

# SP8315 Wireless Test Set

## Product Overview

SP8315 is NB-IoT/eMTC terminal tester from Starpoint, which can be widely used during the terminal developing, testing, certificating, deploying and maintaining. With the help of SP8315, various network scenarios can be built to verify NB-IoT/eMTC terminal functions and performance more quickly, accurately and effectively.

SP8315 contains functional NB-IoT/eMTC base-station protocol stack. It can establish communication with terminal to verify signalling functions.

When used as Communication Test Set, SP8315 can test and measure terminal RF characteristics specified in 3GPP TS36.101 according to TS36.508 and TS36.521-1, including transmitting power, spectrum, modulation quality, receiving power, demodulation performance, etc. It can also generate or demodulate signals of each independent physical channel, which function is important in early stage of chipset development.

When used as Protocol Analyzer, SP8315 can provide hundreds of predefined test cases for testing the functions of NAS layer, RRC layer, PDCP/RLC/MAC layer, Physical layer. Users also could define/develop more test cases according their own requirements.

In addition, SP8315 is the key instrument of NB-IoT/eMTC terminal protocol/RF/RRM conformance test systems as system simulator, channel emulator and vector signal generator.



## Functions

### ✧ System Simulating

<b>Protocol Version</b>	3GPP E-UTRA Release 13
<b>Frequency range</b>	400MHz ~ 3GHz
<b>Cell Number</b>	1~2

### ✧ RF Characteristics Testing

<b>Transmitter Characteristics</b>	<ul style="list-style-type: none"> <li>• Maximum Output Power</li> <li>• Maximum Power Reduction</li> <li>• Configured UE Transmitted Output Power</li> <li>• Minimum Output Power</li> <li>• Transmit OFF Power</li> <li>• General ON/OFF Time Mask</li> <li>• NPRACH Time Mask</li> </ul>
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	<ul style="list-style-type: none"> <li>• Power Control Absolute Power Tolerance</li> <li>• Power Control Relative Power Tolerance</li> <li>• Frequency Error</li> <li>• Error Vector Magnitude</li> <li>• Carrier Leakage</li> <li>• In-band Emissions</li> <li>• Occupied Bandwidth</li> <li>• Spectrum Emission Mask</li> <li>• Adjacent Channel Leakage Ratio</li> </ul>
<b>Receiver Characteristics</b>	<ul style="list-style-type: none"> <li>• Reference Sensitivity Level without Repetitions</li> <li>• Reference Sensitivity Level with Repetitions</li> <li>• Maximum Input Level</li> </ul>

#### ✧ Independent Physical Layer Signal Testing

<b>Signal Generating</b>	<ul style="list-style-type: none"> <li>• NPBCH</li> <li>• NPDCCH</li> <li>• NPDSCH</li> </ul>
<b>Signal Analyzing</b>	<ul style="list-style-type: none"> <li>• NPRACH</li> <li>• NPUSCH (format1, format2)</li> </ul>

#### ✧ Protocol Analyzing

<b>Category of Predefined Test Cases</b>	<p><b>Idle Mode Operations</b></p> <ul style="list-style-type: none"> <li>• PLMN selection</li> <li>• Cell selection and reselection</li> <li>• Access barring</li> </ul> <p><b>MAC</b></p> <ul style="list-style-type: none"> <li>• Channel mapping</li> <li>• RACH procedures</li> <li>• DL-SCH data transfer</li> <li>• UL-SCH data transfer</li> <li>• DRX/eDRX operation</li> <li>• Transport block size selection</li> <li>• Multi-carrier</li> <li>• Multi-tone</li> </ul> <p><b>RLC</b></p> <ul style="list-style-type: none"> <li>• Acknowledged mode</li> </ul> <p><b>PDCP</b></p> <ul style="list-style-type: none"> <li>• PDCP ciphering and deciphering</li> <li>• PDCP integrity protection</li> <li>• PDCP re-establish</li> <li>• PDCP discard</li> </ul>
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	<p><b>RRC</b></p> <ul style="list-style-type: none"> <li>• Paging</li> <li>• RRC connection establishment</li> <li>• RRC connection release</li> <li>• UE capability transfer</li> <li>• RRC connection suspend-resume</li> <li>• RRC connection reconfiguration</li> <li>• Radio link failure</li> <li>• MO exception data transfer</li> </ul> <p><b>EMM-CIOT</b></p> <ul style="list-style-type: none"> <li>• Authentication procedure</li> <li>• Security mode command</li> <li>• Identification procedure</li> <li>• Attach</li> <li>• Detach</li> <li>• TAU</li> <li>• eDRX handling</li> <li>• Service request</li> <li>• Security</li> </ul> <p><b>ESM-CIOT</b></p> <ul style="list-style-type: none"> <li>• UE requested PDN connectivity</li> <li>• UE requested PDN disconnect</li> <li>• UE requested bearer resource allocation</li> <li>• UE requested bearer resource modification</li> <li>• UE routing of uplink packets</li> </ul> <p><b>SMS</b></p> <ul style="list-style-type: none"> <li>• SMS transfer</li> </ul>
<b>Development Language of User Defined Scenario</b>	TTCN-3

## Performance/Specifications

<b>RF Connector</b>	N-type female
<b>Impedance</b>	50Ω nominal
<b>Frequency Range</b>	400MHz ~ 3GHz
<b>Frequency Resolution</b>	1Hz
<b>Max Input Level</b>	35dBm
<b>Output Level Resolution</b>	0.01dB
<b>Output Level Accuracy</b>	±0.5dB
<b>VSWR</b>	IN/OUT port: <1.20 OUT port: <1.30

<b>CW Output Power Range</b>	IN/OUT port: 400MHz ~ 2100MHz: -120dBm ~ -5dBm 2100MHz ~ 3GHz: -120dBm ~ -10dBm OUT port: 400MHz ~ 2100MHz: -120dBm ~ 0dBm 2100MHz ~ 3GHz: -120dBm ~ -5dBm
<b>Voltage and Frequency</b>	100~240V, 50~60Hz
<b>Rated Power</b>	System Server: 300W SP8315: 300W
<b>Operating Temperature</b>	+5 °C ~ +40 °C
<b>Operating Humidity</b>	20% ~ 80% (non-condensing)
<b>Weight</b>	System Server: 9kg SP8315: 20.5kg
<b>Dimensions</b>	System Server: 43cm (W) × 9cm (H) × 38cm (D) SP8315: 42.5cm (W) × 21.5cm (H) × 52cm (D)

## Configuration Guide

### [Major Hardware]

No.	Hardware Components	Test Requirements	
		RF Characteristics Testing	Protocol Analyzing
1	System Server <i>(Used to implement test case software when used as protocol analyzer)</i>		●
2	SP8315 Wireless Test Set <i>(Used to simulate 1~2 active cells and provide RF characteristics measurement functions)</i>	●	●

### [Software]

No.	Software Components	Test Requirements	
		RF Characteristics Testing	Protocol Analyzing
1	Basic Protocol Software for Wireless Test Set	●	●
2	Comprehensive Protocol Software for Wireless Test Set	○	●
3	RF Characteristics Test Software	●	
4	Test Management Software of Protocol Analyzer		●
5	Protocol Analysis Test Case Development Software		○
6	Protocol Analysis Test Case Software		○