

will'tek

Willtek 8050

HindsitePlus



user's guide

version 1.00

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Table of Contents

About This Guide	ix
Purpose and scope	x
Assumptions	x
Related information	x
Technical assistance	xi
Conventions.....	xii
Chapter 1 HindsitePlus Overview	1
About HindsitePlus	2
What's new in version 1.00	3
Features and capabilities	4
HINDSITEPLUS	4
AnalyzerPlus	4
Findings on the network behavior.....	5
Master calls.....	5
Selectable measuring program parameters	6
RF scan window	6
Items included.....	8
Overview of the test system.....	11
Structure of the test system	11
Components of the test system.....	12
Call handling with HindsitePlus.....	17

Table of Contents

	Call duration, pause duration	17
	Normal connection procedure.....	18
	Faulty connection procedure.....	18
	Call markers and their causes	21
	Recorded data.....	25
	Radio channel data	25
	GPS data and status.....	26
	Markers.....	26
	Naming of the measurement files	27
Chapter 2	Installation	29
	Software requirements.....	30
	Hardware requirements.....	30
	Installing the software.....	31
	Content of the CD ROMs.....	31
	If necessary: Install Service Pack 6	31
	Installing components for HINDSITEPLUS	32
	Installing components for AnalyzerPlus	34
	Configuring the software.....	35
	Installing the hardware	36
	Installing the dongle	36
	Installing the right-angle connector and RF antenna on the 8501	36
	Connecting the system components.....	36
Chapter 3	Operation of HindsitePlus	39
	The User Interface	40
	Starting HindsitePlus.....	40
	Exiting HindsitePlus.....	41
	The User Interface	42
	User Rights	44
	Configuring the System.....	48
	Operation	48
	System Configuration	49
	Configuring the Test Equipment	53
	Specifying Default Directories.....	61
	Specifying «User Markers».....	62

Specifying the BTS List.....	63
Specifying the Network List.....	66
Overview of the Preparations for Measurements.....	68
Measurements.....	68
The Measurement Job	69
Measurement Programs.....	70
Locations and Floors.....	72
«Tab Sheets» and «Viewers»	75
«Workspaces»	75
Creating Measurements Programs	76
Defining a Measurement Program	76
Measurement Program Parameters.....	80
Operation Information	86
Creating a Measurement Job.....	92
Overview of the Procedure.....	92
Opening a «Location Library».....	94
Defining Locations	95
Defining Floors	100
Creating Measurement Jobs	112
Designing the View: Tab Sheets and Viewers.....	121
What Can You Show?.....	121
«Tab Sheets»	123
«Viewers».....	131
Creating Workspaces	150
What is a Workspace for?	150
Creating a Workspace	151

Chapter 4	Measurements	155
	Preparing for measurements	156
	Carrying out measurements.....	156
	Switching to Measurement Mode.....	156
	Workspace with automatic measurement start.....	156
	Workspace with manual measurement start	157
	Loading a "Workspace"	157
	Loading a measurement job	157
	Defining the test location name	157

Selecting the Display Mode	159
Map Display	159
Measurement values display	160
Loading tab sheets	160
Loading a viewer configuration	161
Switching to the job editor	162
The zoom functions	162
Starting and stopping measurements	163
Automatic measurement start	163
Starting the measurement manually	163
Starting / stopping the channel measurement	163
Start / stop with viewer	163
Switching the mobile phones on and off	163
System information	163
Duration of a measurement	164
Stopping the channel measurements	164
Selecting a measurement point	164
Status displays	166
Measurement channel states	166
Status Line	166
During the measurement	167
Setting «User Markers»	167
Freezing the Measurement Value Display	168
Editing during measurement	168
Displaying system components	169
Displaying additional layers	174
Setting up connections manually	175
Exiting the measurement mode	176
Data Export to AnalyzerPlus	177
Basic Principles	177
Where should the files be stored on AnalyzerPlus?	177
Data structure during export from HindsitePlus	178
Exporting from HindsitePlus	179
Exporting data	179
Saving your settings	182
Deleting sessions	182
Exporting for a problem report	182
Deleting old data	183

Chapter 5	Additional Features	185
	RF Scan	186
	Configuring the Test Equipment	186
	Connecting the RF Scan Mobile Phone.....	190
	Measuring	190
	Data Acquisition.....	198
	Engineering Features	199
	Requirements	199
	Operation.....	199
Chapter 6	AnalyzerPlus Software	211
	Quick-Start	212
	System Requirements.....	212
	1. Starting AnalyzerPlus	214
	2. Setting the Path to the Measurement Files	215
	3. Selecting Display Tools.....	219
	Map	229
	Map in Detail	239
	Grid Cells.....	239
	Automatic Update	251
	Trace.....	253
	What is a Trace?	253
	Displaying a Trace.....	253
	Trace Point and Related Data	259
	Display Consistency	260
	Browser in Detail	261
	Message Decoder: Using Colors.....	261
	Graph: Separate Window.....	263
	Export	265
	Exporting from Measurement Files.....	265
Appendix A	Specifications	269
	Dedicated Mode Reports, Idle Mode Reports	270
	Dedicated Channel Reports	270
	Layer 3 Messages	270
	GPS Data and Status	271
	Markers	271

Table of Contents

Appendix B	Customer Services	273
	Instrument repair	274
	Equipment return instructions	274
	Warranty information	276
	Hardware.....	276
	Software.....	276
Glossary		279
Publication History		287

About This Guide

This section contains the following basic information:

- "Purpose and scope" on page x
- "Assumptions" on page x
- "Related information" on page x
- "Technical assistance" on page xi
- "Conventions" on page xii

Purpose and scope

The purpose of this guide is to help you successfully use the HindsightPlus features and capabilities. This guide includes task-based instructions that describe how to install, configure, use, and troubleshoot HindsightPlus. Additionally, this guide provides a complete description of Willtek's warranty, services, and repair information.

Assumptions

This manual is intended for novice, intermediate, and experienced users who want to use HindsightPlus effectively and efficiently.

There are two basic user groups:

- **Administrator:** Trained specialists, who for example prepare measurements.
- **Measurement personnel:** HindsightPlus users, who for example carry out measurements.

We are assuming that you have basic computer and mouse/track ball experience and are familiar with basic telecommunication concepts and terminology.

Related information

Use this guide in conjunction with the following information:

Table 1 Additional documents

Document	Document no.	Date
8501 User's Guide	290 008	12/2001
8501 Getting Started Guide	295 008	11/2001

Technical assistance

If you need assistance or have questions related to the use of this product, call or e-mail one of Willtek's technical assistance centers.

Table 2 Technical assistance centers

Region	Phone Number	Fax number, email address
UK	+44 (0)20 8408 5720	+44 (0)20 8397 6286 support.uk@willtek.com
Europe, Middle East, Asia, Africa	+49 (0)89 99641 386 +49 (0)89 99641 227	+49 (0)89 99641 440 support.eu@willtek.com
Americas	+1 317 595 2021 +1 866 WILLTEK	+1 317 595 2023 support.us@willtek.com

Conventions

This guide uses naming conventions and symbols, as described in the following tables.

Table 3 Typographical conventions

Description	Example
User interface actions appear in this typeface.	On the Status bar, click Start.
Buttons or switches that you press on a unit appear in this TYPEFACE.	Press the ON switch.
Code and output messages appear in this typeface.	All results okay
Text you must type exactly as shown appears in this typeface.	Type: <code>a:\set.exe</code> in the dialog box.
Variables appear in this <typeface>.	Type the new <hostname>.
Book references appear in this typeface.	Refer to Newton's Telecom Dictionary
A vertical bar means "or": only one option can appear in a single command.	platform [a b e]
Square brackets [] indicate an optional argument.	login [platform name]
Slanted brackets <> group required arguments.	<password>

Table 4 Keyboard and menu conventions

Description	Example
A plus sign + indicates simultaneous keystrokes.	Press Ctrl+s
A comma indicates consecutive key strokes.	Press Alt+f,s
A slanted bracket indicates choosing a submenu from menu.	On the menu bar, click Start > Program Files .

Table 5 Symbol conventions



This symbol represents a general hazard.



This symbol represents a risk of electrical shock.



NOTE

This symbol represents a Note indicating related information or tip.

Table 6 Safety definitions



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

About This Guide

Conventions

HindsitePlus Overview



1

This chapter provides a general description of HindsitePlus. It shows how HindsitePlus works and the system components it consists of. Topics discussed in this chapter include the following:

- ["About HindsitePlus" on page 2](#)
- ["Features and capabilities" on page 4](#)
- ["Items included" on page 8](#)
- ["Overview of the test system" on page 11](#)
- ["Call handling with HindsitePlus" on page 17](#)
- ["Recorded data" on page 24](#)

About HindsitePlus

HindsitePlus provides you with a cost-efficient drive test data collection and analysis software for wireless network analysis, monitoring and comparison.

HindsitePlus is a versatile tool that can be used as a network performance tool, quality of service tool and optimization tool that monitors and maintains wireless networks, by simulating a subscriber during the call process.

HindsitePlus can be used by infrastructure providers for verification that a new installation is functioning correctly.

HindsitePlus will provide network operators with the necessary information they need to maintain and optimize their networks in order to provide superior customer service and increased profitability.

HindsitePlus is based for example on a notebook computer and a cellular phone. Calls are made to an automatic answering station (e. g. time announcement). The data for connection setup and air interface is recorded.



Figure 1 HindsitePlus system (notebook PC, cellular phone, adapter case)

HindsitePlus with a test mobile is a way for network operators to meet the challenges and resolve issues with monitoring and maintaining network performance.

What's new in version 1.00

This is the first release of the product. It consists of two parts:

- HINDSITEPLUS version 3.3.6
- AnalyzerPlus version 2.1.2

Features and capabilities

HindsitePlus provides excellent services whenever spontaneous measurements are required. HindsitePlus features a number of options – e.g. its "Engineering Features" – and is therefore ideal for rapid fault analyses.

HindsitePlus's design is entirely modular. This means HindsitePlus can be adapted to prevailing circumstances and expand as demands increase.

HindsitePlus consists of the data acquisition part HINDSITEPLUS and the data evaluation part AnalyzerPlus.

HINDSITEPLUS The data acquisition part HINDSITEPLUS records the following data:

- Connection set-up and clear-down
- Radio interface data
- Time
- Location (in the case of outdoor measurements by the GPS)
- Special events (referred to as user marker, e.g. driving into a tunnel)

AnalyzerPlus The measured data is evaluated in the AnalyzerPlus system part. AnalyzerPlus is a versatile representation and analysis tool, which means that the evaluations can be represented according to purpose, for example as:

- Statistics:
for trend analyses, quality comparisons with other networks, management decisions.
- Map representations:
Measured values are shown color-coded along the measurement routes on geographic maps.

- Graphics:
For technical analyses: line charts with the temporal course of the measured values.
- Lists:
With all the required data including the radio interface in chronological order to analyze events in every detail.

Findings on the network behavior HindsitePlus allows you to make an objective comparison with other networks available at the same location as you can set up test connections with one mobile phone.

When analysing problems, for example, you can clearly see the base station via which the connection was established, the precise point at which the handover was carried out, and the areas where connection quality needs to be improved.

Master calls Given HINDSITEPLUS's exceptional modularity, its potential uses completely outstrip previous concepts of mobile communications. It is possible, for example, to measure connections between two mobile phones.

What does MOC mean in this context? To which mobile phone does the uplink belong? For these reasons the following definitions have been drawn up for HINDSITEPLUS.

Channel

One channel is used for measuring the quality of a voice call connection by means of evaluating call parameters such as RxQual and RxLev.

HINDSITEPLUS can have up to two channels: one channel for air interface and the second channel for the RF scan feature.

Master

The Master (the test mobile phone) always makes the first call.

Chapter 1 HindsitePlus Overview

Features and capabilities

The test mobile can call an answer station (e.g. time announcement or to another mobile which answers the call).

Master as the reference point

The test mobile initiates the call.

Selectable measuring program parameters By entering the measuring program parameters you can determine how and what you want to measure. Of the many possibilities available, the main ones are listed below:

Call set-up

- MOC: The test mobile makes the calls.
- Max. number of successive call attempts.
- Delay between two call attempts.
- Time window for successive calls.

Connection

- Call duration
- Pause duration

RF scan window The "RF Scan" window shows you the level of all GSM channels at the observational moment that is of interest to you. It provides a means of identifying interference.

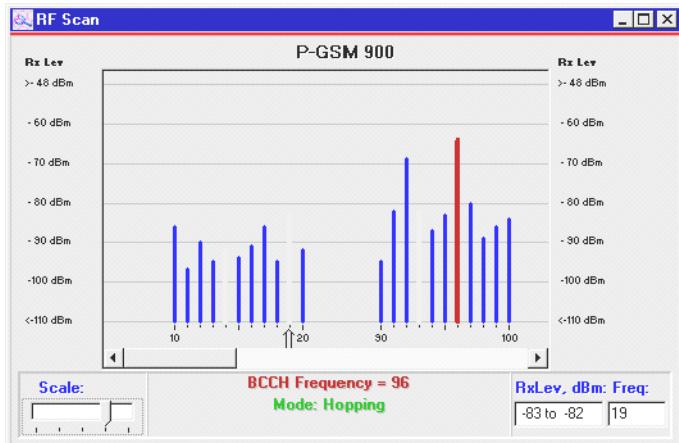


Figure 2 "RF Scan" window

Items included

HindsitePlus is a software product for air interface measurements and analyses. The software supports various hardware components. In addition to a standard notebook PC, Willtek recommends the following products to give a complete test system:

Table 7 Order numbers

Product name and order number	Components
Willtek 8050 Hind-sitePlus M 248 602	<ul style="list-style-type: none">- HINDSITEPLUS CD- AnalyzerPlus CD- Dongle- 3.5 inch floppy disk with dongle key code- HindsitePlus User's Guide
Willtek 8501 GSM Air Interface Test Module M 100 801	<ul style="list-style-type: none">- 8501 mobile phone- Getting Started Guide for the 8501 mobile phone

Table 7 Order numbers

Product name and order number	Components
Accessory Kit MAX-502 for 8501 M 248 600	<ul style="list-style-type: none"> - RF antenna - Right angle adapter (SMA) - Adapter case (without GPS module) - Two RS-232 cables with 9-pin sub-D connectors - Cable with 25-pin sub-D connector and 36-pin mini-D ribbon connector - PS/2 adapter cable for power supply - Floppy disk with "Checksite" demo software for the 8501 mobile phone - User's Guide for the 8501 mobile phone
Accessory Kit MAX-503 for 8501 M 248 601	<p>Except for these two differences, identical to the Accessory Kit MAX-502:</p> <ul style="list-style-type: none"> - Adapter case with GPS module - Three RS-232 cables with "9-pin sub-D" connectors
Miniature GPS antenna M 860 263	<ul style="list-style-type: none"> - GPS antenna - Related documentation

For a test system without a GPS receiver, you need the following components:

- HindsitePlus (M 248 602)
- Mobile phone (e.g. 8501)
- Accessory Kit MAX-502

Chapter 1 HindsitePlus Overview

Items included

- Notebook: Pentium processor > 100 MHz,
min. 64 MB RAM, at least one serial port

For a test system with a GPS receiver, you need the following components:

- HindsitePlus (M 248 602)
- Mobile phone (e.g. 8501)
- Accessory Kit MAX-503
- GPS antenna (e.g. miniature GPS antenna M 860 263)
- Notebook: Pentium processor > 100 MHz,
min. 64 MB RAM, at least two serial ports

For more information about the individual components, see the section entitled "[Overview of the test system](#)" on page 11.

Overview of the test system

Structure of the test system The HindsitePlus test system (hardware components) is structured as follows:

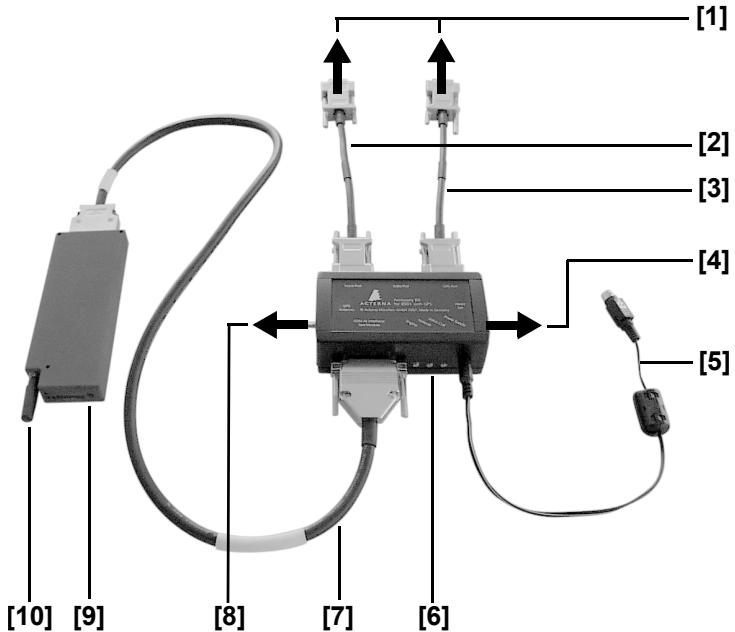


Figure 3 Structure of the test system

Item	Explanation
[1]	Notebook with HindsitePlus software and dongle
[2]	Cable for test connection to notebook (RS-232 cable with 9-pin sub-D connectors)

Chapter 1 HindsitePlus Overview

Overview of the test system

Item	Explanation
[3]	Cable for GPS connection to notebook (RS-232 cable with 9-pin sub-D connectors) Possible only for an adapter case with a GPS module
[4]	Headset (optional)
[5]	PS/2 adapter cable for power supply – 5.5 V to 16 V DC (e.g. via the PS/2 interface of the notebook)
[6]	Adapter case
[7]	Cable for the mobile phone (with 25-pin sub-D connector and 36-pin mini-D ribbon connector)
[8]	GPS antenna (e.g. miniature GPS antenna M 860 263)
[9]	Mobile phone (e.g. 8501)
[10]	RF antenna (installed here without the right-angle connector)

For details on installing the individual software and hardware components, see [Chapter 2 "Installation"](#).

Components of the test system Notebook

The HindsitePlus test system uses a conventional notebook with a Pentium processor (> 100 MHz) and at least 64 MB RAM.

A test system without a GPS receiver requires at least one serial port. A test system with a GPS receiver requires two serial ports.

If your notebook has only a single serial port and you need two serial ports, you can install a PCMCIA card in your notebook.

If you wish to use the 8501 mobile phone's "Checksite" software instead of the HindsitePlus software, you will need an additional serial port.

If you want to use a GPS receiver in this case, you will need three serial ports. You can obtain three serial ports by installing a PCMCIA card with two serial ports in your notebook, for example.

Recommended PCMCIA card:

PCMCIA Dual Serial Port Card from Socket Communications

For additional information, visit the following site:

www.socketcom.com

Dongle

Your HindsitePlus software will work only if the dongle is connected to the notebook's parallel port.



Figure 4 Dongle installed on parallel port

8501 mobile phone

The HindsitePlus software was designed with the 8501 mobile phone from Willtek in mind. The 8501 allows you to fully exploit the features of the HindsitePlus software.

Alternatives to the 8501 include the following mobile phone:
Motorola GSM 1900 test mobile

Chapter 1 HindsitePlus Overview

Overview of the test system

Right-angle connector for the 8501 mobile phone

You can improve the reception properties of the 8501 mobile phone by installing the right-angle connector on the mobile phone's antenna jack and the antenna on the right-angle connector.

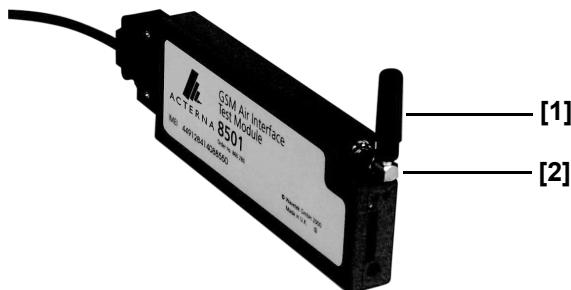


Figure 5 8501 mobile phone – Antenna connection with right-angle connector

Item	Explanation
[1]	RF antenna
[2]	Right-angle connector

Adapter case

The adapter case acts as the connecting element between the mobile phone, notebook and the optional test system components ("GPS antenna" and "Headset").

The adapter case in the accessory kit MAX-503 contains a GPS module to which you can connect a GPS antenna.

The adapter case in the accessory kit MAX-502 does not contain a GPS module.

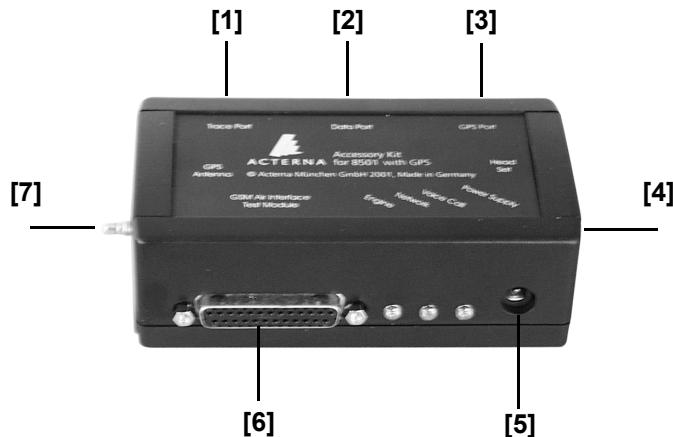


Figure 6 Adapter Case

Item	Explanation
[1]	Trace port for the test connection to the notebook
[2]	Data port Required only for the "Checksite" demo software of the 8501 mobile phone (not for HindsitePlus)
[3]	GPS port for GPS connection to the notebook Only for the adapter case in the accessory kit MAX-503

Chapter 1 HindsitePlus Overview

Overview of the test system

Item	Explanation
[4]	Headset jack
[5]	Jack for the power supply
[6]	Jack for the mobile phone
[7]	Jack for the GPS antenna Only for the adapter case in the accessory kit MAX-503

GPS antenna (possible only for the adapter case with GPS module)

The GPS module requires an additional GPS antenna.

For example, you can use the miniature GPS antenna M 860 263 from Willtek.

Cables

The accessory kits contain all of the cables needed to fully set up the HindsitePlus test system.

The MAX-502 accessory kit contains two RS-232 cables with "9-pin sub-D" connectors, and the MAX-503 accessory kit contains three such cables.

For the HindsitePlus test system, you only need one or two RS-232 cables with "9-pin sub-D" connectors.

You will need the additional RS-232 cable only if you wish to use the "Checksite" demo software for the 8501 mobile phones.

Headset (optional)

If you wish to send and receive audio, you can connect a headset (with headphone / microphone) to the adapter case.

Recommended model: Plantronics M 120.

Call handling with HindsitePlus

This section describes how HindsitePlus interprets and records events during connection set-up and clear-down.

Call duration, Call duration pause duration

Call Duration = effective duration of the call

With HindsitePlus the Call Duration starts with «Connect» and ends with «Disconnect».

Input range:

10...65 535 s.

65 535 s = approx. 18 hours.

The input range is used for both realistic connections lasting 2...3 minutes and long-term connections lasting several hours.

Max. Call Duration 10 hours

After 10 hours of measurement operation HindsitePlus stops all measurements, briefly exits the measurement mode and then starts up again using the same measurement parameters. The main reason for the interruption is to limit the size of the measurement files.

User break

Any call that is disconnected because the user wants to stop the measuring process is given the User Break call status. Connections with User Break do not appear in the statistics during evaluation with AnalyzerPlus.

Pause duration

Range:

10...65 535 s

Chapter 1 HindsitePlus Overview

Call handling with HindsitePlus

Normal connection procedure HINDSITEPLUS interprets messages and events of the connection procedure and stores the corresponding information in the measuring file as call markers. These call markers are used to reconstruct the connection procedure during the subsequent evaluation with AnalyzerPlus. For example call markers provide the basis for compiling call statistics with AnalyzerPlus.

HindsitePlus records call markers in MOC mode. In the fixed network the time interval between call markers differs in part from the time interval on the mobile network. Certain marker types can only occur in the mobile network.

The figure below shows the call markers of a normal connection that are set automatically:



Figure 7 Call Markers for a Normal Connection

HINDSITEPLUS hands over the dialling to the terminal and the connection set-up is successful. Once the call duration is reached, HINDSITEPLUS gives the clear command to the terminal and the connection clear-down is successful.

The call status is Completed Call.

Faulty connection procedure HINDSITEPLUS monitors the connection set-up, the observance of the call duration and the connection clear-down. If HINDSITEPLUS detects any errors in the procedure, it sets additional call markers.

Shown below are a few typical instances of faulty connection procedures, with the corresponding marker combinations.

Call error marker

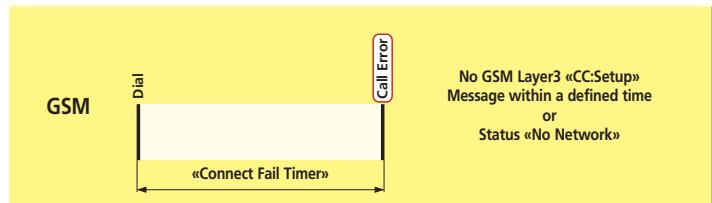


Figure 8 «Call Error» Marker

HINDSITEPLUS hands over the dialling to the mobile phone, which does not, however, send back a «Layer 3 Setup» within 30 s.

The call status is Failed Call.

Connect fail marker

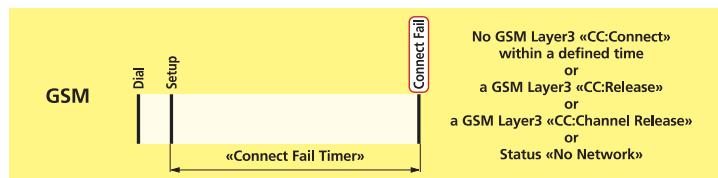


Figure 9 «Connect Fail» Marker

HINDSITEPLUS hands over the dialling to the terminal, which sends a «Layer 3 Setup» but fails to receive a «Layer 3 Connect Acknowledge» from the network within 30 s.

The call status is Failed Call.

Chapter 1 HindsitePlus Overview

Call handling with HindsitePlus

Break marker

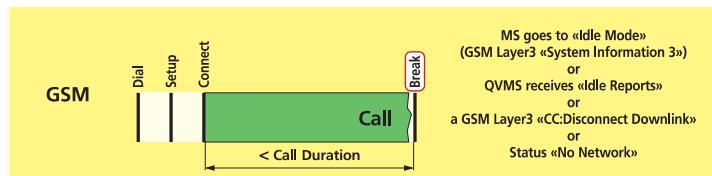


Figure 10 «Break» Marker

The connection set-up is successful. However, the *connection is disconnected* before the call duration is reached.

The call status is Dropped Call.

Release fail marker

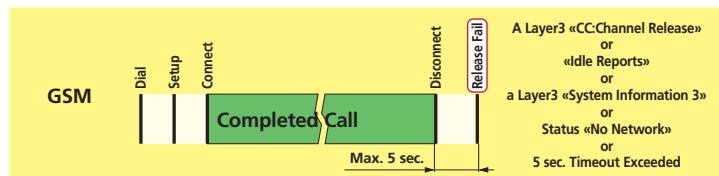


Figure 11 «Release Fail» Marker

The connection set-up is successful. Once the call duration is reached, HINDSITEPLUS gives the clear command to the mobile phone. The mobile phone sends a «Layer 3 Disconnect», but does not receive a «Layer 3 Release» from the network within 5 s.

The call status is Release Failed Call.

Call markers Call markers with the mobile network

and their causes «Dial» will be written...

if HINDSITEPLUS sends a dial command to the mobile phone.

«Setup» will be written...

if HINDSITEPLUS receives a GSM Layer 3 «CC:Setup» message from the mobile phone.

«Call Error» will be written...

if HINDSITEPLUS receives no GSM Layer 3 «CC:Setup» message within 10...255 s after the dial marker (time selectable using the «Connect Fail Timer»)

OR

if HINDSITEPLUS is in the No Network status (no messages from the mobile phone within the last 10 s).

«Connect» will be written...

if HINDSITEPLUS receives a GSM Layer 3 «CC:Connect Acknowledge» message.

«Connect Fail» will be written...

if HINDSITEPLUS receives no GSM Layer 3 «CC:Connect Acknowledge» message within 10...255 s after the dial marker (time selectable using the connect fail timer)

OR

if HINDSITEPLUS receives a GSM Layer 3 «CC:Release» message

OR

if HINDSITEPLUS receives a GSM Layer 3 «CC:Channel Release» message

Chapter 1 HindsitePlus Overview

Call handling with HindsitePlus

OR

if HINDSITEPLUS is in the No Network status (no messages from the mobile phone within the last 10 s).

«Break» will be written...

if the mobile phone goes to the idle mode (GSM Layer 3 «System Information 3»)

OR

if HINDSITEPLUS receives idle reports

OR

if HINDSITEPLUS receives a GSM Layer 3 «CC:Disconnect Downlink» message

OR

if HINDSITEPLUS is in the No Network status (no messages from the mobile phone within the last 10 s OR no Layer 3 «Measurement Report» within 3...4 s).

«Disconnect» will be written...

if HINDSITEPLUS receives a GSM Layer 3 «CC:Disconnect Uplink» message.

«Release» will be written...

if HINDSITEPLUS receives a GSM Layer 3 «CC:Release Complete» message.

«Release Fail» will be written...

if HINDSITEPLUS receives one of the following messages *before* a GSM Layer 3 «CC:Release Complete» message:

GSM Layer 3 «CC:Channel Release» message

OR

«Idle Report»

OR

GSM Layer 3 «System Information 3»

OR

No Network status

OR

5 s timeout after disconnect marker has elapsed.

«User Break» will be written, if the user stops the measurement...

during the dedicated mode

OR

during call establishing

OR

during the call release.

«System Release» will be written...

if the call was terminated by HINDSITEPLUS, for instance because the battery is discharged or the operating temperature has been exceeded.

Recorded data

This section provides an overview of all the data HindsitePlus is capable of recording and describes how measurement files are named.

Radio channel data The following data is recorded from the mobile network:

Dedicated mode reports, idle mode reports

These reports provide an overview of the transmission conditions:

- Channel number (ARFCN)
- Field strength (RxLev) of serving cell
- Field strength of the six best non-serving cells
- BSIC of the BTS

Recorded "dedicated channel" parameters include:

- Signal transmit time (TA)
- Transmitting power
- Bit error rate (RxQual)

Dedicated channel reports

Reports the current channel.

- BCCH frequency
- Serving cell BSIC
- Channel type
- Timeslot number
- Subchannel number

Layer 3 messages

All Layer 3 signaling channel messages are recorded along with an indication of the transmission direction.

- GPS data and status**
- Location co-ordinates
 - Elevation
 - Speed
 - GPS fix level

Markers Markers available include:

- Call error
- Setup
- Connect successful
- Connect fail
- Disconnect
- Release
- Release error
- Break
- User break
- Handover command
- Handover complete
- Handover failure
- Location update request
- Location update accepted
- Location update rejected
- Cell reselection
- Immediate Assignment
- Immediate Assignment Reject
- Assignment command

Chapter 1 HindsitePlus Overview

Recorded data

- Assignment complete
- Assignment failure
- User markers (e.g. tunnel)

Naming of the measurement files

The names of the measurement files are automatically allocated by HINDSITEPLUS at the start of each measurement process.

General format:

YYYYMMMD-aaaa...a-bbbb...b-TCnnn.qmd

YYYY	= Date on which the file was created: year
MMM	= Date on which the file was created: month
DD	= Date on which the file was created: day
aaaa...a	= The mobile phone number (n digits). If the phone number of the test mobile is not available, this field is not available.
bbbb..b	= The called party phone number (n digits)
T	= Type: M always
C	= Channel number (1...4)
nnn	= Serial number (001...999) Starts every day at 001. Incremented by 1 every time a channel is started.
.qmd	= HindsitePlus measurement file

Examples of a measurement file names:

2001JUN06-07912345678-0327654321-M1007.qmd

2001JUN06--0327654321-M1007.qmd

Installation



This chapter describes how to install/setup HindsitePlus. The topics discussed in this chapter are as follows:

- "Software requirements" on page 28
- "Hardware requirements" on page 28
- "Installing the software" on page 29
- "Configuring the software" on page 33
- "Installing the hardware" on page 34

Software requirements

In order for the HindsitePlus software to work properly, the following operating system must be installed on your notebook:
Windows NT 4.0 with Service Pack 6.

Hardware requirements

In order for the HindsitePlus software and the AnalyzerPlus software to work properly, the following hardware configuration is required:

- Pentium processor > 100 MHz
- Min. 64 MB RAM
- For use without a GPS receiver:
One serial port and one parallel port
- For use with a GPS receiver:
Two serial ports and one parallel port

If your notebook has only a single serial port and you need two serial ports, you can install a PCMCIA card in your notebook.

See also "["Notebook" on page 12.](#)

Installing the software

Please use Windows Explorer to change directories and start the installation programs as described below.

Content of the CD ROMs HindsitePlus is delivered with the following two CD ROMs:

Table 8 HindsitePlus CD ROMs

CD ROM	Content
HINDSITEPLUS CD ROM	<ul style="list-style-type: none">- Service Pack 6 for Windows NT 4.0- HINDSITEPLUS software- MapX software- Code for the dongle
AnalyzerPlus CD ROM	<ul style="list-style-type: none">- AnalyzerPlus software- Acrobat Reader 4.0

If necessary: Install Service Pack 6 If Service Pack 6 for the Windows NT 4.0 operating system is not yet installed on your notebook, then you will have to install it from the HINDSITEPLUS CD ROM.

- 1 Insert the HINDSITEPLUS CD ROM.
- 2 In the directory "Instal>sp6a", double-click on the file "sp6ai386std.exe".
The start-up window for the installation routine should open.
- 3 Click the **OPEN** button to select "Confirm file open".
- 4 Click the **NEXT** button to confirm the Welcome text.
- 5 Click the **Yes** button to confirm the "Licence Agreement".
- 6 Click the **Next** button to select "Install Service Pack".

- 7 Click the **NEXT** button to select "No, I don't want to create an Uninstall directory".

Do not overwrite the PCMCIA driver!

- 8 Click the **FINISH** button.
- 9 Click the **OK** button to confirm "Windows NT 4.0 has been updated...".

Your notebook will restart automatically.

Service Pack 6 has now been installed.

Installing components for HINDSITEPLUS All of the installation steps required for proper operation of the HindsitePlus software component HINDSITEPLUS are described below.

Installing MapX

- 1 In the "MapX" directory on the HINDSITEPLUS CD ROM, double-click on the file "Startup.exe".
The start-up window for the installation routine should open.
- 2 Click the **NEXT** button to confirm the Welcome text.
- 3 Click the **Yes** button to confirm the "Licence Agreement".
- 4 Choose the default entry for the target directory with the **NEXT** button.
A window will open to allow you to choose the software components to be installed.
- 5 Select all of the software components (scroll through the window) except for:
 - Sample Application
 - Online Help Files
- 6 Click the **NEXT** button to confirm "Select Program Folder".
- 7 Click the **NEXT** button to confirm "Start copying files".

The MapX files will now be installed. A window will appear when all of the files have been copied.

- 8 Choose "Restart" and click the FINISH button.

Your notebook will restart automatically.

MapX has now been installed.

Installing the HINDSITEPLUS software

- 1 In the "SystemFiles" directory on the HINDSITEPLUS CD ROM, click on the file "HindsitePlus 3.2.x.exe".

The start-up window for the installation routine should open.

- 2 Follow the instructions for the installation routine and choose the desired options.

Modifying the INI file

HINDSITEPLUS licences are protected: In accordance with the acquired rights of use, your system will be allocated a cryptic code (or key). This «key» determines for example the maximum number of channels available and the options you can use.

Each «key» is valid exclusively for a particular hardware set-up.

- 1 Use a text editor to open the file "QVoiceSystem.ini" on the notebook in the directory "c:\Acterna".
- 2 Mark the existing "Options line" and "Key line" as comments:
Rem Options=557075
Rem Key=1C9FC25AAF679C8E3161E5776C30302
- 3 From the HINDSITEPLUS CD ROM, copy the "Options line" and "Key line" into the file "QVoiceSystem.ini".
- 4 Save the file "QVoiceSystem.ini".

You have now finished installing the "HINDSITEPLUS" program. You can launch the program on the notebook by double-clicking on the Acterna icon on the Windows desktop.

Chapter 2 Installation

Installing the software

Installing components for AnalyzerPlus The following section describes all of the steps needed for proper installation of the AnalyzerPlus component of the HindsitePlus software.

Note that the installation steps required for HINDSITEPLUS must have been previously completed on your notebook for this to work (see above section).

Installing AnalyzerPlus

- 1 On the AnalyzerPlus CD ROM, double-click on the file "Setup.exe".

The start-up window for the installation routine should open.

- 2 Click the **NEXT** button to confirm the welcome text.
- 3 Click the **NEXT** button to confirm the "Read Me" text.
The "Select Components" window should open.
- 4 Select "AnalyzerPlus".

Acrobat Reader is needed to read the manual PDF files.

- 5 If Acrobat Reader (version 4.0 or higher) is not yet installed on your notebook, select "Acrobat Reader".
- 6 Confirm the selected components with the **Next** button.
- 7 Follow the instructions from the installation routine.

The following components are installed:

- AnalyzerPlus program files
- Default maps
- MapX
- Dongle driver
- Acrobat Reader 4.0 (if selected)

If required: Installing additional maps

The installed maps are generally sufficient. If required, you can obtain additional maps from MapInfo that provide a more detailed description of certain regions, for example.

- Copy the additional maps into the directory "C:\Program Files\Common Files\MapInfo Shared\MapX Common\Maps".

If required: Installing grid files

AnalyzerPlus supports the use of grid files. If required, you can obtain grid files from MapInfo.

- Copy the grid files into the directory "C:\Program Files\Common Files\MapInfo Shared\MapX Common\Maps".

If required: Installing geosets

The AnalyzerPlus supports the use of geosets. A geoset contains multiple layers which can be opened simultaneously.

If required, you can obtain geosets from MapInfo.

- Install the geosets as described in the documentation from MapInfo.

Configuring the software

Prior to making any measurements, you must configure the HindsitePlus software to suit the test environment. For a detailed description of how to configure the software, see the section "["Configuring the System" on page 46](#).

Installing the hardware

Installing the dongle The HindsitePlus software works only if the dongle is connected to the parallel port of the notebook.

- Connect the dongle to the parallel port of the notebook and tighten the screws.

Installing the right-angle connector and RF antenna on the 8501 You can improve the reception properties of the 8501 mobile phone by installing the RF antenna perpendicular to the longitudinal axis of the phone using the right-angle connector.

- 1 Screw the right-angle connector on to the 8501 mobile phone.
- 2 Screw the RF antenna on to the right-angle connector.

Connecting the system components Connect the mobile phone on the adapter case

- 1 Latch the 36-pin mini-D ribbon connector of the mobile phone connecting cable to the mobile phone.
- 2 Connect the 25-pin sub-D connector of the mobile phone connecting cable to the mobile phone jack on the adapter case and tighten the screws.

Establish the measurement connection to the notebook

- Connect a serial port on the notebook to the trace port on the adapter case using one of the RS-232 cables.

Connect the power supply

- 1 Plug the PS/2 connector of the power supply cable into a PS/2 interface on the notebook.
- 2 Plug the other connector of the power supply cable on the adapter case into the jack for the power supply.

Establish the GPS connection to the notebook
(possible only for an adapter case with GPS module)

- Connect a serial port on the notebook to the GPS port on the adapter case using one of the RS-232 cables.

Connect the GPS antenna to the adapter case
(possible only for an adapter case with GPS module)

- Plug the GPS antenna on the adapter case into the jack for the GPS antenna.

Connect the headset
(optional)

- Connect the headset on the adapter case to the jack for the headset.

Chapter 2 Installation

Installing the hardware

Operation of HindsitePlus

3

The following describes the configuration of the HindsitePlus software, as for example the adjustment of the software to measurement conditions. This chapter is addressed mainly to persons who create measurement jobs (administrators). Topics discussed in this chapter are as follows:

- ["The User Interface" on page 38](#)
- ["Overview of the Preparations for Measurements" on page 66](#)
- ["Creating Measurements Programs" on page 74](#)
- ["Creating a Measurement Job" on page 90](#)
- ["Designing the View: Tab Sheets and Viewers" on page 119](#)
- ["Creating Workspaces" on page 148](#)

The User Interface

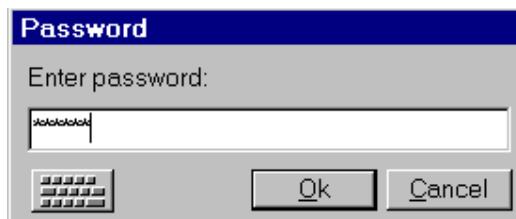
This section describes the user interface in general, the user rights, the operation of the system with the operating unit and with the keyboard and monitor, as well as the directory structure.

- Starting HindsitePlus** Switch on the computer at the main switch. When the system is switched on, Windows starts up first.

When Windows loading is completed, double-click on the Acterna icon to launch the HindsitePlus software.

HindsitePlus can be password-protected. No passwords are set after the installation of the HindsitePlus software, in other words you will automatically access the administrator mode (see [page 42](#)).

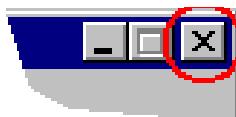
Once passwords have been defined, you will be prompted to enter your password whenever you start up the HindsitePlus software:



Enter the password (take note of upper and lower case letters!) and click «OK» to confirm.

The HindsitePlus software also starts up the desktop map system MapX™. MapX is used for displaying the maps for outdoor measurements and the floor plans for indoor measurements.

Exiting
HindsitePlus



1 *Exit HindsitePlus.*

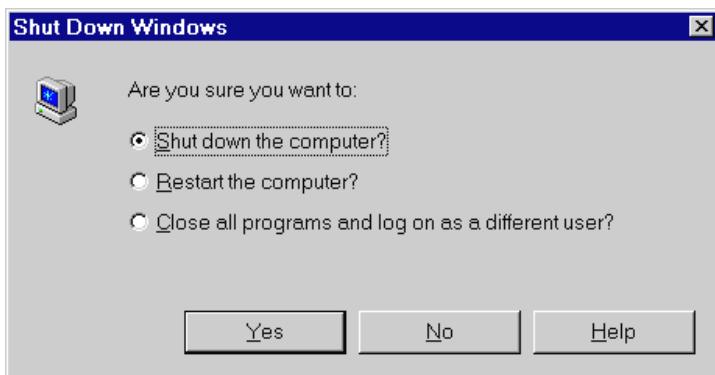
Click the closing icon or the «Exit» command from the «File» menu.

2 *Exit Windows.*

Move the mouse pointer to the bottom edge of the screen so that the «Task Bar» appears.

Click «Start»: the start menu pops up.

Click «Shut Down...»: the following dialog box appears:

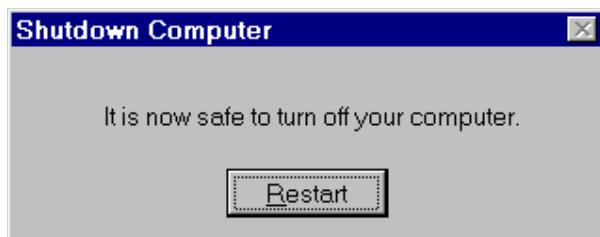


Chapter 3 Operation of HindsightPlus

The User Interface

Select «Shut down the computer?» and confirm with «Yes».

Wait for the following message to appear:



3 Switch off the PC.

The User Interface The user interface and operating response of HindsightPlus complies with the Windows rules.

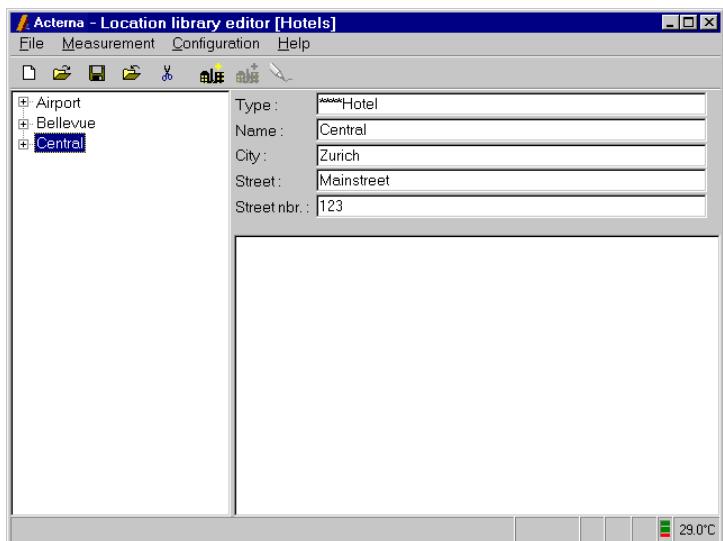
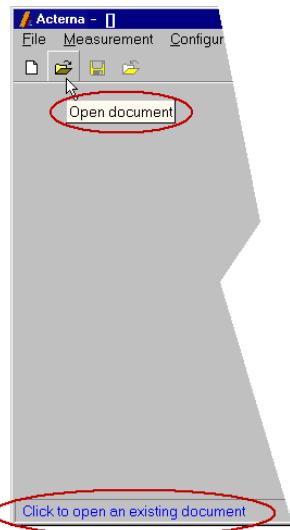


Figure 12 The HindsightPlus User Interface

As usual with Windows, the user interface adapts to whatever possibilities are available at the time (context-sensitive buttons and menus). This provides good user prompts.

The function of the buttons is easy to see: If you *move the cursor on to a particular button* (without clicking), its function is displayed for a few seconds.

The functional description is also displayed on the *status line* at the bottom of the screen, without any time limit.



User Rights HindsitePlus makes a distinction between two user categories: «administrator» and «user».

Administrator

The administrator has access to all HindsitePlus functions. For instance he can define measurement programs, create «measurement jobs» and shape the layout of the user interface for measurements. To do so he needs detailed knowledge of HindsitePlus.

User

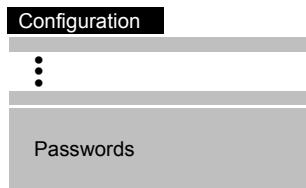
The user (e.g. a test driver) is able to operate HindsitePlus within a predefined framework. He does not need to have detailed knowledge of HindsitePlus. The user does not have access to the editing functions and may not alter the default values.

The user does not have access to the following:

Table 9

	Menu	Commands
In general	File	New Open Save Save As Save Workspace
Not in measurement mode	Configuration	All commands
In measurement mode	Trace Values Viewers	Configure All commands All commands

Passwords



The command displays the following dialog box:



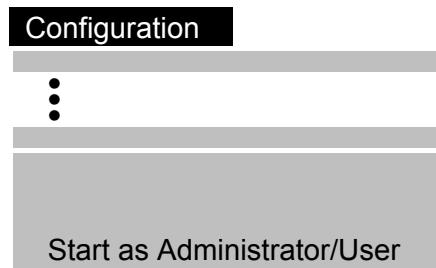
- 1 Select the user category to be given a new password: «Administrator Password» or «User Password».
- 2 Enter the new password in the two text boxes.

Deactivating the password

You can deactivate the password protection by *not* entering *any* password at all.

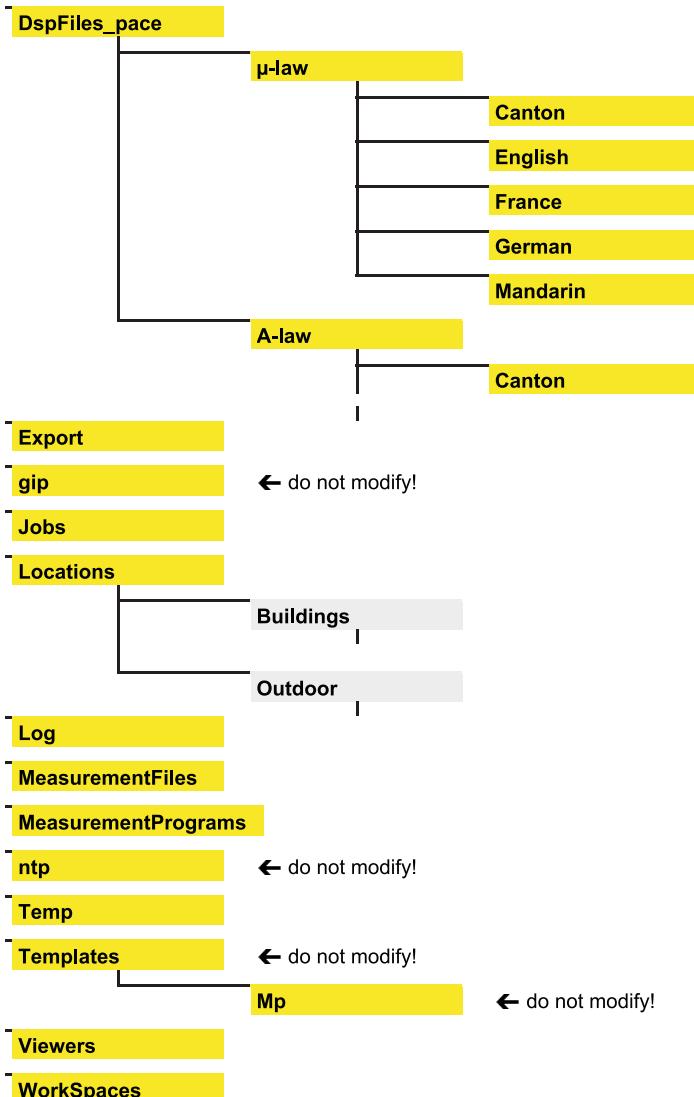
If you do so, you will not be prompted for a password when you start up the program.

Specifying the User Category for the Next Startup



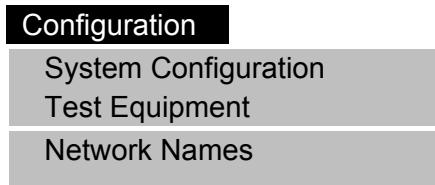
This command allows you to specify whether the next HindsitePlus startup is to be for the administrator or the user.

Directory Structure



Configuring the System

Operation The configurations are usually opened using the «Configuration» menu.



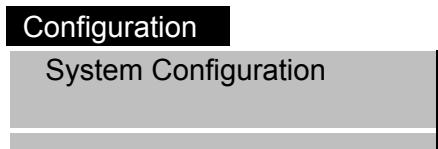
To store the configurations, use the «Save Document» button or the «Save» command from the «File» menu.



«Close Document» takes you back to the main «HINDSITEPLUS» window.

System Configuration As the name implies, the basic configuration for your HINDSITEPLUS system is determined here.

Use the following command to open the system configuration:



The command displays the following user interface:

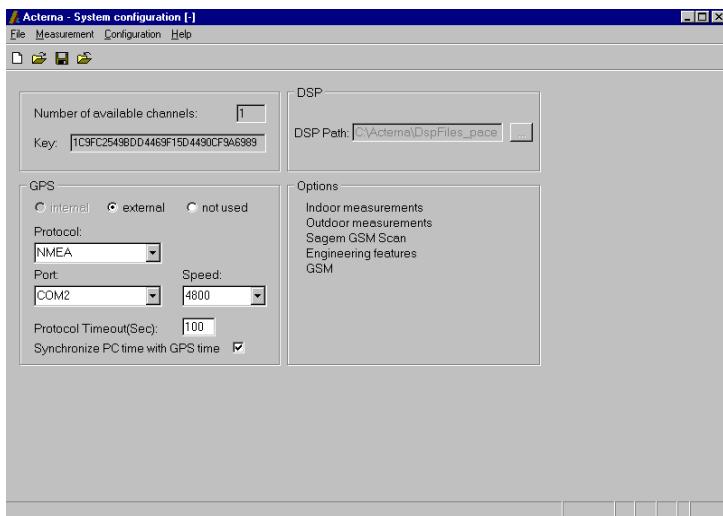


Figure 13 Configuring the System

«Key» = Your System's Scope

The system limits (maximum number of channels, options) depend on what you have acquired. In accordance with the utilization rights acquired your system is allocated an encrypted code (key). This key determines for example the maximum number of available channels.

The key cannot be used on other systems.

If you wish to subsequently upgrade your system, you will be notified of a new key to enable the upgrade.



Valid key required

Without a valid key, HINDSITEPLUS is not operable.

Do Not Use Resource-burdening Programs



Keep resources available

During measurements do not start any programs likely to heavily load resources.

Do not activate any screen saver likely to heavily load resources, such as «3D Text» for example.

If resource-loading programs are running during the measurement process, the test results might be corrupted.

GPS Settings

Table 10

- internal	Not used.
- external	Uses an external GPS receiver.
- not used	Measures without GPS.

Protocol:

Table 11

NMEA	NMEA protocol
TAIP	TAIP protocol
Expert GPS Clock	Not used.

Port:

This determines the COM port to which the GPS receiver is connected.

Speed:

Table 12

9600	baud rate [bit/s]
4800	

Protocol Timeout:

If the GPS signal is missing for longer than the set time, an information box containing a warning will appear.

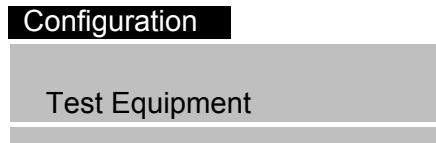
Synchronize PC time with GPS time

The PC clock will be synchronized with GPS time as long as HindsightPlus is not in measurement mode.

DSP Settings

These settings are factory set and should not normally be modified.

Configuring the Test Equipment The following command lets you open the test equipment configuration you used last:



This user interface appears:

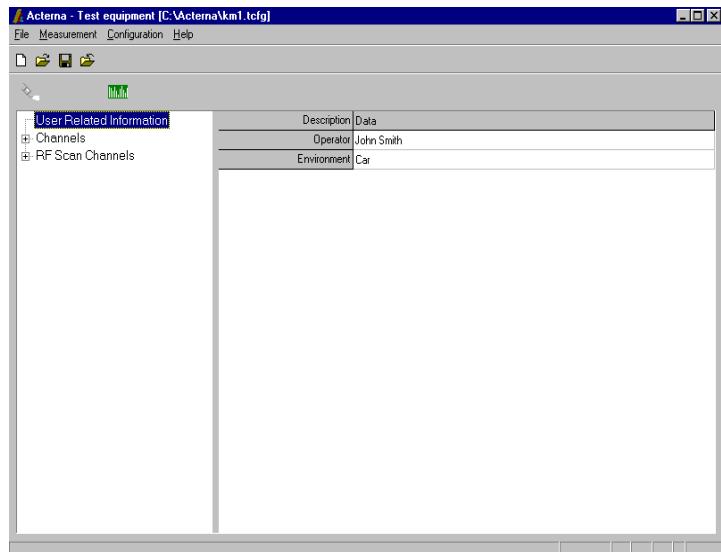


Figure 14 Configuring the Test Equipment

The window title indicates the name of the configuration file.

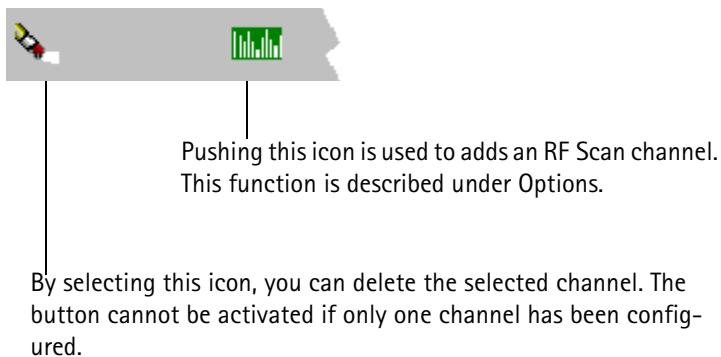
General User Instructions

The left-hand window uses a tree view.

Click  to open the relevant subordinate terms. On the right the corresponding entry fields appear.

Selecting Channels

The maximum number of measurement channels depends on the system configuration you have acquired. A smaller number can also be used.



Saving Test Equipment Configurations

You can create a selection of test equipment configurations so that they are always available to you for the same measurements. Save an open test equipment configuration with «Save As...» or create a new one with «New...».

.tcfg und .ini:

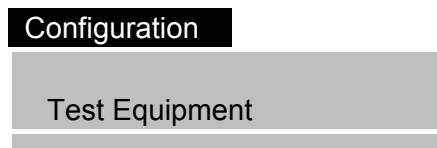
Test equipment configurations have the extension «.tcfg». To be able to re-use the test equipment configuration from an earlier release, you can also open the file called «TestEquipment.ini».

Directory:

If you intend to store lots of test equipment configurations, we recommend that you create a separate directory in the main «Acterna» directory, for example «Test Equipment». Test equipment configurations are stored in the «Acterna» directory by default.

Opening the Test Equipment Configuration last used

The following command always opens the test equipment configuration which you used last:



The name of the open test equipment configuration appears in the header.

Opening a Specific Test Equipment Configuration



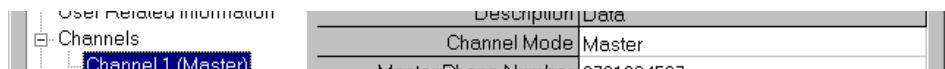
After «Open...» enter the following command:



The file list box appears. Open the directory that contains your test equipment configurations, and then the file you want.

Input

Certain entry fields respond with a toggle function, i.e. they change state when clicked, e.g. Master/Slave.



Many entry fields can be edited in the usual way:



With certain entry fields a list box appears when they are clicked:

From	To
Network Device	Ascom Axento
Band Forcing	Motorola Dual Band
Full Rate Forcing	Motorola Timeport
MNC	Sagem OT35
MCC	Sagem OT75
PIN	Sagem OT95
Antenna	Sagem OT96
Antenna Gain	GSM 07.07 Handset
Cable Loss	Acterna MAM-8501

User Related Information

Table 13

Operator	Name of the user.
Environment	Location of this HindsitePlus system.

These inputs are included in the «header» of the measurement file and provide additional identification during analysis with AnalyzerPlus.

Inputs per Channel

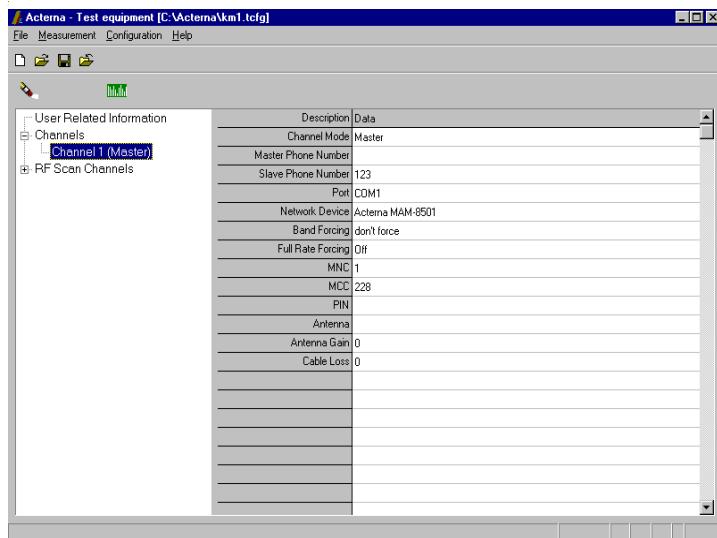


Figure 15 Configuring a Channel

Channel Mode

Master is supported only.

Master Phone Number

Entering phone numbers

Here you must enter the phone number of the Master.

Default Measurement Program

Here you can specify the default measurement program.

Port

This determines the COM port to which the mobile phone is connected (see "[Connecting the system components](#)" on page 34).

Network Device

The choice available appears here.

Band Forcing

Table 14

don't force	Automatic frequency band selection
force GSM900	Frequency band GSM900
force GSM1800	Frequency band GSM1800

Full Rate Forcing

Table 15

On	Full Rate Modus
Off	Automatic selection of Enhanced Full Rate (EFR)

Available with certain mobile phones only.

Trace Port

Additional port for air interface related data (available only with certain mobile phones). Clicking this field displays all the available COM ports. Select the COM port that belongs to the selected channel.

MNC MCC

Specify here the network in which the measurements are to be carried out. This information will be included in the «header» of the measurement file and is used during the evaluation to determine the roaming.

PIN

If you are using a mobile phone protected by a PIN, enter the PIN here.

Table 16

Antenna	Antenna designation
Antenna Gain	(self-explanatory)
Cable Loss	Antenna cable loss

These three entries are additional information and are written in the «header» of the measurement file.

Antenna Connection

This entry field appears only on certain mobile phones.

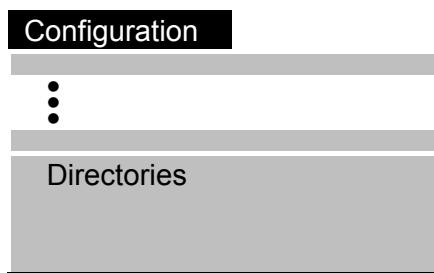
Specify here whether the antenna of the mobile phone or an external antenna is to be used.



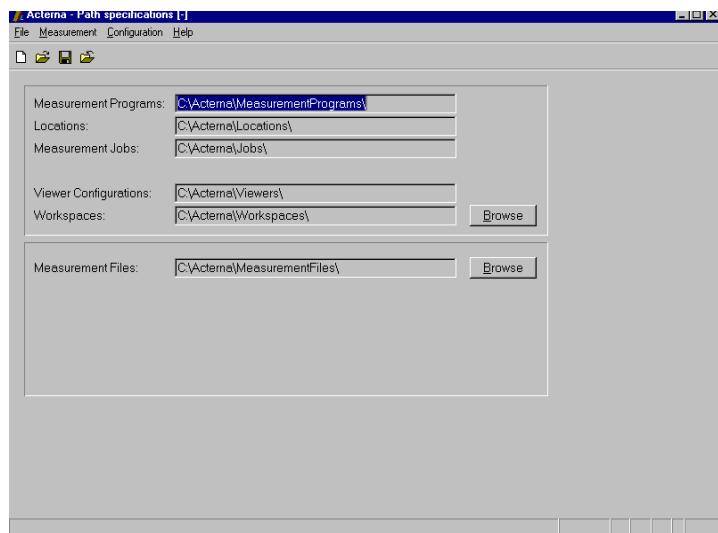
Connect ext. antenna

If you select «external», you must connect the external antenna to carry out the measurements; otherwise the send/receive conditions will not be right.

Specifying Default Directories



The command displays the following user interface:

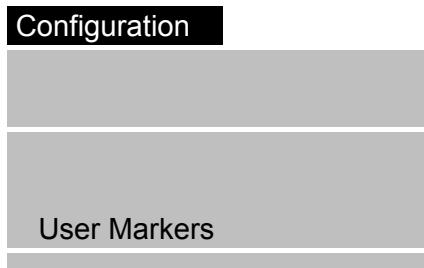


Here you can adapt the default paths to your directory structure (if for example you use subdirectories for your measurement files).

You can change a path by selecting the new directory with «Browse» or by editing the path directly.

Any changes made will take effect after the next start.

Specifying Configuration «User Markers»



The command displays the following user interface:

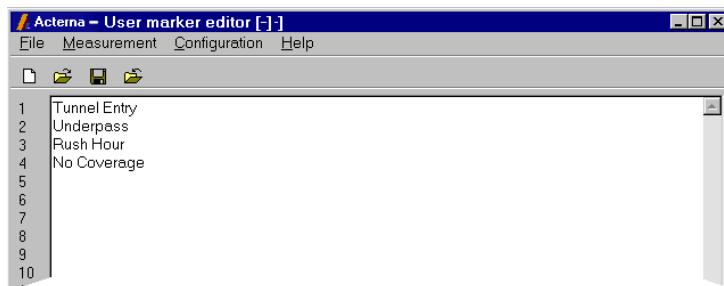


Figure 16 List of User Markers

Here you can create a list of user markers to suit your requirements. Whenever a user marker is set during the measurements, the text defined here for that marker will be inserted into the measurement files. The «viewer» determines which user markers are available during measurement.

Editing

The list of user markers is a text file and can be edited in the usual way.

Specifying the BTS List

Configuration

Base Stations

This command displays the BTS list:

The screenshot shows a software application window titled "Acterna - Bits list editor". The menu bar includes "File", "Measurement", "Configuration", and "Help". Below the menu is a toolbar with icons for file operations like Open, Save, and Print. The main area is a table with the following columns: CELLID, LAC, MNC, MCC, BSIC, BCCH, Longitude, Latitude, and SiteId. The table contains approximately 30 rows of data, each representing a base station with its unique identifier and geographical coordinates.

CELLID	LAC	MNC	MCC	BSIC	BCCH	Longitude	Latitude	SiteId
11003	606	1	333	12	123	5.055529594	47.39369964	Aarau
11001	606	1	333	12	115	5.055529594	47.39369964	Aarau
11002	606	1	333	12	119	5.055529594	47.39369964	Aarau
4043	202	1	333	17	115	3.274640083	47.04230117	Aarberg
11025	606	1	333	11	113	3.770559787	47.24079895	Aarwangen
15022	303	1	333	13	119	3.552239894	46.48220062	Adelboden
15023	303	1	333	15	117	3.396689891	46.64099884	Adlemsried
17066	909	1	333	16	123	5.531490325	47.30770111	Adliswil
1227	404	1	333	17	124	3.597539901	47.47100067	Aesch
17080	303	1	333	11	115	5.454139709	47.28160095	Affoltern_am_Albis
8031	101	1	333	17	90	4.946509838	46.30260086	Aigle
8032	101	1	333	10	94	4.946509838	46.30260086	Aigle
2009	1414	1	333	12	124	5.611069679	46.52880096	Airolo
2041	1414	1	333	14	120	5.598239898	46.54140090	Airolo
3024	1212	1	333	10	0	3.578320026	47.08570098	Alchenfluh
8004	101	1	333	10	93	4.410739898	46.47480010	Allmann
1006	404	1	333	10	91	3.540000000	47.55000000	Altstetten

Figure 17 The BTS List

The BTS list is not compulsory. It is used during the measurements to indicate the *name of the BTS* (Site Id) via which the connection is made.

Sorting

When you open the list, its entries are sorted according to «Site Id». You can sort the entries according to any of the columns simply by clicking the corresponding column header.

Adding a Line



Click the «Add BTS Entry» button. A blank line is added to the bottom of the table.

Editing

The entries can be edited directly in the table fields, which is a good way of adding supplements to the table. To create an entire BTS list it is advisable to export the data in the requisite format from the BTS management program.

Data Format

The BTS list is a text file and must have the following format:

```
CELLID,LAC,MNC,MCC,BSIC,BCCH,  
Longitude,Latitude,SiteId,CellName  
11003,606,1,333,12,123,8.05552959442139,  
47.3936996459961,Aarau,6ARFZ3D  
11001,606,1,333,12,115,8.05552959442139,  
47.3936996...
```

BTS List Format: Entries Separated only by Commas

Deleting an Entry



Click any field of the line you wish to delete. Next click the «Remove BTS Entry» button. The contents of the entire line are deleted.

Specifying the Network List

Configuration

Network Names

The command displays the following user interface:

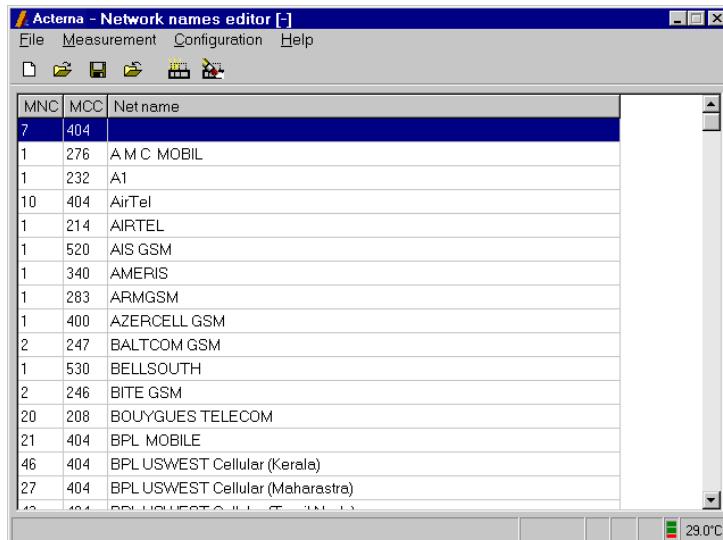


Figure 18 The Network List

HINDSITEPLUS provides a predefined list of networks. With the aid of the network list you can use MNC and MCC to find the *name* of the network. During the measurements the name can be displayed under «Network:» on the «tab sheets» and «viewers». «??» indicates that the network list does not yet contain the name of the network and that you can now enter it.

Sorting

When you open the list, its entries are sorted by net names. You can sort the entries according to any of the columns simply by clicking the corresponding column header.

Adding a Line



Click the «Add Net Name» button. A blank line is added to the bottom of the table.

Editing

The entries can be edited directly in the table fields.

Deleting an Entry



Click any field of the line you wish to delete. Next click the «Remove Net Name» button. The contents of the entire line are deleted.

Overview of the Preparations for Measurements

This section provides an overview of the components you need for a measurement and the procedure involved. It also explains important definitions relating to HINDSITEPLUS and the basics of MapX.

Measurements Clear measurement sequence

Measurements are determined by precise job orders known as «measurement jobs». These measurement jobs are to be drawn up by trained users prior to the measurements.

Outdoor / Indoor

Outdoor measurements in open terrain and indoor measurements inside buildings and in pedestrian areas are prepared and carried out in exactly the same way.

Display / Operation

The choice of display and therefore of operation can either be left up to the measuring personnel or stipulated. The display is defined with «tab sheets» or «viewers».

Defined defaults

Measurement job, display and operation can be stored together in what is known as a «Workspace».

For example you can define a HindsightPlus that starts automatically – if you deactivate the password prompt – and then makes the channels available for measurement.

The Measurement A measurement job defines the following:

Job 1 The *sequence* of measurement points.

2 The *location* of each measurement point
for outdoor measurements: with the map.
for indoor measurements: with the Floor Plan.

3 The *measurement program* to be used for each measurement point and for each channel.

You can create measurement jobs in a clearly structured way using the «Job Editor».

Requirements

The following components must be available:

- the measurement programs you require
- the Locations with the maps or the Floor Plans.

Measurement Programs A measurement program specifies the measurement parameters, for example:

Call Set-up

- Delay before the first call in each time window
- Max. number of successive call attempts
- Delay between two call attempts
- Time window for successive calls

Connection

- Call duration
- Pause duration

Transmission Direction

- Uplink
- Downlink
- Half-duplex

You can use the Measurement Program Editor to create new measurement programs or modify existing ones. This tool is extremely user friendly: due to the numeric measurement program parameters a measurement sequence is displayed as a graph. This immediately shows you what effect your inputs will have and which parameters mutually influence one another.

Measurement programs are stored in a separate directory. You can set up your own library of measurement programs. The system is supplied with a number of basic samples for you to use such as MOC.

Important Definitions

Given HINDSITEPLUS's exceptional modularity, its potential uses completely outstrip previous concepts of mobile communications. It is possible, for example, to measure connections between two mobile phones. What does MOC mean in this context? To which mobile phone does the uplink belong? For these reasons the following definitions have been drawn up for HINDSITEPLUS.

Channel

A *channel* is a connection with mobile phone or an ISDN connection.

A HINDSITEPLUS system can have up to two channels, one for air interface data and the second channel for the RF scan feature.

Master

The *Master* always makes the first call.

The Master can call an answer station (e.g. time announcement or to another mobile which answers the call):

Here the Master exclusively makes the calls (MOC); no measurement program is transmitted.

Master as the reference point

- *MOC*

The Master makes the call.

Locations and Floors To obtain clear evaluations, maps or floor plans are used already during measurement. The plan management is hierarchically structured.

«Location Library»

A «Location Library» is a file that contains data on different locations. Data stored here includes:

Table 17

Outdoor example	Indoor example
Country names	Location names, addresses
Path and names of the relevant regional maps	Location names, addresses

For example the «Location Library» called «Hotels.loc» might contain the data for the Locations Airport, Bellevue, Central, etc.

The «Location Library Editor» enables you to create «Location Libraries» in a clearly structured layout and to manage Locations.

Location

A Location can be defined as follows:

Table 18

Outdoor example	Indoor example
Country	Location, building
With at least one or possibly several regions	With at least one or possibly several floors

Floor

Each floor has a map or Floor Plan. You can import maps or scanned plans or draw the plans yourself. If you wish to draw the plans, HINDSITEPLUS features its own «Floor Plan Editor».

On the Floor Plan you also draw in the points at which you want to carry out measurements.

Ultimately the measurements are based on these Floor Plans.

Information on MapX™

The desktop map system MapX is used for representing the maps used for outdoor measurements and the Floor Plans used for indoor measurements. MapX runs in the background and is controlled by the HINDSITEPLUS software.

Map projection format

The «WGS 84» projection format is recommended for maps. You can use any projection format that is compatible with «MapInfo Professional».

File format

The «.tif» file format is recommended for grid maps. Grid maps for outdoor measurements must be geocoded (e.g. with «MapInfo Professional»).

Write-protected maps (e.g. from a CD ROM) cannot be used in MapX.

File names for Import

To be able to import maps or plans using the HINDSITEPLUS Import function, files that belong together must have the same file name (e.g. «City.tab» + «City.tif»).

Layer

With MapX the data is placed on separate representation levels (known as layers) like transparent films over a map.

Each Floor Plan has three such layers:

on top

measurement point layer

in the middle

measurement route layer

on the bottomfloor

plan layer

Four files per layer

MapX creates four files for each layer; with the floor plan layer a fifth file is added in the case of scanned plans.

To ensure that you have a clear overview of all the files at all times, HINDSITEPLUS automatically creates subdirectories:

- For each «Location Library» a subdirectory is created *in the default directory*.
- For each Location a subdirectory is created with the name of the Location.
- In that subdirectory, for each Floor a subdirectory is again created and used to store the relevant floor files.

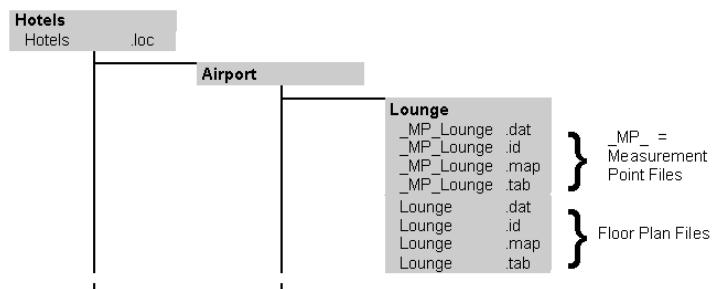


Figure 19 Example of MapX Files

«Tab Sheets» You can modify the layout of the display during the measurement and **«Viewers»** operations to suit your needs.

Table 19

Tab sheets	show the acquired data in numerical form.
Viewers	are used to plot the acquired data in graphic form and can be provided with control elements.

For example you can create a display that shows the measured values you are interested in and, to make operation simpler, already includes a start/stop button.

You can save these display configurations so that they are available for use in later sessions.

«Workspaces» You can save combinations consisting of measurement job, test equipment configuration and display («tab sheets» and «viewer») in so-called **«Workspaces»**. Again these combinations will be available to you in later sessions. You can also use **«Workspaces»** as default values for **«users»**.

Creating Measurements Programs

This section describes how measurement programs are created. The measurement program parameters are explained in detail along with the way in which they are related.

Defining a Measurement Program A measurement program is a file in which all the measurement parameters are specified. You can create measurement programs that comply with your specific requirements.

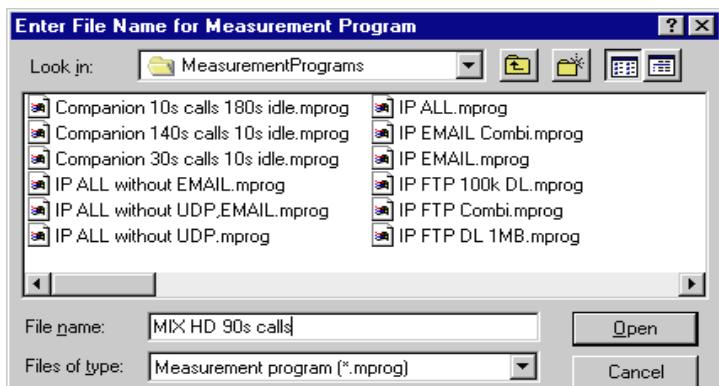
Procedure

A – Creating a new measurement program



- 1 Click the «New Document» button, then «Measurement Program» (or the command `New > Measurement Program` from the «File» menu).

The file list box appears:



- 1 Under «File Name:» enter a file name for the new measurement program. Measurement programs have the extension «.mprog». Click «Open».

The user interface for the «Measurement Program Editor» appears:

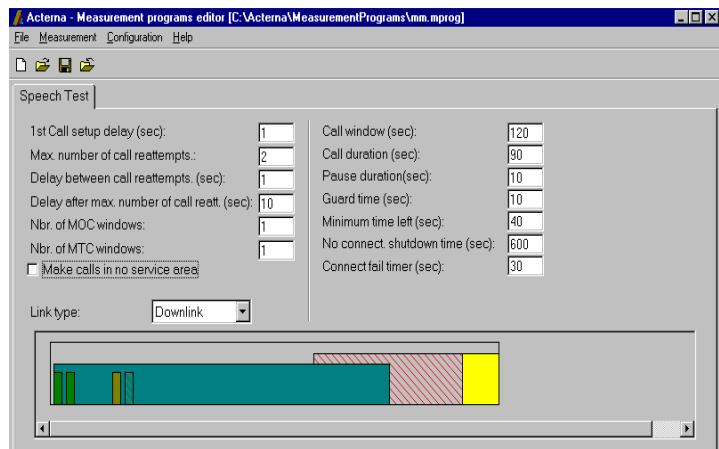


Figure 20 The Measurement Program Editor

The values displayed are the default values, which you can change. Any options currently enabled are indicated by the corresponding tabs. One measurement program is capable of controlling several measurements simultaneously:

Table 20

Register tab	Settings for measuring the...
Speech Test	Quality of speech connections

B – Defining the measurement program

The Measurement Program Editor is structured particularly clearly. With «Speech Test» it can be operated in two ways:

1 Using the input fields

When you click an input field, the value is selected. You can change the value using the keyboard (cursor in the top right-hand corner of the display). The new value is accepted as soon as you click another input field or use «Ret» (Return). «Ret» also makes the keyboard disappear again.

2 By seizing and dragging the bar in the chart

When you move the cursor to an area of the graphic, a hint appears with the explanation of the measurement program parameter you can change in that particular instance:

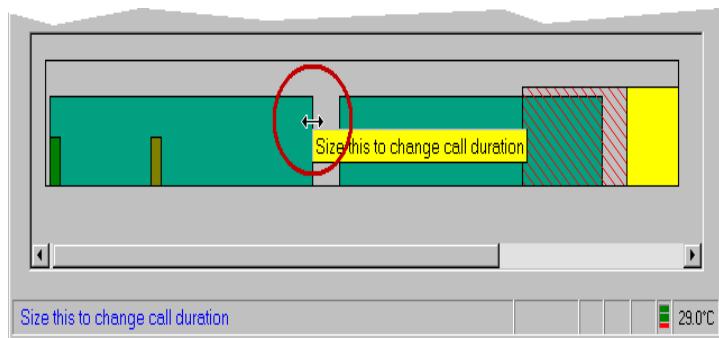


Figure 21 Graphic Operation

Measurement program parameters: see next page.

Operation information: see [page 84](#).

C – Saving the measurement program



To save the measurement program click the «Save Document» button or use the «Save» command from the «File» menu.



«Close Document» takes you back to the main «HINDSITEPLUS» window.

Measurement Units

Program Parameters The *units* are indicated in brackets behind the measurement program parameters on the user interface.

Range limits

The range limits are displayed on the status line when you move the cursor onto an input field.

65 535 s = approx. 18 hrs.

The measurement program parameters are explained in the same sequence as they occur on the user interface.

1st Call Setup Delay (sec)

1...65 535

Delay prior to the first call with every «Call Window».

Max. Number of Call Reattempts

1...255

Max. number of failed call attempts by a group.

Delay between Call Reattempts (sec)

1...65 535

Delay between two call attempts.

Delay After Max. Number of Call Reattempts (sec)

5...65 535

Delay after the max. number of failed attempts; after that, a new group of call attempts begins. Subscriber behavior can be well simulated in this way. The process is repeated until a connection is established or the «Minimum Time Left» is reached. Only two groups of call attempts are shown on the chart so that clear legibility is maintained:

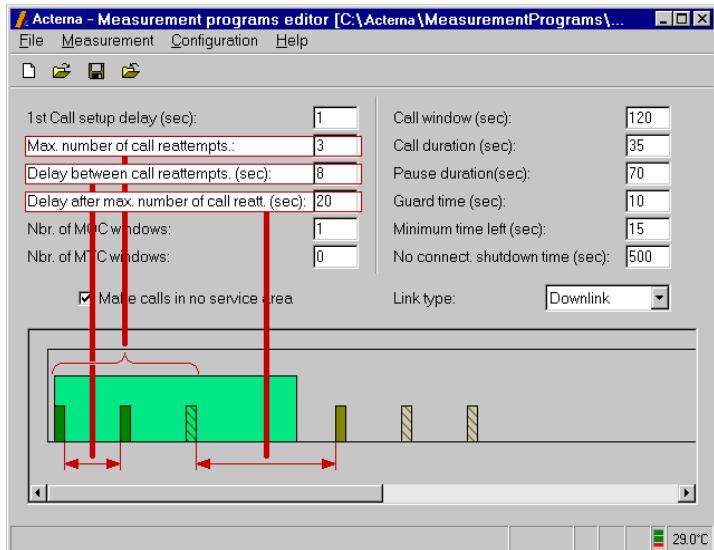


Figure 22 Call Attempts and Delays

No. of MOC Windows

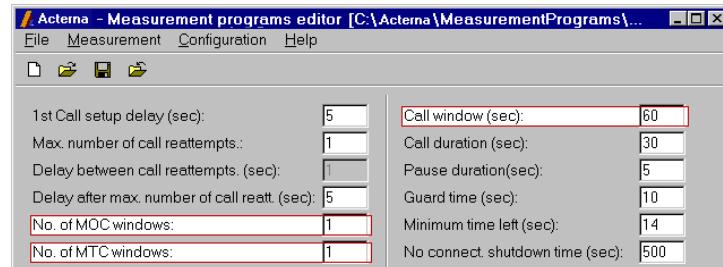
0...255

Number of successive «Call Windows» for the Master channel. After each start of a measurement the process begins with MOC.

Call Window (sec)

60...65 535

Time window that provides a constant rhythm. «Call Windows» follow one by one without gaps. The «Call Window» applies to the Master channel. Within a «Call Window» all MOC are set up. Calls are defined within the «Call Window».



The figure below shows examples of MOC:

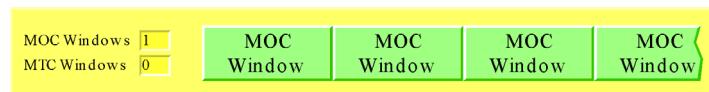


Figure 23 Call Windows

MOC mode

«No. of MOC Windows»1

«No. of MTC Windows»0

The number of MOC Windows is determined by the duration of the measurement.

Call Duration (sec)

10...65 535

Normal call duration. Can be shortened in the measurement procedure if the connection was only established after x attempts and the «Guard Time» forced a premature clear-down.

Pause Duration (sec)

5...65 535

Pause duration if several connections are set up and cleared down within a «Call Window».

Guard Time (sec)

10...65 535

Guard time for a connection clear-down. If a call runs into this time, it is terminated.

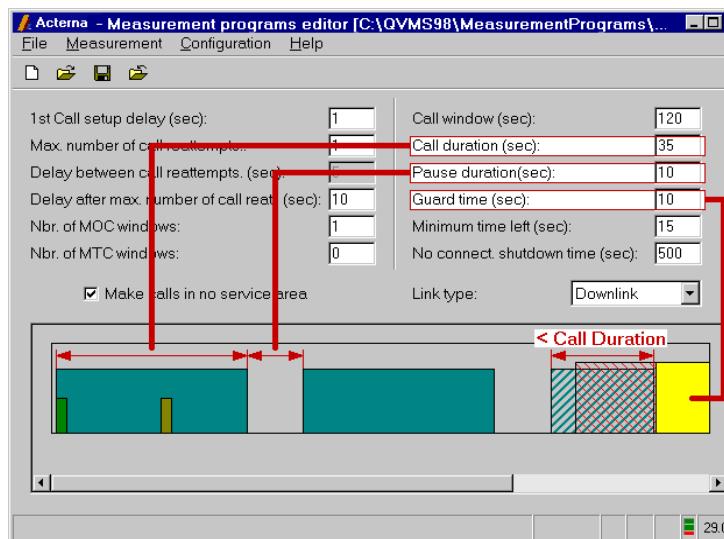


Figure 24 Call Duration, Normal and Abridged

Minimum Time Left (sec)

30...65 535

Minimum time remaining. A call cannot be set up within this time range. This allows you to specify the shortest call duration. If under «Minimum Time Left» you select the same value as for «Call Duration», only calls with a normal duration will occur.

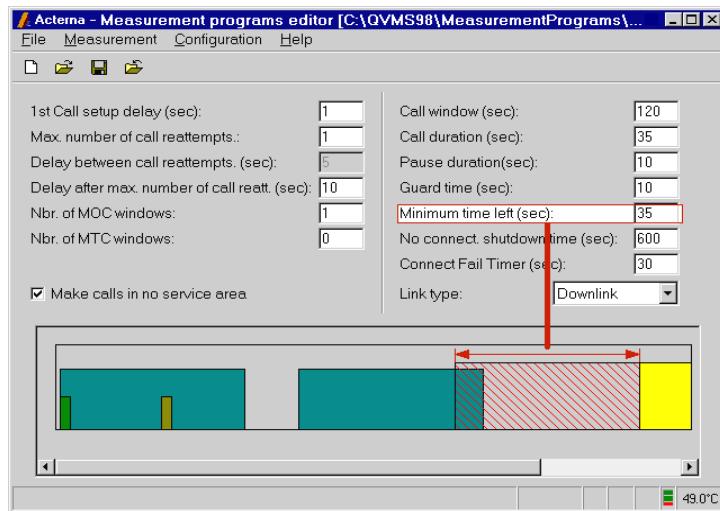


Figure 25 «Minimum Time Left» Prevents Short Calls

No Connect Shutdown Time (sec)

60...65 535

The measurement is terminated for this channel if this time is exceeded without any successful calls.



Make sure the «No Connect Shutdown Time» you select is significantly greater than the «Pause Duration»; otherwise the measurement will be terminated after one call.

Connect Fail Timer (sec)

10...255

The timer starts with the dialing. If there is no «Connect» from the network within that time, the call is classified as a «Failed Call».

Make Calls in No Service Area

- The call only starts if the mobile phone is logged on.
- Call attempts are also made in areas without coverage, following strictly the measurement program.

This setting is useful for obtaining comparative measurements of cellular networks: In borderline areas for example it may be possible to communicate using one particular network – albeit with poor quality –, and not at all using another. Since the measurement program goes ahead for both networks regardless, the comparative values are not corrupted.

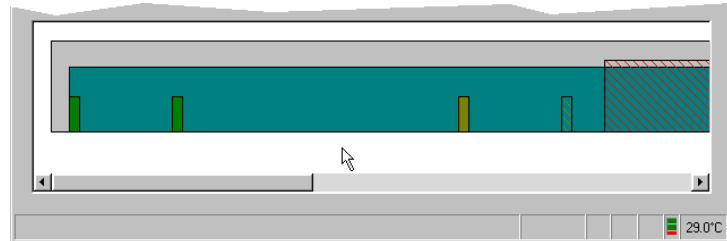
Link Type

Transmission direction:

Table 21

Uplink	Not supported..
Downlink	Not supported.
Half-duplex	Both transmission directions are alternately evaluated. Each call begins with a downlink evaluation.

Operation Zoom Functions Information



By double-clicking the area shown here in white you can automatically adapt the size of the graphic to the window:

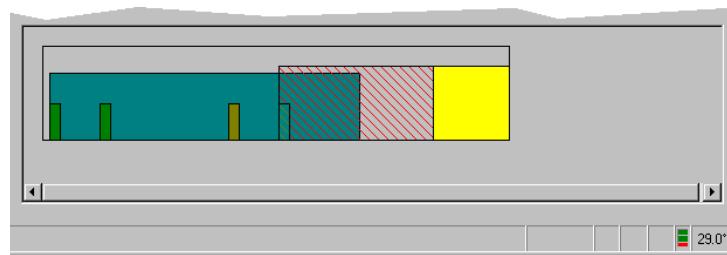


Figure 26 Double-clicking to Adapt the Graphic to the window

To magnify a section: drag across the time range you want in the area shown here in white. When you release the mouse or pen the section fills the window:

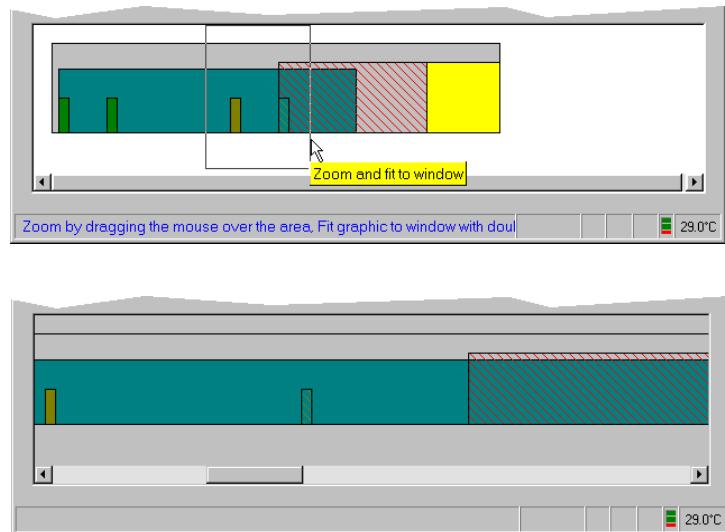


Figure 27 Magnifying a Section

All Calls from a Single «Call Window»

In pure MOC mode you can define a long «Call Window» in which calls are constantly generated. Here the interval between the calls is determined by the «Pause Duration» (provided that the connections are established immediately).

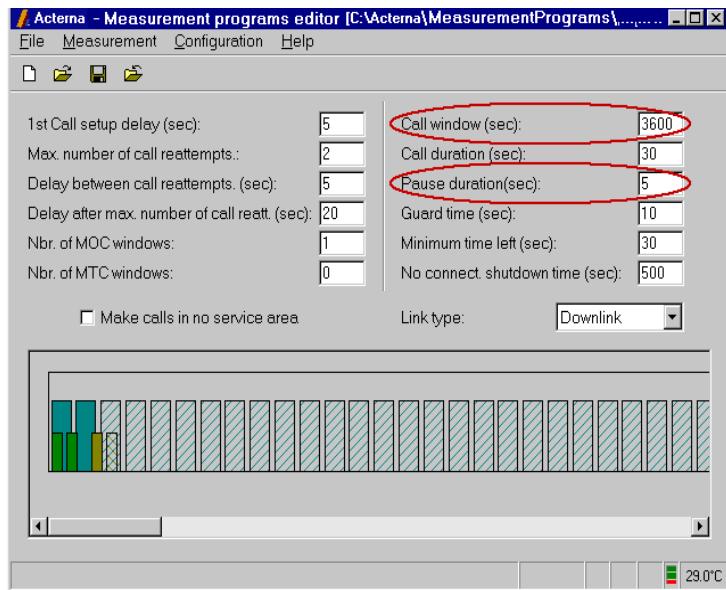


Figure 28 Many Calls Within a Single «Call Window»

Advantages:

- Possibility of minimal pauses of 5 s.
- Possibility of short calls in quick succession

Disadvantages:

With this measurement program it is not possible to guarantee that several channels remain synchronous over a longer period of time.

One Call per «Call Window»

You can define a «Call Window» in which only one connection is generated. Example:

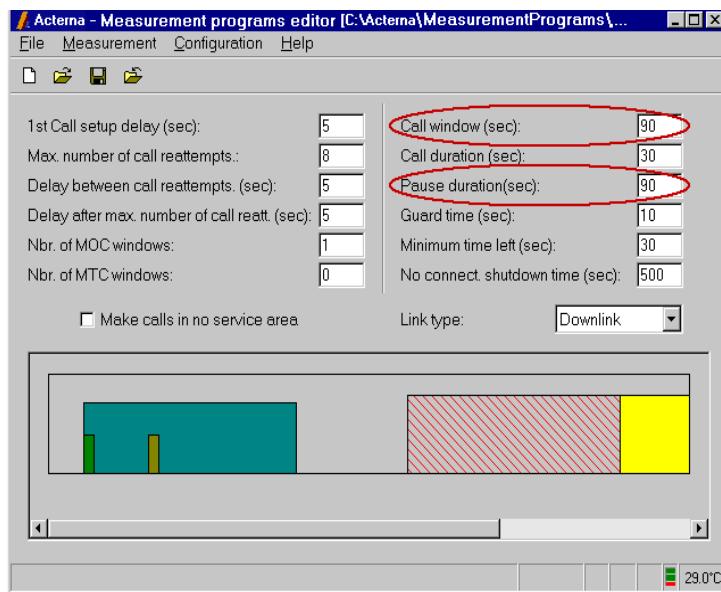


Figure 29 One Call per «Call Window»

With these values a maximum of one connection can be set up within a single «Call Window». Up to eight call attempts are made. The selected «Minimum Time Left» prevents abridged connections. The calls succeed one another at the rhythm of the «Call Windows». The interval between two calls is as follows (providing the connections are established immediately):

$$\begin{aligned} & \text{«Call Window»} \\ - & \text{«Call Duration»} \\ \hline = & \text{Interval between the calls} \end{aligned}$$

Call Set-up

A successful call set-up consists of the following steps:



Figure 30 Call Set-up

The duration of the call set-up is not fixed. It depends among other things on the network's characteristics and its level of capacity utilization. Typical values are around 8 s. If the call is not established within 10...255 s (select time value using the «Connect Fail Timer»), HINDSITEPLUS values the attempt as an error (see "[Call handling with HindsitePlus](#)" on page 17).

Since the call set-up cannot be determined, it is not possible to expect that a specific number of calls are established during a «Call Window».

Call Duration

Call Duration = effective call duration

With HINDSITEPLUS the call duration begins with the «Connect» and ends with the «Disconnect».

Creating a Measurement Job

This section explains how to draw a Floor Plan; how to enter measurement points and finally how a measurement job is created.

The examples relate to preparations for an indoor measurement. The preparations for outdoor measurements are identical.

Overview of the Procedure A measurement job is based on various elements, some of which must first be set up or adapted. The main steps are briefly listed below by way of an overview and to illustrate a possible sequence:

A – Defining the Location

Define the Location (Country / Location).

See as of [page 92](#)

B – Defining the Floor Plans

Define the Floor Plans (Regional Maps / Floor Plans) of the Location.

See as of [page 98](#)

C – Entering the measurement points

Enter the measurement points on the Floor Plans. To do so, select the measurement mode: «Outdoor» or «Indoor».

See as of [page 106](#)

At least one measurement point

You have to enter at least one measurement point since the measurement programs are allocated to the measurement points.

D – Checking or adapting the measurement programs

Determine the measurement programs to be used. Where appropriate, adapt the measurement programs or create new ones.

See as of [page 74](#)

E – Creating a new Measurement Job

Open a measurement job and specify the measurement procedure: the sequence of measurement points and the measurement program to be used in each case.

See as of [page 110](#)

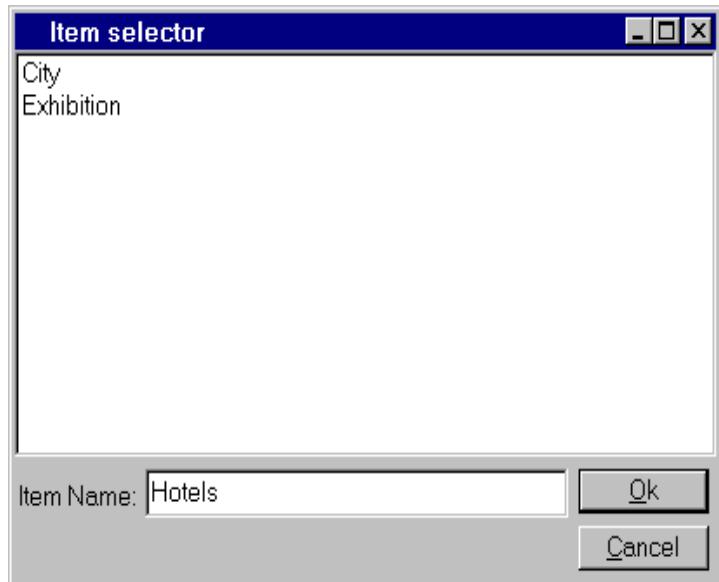
Opening a «Location Library» A «Location Library» is a file that consists of data from different locations.

Library»



- 1 Click the «New Document» button, then «Location Library» (or use the command **New** **Location Library** in the «File» menu).

The following dialog box appears:



- 1 Under «Item Name:» enter a name for the new Location Library and confirm with «OK».

This creates a *directory* with the name you specified. The user interface of the «Location Library Editor» appears:

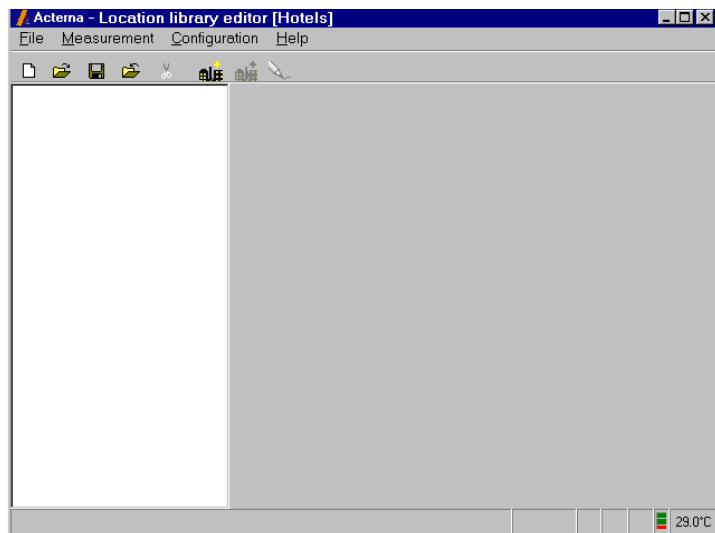


Figure 31 The Location Library Editor



- 1 Click the «Save Document» button to store the Location Library.

A subdirectory with the name of the new Location Library is created in the default directory and used to store the Location Library. Location Libraries have the extension «.loc».

Defining Requirement

Locations

To be able to define Locations, you need to ensure there is a «Location Library» (see [page 93](#)).

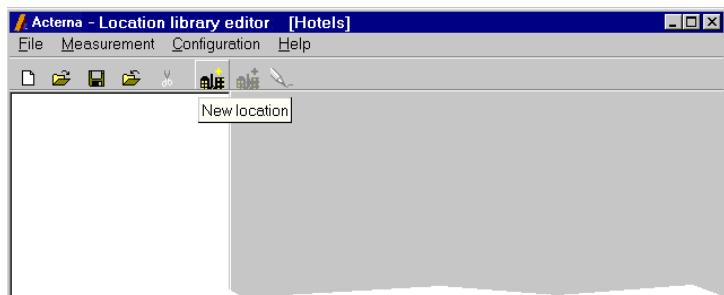
Defining a Location

A - Adding the new Location



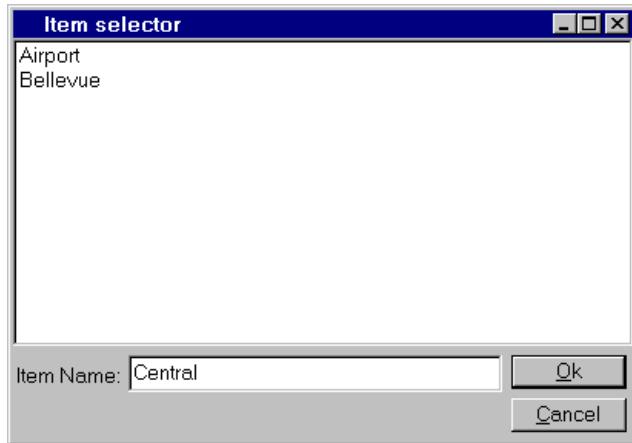
- 1 Open the appropriate «Location Library».

The user interface of the «Location Library Editor» appears:



- 1 Click the «New Location» button.

The following dialog box appears:



- 1 Enter a name for the new Location (e.g. building name) and confirm with «OK».

A directory is created for the new Location; it will be used to store subdirectories with the Floor Plans or maps.

Your entry appears in the left-hand window of the «Location Library Editor»:

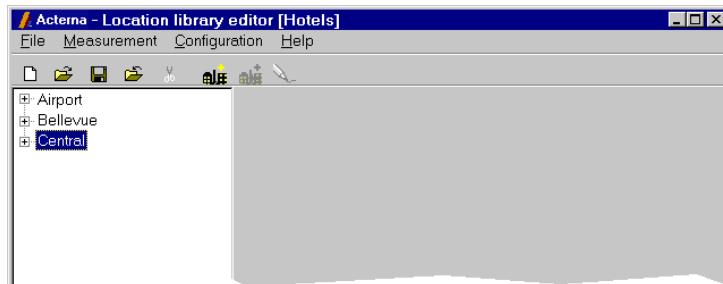


Figure 32 Location Details

B – Defining the Location

- 1 Click the location name.
The text boxes appear. The name is already entered.
- 2 You can use the text boxes on the right to add more details about the Location.

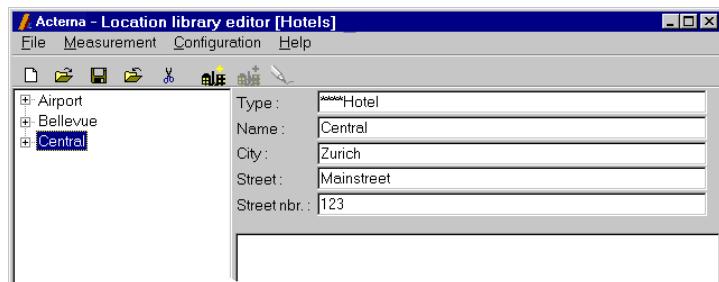


Figure 33 Location Details



- 1 Save the definition of the Location by clicking the «Save Document» button.

The information is stored in the Location Library.

Proceed in the same way to add other Locations.

Deleting a Location

- 1 From the left-hand window of the «Location Library Editor» select the Location you want to delete.



- 2 Click the «Cut Object» button. The entries of the selected Location are deleted in the Location Library.



- 1 Re-save the Location Library by clicking the «Save Document» button.

Directories are not deleted

Deleting only removes the entries in the Location Library; the directories and files remain.

You can use the «Windows Explorer» to delete any Locations you no longer require. Please bear in mind that Floor Plans may also be deleted in the process.

Exiting the «Location Library Editor»



«Close Document» takes you back to the main «HINDSITEPLUS» window.

Defining Floors Floor Management

Subdirectories

Eight or nine files are created per Floor (see [page 71](#) for details). To ensure that you always have a clear overview of the growing number of files, subdirectories are created automatically:

- For each Location a subdirectory is created with the name of the Location.
- In that subdirectory, for each Floor a subdirectory is again created and used to store the relevant floor files.

The example below contains only the visible files (with the extension «.tab»):

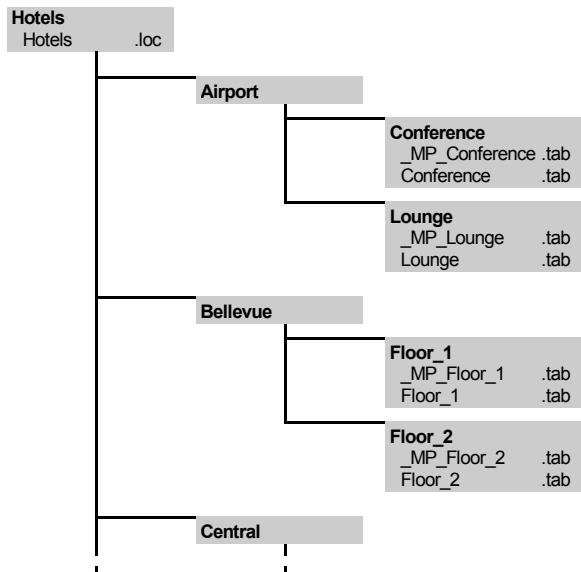


Figure 34 Subdirectories for Each Location and Floor

Defining a Floor

Requirement

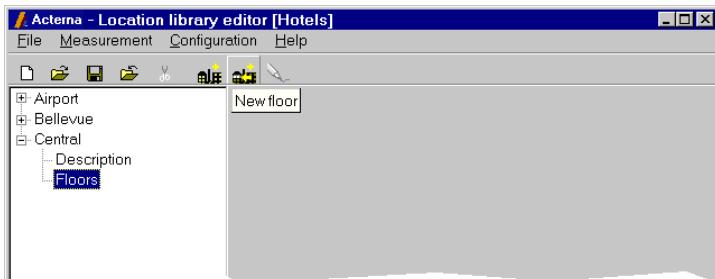
To be able to define Floors, you need to have defined the corresponding Location first.

Open the Location for which you want to add a Floor. This brings up the user interface of the «Location Library Editor».

A – Adding the Floor

In the left-hand window of the «Location Library Editor» click **[+]** next to the name of the Location.

Click the designation «Floors» situated below it: this activates the «New floor» button:





- 1 Click the «New Floor» button.

The following dialog box appears:



- 2 Type in a name for the new Floor and confirm with «OK».

A subdirectory is created for the new Floor and will contain the relevant Floor Plans.

Your entry appears in the left-hand window of the «Location Library Editor» and on the right under «Floor Plan:».



B1 – Importing the map or the Floor Plan

If you have geocoded maps or scanned-in plans, you can import them.

Import formats

You can import plans with the following file extensions:

.tab

.tiff

- 1 Select the Floor.



Click the «New Floor» button.

The «Item Selector» dialog box with the Import button appears.

- 1 Click the «Import» button.



Import

A rectangular button with the word "Import" centered in white text. The button has a light gray background and a dark gray border.

The file list box appears.

Select the directory and the plan you want. Confirm the import with «Open».

B2 – Drawing the Floor Plan

- 1 From the left-hand window of the «Location Library Editor» select the Floor you want to draw.



- 2 Click the «Floor Plan Editor» button.

The user interface for the «Floor Plan Editor» appears.

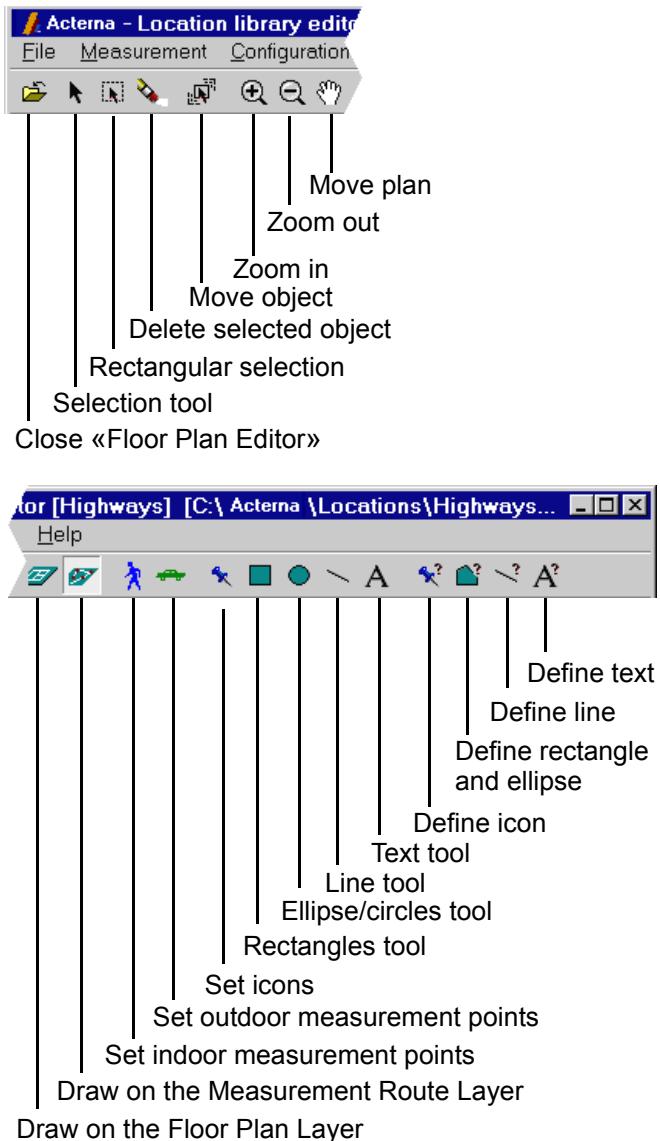


Figure 35 Buttons on the «Floor Plan Editor»

3 Draw the localities.

Large objects are reduced vertically by MapX (projection correction). Therefore you should first draw a reduced-size rectangle, then magnify it with the zoom function.

If drawn areas obstruct the labelling, define the rectangles / ellipses *without fill* (Fill, Pattern: N).

All the actions in the «Floor Plan Editor» are immediately stored. There is no Undo function.

Drawing in the measurement route

Here you can draw in the route to be driven or walked by the person conducting the measurement, or you enter measurement instructions (e.g. «Measure for 20 minutes»). This layer is not imported with AnalyzerPlus.

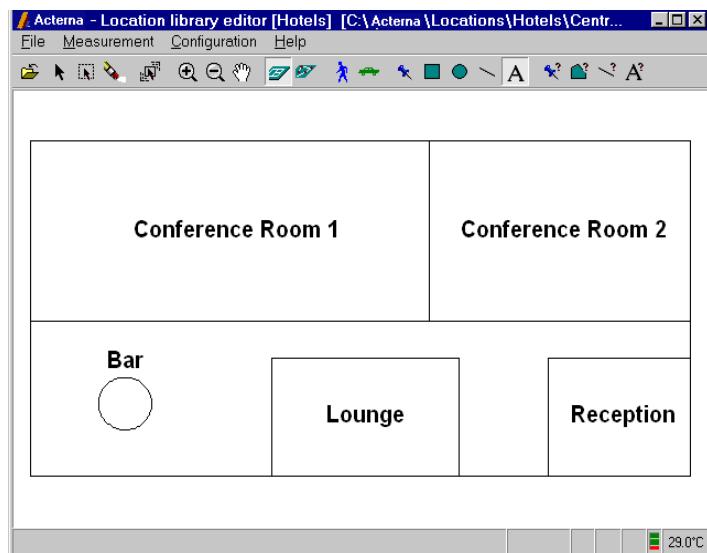
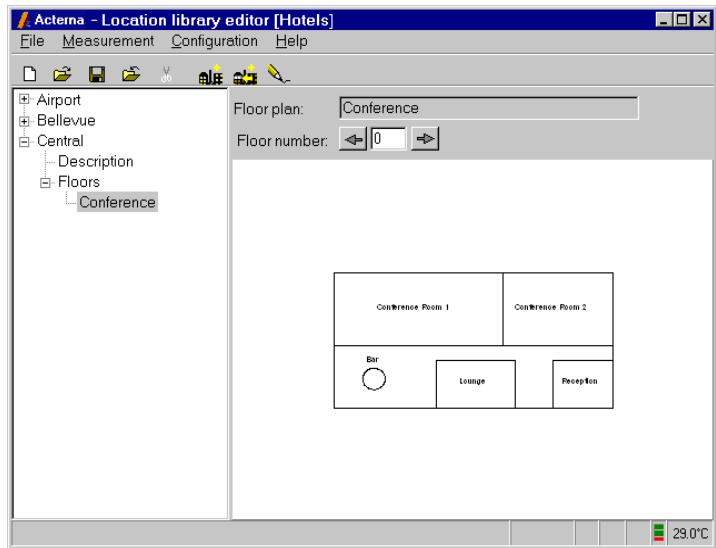


Figure 36 Example of a Drawn Floor Plan

When you close the «Floor Plan Editor», you return to the «Location Library Editor». The Floor Plan appears in the right-hand window:



Similar Floor Plans

If a similar Floor Plan already exists (e.g. same layout of several floors), you can duplicate it with the import function.

A copy of the Floor Plan is automatically stored in the subdirectory.

C – Entering measurement points on the Floor Plan



- 1 Open the Floor Plan.
- 2 Click the measurement point icon you want:



Indoor Mode Point



Outdoor Mode Point

- 3 Enter the measurement points:

On the Floor Plan click the location at which you want to insert the measurement point. The measurement point is represented using the selected measurement point icon and given a serial number.

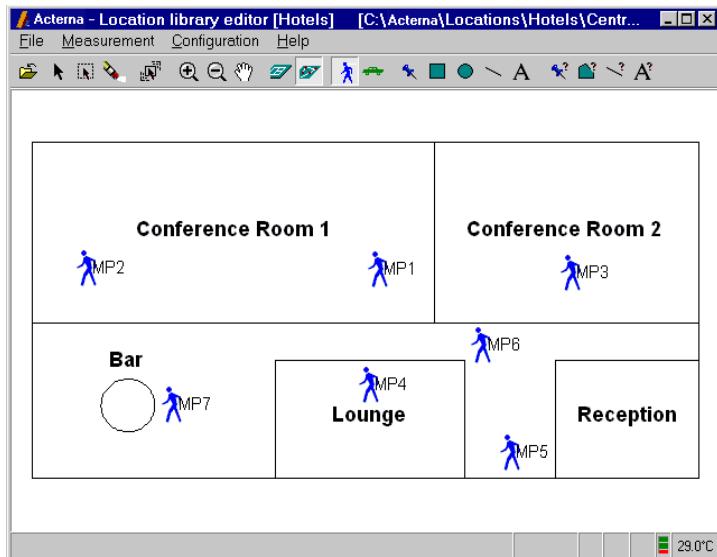


Figure 37 Floor Plan with Measurement Points

Moving a Measurement Point



- 1 Select the measurement point you want to move by clicking the measurement point icon.



- 2 Click the «Object Move Tool» button. You can now seize the measurement point and move it to the position you want.

Deleting a Measurement Point



- 1 Select the measurement point you want to delete by clicking the measurement point icon.



- 2 Click the «Cut Object» button.

Numbering

If you subsequently add a measurement point its serial number will be based on the highest measurement point number so far.

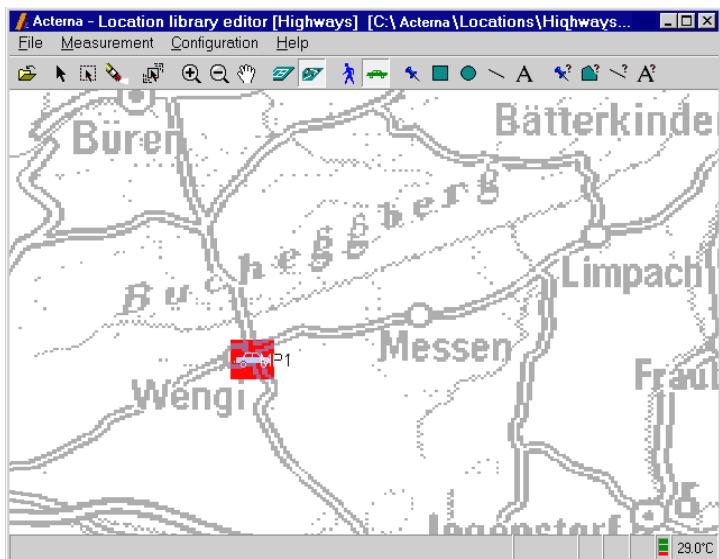


Figure 38 For an Outdoor Measurement: Map with Measurement Point

Exiting the «Floor Plan Editor»



Click the «Quit Floor Plan Editor» button to return to the Location Library Editor.

Deleting a Floor

- 1 From the left-hand window of the «Location Library Editor» select the Floor you want to delete.



- 2 Click the «Cut Object» button.



- 3 Click the «Save Document» button or use the «Save» command from the «File» menu.

Directory is not deleted

When deleting, the Floor entry is deleted from the «Location Library» but the subdirectory with the floor data is retained.

You can use the «Windows Explorer» to delete any Floors you no longer require. Please bear in mind that Floor Plans may also be deleted in the process.

Creating Measurement A measurement job specifies the procedure for carrying out measurements:

Jobs

- You specify which measurement programs are to be carried out where.
- You determine the *sequence of measurements*.

Requirements

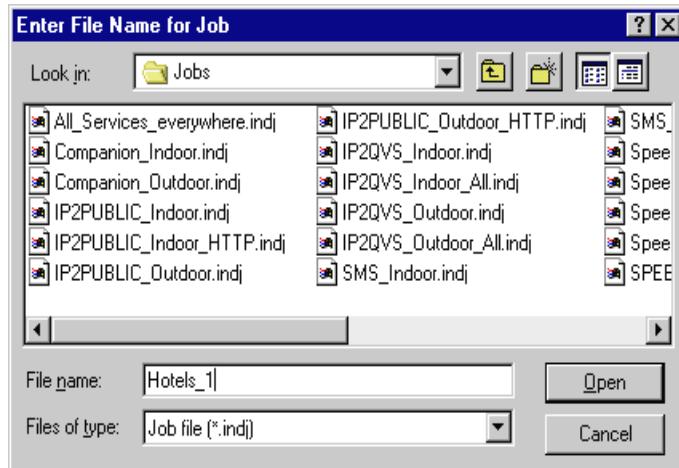
- The requisite measurement programs are available.
- The Locations with the maps or Floor Plans are defined and the measurement points entered.

A - Defining the Measurement Job



- 1 Click the «New Document» button, then «Measurement Job» (or use the command **New**  **Measurement Job** from the «File» menu).

The file list box appears:



- 1 Under «File Name:» enter a name for the new measurement job.
Click «Open».

The user interface for the «Job Editor» appears:

Chapter 3 Operation of HindsitePlus

Creating a Measurement Job

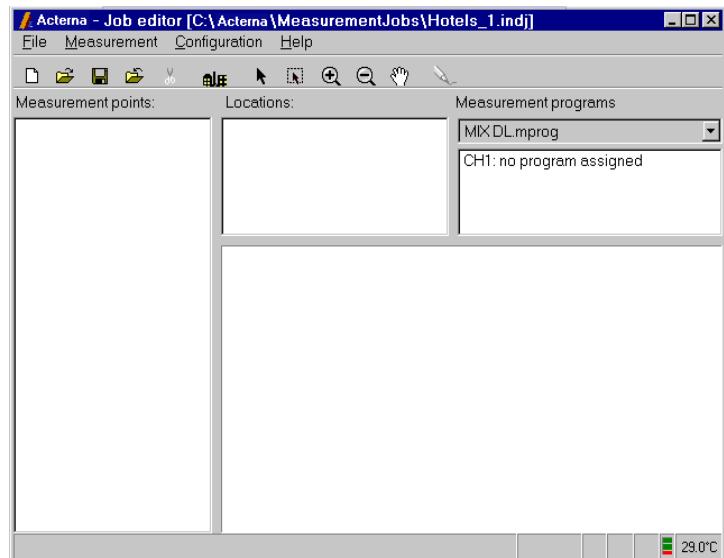


Figure 39 The Job Editor

B – Select the Location



- 1 Click the «Location Library» button.

The «Item Selector» dialog box appears.

- 2 Select the Location you want and confirm with «OK».

The selected Location appears in the «Locations:» window of the Job Editor.

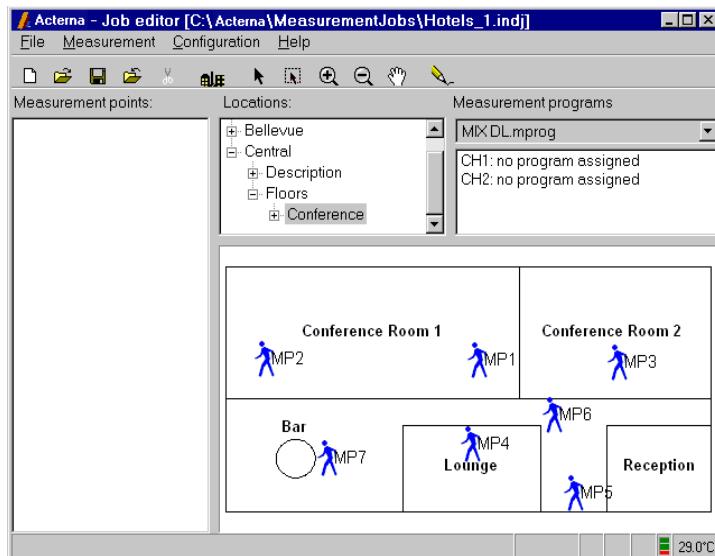
C – Select the Floor

- 1 From the «Locations» window click **[+]** next to the name of the selected Location and then on **[+]** next to the designation «Floors» below it.
- 2 Click the Floor for which you want to create a measurement job.
The window below it displays the Floor Plan with the entered measurement points.

Floor Plan excerpt

You can move the excerpt of the Floor Plan you want around the viewing area using the «Zoom in», «Zoom out» and «Move Floor Plan» buttons.

Example of a selected Floor Plan:



E - Allocating the measurement program

Table 22

Here you specify:

- which channel measures with which measurement program
- which channel does not measure (No Program Assigned)

- 1 Under «Measurement Programs» select the channel you want (e.g. CH1).
- 2 Open the combobox and select the measurement program you want.

The measurement program is allocated to the selected channel.

In the example below, channel CH1 has been allocated the measurement program «MIXDL.mprog»:

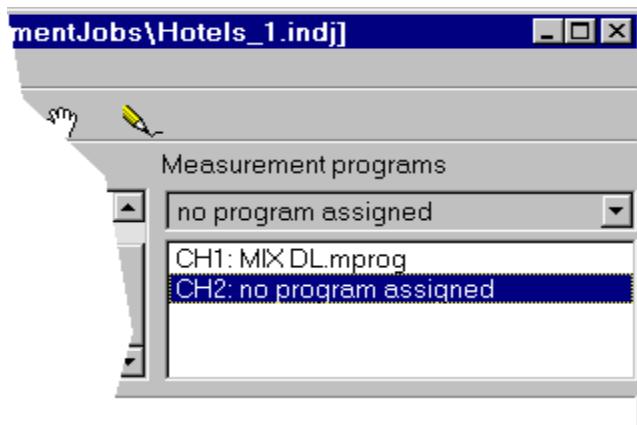


Figure 40 Allocating Measurement Programs to the Channels

D – Listing measurement points

Table 23

Here you specify the measurement points at which the measurements are carried out with the selected measurement programs.

1 Specifying the measurement points individually



- a Click the «Select Measurement Point» button.
- b On the Floor Plan select the measurement point you want by clicking the measurement point icon.
The measurement point is entered in the «Measurement Points:» window.
- c Repeat the procedure for all the measurement points at which you want to measure using the selected measurement programs. This creates a list of measurement points.

A different measurement program

To allocate a different measurement program to a measurement point, repeat point D on page 81 Allocating the measurement program

1 Specifying lots of measurement points in one go



- a Click the «Select Measurement Points» button.
- b On the Floor Plan select the measurement points you want by placing a border around the measurement point icons.
The measurement points are entered in the «Measurement Points:» window.

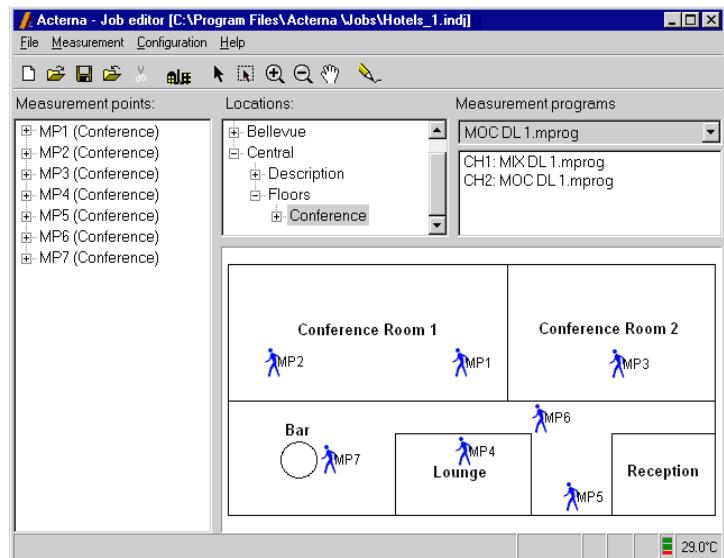


Figure 41 «measurement job» with the Measurement Points Entered

Removing a Measurement Point

- 1 From the «Measurement Points» window select the measurement point you want to remove.



- 2 Click the «Cut Item» button.

Determining Which Measurement Programs have been Assigned

For each measurement point you can display the measurement programs that have been assigned: Expand the structure by clicking the corresponding .

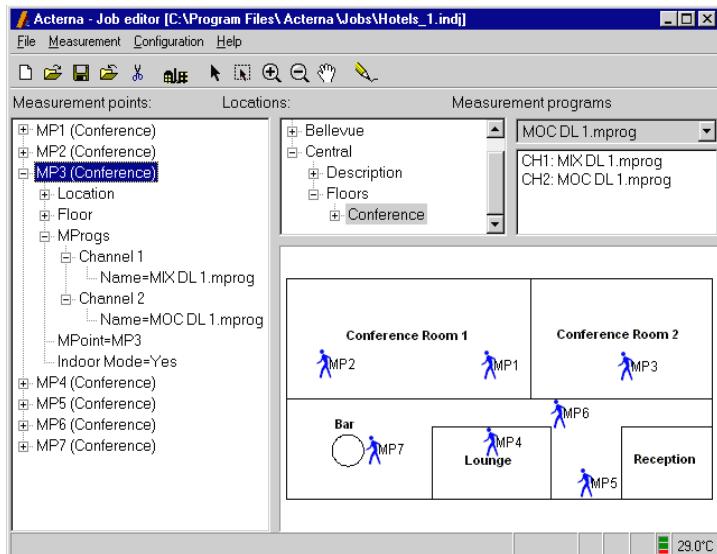


Figure 42 Displaying Assigned Measurement Programs

You can widen the Measurement Points window: Seize the right-hand border of the window and drag it to a suitable position.

Modifying measurement parameters

Measurement jobs store copies of the measurement programs used.

To modify measurement parameters, you must first adapt the measurement program and then specify new measurement points in the measurement job.

F – Specifying the measurement procedure

In the Measurement Points window you can modify the sequence of measurement points: Seize a measurement point and drag it to the position you want.

The measurement point at the top of the list will be carried out first during the measurements; the one at the bottom of the list, last.

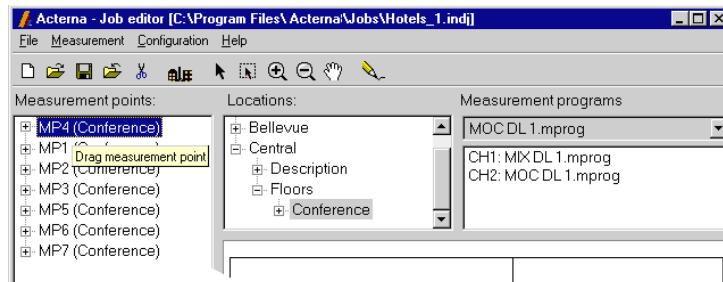


Figure 43 Modifying the Sequence of Measurement Points

G – Saving the measurement job



To save the measurement job click the «Save Document» button or use the «Save» command from the «File» menu.



«Close Document» takes you back to the main «HINDSITEPLUS» window.

Designing the View: Tab Sheets and Viewers

During the measurement process measurement data is displayed on the screen.

This section describes how you can design these views and create «viewers».

What Can You «Tab Sheets»

Show? During a measurement *all the measurement data* is continually displayed on «tab sheets» (index cards) in the form of figures and text. This provides you instantly with extensive information about a network.

You can structure the measurement parameters on the «tab sheets» or divide them up onto additional «tab sheets».

During a measurement you can switch from one «tab sheet» to another.

«Viewers»

Viewers are windows which you can use to design your own display and control interfaces. Examples:

- You can chart measurement data – as a function of time – so that you can observe its progression.
- You can create a special interface for the test driver, with all the display and control elements that are important for him.

You can customize viewers in a simple way according to your requirements.

Once you have created several viewers, you can switch from one viewer to another during a measurement.

General Requirement

Configuration – Equipment

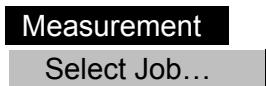
The configuration of the test equipment must be selected as it will be used during measurement (number of channels).

«Tab Sheets» Requirement

The required measurement job is available.

Displaying «Tab Sheets»

- 1 Enter the command:



The file list box appears.

- 1 Load the measurement job you want.

The HINDSITEPLUS measurement interface appears. In the case of an outdoor measurement, the allocated map is displayed; in the case of an indoor measurement, the Floor Plan.



- 2 Click the «Show Measurement Values» button.

The «tab sheets» with the measurement parameters are displayed:

Chapter 3 Operation of HindsitePlus

Designing the View: Tab Sheets and Viewers

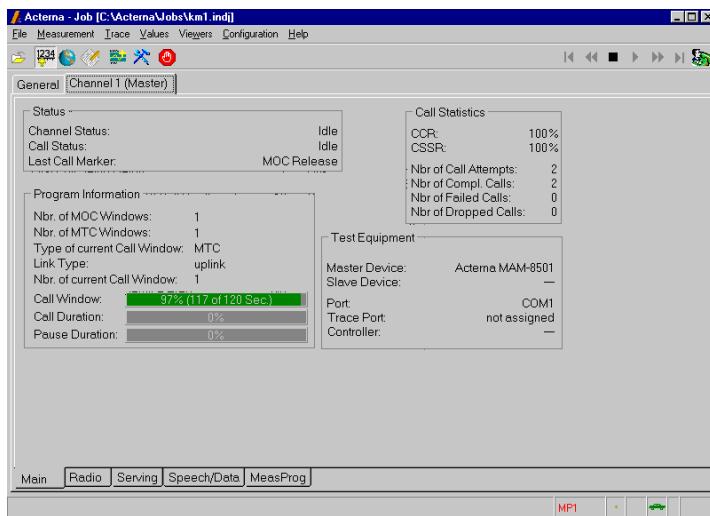


Figure 44 HINDSITEPLUS Measurement Interface with «Tab Sheet»

Structure of the «Tab Sheets»

In the HINDSITEPLUS original setting, the measurement parameter configuration is laid out on «tab sheets»:

- «General» tab sheet, with the system and GPS informations.
- Additional «tab sheets» for each channel, which contain the other measurement parameters in a thematical order.

The measurement parameters are laid out in groups (e.g. «Status»). The measurement parameter groups are displayed...

- in accordance with the current test equipment configuration
- for the options currently enabled

Customizing a «Tab Sheet»

You can reposition the measurement parameter groups. Click a group and move it to the position you want:

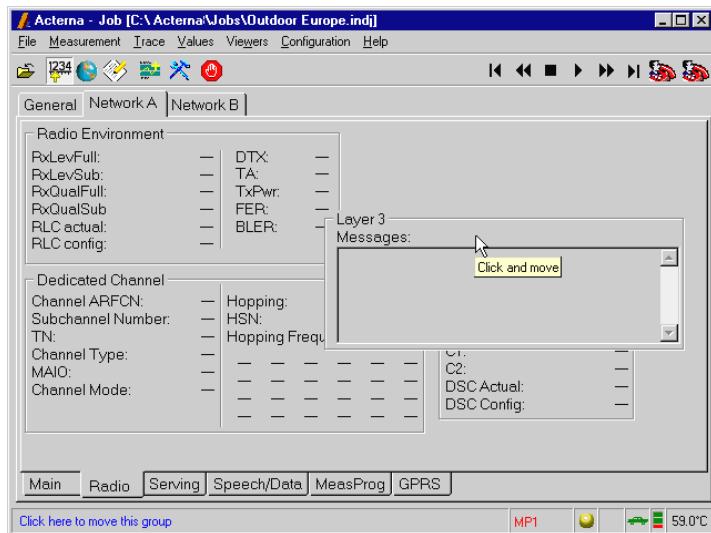


Figure 45 Groups can be Moved Around

Rename a «Channel» Tab Sheet



This command is used to give the selected main tab sheet a different name, e.g. the name of the cellular network.

Placing a Group in the «Container»

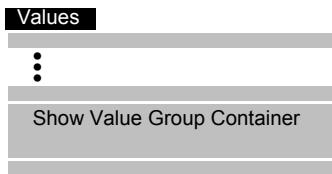
To remove a group from a «tab sheet»: *Double-click the group*. Deleted groups are placed in a «Container».

Retrieving a Group from the «Container»

To retrieve a group placed in the «Container» and place it in a «tab sheet», proceed as follows:

- 1 Select the «tab sheet» into which you want to insert a binned group.

2 Enter the command:



This displays the «Container» with *all* the stored groups:

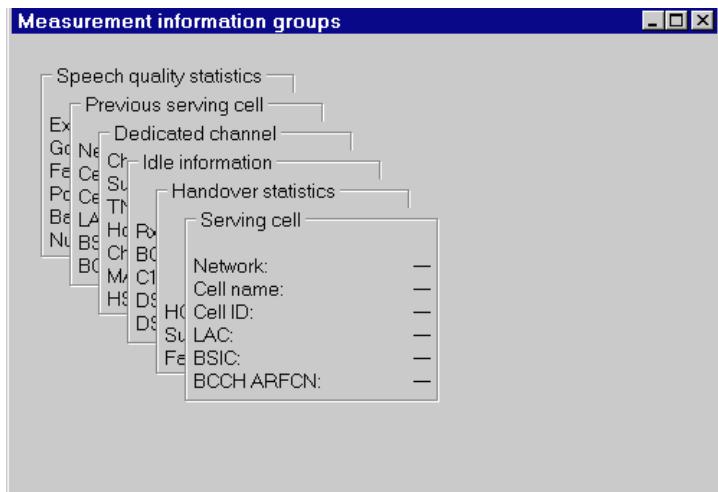


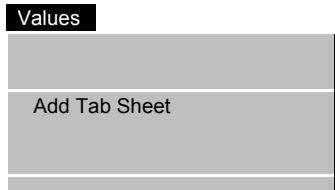
Figure 46 Container with Deposited Groups

- 1 Double-click a group to move it from the «Container» into the «tab sheet».

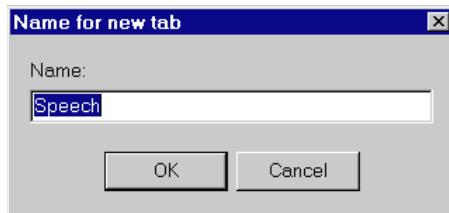
Creating a New «Tab Sheet»

You can create additional «tab sheets» and place there the measurement parameter groups you want.

- 1 Enter the command:



The following dialog box appears:



- 2 Enter a name for the additional «tab sheet» (e.g. «Speech») and confirm with «OK».
Each channel has now a tab sheet «Speech».
- 3 Select the «tab sheet» with the groups you want to use.
Place in the «Container» those groups you want to add to the «Speech» tab sheet. Take note of the paragraph «Placing a Group in the Container» on [page 123](#).
- 4 Switch over to the «Speech» tab sheet.
- 5 Insert the groups placed in the «Container» into the «Speech» tab sheet. Take note of the paragraph «Retrieving a group from the Container» on [page 123](#).
- 6 Customize the «Speech» tab sheet to suit your requirements.

Chapter 3 Operation of HindsitePlus

Designing the View: Tab Sheets and Viewers

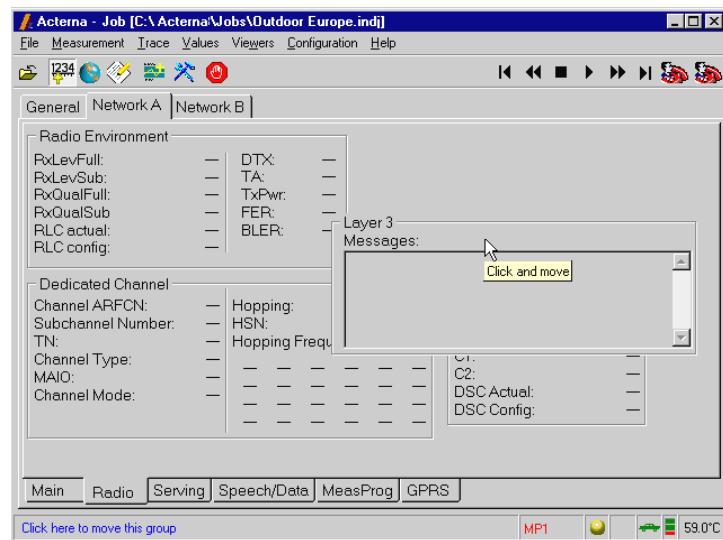
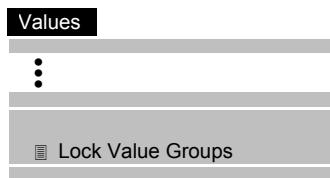


Figure 47 Example: New «Speech» Tab Sheet

Locking the «Tab Sheets»

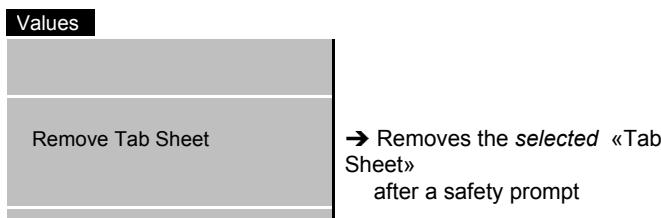
The following command allows the administrator to save all the «tab sheets» to protect them against unintentional modifications:



Re-clicking the command a second time by the administrator cancels out the protection.

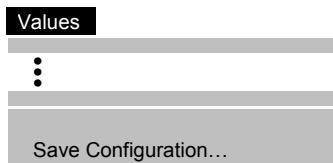
As far as the «user» is concerned, «tab sheets» are always protected as he is not authorized to modify them.

Removing a «Tab Sheet»



If you remove «tab sheets», the groups with the measurement parameters are placed in the «Container» and are not lost.

Saving the «Tab Sheets»



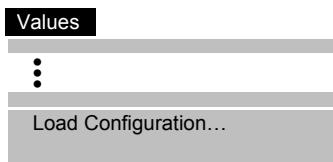
The command displays the file list box. File names for tab sheet configurations have the extension «.ibc».

Default Configuration

You can assign the file name «default.ibc» to one tab sheet configuration and save it in the «Acterna» directory. This default configuration is then automatically selected whenever a measurement job is loaded.

Loading «Tab Sheets»

To load a tab sheet configuration click the following command:



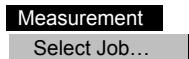
«Viewers» Requirement

The required measurement job is available.

Creating a «Viewer»

A – Loading the measurement job

Load a measurement job using the following command:



B – Creating a viewer



- 1 Click the «Create Viewer» button or use the command «New Viewer» from the «Viewers» menu.

An empty viewer called «untitled» appears:



Figure 48 Empty viewer

2 Enter the command:



← Menu in the Viewer

The following dialog box appears:



3 Enter a name for the viewer and confirm with «OK».

4 You can alter the size of the viewer:

Seize any border of the viewer or one of its corners and drag it to the position you want.

C – Adding measurement parameters to the viewer

- 1 From the «tab sheet» seize a measurement parameter you want and drag it to the viewer:

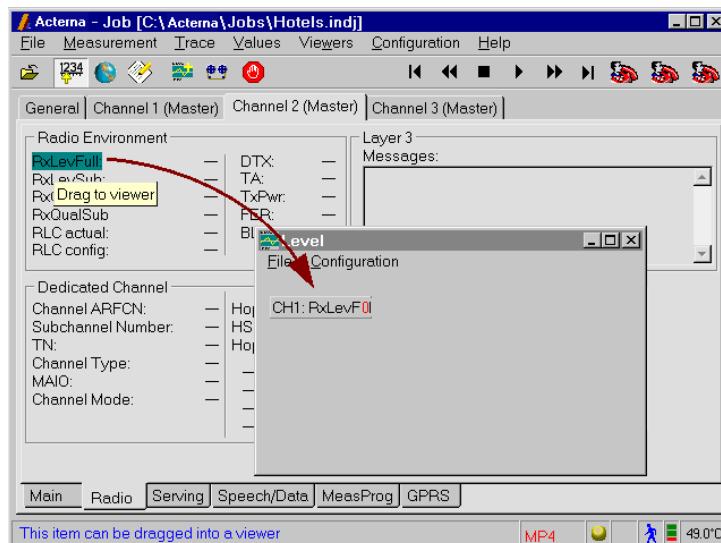


Figure 49 Adding a Measurement Parameter to the Viewer

- 2 Repeat the process with all the measurement parameters you want to display in the viewer. You can drag measurement parameters from different channels into the viewer.

The measurement parameters will appear in the viewer overlapping one another. The last measurement parameter being dragged to the viewer will be on top.

- 3 From the viewer seize the measurement parameters and move them to the position you want:

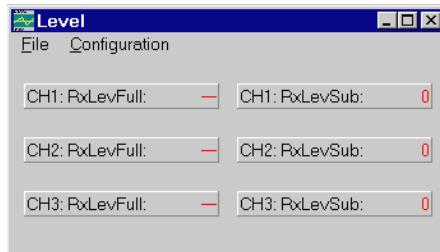
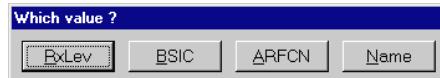


Figure 50 Viewer with Measurement Parameters

Parameters from the «Serving and Neighbour Cells» Group

If you want to place a measurement parameter from the «Serving and Neighbour Cells» group into the viewer, the following dialog box appears:

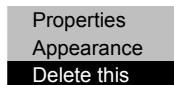


Click the measurement value you want to have displayed.

Removing a Measurement Parameter from the Viewer

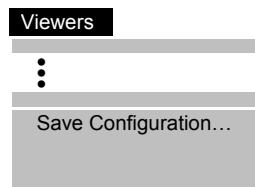
- 1 Click the measurement parameter you want to remove.

The following menu appears:



- 2 Click the «Delete this» command.

D – Saving a viewer



The command displays the file list box. File names for viewers have the extension «.view».



With «Abort Measurement» (or the «Close» command from the «File» menu) you can terminate the «Measurement Mode». The command is followed by a safety prompt. Click «OK» to return to the main «HINDSITEPLUS» window.

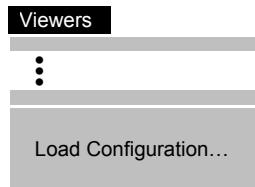
Grouping Several Viewers Together

You can spread measurement parameters over several viewers and save it as a viewer configuration. You can create new viewers or work on the basis of existing viewers.

An open viewer configuration is deleted if an existing one is loaded.

Loading an Existing Viewer Configuration

- 1 Load a measurement job and click the following command:



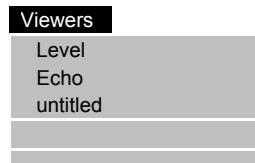
The file list box appears.

- 2 Open the viewer configuration you want from the «Viewers» directory.

The viewers are displayed.

Opened Viewers

The upper section of the «Viewers» menu lists the names of all the opened viewers. In the example below the viewers «Level», «Echo» and «untitled».



Switching Over to Another Viewer

- a Click the viewer you want, provided part of it is visible.
- b From the «Viewers» menu click the name of the viewer you want.

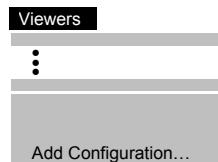
Take note of the paragraph «Opened Viewer»

Displaying a closed Viewer

When you close a viewer, its menu entry remains until you close the measurement job. This means you can once again display a closed viewer as described above.

Adding Viewers

To add other existing viewers to the current viewer configuration, enter the following command:



Removing a Viewer



Customizing Viewers

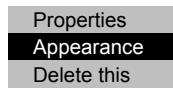
Requirement

The viewer must not be locked in the «Configuration» menu:
not « locked».

A – Selecting the appearance for measurement parameters

- 1 In the viewer, click the measurement parameter whose appearance you want to select.

The following menu appears:



- 2 Click the «Appearance» command.

A submenu appears and provides you, depending on the measurement parameter, with possibilities for modifying its appearance:

Appearance for measurement parameters

Labeled Numeric Value	Measurement values as figures
Labeled Progress Bar	Measurement value as a bar
Graph	Measurement values as a line chart
Labeled String	Measurement value as a text line
Labeled Memo	Measurement value as a text panel (e. g. for <History>)

Since the measurement parameters are inserted from the tab sheet into the viewer, the corresponding appearance is automatically accepted as the default setting.

- 1 Click the appearance you want.

The measurement parameter is displayed accordingly in the viewer.

B – Determining the size of the display

Display areas for figures, bar, text line:
Seize and drag the *right-hand border*.

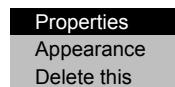
Line chart, text panel:

Seize and drag the bottom border / right-hand border / bottom right-hand corner.

C – Determining the display for measurement parameters

- 1 Click a measurement parameter.

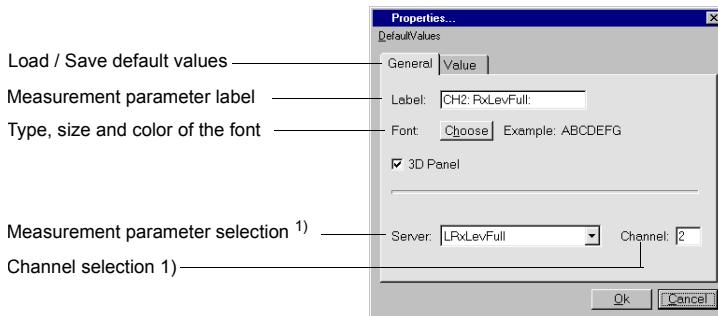
The following menu appears:



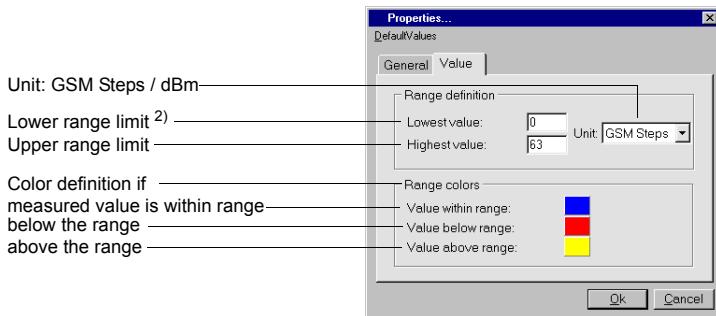
- 2 Click the «Properties» command.

The «Properties...» dialog box appears. The choice depends on the appearance selected (see examples below).

Example: Numerical Measured Value



- 1 If you modify the channel or the measurement parameter, you may have to adapt the labelling.



2 Negative value possible, e.g. -110 for Unit = dBm

Example: Line Chart

If you display a measurement parameter as a line chart («Graph» appearance), you can drag other measurement parameters directly into the line chart:

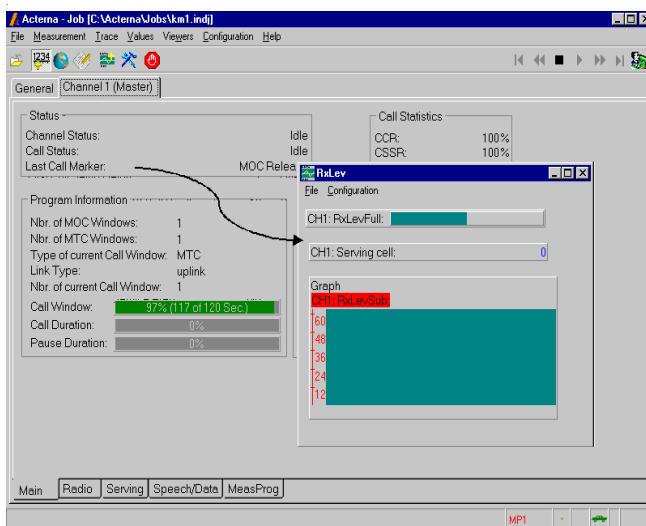


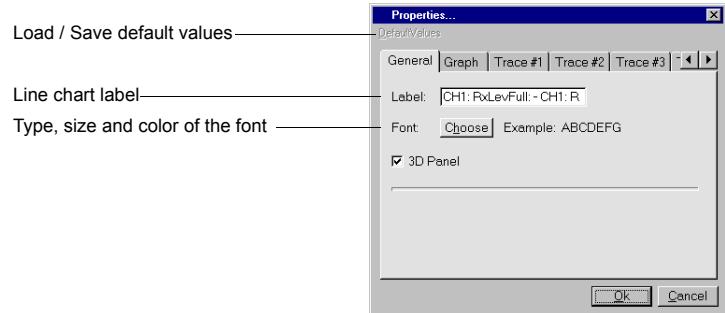
Figure 51 «Graph» Viewer: Adding other Measurement Parameters

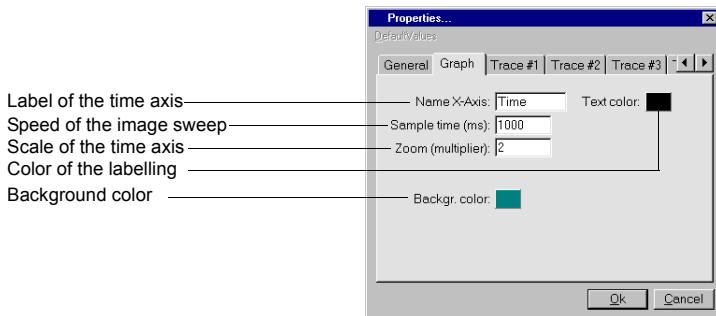
If you add «Last Call Marker», the Call Markers will be displayed. The characters have the following meaning:

Table 24

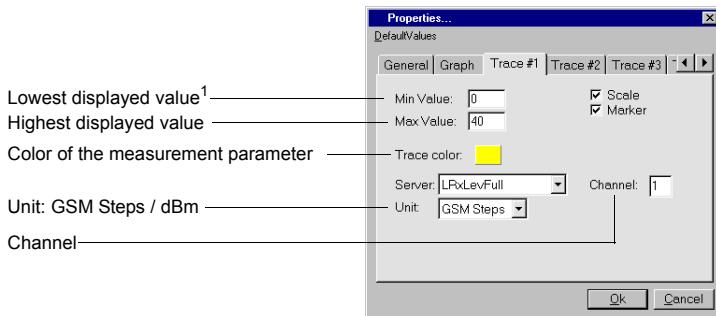
#	Dial
B	Break
C	Connect
D	Connect
E	Call Error
F	Connect Fail
L	Release Error
R	Release
S	Setup

Customizing a Line Chart





For each measurement parameter a «Trace» tab appears:



Scale

Here you can show or hide the vertical scale for each «Trace». It will appear on the left in the line chart and have the same color as the measurement parameter to which it relates. The scale depends on the selected display values and the height of the line chart.

Marker

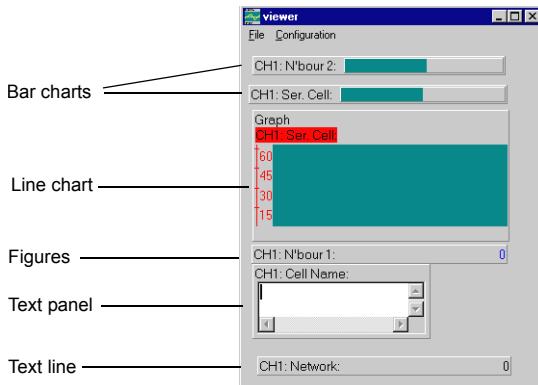
Here you can show or hide the marker for each «Trace» (vertical line, see next Figure). It indicates the measured value at the current position. You can seize the marker at the triangle and move it.

1 Example for Unit = dBm:

Table 25

Min Value:	-110
Max Value:	-40

Example: Customized Viewer



D – Saving the Viewer

See [page 133](#)

Viewer as a User Interface

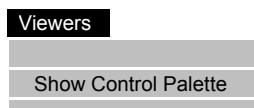
You can easily incorporate buttons into your viewers. This allows you to create your own user interfaces and prepare them for a user.

Requirement

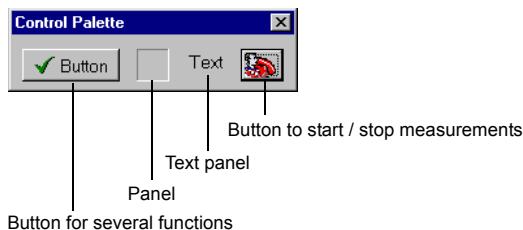
The viewer must not be locked in the «Configuration» menu:
not «locked».

A – Adding elements

- 1 Enter the command:



The palette with the choice of elements appears:



- 1 Seize the element you want on the palette and drag it into the viewer.

Repeat the process for additional elements.

Changing the Size of the Elements

Button and panel:

Seize and drag the bottom border / right-hand border / bottom right-hand corner.



When the size of the Start/Stop buttons is increased, the size of the picture itself also increases automatically.

Text panel:

Seize and drag the *right-hand border*.

Positioning

In the viewer seize the element and move it to the position you want.

Adjusting the size of the Viewer

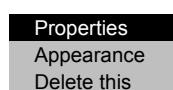
You can size the viewer to match the HINDSITEPLUS user interface.

B – Customizing the user interface

You can specify the properties for the elements:

- 1 Click a button, panel or text panel.

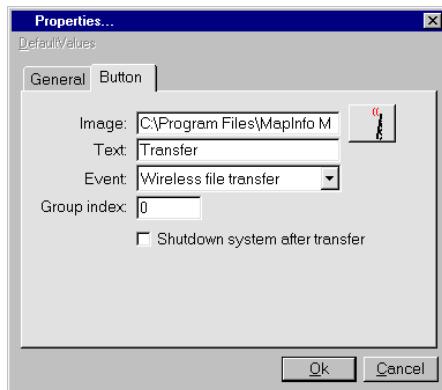
The following menu appears:



- 2 Click «Properties».

The «Properties...» dialog box appears. The choice depends on the element selected (see examples below).

Customizing Buttons



- 1 You can add a bitmap image to the button:

Under «Image» click the button. The «Bitmap Selector» dialog box appears.

Open a directory that contains bitmap images. Bitmap images have the extension «.bmp».

Double-click an image to display all the images.

Double-click the image you want to insert it.

If you prefer to have the button without an image: delete the entry under «Image».

- 1 You can add a label for the button under «Text».

- 2 Under «Event» select the effect of the button:

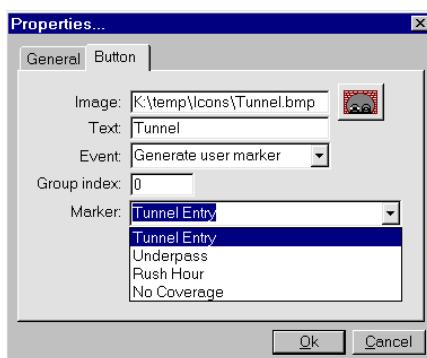
Table 26

Event	Effect
Exit measurement mode	Exits the measurement mode, exits HINDSITEPLUS
Export meas files	Exports measurement files
Generate user marker	Adds a «user marker» *

Table 26

Start measurement	Starts the measurement. If you enter «0» as the channel number, all the Masters will be started.
Stop measurement	Stops the measurement. If you enter «0» as the channel number, all the Masters will be stopped.

*If you select «Generate user marker», the Marker text box appears:



The text box contains all the user markers that have been defined (see [page 60](#)).

Select the user marker you want to allocate to the button.

- 1 Under «Group Index:» you can allocate the same group number to the buttons that belong together in terms of function.

In this way the buttons are regarded as a group. Example: If you press a «Stop» button, the corresponding «Start» button will automatically be reset.

Panels

Use panels to arrange elements that belong together. You can label the Panels and choose a color for each one.

Removing a Button, Panel or Text Panel

- 1 Click the element.

The following menu appears:

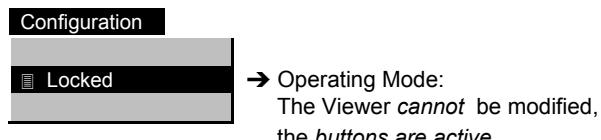
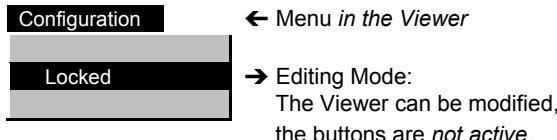


- 2 Click the «Delete this» command.

Protecting the Viewer and Releasing it for Operation

For each viewer the administrator can specify one of the two states:

Editing Mode / Operating Mode

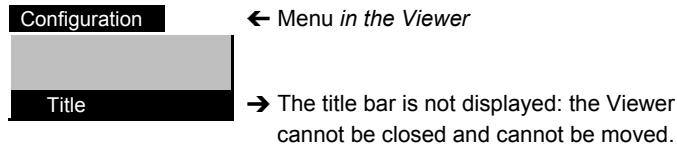


Unlocking the Viewer

Clicking the command a second time, the administrator can unlock the protection again.

Hiding the Title Bar

The administrator can prevent a viewer from being closed and moved by using the following command:



Clicking the command a second time, the administrator can unlock the protection again.

Creating Workspaces

This section describes what a Workspace is for and how to create Workspaces.

What is a Workspace for? You can save a measurement job together with the test equipment configuration and a user interface of your choice in the form of a Workspace. This allows you to prepare a complete measurement procedure with the relevant measurement data display for any given user (e.g. test driver).

A Workspace stores the following information:

- Measurement job
(the measurement job is in turn based on measurement programs and Locations with the Floor Plans / maps)
- Parameters of the test equipment configuration
- Tab sheet configuration
- Viewer configuration

During the subsequent measurement with a Workspace the following requirements must be met:

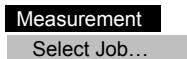
- All the underlying files must still be available
- The test equipment must be configured identically as it was specified in the test equipment configuration.

Creating a Requirement Workspace

The required measurement job is available.

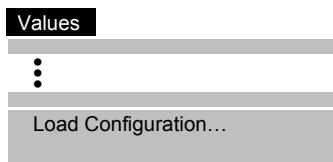
A – Loading the Measurement Job

Load the measurement job you want using the following command:



B – Loading the tab sheet configuration

1 Enter the command:



The file list box appears.

2 Open the tab sheet configuration you want.

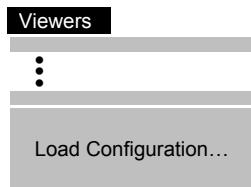


3 Click the «Show Measurement Values» button.

The selected tab sheet configuration appears on the HIND-SITEPLUS measurement interface.

C – Loading the viewer configuration

Load the viewer configuration you want using the following command:

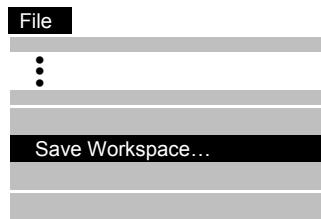


D – Saving as Workspace

To save the complete configuration consisting of measurement job, tab sheet configuration and viewer configuration as a Workspace, proceed as follows:

- 1 Enter the command:

The file list box appears.



- 2 Under «File Name:» enter a file name. Workspaces have the extension «.work».

Click «Save».

Your Workspace is saved in the opened directory.

Deleting a Workspace

Always use the following command to delete Workspaces (never use the Windows Explorer):

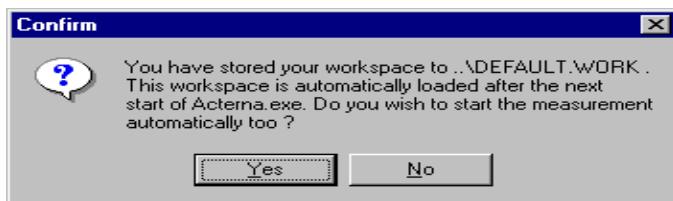


Workspace that Starts Measurement Programs Automatically

Default configuration

You can assign the file name «default.work» to *one* Workspace.

After you click «Save» the following dialog box appears:



Workspace is loaded automatically

«No»:

The default configuration is stored and subsequently *loaded automatically every time you start up HINDSITEPLUS*.

Automatic start of measurement

«Yes»:

The default configuration is stored and subsequently *loaded automatically every time you start up HINDSITEPLUS; the measurement is also started*.

Requirements

The password protection must be deactivated so that HindsitePlus can automatically start measurement programs after start-up.

Changing the «Workspace with Automatic Start»

- a Stop the measurement; create a new Workspace with the file name «default.work».
- b Stop the measurement, exit the measurement mode, delete «default.work» (File – Delete Workspace...).

Measurements



4

This chapter describes the possibilities and procedures for carrying out a measurement job.

Outdoor and indoor measurements are carried out in the same way. The examples here are taken from an indoor measurement. Topics discussed in this chapter are as follows:

- "Preparing for measurements" on page 154
- "Carrying out measurements" on page 154
- "Data export to AnalyzerPlus" on page 175

Preparing for measurements

The following requirements must be met before a measurement job can be carried out:

- "Measurement Job" must be available.
- "Locations" with the maps or the floor plans required in the "Measurement Job" must be available.
- "Workspaces",
"Tab Sheet" configurations,
"Viewers"
If they are prepared for the measurement job they should be available.
- Measuring equipment is configured:
See [Chapter 2 "Installation"](#) for setting up the hardware.
The mobile phones are connected to the corresponding COM port of the computer.
For measurements with "Workspace": The configuration of the measuring equipment used for measuring must be the same as it was when creating the "Workspace".

Carrying out measurements

Switching to measurement mode There are several possibilities for switching to measurement mode.

Workspace with automatic measurement start A workspace with the file name default.work is automatically loaded when you start up HINDSITEPLUS and the measurement is started automatically. See section "["Creating Workspaces" on page 148](#)" for more information about workspaces.

Workspace with manual measurement start A workspace with the file name default.work is automatically loaded when you start up HINDSITEPLUS.

The measurement personnel can then start the measurement.

Loading a workspace You can load a pre-prepared workspace and then start the measurement:

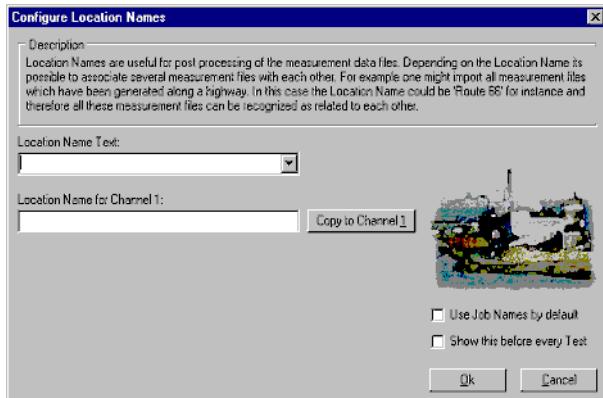
- 1 From the menu select File > Load Workspace...
The file list box appears.
- 2 Select the workspace you want.
- 3 Click Open.
The workspace is loaded. This defines:
 - the configuration of the test equipment,
 - the measurement job,
 - the tab sheet configuration,
 - the viewer configuration.
- 4 Start the measurement.

Loading a measurement job You can load a measurement job and then start the measurement:

- 1 From the menu select Measurement > Select Job...
The file list box appears.
- 2 Select the measurement job you want.
- 3 Click Open.
The HINDSITEPLUS measurement interface appears and the map or floor plan belonging to the selected measurement job is visible.
- 4 Start the measurement.

Defining the test location name You can insert a name into the measurement files to group with it the measurement files according to specific criteria, e.g. geographically, chronologically or according to mobile networks. The grouping itself is useful when evaluating in AnalyzerPlus.

- 1 Select Configuration > Test Location Name from the menu.
The command displays the following dialog box:



- 2 Enter the name in the combo box and then copy it into the channel entry fields.

All the names entered are stored for reuse and appear in alphabetical order when you open the combo box.

Copy to Channel 1

This button copies the name of the combo box into the entry field of channel 1.

OK saves your inputs and closes the dialog box. The names for the channels are entered into the newly created measurement files after each start.

The names are retained

The names for the channels are retained until you change or delete them.

Use Job Names by default

If this field is active, the measurement job's name is entered into the measurement files as "Test Location Name".

Show this before every test

If this field is active, the dialog box is displayed with each start of a measurement.

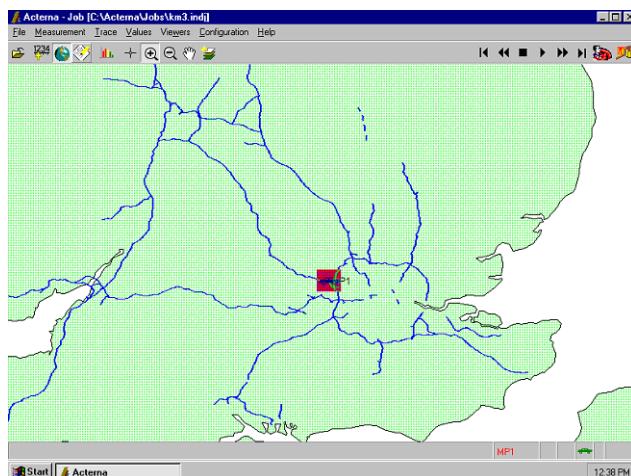
Selecting the display mode You can select the display mode before and during the measurement.

Map display



Click the Show Floor Plan button.

The map or floor plan belonging to the measurement job is displayed along with the measurement points.



This display mode appears automatically as the default when a workspace or measurement job is loaded.

Chapter 4 Measurements

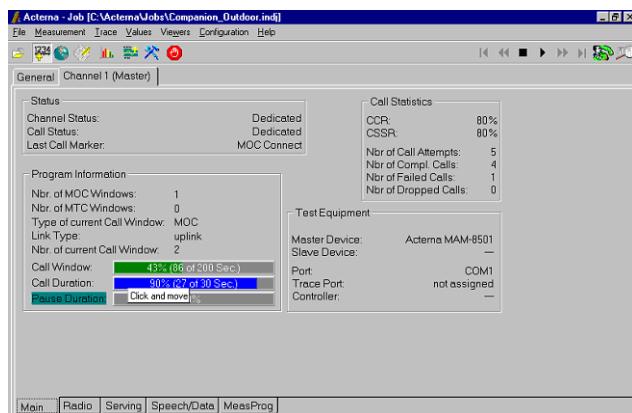
Carrying out measurements

Measurement values display



Click the Show Measurement Values button.

The tab sheets with the measurement parameters are displayed.



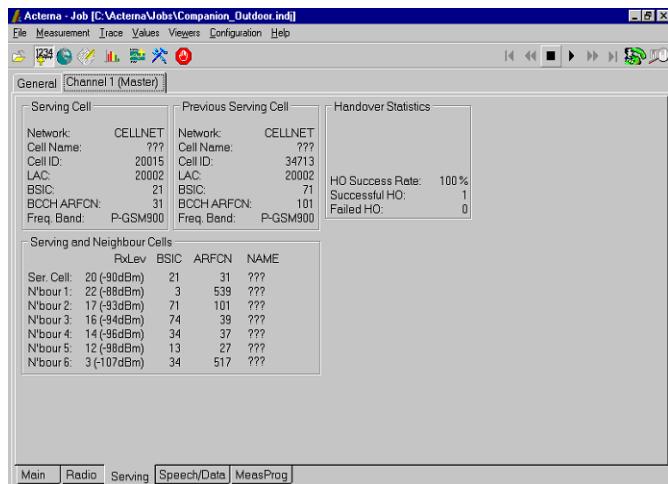
- Loading tab sheets**
- From the menu, select Values > Load Configuration...
The file list box appears.
 - Open the tab sheet configuration you want.

Default configuration

A tab sheet configuration with the file name default.ibc is automatically loaded each time you switch to measurement mode.

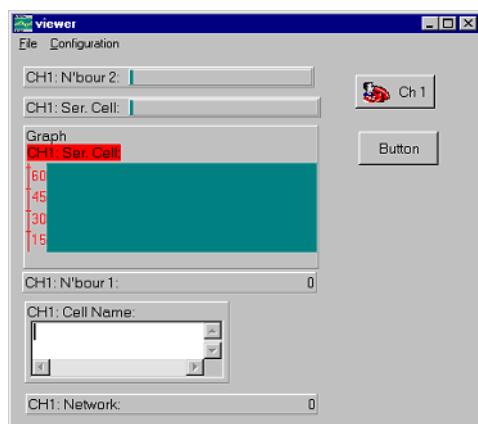


The tab sheet configuration is displayed if the Show Measurement Values button is activated:



- Loading a viewer configuration**
- From the menu, select Viewers > Load Configuration...
The file list box appears.
 - Open the viewer configuration you want.

Example:



Switching to the Prerequisites:

job editor

- To be able to switch over to the job editor, you need to stop any measurement already in progress.
- The administrator user rights are required.

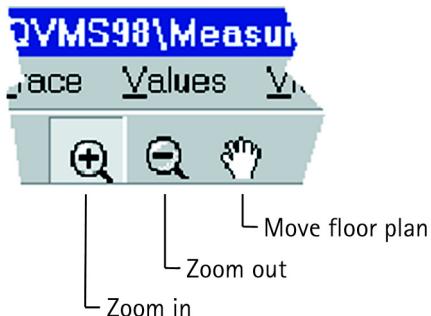


Click the «Show Job Editor» button.

The Job Editor user interface appears.

Switching to the Job Editor may be necessary if, for example, you want to use a different measurement program and therefore have to insert a new measurement point.

The zoom functions To display the excerpt you want, you have the following tools at your disposal in both the map representation and the job editor:



Starting and stopping measurements You can start and stop a measurement in any of the display modes.

Automatic measurement start When you start up HINDSITEPLUS a workspace with the file name default.work automatically starts the measurement at the first measurement point from the measurement job.

Starting the measurement manually



Click the Start Measurement button to start the measurement on the channel.

Starting / stopping the channel measurement



The Channel button is used to start or stop the channel measurement (for the channel status, see [page 164](#)).

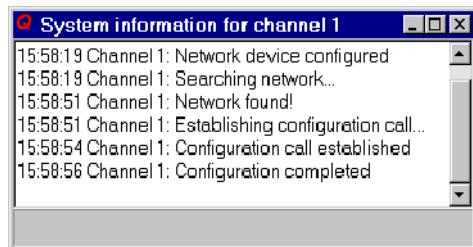
Start / stop with viewer If a viewer with buttons is available, you can start and stop measurements with this buttons.



The buttons are active only in the locked viewer.

Switching the mobile phones on and off Mobile phones with an outside power supply have to be switched on before the start of a measurement.

System information When you start and stop measurements, an information box appears:



All the events from the start of the first measurement to the completion of a measurement job are logged in the information box.

The information box disappears once a measurement has been successfully started or stopped. If an error message appears, the information box remains.

In measurement mode you can use the following command to switch the system information display on and off: **Configuration > Show System Info Windows**

Duration of a measurement A measurement will continue until you stop the measurement. This also applies in the case of an automatic measurement start.

Stopping the channel measurements



Click the Stop Measurement button to stop the measurement.

Selecting a measurement point Start position

When you load a workspace or a measurement job, HINDSITEPLUS goes to the first measurement point of the measurement job (not necessarily measurement point no. 1). The measurement point number is displayed on the status line. You can then start the measurement at that measurement point or select a different measurement point at which to start the measurement.



Wind Back button – goes back to the first measurement point.



Step Back button – goes back to the previous measurement point.



Advance button – goes to the next measurement point.



Go to Last button – goes to the last measurement point.

With the automatic measurement start HINDSITEPLUS starts the measurement at the first measurement point of the measurement job.

Once you have stopped a measurement, HINDSITEPLUS automatically moves on to the next measurement point of the measurement job. You can then start the measurement at this measurement point or select a different measurement point from which to continue the measurement.

Status displays

Measurement HINDSITEPLUS indicates the operating state for the channel. The **channel states** table shows the possible operating states.

Table 27 Channel operating states

Icon	Color	State	Meaning
	Red	Ready	Measurement over; channel on standby for next measurement
	Yellow	Starting	Preparation for start
	Green	Idle	Wait state
	Green	Dialing	Dial state: HINDSITEPLUS gives the mobile phone a dial command; the connection is set up.
	Green	Dedi- cated	Connection established; measurement in progress
	Grey	Stopping	Stop process: Measurement is stopped, connection is cleared down.
	Blue	No net- work	Mobile network: area without coverage / Possible fault: mobile phone or connecting cable

Status Line The HINDSITEPLUS status line contains important status messages:



The symbols indicate (from left to right)

- the measurement point number

- that the measurement is ok
- GPS reception
- outdoor/indoor mode

GPS reception

If the GPS signal is missing for longer than 10 s, the symbol disappears.

During the measurement

Setting user markers

Prerequisite

The user markers must be defined and present as buttons in the viewer.

Use user markers along the measurement route to identify events that are important for the evaluation of the measurement data.

The user markers are used for identifying the events during the subsequent analysis with ANALYZERPLUS and are entered at the appropriate spots on the floor plan.

Example:

When you enter an underpass, click the button provided in the viewer for that particular occasion.

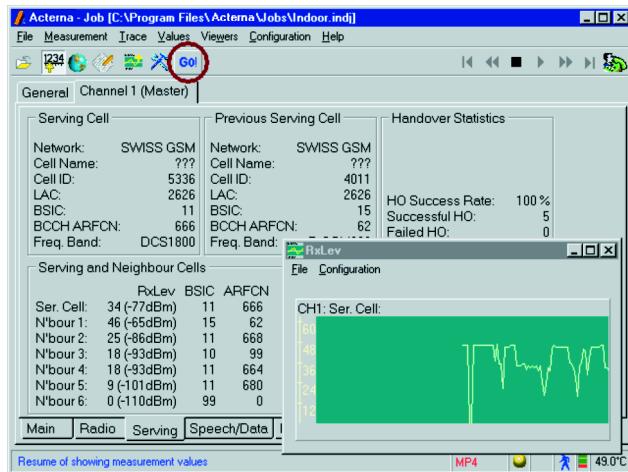
Freezing the measurement value display



To read off measurement values that are changing all the time, use the Pause button to freeze the display.

Chapter 4 Measurements

Carrying out measurements



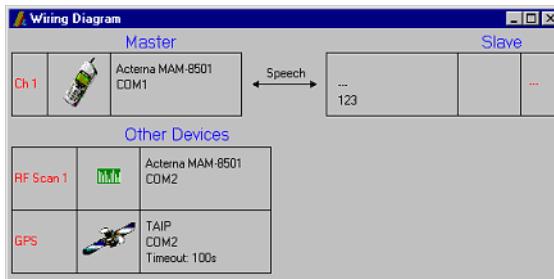
The display is frozen and the button changes to «Go!» so you can release the display again when you are ready.

Only the display is frozen; measurement value acquisition goes on.

Editing during measurement If you started up HINDSITEPLUS as an administrator, you will have several editing possibilities at your disposal during measurement:

- Modifying the tab sheet configuration
See "[Designing the View: Tab Sheets and Viewers](#)" on [page 119](#).
- Creating or modifying a viewer configuration
See section "[Designing the View: Tab Sheets and Viewers](#)" on [page 119](#).
- Specifying the trace display
See the following section.

Displaying system components In measurement mode, select Configuration > Show Wiring Diagram to see the system configuration:



Trace: Displaying measurement data along the route

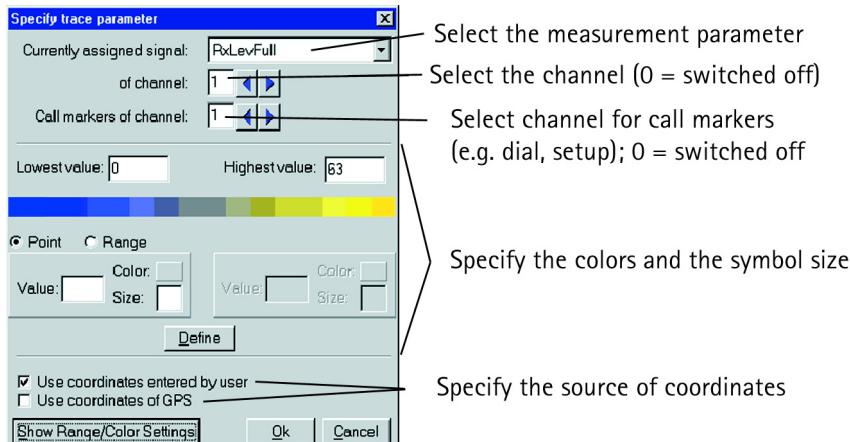
In measurement mode you have the possibility of plotting the measured data of a selected measurement parameter of one channel continuously on the map or floor plan. This allows you to monitor its changes as they occur.

Procedure

1. Defining the trace

Select Trace > Configure...

The following dialog box appears:



Use coordinates entered by user

This check box should be activated if the person measuring is to mark out the measurement route (e.g. for indoor measurements).

Use coordinates of GPS

If you are measuring outdoors and you are equipped with a GPS receiver, you can have the measurement route recorded.

Determining the trace colors and size

After HINDSITEPLUS software installation the trace representation is already predefined for many measurement parameters. There is a simple way for you to define the colors and size of the trace yourself:

1 Highest Value:

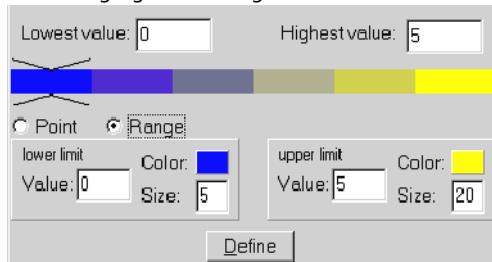
Enter here the highest value to be displayed.

2 Lowest Value:

Enter here the lowest value to be displayed. Next click a different field.

The number of bands is displayed as a colour gradient from red to green.

3 Changing the color gradient



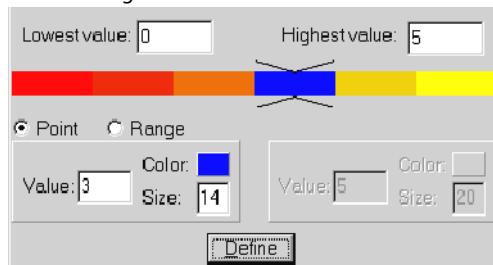
On the color bar click the band at which you want the new color gradient to start. The input fields on the left take on the current values for that band.

Activate the Range button. The input fields to the right become available and are used to define the upper limit for the colour gradient.

You can define the highest and lowest bands for the color gradient in terms of value, color, and size.

Click Define. Your inputs are accepted and the representation is updated.

4 Defining individual band



On the color bar click the band you want to redefine. The input fields on the left take on the current values for that band.

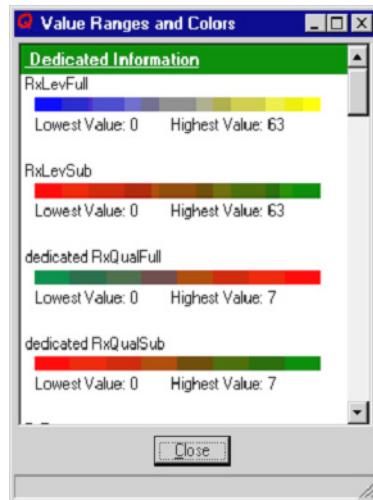
Activate the Range button. Define the measurement value, color and size [pixels].

Click Define. Your inputs are accepted and the representation is updated.

Click OK once the trace definition matches your requirements. It will remain available even after you restart HINDSITEPLUS.

Overview of trace definitions

Click the Show Range/Color Settings button to display a freely positionable dialog box:

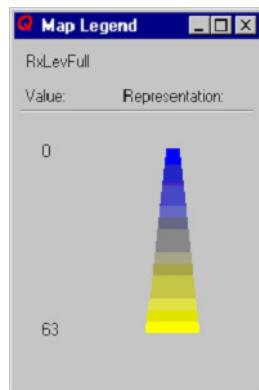


If you double-click a measurement value, its definition will be transferred to the trace definition box.

2. Displaying the legend

Select Trace > Show Legend.

The freely positionable legend appears:



The legend tells you which measurement parameter was selected and how the measurement values are displayed on the trace.

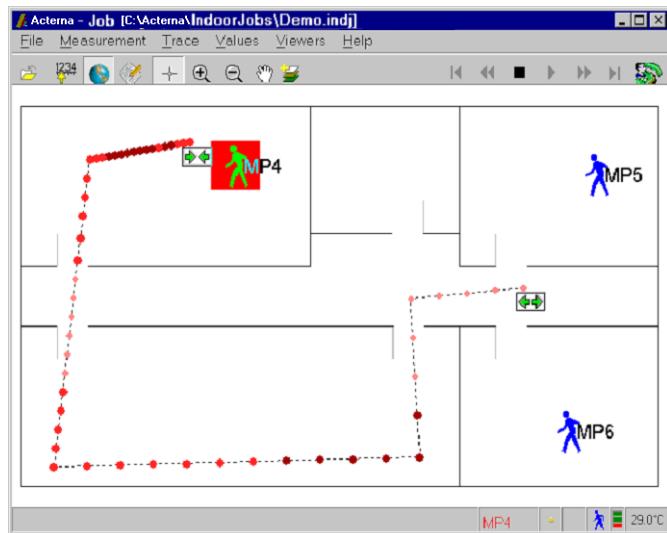
3. Displaying the trace

- 1 Click  to display the map or floor plan.
- 2 Start a measurement.
- 3 For measurements with GPS:
As soon as measured values for the chosen measurement parameter are available and the coordinates change, the trace will appear on the map.
For measurements without GPS (e.g. indoor):
If measurement values are available for the selected measurement parameter and you stop the measurement, the trace will appear between the previous and the next measurement point.

Marking the measurement route

You can set intermediate points used to mark out the measurement route:

- 1 Use Coordinates Entered by User - This check box must be activated (see [page 167](#)).
- 2 Activate the «Support Point Set Tool» button. 
- 3 Set intermediate points by clicking the floor plan for example with every change of direction. The coordinates for the intermediate points are stored in the measurement file.



Moving the map automatically

Select Configuration > Automatic Map Recenter.

The map or floor plan is shifted automatically: As soon as the trace reaches the edge of the map window, the map is positioned in such a way that the last trace point is located in the middle of the window.

Removing the trace

Select Trace > Clear.

Displaying additional layers In the map display mode you can place additional layers over the map or floor plan. These layers may contain additional information such as waterways, town maps or furnishings (in the case of indoor premises).

Creating additional layers

Before the start of a measurement job you can create your own layers and store them in a directory. File names for layers have the extension «.tab». To create a layer use programs such as MapInfo Professional™.

You can also use existing map material such as MapInfo or material from other suppliers.

Loading an additional layer

- 1 Click the Add Layers button.
The file list box appears.
- 2 Select the file you want.
- 3 Load the file.

Setting up connections manually To set up a connection with a particular point in time, you can use the «User Control Mode».

Prerequisite: pure MOC mode

The system is in measurement mode with an MOC measurement program. Select Configuration > User Control Mode.

The following dialog box appears:



You can now set up and clear down the connections at the moment you want.

Tip: If you do not want the measurement program to set up any connections prior to the manual commands, enter a large value for the 1st Call Setup Delay parameter.

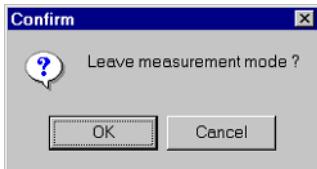
Exiting the measurement mode You need to stop a measurement in progress before you can exit the measurement mode.

mode

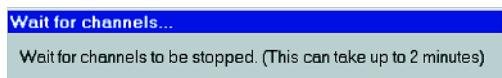


To end the measurement mode, select the Abort Measurement button or File > Close.

The following dialog box appears:



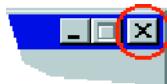
Your input OK is followed by the message:



HINDSITEPLUS returns you to the main window.

In special cases

In some special system states «Abort Measurement» cannot be executed. Use the Close button in such cases.



Data export to AnalyzerPlus

This section explains how the recorded data is transmitted to AnalyzerPlus.

Basic principles HindsitePlus stores the recorded measurement data in measurement files on the internal hard disk.

The measurement files are given file names in accordance with a defined structure (for name allocation see "[Recorded data on page 24](#)"). The measurement files can be identified precisely on the basis of their name.

Files required

AnalyzerPlus always needs the following files to carry out the evaluation:

- the measurement files

Plus, in the case of indoor measurements:

- the measurement jobs used
- the underlying location libraries

To relieve the user's workload, HINDSITEPLUS has export functions which automatically compile the files required.

Where should the files be stored on AnalyzerPlus? File import on AnalyzerPlus is simplest if all the measurement files are stored in the same directory in HindsitePlus

However, frequent export operations can result in an unmanageable flood of data.

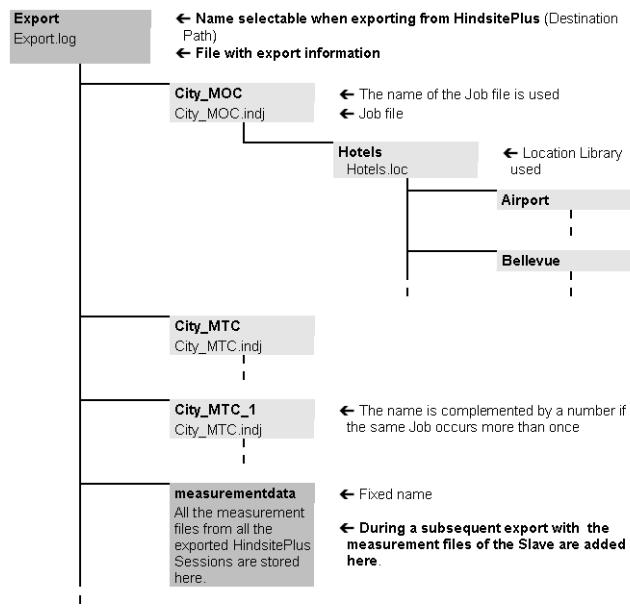
Chapter 4 Measurements

Data export to AnalyzerPlus

If you are conducting measurements over long periods of time or with many HindsightPlus, we recommend splitting up the data.
Examples:

- Destination directories per month
- Destination directories per region

Data structure during export from HindsightPlus During export, sub-directories are created automatically in the selected destination directory and the files are then stored there. You can also export job files and locations as required. The directory structure is created as follows:

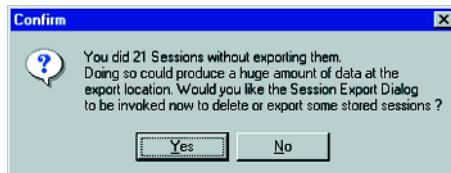


Exporting from HindsitePlus

Restriction to 20 sessions

With HindsitePlus the number of sessions that have not yet been exported is monitored in order to limit the volume of data on the internal hard disk. A session consists of all the measurements from the moment you enter the measurement mode to the moment you exit it.

As soon as there are more than 20 sessions ready for export, the following dialog box will appear when you start up HINDSITEPLUS:



Select Yes to call up the Export dialog box, which allows you to export or delete sessions.

Push No to simply add another session.

Sessions are overwritten



Sessions may be overwritten

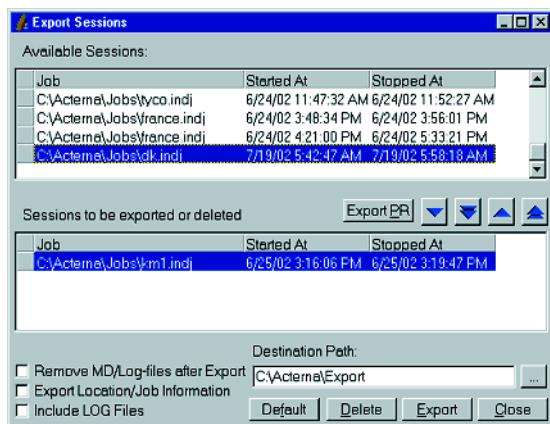
Special case: Workspace with automatic measurement start.

Here the number of sessions not yet exported is limited to 20. The oldest session in each case is deleted since the automatic start of measurement takes priority; therefore the dialog box above does not appear.

Exporting data Starting the export function

In HINDSITEPLUS, select File > Export Measurement Data.

The Export dialog box appears:



The Available Sessions box lists all the sessions that have not yet been exported.

Session

Each line corresponds to a session. A session comprises all the measurements from the moment you access the measurement mode until you exit. Each time you start a measurement a new measurement file is created.

Selecting the sessions to be exported

Move the sessions you wish to export or delete to the window entitled "Sessions to be exported or deleted".



The meaning of the keys from the left to the right:

- Move All Sessions back – Moves all the sessions to the upper field.
- Move Selected Sessions back – Moves the selected sessions to the upper field.
- Move All Sessions to Export List – Moves all the sessions to the export field.

- Move Selected Sessions to Export List – Moves the selected sessions to the export field.



Measurement data (sessions) can only be exported once.

This ensures that a clear overview of the measurement data is retained and prevents any corruption of the evaluations.

Selecting the destination directory



A push on this button displays the following dialog box:



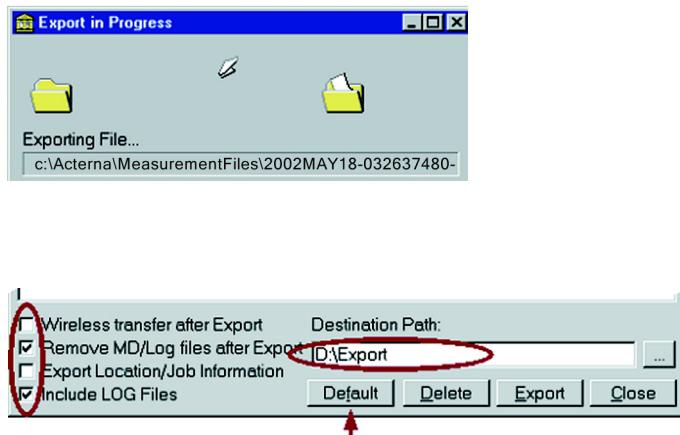
Use this button to create a new directory.

Starting the export



Use this button to start exporting the data from HindsitePlus.

The export process is indicated as follows:



Click the "Default" button to save the check box settings and the target directory.

Deleting sessions In the Export dialog box you can also delete sessions without exporting them:

- 1 Select the sessions you want to delete.
- 2 Click the "Delete" button.

Exporting for a problem report If you recorded sessions in which problems occurred, you can export them separately. The relevant data is automatically exported along with the sessions so that the result is suitable for a problem report.

Procedure

1 Call up the Export dialog box and select a session during which problems occurred.

2 **Export PR** Click the "Export PR" button.

The following dialog box appears:



3 Narrow down the time range if you know that the problem only occurred at a particular time.

From field: The session start time is entered here automatically.

To field: The session end time is entered here automatically. To change the date or time, click the point you want to change. Next, press the small arrow keys to increase or reduce the value.

4 Channel field: Enter here the channels concerned if you know that only certain channels caused problems.

5 Push OK to initiate the data export.

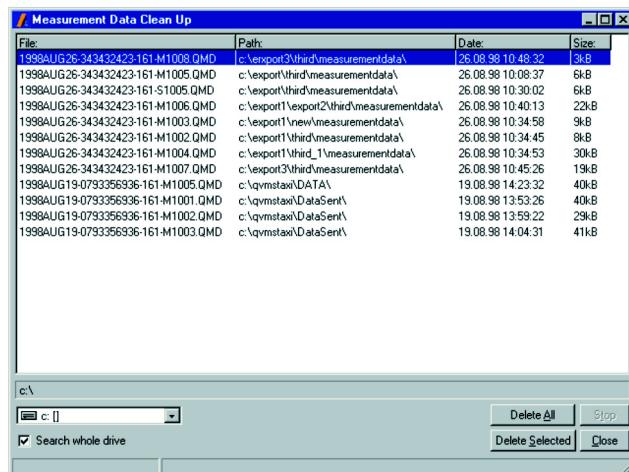
Result: A subdirectory with the same name as the session selected is created in the target directory. All the files involved are stored in that subdirectory.

Deleting old data If you do not have the measurement files on HindsitePlus deleted during export, they will start to accumulate and take up space on the hard disks.

HINDSITEPLUS provides a function for locating measurement files. Follow the procedure:

Select File > Clean Up Measurement Data

As a result, the following dialog box appears:



Search options

Activate the **Search Whole Drive** button to have HindsitePlus search for measurement files on the whole selected drive.

Deactivate the button to have HindsitePlus search for measurement files in the default directory.

Delete options

Delete All

Deletes all the measurement files found.

Delete Selected

Deletes the selected measurement files.

Aborting the search process

Stop

Stops the current search process (e.g. if you wish to abort the complete search of a large hard disk).

Additional Features



5

This chapter describes two particular features of HindsitePlus which are as follows:

- ["RF Scan" on page 184](#)
- ["Engineering Features" on page 197](#)

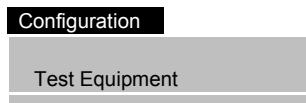
RF Scan

The «RF Scan» option is used to record additionally the activity of the 124 GSM900 and the 373 GSM1800 channels with one or two RF Scan mobile phones.

This section describes the configuration, operation and data acquisition.

Configuring the Test Equipment

Use the following command to open the configuration of the test equipment:



This user interface appears:

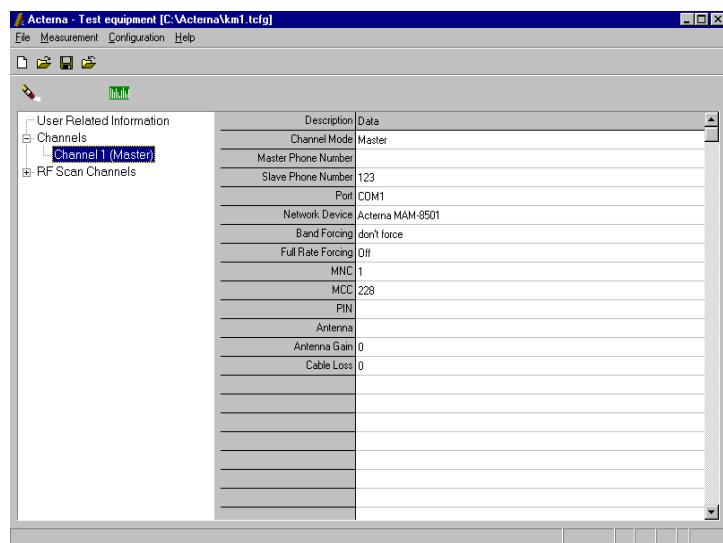


Figure 52 Configuration of the Test Equipment

General User Instructions

The left-hand window uses a tree view.

Click  to open the relevant subordinate terms. On the right the corresponding entry fields appear.

Selecting RF Scan Channels



This button is used to add an RF Scan channel. You can specify one or two RF Scan channels (e.g. one for GSM 900, the other for GSM 1800) if the RF Scan option has been acquired.



The «Delete Channel» button is used to delete the selected channel.

Input

When you click certain entry fields they display a list box:

Puri	LUMO
Network Device	Motorola Dual Band
PIN	Motorola Timeport
Antenna	Sagem OT35
Antenna Gain	Sagem OT75
Cable Loss	Sagem OT95
	Sagem OT96
	GSM 07.07 Handset
	Acterna MAM-8501

Several entry fields can be edited in the usual way:

PIN	
Antenna	Type
Antenna Gain	

Entries for Each RF Scan Channel

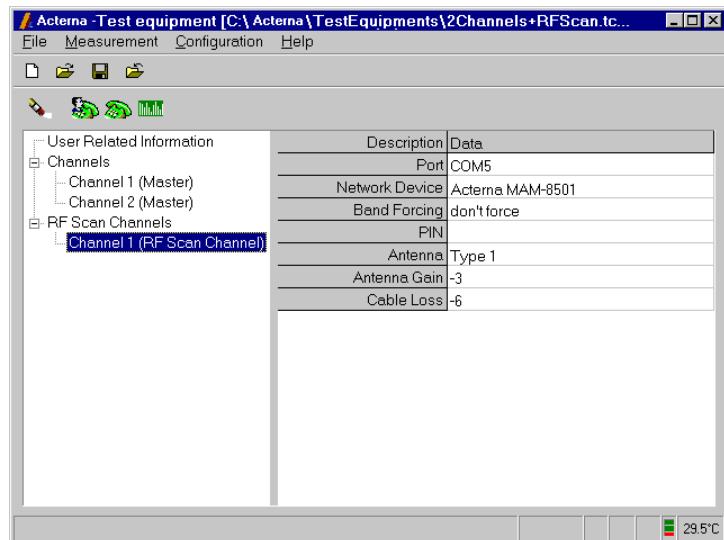


Figure 53 Entry Fields for an RF Scan Channel

Port

Here you specify the COM port to which the RF Scan mobile phone is to be connected (see Register 2 for ports and connectors).



With / without power supply

Network Device

The choice available is displayed here.

PIN

Enter the PIN here if you are using an RF Scan mobile phone with a SIM card protected by a PIN.

Table 28

Antenna	Antenna designation
Antenna Gain	Antenna gain
Cable Loss	Antenna cable loss

These three entries are additional information and are written in the «Header» of the measurement file.

Connecting the RF Scan Mobile Phone Connect the RF Scan mobile phones to the COM ports you configured for that purpose.

Measuring The operation is basically the same as for measurements without RF Scan. The RF Scan-specific possibilities and procedures are described below.



Requirement: *Operation with SIM card*

On COM Ports 1, 2, 4

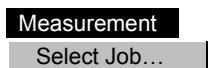
RF Scan mobile phones connected to these ports *must be switched on and off manually*. Depending on the operating mode you will need to switch the RF Scan mobile phones on again before every measurement start.

Starting the Measurement

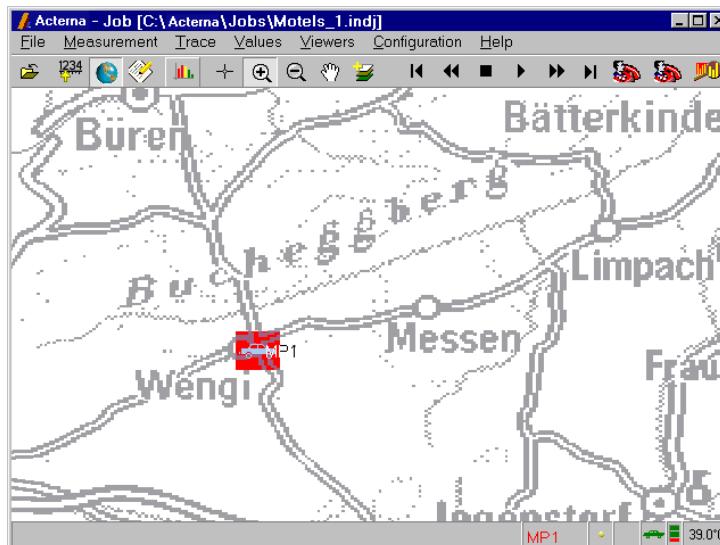
Prerequisite

A «measurement job» has to be prepared that matches the configuration used.

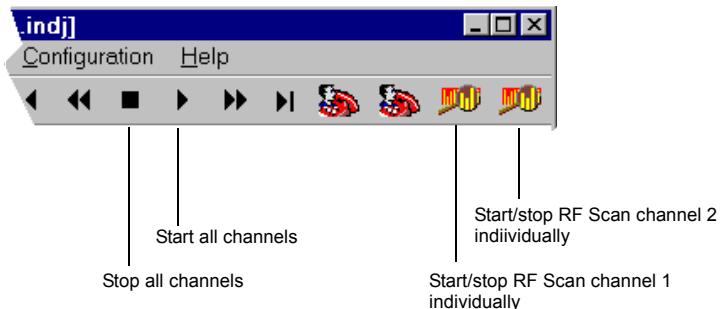
Set HindsitePlus to measurement mode by loading a «measurement job»:



The HindsitePlus measurement interface appears. In the case of an indoor measurement the floor plan appears; in the case of an outdoor measurement, the map:



The top right-hand corner contains the buttons for RF Scan. If one RF Scan channel has been configured, one button will appear; if both were configured, two will appear.



Operating State Indication

HINDSITEPLUS indicates the operating state for each RF Scan channel:

Table 29 Operating States of an RF Scan Channel

Icon	Colour	Meaning
	Red	Standby
	Blue	RF Scan measurement in progress
	Grey	During the start and stop procedure, until the end state is reached (approx. 30 s)



Check

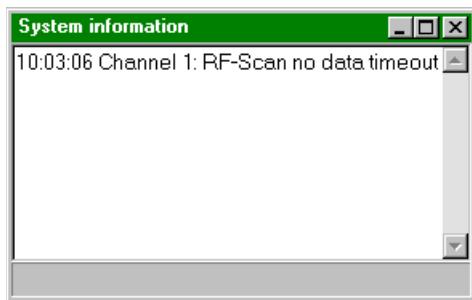
In the case of RF Scan mobile phones that are *not* switched on and off automatically:

Check *before the start of every measurement* to make sure the mobile phones are switched on.

RF Scan Messages

No RF Scan Data

If HindsitePlus does not receive any RF Scan data for around 30 s, an information window appears with the following warning (the other measurements continue to run):



If so, check the following points:

- Are all the cable connections OK?
- Is the RF Scan mobile phone running without an external power supply and is the battery discharged?

Defining Display Filters

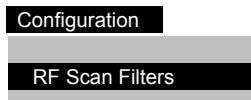
You have the possibility of displaying the measurement results of the RF Scan processes. But first you need to define the display. Display filters are used to create a clearly structured, easily legible display. You can:

- display only those channels you are interested in
- color-code the displayed channels, in which case a legend is created automatically.

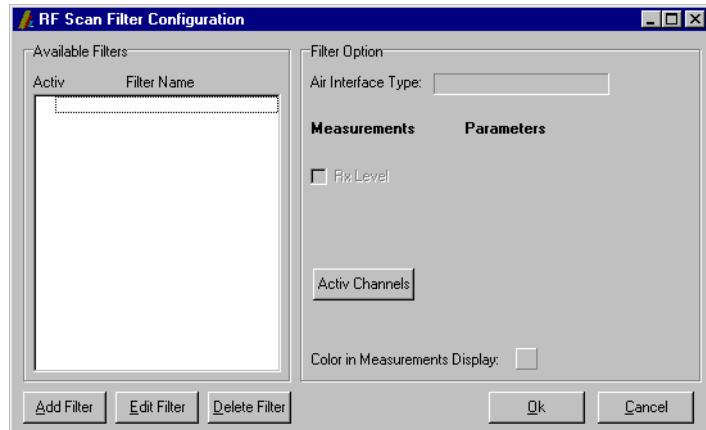
Chapter 5 Additional Features

RF Scan

With RF Scan measurement running, enter the command:



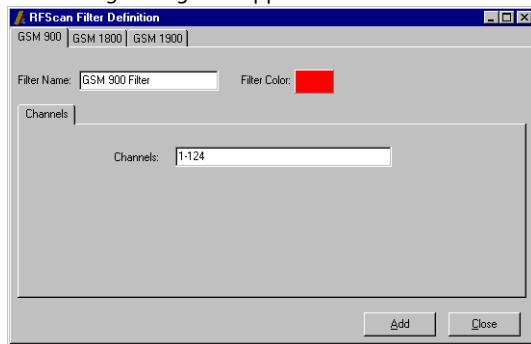
The following dialog box appears:



To define an RF Scan display filter, proceed as follows:

- 1 Select Add Filter.

The following dialog box appears:



- 2 Select the network type, e.g. «GSM 900».

- 3 Name:
Give the filter a name. This name will be used in the legend.
- 4 Frequencies:
Enter the channel numbers of those channels you want to have displayed:
To enter ranges:use hyphens
To separate groups:use commas
Channel numbers that are outside the possible range will simply be ignored.
- 5 Color:
Select the color in which the channels defined above are to be displayed.

Add To List

- 6 Click this button to save the new display filter. The filter name appears in the «Available Filters» window (left).
If required, create other filters with other display criteria. These filters will still be available in subsequent sessions, too.

Filter effect

These filters only control the display; the data acquisition is not affected!

You can activate several filters at the same time, thereby combining the filter effects.

Activating Display Filters

To activate the filters, check the boxes by the filter names.

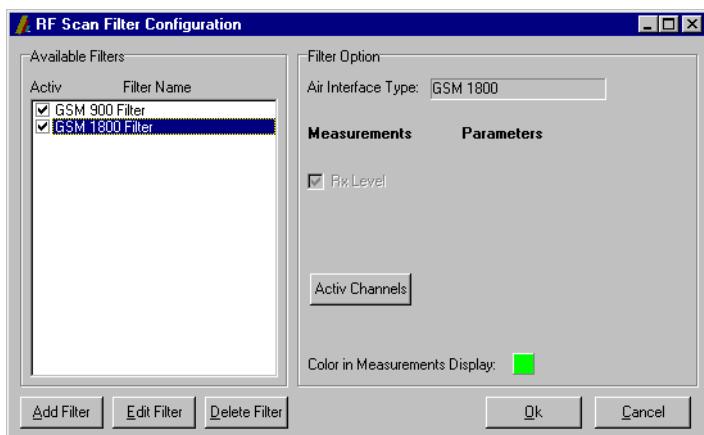


Figure 54 Defining and Activating RF Scan Display Filters

Changing Display Filters

Select the filter you want to change. Its current settings will appear. Enter the new settings.

Apply

Click the «Apply» button to save the new definition.



To delete filters, select them, then click this button.

Displaying the RF Scan Window

Requirement

You need to define and activate one (or several) suitable display filter(s).



Click this button. The «RF Scan» window appears and continually shows the measurement results of the RF Scan process:

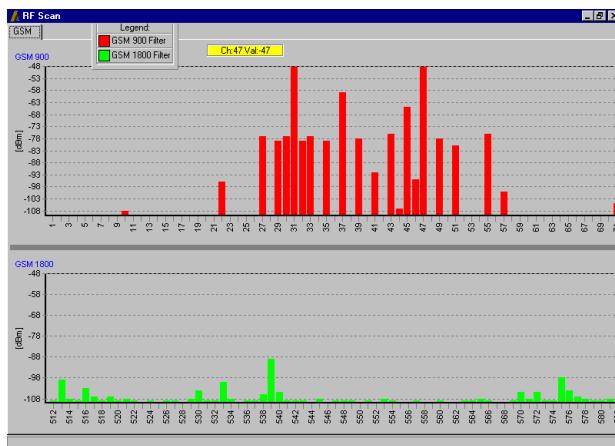


Figure 55 RF Scan Window

The channels can only be displayed if RF Scan data is available. Only those channels that are specified by the filter inputs are displayed.

The legend can be moved around. It indicates the name and color codes used for the active filters.

Stopping the Measurement



Click the «Stop Measurement» button to stop all the channels.



Stopping an RF Scan Channel Individually

Click the «RF Scan Channel X» button to stop the channel in question.

Data Acquisition RF Scan measurements are carried out in addition to the standard measurements.

With standard measurements one measurement file is created for each measurement channel with each measurement. This means that between the start and stop of a measurement a minimum of one and a maximum of four measurement files are created. If at the same time you are also measuring with GSM and DCS mobile phones, GSM measurement files and DCS measurement files are created in parallel.

The additional data collected as a result of RF Scan measurements is written into the measurement files to the standard measurements, specifically:

Table 30

RF Scan Data	Measurement files
from GSM900	→ in all GSM900 measurement files
from GSM1800	→ in all GSM1800 measurement files
from GSM1900	→ in all GSM1900 measurement files

Table 30

RF Scan Data	Measurement files
for dual band measurement	→ in all GSM900 measurement files + in all GSM1800 measurement files + in all Dual Band measurement files

Engineering Features

This option lets you control the response of the mobile phones in the mobile network, allowing you to locate and analyze incidents more effectively.

This section describes the mode of operation and how it influences the mobile phones.

Requirements Availability of the «Engineering Features» is subject to the following requirements:

- Measurements conducted with «Caesium 8501» mobile phones.
- This option is always enabled with «HindsitePlus».

Operation General

The «Engineering Features» can be called up *in measurement mode* using the following button:



Figure 56 Button for Engineering Features

A dialog box will then appear with an index card for each active channel:

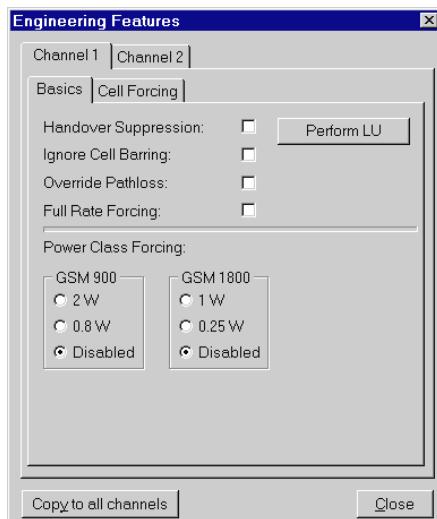


Figure 57 Engineering Features after the Start of Measurement

Each channel has two sub-tabs with user-modifiable parameters.

Copy to all channels

If you have several channels at your disposal and wish to have the same settings for all of them, you can specify the parameters for one channel and then copy them to the other channels using the «Copy to all Channels» button.

The settings will only remain stored for as long as a measurement lasts.

Take your time with the operations

Do not modify several parameters in quick succession.

Mobile phone and the network need a certain amount of time to execute the commands.

An exclamation mark is displayed for as long as the standard settings are modified by the Engineering Features:

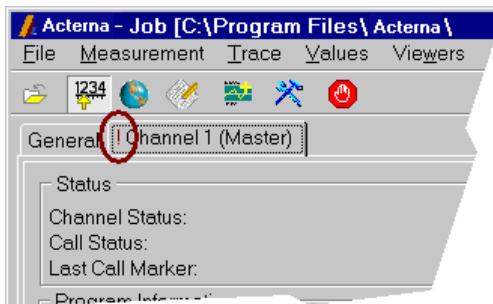


Figure 58 Indication on the «Tab Sheets»



The exclamation mark can also be located at the beginning of the line.

Figure 59 Indication on Mobile Phones



Use with caution
Use the «Engineering Features» with caution as they affect the response of the mobile phone in the network and can distort measurement results.

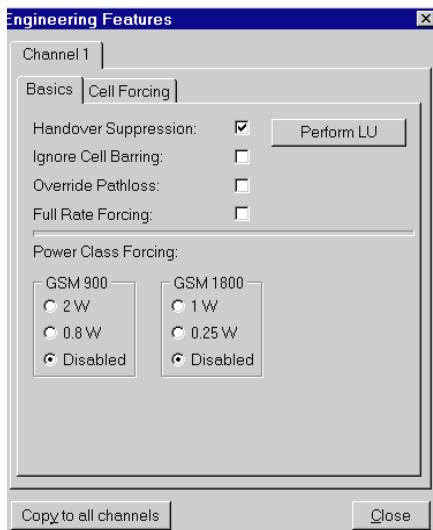


HindsitePlus Info

For this reason the activation and deactivation of «Engineering Features» is recorded in the measurement file as an «Info».

The individual functions are explained below. You can combine the functions as required.

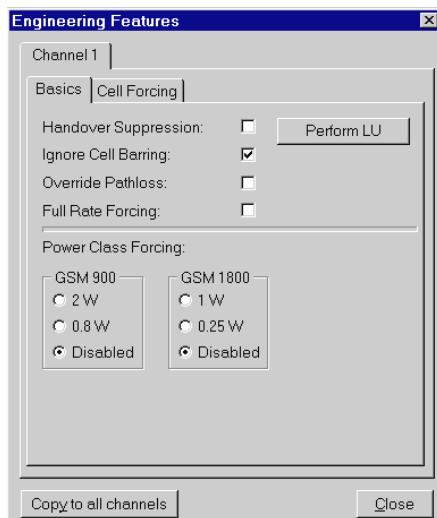
Suppressing the Handover



Handover Suppression

If you activate this function, the mobile phone will no longer send neighboring cell information in the «Measurement Reports», which means the mobile network will not initiate a handover. The connection remains tied to the Serving Cell and may end through a break.

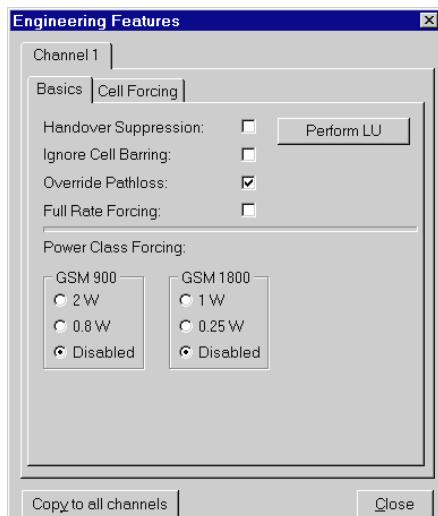
Ignoring «Cell Barring Access List»



Ignore Cell Barring

If you activate this function, the mobile phone will ignore the «Cell Bar Access bit» in the RACH control parameters and will therefore be able to communicate via cells which are normally not accessible.

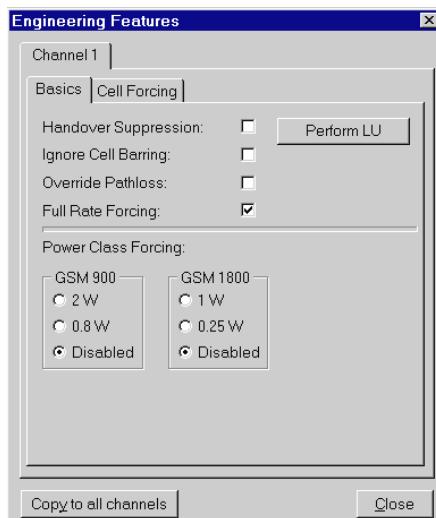
Suppressing Selection / Reselection



Override Path Loss

If you activate this function, the selection and reselection criteria that do not allow a negative «Path Loss» (C1 criterion) are eliminated. The mobile phone will therefore consider a cell as Serving Cell, regardless of the receiving level and the cell selection parameters.

Forcing Full Rate Mode



Full Rate Forcing

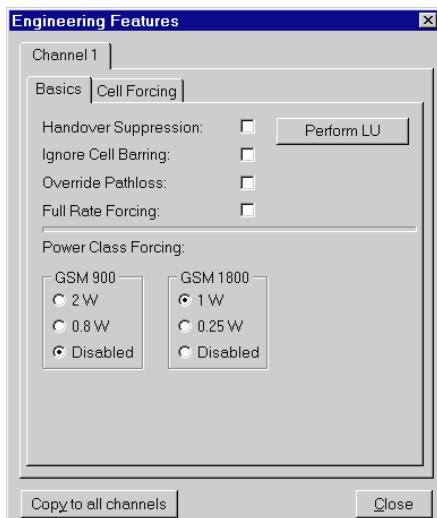
If you activate this function, the mobile phone will switch from EFR to FR mode.

Table 31

The FR mode begins:	with the next call («FR Forcing» occurs in idle mode)
---------------------	--

The FR mode ends:	when the measurement is stopped or with the next call once you have deactivated «FR Forcing».
-------------------	--

Changing the Power Class



Power Class Forcing

Specifies the mobile phone power class for GSM 900 and GSM 1800.

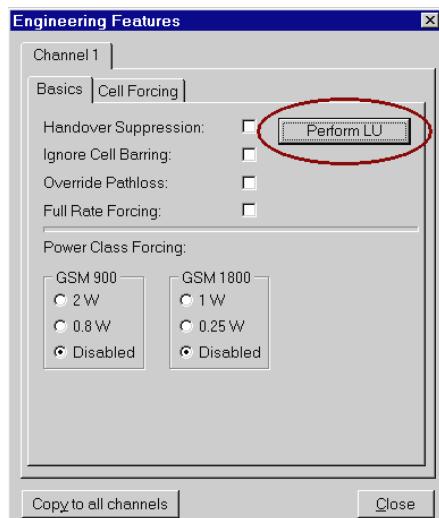
Table 32

GSM 900		GSM 1800	
2 W	= 33 dBm	1 W	= 30 dBm
0.8 W	= 29 dBm	0.25 W	= 24 dBm

- **Disabled**

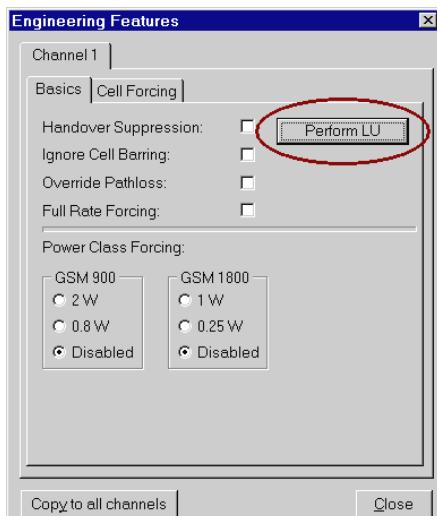
the mobile phone's standard power class is used.

Triggering a Location Update



This button allows you to prompt the mobile phone to initiate a «Location Update».

Forcing the Use of a Cell



On the «Cell Forcing» sub-tab you can allocate a particular cell to the mobile phone, which it should then use and retain.

Handover

Allocating a different cell *during a call* will trigger a handover.
This command overrides the «Handover Suppression» function.

The left-hand field indicates the status of the measurement channel. The neighboring cells available during the measurement are indicated in the bottom section.

Procedure

- 1 Select the mode you want to influence
 - Idle mode
 - Dedicated mode
 - Both modes
- 2 Use a neighboring cell

During the measurement click the button of the neighboring cell (Neighbour) to be used.

or

- 1 Allocate any cell of your choice

In the field «Force any Cell», you can make entries before and during a measurement.

In the combo box enter the required BCCH.

Force Now!

Click the «Force Now!» button.

Display

If you have allocated a BCCH, it will be displayed in color for the mode in question (in the figure above, it is circled in).

Deactivating «Cell Forcing»

Procedure

- 1 Select the mode for which you want to deactivate «Cell Forcing»**
 - Idle Mode
 - Dedicated Mode
 - Both modes

Deactivate

- 2 Click the «Deactivate» button**

AnalyzerPlus Software

6

This chapter describes the AnalyzerPlus software which is used for the analysis of measurement data. Topics discussed in this chapter are as follows:

- "Quick-Start" on page 210
- "Map in Detail" on page 237
- "Trace" on page 251
- "Browser in Detail" on page 259
- "Export" on page 263

Quick-Start

AnalyzerPlus is an exceptionally powerful and versatile tool for the rapid analysis of HindsitePlus measurement data. It is particularly useful for the analysis of individual measurement files and is equally well suited for analyzing geographic areas with large volumes of data.

This section shows you how to quickly obtain your own analysis results.

System Requirements AnalyzerPlus runs on PCs / Notebook PCs with:

Windows NT 4.0, Service Pack as per Release Notes – AnalyzerPlus.

MapX is installed at the same time so measured values can be displayed on geographic maps.

Operation is subject to the following requirements:

- Dongle (protection module) and the appropriate «key»

Note Concerning Operation

AnalyzerPlus Release 2.0 was developed according to the latest findings and with a view towards future expansions.

Options

AnalyzerPlus is available with some options, namely:

- Light Version:
Only one measurement file can be opened with map at any given time.
- Multi File Selection:
A large number of measurement files can be opened simultaneously with map.
- Technology:
Analyzing measurement data from different mobile network types (e.g. GSM, CDMA, ...) is possible.

Options may be used in accordance with the licences acquired.

1. Starting AnalyzerPlus



Start AnalyzerPlus.

The main window and the control panel appear:

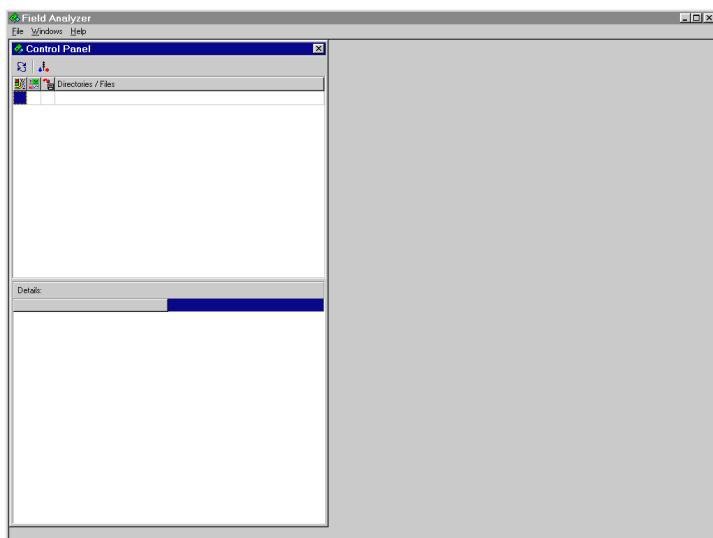


Figure 60 AnalyzerPlus with an empty control panel

The control panel is used for the following functions:

- Selecting the data to be displayed
- Selecting the display tool
- Exporting data

Measurement files will appear in the control panel as soon as you have set the path to at least one directory containing measurement files.

- 2. Setting the Path to the Measurement Files** You need to specify the directories that contain the measurement files you require for the analysis. The corresponding command is located in the context menu:

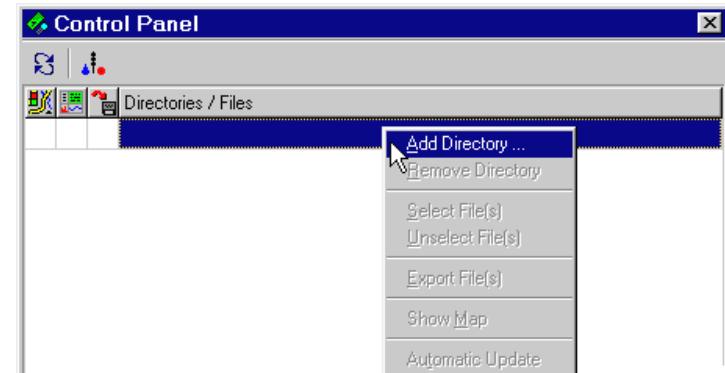


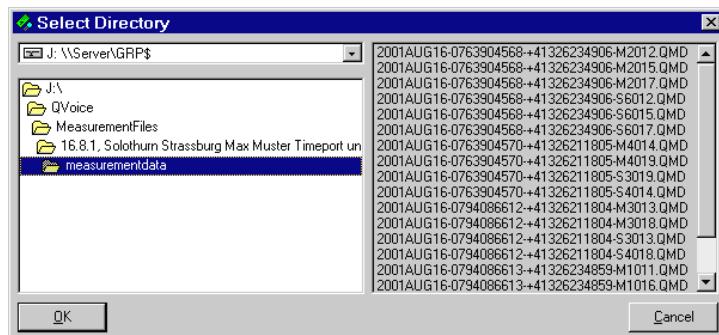
Figure 61 Control panel with context menu

To call up the context menu

- a Click any table field using the *right mouse button*.
- b Click any table field *for a whole second* using the left mouse button.

Setting the directory path(s)

The «Add Directory...» command calls up a dialog box:



Left window

Here open a path to the directory with the HindsitePlus measurement files you are interested in.

Right window

If the directory you have opened contains HindsitePlus measurement files, the files will be displayed here.

Click the «OK» button; the path and measurement files are now displayed in the control panel:

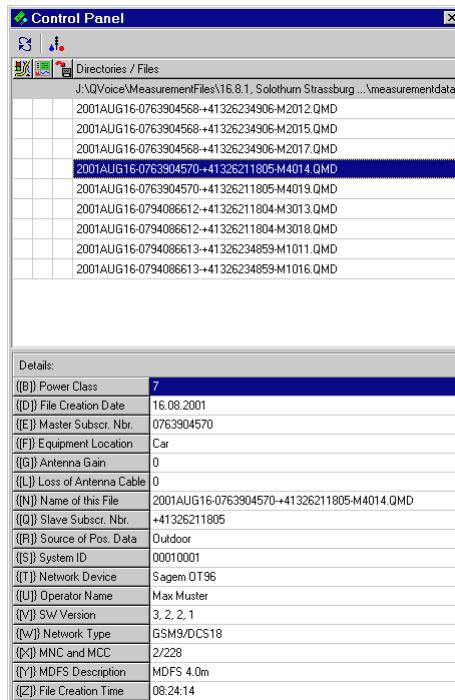
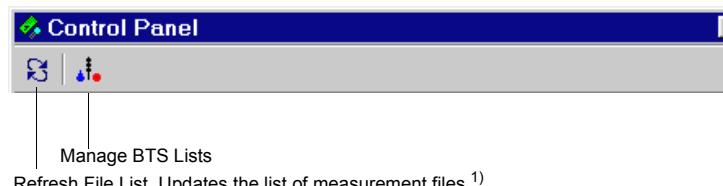


Figure 62 Control panel with measurement files

Details:

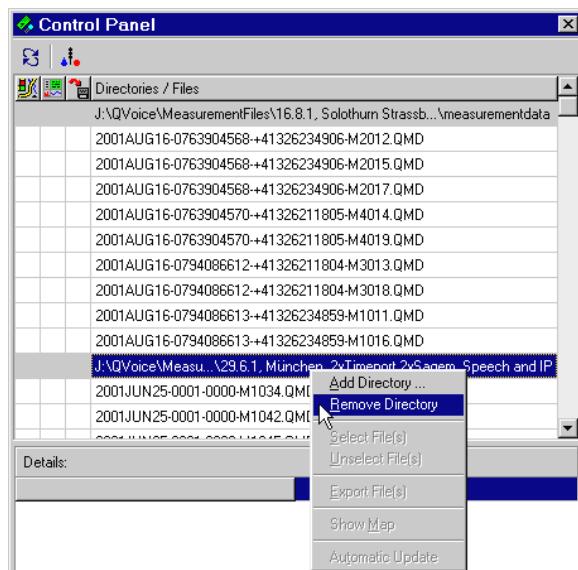
Displays the data relating to the measurement file selected above.

Control Panel Toolbar



- 1) The list is automatically refreshed every minute.

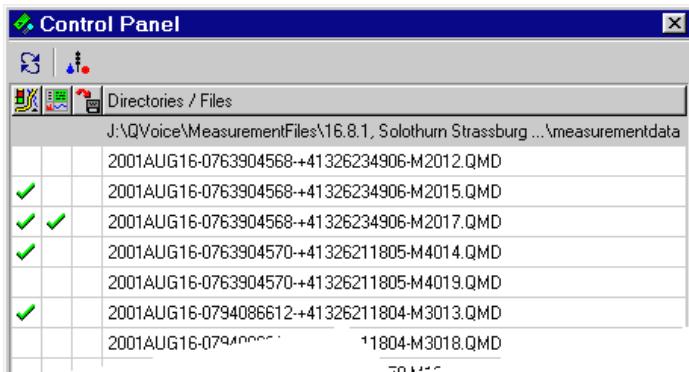
Deleting directory paths



- 1 Right-click *the path you want to delete*.
- 2 Give the command «Remove Directory».

3. Selecting Tools

Display Tools



Export

Exports the required data in ASCII format.
(see page 74)

Browser

Detailed display of recorded data in the form of text and charts.
Only one measurement file can be selected at any given time.

Map

Map representation of the measured values.
With the «Multi File Selection» option: possibility of multiple selections.

Selecting / Deselecting Measurement Files

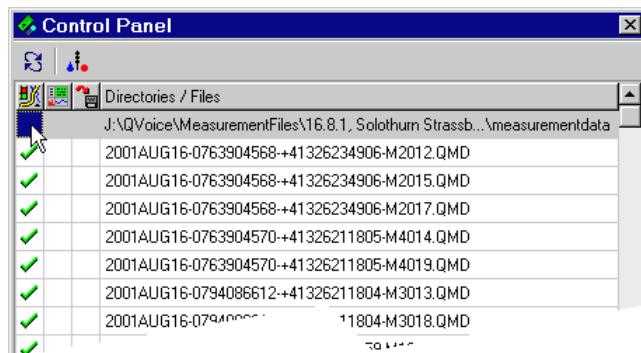
a Using a double-click

Double-click the measurement file *in the tool column you want.*

b Using the context menu

Right-click the measurement file *in the tool column you want.*
The context menu appears. Use the command «Select File(s)».

c With map: All the files of a directory¹⁾



This process may take a while.

a With map: Specific files¹⁾

Multiple selections are possible using Shift + click or Ctrl + click in the usual way with Windows.

1) Condition: «Multi File Selection» option.

Handling Windows

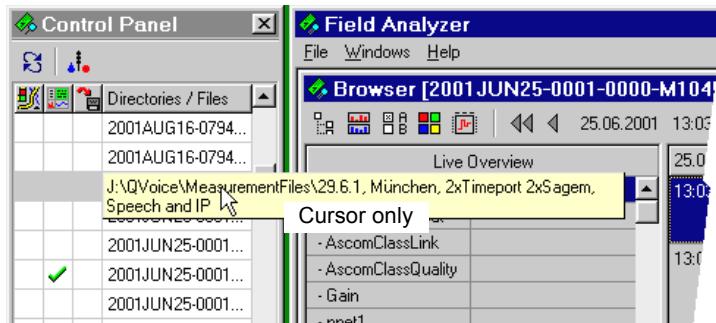
When you select a measurement file the tool you want is started: browser or map. Both tools consist of windows within the «Analyzer-Plus» main window.

Table 33

The control panel is always «on top» and can be moved as required.

If the control panel covers up too much, you have the following possibilities:

- a Reducing the control panel

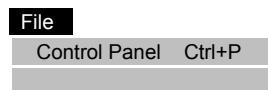


Truncated path names and measurement file names can be displayed in full by moving the mouse pointer onto them.

a Closing the control panel



To re-display the control panel, use the «AnalyzerPlus» command:



Browser

The browser loads the selected measurement file. The duration of the loading process depends on the file size and may take a few seconds.

You can then use the various browser tools to display the data of the measurement file you are interested in:

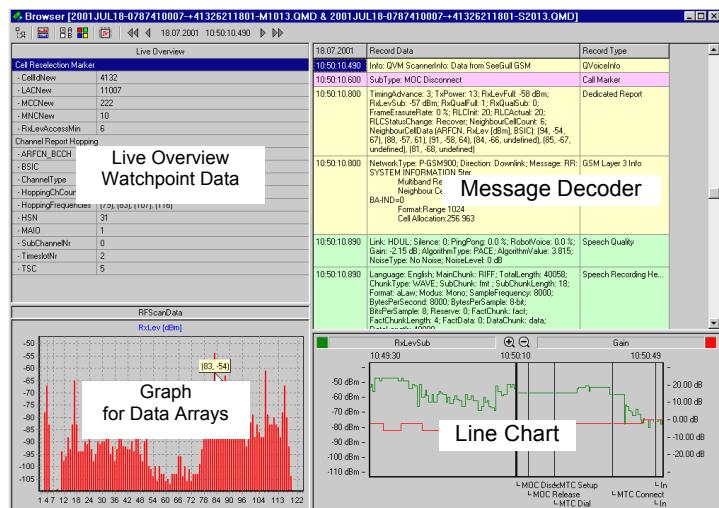
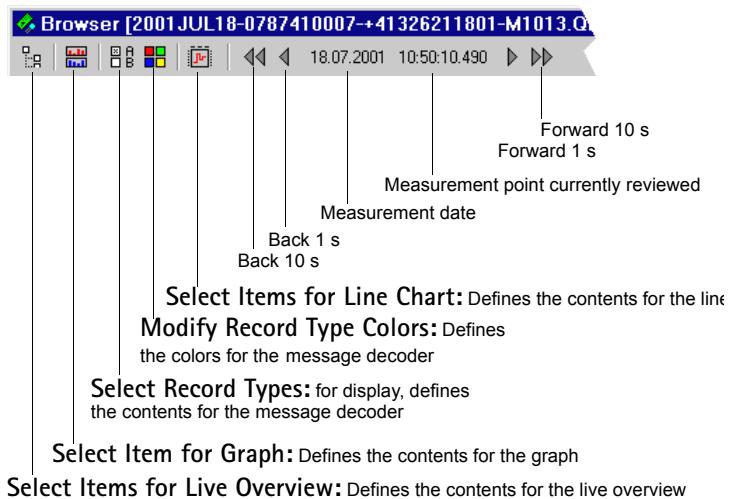


Figure 63 **Browser with display tools**

Browser Toolbar



Defining Displays

Defining the live overview contents

Table 34

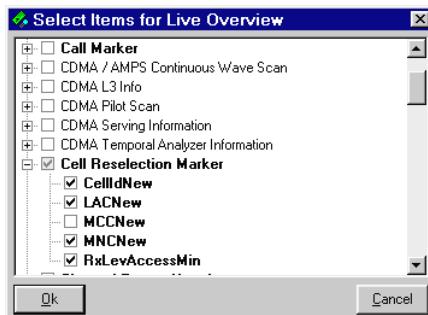
The live overview provides a clearly structured representation of the measurement parameters you have selected, at the measurement point currently under review.



The «Select Items for Live Overview» command displays the following dialog box:

Chapter 6 AnalyzerPlus Software

Quick-Start



Bold type = The file contains this measurement parameter.

Activate the measurement parameters to be displayed.

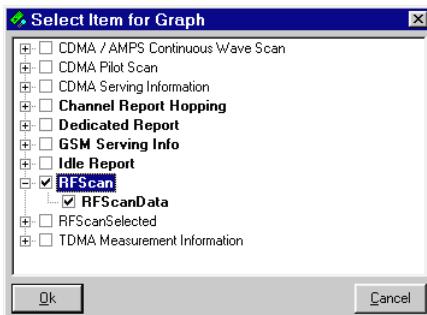
Defining the Graph contents

Table 35

Choice of measurement parameters that provide complex results; they are much clearer in graph form than in numerical form (e.g. RF scan, neighbor cell data).



The «Select Item for Graph» command displays the following dialog box:



Bold type = The file contains this measurement parameter.

Activate the measurement parameter to be displayed. *Only one measurement parameter* can be displayed at any given time.

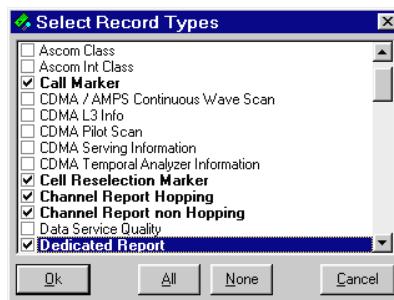
Defining the message decoder contents

Table 36

The message decoder is used to display in plain text the layer 3 messages, measured values, markers and GPS data you want.



The «Select Record Types for Display» command displays the following dialog box:



Bold type = The file contains this measurement parameter.

You can also:

- highlight particular record types using a background color

See [page 259](#)

Defining the line chart contents

Table 37

The Line Chart allows you to observe the course of two measurement parameters over time.



The «Select Items for Line Chart» command displays the following dialog box:



Bold type = The file contains this measurement parameter.

Activate the measurement parameters to be displayed.
two measurement parameters can be displayed simultaneously.

Navigating Through the Measurement File

You can shift the observation point as follows:

Table 38

Where	How	Shift result
	Cursor keys	Click
		1 s
	Click scroll arrows	10 s
	Move scroll button	1 record
	Move line chart using the <i>right mouse button</i>	random

The browser displays and the position of the blue arrow in the map window are updated at the same time.

Observation Point

When you move around the measurement file in the browser, the tools will display the following data at the current observation point:

Table 39

Tool	Display
Live Overview	Data of the last record that contained the measurement parameters.
Graph	Data of the last record that contained the measurement parameter.
Message Decoder	Observation point: Selected Record

Table 39

Line Chart	1) Observation point: Vertical line in the center
Map	Observation point: Blue tailed arrow

1) Resizing is effected from the center outwards.

Map Once you have selected the measurement files from the map column on the control panel, the map window appears.

Map uses the data from the selected measurement files to create a local database. The amount of time required for this process depends on the number and size of the measurement files, and can take a few minutes. The database is automatically deleted again when you exit «AnalyzerPlus».

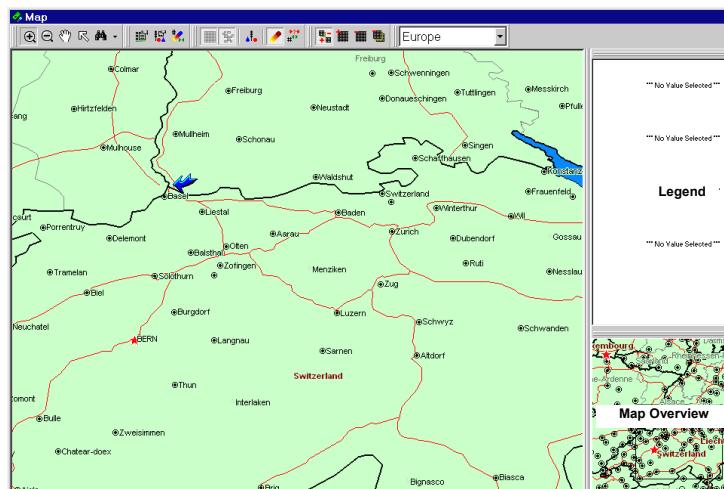


Figure 64 Map with action window, legend and overview map

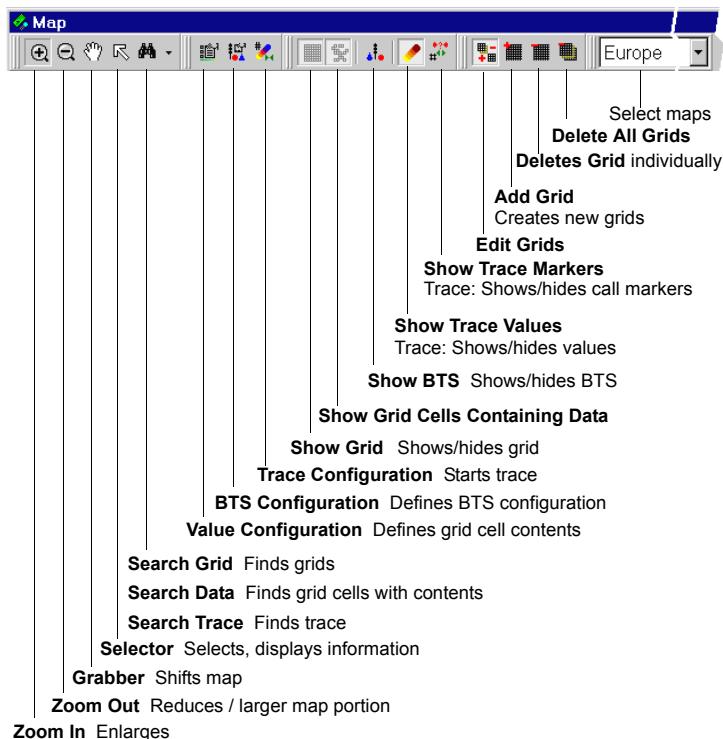
Map Overview

Table 40

You can alter the scale of the overview map. Clicking the map overview with the right mouse button displays the following menu:

2400%
1200%
800%
400%
• 200%

Map Toolbar



Displaying Measured Values in Map

A – Display the measurement area

Display the map section from which the measurement data is taken.
The blue arrow helps you to locate the map section.

B – Mark out a grid

Table 41

With the map the analysis is based on square grid cells, which you define by marking out a grid over the measurement area.

- 1 Activate the buttons «Edit Grids» and «Add Grid».
- 2 With the left mouse button pressed down, mark out a grid over the measurement area.

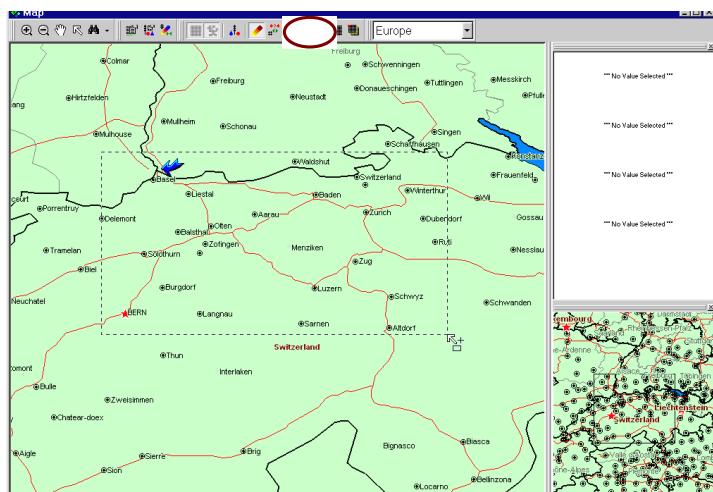


Figure 65 Map: Marking out a grid

The following dialog box appears:

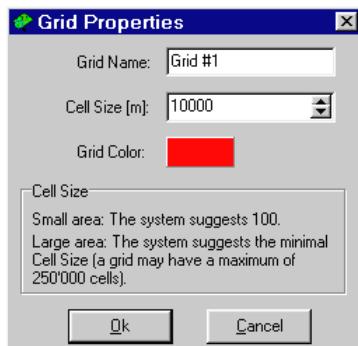


Figure 66 Map: Defining grid cells

Cell Size [m]:

Initially, enter a large value for the cell size, say 10000. This provides an overview and you can then display in more detail the elements you are interested in.

Click «OK»; the system determines:

- the grid cells that contain measured values
- the measured values to be displayed

This process may take a little while.

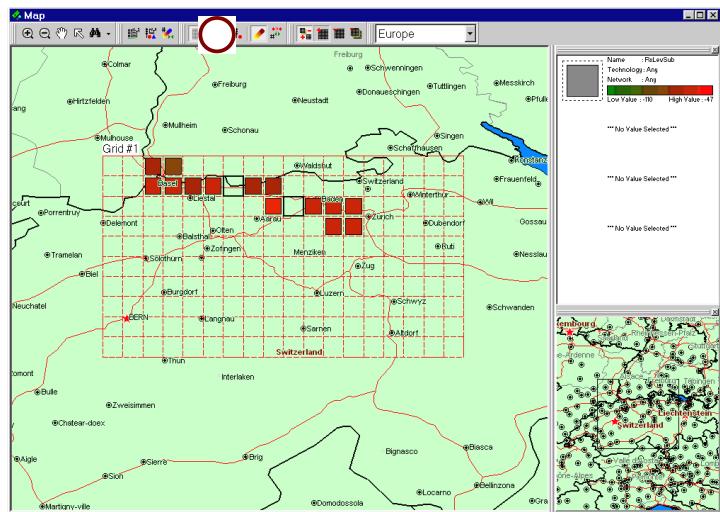


Figure 67 Map: Grid with cells that contain measurement data

«Show Grid Cells Containing Data»

Table 42

Make sure that the selected button is activated.

The measurement route then appears as follows:

Table 43

Measured values configured that occur in the grid cell:

Grid cell colored according to value

Table 44

- Measured values configured that do not occur in the cell
- No measured values configured

Grid cell with a black border

C – Define the display

Click the «Value Configuration» button to call up the following dialog box:

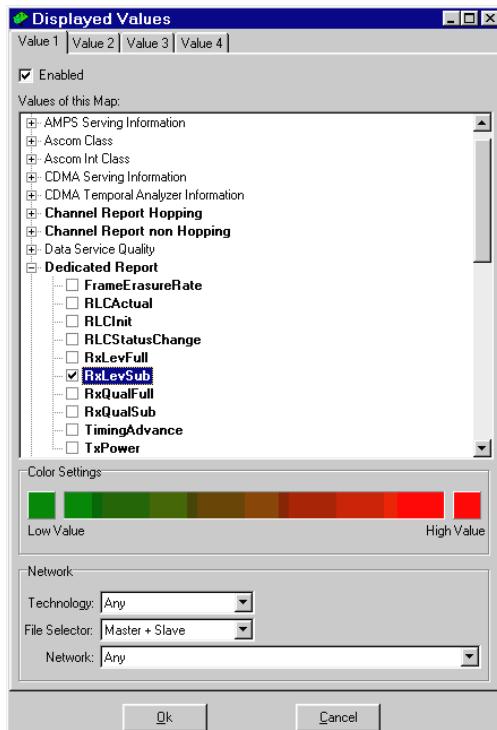


Figure 68 Map: Selecting the measurement parameters to be displayed

There are four tabs, i.e. you can display up to four measurement parameters simultaneously.

Enabled

The check box must be activated for the definition to be effective.

«Values of this Map» window

Only one measurement parameter can be selected at any given time for each tab. Selecting a different measurement parameter automatically deselects the previously selected parameter.

Bold type =

The selected files contain this measurement parameters.

... (obsolete) =

Measurement parameters from measurement files with MDF prior to version 4 (Measurement Data File Structure).

Color Settings

Each measurement parameter is allocated a color gradient between the lowest and the highest possible value. You can alter the color gradients: Click the colored button «Low Value» or «High Value» to open the color palette, then allocate the color you want.

Table 45

The colors allocated are then valid for all four tabs.

This means a measurement parameter has the same color gradient on all the tabs, which allows you to make a direct comparison of, for example, the PACE values of two mobile networks.

Technology:

Lets you restrict the display to a particular type of mobile network (GSM, CDMA, ...).

File Selector:

Use Master files only.

Network:

Lets you restrict the display to a particular mobile network.

Settings are stored

These settings will again be available the next time you start «AnalyzerPlus».

D – Refining the display

- 1 Zoom in on the area you are interested in.
- 2 Mark out a tighter grid

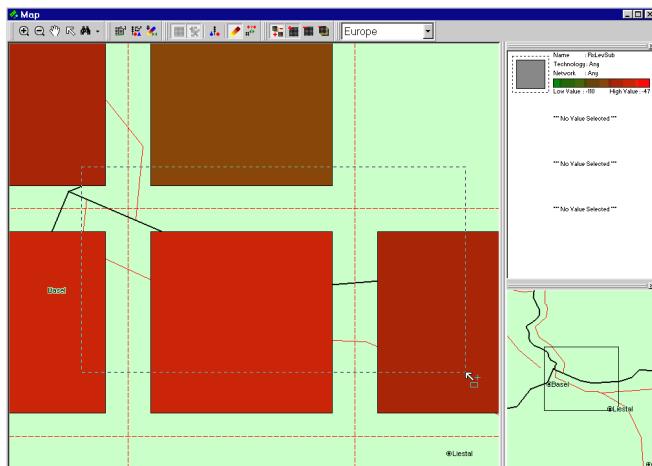
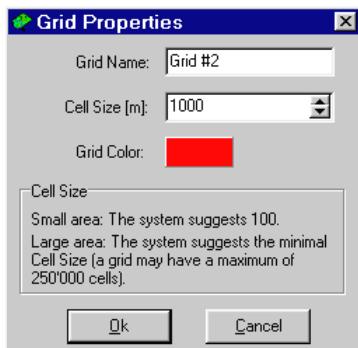


Figure 69 Map: Marking out a tighter grid



Cell Size [m]:

The system suggests the following cell sizes:

- Grid over a small area:
100
- Grid over a large area:
Minimum side length possible (a grid can contain a maximum of 250,000 cells)

If you enter 0 (zero), the minimum is calculated. 15 is the absolute minimum.

Repeat step° C until you obtain the level of detail you require.

Hiding the grid

You can use the «Show Grid» button (selected in the figure below) to hide / show the grids. The cell contents are displayed regardless.

Deleting grids

- 1 Activate the «Delete Grid» button.
- 2 Use the cursor to touch the grid you want to delete, then click it. A delete prompt appears with the name of the grid. *Deleting a grid also deletes its cell contents.*

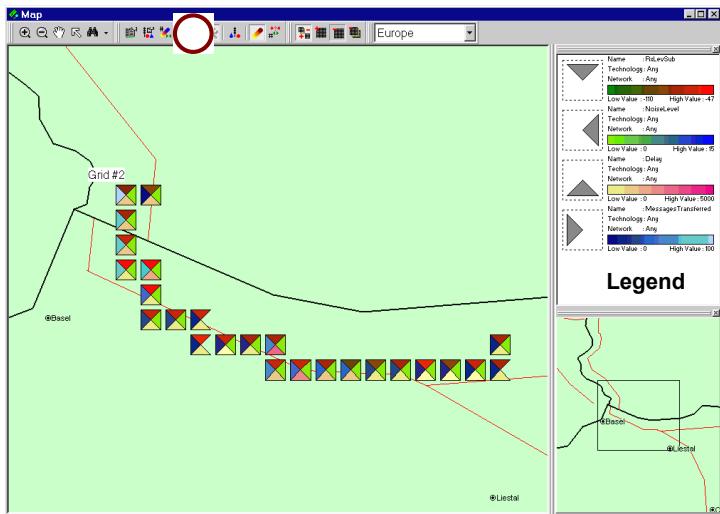


Figure 70 Map: Displaying measured values

If you select several measurement parameters to be displayed, the grid cells are subdivided. The legend shows how the measurement parameters are allocated.

Mean values

For each grid cell the mean values of all measurements that took place in that cell are calculated for each measurement parameter.

For details of the display, see [page 237](#)

Map in Detail

This section provides detailed information on how Map works and its characteristics.

Grid Cells Purpose

- 1 By marking out a grid you define geographic areas (grid cells). The analysis can then be carried out in relation to a particular area.
- 2 For each grid cell the mean values of all measurements that took place in that cell are calculated for each measurement parameter.

Mean values

If you selected several measurement files, all the files that contain data relating to a grid cell will be included into the calculation of the mean value.

Cell Area Utilisation

The measured value display uses only 80% of the grid cells so that the map is not covered up completely but still «shines through».

Displaying Grid Cell Information

Activate the «Selector» (selected in the Figure). Now if you move the cursor onto a grid cell (without clicking), the existing data is displayed:

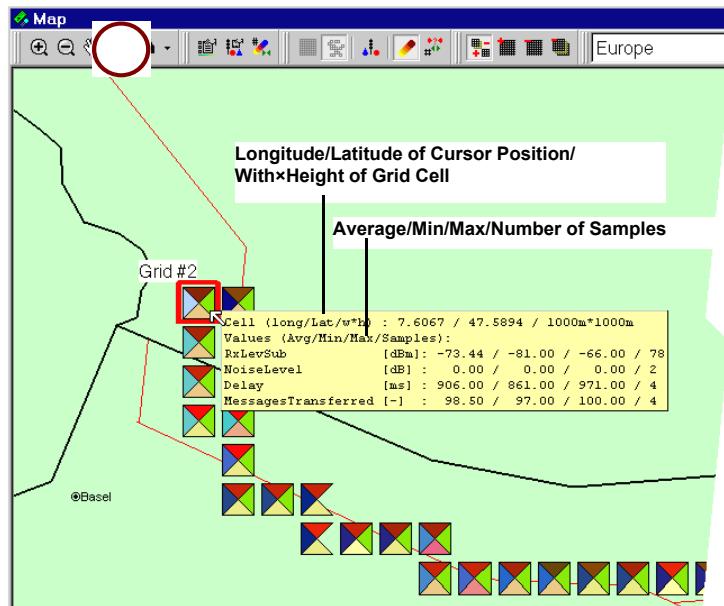


Figure 71 Grip cell information

The grid cell selected has a red border.

Cell

Longitude / latitude of *the cursor position* / width × height of the grid cell.

Avg

Average of all selected measurement files containing data on the grid cell.

Min

Lowest value in that grid cell.

Max

Highest value in that grid cell.

Samples

Number of times each measurement parameter was measured in that grid cell.

Measured Value Statistics of a Grid Cell

Activate the «Selector» (selected in the Figure). Double-click the grid cell you are interested in.

The statistics window appears and indicates the measured value distribution in that cell. The combo box contains the measurement parameters that have been configured:

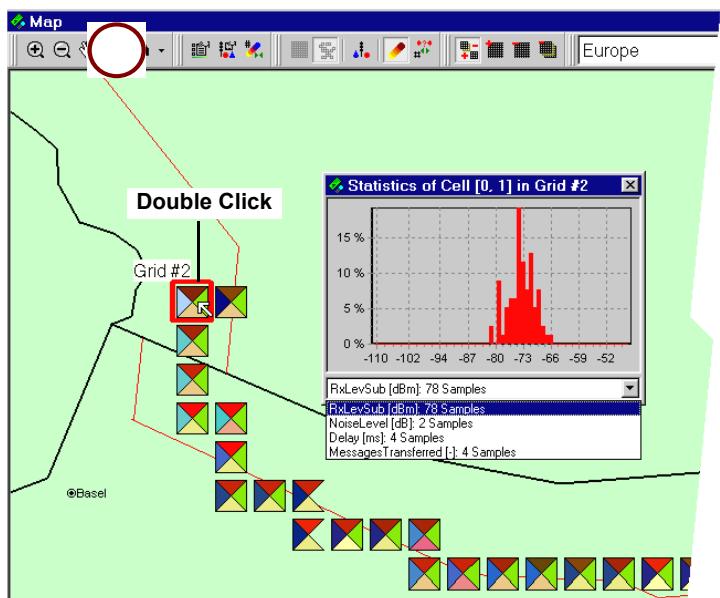


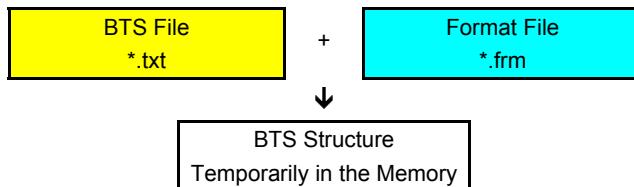
Figure 72 Map: Statistics from a grid cell

Displaying BTS

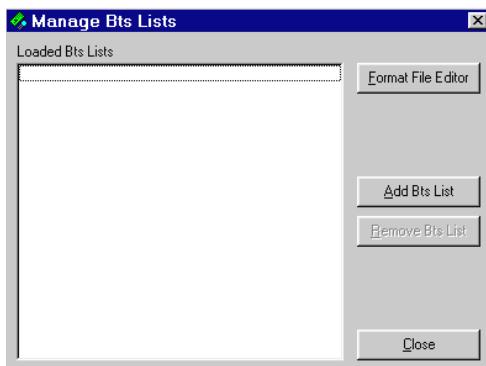
If the BTS list exists as a text file, you can call it up and have the BTS displayed on the map.

Calling up the BTS file

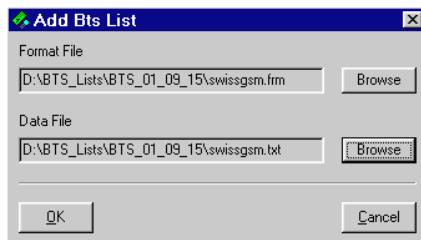
«AnalyzerPlus» temporarily stores a BTS structure in the main memory. It is created when you call up your BTS file and a format file (in a similar procedure as for AnalyzerPlus):



If you click the selected button, the following dialog box appears:



«Add BTS List» calls up the following dialog box:



Use «Browse» to open the directories that contain the format file and the BTS file. The paths and file names are stored so that the «Network Analyzer» can regenerate the BTS structure the next time it is started.

You can call up and use several BTS files simultaneously.

Format File and BTS File

The Format File

The format file describes the BTS file (the fields it contains, the position of each field). It is used to control the separation and sorting of the data during the import process.

The BTS File

Format:

ASCII, separated by comma, terminated with CR/LF.

The following fields are possible:

italics = mandatory

Table 46

Field name	Value range	Explanation
CellID	1...65000	
LAC	1...65000	
MCC	1...999	
MNC	1...9	
Longitude	Float	Position of the BTS
Latitude	Float	Position of the BTS
TransmitDirection	0...360	Direction of transmission
TransmitAngle	0...360	Aperture (beam width)
BCCH	1...999	
BSC	1...999	
BSIC	1...999	
Cell Name	Ascii text	
Dummy	Random value	Can occur several times; skipped when the file is called up
Equipment	Ascii text	
MSC	Ascii text	
SiteID	Ascii text	
TCH1	1...999	

Table 46

Txt Comment	Ascii text
-------------	------------

Example 1: Minimum Number of Fields

Format file:

, → Indicates the separating character

CellId

LAC

MCC

MNC

Longitude

Latitude

BTS file:

1000,1212,228,1,4.1234567,47.223344

1005,1313,228,1,4.556345,47.034

Example 2: Maximum Number of Fields

Format file:

, → Indicates the separating character

CellId

LAC

MCC

MNC

Longitude

Latitude

TransmitDirection

TransmitAngle

Altitude

BCCH

BSC

BSIC

Chapter 6 AnalyzerPlus Software

Map in Detail

BtsState
CellName
Dummy
Equipment
MSC
SiteId
TCH1
TCH2
TCH3
TCH4
TCH5
TCH6
TxtComment

BTS file:

```
1000,1212,228,1,4.1234567,47.223344,90,120,1
22,45,1,23,READY,CityW,xyz,Motorola,KN12,KN1
2A3m,23,45,67,89,12,14,freeComment
```

Creating a Format File

Open the «format file editor» (see [page 237](#) for the procedure):

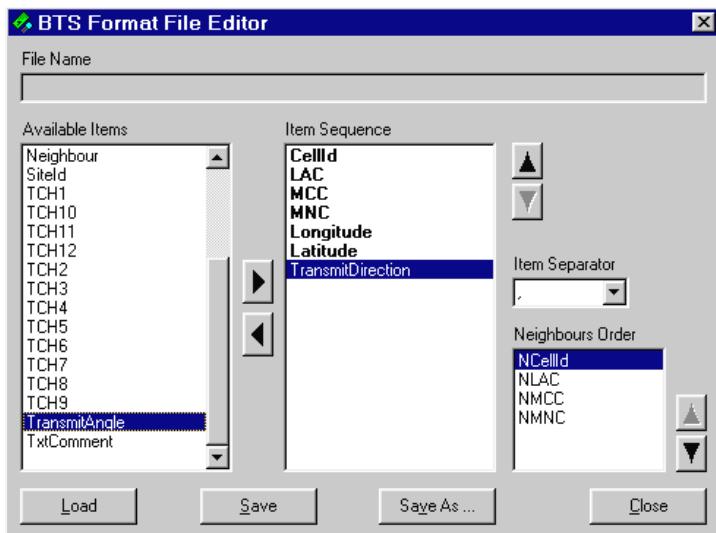


Figure 73 Format File Editor

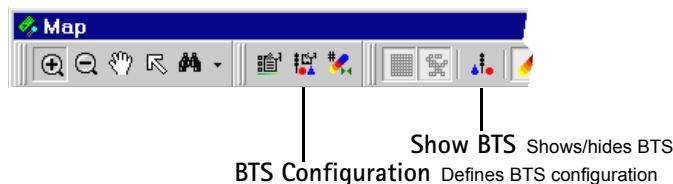
The editor provides a clearly structured method for creating a format file. Use the arrow keys to add°/ remove elements and to alter the sequence.

Bold type = mandatory element.

Store the completed format file under an appropriate name. You can only store the file once all the mandatory elements have been selected.

Defining a BTS Display

You can modify the color and size of the symbols fnd sector antennas.



The «BTS Configuration» button opens the following dialog box:

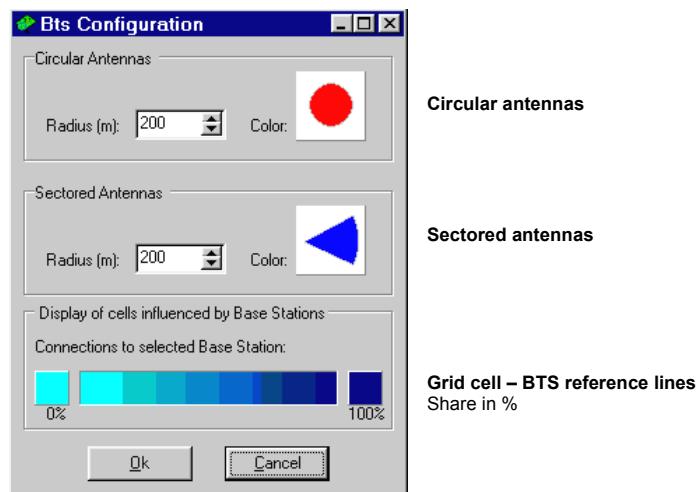


Figure 74 Map: Defining BTS symbols and reference lines

Radius [m]

Suitable values depend on the map magnification selected. Choose values so that the BTS symbols are of a suitable size.

Displaying Serving BTSs

- 1 Activate «Show BTS» (selection 1). The BTSs are displayed.
- 2 Activate the «selector» (selection 2).
- 3 Click once on the *grid cell* you are interested in.

The reference lines indicate all the BTSs that served the grid cell during the selected measurements:

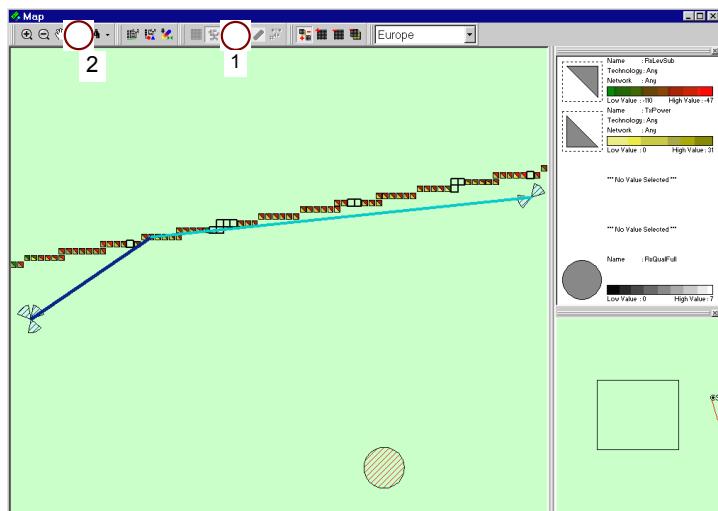


Figure 75 Map: Displaying the Serving BTSs

Reference line color

Indicates the share in that grid cell's radio connections.

Sectored antennas

The symbols can only be displayed if the BTS file contains the corresponding information. If the information is not available, overlapping circular antennas are displayed instead.

Displaying Grid Cells Served by BTS

1 Activate «Show BTS» (selection 1). The BTSs are displayed.

2 Activate the «selector» (selection 2).

3 Click once on the *BTS* you are interested in.

The reference lines indicate all the grid cells served by this BTS during the selected measurements:

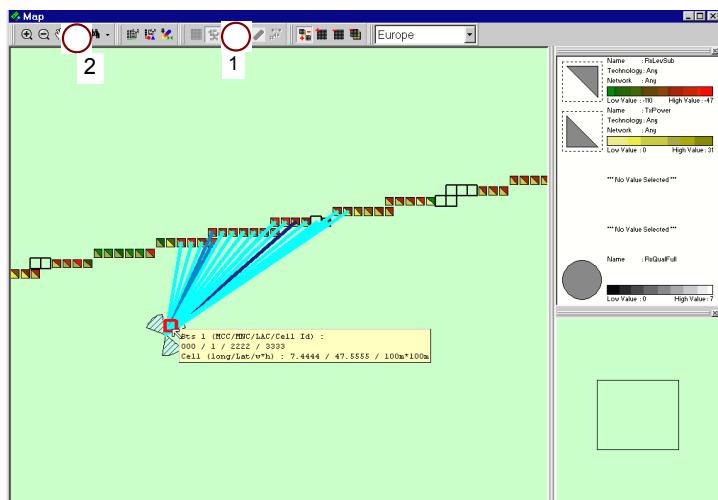


Figure 76 Map: Displaying the served grid cells

Reference line color

Indicates the BTS's share in the radio connections.

Information on the BTS

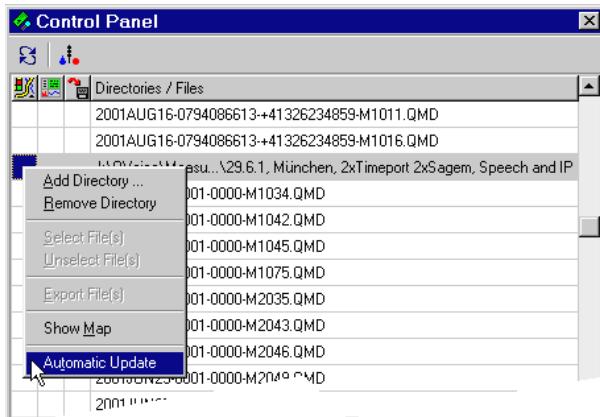
If you move the cursor onto a BTS – with «selector» activated – the information that relates to the BTS will be displayed.

Automatic Update

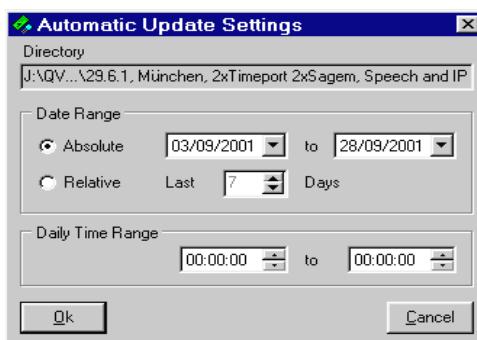
Purpose

You can specify an individual time range for each measurement file directory. The control panel will then only display the measurement files created within that time range.

Right-click to the left of the directory line:



The «Automatic Update» command opens the following dialog box:



- **Absolute**
Date from ... to ...

Chapter 6 AnalyzerPlus Software

Map in Detail

- **Relative**

The last x days

- **Daily Time Range**

Daily from ... to ...

Trace

This section explains how the trace works and its characteristics.

What is a Trace?

No mean values

The trace shows *all the successive values* of a measurement parameter *from a single* measurement file (i.e. no mean values). Each measured value is represented as a colored dot; the color of the dots corresponds to the measured value. This lets you see every change in the measured value.

Displaying a Trace

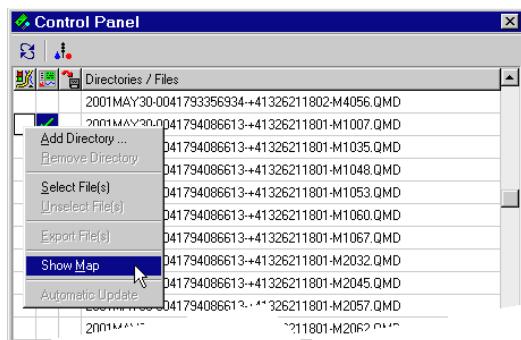
A – Display the measurement file in the browser

Table 47

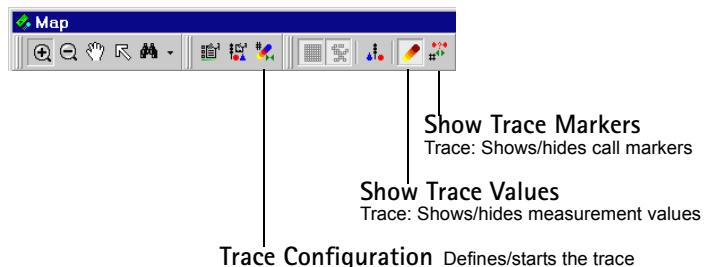
First display in the browser the measurement file you want as a trace.

B – Open Map

If the map is not already open, you can for example use the following command:



C – Select the Measurement Parameter



The «Trace Configuration» button displays a dialog box:

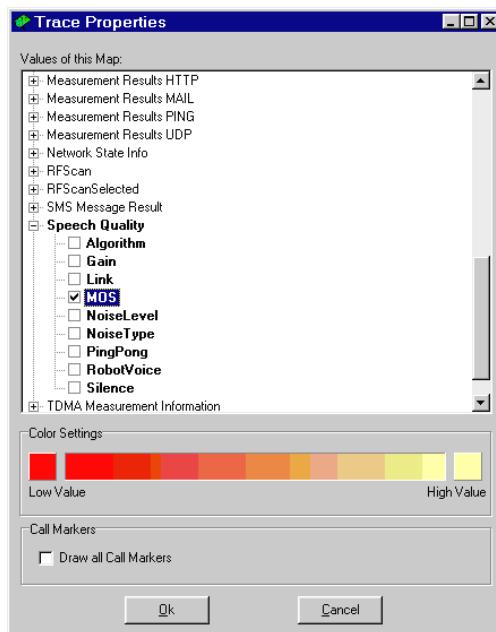


Figure 77 Trace: Selecting the measurement parameter
«Values of this Map:» window

Only one measurement parameter can be selected at any given time. Selecting a different measurement parameter automatically deselects the previously selected parameter.

Bold type =

The selected files contain this measurement parameters.

... (obsolete) =

Measurement parameters from measurement files with MDF prior to version 4 (Measurement Data File Structure).

Color Settings

Each measurement parameter is allocated a color gradient between the lowest and the highest possible value. You can alter the color gradients: Click the colored button «Low Value» or «High Value» to open the color palette, then allocate the color you want.

Draw all Call Markers

The call markers are displayed. You can also hide and show them later using the «Show Trace Markers» button.

OK

creates the trace on the map. The selected measurement parameter is shown along the measurement file's entire route.

If the trace is outside the visible area, use «Search Trace» to locate it immediately:

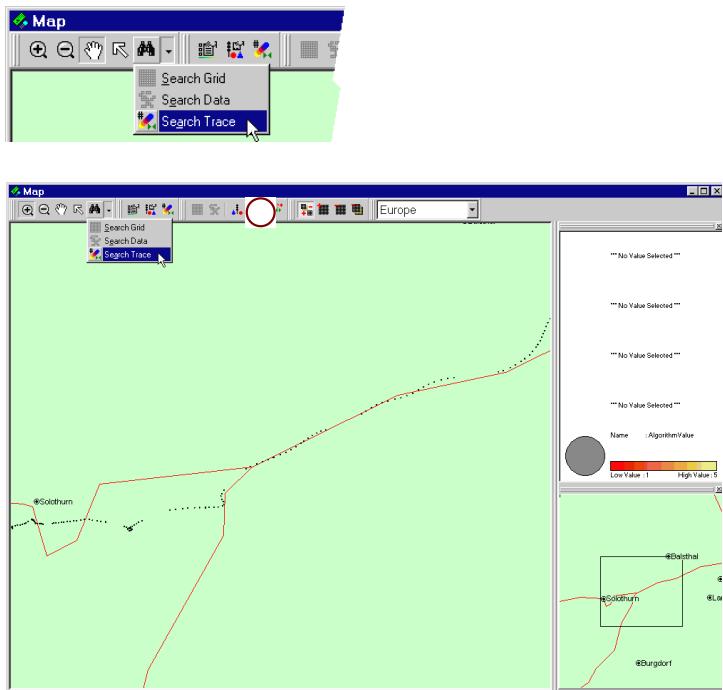


Figure 78 Trace: «Search Trace» shows the trace in full screen

Show Trace Values (selected)

This button must be activated in order to display the trace.

D – Finding the optimum display for the trace

- 1 If the trace is long, zoom in on the section you are interested in.
- 2 You can show the Call Markers (button selected):

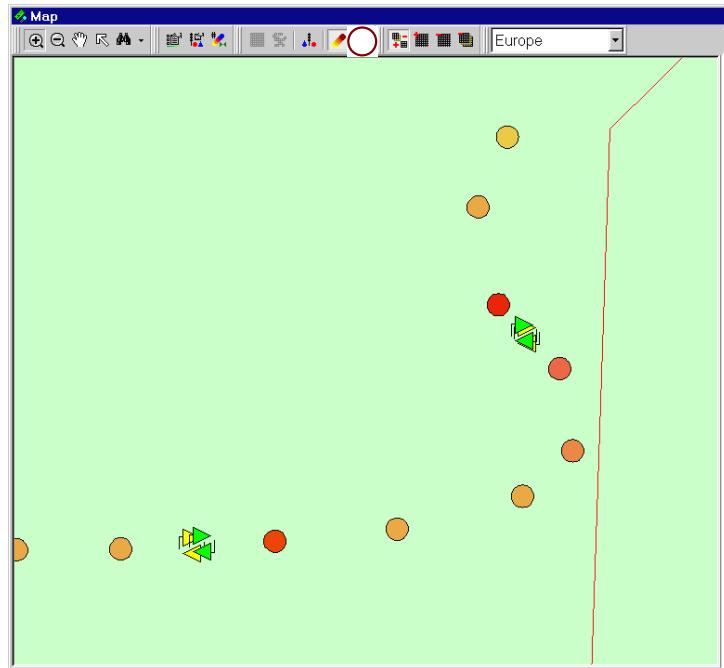


Figure 79 Trace with Call Markers

- 3 Hide the grids that are in the way. If the map data is in the way: Deactivate all the values, deactivate the «Show Grid Cells Containing Data» button.

Table 48

The trace display does not require any grids.

Trace Point and Related Data To see the measured values that belong to a trace point, proceed as follows:

- 1 Arrange the browser and map in such a way that both windows are visible.
- 2 Define the following as content for the message decoder:
 - a *The same measurement parameter as for trace*
 - b Other measurement parameters if required

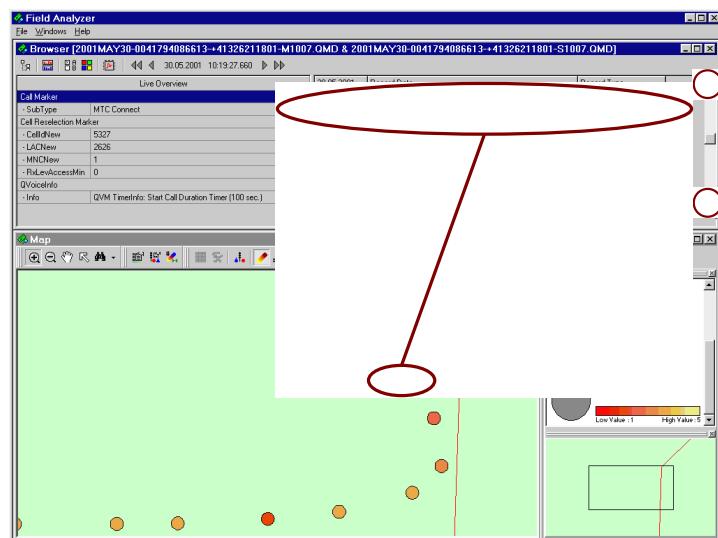


Figure 80 Map + browser: Measured values belonging to the trace point

- 3 In the browser move the observation point (see [page 226](#)) until the blue arrow reaches the trace point you are interested in. Use the scroll arrows for the fine positioning (marked in the figure).

Trace points and records

The blue arrow stops during scrolling

Reason: Several records were recorded during measurement without signalling a new position in between.

The blue arrow points between the trace points

Reason: Several position signals were recorded between two measurement parameter records during measurement.

Display Consistency You have selected a different measurement file in the browser
→The trace remains displayed, i.e.:

- The data in the browser and the trace displayed do not go together
- The position of the blue arrow belongs to the newly selected measurement file

You can display the trace *of the newly selected measurement file* («Trace Configuration» button).

You have selected a different map

→The trace is deleted:

You can display the same trace once again («Trace Configuration» button).

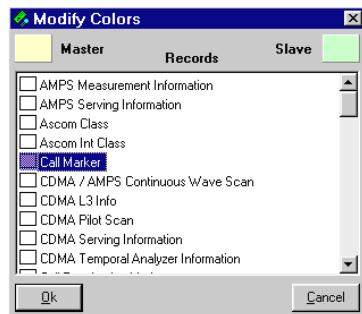
Browser in Detail

This section provides detailed information on how the browser works and its characteristics.

- Message** You can:
- Decoder: Using Colors** – highlight particular record types using a background color



Use the selected button to call up the following dialog box:



To open the color palette, proceed as follows:

Table 49

Measurement parameter	Double-click
-----------------------	--------------

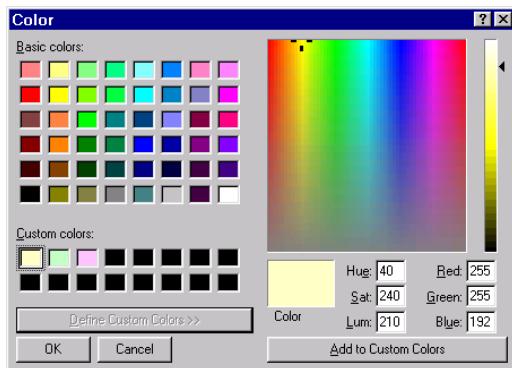


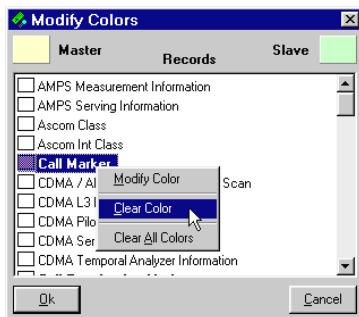
Figure 81 Color palette with bright «Custom colors»

Bright colors

Use very bright colors to ensure good legibility.

Clearing colors

Right-click the colored term. The following context menu appears:



Graph: Separate Window

Table 50

As some graph displays require more space, the graph can be undocked as a separate window.

- 1 Click the graph with the *right mouse button*. A context menu appears:

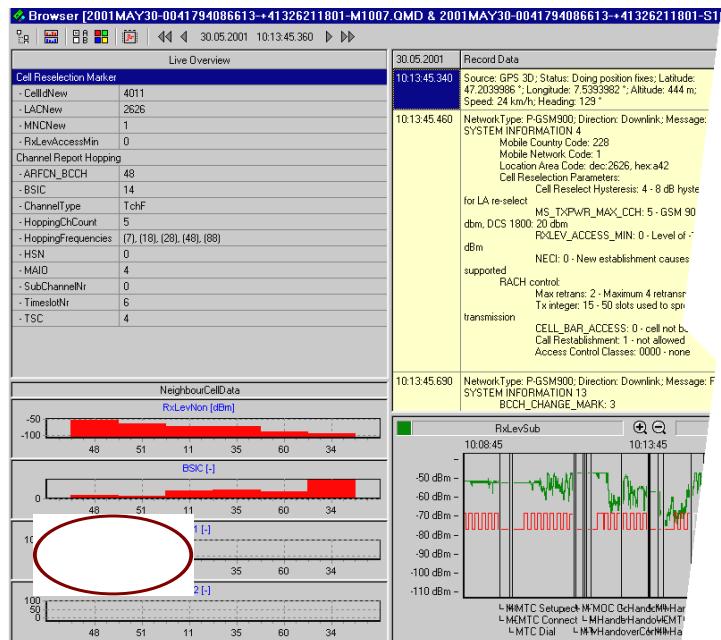


Figure 82 Graph: Context menu for separating the window

- 2 Click «Undock». The graph appears as a separate window, which you can position and size as required:

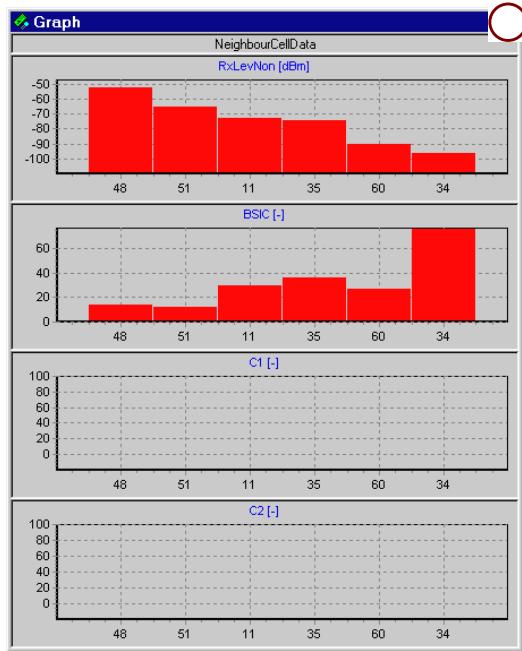


Figure 83 Graph as a separate window

Close (selected)

Inserts the graph back into the browser.

Export

This section explains how the export functions work and their characteristics.

Exporting from Measurement Files You can export certain data (or all the data) from measurement files into ASCII files for further processing, for example with Excel. The data is extracted unmodified from the measurement files.

Separating Character

The separator separates the columns in the file.

Table 51

«AnalyzerPlus» uses the separator character defined in your Windows settings.

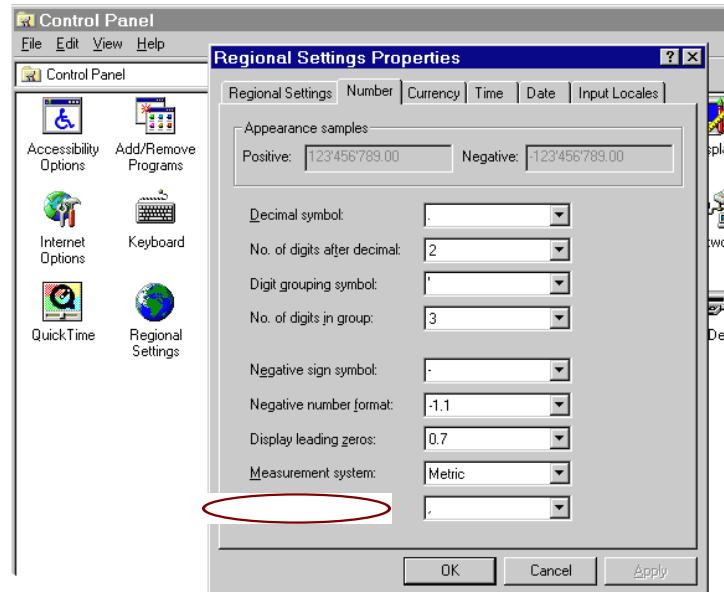


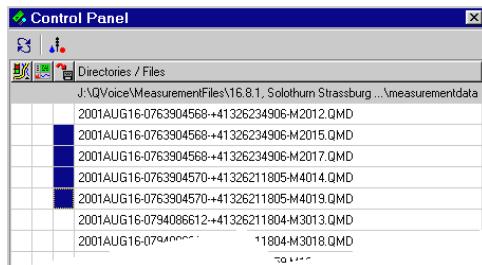
Figure 84 Windows setting for the separator character

Table 52

File extension: csv (even if separator = comma)

Exporting Data

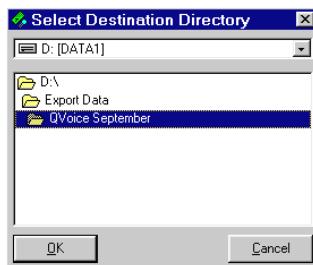
A – Select measurement files, initiate the export



Multiple selections are possible using Shift + click or Ctrl + click in the usual way with Windows.

Double-clicking one of the selected fields of the Export column starts the export dialog.

B – Select the destination directory



Use this dialog box to specify the destination directory.

Click «OK»; the dialog box for defining the export appears.

C – Define the measurement parameters for export

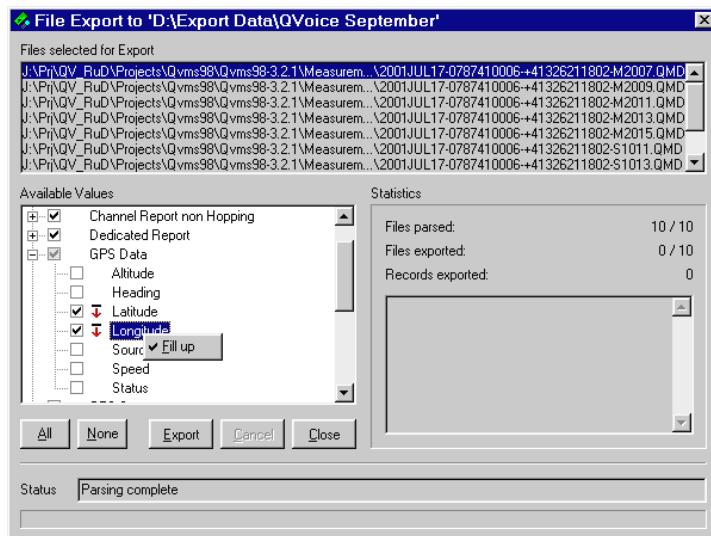


Figure 85 Export: Selecting the measurement parameters

Files selected for Export

Listed here are the measurement files used for exporting the data.

Available Values

This window displays all the measurement parameters that occur in the measurement files listed above. If you are exporting from a single measurement file, the number of parameters displayed may well be quite limited.

Activate the measurement parameters to be exported.

↓ Filling out the columns automatically

Certain measured values occur less frequently than others (e.g. GPS data). During a normal export the corresponding table column will only occasionally contain a measured value, which can make searching for the current value very time-consuming.

So for each measurement parameter you can specify whether the table column should be filled out: The value is then repeated until a new measured value appears.

Use the *right mouse button* to click the measurement parameter (not the group term). The «Fill up» command appears. Click to activate the command (toggle function) and a small red arrow appears next to the measurement parameter.

Export

The «Export» button starts the export.

Specifications

A large blue square containing a white capital letter 'A'.

This appendix describes the HindsitePlus specifications. Topics discussed in this appendix are as follows:

- "Dedicated Mode Reports, Idle Mode Reports" on page 268
- "Dedicated Channel Reports" on page 268
- "Layer 3 Messages" on page 268
- "GPS Data and Status" on page 269
- "Markers" on page 269

Dedicated Mode Reports, Idle Mode Reports

These reports provide an overview of the transmission conditions.

- Channel number (ARFCN)
- Field strength (RxLev) of serving cell
- Field strength of the six best non-serving cells
- BSIC of the BTS

Recorded "dedicated channel" parameters include:

- Signal transmit time (TA)
- Transmitting power
- Bit error rate (RxQual)

Dedicated Channel Reports

Reports the current channel.

- BCCH frequency
- Serving cell BSIC
- Channel type
- Timeslot number
- Subchannel number

Layer 3 Messages

All Layer 3 signaling channel messages are recorded along with an indication of the transmission direction.

GPS Data and Status

- Location co-ordinates
- Elevation
- Speed
- GPS fix level

Markers

Markers available include:

- Call error
- Setup
- Connect successful
- Connect fail
- Disconnect
- Release
- Release error
- Break
- User break
- Handover command
- Handover complete
- Handover failure
- Location update request
- Location update accepted
- Location update rejected
- Cell reselection
- Immediate Assignment
- Immediate Assignment Reject
- Assignment command
- Assignment complete

Appendix A Specifications

Markers

- Assignment failure
- User markers (e.g. tunnel)

Customer Services



B

This chapter describes the customer services available through Willtek. Topics discussed in this chapter include the following:

- "Instrument repair" on page 272
- "Equipment return instructions" on page 272
- "Warranty information" on page 274

Instrument repair

Our service centers provide repair, calibration and upgrade services for under warranty equipment. Willtek understands the impact of equipment down time on operations and is staffed to ensure a quick turn-around. Available services include the following:

Product Repair — All equipment returned for service is tested to the same rigorous standards as newly manufactured equipment. This ensures products meet all published specifications, including any applicable product updates.

Calibration — Willtek's calibration methods are based on national standards.

Factory Upgrades — Any unit returned for a hardware feature enhancement will also receive applicable product updates and will be thoroughly tested, ensuring peak performance of the complete feature set.

Equipment return instructions

Please contact your local service center for Willtek products via telephone or web site for return or reference authorization to accompany your equipment. For each piece of equipment returned for repair, attach a tag that includes the following information:

- Owner's name, address, and telephone number.
- The serial number, product type, and model.
- Warranty status. (If you are unsure of the warranty status of your instrument, include a copy of the purchase order.)
- A detailed description of the problem or service requested.
- The name and telephone number of the person to contact regarding questions about the repair.
- The return authorization (RA) number (US customers), or reference number (European customers).

If possible, return the equipment using the original shipping container and material. Additional Willtek shipping containers are available from Willtek on request. If the original container is not available, the unit should be carefully packed so that it will not be damaged in transit. Willtek is not liable for any damage that may occur during shipping. The customer should clearly mark the Willtek-issued RA or reference number on the outside of the package and ship it prepaid and insured to Willtek.

Warranty information

Hardware Willtek warrants its hardware products to be free from defects in workmanship and materials, under normal use and service, for one year from the date of purchase from Willtek or its authorized agent. Willtek certifies that all instruments are tested and inspected to comply with the published specifications originating from the company.

If a product does not operate as warranted during the warranty period, Willtek shall, at its option, repair the defective product or part (except batteries), deliver an equivalent product or part to replace the defective item, or refund the purchase price paid for the defective product. Transportation of the defective product or part to the factory or service centre is to be pre-paid by the customer. All products that are replaced will become the property of Willtek. Any replaced or repaired product or part has a ninety-(90) day warranty or the remainder of the initial warranty period, whichever is longer.

Software Willtek warrants that the software programs licensed from it will perform in substantial conformance to the program specifications for a period of one year from the date of purchase from Willtek or its authorized agent. Willtek warrants the magnetic media containing software against failure during the warranty period. Sole obligation hereunder shall be (at Willtek discretion) to refund the purchase price paid for any defective software products, or to replace any defective media with software which substantially conforms to applicable published specifications. Willtek makes no warranty that its software products will work in combination with any hardware or applications software products provided by third parties, that the operation of the software products will be uninterrupted or

error free, or that all defects in the software products will be corrected. Willtek will make reasonable efforts to provide compatibility, except where the non-compatibility is caused by a defect in the third party's product.

All information in this manual is given in good faith. However, Willtek Communications shall not be liable for any loss or damage whatsoever arising from the use of this manual, the product described in it or any errors or omissions in either.

Appendix B Customer Services

Warranty information

Glossary

This Chapter explains the abbreviations and terminology.

A

ARFCN	Absolute Radio Frequency Channel Number
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B

BCCH	Broadcast Control Channel
Browser	Tool for representing tables on the screen
BSIC	Base Transceiver Station Identity Code
BTS	Base Transceiver Station

C

C1	Cell Reselection Criterion with GSM: $C1 = [A - \max(B, 0)]$ <p>A = Received Level Average – p1 B = p2 – Max. RF Power of the Mobile Station p1 = RxLev_Access_Min. p2 = MS_TxPwr_Max_CCH (all numeric values in dBm)</p>
C1_BSIC	Base Transceiver Station Identity Code of the 1 st neighbouring BTS
C2_BSIC	Base Transceiver Station Identity Code of the 2 nd neighbouring BTS
C1_Freq	Frequency of the 1 st neighbouring BTS
C2_Freq	Frequency of the 2 nd neighbouring BTS
C1_RxLev	Receive level of the 1 st neighbouring BTS
C2_RxLev	Receive level of the 2 nd neighbouring BTS
Call Record	Contains all the data for checking the call charges (Cell, LAC, MNC, MCC, Start Time, Call Duration).
Call Statistic	Call statistics
Channel Report	Information transmitted at regular intervals on the send channel
CDMA	Code Division Multiple Access Mobile network system.
Coverage Presentation	Presentation of connecting lines between the measurement points and the serving BTS or 1 st neighbouring BTS.
CS	Coding Scheme Type of error protection coding with GPRS.

D

Dead-Reckoning GPS add-on feature: Position tracking based on speed and direction if no reception.

Dedicated Report Parameters of the serving cell and six neighbouring BTS transmitted at intervals of 480 ms during a call.

DGPS Differential GPS

Downlink Radio channel from BTS to mobile phone.

DSP Digital Signal Processor

F

FTP File Transfer Protocol
File transmission protocol (see RFC 959).

G

Geo-coding Allocation of X and Y co-ordinates to a table value, so that it can be displayed as an object on a map.

GPRS General Packet Radio Service

GPS Global Positioning System
Satellite navigation.

Grid cell Square map excerpt

GSM Global System for Mobile Communication
Mobile network system.

H

Half-duplex alternating downlink and uplink

Handover Switchover to another BTS (cell change)

HTTP Hyper Text Transfer Protocol
Transmission protocol (see RFC 1945/2068).

I

Idle Report As with the Dedicated Report, but without an active call

IPC Inter Process Communication

ISDN Integrated Services Digital Network

L

LAC Location Area Code

Layer Presentation level

LLC Logical Link Control

Location Update A location is a group of BTS in which a mobile station is currently situated. Location Updates are used to determine a switch to another group, so the mobile station can be <followed>.

M

Master The Master always makes the first call. The Master can call a response station.

MCC Mobile Country Code
Country code for mobile telephony networks.

**Measure-
ment job** File with a prepared measurement job

Mime Multipurpose Internet Mail Extensions
Coding procedure for e-mails (see RFC 1521).

MNC Mobile Network Code
Code for network operators.

MOC Mobile Originated Call
Mobile phone makes the call.

MP Measurement Point

MS Mobile Station

Msg	Message
MTC	Mobile Terminated Call Mobile phone is the call destination.

P

PDOP	Position Dilution of Precision
Point Presentation	Measured values are represented as colour-coded symbols on a map.
POP	Post Office Protocol Transmission protocol (see RFC 1225, RFC 1939).
PSTN	Public Switched Telephone Network

R

RAS	Remote Access Service
Report	A representation of selected data sorted and formatted according to specific criteria.
RLC	<ul style="list-style-type: none"> a Radio Link Control Layer in the protocol stack b Radio Link Counter Value for radio connection errors with GPRS
RxLev	Receive level Range with GSM: 0...63 / -110...-48 dBm
RxQual	Receive quality (bit error rate) Range with GSM: 0...7

S

Script	Application-related instruction list
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Serving Cell	The base station supplying the measurement point currently under observation.
Setup Time	Time between Setup Marker and Connect Marker
SIM	Subscriber Identity Module Subscriber card for personal identification.
SMS	Short Message Service Text message service with GSM.
SQL	Structured Query Language Query language for relational databases standardised by ANSI.
SMTP	Simple Mail Transfer Protocol E-mail transmission protocol (see RFC 821).
Stored Procedure	A list of instructions stored on the database server and used for collating and calculating the data required for a report. A stored procedure call can contain parameters, e.g. the time domain of the requested evaluation.

T

TA	Timing Advance To compensate the signal delay.
TCH	Traffic Channel
Trace	Displays all the successive values of a measurement parameter as coloured dots. The colour corresponds to the measured value.
TxPwr	Send level Range with GSM: 0...31 (dBm depends on the frequency band)

U

UDP	User Datagram Protocol Transmission protocol (see RFC 768).
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Uplink Radio channel from mobile phone to BTS.

W

Workspace Storage area for saving the configuration of open MapX™ tables and windows.

Glossary

Publication History

Revision	Changes
0209-100-A	First revision.
0210-100-A	Formal changes.

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