

# RRU3926 Description

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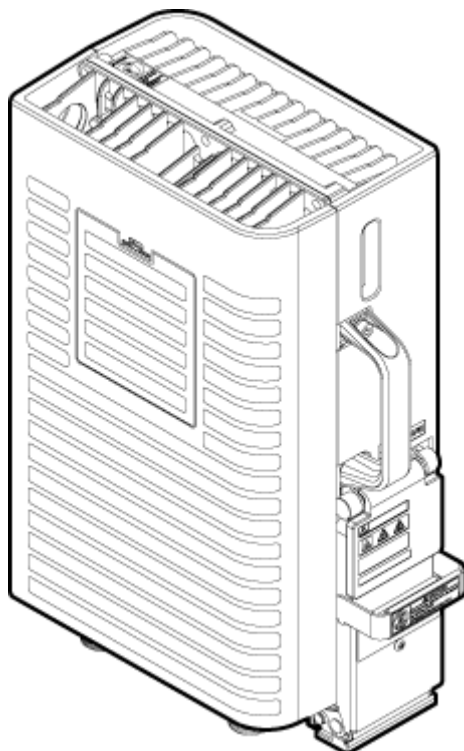
# 1 Introduction

The RRU3926 is an outdoor remote radio unit. It is the radio frequency (RF) part of a distributed base station and can be located near antennas. The RRU3926 can modulate, demodulate, combine, and divide baseband and RF signals. It also processes baseband and RF signal data. With the Software Defined Radio (SDR) technology, the RRU3926 can work in GU dual-mode through software configuration modification.

## 1.1 Appearance

Figure 1-1 shows the appearance of the RRU3926.

**Figure 1-1** Appearance of the RRU3926



## 1.2 Physical Ports

RRUs have a modular design. Its external ports are located in the cabling cavity and at the bottom of the module.

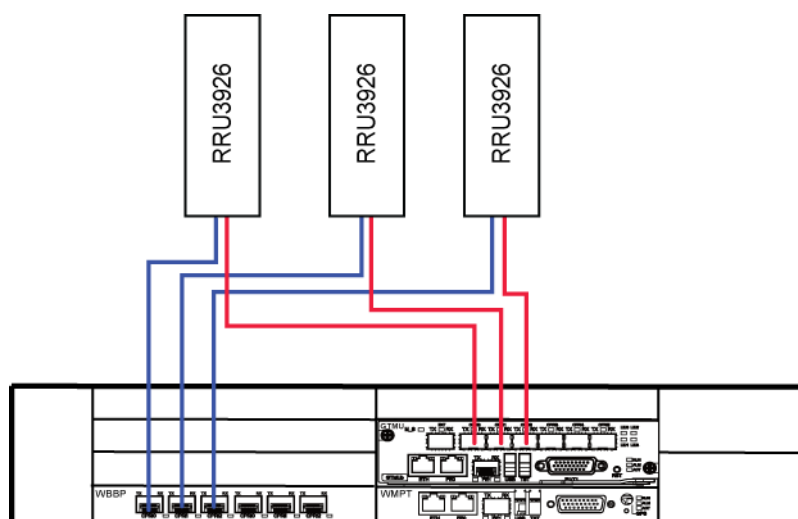
**Table 1-1** Physical ports on the RRU3926

Port	Connector	Quantity	Function
RF port	DIN	2	Connects to an antenna
Interconnection port for receiving RF signals	DB2W2	1	Connects to the another RF module
Common public radio interface (CPRI) port	DLC	2	Connects to the baseband unit (BBU3900)
Power supply socket	Easy power receptacle (pressfit type)	1	Receives -48 V DC power
RET port	DB9	1	Connects to a remote control unit (RCU)
MON port	DB15	1	Port for monitoring and maintenance

A BBU3900 and RRU3926 are connected through a CPRI port using an electrical or optical cable to transmit CPRI signals.

The BBU3900 and the RRU3926 are connected in dual-star topology. In this topology, the CPRI port on the GTMU or UBRI is connected to CPRI0 on the RRU3926, and the CPRI port on the WBBP or LBBP is connected to CPRI1 on the RRU3926, as shown in Figure 1-2.

**Figure 1-2** Dual-star topology



# 2 Technical Specifications

## 2.1 Frequency Band

Table 2-1 RRU3926 frequency band

Frequency Band (MHz)	RX Frequency Band (MHz)	TX Frequency Band (MHz)
900	880–915	925–960
	890–915	935–960
1800	1710–1785	1805–1880

## 2.2 Capacity

Table 2-2 Single-mode capacity

Mode	Capacity
GSM	Each RRU3926 supports 8 TRXs.
UMTS	Each RRU3926 supports 6 carriers.

Table 2-3 Dual-mode capacity

Mode	Capacity
GSM + UMTS	For detailed specifications, see Table 2-6.

## 2.3 Receiver Sensitivity

Table 2-4 RRU3926 receiver sensitivity

Mode	Frequency Band (MHz)	1-Way Receiver Sensitivity (dBm)	2-Way Receiver Sensitivity (dBm)	4-Way Receiver Sensitivity (dBm)
GSM	900	-113.7	-116.5	-119.2 (theoretical value)
	1800	-114	-116.8	-119.5 (theoretical value)
UMTS	900	-125.8	-128.6	-131.3
	1800	-126.1	-128.9	-131.6

 **NOTE**

- The receiver sensitivity of GSM, as recommended in 3GPP TS 51.021, is measured in the central band (80% of the entire operating band, excluding the edge band) at the antenna connector on the condition that the channel rate is 13 kbit/s and the Bit Error Rate (BER) is not higher than 2%.
- The receiver sensitivity of UMTS, as recommended in 3GPP TS 25.104, is measured in the entire operating band at the antenna connector on the condition that the channel rate is 12.2 kbit/s and the BER is not higher than 0.001.
- The receiver sensitivity of LTE is measured, as recommended in 3GPP TS 36.104, under a 5 MHz channel bandwidth based on the FRC A1-3 in Annex A.1 (QPSK, R = 1/3, 25 RBs) standard.

## 2.4 Output Power

 **NOTE**

- RRU3926 modules operating in GSM mode and in the 900 or 1800 MHz frequency band comply with the standard EN 301 502 V9.2.1.
- RRU3926 modules operating in UMTS, LTE, or Multi-Standard Radio (MSR) mode and in 900 or 1800 MHz frequency band comply with the standard ETSI EN 301 908 V5.2.1 and 3GPP TS 37.104.
- The output power is 1 dB lesser than the standard power when the RRU3926 is located at a height of 3500 m to 4500m; and is 2 dB lesser than the standard power when the RRU3926 is located at a height of 4500 m to 6000m.
- For S1, S2, S3 the GSM output power in 8PSK mode is the same as that in GMSK mode with the improvement in the hardware capability. For S4 to S8, the GSM output power in 8PSK mode is the same as that in GMSK mode with the the GBFD-118104 Enhanced EDGE Coverage feature enabled. This feature is under license control and therefore you must purchase the license before you can use this feature.
- Factors such as the site-to-site distance, frequency-reuse factor, power control algorithm, and traffic model affect the gain achieved by dynamic power allocation. Therefore, in most cases, the network planning can be based on the power specification achieved by dynamic power allocation.
- In power sharing mode, the power control and DTX functions must be enabled. In GBSS8.1, the dynamic power sharing feature is mutually exclusive with the GBFD-113201 Concentric Cell, GBFD-114501 Co-BCCH Cell, GBFD-118001 BCCH Dense Frequency Multiplexing, and GBFD-117501 Enhanced Measurement Report (EMR) features. In GBSS9.0 and later versions, the dynamic power sharing feature can be used together with these features. However, the dynamic power sharing feature currently cannot be used together with the GBFD-117002 IBCA (Interference Based Channel Allocation), GBFD-117001 Flex MAIO, GBFD-118701 RAN Sharing, and GBFD-114001 Extended Cell features in GBSS8.1, GBSS9.0, and later versions.
- Power sharing assumes a random distribution of UEs in the cell.
- \*: The UMTS mode is supported in terms of hardware.

Table 2-5, Table 2-6 list the typical configurations of the RRU3926.

**Table 2-5** Typical RRU3926 configuration (900 MHz/1800 MHz, single-mode)

Number of GSM Carriers	Number of UMTS Carriers	Output Power per GSM Carrier (W)	Output Sharing Power per GSM Carrier (W)	Output Power per UMTS Carrier (W)
1	0	80	80	0
2	0	40	40	0
3	0	27	31	0



4	0	20	27	0
5	0	16	20	0
6	0	12	20	0
7	0	10	16	0
8	0	7	12	0
0	1	0	0	80
0	2	0	0	40
0	3	0	0	25
0	4	0	0	20
0	5*	0	0	16*
0	6*	0	0	12*

**Table 2-6** Typical RRU3926 configuration (900 MHz/1800 MHz, GU MSR)

Number of GSM Carriers	Number of UMTS Carriers	Output Power per GSM Carrier (W)	Output Power per UMTS Carrier (W)
1	1	40	40
1	2	40	20
2	1	30	20
2	1	20	40
2	2	20	20
3	1	20	20
3	2	16	10
4	1	12	20
4	2	12	10
5	1	10	20
5	2	10	10
6	1	10	10
6	2	8	10
7	1	8	10

## 2.5 Power Consumption

### NOTE

- The typical power consumption and the maximum power consumption are measured when the base station works at a temperature of 25 °C.
- The typical power consumption for GSM is reached when the base station works with 30% load and power control and DTX are enabled. The maximum power consumption for GSM is reached when the base station works with 100% load.
- The typical power consumption for UMTS is reached when the base station works with 40% load. The maximum power consumption for UMTS is reached when the base station works with 100% load.

**Table 2-7** Power consumption of the DBS3900 (configured with RRU3926, 900 MHz)

Mode	Configuration	Output Power per Carrier (W)	Typical Power Consumption (W)	Maximum Power Consumption (W)
GSM	S2/2/2	20	535	635
	S4/4/4	20	655	960
UMTS	3 x 1	20	445	525
	3 x 2	20	555	695
GSM + UMTS	GSM S2/2/2 + UMTS 3 x 1	GSM: 20 UMTS: 20	725	885
	GSM S3/3/3 + UMTS 3 x 1	GSM: 20 UMTS: 20	795	1045

**Table 2-8** Power consumption of the DBS3900 (configured with RRU3926, 1800 MHz)

Mode	Configuration	Output Power per Carrier (W)	Typical Power Consumption (W)	Maximum Power Consumption (W)
GSM	S2/2/2	20	587	690
	S4/4/4	20	725	1020

## 2.6 Input Power

**Table 2-9** Input power

Item	Specifications
Input power	-48 V DC; voltage range: -36 V DC to -57 V DC

## 2.7 Equipment Specifications

**Table 2-10** Equipment specifications

Item	Specifications
Dimensions (H x W x D)	400 mm x 240 mm x 160 mm (with the housing)
Weight	15 kg (with the housing)

## 2.8 Environment Specifications

**Table 2-11** Environment specifications

Item	Specifications
Operating temperature	-40°C to +50°C (with solar radiation) -40°C to +55°C (without solar radiation)
Relative humidity	5% RH to 100% RH
Absolute humidity	1 g/m <sup>3</sup> to 30 g/m <sup>3</sup>
Atmospheric pressure	70 kPa to 106 kPa
Operating environment	The RRU complies with the following standards: <ul style="list-style-type: none"> <li>• 3GPP TS 45.005</li> <li>• 3GPP TS 25.141</li> <li>• 3GPP TS 36.141</li> <li>• 3GPP TS 37.141</li> <li>• ETSI EN 300019-1-4 V2.1.2 (2003-04) Class 4.1: "Non-weather protected locations."</li> </ul>
Shockproof protection	NEBS GR63 zone4
Ingress Protection (IP) rating	IP65

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# 3 Acronyms and Abbreviations

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Abbreviation	Full Name
3GPP	3rd Generation Partnership Project
BBU	Baseband Unit
BER	Bit Error Ratio
CPRI	Common Public Radio Interface
DTX	Discontinuous Transmission
MSR	Multi-Standard Radio
RRU	Remote Radio Unit