

## Tune up procedure

Tune up procedure shall be over the power range or at specific operating power levels.

1. It must provide an operational voltage to turn on the device and on one certain channel in service mode by means of company proprietary software.
2. Base station simulator (CMW500) measures the Mobile phone device specific RF characteristics.
3. The maximum gains of each individual device are adjusted until the target value met.

Tune - up Power		
Mode	GSM 850	GSM 1900
GSM	32.0 dBm±1.0	29.0 dBm±1.0
GPRS 850 1Txslot	32.0 dBm±1.0	29.0 dBm±1.0
GPRS 850 2Txslots	30.0 dBm±1.0	26.5 dBm±1.0
GPRS 850 3Txslots	27.5 dBm±1.0	24.5 dBm±1.0
GPRS 850 4Txslots	25.5 dBm±1.0	22.5 dBm±1.0
EGPRS 850 1Txslot	32.0 dBm±1.0	24.5 dBm±1.0
EGPRS 850 2Txslots	30.0 dBm±1.0	22.5 dBm±1.0
EGPRS 850 3Txslots	27.5 dBm±1.0	20.5 dBm±1.0
EGPRS 850 4Txslots	25.5 dBm±1.0	18.5 dBm±1.0

Tune - up Power			
Mode	WCDMA Band II	WCDMA Band IV	WCDMA Band V
RMC 12.2kbps	22.0dBm ±1.0	22.0dBm ±1.0	22.0dBm ±1.0
HSDPA	21.5dBm ±1.0	22.0dBm ±1.0	22.0dBm ±1.0
HSUPA	21.5dBm ±1.0	22.0dBm ±1.0	22.0dBm ±1.0

Tune - up Power			
Mode	LTE Band 2	LTE Band 4	LTE Band 5
QPSK	23.0dBm ±1.0	23.0dBm ±1.0	23.0dBm ±1.0
16QAM	23.0dBm ±1.0	23.0dBm ±1.0	23.0dBm ±1.0

Tune - up Power			
Mode	LTE Band 7	LTE Band 12	LTE Band 17
QPSK	22.5dBm ±1.0	23.5dBm ±1.0	23.5dBm ±1.0
16QAM	22.5dBm ±1.0	23.5dBm ±1.0	23.5dBm ±1.0

Tune - up Power		
WLAN 2.4G	802.11b	13.0 dBm±1.0
	802.11g	11.0 dBm±1.0
	802.11n(HT20)	10.0 dBm±1.0
	802.11n(HT40)	9.5 dBm±1.0
WLAN 5.1G	802.11a	10.0 dBm±1.0
	802.11n(HT20)	8.5 dBm±1.0
	802.11n(HT40)	7.5 dBm±1.0
	802.11ac(HT20)	8.5 dBm±1.0
	802.11ac(HT40)	7.5 dBm±1.0
	802.11ac(HT80)	7.0 dBm±1.0
WLAN 5.8G	802.11a	10.5 dBm±1.0
	802.11n(HT20)	9.0 dBm±1.0
	802.11n(HT40)	8.0 dBm±1.0
	802.11ac(HT20)	9.0 dBm±1.0
	802.11ac(HT40)	8.5 dBm±1.0
	802.11ac(HT80)	7.0 dBm±1.0
Bluetooth	GFSK	-2.0 dBm±1.0
	Pi/4QPSK	-0.5 dBm±1.0
	8DPSK	-0.5 dBm±1.0
BLE(1M)	GFSK	-1.5 dBm±1.0

Then these appropriate gain settings are stored in each device individually.

The user has no possibility to change these settings later on, and during manufacturing each device will be individual calibrated. The measurement is done in fully calibrated setup, which is based on a CMW500 base station simulator. Furthermore, the highest power level is verified afterwards in a call measurement on three channels (low, middle and high).