

## Calibration Services

Application Note AN001

The Rosenberger calibration laboratory offers two types of calibration services, the **Factory Calibration** and the **Accredited Calibration**.

Each calibration kit, calibration standard, gauge and torque wrench comes with a calibration certificate if this is explicitly mentioned in the specific datasheet. Measurement results and uncertainties are included.

When a Factory Calibration is not part of the standard delivery it can be ordered separately.

Optional delivery is the Accredited Calibration. In this case the calibration kit is calibrated in the Rosenberger calibration laboratory that is accredited by the German accreditation body DAkkS (Deutsche Akkreditierungsstelle) according to DIN EN ISO 17025. Calibration Certificates issued by an accredited calibration laboratory are worldwide accepted to demonstrate that measurement results are traceable to national / international standards.

Dimensional- and mechanical measurements and the calibration of Sliding Loads are not available under the Rosenberger DAkkS accreditation. These devices will be delivered with a separate Factory Calibration Certificate if an Accredited Calibration was ordered.

The following tables show in detail the standard technical services and the documents that are included if a Factory Calibration or the optional Accredited Calibration is ordered. Other services and documents are available on request.

Accredited Calibration services can be performed in the Rosenberger calibration Laboratory for the connector systems:

- RPC-N 50 Ohm
- RPC-3.50
- RPC-2.92

For other connector systems accredited calibrations can be subcontracted to another DAkkS accredited calibration laboratory:

- RPC-2.40
- RPC-1.85
- RPC-7

## Calibration Services

Application Note AN001

### Calibration Kits and single Calibration Standards *Kalibrier Kits und einzelne Kalibrierstandards*

#### Services performed on new devices *Leistungen bei Neuteilen*

	Factory Calibration <i>Werkskalibrierung</i>	Accredited Calibration <i>Akkreditierte Kalibrierung</i> (DKD/DAkKS ISO 17025)
Visual Inspection <i>Optische Kontrolle</i>	X	X
Gauging No documented values <i>Prüfung der Anschlußmaße</i> <i>Keine Messwertdokumentation</i>	X	X
Electrical measurements <i>Elektrische Messungen</i> Open, Short Load, Thru, Adapter	<b>Measurands</b> Phase Return Loss  1 coaxial orientation	<b>Measurands</b> Phase Return Loss  Average of 4 coaxial orientation
Electrical measurements <i>Elektrische Messungen</i> Sliding Load	<b>Measurand</b> Effective Return Loss <sup>*2</sup>	Not available <sup>*1</sup>
Dimensional measurements <i>Mechanische Messungen</i> Air Line:	<b>Measurands</b> Length of inner conductor Length of outer conductor Diameter of inner conductor Diameter of outer conductor	Not available <sup>*1</sup>
Dimensional measurements <i>Mechanische Messungen</i> Gauge	<b>Measurand</b> Gauge measurement error (at two significant recessions)	Not available <sup>*1</sup>
Mechanical measurements <i>Mechanische Messungen</i> Torque Wrench	<b>Measurand</b> Torque	Not available <sup>*1</sup>
Measurement frequencies <sup>*3</sup> Messfrequenzen	100 MHz to max Kit frequency in 100 MHz steps	100 MHz to max Kit frequency in 100 MHz steps
Individual optimized Model Based Standard Definitions <i>Individuell optimierte Model</i> <i>Based Standard Definitions</i>	X	X

\*1 Not under DAkKS accreditation. Separate Factory Calibration Certificate.

*Nicht unter DAkKS Akkreditierung. Getrennter Werkskalibrierschein.*

\*2 At Sliding Load specific frequencies.

*An Sliding Load spezifischen Frequenzpunkten.*

\*3 Other frequencies on request. Lowest available frequency is 9 kHz.

*Andere Frequenzen auf Anfrage. Die niedrigste mögliche Frequenz beträgt 9 kHz.*

## Calibration Services

Application Note AN001

### Documentation Dokumentation

	Factory Calibration <i>Werkskalibrierung</i>	Accredited Calibration <i>Akkreditierte Kalibrierung</i> (DKD/DAkKS ISO 17025)
Document Title <i>Bezeichnung</i>	„Calibration Certificate“	“Calibration Certificate” (DAkKS/DKD)
Printed Measurement Values incl. filing <i>Ausgedruckte Messwerte incl.</i> <i>Archivierung</i>	X	X
Tabular Measurement Values Measurement Uncertainties Data Sheet Specification Limits Compliance Statements <sup>*4, *5</sup> <i>Tabellarische Messergebnisse</i> <i>Messunsicherheiten</i> <i>Datenblatt</i> <i>Spezifikationsgrenzen</i> <i>Konformitätsaussage</i>	Open, Short (Phase) Load, Thru, Adapter (Return Loss)  In 1 GHz steps	Open, Short (Phase) Load, Thru, Adapter (Return Loss)  In 1 GHz steps
Graphical Measurement Values <i>Grafische Messergebnisse</i>	Open, Short (Phase Error) Load, Thru, Adapter (Return Loss)  All Measurement frequencies	Open, Short (Phase Error) Load, Thru, Adapter (Return Loss)  All Measurement frequencies
Tabular Measurement Values Measurement Uncertainties <i>Tabellarische Messergebnisse</i> <i>Messunsicherheiten</i>		Open, Short, Load, Thru, Adapter (Return Loss + Phase)  All Measurement frequencies
Graphical Measurement Values <i>Grafische Messergebnisse</i>	Sliding Load (Effective Return Loss <sup>*2</sup> )	Not available <sup>*1</sup>
Tabular Measurement Values Measurement Uncertainties <i>Tabellarische Messergebnisse</i> <i>Messunsicherheiten</i>	Air Line, Gauge (Dimensional measurands) Torque Wrench (Mechanical measurands)	Not available <sup>*1</sup>
Description of the calibration method <i>Beschreibung des</i> <i>Kalibrierverfahrens</i>	X	X

\*4 Factory Calibration: Measured results are directly compared to the specification limits. Measurement uncertainties are not taken into account.

*Factory Calibration: Messergebnisse werden direct mit den spezifizierten Grenzwerten verglichen. Messunsicherheiten werden nicht berücksichtigt.*

\*5 Accredited Calibration: According to Guideline DAkKS-DKD-5  
*Akkreditierte Kalibrierung: Gemäß Richtlinie DAkKS-DKD-5*

## Calibration Services

Application Note AN001

### Documentation (continued) Dokumentation (Fortsetzung)

Traceability Information Angabe der Rückführbarkeit	X	X
List of Working Standards used <i>Liste der Gebrauchsnormale</i>	X	*6
Service Report <i>Servicebericht</i>	X	X
Calibration Label <i>Kalibrieraufkleber</i>	„Calibrated“	DAkKS specific *5
Actual Standard Definition Cards with optimized Model Based Standard Definitions <i>Aktuelle Standard Definition Cards mit optimierten Model Based Standard Definitions</i>	X	X
USB stick with Standard Definitions <i>USB Stick mit Standard Definitions</i>	Model based *7	Model based *7 + Data based *7

\*6 According to the Sample Calibration Certificate in Guideline DAkKS-DKD-5 no List of Working Standards is used  
*Gemäß Musterkalibrierschein in der Richtlinie DAkKS-DKD-5 wird keine Liste der Gebrauchsnormale verwendet*

\*7 Agilent/Keysight PNA family and R&S ZVA, ZNB family. Other VNAs on request.  
*Agilent/Keysight PNA Familie und R&S ZVA, ZNB Familie. Andere VNAs auf Anfrage.*

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Application Note AN001

### Re-Calibrations Re-Kalibrierungen

The Calibration Services described are not only available with new Rosenberger Calibration Kits and Calibration Standards but also as Re-Calibrations of calibration kits from Rosenberger and other manufacturers.

### Additional Services at a Re-Calibration Weitere Leistungen einer Re-Kalibrierung

	Factory Calibration Werkskalibrierung	Accredited Calibration Akkreditierte Kalibrierung (DKD/DAkkS ISO 17025)
Cleaning <i>Reinigung</i>	X	X
Incoming status: measurements before adjustment, repair and replacement, if possible. <i>Anlieferungszustand: Messungen vor Justierung, Reparatur oder Austausch, falls möglich.</i>	X	X

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Joachim Schubert	28/10/14	Herbert Babinger	28/10/14	a00	14-s367	Joachim Schubert	28/10/14
Rosenberger Hochfrequenztechnik GmbH & Co. KG P.O.Box 1260 D-84526 Tittmoning Germany <a href="http://www.rosenberger.de">www.rosenberger.de</a>				Tel. : +49 8684 18-0 Email : <a href="mailto:info@rosenberger.de">info@rosenberger.de</a>			Page 5 / 5