Agilent E7473A
CDMA Drive-Test System

Configuration Guide

The Agilent Technologies E7473A CDMA drive-test system is used to obtain RF coverage and service performance measurements for wireless communications networks that use IS-95 and J-STD-008 technologies. The system software runs on a PC that interfaces with an Agilent digital RF receiver and/or a CDMA mobile phone. The system can control up to four receivers and four phones simultaneously.

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The E7473A CDMA drive-test system is available in several configurations:

- **Phone-based systems**
- **Receiver-based systems**
- **Combined phone- and receiver-based systems**

The purpose of this configuration guide is to assist you in ordering the correct system configuration for your application. It is designed to be used in conjunction with the Agilent E7473A Drive-Test System Technical Specifications (literature number 5968-5555E), which describes the features and functions in detail. This document is divided into seven parts:

Part 1: Basic description of product configuration

Part 2: Software options

Part 3: Receiver hardware options

Part 4: Accessories

Part 5: For those familiar with the E7450B, E7452A, E7460A, E7470A and E7472A

Part 6: Upgrading existing systems

Part 7: Ordering examples

The E7473A system model number replaces five previous model numbers for CDMA drive-test systems E7450B, E7452A, E7460A, E7470A, and E7472A. Complete compatibility and system functions are maintained with the model number transition, but the ordering process is different.

Part 5 describes the ordering process for those familiar with the previous model numbers.

Part 6 provides the information required for upgrading existing systems.

For example, if you currently own an E7473A system with only phone-based measurement capability, and you want to upgrade it to have combined phone-and receiver-based measurement capability, then the information in Part 6 will assist you in ordering the necessary options.

Part 1: Basic description of product configuration

The system is made up of software, receiver hardware and accessories.

To order a system:

1. Choose the software function that you want (option numbers in the 100's)
2. Choose the receiver hardware that you want (option numbers in the 300's)
3. Choose the accessories that you want (86154A and E6473A drive-test system accessories)

Each system requires either an Agilent digital receiver, a CDMA mobile phone, or both. The system also requires a PC with Windows® 95, 98 or NT® running the measurement software. A GPS receiver and GPS antenna are required to log the position information and provide timing for the receiver CDMA measurements.

IMPORTANT: At least one option must be ordered for the product configuration to be valid.

Part 2: Software options

Figures 1 and 2 illustrate how to choose the specific options to order with your E7473A system.

Figure 1. Ordering decision process - new systems

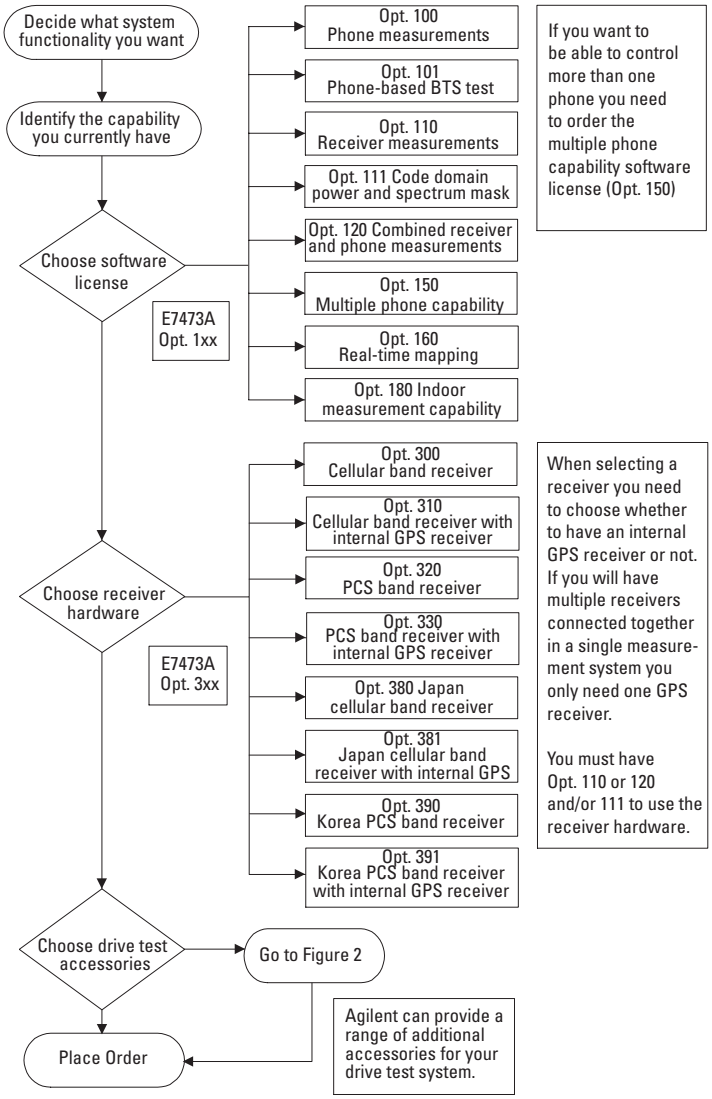
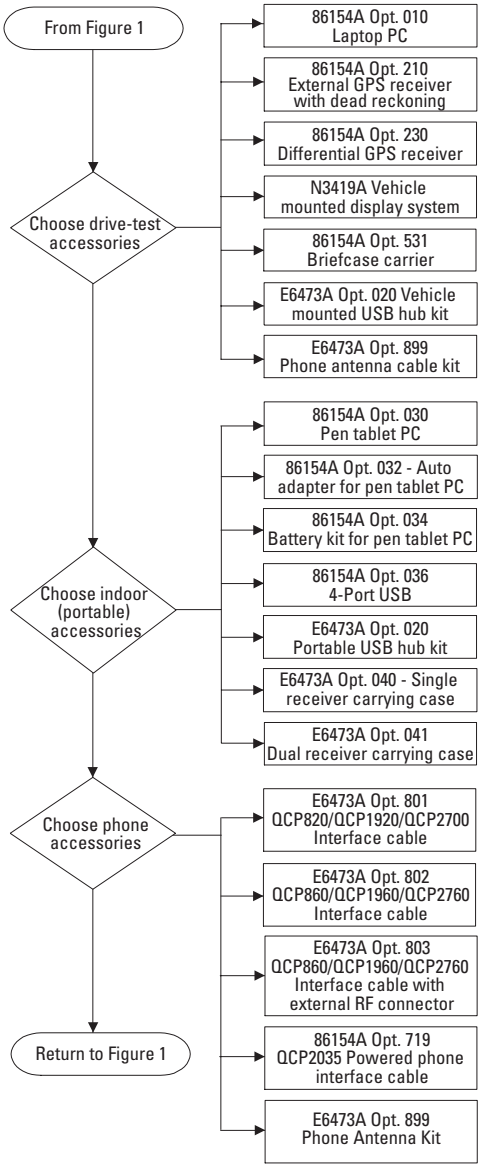


Figure 2. Ordering decision process - accessories for new systems



Part 2: Software options (continued)

Following is information for ordering a new system software function. If you are adding a function to an existing system, refer to Part 6: Upgrading existing systems.

The following software options are available for the Agilent E7473A:

- **Option 100:** CDMA phone-based system software license
- **Option 101:** CDMA phone-based BTS test software license
- **Option 110:** CDMA receiver-based system software license
- **Option 111:** Code domain power and spectrum mask software license
- **Option 120:** CDMA combine phone- and receiver-based system software license
- **Option 150:** CDMA multiple phone capability software license
- **Option 160:** Real-time mapping software license
- **Option 180:** Indoor measurement capability

Use Table 1 to determine which software option(s) you require for your application. For a detailed description of the function, please refer to the *Agilent E7473A Drive-Test System technical specifications* (literature number 5968-5555E).

Each software order includes the following components:

- CD with software and documentation
- Getting started guide
- Software license keys (attaches to PC parallel port or USB port)

Options 101, 111, 160 and 180 can be combined with any other valid set of options. Option 120 should not be ordered along with 100 or 110, as 120 has all of the functionality of 100 and 110 combined. Option 150 should only be ordered along with 100 or 120 or by a customer who already has 100 or 120.

Table 1. Software function

Desired function	Software option(s) required
Phone-based drive system measurements (single phone)	100
Phone-based drive system measurements (up to four phones)	100 AND 150
Receiver-based drive system measurements (up to four receivers)	110
Phone-based drive system measurements (single phone) AND Receiver-based drive system measurements (up to four receivers)	120
Phone-based drive system measurements (up to four phones) AND Receiver-based drive system measurements (up to four receivers)	120 AND 150
Phone-based BTS test capability (automated MOST function) (can be combined with all other software functionality)	101 (can be combined with any or all other software option numbers)
Code domain power and IS-97 spectrum mask (can be combined with all other software functionality)	111 (can be combined with any or all other software option numbers)
Real-time mapping capability (can be combined with all other software functionality)	160 (can be combined with any or all other software option numbers)
Indoor measurement capability (can be combined with all other software functionality)	180 (can be combined with any or all other software option numbers)

If Option 150 is ordered with Option 100 or Option 120, the software licenses will be placed on a single security key. If Option 150 is ordered as an upgrade, its license will be supplied on a separate security key. The license can then be transferred to the customer's existing security key using the supplied license manager software.

Options 100, 101, and 120 each include a Socket I/O ruggedized single serial port PCMCIA card for connecting phones to the PC. Option 150 includes a Socket I/O ruggedized dual serial port PCMCIA card.

IMPORTANT: Cables are required to connect CDMA handsets to the PC. For cable options for different CDMA handsets, refer to Part 4: Accessories.

Part 3: Receiver hardware options

Following is information for ordering new RF receiver hardware. If you are adding a function to an existing system, refer to Part 5: Upgrading existing systems.

The following digital receiver hardware options are available for the E7473A:

- **Option 300:** Cellular band digital receiver
- **Option 310:** Cellular band digital receiver with internal GPS receiver
- **Option 320:** PCS band digital receiver
- **Option 330:** PCS band digital receiver with internal GPS receiver
- **Option 380:** Japan Cellular band receiver
- **Option 381:** Japan Cellular band receiver with internal GPS receiver
- **Option 390:** Korea PCS band receiver
- **Option 391:** Korea PCS band receiver with internal GPS receiver

Software Option 110, 111 or 120 is required to operate receivers. One software package can control up to four receivers.

When selecting a measurement receiver, you have the option of having GPS internal to the receiver. Internal GPS provides portability and simplifies system configuration. If you require dead-reckoning with your GPS, use an external GPS and do not select a receiver with internal GPS. Agilent RF receivers with internal GPS cannot be used with an external GPS. Agilent offers an external GPS with dead-reckoning capability. Refer to Part 4: *Accessories*.

For receiver specifications and a detailed description of the receiver function, please refer to the Agilent E7473A Drive-Test System Technical Specifications (literature number 5968-5555E).

Select the receiver that covers the frequency band in which you want to make measurements. If you need to make measurements in more than one band, order additional measurement receivers.

In multiple-receiver configurations, only one of the receivers requires GPS. If you are using multiple receivers in your system, you should only select ONE of the receivers with internal GPS.

Each receiver includes the following components:

- Magnetic-mount RF antenna for the corresponding frequency band
- TNC-to-type N adapter for RF antenna
- RS-232 cable for connection to PC*
- Cable to connect multiple receiver configurations
- AC/DC power supply*
- DC power cord-cigarette lighter type*
- Mounting kit-brackets and screws for mounting receiver in a vehicle

The receivers with internal GPS receivers (Options 310, 330, 381, and 391) also include the following:

- Magnetic-mount GPS antenna with cable

*Alternatively, Agilent provides optional system accessories that can be used to power and connect simultaneously up to 2 phones and up to 2 receivers to the PC. Two configurations are provided E6473A option 010 (Vehicle-Mounted USB Hub Kit) and option 020 (Portable USB Hub Kit) for in-vehicle and indoor (portable) wireless measurement applications, respectively. Refer to Part 4: Accessories.

Part 4: Accessories

In addition to the E7473A system components for drive testing, Agilent supplies a range of accessory products to supplement and enhance your E7473A measurement system. The accessories can be divided up into the following categories:

- Drive test system accessories
- Drive test system replacement accessories
- Indoor (portable) measurement system accessories

The following accessories are ordered under the 86154A or E6473A accessories product numbers, not the E7473A drive test product. The accessory model number is provided for each option to distinguish which product number should be used.

For a detailed description of these accessories, please refer to the Agilent E7473A CDMA Drive-test system technical specification (literature number 5968-5555E).

Drive test system accessories

The following accessories are provided for drive testing (in-vehicle measurements). The drive test accessories are ordered using Agilent 86154A and/or E6473A accessories product numbers.

- **86154A Option 010:** Laptop PC
- **86154A Option 210:** Trimble Placer GPS 455 with dead-reckoning
- **86154A Option 230:** Differential GPS receiver
- **86154A Option 520:** Vehicle-mounted display system
- **86154A Option 531:** Briefcase carrier

The briefcase carrier is a lightweight briefcase carrier designed for one test mobile, one Agilent digital receiver, a laptop PC, and connecting cables. The case is designed for transporting the system. It is not intended that the system be operated from within the case.

E6473A Option 010: Vehicle-mounted USB hub kit

This vehicle-mounted USB hub kit is designed for in-vehicle wireless measurements. The USB hub allows the simultaneous connection of up to two phones and two receivers to the laptop PC. In addition, the kit provides powering capability for the phone(s) and/or receiver(s).

The kit includes:

- USB Hub
- Universal mounting plate
- Permanent power cable
- USB to computer interface cables (a 3-foot cable and a 15-foot cable)
- Auto cigarette lighter power cable
- One USB hub to Agilent digital receiver interface cable. For a dual receiver configuration, an additional USB hub to digital receiver power cable is provided to power the second receiver. For PC communication to the second receiver, use the serial cable provided with the receivers to connect the two receivers.

The USB hub to phone interface cables are not included in the kit and must be ordered separately.

For portable applications, it is recommended that the equivalent E6473A option 020 portable USB hub kit is used. The same USB hub functionality is provided but the kit itself is designed specifically for indoor and portable wireless measurements.

Phone accessories

The following options provide interface cables for the supported CDMA phones. The phone interface cables are required to connect the phone to the PC. The interface cables can be used with or without the E6473A options 010 (Vehicle) and 020 (Portable) USB Hub Kits. Each phone interface option includes the following additional accessories.

- Phone to USB Hub interface cable (designed to be used with E6473A options 010 or 020).
- USB Hub to DB9 converter
  - Used with the phone to USB hub interface cable when E6473A options 010 or 020 USB hub kits are not present
  - Connects directly to the laptop PC or pen tablet computer
  - No power is provided to the phone. If power for the phones is required, order E6473A option 010 for in-vehicle applications or the E6473A Option 020 for portable applications.
- Audio headset
- 15 foot extension cable

E6473A Option 801: CDMA QCP820, QCP1920, and QCP2700 interface cable

This phone interface cable is required to connect the following phones to the PC: QCP820, QCP1920, and QCP2700. This option includes an RF breakout kit.

E6473A Option 802: CDMA QCP860, QCP1960, and QCP2760 Interface cable

This phone interface cable is required to connect the following phones to the PC: QCP860, QCP1960, and QCP2760. This cable does not provide an external RF connection.

E6473A Option 803: CDMA QCP860, QCP1960, and QCP2760 interface cable with external RF connector

This phone interface cable is required to connect the following phones to the PC: QCP860, QCP1960, and QCP2760. This option includes an external RF connector that can be used with the E6473A option 899 - phone antenna kit.

86154A Option 719: Powered QCP2035 phone interface cable

This phone interface cable is required to connect the QCP2035 phone to the PC. This cable is not designed to work with the E6473A option 010 and/or E6473A option 020 USB hub kits.

E6473A Option 899: Phone antenna kit

The phone antenna kit is designed for use with the E6473A option 803 - CDMA QCP860, QCP1960, and QCP2760 interface cable with external RF connector. It includes a phone adapter cable and an antenna magnetic mount kit.

Drive test replacement accessories

The following list of drive test accessories includes replacement accessories that are included with the E7473A CDMA drive-test system. In most cases, these options are only ordered to replace lost or damaged accessories.

- **Option 099:** Multiple receiver interconnect kit
- **Option 410:** PCS band magnetic mount RF antenna
- **Option 430**: Cellular band magnetic mount RF antenna
- **Option 500:** Vehicle mounting 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

The pen tablet battery kit includes:
- Pen tablet battery
- Battery charger

86154A Option 036: Universal serial bus hub

This accessory is useful when the indoor measurement is being used with more than one receiver and/or phone in the backpack carrying case. The USB hub permits a single cable to be connected from the backpack to the pen tablet computer and at the same time provide the ability to connect multiple serial port configurations. Alternatively, the Agilent E6473A Option 020, portable USB hub kit can be used to provide multiple serial port connections to the pen tablet computer, as well as provide power to the receiver(s) and/or phones.

E6473A Option 020: Portable USB hub kit

This USB hub kit allows the connection of up to two phones and two receivers to the pen tablet computer. In addition the kit provides powering capability for the phone(s) and/or receiver(s). The kit includes:

- USB hub
- USB hub carrying bag
- USB hub battery and battery charger
- USB to pen tablet computer interface cable
- Auto cigarette lighter power cable
- One USB hub to Agilent digital receiver interface cable. For a dual receiver configuration, an additional USB hub to digital receiver power cable is provided to power the second receiver. For PC communication to the second receiver, use the serial cable provided with the receivers to connect the two receivers.

The USB hub to phone interface cables are not included in the kit and must be ordered separately.

E6473A Option 040: Single receiver carrying case

The single receiver carrying case is used for portable configurations where only one Agilent digital receiver is used to perform wireless measurements. The single receiver carrying case is recommended for use with the E6473A USB hub kit and includes one tri-band indoor antenna. For dual receiver configurations, the E6473A Option 041, dual receiver carrying case is recommended for use with the Portable USB hub kit when two receivers are being used.

E6473A Option 041: Dual receiver carrying case

The dual receiver carrying case is used for portable configurations where two Agilent digital receivers are being used to perform wireless measurements. The dual receiver carrying case is recommended when two receivers are used with the E6473A Option 020 USB hub kit. The kit includes two tri-band indoor antennas.

Please note indoor receiver-based pilot channel analysis and code domain power measurements are limited due to difficulty with GPS timing. Please refer to Agilent E7473A Drive-test System technical specification (literature number 5968-5555E) for a detailed description of CDMA indoor measurements.

Part 5: For those familiar with the E7450B, E7452A, E7460A, E7470A and E7472A

The E7473A system model number replaces five previous model numbers for CDMA drive-test systems E7450B, E7452A, E7460A, E7470A and E7472A. Complete compatibility and system functions are maintained with the model number transition, but the ordering process is different. Table 2 translates the previous system product numbering structure to the current structure.

The items listed below, that were options with the previous structure, are now included with each receiver. E7473A Options 300, 310, 320, 330, 380, 381, 390, and 391 include the following:

• Magnetic-mount RF antenna for the corresponding frequency band (formerly Option 410 on the E7450B and E7470A; Option 430 on the E7452A and E7472A).

• Mounting kit – brackets and screws for mounting receiver in a vehicle (formerly Option 500 on the E7450B, E7452A, E7470A and E7472A).

All other accessories, such as laptop PCs and phone cables, are now ordered using the 86154A drive-test accessories model number. Please refer to Part 4: *Accessories*.

Table 2. Translation from previous structure to current product structure

Former model/option numbers	Equivalent model/opt. numbers in current structure
E7450B	E7473A + Options 110, 320
E7452A	E7473A + Options 110, 300
E7460A	E7473A + Options 100, 150
E7470A	E7473A + Options 120, 150, 320
E7472A	E7473A + Options 120, 150, 300
E7450B + Option 200 (internal GPS)	E7473A + Options 110, 330
E7452A + Option 200	E7473A + Options 110, 310
E7470A + Option 200	E7473A + Options 120, 150, 330
E7472A + Option 200	E7473A + Options 120, 150, 310
E7450A Option E01	E7473A + Options 110, 390
E7470A Option E01	E7473A + Options 120, 150, 390
E7452A Option E02	E7473A + Options 110, 38
E7472A Option E02	E7473A + Options 120, 150, 380
E7450A Option E01+ Option 200	E7473A + Options 110, 391
E7470A Option E01+ Option 200	E7473A + Options 120, 150, 391
E7452A Option E02+ Option 200	E7473A + Options 110, 381
E7472A Option E02+ Option 200	E7473A + Options 120, 150, 381

Part 6: Upgrading existing systems

The E7473A is a scalable system. You can start with one set of capabilities and integrate additional capabilities later. Some examples:

- Start with a phone-based system and upgrade to include receiver-based measurements
- Start with a receiver-based system and upgrade to include phone-based measurements
- Start with a single phone system and upgrade to provide multiple-phone capability
- Start with an outdoor drive-test system and upgrade to include indoor measurement capability
- Start with drive-test functionality and upgrade to include base station test capability

The system is made up of software, receiver hardware and accessories. Upgrading a system is similar to ordering a system from scratch. You simply order those system elements that you don't currently have. To upgrade a system:

1. Decide what system capability you want
2. Identify the capability you currently have
3. Choose the software options that you want (option numbers in the 100's), refer to Part 2: *Software options*
4. Choose the hardware options that you want (option numbers in the 300's), refer to Part 3: Receiver hardware options
5. Choose the accessories that you want (86154A and E6473A drive-test system accessories), refer to Part 4: *Accessories*

Figures 3 and 4 illustrate how to choose the specific options to order when you are upgrading an E7473A system.

Figure 3. Ordering decision process - upgrades

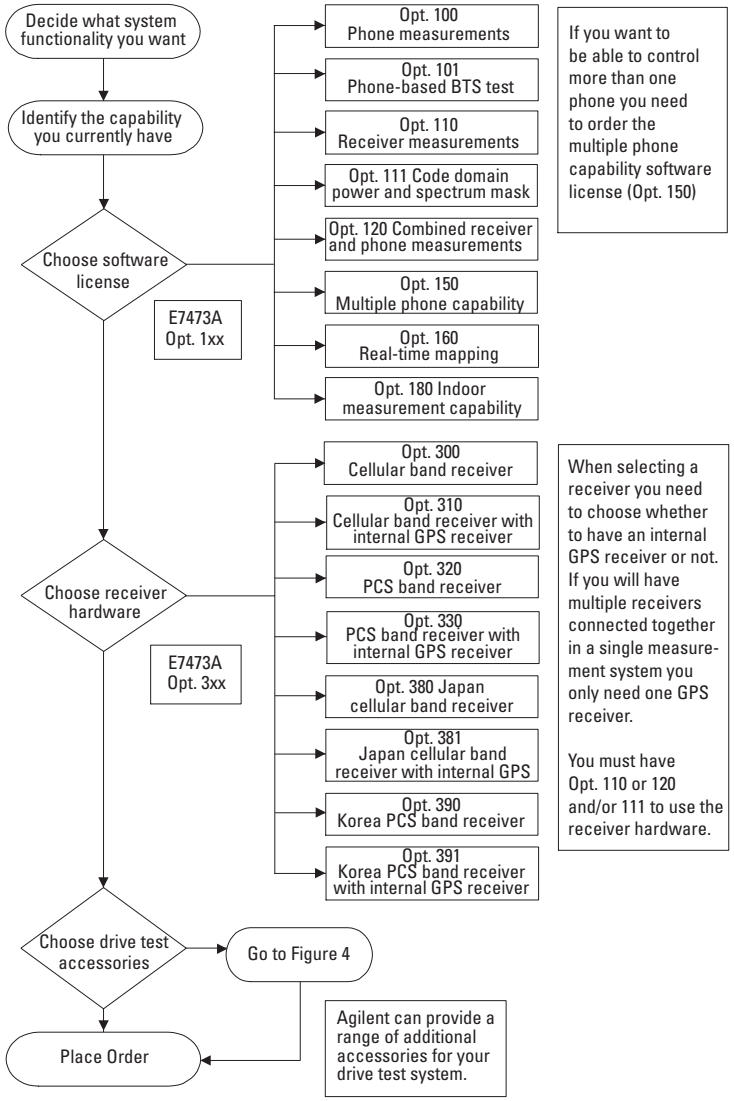
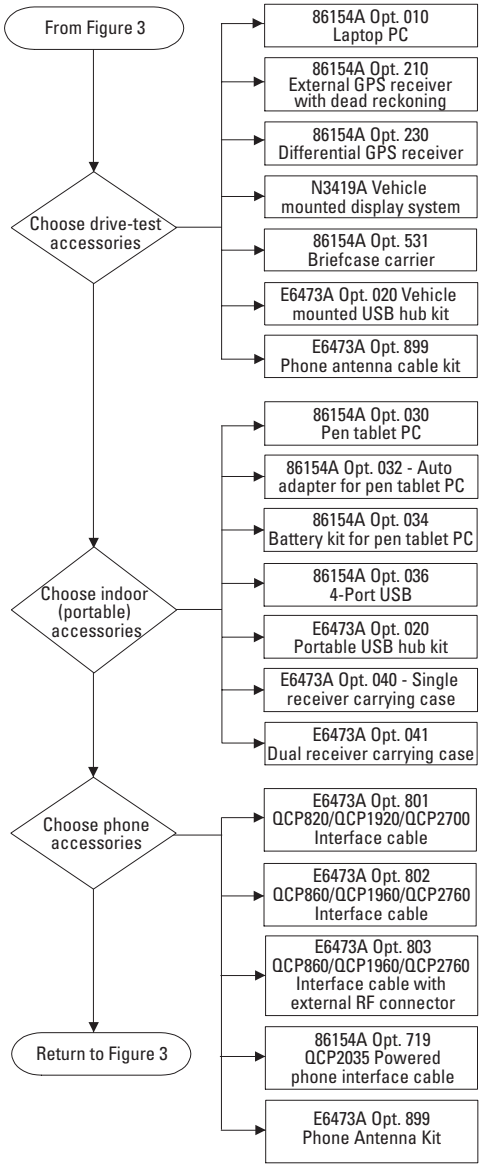


Figure 4. Ordering decision process - accessories for upgrades



Part 7: Ordering examples

Table 4 lists several typical E7473A system configurations along with the products and options that must be ordered for each configuration. This is not a complete list of all possible configurations, but it includes typical configurations to illustrate the ordering process.

Table 4. Typical order configuration

Desired system capability	What to Order	Description	Quantity
Phone-based measurement system (single phone). Interface cable for QCP2760 (no power provided). You will provide your own GPS and laptop.	Agilent E7473A	CDMA drive-test system	
	Option 100	Phone measurement software	1
	Agilent E6473A	Drive test accessories	
	Option 802	QCP860, 1960, 2760 interface cable	1
Phone-based measurement system (single phone). Power and cabling for QCP 820. Carrying case for the system. You want GPS and laptop included with the system.	Agilent E7473A	CDMA drive-test system	
	Option 100	Phone measurement software	1
	Agilent 6154A	Drive test accessories	
	Option 010	Laptop PC	1
	Option 210	External GPS with DR	1
	Option 531	Briefcase carrier	1
	Agilent E6473A	Drive test accessories	
	Option 010	Vehicle-mount USB hub kit	1
	Option 801	QCP820, 1920, 2700 interface cable	1
Phone-based measurement system (four phones). Cabling and power for two QCP1920s and two QCP1960s. You will provide your own GPS and laptop.	Agilent E7473A	CDMA drive-test system	
	Option 100	Phone measurement software	1
	Option 150	Multi-phone measurement capability	1
	Agilent E6473A	Drive test accessories	
	Option 010	Vehicle-mounted USB hub kit	2
	Option 801	QCP820, 1920, 2700 interface cable	2
	Option 802	QCP860, 1960, 2760 interface cable	2

Desired system capability	What to Order	Description	Quantity
Receiver-based measurement system for the Cellular band. Carrying case for the system. You will provide your own GPS and laptop.	Agilent E7473A	CDMA drive-test system	
	Option 110	Receiver measurement software	1
	Option 300	Cellular band RF digital receiver	1
	Agilent E6473A	Drive-test accessories	
	Option 531	Briefcase carrier	1
Receiver-based measurement system for the Cellular band with internal GPS. Carrying case for the system. You will provide your own laptop.	Agilent E7473A	CDMA drive-test system	
	Option 110	Receiver measurement software	1
	Option 310	Cellular receiver with internal GPS	1
	Agilent 86154A	Drive-test accessories	
	Option 531	Briefcase carrier	1
Combined phone and receiver-based measurement system for the cellular band (single phone). Phone cable for QCP820. You will provide your own GPS and laptop.	Agilent E7473A	CDMA drive-test system.	
	Option 120	Combined phone-and receiver-based measurement software.	1
	Option 300	Cellular band RF digital receiver	1
	Agilent E6473A	Drive test accessories	
	Option 801	QCP820, 1920, 2700 interface cable	1
Combined phone and receiver based measurement system for the cellular band (two phones). Internal GPS. power and cabling for the QCP2700. Carrying case for the system. You will provided your own laptop.	Agilent E7473A	CDMA drive-test system	
	Option 120	Combined phone and receiver-based measurement system.	1
	Option 150	Multi-phone measurement capability	1
	Option 310	Cellular receiver with internal GPS	1
	Agilent 86154A	Drive test accessories	
	Option 531	Briefcase carrier	1
	Agilent E6473A	Drive test accessories	
	Option 010	Vehicle-mounted USB hub kit	1
	Option 801	QCP820, 1920, 2700 interface cable	2
Combined phone and receiver-based system for both cellular and PCS bands (two phones). Dead-reckoning. Power and cabling for one QCP2700 phone and one QCP820 phone. Carrying case for the system. You may want external GPS and laptop PC included with the system.	Agilent E7473A	CDMA drive-test system	
	Option 120	Combined phone and receiver-based measurement system.	1
	Option 150	Multi-phone measurement capability	1
	Option 300	Cellular band RF digital receiver	1
	Option 320	PCS band RF digital receiver	1
	Agilent 86154A	Drive test accessories	
	Option 010	Laptop PC	1
	Option 210	External GPS with DR	1
	Option 531	Briefcase carrier	1
	Agilent E6473A	Drive test accessories	
	Option 010	Vehicle-mounted USB hub kit	1
	Option 801	QCP820, 1920, 2700 interface cable	2
Phone-based measurement system (two phones). Indoor measurement capability. Power and cabling for the QCP1960 phones. Fujitsu pen tablet computer for indoor measurements. Extra battery for pen tablet.	Agilent E7473A	CDMA Drive-test system	
	Option 100	Phone measurement software	1
	Option 150	Multiple-phone measurement capability	1
	Option 180	indoor measurement software	1
	Agilent 86154A	Drive test accessories	
	Option 030	Fujitsu pen tablet computer	1
	Option 034	Pen tablet battery kit	1
	Agilent E6473A	Drive test accessories	
	Option 020	Portable USB hub kit	1
	Option 802	QCP860, 1960, 2760 interface cables	2

Additional literature

Literature title and type	Literature number
E7473A CDMA Drive-Test System, technical specifications	5968-5555E
CDMA Drive-Test, product note	5968-5554E
E7480A CDMA Post Processing Software, product overview	5968-1549E
E7474A TDMA Drive-Test System, technical specifications	5968-5556E
E7474A TDMA Drive-Test System, configuration guide	5968-5861E
E7474A TDMA Drive-Test System, configuration guide	5968-5861E
E7475A GSM Drive-Test System, technical specifications	5968-8689E
E7475A GSM Drive-Test System, configuration guide	5968-5563E
E7475A GSM Drive-Test System, awareness brochure	5968-5562E
E7490A CDMA Over-Air Maintenance Tool, technical specifications	5968-8687E
E7490A CDMA Over-Air Maintenance Tool, configuration guide	5968-8696E
E7490A CDMA Over-Air Maintenance Tool, product overview	5968-8697E
Agilent Indoor Wireless Measurement Systems, product overview	5968-8689E

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Our Promise

Our Promise means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. Many self-help tools are available.

Your Advantage

Your Advantage means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and on-site education and training, as well as design, system integration, project management, and other professional engineering services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.

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