

**WLR-1900C**  
TECHNICAL DOCUMENTATION

2001. 11

**Withus Co.,Ltd**

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Withus Co., LTD  
MODEL: WLR 1900C  
Test #: 011109  
Test to: FCC Parts 2 and 24

## **1. Introduction & Organization**

### **1.1 Introduction**

The repeater, WLR-1900C, is an economical solution to eliminate dead zones or no service areas for CDMA networks.

### **1.2 Organization**

The repeater are consist of bellow parts.

Number	Item	Quantity	Remark
1	Mobile Antenna	1	For Mobile
2	RF MODULE	1	RF Module
3	CONTROLLER Module	1	
4	POWER SUPPLY	1	AC110V / DC 9V, 2A
5	Donor Antenna	1	For BTS
6	Cabinet	2	Upper and Bottom and Wall
7	RF Cable	1	3 M / 9.85 Ft( Standard )
8	Screws	8	For installation

## 2. Specification

### 2.1 The characterization of repeater frequency

Item	Specification	Remark
Frequency Range		
Forward	1930 ~ 1950 MHz	
Reverse	1850 ~ 1870 MHz	
Flatness	Less than 3dB	(Peak to Peak)
Frequency stability	Less than 0.05PPM	
Communication Type	G7W	
Occupied Bandwidth	Less than 1.32MHz	CDMA, FA

### 2.2 The characterization of repeater amplification

Item	Specification	Remark
Gain	70 dB	Forward / Reverse

### 2.3 The characterization of repeater input & output

Item	Specification	Remark
Max. Input Level	Max. - 45 dBm	Total Power
Output Power ( forward/reverse )	15 dBm / 7 dBm 13 dBm / 5 dBm	Total max. Power Total norm. Power
1dB gain compression	More than + 23dBm	
Power Control Function		
AGC(Auto Gain Control) ALC(Auto Level Control)	15 dBm / Total 7 dBm / Total	+/- 2 dB

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2.4 The characterization of Noise Figure and Spurious

Item	Specification	Remark
Noise Figure(NF)	Less than 5dB	Max. Gain
Spurious		
Up-link	More than 48dBc	$F_c > 885$ KHz
Up-link	More than 60dBc	$F_c > 1.98$ MHz
Down-link	More than 46dBc	$F_c > 885$ KHz
Down-link	More than 60dBc	$F_c > 1.98$ MHz
Useless Spurious emission		
9KHz~1GHz	Less than -36dBm	In-Band
1G~12.75GHz	Less than -30dBm	Out-Band
I.M.D	More than 45 dBc	

2.5 Others

Item	Specification	Remark
Equipment Delay	Less than 3 uSec	
V.S.W.R	Less than 1:1.5	
In-Out Impedance	50Ω	
RF Connector type	SMA-TYPE	

2.6 The condition of Environment

Item	Specification	Remark
Temperature/Humidity Characteristics	Temp: -20 ~ +50°C Humidity: 10 ~ 98% RH	-Damage: None -Output changes: Less than ±2dB -Others: None
Vibration Characteristics	Vibration Condition -Frequency range: 10 ~ 55Hz -Width: ±0.75mm	-Damage: None -Others: None
Input Power	AC 110V ± 30% / DC 9V	SMPS

### **3. Installation and control methods**

#### **3.1 How to install**

##### **3.1.1 Install the repeater in the place designated for service extension.**

The installation location should be well ventilated and should be available for the flexible connection with power cables and antenna power feeders, but it should be installed in vertical direction.

##### **3.1.2 Allow a space of over 0.5 ft on the top of the repeater. This space is for ventilation and for mounting of the repeater.**

(Do not install the repeater where ventilation is not properly made.)

##### **3.1.3 Fix the repeater on the wall by fastening 4 anchor bolts. Connect the antenna cable to the "Donor Antenna" for BTS-link.**

##### **3.1.4 Supply AC110V / DC 9V power to the repeater.**

##### **3.1.5 After the installation of power cable, antenna power feeder and Mobile antenna.**

Follow the below step for good installation.

##### **3.1.5.1 Push the MODE and FUNC switch at the same time and plug the DC connector from the power supply to DC jack then the both LED ( Green / Red ) of RUN and FAIL will be ON.**

And release from the both switch.

##### **3.1.5.2 To find the proper location of Donor antenna with more than 85 dB isolation level from the Mobile antenna for mobile, push the FUNC switch one time then the Green LED of RUN and Red LED of FAIL will be flashing until Donor antenna locate the proper position with sufficient isolation level between Donor and Mobile Antenna.**

If the Donor antenna is located on the proper position, the RUN LED will be ON and the FAIL LED will be OFF.

If not, the RUN and FAIL LED will be ON.

Try again and change the Donor antenna position and follow above step ( 3.1.5.2 ).

##### **3.1.5.3 To find the proper direction of Donor antenna for BTS, push the**

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MODE switch one time then the LEDs of RUN and FAIL will be flashing and the Donor antenna shall be moved/rotated for up/down and right/left to record the signal strength from BTS.

At that time the repeater will record the RSSI level on the MPU with memory automatically.

And push the MODE switch two times with short period, the RUN LED and FAIL LED will be ON until to find maximum RSSI level compare with previous recorded RSSI level value.

At that time the Donor antenna shall be moved/rotated for up/down and right/left. If Donor antenna position with proper direction for BTS, the RUN LED will be ON and the FAIL LED will be OFF.

If not, the RUN and FAIL LED will be ON both until to find the optimum RSSI level.

3.1.5.4 To finish the installation, push the MODE and FUNC switch at the same time then the RUN LED and FAIL LED will be Flash 3 times and the RUN LED will be ON only.

It is a ready to use the repeater for clean communication.

Estimation of output

Service Area	Total Output Power
Less than 15,000 ft <sup>2</sup>	-5dBm ~ 0dBm
Less than 30,000 ft <sup>2</sup>	0dBm ~ 3dBm
Less than 60,000 ft <sup>2</sup>	4dBm ~ 7dBm
Less than 90,000 ft <sup>2</sup>	8dBm ~ 10dBm
More than 90,000 ft <sup>2</sup>	10dBm ~ 13dBm

The output power mark in repeater is general power.(the final output in case of 2FA) 15 dBm is also general output in repeater

3.1.6. Although the input level (electric field strength ) depends on the repeater output, it should be between - 85dBm and - 45dBm.

If the input level is lower than - 80dBm, adjust the location and direction of the Donor antenna (to Base Station).

If the level is over - 40dBm, adjust the direction of the antenna to

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If the level is over - 40dBm, adjust the direction of the antenna to make the level proper.

3.1.7. For ALC and AGC operation, if input signal higher than ALC level which was set at factory during over 1 second the repeater will be operated the Shutdown function to prevent the interference for BTS with RUN and FAIL LED Flashing during 10 seconds.

After 10 seconds the repeater will be recovered and check again.  
If the repeater receiving the strong signal still, the repeater will shutdown again during 30 seconds with .  
Check Third times the repeater will be Shutdown during 60 seconds and Fourth times, during 120 seconds.

If the repeater follow the above Shutdown whole step the repeater will be Shutdown without any function until Power OFF and ON.

## Installation Flow Chart

