

# **RF Repeater**

## **Installation and Operational Manual**

### **(Model: HR1900P)**

**JAS Teletech**

# **Table of Contents**

## **1. General Information**

1.1 Introduction

1.2 Specifications

1.3 Description

## **2. Installation**

2.1 Introduction

2.2 Unpacking and Inspection

2.3 Preparation for Use

2.4 Before Installation

2.5 Antenna Installation

2.6 Repeater Installation

2.7 Connectors

2.8 Installation Example

## **3. Operation**

3.1 Introduction

3.2 Operating Instructions

## **4. Trouble Shooting**

## **5. Drawings**

## 1. General Information

### 1.1 Introduction

This manual provides information pertaining to the installation and operation of JAS Teletech's HR1900P Home Repeater. This Unit is for CDMA, GSM, and TDMA modulations in the PCS frequencies as shown in Table 1-1.

<Table 1-1: HR1900P>

Model Number	Down Link* Frequencies	Up Link** Frequencies	Modulation
HR-1900P	1930~1960MHz	1850~1910MHz	CDMA, GSM, TDMA

\* Down Link: signal from base station to mobile

\*\* Up Link: signal from mobile to base station

## 1.2 Specifications

<Table 1-2: HR1900P Specifications>

No	Parameters	Specifications		Remarks
		Downlink	Uplink	
1	Frequency Range	1930~1990MHz	1850~1910MHz	60MHz B.W
2	Output Power	+7dBm /1FA[Max.]		
3	Gain	50dB ±2dB/Fc		
4	Gain Flatness	≤ 7dB		
5	In Band Spurious	Fc +885KHz	≥ -45dBc/30KHz	
		Fc -885KHz	≥ -45dBc/30KHz	
		Fc +1.98MHz	≥ -50dBc/30KHz	
		Fc -1.98MHz	≥ -50dBc/30KHz	
6	Out OF Band Spurious	Less than -13dBm/1MHz	≥ -13dBm	
7	P1dB	≥ +14dBm		
8	Output IP3	≥ +24dBm		
9	Down/Up Link shutdown Function	≥ 9dBm		
10	Noise Figure	≤ 7dB		@ Full Band
11	V.S.W.R	≤ 1 : 2.0		Up/Down Link Port
12	Impedance	50Ω		
13	Operating Temperature	0 ~ +50		
14	Dimension (W x H x D)	120mm x 97mm x 43mm [Max.]		Without Connector
15	Weight	≤ 600 g		
16	RF Connector	SMA-Type (Female)		Up/Down Link Port

### 1.3 Description

This product is designed to cover blank spots of small offices, hotel rooms, small parking lots, garages or small buildings. It helps to improve PCS communications signal and coverage by extending the coverage of a base station.

Outdoor antenna receives signal from a PCS base station, then HR1900P repeater amplifies the signal. After amplification, the signal is passed through to the indoor antennas. Conversely, signals from handsets are amplified and retransmitted to the base station.

## 2. Installation

### 2.1 Introduction

This section provides information for the installation and setup of the HR1900P repeater. The information consists of procedures for unpacking, inspection and preparation for the installation, as well as the actual installation and the setup.

### 2.2 Unpacking and Inspection

Examine the shipping carton for damage before unpacking the unit. If the shipping carton is damaged, try to have the carrier's agent present when the equipment is unpacked. If visual inspection reveals physical damage to the equipment, you should send it back for replacement.

Verify that the equipment is complete, as listed under packing slip. Contact JAS Teletech with any missing component.

### 2.3 Preparation for Use

#### 2.3.1 Power Requirements

The power supply of the HR1900P accepts 5.1 VDC. Power consumption of the HR1900P is approximately 2.5 Watts.

#### 2.3.2 Operating Environment

The HR1900P is intended for indoor use only. Do not install it where it might be exposed to the outside elements as this could result in destruction of the unit and other hazards. For normal operations, the environmental conditions should be as follow.

- Temperature range: -20 ,to 50

- Maximum Humidity: 95%

## 2.4 Before Installation

You will need to determine the following before beginning the HR1900P installation:

- Base Station location
- Location where the outdoor antenna is to be installed
- Location where the indoor antenna is to be installed
- Location where the HR1900P is to be installed
- Length and type of coaxial cable needed to connect from the outdoor antenna to the repeater unit
- Length and type of coaxial cable needed to connect from the repeater unit to the indoor antenna

## 2.5 Antenna Installation

### 2.5.1 Outdoor Antenna

Select a site for your outdoor antenna, making sure you have enough signal strength at that location. Using coax cable, connect the antenna to the repeater. If you are using directional antenna such as a Yagi type, the antenna should be installed so that it is in line of sight of the base station. Then, align the directional antenna toward that direction, and secure the antenna using provided mounting hardware.

Use of a lightning arrester is highly recommended. By installing a lightning arrester between the outside antenna and the repeater, you can protect the repeater unit from electrical surge from lightning.

### 2.5.2 Indoor Antenna

Install the indoor antenna at a convenient location. It should be free of metallic obstruction in order to have an effective coverage. Depending on the circumstance of the installation, either one or a combination of following antenna can be used: Ceiling mount patch antenna, Wall mount patch antenna, Corner reflector

## 2.6 Repeater Installation

HR1900P is an indoor repeater. Accordingly, the environment of the intended installation site needs to be considered. The repeater must be shielded from moisture, such as rain, and excessive temperatures. The operating temperatures should be between -20 and 50 .

### 2.6.1 Turn-on Procedure

Verify all RF connectors are tightened and cables and antennas are secured. Connect AC/DC Adaptor on the repeater's DC IN connector. The Power indicator LED should be green. Make sure that no other LED is illuminated. If any other LED is lit, consult the trouble shooting page of this manual, or "2.6.2 Antenna Isolation and Alignment" section.

### 2.6.2 Antenna Isolation and Alignment

HR1900P is equipped with an over drive protection circuit. If the output power level of uplink exceeds prescribed limit, then uplink is disconnected and the FAIL LED(RED) is on. Repeater automatically checks output power level every 1 minute of a 5 minute cycle when uplink has over power. If uplink still exceeds level then shut down mode continues for another 10 minutes. After 10 minutes, uplink is switched on again and it checks output power again.

#### A. Antenna

If you are triggering the overdrive alarms at any point, try to increase the isolation between the antennas by relocating them. The indoor antenna should be placed physically as far away from the outdoor antenna as practical. If the geometry of the intended coverage area allows it, you should also try the indoor antenna in such way that interference between the antennas is at the minimum. If you are using directional antennas, try to find a location for the indoor antenna where it can cover the needed area and oriented back o back with respect to the outdoor antenna.

## 2.7 Connectors

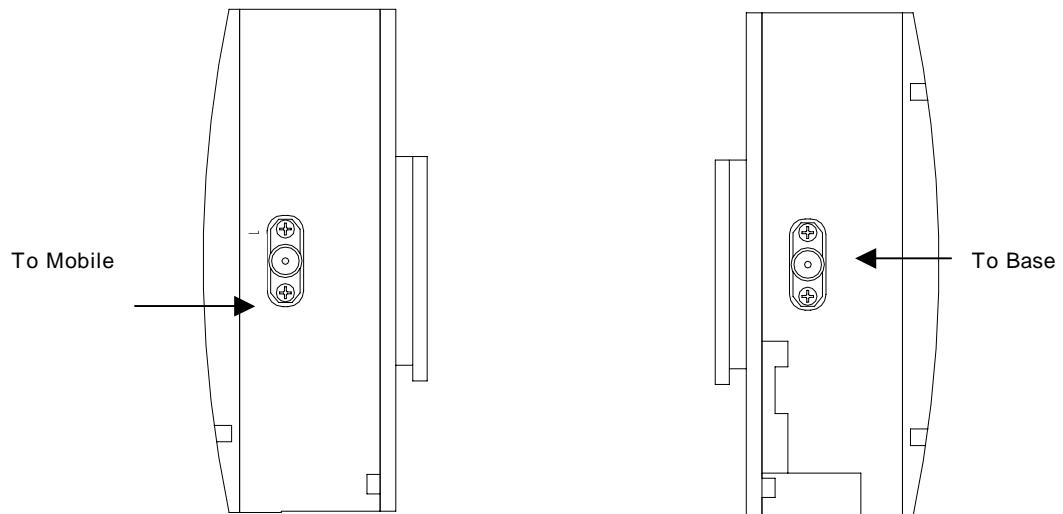
Figure 2-7 shows the connectors and Table 2-7 provides a description of each connector on the HR1900P unit.

<Table 2-7: HR1900P Connectors>

Label	Description
DD IN	Connect AC/DC Adaptor for supplying DC power to the unit
TO BASE	SMA-type female connector transmits base station RF, receives mobile RF, and connects to the outdoor antenna

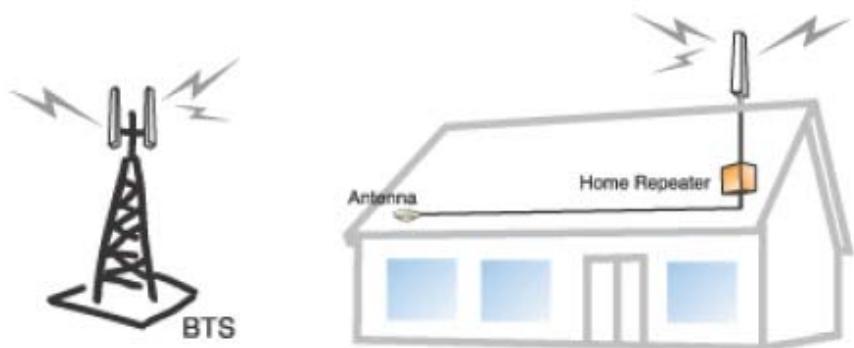
TO MOBILE	SMA-type female connector transmit mobile RF, receives base station RF, and connects to the indoor antenna
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<Figure 2-7: HR1900P Connectors>



## 2.8 Installation Example

HR1900P can be installed as shown in Figure 2-8.



### **3. Operation**

#### 3.1 Introduction

This section provides information for operating the HR1900P repeater.

#### 3.2 Operating Instruction

##### 3.2.1 Power-up

Connect the repeater to AC/DC Adaptor. If no FAIL condition is present, only the "POWER" LED will remain lit. The repeater is then operating properly.

##### 3.2.2 Fail Status

###### 3.2.2.1 Overdrive Fail

There is one overdrive fail on the unit, for the uplink. Over driving occurs when the RF output power of the repeater exceeds a prescribed limit. This means that the input RF power level is too high, or the repeater is oscillating. The condition may be transient, caused by a passing emergency vehicle emitting a strong signal for example, or permanent, due to a nearby base station. It may also indicate low isolation between the antennas, which causes the unit to oscillate (please refer to the section 2.6.2 of this manual for antenna alignment and isolation.)

The overdrive fail on the HR1900P repeater is design to detect whether the over driving is transient or permanent. If the output power level of uplink exceeds prescribed limit ,then uplink is disconnected and the FAIL LED(RED) is on. Repeater automatically checks output power level every 1 minute of a 5 minutes cycle when uplink has over power. If uplink still exceeds level then shut down mode continues for another 10 minutes. After 10 minutes, uplink is switched on again and it checks output power level again. (Repeats the process)

### **4. Trouble Shooting**

If the repeater does not operate properly after installation, first make sure that the installation procedures as described in section 2 of this manual were followed correctly. Inspect each connection, both RF and AC, and connectors for a secure fit, checking to see if all the connections are made to the proper ports of the unit and the antennas.

If the malfunction is due to an alarm condition, refer to the appropriate part of the section 3.2 of this manual. Corrective actions may be taken for the overdrive alarms.

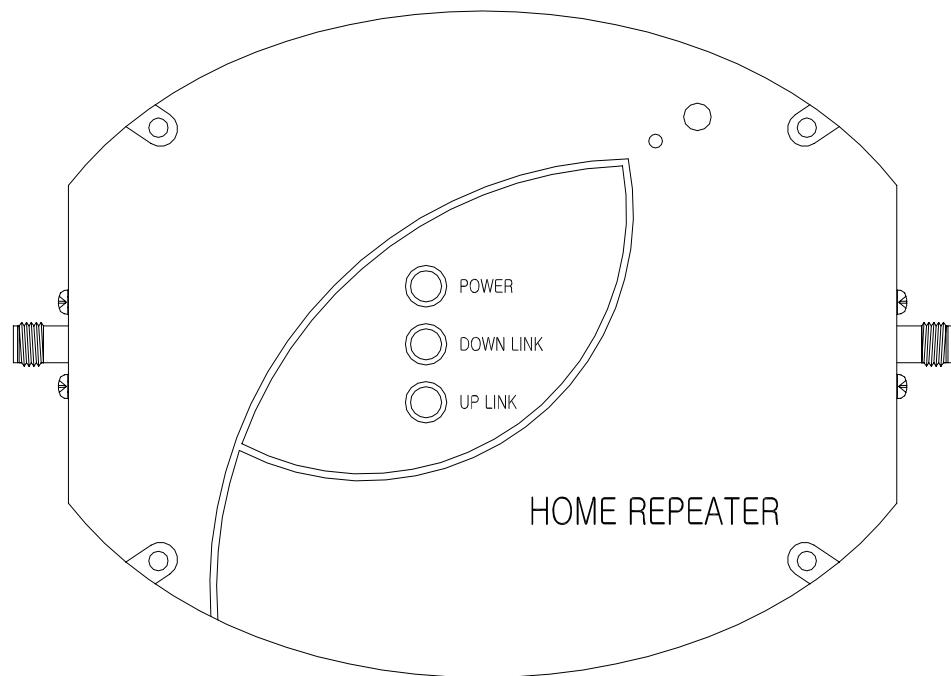
**CAUTION!**

There are no user serviceable parts in the HR1900P.  
DO NOT OPEN the unit. There is a danger of an electric shock.  
Opening the covers of the unit will void all warranties.

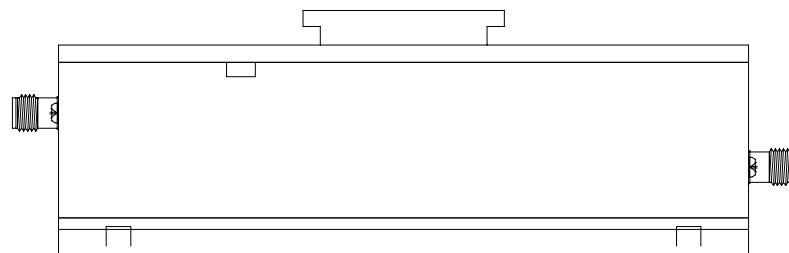
## 5. Drawings

### 5.1 Front and Back views

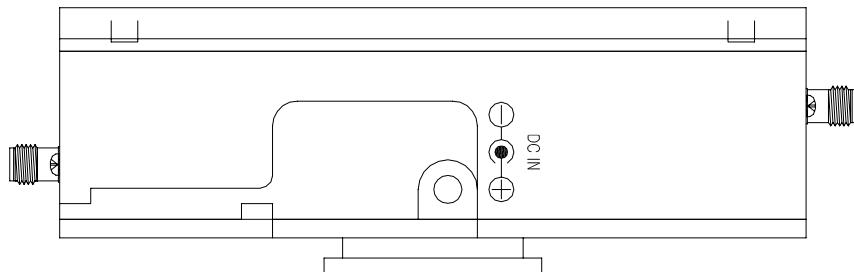
<Figure 5-1: HR1900P Front view>



### 5.2 Top and Bottom views



Top



Bottom

### 5.3 Side views

