to 3 kHz: < 6 Ω
- Load impedance: ≥ 200 Ω

1 kHz modulation generator C

- Distortion (test bandwidth: 100 kHz): ≤ 0.4 % (all other data like var. mod gen. A)

Beat-frequency oscillator

- Sum level for modulation beating gen. A + B + C/Ext: ≤ 15 V_{pp} (for gen. B see options, data module)

AF evaluation

AF voltmeter

- Frequency range (1 dB bandwidth) DC/AC: 0/0.03 to 6 kHz min.
- AC measurement range: 0 to 20 V
- DC measurement range: 0 to ±30 V
- Resolution ≥ 10 V: 100 mV
  - < 10 V: 10 mV
  - < 1 V: 1 mV
  - < 0.1 V: 0.1 mV
- Measuring error at 1 kHz, DC: ≤ 2.5 % + 1 digit
- Measuring error 0.1 to 3 kHz: ≤ 5 % + 1 digit
- DC offset, after calibration: ≤ 2 mV
- Input impedance unbal.: ≥ 1 MΩ 20 pF
- CCITT filter: to CCITT P53 standard
- C-weighting filter: to IEEE 743-1984 standard
- Highpass/lowpass/bandpass filters: selectable

AF counter

- Frequency range: 0.03 to 30 kHz
- Resolution < 300 Hz: 0.1 Hz
  - ≥ 300 Hz: 1 Hz
- Measuring error: ≤ 2 digits
- Input level 0.1 to 3 kHz: ≥ 10 mV
  - 0.05 to 10 kHz: ≥ 20 mV
- Min. FM deviation for transmitter test: 500 Hz

Distortion & SINAD meter

- Test frequency (1 kHz for SINAD): 0.2 to 2 kHz
- Measurement range
  - for distortion: 0 to > 50 %
  - for SINAD: 0 to > 45 dB
- Resolution for
  - distortion measurement: 0.1 %
  - for SINAD: 0.1 dB
- Measuring error
  - for distortion < 10 %: ±0.5 % absolute
  - for SINAD 6 to 20 dB: ±0.5 dB
- Input level: > 100 mV
- Min. FM deviation for transmitter test: 500 Hz

Scope & analyzer

Digital storage oscilloscope

- Modes: one shot, continuous, freeze, time measurement
- Frequency range, AC, DC: like AF voltmeter
- Measuring error: like AF voltmeter
- Input switching: like AF voltmeter
- Trigger settings: autotrigger, variable positive/negative
- Trigger signals: voltmeter, TX power, RX level, external TTL
- Horizontal deflection, timebase: 0.1 to 500 ms/div
- Vertical deflection, (setting manually or automatically) level scale: 2 mV/div to 10 V/div

Spectrum analyzer

Modes

- "Analyzer" = spectrum analyzer
- "Marker" = analyzer with frequency markers, optionally with automatic tuning of frequency marker
- "Freeze" = display stored, with demodulation (and aural monitoring) of marker frequency

Frequency

- Frequency range: 1.5 to 1000 MHz
- Sweep width selectable: 0.25 to 10 MHz
- Evaluation bandwidth corr. to sweep width: max. 20 kHz
- Sweep time: ≤ 2.5 s

Level

- Dynamic range: −100 to +50 dBm
- P_{ref}, n x 10 dB switchover
  - RX/TX socket: +10/+20 to +50 dBm
  - TX SENS socket: −50/−40 to 0 dBm
- Display range (P_{ref} = 0 dBrel): 0 to −60 dBrel
- Measuring error at
  - 0 to −40 dBrel absolute: ≤ 3 dB
  - relative, Diff < 20 MHz: ≤ 1 dB
- Inherent noise: ≤ −45 dBrel

Intermodulation products

- P_{max} ≤ +20 dBm: ≤ −40 dBrel

Signal/image ratio

- (zero down-conversion!): image-free

Options

HARDWARE OPTIONS

External synchronization (10 MHz)

- Sync display: LED
- Input: BNC socket, approx. 200 Ω
- Ref. signal: 10 MHz, > 0.2 Vrms

OCXO reference oscillator

- Reference frequency: 10 MHz
- Frequency error during warmup (> 4 min after power-up at 25°C, > 7 min at 0°C): < ±0.05 ppm
- Frequency error, ambient temp. 0 to 50°C): ≤ ±0.05 ppm
- Aging/year: ≤ approx. ±0.1 ppm

Duplex synthesis

- For simultaneous RX and TX functions.
- All data as for RX and TX above.
- Duplex spacing selectable (usable from 0 to 2 MHz): > 2 MHz
- Min. TX frequency: 1.5032 MHz

Data module

Digital encoder and decoder for radio-data systems

- Coding
  - NRZ: ≤ 10 kBaud
  - FFSK: ≤ 5 kBaud
  - FSK: ≤ 2 kBaud
  - Manchester: ≤ 10 kBaud
- Encoder
  - additional level setting error: ≤ 4 %
  - overshoot on squarewave: ≤ 5 %
- Decoder
  - FM deviation range: 1 to 10 kHz

Variable modulation generator B

- Additional level error: ≤ 2 %
- Distortion 0,03 to 30 kHz (test bandwidth 100 kHz): ≤ 1 %
- all other data like var. mod gen A

DTMF module

- Encoder and decoder, selectable duration and pause.

Interface IEEE bus/RS-232-C/keyboard

IEEE bus interface

- Standard: IEEE-488, GPIB
- Connector: Amphenol socket, 24-way
- Functions: AH1, SH1, L2, T1, SR1, RL1, DC1

Keyboard interface

for keyboard, ordering code 248 192

- Connector: submin D socket, 15-way

RS-232-C interface

- Connector: submin D plug, 9-way

Interface Centronics/RS-232-C/keyboard

Centronics interface

- Connector: Amphenol socket 36-way

Keyboard interface

for keyboard, ordering code 248 192

- Connector: submin D socket 15-way

RS-232-C interface

- Connector: submin D plug, 9-way

Internal battery

- Operating time, battery fully charged: > 1 h
- Internal charge, automatically controlled (start when connected to line, stop upon limit temperature): approx. 14 h
- Battery-voltage indication on display: typ. 12 V
- Battery operation for line outage: automatic switchover

General data

Power supply

- AC line: 220/115 V ±20 %, 47 to 450 Hz
- External DC supply (minus on ground): +10 to 32 V
- Upon line outage automatic switchover to internal or external battery
- Power consumption (see options for internal battery): approx. 80 W

Control interface

- Connector: submin D socket 25-way
- 4 control relays, each with 1 contact = 2 lines freely programmable or as automatic switch for RX/TX, squelch
- TTL control
  - outputs: 12
  - inputs: 1
- Auxiliary power supply
  - 3 DC voltages: +15, −15, +5 V
  - current limiting: approx. 30 mA

Dimensions and weight

- Weight w/o options: approx. 9,5 kg
- with all options incl. battery: ≤ 13 kg
- Dimensions W/H/D: 338 / 176 / 350 mm

Environment

- Operating temperature: 0 to 50°C
- Storage temperature: −40 to +70°C
- Full specifications after: 15 min
- Mechanical strength (to DIN 40046)
  - Shock: 30 g
  - Vibration: 5 to 10 Hz for 10 mm amplitude, 10 to 60 Hz, 2 g constant
  - Safety: to VDE 0411/IEC 348

Radiated interference

- RF tightness, measured with coil, 2 turns, 25 mm diameter on 50 Ω at 25 mm distance
  - > 60 MHz: ≤ 1 µV
  - < 60 MHz: ≤ 3 µV
- Radiated interference to VDE 0871: ≤ "limit value B"

Check list

Order number	248 145	860 182	236 012	236 013	229 038	248 171	236 016	248 192	
Application \ Option	VSWR bridge	IEEE-488 Interface PCII A	Interface Centronics / RS-232-C / keyboard or Interface IEEE bus / RS-232-C / keyboard		Duplex synthesis	DTMF module	Data module	Keyboard	Software Option
Simulation of answer back systems (RF output and feeding in of tone sequences)					●				
DTMF signal encoding/decoding						●			
Program-controlled measurements (AUTORUN)			●					●	
ARE: Software package for PC based development of AUTORUN programs		●		●					897 100
Measuring protocol with explanatory text			●					●	
Measuring protocol, hardcopies from screen, AUTORUN listings			●						
NMT 450 i/900 Scandinavia					●		●		897 818
NMT 450 i					●		●		897 816
NMT 900 Scandinavia					●		●		897 980
NMT 450 universal					●		●		897 975
NMT Benelux					●		●		897 977
NMT France					●		●		897 978
NMT Turkey					●		●		897 901
Natel-C Switzerland					●		●		897 979
C-Net Austria					●		●		897 976
EAMPS					●		●		897 972
ETACS UK					●		●		897 971
JTACS (ETACS Japan)					●		●		897 973
NTACS					●		●		897 935
NAMPS					●		●		897 934
EDACS MS-Test					●		●		897 810
EDACS BS-Test CC Trace					●		●		897 814
RC 2000					●		●		897 968
POCSAG (NRZ)							●		897 981
POCSAG (FFSK)							●		897 982
POCSAG Monitoring							●		897 817
Cityruf							●		897 932
FMS					●		●		897 936
VDEW digital standard					●		●		897 937
ZVEI binary					●		●		897 938
DIGI-S					●		●		897 939
Trunking MPT 1327 / PAA 2424					●		●		897 983
Trunking BS-Test CC Trace							●		897 815
Tracking and Cable Fault Finder	●				●				897 933
US Signalling					●		●		897 984
LTR and US Signalling					●		●		897 966
AT&T Microcell					●		●		897 931
ATIS					●		●		897 821
UIC 751-3					●		●		897 822

Accessories

Accessories supplied 249025

Set of miniature fuses 849036/849064
RF-SMD spare fuse (3x) [1] 894049
Power cable standard or 880604
Power cable USA or 880620
Power cable UK 880621
50 Ω BNC termination (2 x) 874009
Panel cover (2 x) 501370
Headphones jack 884123
Battery-cable socket 884015
1 memory card (blank, 32 Kbytes) 897050
User manual 290089

Recommended extras

IEEE 488 interface PCIIA (for PC) 860182
Microphone 248147
Telescopic antenna 248148
Battery pack, external, with connecting cable 248185
Keyboard 248192
RF probe 860108
1 MΩ probe 860148
VSWR directional coupler + access. 248104
VSWR bridge + accessories 248145
Spare cartridge for printer 860133
Printer paper 2500 sheets 860134
Memory card 32 Kbytes 897050
Memory card 64 Kbytes 897051
Memory card 128 Kbytes 897052
Protecting edges, large, for back panel 248146
Symm. AF transformer 248194
Heat sink for N socket 886220
Submin D connector set, 25-way for control interface 300641
Submin D connector set, 9-way for RS-232-C 300756
Cable set (RF cables and adapters) 300690
IEEE cable (2 m) 860110
Centronics cable 860180
Service manual 291089
Transport case 300750
Carrying bag 378268
RF-SMD spare fuse 894049
RF-power protection [2] 248237

1) from serial No. 0889000 onwards
2) Standard from serial No. 0889000 onwards. For older units please check with your Wavetek representative.

Ordering data

STABILOCK 4015 108901

Hardware options

Duplex synthesis 229038
Data module 236016
DTMF module 248171
Interface Centronics/RS-232-C/Keyboard 236012
Interface IEEE-488/RS-232-C/Keyboard 236013
Internal battery 205006
External synchronization (10 MHz) 214026
OCXO reference oscillator 214027

Software options

NMT 450 i/900 Scandinavia 897818
NMT 450 i 897816
NMT 900 Scandinavia 897980
NMT 450 universal 897975
C-Net Austria 897976
NMT Benelux 897977
NMT France 897978
NMT Turkey 897901
Natel-C Switzerland 897979
ETACS UK 897971
JTACS (ETACS Japan) 897973
EAMPS 897972
NTACS 897935
NAMPS 897934
EDACS MS-Test 897810
EDACS BS-Test CC Trace 897814
RC 2000 897968
POCSAG (NRZ) 897981
POCSAG (FFSK) 897982
POCSAG Monitoring 897817
Cityruf 897932
FMS 897936
VDEW digital standard 897937
ZVEI binary 897938
DIGI-S 897939
Trunking MPT 1327 / PAA 2424 897983
Trunking BS-Test CC Trace 897815
Tracking and Cable Fault Finder 897933
US Signalling 897984
LTR and US Signalling 897966
AT&T Microcell 897931
ATIS 897821
UIC 751-3 897822
ARE AUTORUN Editor (5 1/4 or 3 1/2" disc) 897100

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A closely linked network of 29 affiliated companies and more than 65 representatives ensure that our customers receive the best possible advice in solving specific measurement problems.

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