

4916 Antenna Coupler



boosting wireless efficiency

All mobiles fit on 4916 Antenna Coupler

Willtek's 4916 Antenna Coupler moves mobile phone testing into a new dimension by introducing three new objectives:

- Testing mobile phones with a good RF connection independent of size and antenna location,
- A wide frequency range covering current and upcoming 3G frequency bands,
- An RF match, as yet unachieved in the market, for measuring accuracy and high certainty.

The 4916 Antenna Coupler achieves all three objectives without compromising on state-of-the-art performance. It ensures an enhanced level in mobile phone testing to service shops, repair centres, manufactures and R&D labs.

The diversity in mobile phone design is ever increasing. The age of the simple rectangular phone with a top-located antenna has passed. Today's phones are made in all kinds of shapes and sizes with varying antenna positions.

A testing device such as the 4916 Antenna Coupler needs to reflect this. Its flexible shuttle allows every phone antenna to be moved above the „sweet spot“ (centre point of reception) to provide precise and repeatable measurements. The shuttle snaps in five locations, guaranteeing sustained accuracy of measured results.

The standard shuttle carries a universal mobile phone cradle suitable for most standard phones. Phones can be placed on or removed from the 4916 Antenna Coupler using only one hand.

To test large phones like PDAs, this standard shuttle can be replaced by a shuttle with a PDA cradle.

Move the shuttle down while pressing the unlock latch, remove the shuttle from the 4916's coupling plate, place the PDA shuttle on the plate and move it up. That's it! 4916's PDA shuttle carries a universal cradle for all types of wide phones and wireless PDAs. For special phones, Willtek provides shuttles with specific phone frames on request.

Highlights

3G ready solution for all mobile phone types

Wide frequency range for future technologies

Precise results with excellent RF match

Good coupling values on all phones

High repeatability using snap positions



Position 1



Position 3



Position 5

Wide frequency band covers 3G, Wireless LAN and GPS

Willtek's 4916 Antenna Coupler covers a continuous wide frequency range from 700 MHz to 2.7 GHz. Unique to the market, the 4916 covers all frequencies within this range gap-free. This wide range encompasses all current mobile phone frequency bands such as GSM 850/ 900/1800/1900, CDMA, TDMA, AMPS, PDC; new mobile phones technologies including UMTS, CDMA2000, Bluetooth™, Wireless LAN, GPS and future technologies, extended cellular (750 MHz) and Galileo.

All these systems are encompassed by a new antenna design. This also means a centre point for all frequencies, no compromise in coupling position on dual or triple-band phones.

Additionally, this new antenna design is non-sensitive in orientation. Horizontal or vertical polarisation makes no difference. Good coupling values are achieved for both polarisations. Especially in respect of new mobile phones with built-in flat antennas (PIFA) have different polarisations through the frequency bands. The new RF design on 4916 tolerates different polarisations and provides continuously good coupling values. The results can be repeated, regardless of whether the antenna is a stick-on, left, right, centre or a flat built-in antenna.



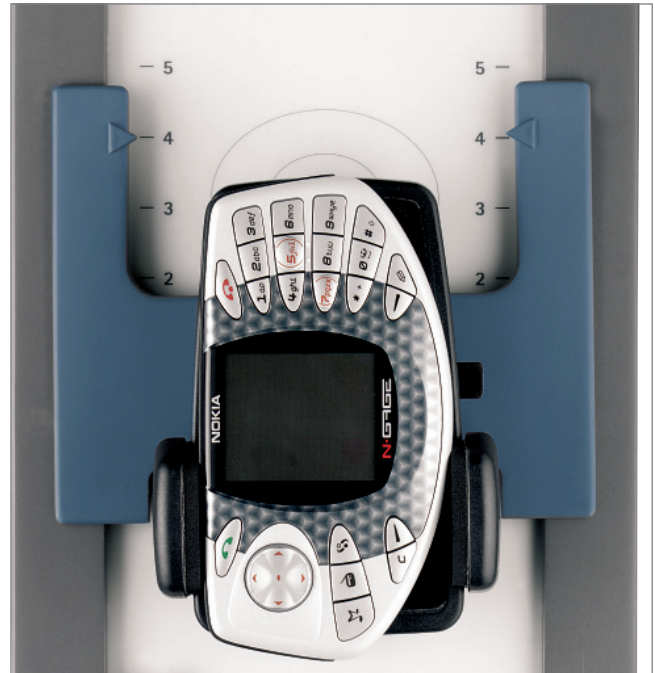
Precise measurements with high accuracy

A measurement tool needs to support precise testing. Therefore special wideband RF networks are designed to provide an excellent match. An RF match which is unique in the antenna coupler market. With this RF match, precise measurements are possible without compromising accuracy.

Conversely, a bad RF match can also impact the frequency response. This will result in incorrect RF level measurements or in distortion on wideband carriers like UMTS, cdma2000 or Wireless LAN. The 4916's frequency response is flat, ensuring very little coupling variation within a band and no impact on wideband carriers.

Moving mobile phones into the coupling centre increases resistance to interfering signals. Such interfering signals are base stations or mobiles being tested on an adjacent work-bench. Interference can also occur if the test signal is reflected by a metal plate close to an antenna coupler. Measurements achieved with high coupling losses can easily be impacted by other signals or reflected waves. Such measurements produce a false reading. With good coupling values – like those on the 4916 – the interference impact is low and mostly below measurement resolution.

However, the mobile being tested must be positioned correctly to ensure accurate readings. The 4916 has five snap-in positions, which are spaced 2 cm or 0.8 inch apart. This is close enough to find good coupling values but also wide enough to avoid handling errors.



Willtek's support beyond the product

Willtek characterises phones on request and integrates the coupling values into remote applications like 7310 Lector, the remote control program for the 3100 Mobile Fault Finder.

There are different procedures for measuring the coupling loss values for the different technologies. For GSM phones for example, six coupling loss values per frequency band are recorded, one value each for RX and for TX. These two values are recorded and stored for the defined low, mid and high channels.

The values are used in 7310 Lector; the software identifies the mobile phone and selects the correct coupling values before the tests are performed.



Shielding avoids false results and protects against interference

Testing mobile phones on an antenna coupler requires operation of the mobile phone on various frequencies at different power levels.

These frequencies are often used by network operators. Interference is an obvious problem. Even though interference of surrounding signals is reduced by 4916's good coupling values, they are still present.

Additional mobile phones under test radiate, and this radiation has a high potential of interfering with a mobile phone network.

These interference effects range from bad voice quality to disrupting mobile phone calls in the vicinity.

The Willtek 4921 RF Shield encloses the 4916 Antenna Coupler, providing the necessary isolation. The package consisting of RF Shield and Antenna Coupler ensures accurate, interference-free testing and avoids distortion of network operators' business.



Specifications

Frequency range (continuous)

Usable	700 to 2700 MHz
Optimised	800 to 2200 MHz

RF match (VSWR)

in the range 0.8 to 2.2 GHz	< 2.5, typ. 2.0
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Coupling deviation

to reference unit	< 0.7 dB
between two units	< 1.4 dB

Max. power

Mobile phone	38 dBm
At 4916's QMA connector	26 dBm

RF connector

On board	QMA (Quick SMA)
RF cable	N-Type or TNC

Weight

Board	approx. 700 g
Shuttle	approx. 130 g

Dimensions

Board	175 x 255 x 50 mm
Shuttle	160 x 120 x 55 mm

Ordering information

4916 Antenna Coupler	M 248 641
Coupling plate and standard shuttle	

PDA Shuttle for 4916	M 248 692
Shuttle with universal cradle for PDA or wide phones	

4921 RF Shield (N) & 4916 Antenna Coupler package	M 248 642
includes RF cable N (fem.) – N (fem.)	



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