M T 2
Château de la Valentine
07300 Tournon

Tel : +33 4 75 07 99 36
Fax : +33 4 75 07 99 31
Internet : www.mt2.fr

«Pack TBR21»
Presentation

Référence : MT2/Présentation pack TBR21/02
Edition 2 du 10 Avril 2002
Auteur : Christian Sellier

Contents

Presentation

The TBR21 «pack» is a hardware + software set offering the possibility of testing a telephony terminal in accordance with the different paragraphs of the ETSI **TBR21** standard. The software enables account to be taken of **ATAAB** (Analog Type Approval Advisory Board) requirements specific to certain countries. If required, the **EN 301 437** Standard (and so the **TBR37**) for terminals requiring a minimum line current can be applied.

The MT2 range of test and measuring equipment and especially the PA100 feeding bridge in the heart of the device, allows tests of the TBR21 standard. In order to facilitate the engineer working, MT2 offers a «tunkey» solution. It save wiring and permit measurement report edition. This aspect is important for manufacturers who must auto-certify their products for European regulation.

Operating principle

See the schematic opposite.

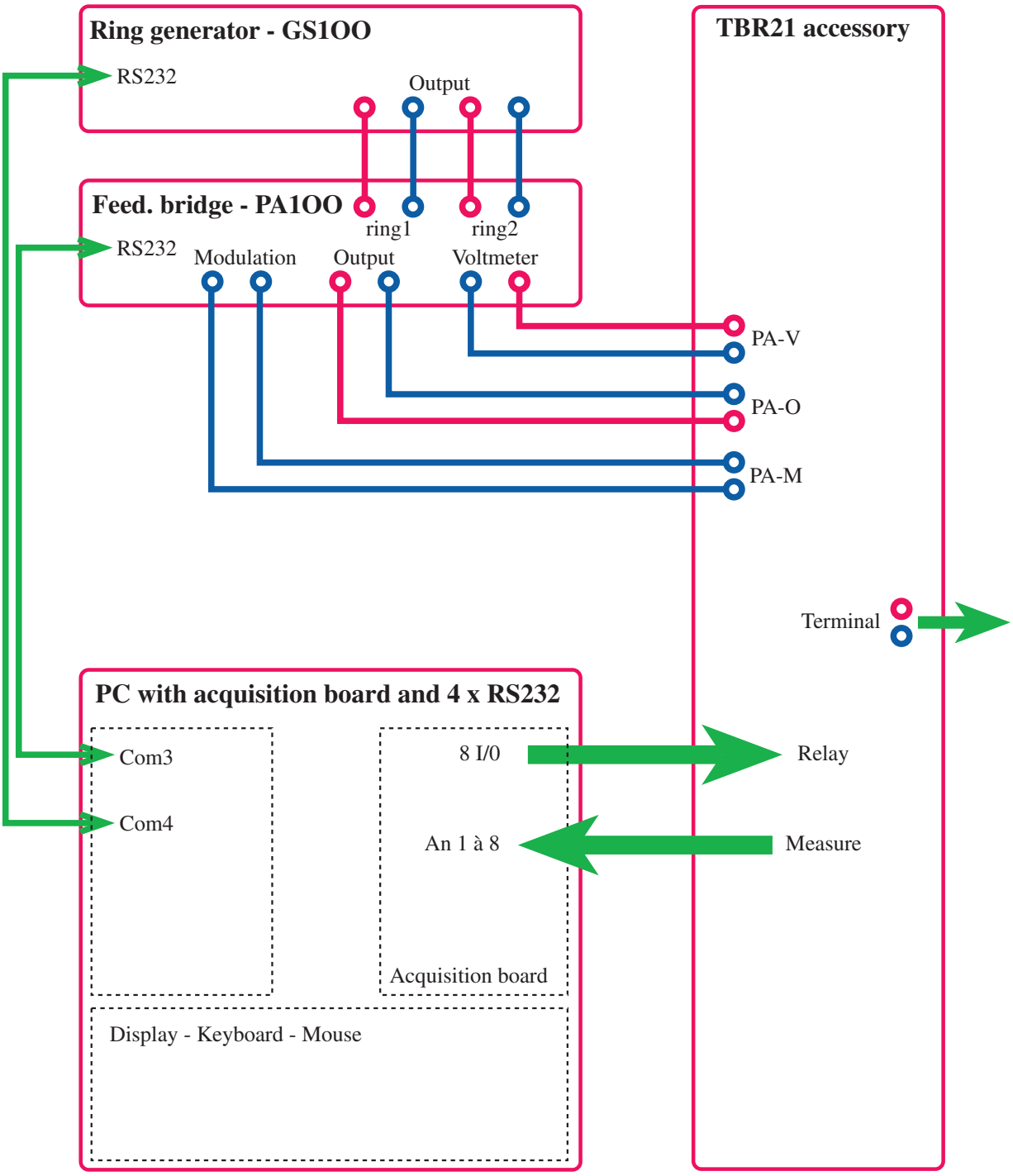
Two standard equipment are used : A GS100 ringing generator and a PA100 feeding bridge. These equipment are remote controlled by a PC fitted with 2 RS232 port.

Ringing generator is connected to the feeding bridge. The feeding bridge is connected to the measurement accessory : Output (PA-O) and Modulation (PA-M).

The PC is also fitted with an acquisition board (National Instrument). This board is mainly used for dynamic measurement and for the control of the specific “TBR21 accessory” equipment.

The terminal under test is connected to the TBR21 accessory. Then, the suitable measurement circuit is established regarding about the paragraph of the standard.The human interface is friendly and all the necessary items for a good trace of the test are provided (date, tested terminal, operator, measurement results, verdict, etc.).

Schematic


Ring generator - GS1OO
RS232
Output
Feed. bridge - PA1OO
ring1
ring2
RS232
Modulation
Output
Voltmeter
TBR21 accessory
PA-V
PA-O
PA-M
Terminal
PC with acquisition board and 4 x RS232
Com3
Com4
8 I/0
Relay
An 1 à 8
Measure
Acquisition board
Display - Keyboard - Mouse

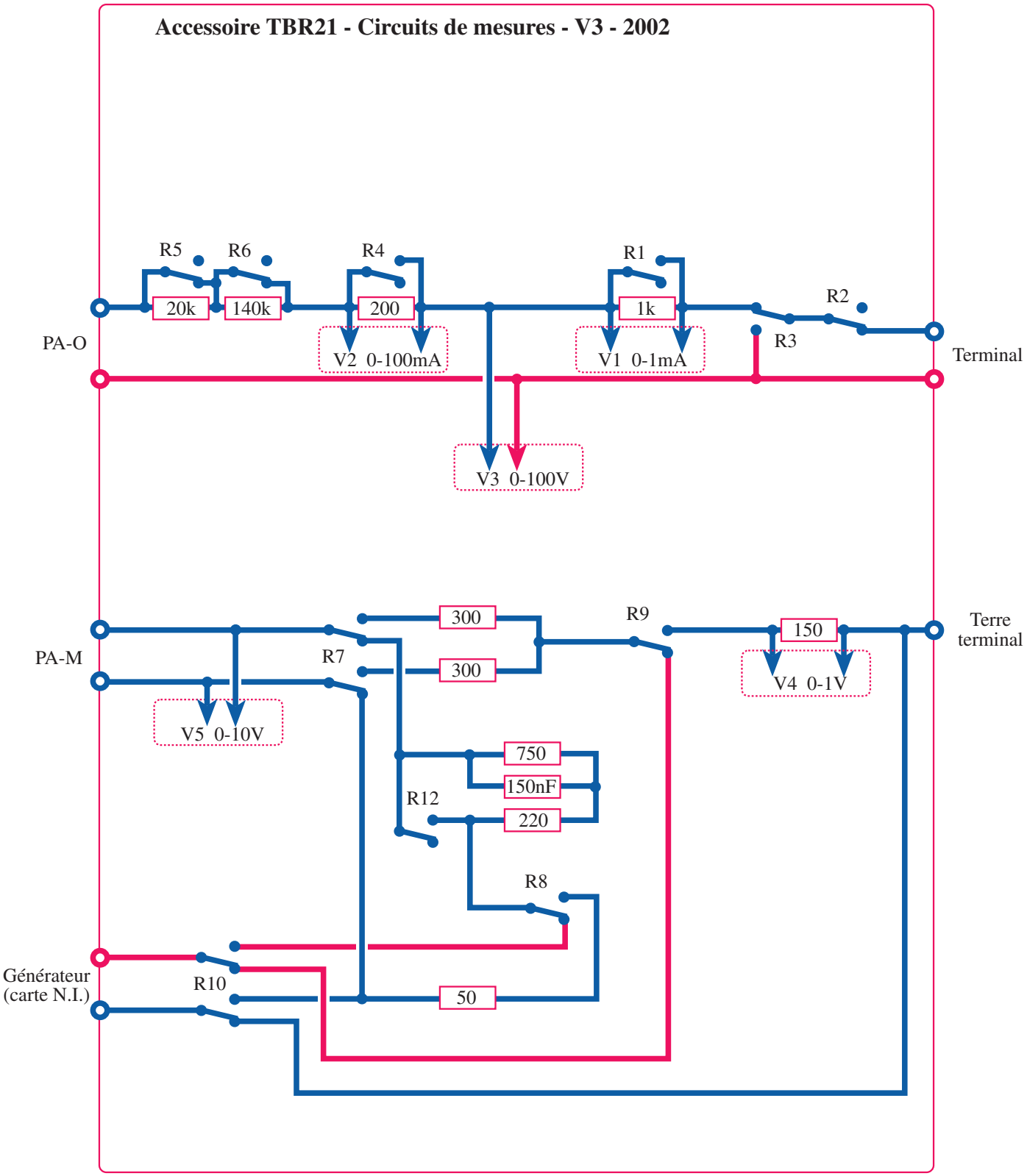
TBR21 Accessory - Measuring circuits

In the higher part of the schematic, the output of the feeding bridge is connected to the terminal output through 2 current shunts. These shunts can be bypassed when they are not used. Two resistances allows to increase the line resistance aver the 20 000 Ohms capability of the feeding bridge. Relays R2 and R3 allow opening circuit or making a short circuit of the terminal.

Modulation input of thge feeding bridge can be connected on a balanced load (2 x 300Ω) or Zref impedance. The 270Ω resistance of Zref is made with 220Ω + 50Ω. The 50Ω are made either by a resistance when Zref is only a load, or by the generator output when the generator must be used (R8).

Different schematics of the standard can be realised using the relays. This is possible beacuse all the voltmeters are floatting.

V1 to V5 measurements are done using instrumentation amplifiers with galvanic isalolation, except V5 used for Measurements up to 200KHz. Antialiasing filters are used for good measurements. The schematic shown is a simplified version (for example all the impedances are balanced ....).


Accessoire TBR21 - Circuits de mesures - V3 - 2002
R5
R6
R4
R1
R2
20k
140k
200
1k
PA-O
V2 0-100mA
V1 0-1mA
R3
Terminal
V3 0-100V
300
R9
150
Terre terminal
PA-M
R7
300
V4 0-1V
V5 0-10V
750
150nF
R12
220
R8
Générateur (carte N.I.)
R10
50

Software

Main points of the Pack TBR21 software are :

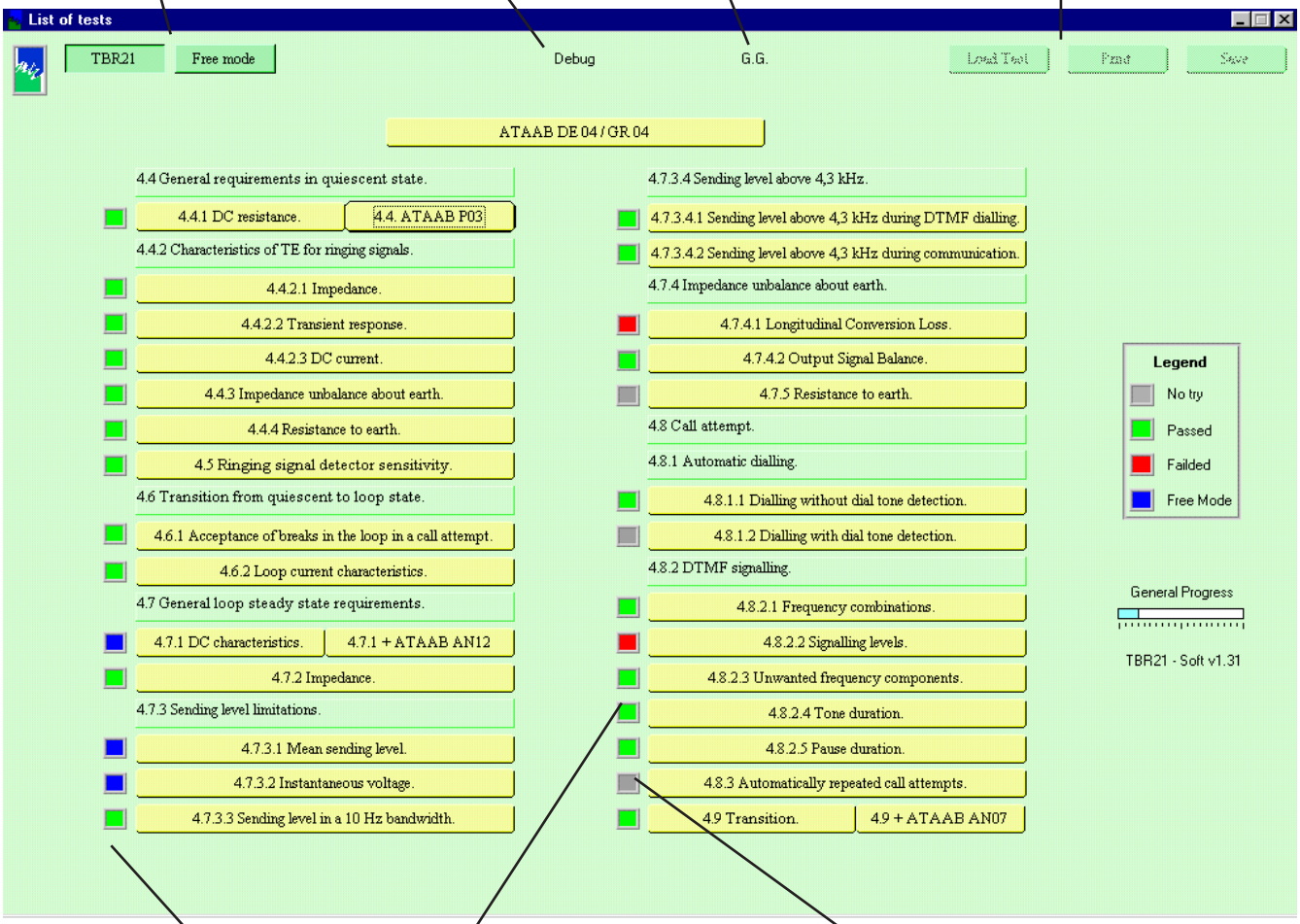
- Easy to use. Simple and intuitive : no menus, the commands are accessible by a silple click and buttons are placed for a logic use.
- Storing and security of datas. Measurement can be stored and then, they cannnot be modified. It is also possible to work on different terminals, datas are stored in different folders (one for each terminal).
- Report generation : Each folder can be printed with creation of an index and numbering of the pages.
- Quick and quality of measurements. Different measurements have been validated by both our internal measurement and partnership with some of our customers.
- Free mode enablkes measurement with modified parameters compared to TBR21. This enables to make investigation and is very useful for perfecting a prototype for example.

The different screen copies shown illustrate how these points are tken in account.

The main screen give access to the different paragraphs and inform on the stus of measurements :

Commands that appear on all screens

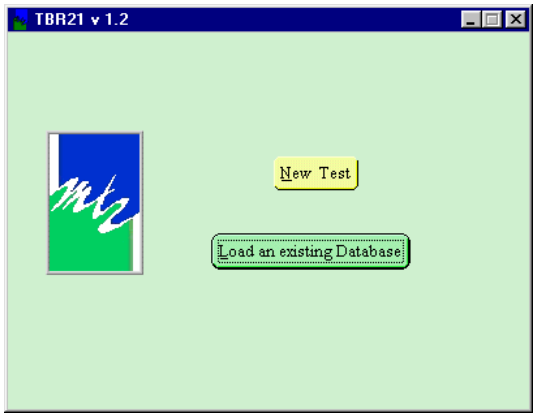
Utilisation mode - Name of the tested device - Operator - Loading, printing or saving a measurement



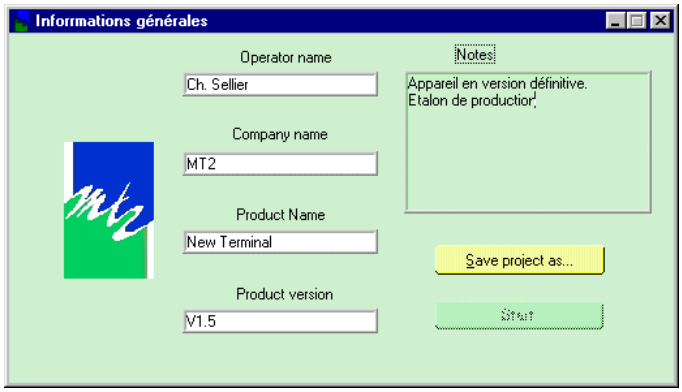
Done measurements Good/Bad/Freemode - Not done measurement

Switching On

At the switching on , you have the choice between an existing or a new folder :



If a new folder is asked :

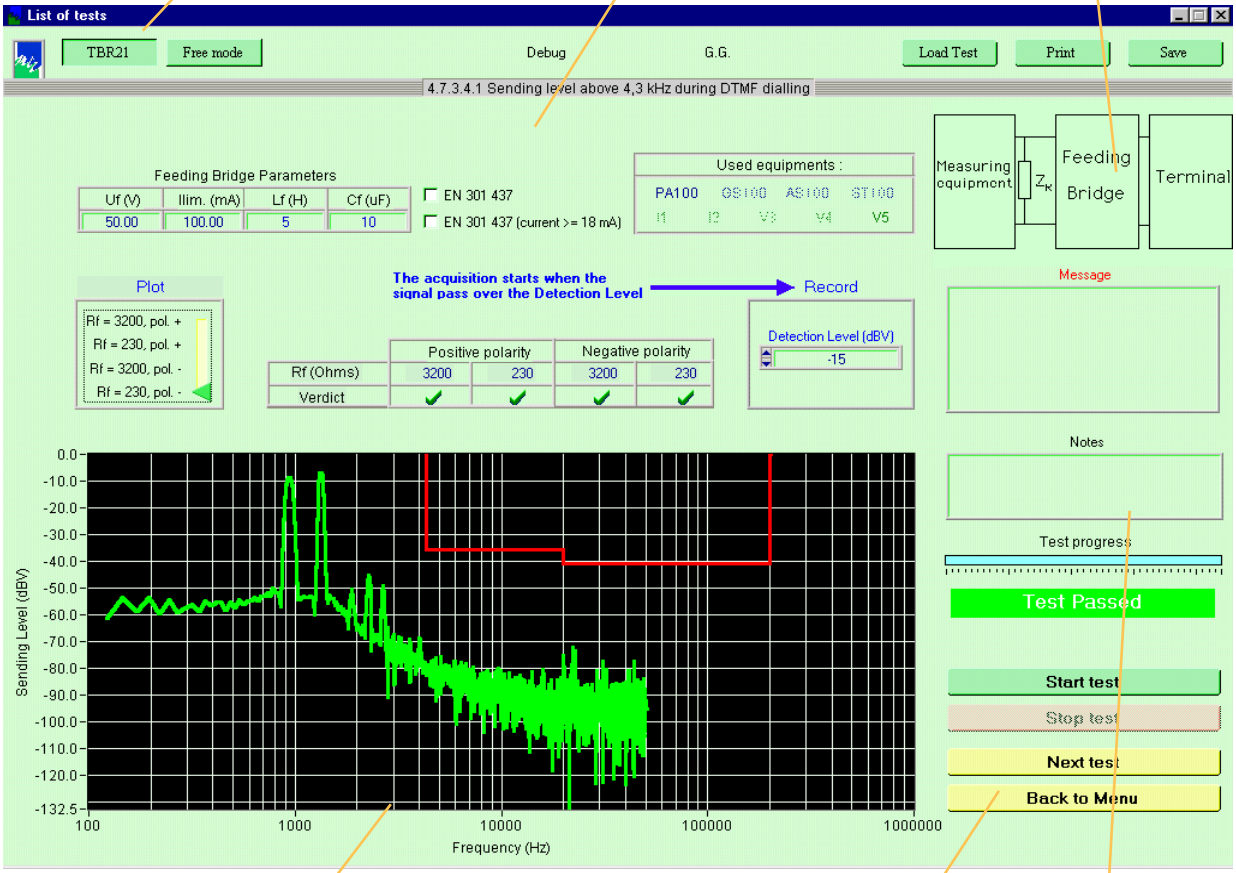


Measurement screens

For each pargraph a specific screen is proposed.

TBR21 or free mode

Equipments used and TBR21 schematic

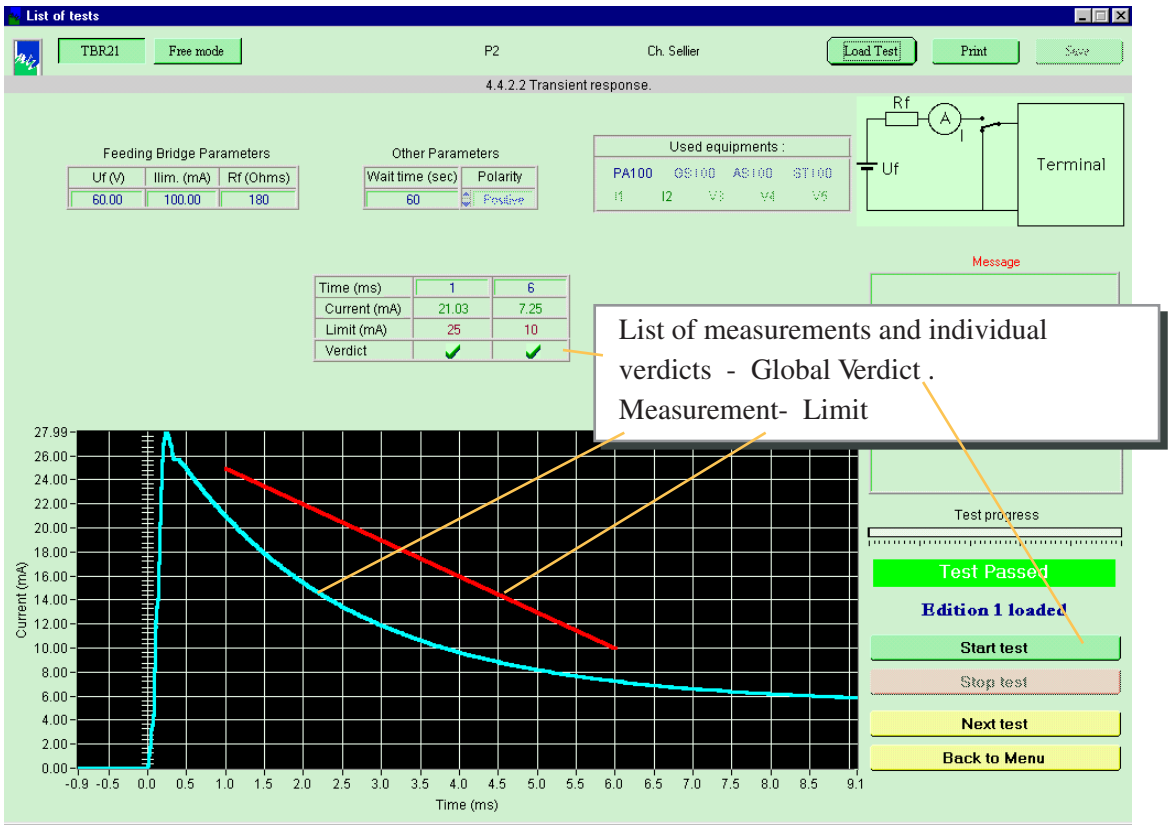


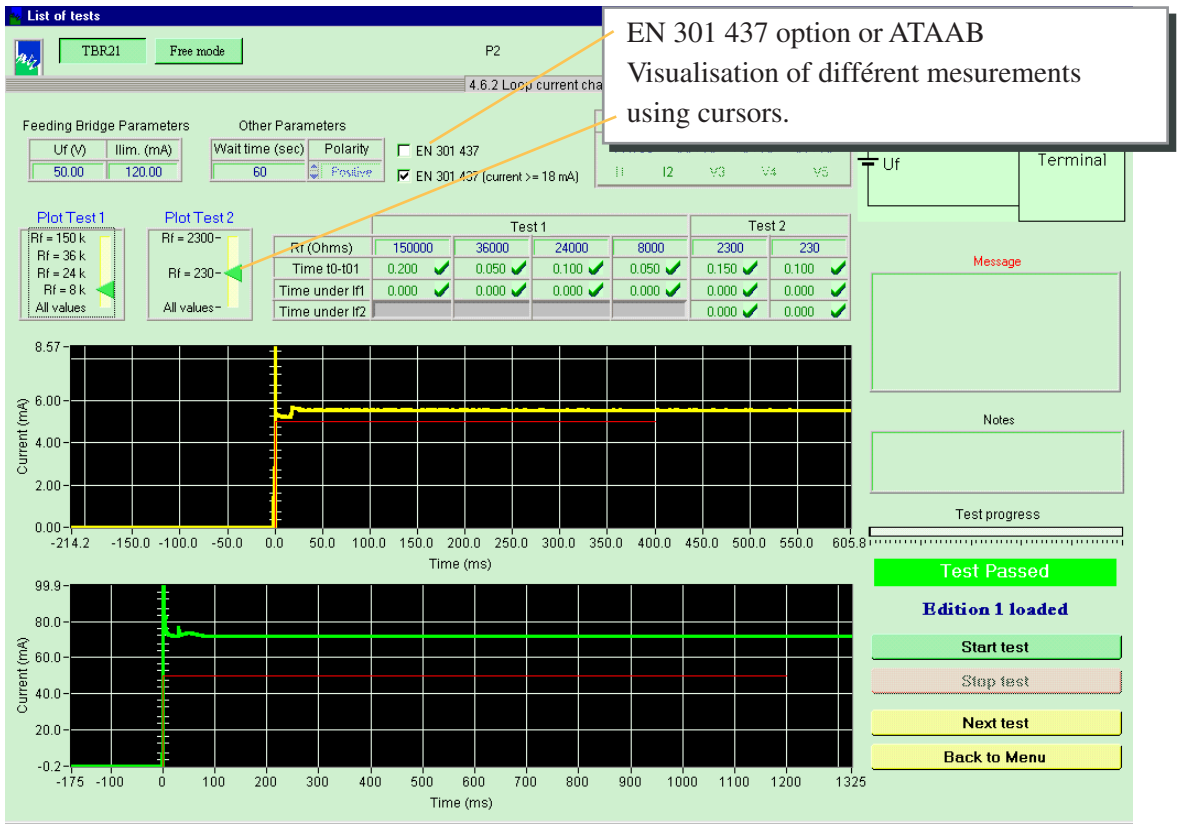
Measurement results are displayed as lists and/or graphs.

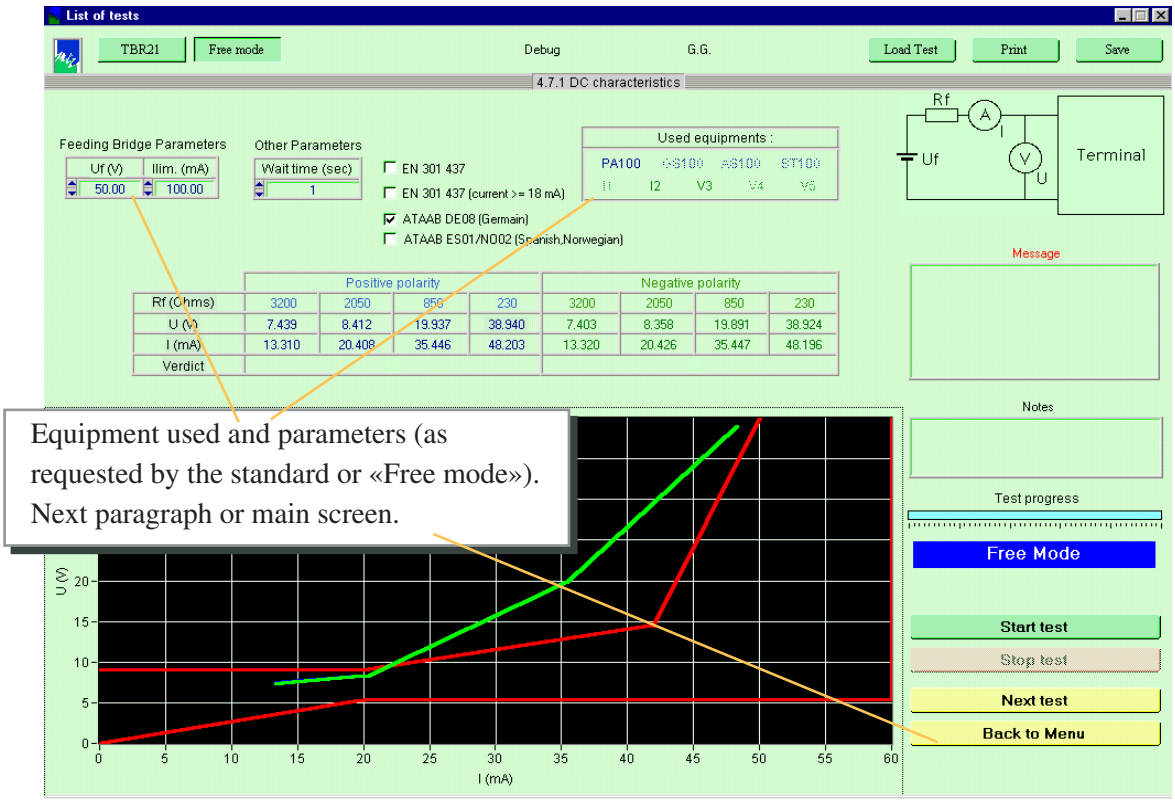
Notes for this measurement

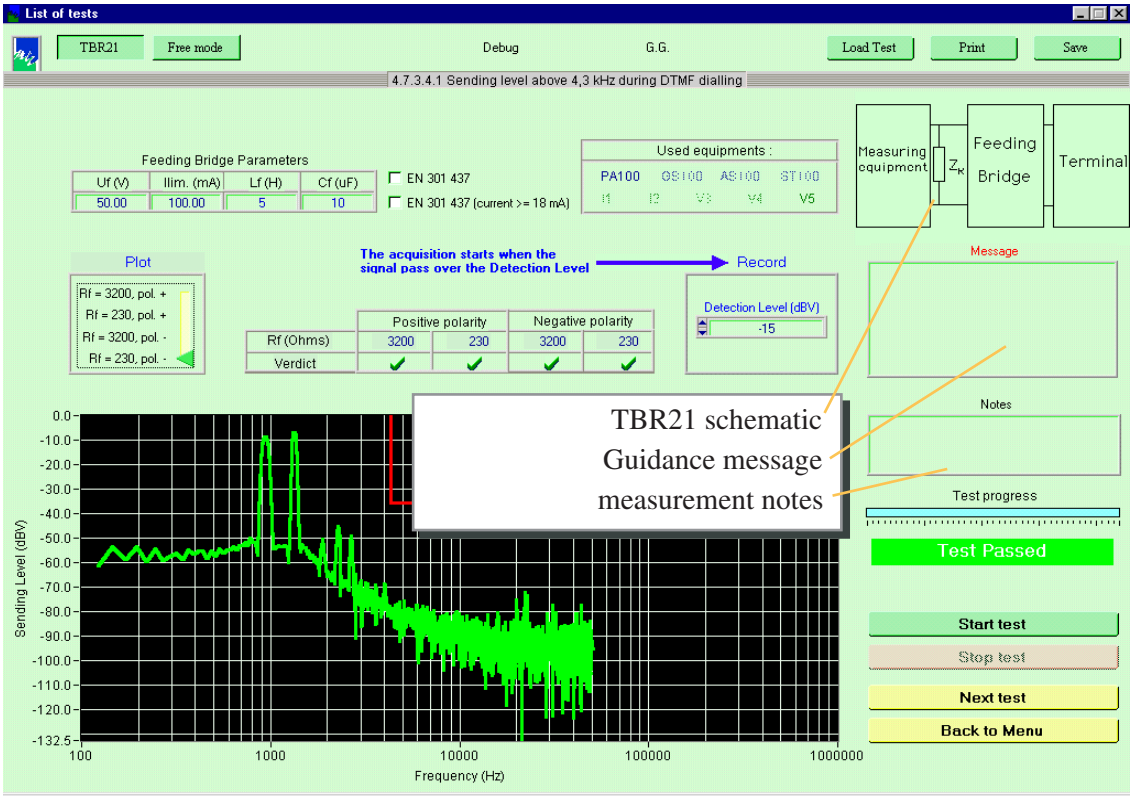
Command buttons are always at the same place : Down and right for measurement commands, at the top for genaral commands

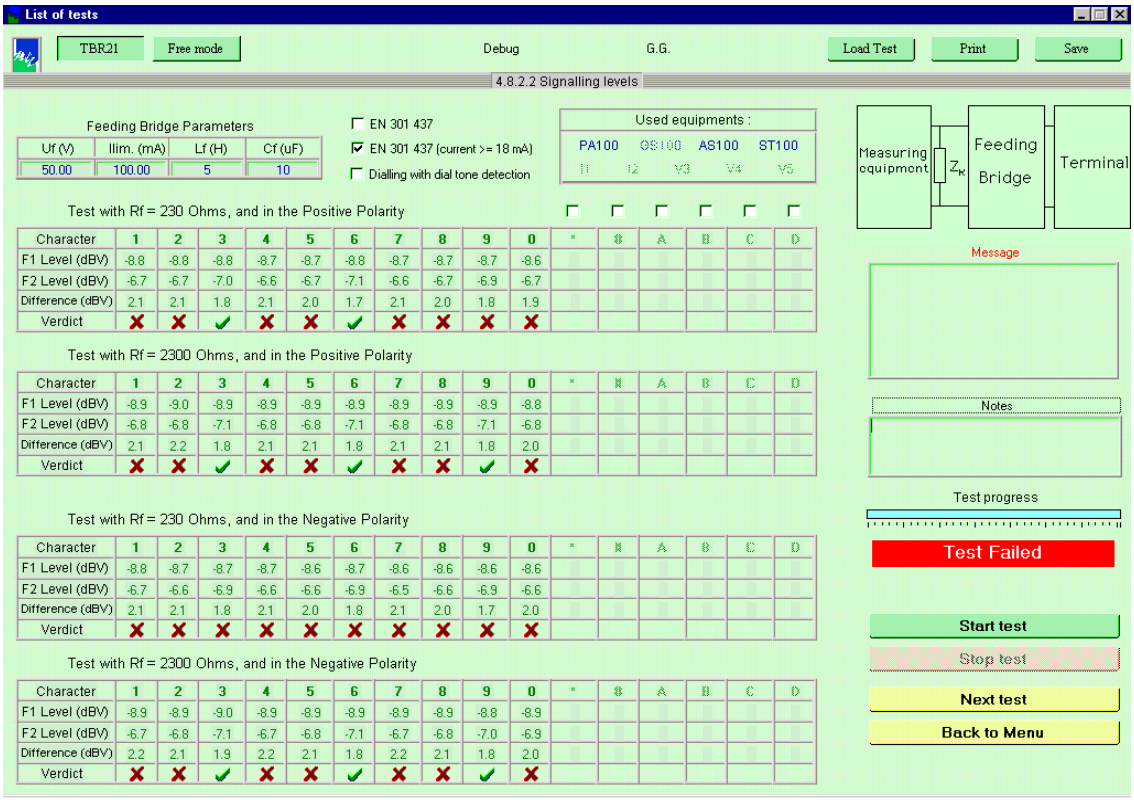
Examples of measurement screens

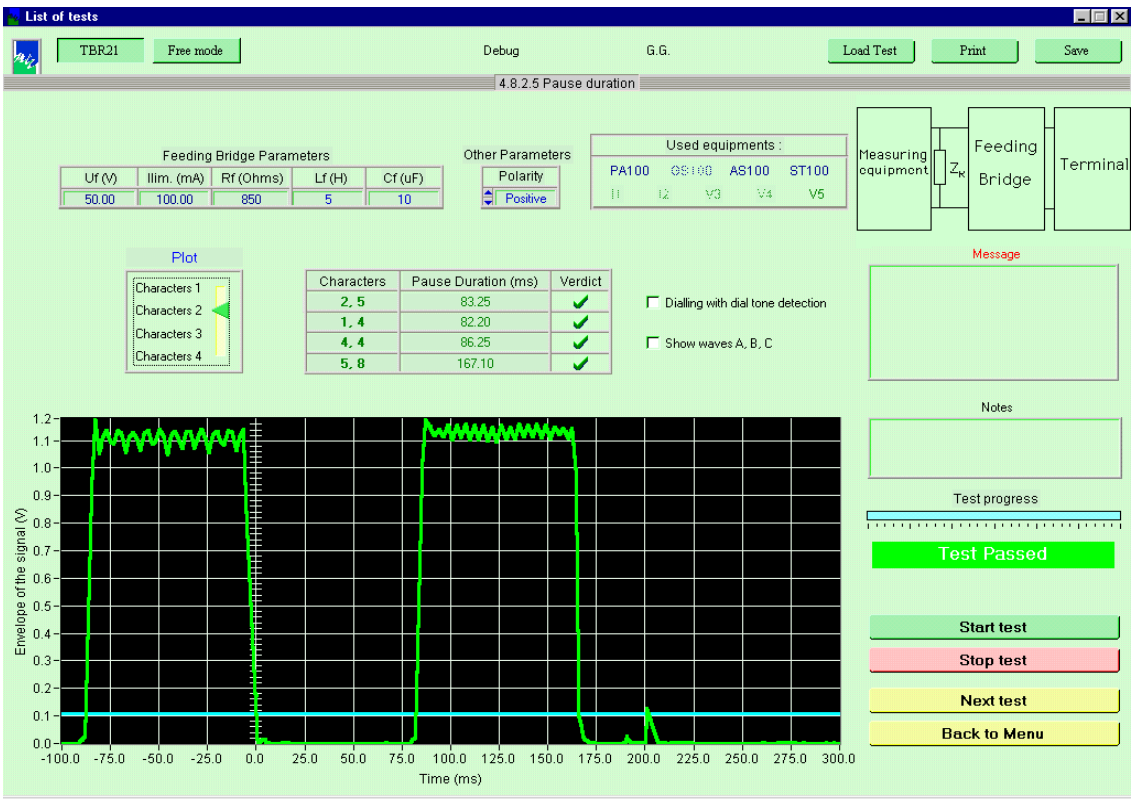





List of tests
TBR21
Free mode
Debug
G.G.
Load Test
Print
Save
4.7.1 DC characteristics
Feeding Bridge Parameters
Uf (V)
Ilim. (mA)
50.00
100.00
Other Parameters
Wait time (sec)
1
EN 301 437
EN 301 437 (current >= 18 mA)
ATAAB DE08 (Germain)
ATAAB ES01/N002 (Spanish,Norwegian)
Used equipments :
PA100
GS100
AS100
ST100
I1
I2
V3
V4
V5
Rf
A
I
Uf
V
U
Terminal
Positive polarity
Negative polarity
Rf (Ohms)
3200
2050
850
230
U (V)
7.439
8.412
19.937
38.940
7.403
8.358
19.891
38.924
I (mA)
13.310
20.408
35.446
48.203
13.320
20.426
35.447
48.196
Verdict
Message
Notes
Test progress
Free Mode
Start test
Stop test
Next test
Back to Menu
U (V)
I (mA)
Equipment used and parameters (as requested by the standard or «Free mode»).
Next paragraph or main screen.

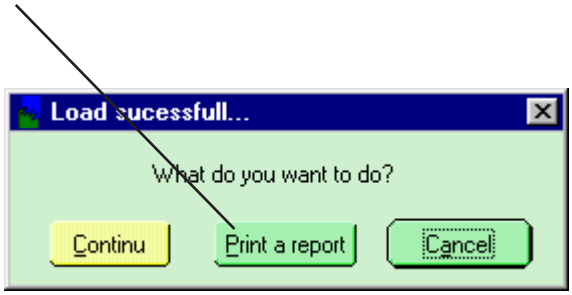

List of tests
TBR21
Free mode
Debug
G.G.
Load Test
Print
Save
4.7.3.4.1 Sending level above 4,3 kHz during DTMF dialling
Feeding Bridge Parameters
Uf (V)
Ilim. (mA)
Lf (H)
Cf (uF)
50.00
100.00
5
10
EN 301 437
EN 301 437 (current >= 18 mA)
Used equipments :
PA100
GS100
AS100
ST100
I1
I2
V3
V4
V5
Measuring equipment
Feeding Bridge
Terminal
Plot
Rf = 3200, pol. +
Rf = 230, pol. +
Rf = 3200, pol. -
Rf = 230, pol. -
The acquisition starts when the signal pass over the Detection Level
Record
Detection Level (dBV)
-15
Positive polarity
Negative polarity
Rf (Ohms)
3200
230
3200
230
Verdict
Message
Notes
Test progress
Test Passed
Start test
Stop test
Next test
Back to Menu
Sending Level (dBV)
Frequency (Hz)
TBR21 schematic
Guidance message
measurement notes


List of tests
TBR21
Free mode
Debug
G.G.
Load Test
Print
Save
4.8.2.2 Signalling levels
Feeding Bridge Parameters
Uf (V) Ilim. (mA) Lf (H) Cf (uF)
50.00 100.00 5 10
EN 301 437
EN 301 437 (current >= 18 mA)
Dialling with dial tone detection
Used equipments :
PA100 OS100 AS100 ST100
Measuring equipment
Feeding Bridge
Terminal
Test with Rf = 230 Ohms, and in the Positive Polarity
Test with Rf = 2300 Ohms, and in the Positive Polarity
Test with Rf = 230 Ohms, and in the Negative Polarity
Test with Rf = 2300 Ohms, and in the Negative Polarity
Character
F1 Level (dBV)
F2 Level (dBV)
Difference (dBV)
Verdict
Message
Notes
Test progress
Test Failed
Start test
Stop test
Next test
Back to Menu


List of tests
TBR21
Free mode
Debug
G.G.
Load Test
Print
Save
4.8.2.5 Pause duration
Feeding Bridge Parameters
Uf (V) Ilim. (mA) Rf (Ohms) Lf (H) Cf (uF)
50.00 100.00 850 5 10
Other Parameters
Polarity
Positive
Used equipments :
PA100 OS100 AS100 ST100
Measuring equipment
Feeding Bridge
Terminal
Plot
Characters 1
Characters 2
Characters 3
Characters 4
Characters
Pause Duration (ms)
Verdict
2, 5 83.25
1, 4 82.20
4, 4 86.25
5, 8 167.10
Dialling with dial tone detection
Show waves A, B, C
Message
Notes
Test progress
Test Passed
Start test
Stop test
Next test
Back to Menu
Envelope of the signal (V)
Time (ms)

Report edition

When choosing a folder you can ask for a report printing.



When the report is printed, it is fitted with date, Index and numbering of pages.