Agilent
E7478A GPRS Drive-Test System

Configuration Guide

The Agilent E7478A GPRS drive-test system is a scalable, integrated, air interface measurement system. This system is used to support integration and maintenance of GPRS networks obtaining comprehensive call performance and quantifying the end-user's experience for both voice and data. The system includes a comprehensive GSM measurement capability, as available on the E7475A GSM drive-test system. Measurement capabilities are selected via stackable software licenses that are initiated via supplied software protection keys.

Depending on the selected hardware options, the E7478A system can make measurements on E-GSM900, DCS1800, or dual-band GSM/DCS networks, using single or multiple mobile phones.

Agilent Technologies

Introduction

The purpose of this configuration guide is to assist you in ordering the correct Agilent GPRS drive-test system configuration for your application. It is designed to be used in conjunction with the Agilent E7478A GPRS Drive-Test System Data Sheet, literature number 5988-1506EN, which describes the features and functions in detail. This document is divided into four parts:

- **Part 1: Basic description of product configuration**
- **Part 2: System option contents**
- **Part 3: Option descriptions**
- **Part 4: Drive-test accessory products**

Part 1: Basic description of product configuration

The Agilent E7478A GPRS drive-test system is a scalable measurement system for wireless optimization. The measurement and characterization of data payload is fundamental in the verification of a GPRS network. This is reflected in the wireless data measurement options available.

Each system requires a GPRS test mobile phone. The system also requires a laptop PC with Windows®, 98 or NT running the measurement software. A navigation system, such as a GPS receiver and GPS antenna, is required to obtain longitude and latitude information for logging the position at which the measurements were taken and for exporting to the optional real-time mapping application. The GPS receiver may be integrated into the fully compatible E7475A GSM digital receiver or can be an external device.

A compatible laptop PC and external GPS receiver can be supplied as drive-test accessory products. Alternatively, the system can be configured for use with a pen-tablet computer for indoor data collection without GPS. The complete system is transportable in a lightweight briefcase that can be supplied as an accessory product.

The Agilent E7475A GSM digital receiver options can be used in conjunction with the E7478A system allowing correlation of RF measurements and phone measurements. The digital receivers can be supplied with or without an internal GPS receiver. Receivers are supplied with magnetic mounting antennas, car mounting brackets and RS232 connection cables to link to the laptop PC (available as an accessory). Phone software licenses are supplied with dual-port ruggedized PCMCIA serial I/O cards. The system can also be configured for use with a pen-tablet computer for indoor measurements without GPS.

Agilent Wireless Data Measurement software options facilitate end-to-end measurement of transmitted and received data payload, allowing simulated performance of applications such as wireless web access, file transfer and e-mail transactions to be quantified. This capability is provided by configuring a laptop PC and mobile phone combination and a remote PC in a client/server architecture, with a server capable of supporting several clients.

The GPRS drive-test system can be configured to supply the software and hardware you require to make the measurements you want. You can easily upgrade the measurement functionality by adding options later as your needs change.

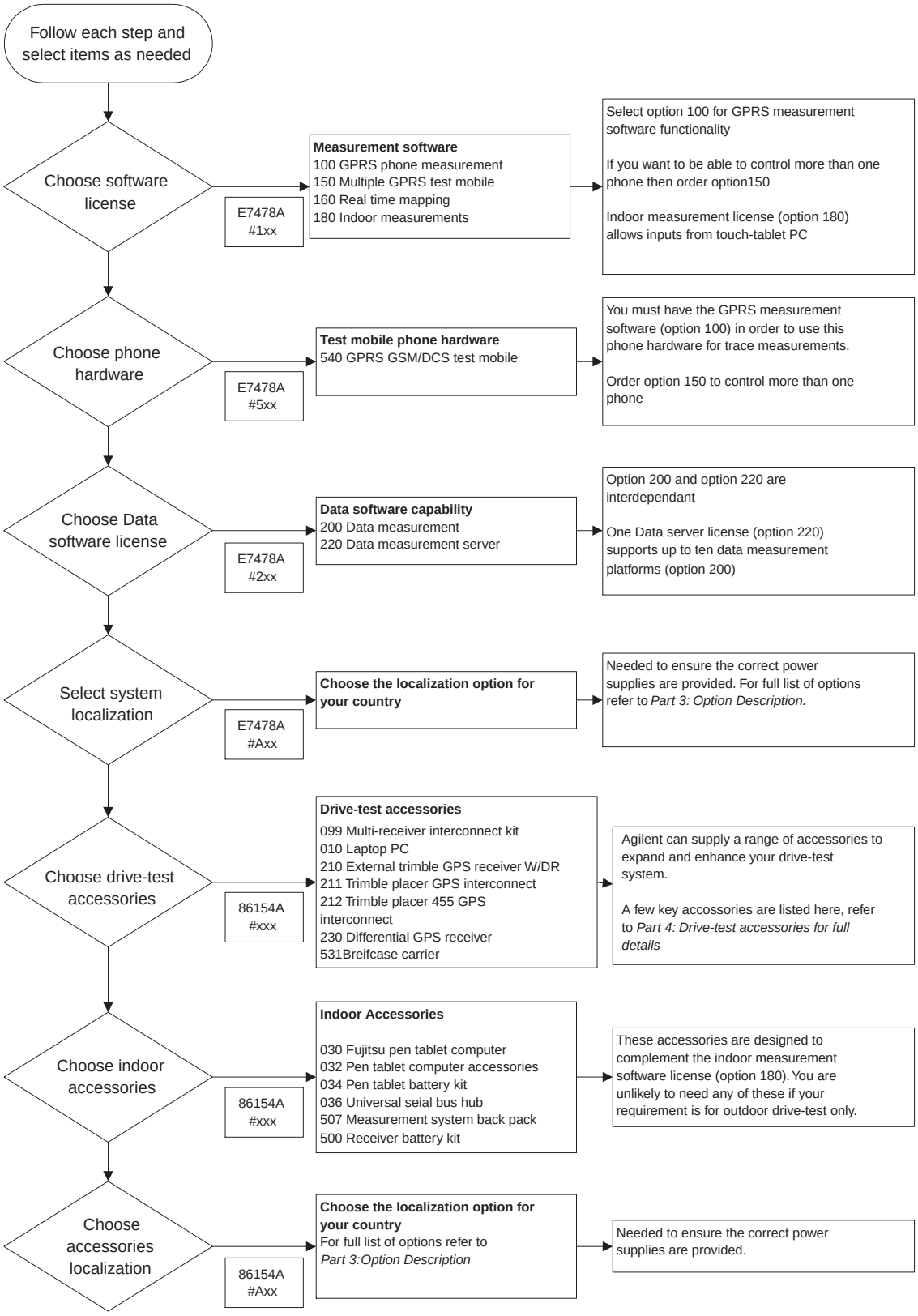

Figure 1 - Configuration chart for new GPRS system

There are a number of E7478A software license options that govern the types of measurements that you can make and the hardware required to support these measurements. GPRS phone measurements are made with option 100, allowing capture and display of comprehensive GPRS and GSM protocol information. This software is designed to run on a laptop PC, on a Windows, 98 or NT platform and to be used in conjunction with the GPRS test mobile (option 540). If multiple phone control is required for benchmarking with two or more networks, then a multiple phone control software license (option 150) must also be ordered.

To allow reliable and accurate measurements a GPRS network needs to be stimulated with controlled data transactions. Data flow may be initiated via the data measurement software license (option 200) and associated data measurement server software license (option 220) giving an extensive data measurement and characterization capability, independently on the uplink and downlink paths.

Commercially available applications for mobile phone and internet protocols such as WAP, http, and others are also supported on the system and will afford a limited measurement capability. Agilent does not supply these commercial applications.

When configuring your system, you need to first decide which types of measurements you wish to make and then select the appropriate software license.

E7478A GPRS drive-test system software license options

- ❑ Option 100: GPRS phone measurement software license
- ❑ Option 150: Multiple GPRS test mobile software license
- ❑ Option 160: Real-time mapping software license
- ❑ Option 180: Indoor measurement capability software license
- ❑ Option 200: Data measurement software license
- ❑ Option 220: Data measurement server software license

The E7475A GSM digital receiver options are also compatible with the E7478A system allowing GSM RF measurements to be integrated with the GPRS phone measurements. Please refer to the E7475A GSM Based Drive-Test System Configuration Guide, literature number #5968-5563E, for detailed information on the receiver software and hardware options appropriate to your requirements.

Once you have selected the software license to enable the measurements you require, you need to purchase the appropriate measurement hardware. Hardware options include:

- ❑ GPRS test mobile
- ❑ GPS receiver
- ❑ Laptop PC

GPRS test mobile phone

- ❑ Option 540: GPRS GSM/DCS test mobile (Sagem OT-96MGPRS)

Localization

In addition to the measurement hardware, a localization option will ensure that you receive the correct power cords for your country of operation. For a list of the localization options available, refer to Part 4: Drive-test accessories.

Laptop PC requirements

The E7478A system requires a PC to control the measurement hardware and log the collected data. PC minimum performance specifications are dependent on your requirements and chosen configuration, please contact your Agilent representative for further information. If you wish to purchase a laptop PC with your system, it is available as a drive-test accessory product (86154A Option 010). For more details, refer to Part 4: Drive-test accessories.

Server PC requirements

The data measurement capability (options 200 and 220) requires a PC to act as a server. One server can support an interface with up to ten laptop PC (clients).

The server acts as a reflector for client's data and is designed to be unmanned. The server performs error checking on the incoming data and replies with encoded pages including information on results. The minimum server system requirements are as follows:

- ❑ Windows NT / 2000 server operating system platform
- ❑ PIII, 500MHz, 64MB RAM
- ❑ Ethernet, modem or ISDN connection
- ❑ Parallel port or USB

The server PC is not supplied as a standard option.

PC requirements for indoor measurements

In order to make wireless network measurements indoors, where GPS information is not available, a pen-based tablet PC is highly recommended. The Fujitsu tablet PC, as well as accessories, are available to purchase directly from Agilent. For more details, refer to the accessory products section in part 4 of this configuration guide.

Drive-test accessories

For ordering convenience you may wish to purchase drive-test accessories from Agilent. These accessories include a laptop computer, briefcase carrier and external GPS receiver. For a full description of accessory products, refer to Part 4: Drive-test accessories.

Typical system configuration for GPRS drive-test system

Table 1 below provides some typical examples demonstrating E7478A GPRS drive-test system configurations. Localization options have also been included for illustration purposes.

You wish to purchase	You need to order	Description	Quantity
GPRS measurement system (software and phone) and include a briefcase carrier and GPS receiver with dead reckoning from Agilent. You will provide your own laptop PC. You are working in the U.K.	**E7478A**	**GPRS drive-test system**	1
	Option 100	Phone measurement software license	1
	Option 540	GPRS test mobile	1
	Option ABU	UK localization	1
	86154A	Drive-test accessory products	1
	Option 210	External GPS with D/R	1
	Option 531	Briefcase Carrier	1
GPRS measurement software, test phone, data measurement capability, GPS receiver with dead reckoning and a laptop PC. You will supply your own server PC. You are working in Hong Kong.	**E7478A**	**GPRS drive-test system**	1
	Option 100	Phone measurement software license	1
	Option 540	GPRS test mobile	1
	Option 200	Date measurement software license	1
	Option 220	Date measurement server software license	1
	Option ARS	Asia pacific localization	1
	86154A	Drive-test accessory products	1
	Option 010	Laptop PC	1
	Option 210	External GPS with D/R	1
	Option ARS	Asia pacific localization	1
GPRS measurement software for 5 systems, data measurement capability for 5 systems, a DCS1800 digital receiver measurement capability with internal GPS and an E-GSM900 digital receiver measurement capabilit with internal GPS. You will provide your own laptop PC's, server PC, test phones and additional GPS receivers. You are working in France	**E7478A**	**GPRS drive-test system**	1
	Option 100	Phone measurement software license	5
	Option 200	Date measurement software license	5
	Option 220	Date measurement server software license	1
	E7475A	**GSM drive-test system**	1
	Option 110	Receiver measurement software license	2
	Option 330	DCS1800 receiver with internal GPS	1
	Option 310	E-GSM900 receiver with internal GPS	1
	Option ABB	Continental Europe localization	1

Table 1 - Agilent E7478A GPRS drive-test system typical configuration examples

Part 2: System option contents

Refer to Table 2 below for a list of the hardware and software that is supplied with each of the system options.

	Sof	ware licen	se op	ions	GPRS test phone option
Description	100	200, 220	150	160,180	540
Software on CD-ROM	x	x			
Software license on security key	x	x	x	x	
Sagem test mobile phone with standard and extra battery					x
Power/Data cable for test mobile phone					x
AC/DC charger for test mobile					x
Dual port ruggedized PCMCIA serial I/O card	x		x		
Software tutorial	x	x	x	x	
Getting started guide	x	x			

Table 2 - E7478A GPRS drive-test system options and what is included

Part 3: Option descriptions

E7478A GPRS drive-test system

The following section describes the system options in detail. For technical specifications, please refer to the Agilent E7478A GPRS Drive-Test System Data Sheet, literature number 5988-1506EN.

E7478A GPRS drive-test system options

GPRS phone-based measurement capability:

Option 100: GPRS phone measurement software license

This option, along with the corresponding test mobile phone hardware (option 540) enables comprehensive measurement and message logging of GPRS and GSM information.

Data measurement capability:

Option 200: Data measurement software license

Option 220: Data measurement server software license

The GPRS phone measurement software is at its most effective when controlled data traffic is being transferred to and from a TCP/IP network. Agilent Wireless Data Measurement software options (200 and 220) support this data exchange and enable extensive data measurement and characterization capability.

In addition, it is possible to extend the measurement capabilities of your system by adding the following extra software licenses:

Option 150 multiple GPRS test mobile software license

The multiple GPRS test mobile software license is used in conjunction with option 100, GPRS phone measurement software license. It enables you to control more than one test mobile simultaneously. This software license would be useful for applications when you need to benchmark two or more networks with phone calls set up on each network at the same time.

Option 160 real-time mapping software license

The real-time mapping software license provides real-time data mapping. A single measurement parameter is plotted on the map, in color-coded thematic format, as the data is collected. Base station locations are plotted on the map with site names, sector orientations and channel sets. Alarms are plotted on the map; double clicking on the alarm symbol displays the corresponding alarm text message.

Option 180 indoor measurement software license

The indoor measurement software license extends the option 100 software license with the ability to make GPRS measurements inside of buildings. While walking through a building, waypoints are recorded on a floor plan of the building. Measurement results are interpolated between the waypoints. Indoor measurements require a floor plan or sketch of the building to be measured. The floor plan can be in .gif, .tif, or .png file formats. This option enables navigation indoors without GPS. The system software is supplied on a CD-ROM and the license on a software security key that connects transparently to the parallel port of your PC.

GSM digital receiver capability

The receiver measurement functionality of the E7475A GSM drive-test system is compatible with the E7478A system. Refer to the E7475A's Technical Specifications, literature number 5968-5564E for details.

Part 4: Drive-test accessories

Agilent can supply a range of accessory products to supplement and enhance your E7478A drive-test system.

The following product options are ordered under the 86154A drive-test accessories product, NOT the E7478A drive-test product.

External GPS receiver and accessories

The E7478A system has the ability to work with several types of GPS interfaces. The system is compatible with the communications protocols listed below. The physical interface is RS-232 with a DB9 connector. The E7475A system is also compatible with the Magneti Marelli NAV200 navigation system and the Bosch Travel Pilot RGS08 Professional Navigation system. Agilent does not supply these systems.

Compatible GPS protocols

- ❑ TAIP
- ❑ TSIP
- ❑ NMEA

Agilent 86154A Option 210 adds a Trimble Placer 455-DR GPS receiver with dead reckoning for external connection to the E7478A systems.

Note: This accessory option is not compatible with Agilent receivers that have been configured with an internal GPS.

86154A Option 210 -
External GPS receiver with dead reckoning

- ❑ Trimble Placer GPS 455 with dead reckoning
- ❑ Heading sensor
- ❑ Odometer sensor
- ❑ Interconnect adapter (to connect to an Agilent digital receiver)
- ❑ Interconnect cables
- ❑ Magnetic mount antenna with cable
- ❑ Differential compatible
- ❑ Cigarette lighter power card

86154A Option 211,
Option 212 - Trimble interconnect cables

Options 211 and 212 are interconnect adapters for connection to certain Trimble GPS receivers. Table 3 below lists several GPS receiver models and the associated interconnect requirements. For other models of external GPS receivers, consult an Agilent representative for adapter availability.

Interconnect cables for external GPS receivers

GPS receiver model	Interconnect requirement
Trimble Placer GPS/DR (obsolete)	Option 211
Trimble Placer GPS 455	Option 212
Trimble SveeSix	Straight-through RS-232 cable
Trimble Placer GPS 400 (obsolete)	Straight-through RS-232 cable

Table 3. Interconnect requirements

If a GPS receiver is purchased from Agilent as an option to the system, all necessary interconnect parts and a magnetically mounted GPS antenna will be provided. If you order Option 210, you do not need to order Option 211 or 212.

86154A Option 230 - Differential GPS receiver

- ❑ Differential corrections, incorporated RDS-3000
- ❑ Magnetic mount antenna
- ❑ Interconnect cables

Differential GPS can be used with the E7478A systems provided the GPS receiver being used is differential compatible. 86154A option 230 adds a differential GPS receiver to the system.

Note: Activation and payment for differential service is not included. Contact Differential Corrections, Inc., for more information.

Portability accessories

86154A Option 531 - Briefcase carrier

Lightweight briefcase carrier for one test mobile, Agilent digital receiver, laptop PC and connecting cables.

Designed for transporting the system. It is NOT intended that the system be operated from within the case.

Laptop PC

86154A Option 010 - Laptop PC

Laptop PC specifications are subject to frequent changes. Please contact your Agilent representative for current specifications of this option.

Miscellaneous accessories

86154A Option 020 - Extra dual-port ruggedized PCMCIA serial I/O card

Provides an additional serial I/O card to enable receivers or phones to be connected to a laptop PC.

86154A Option 099 - Multi-receiver connection cable kit

Contains an extra-long connection cable for use in applications where it is necessary to connect more than three Agilent digital receivers together. A regular-length cable, is supplied as standard with all digital receivers and is also included in the kit.

Indoor (portable) measurement accessories

The following accessories are provided for indoor and portable wireless measurements. For a detailed description of the indoor accessories, please refer to the Agilent Indoor Wireless Measurement System product overview, literature number 5968-8689E.

86154A Option 030

❑ Fujitsu pen tablet computer

The pen tablet computer includes a customized pen tablet computer case. A pen tablet computer is highly recommended for indoor (portable) measurements.

86154A Option 032

❑ Pen tablet computer auto power adapter

86154A Option 034 - Pen tablet battery kit

❑ Pen tablet battery

❑ Battery charger

This option provides an extra battery for the Fujitsu pen tablet computer. It also provides an external charger to charge one battery while the other is in use.

86154A Option 036 - Universal serial bus (USB) hub

This accessory is useful when the indoor measurement system is being used with more than one receiver or phone in the backpack carry case. It permits a single cable to be connected from the backpack to the pen tablet computer with other receiver and phone interconnects kept within the backpack carry case. The hub converts USB (from tablet computer) to multiple serial ports for connection to the measurement hardware.

86154A Option 425 - Dual band indoor antenna

86154A Option 507 - Measurement system backpack

Custom backpack designed to carry two receivers, batteries and all accessories

86154A Option 500 - Receiver battery kit

❑ Receiver battery

❑ Battery charger

This battery allows the use of the receiver hardware in an indoor environment where it would be inconvenient to have a power supply cable.

E7478A Option Summary

This is a complete list of all product options for the E7478A GPRS drive-test system

E7478A GPRS drive-test system

Software license options

Option 100: GPRS phone measurement software license

Option 150: Multiple GPRS test mobile software license.

Option 160: Real-time mapping software license

Option 180: Indoor measurement software license

Option 200: Data measurement software license

Option 220: Data measurement server software license

Test mobile phone options

Option 540: GPRS GSM/DCS test mobile phone

Localization options

Option ABU: United Kingdom - English localization

Option ABB: Europe - English localization

Option ARS: Asia Pacific - (UK Cord)/English localization

Option ABA: U.S. - English localization

Option ABG: Australia - English localization

Option ACD: Switzerland - English localization

Option ACE: Denmark - English localization

Option ACQ: S. Africa - English localization

Option AKM: China - English localization

Option AKJ: Israel - English localization

Option A1X: Chile - English localization

Option ARM: Argentina - English localization

Option AKL: Thailand - English localization

Drive-test accessory option summary

This is a list of the drive-test accessory options relevant to the GSM drive-test system.

86154A Drive-test accessory options

External GPS receiver

Option 210: External GPS receiver with dead reckoning

Option 211: Interconnect cable for Trimble Placer

Option 212: Interconnect cable for Trimble Placer 455

Option 230: Differential GPS receiver

Portability Accessories

Option 531: Briefcase carrier

Laptop PC

Option 010: Laptop PC

Indoor measurement accessories

Option 030: Fujitsu pen tablet computer
Option 032: Pen tablet accessories
Option 034: Pen tablet battery kit
Option 036: Universal serial bus hub
Option 507: Measurement system backpack
Option 500: Receiver battery kit
Option 425: Dual-band indoor antenna

Localization options

Option ABU: United Kingdom - English localization
Option ABB: Europe - English localization
Option ARS: Asia Pacific - (UK Cord)/English localization
Option ABA: U.S. - English localization
Option ABG: Australia - English localization
Option ACD: Switzerland - English localization
Option ACE: Denmark - English localization
Option ACQ: S. Africa - English localization
Option AKM: China - English localization
Option AKJ: Israel - English localization
Option A1X: Chile - English localization
Option ARM: Argentina - English localization
Option AKL: Thailand - English localization

Recommended literature:

- ❑ E7478A GPRS Drive-Test System Product Overview 5980-2375E
- ❑ Wireless Data Measurement Product Overview 5980-1470E
- ❑ Wireless Data Measurement Data Sheet 5988-1507EN
- ❑ E7478A GPRS Drive-Test System Data Sheet 5988-1506EN
- ❑ Network Optimization Brochure 5980-0216E

Additional literature:

- ❑ E7475A GSM Drive-Test System Technical Specifications 5968-5564E
- ❑ Indoor Wireless Measurement System Product Overview 5968-8691E
- ❑ E7475A GSM Drive-Test System Brochure 5968-5562E

For additional information please visit:
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