1. MMR Remote Unit Tune-Up Procedure

Included in this document are commands used to get and set various MMR remote unit parameters. The only parameter that needs to be adjusted during field installation is the Attenuation parameter. All other parameters are factory set.

Inject an RF carrier of know power into the master and measure output power of that carrier at the MMR remote RF connector. The difference between those signal levels is the system gain. Using the Set Attenuation command described in Section 1.1.19, set the attenuation to obtain the designed system gain.

1.1 Local Commands for MMR Remote Unit

1.1.1 Software version

Syntax: g ver↵

Gets the software version of the remote unit software.
Response example:
-> RU0000 V2.1.0.0

1.1.2 Software ID

Syntax 'get' command: g sid↵
Syntax 'set' command: s sid=1234567890↵

Get/set the software the ANDREW software identification number of the remote unit software.

Response example:
-> SW-ID: 1234567890

1.1.3 Hardware revision

Syntax 'get' command: g rev↵
Syntax 'set' command: s rev=1.23↵

Get/set the hardware revision of the remote unit.

Note: This command is obsolete

Response example:
-> Rev: 1.23

1.1.4 Hardware ID

Syntax 'get' command: g hid↵
Syntax 'set' command: s hid=1234567890↵

Get/set the software the ANDREW hardware identification number of the remote unit.
Response example:
➔ HW-ID: 1234567890

1.1.5 Serial number

Syntax 'get' command: g ser↵
Syntax 'set' command: s ser=1234567890↵

Get/set a serial number of the remote unit.
Response example:
-> SN: 1234567890

1.1.6 Module Type

Syntax 'get' command: g mtp↵
Syntax 'set' command: s mtp=1234↵

Get/set a unique module type of the remote unit.
Response example:
➔ M-TYPE: 1234

1.1.7 Fixed address

Syntax 'get' command: g adr↵
Syntax 'set' command: s adr=*value*↵

value ={1..4} sub address, if this RU is used as cascaded RU

Get/set the sub address. This address is linked with the laser frequency used in this RU.

Response:
-> ok

1.1.8 Configuration switches

Syntax 'get' command: g cfg↵
Syntax 'set' command: s cfg=012F↵

Get/set a 2 byte configuration word. The bits of this two bytes allow hard- and software configuration. For exact meaning of the single bits see **Error! Reference source not found.** .

Response example of a get command:
-> CFG: 012F

1.1.9 Attenuation

Syntax 'get' command: g att↵
Syntax 'set' command: s att index=value↵

index = 1 ...6
value = 000 ... 030 [dB]

e.g. index refers to the following amplifiers
1 = UMTS UL, 2 = UMTS DL, 3 = DCS UL, 4 = DCS DL, 5 = GSM UL, 6 = GSM DL

Example for a set command:
s att 2=10↵ => set attenuation UMTS DL = 10dB

Response example of a get command:
-> 012 014 016 009 021 023 dB

1.1.10 Gain offset

Syntax 'get' command: g ofs↵
Syntax 'set' command: s ofs index=value↵

index = 1 ...6
value = -9..9 [dB]

e.g. index refers to the following amplifiers
1 = UMTS UL, 2 = UMTS DL, 3 = DCS UL, 4 = DCS DL, 5 = GSM UL, 6 = GSM DL

Examples for set commands:
s ofs 3=6↵ => set ofs DCS UL = +6dB
s ofs 6=-9↵ => set ofs GSM DL = -9dB

Note: sign is necessary for minus

Response example of a get command:
-> -01 +02 +01 -02 +02 +00 dB

1.1.11 ALC value

Syntax 'get' command: g alc↵
Syntax 'set' command: s alc index=value↵

index = 1 ... 6
value = 0 ... 255

e.g. index refers to the following amplifiers
1 = UMTS UL, 2 = UMTS DL, 3 = DCS UL, 4 = DCS DL, 5 = GSM UL, 6 = GSM DL

Examples for set commands:

s alc 1=145↵ => set alc UMTS UL = 145
s alc 5=88↵ => set alc GSM UL = 88

Response example of a get command:
-> 255 253 199 177 099 123

1.1.12 FSK Dynamic

Syntax 'get' command: g fsk↵
Syntax 'set' command: s fsk index=value↵

index = 2
value = 0...255 (Default value is 127)

Set example:
s fsk 2=150 => set FSK dynamic in Remote Unit = 150

Response of a get command:
-> xxx 150 => FSK dynamic = 150, ignore xxx

Note:
index=2 when connected to the master unit or *index*=1 when connected to the remote unit won't have any effect.

1.1.13 External Outputs

Set external outputs and read the status of external outputs.

Syntax ‘get’ command: g ext↵
Syntax ‘set’ command: s ext index=value↵

index = 1..4 (external output 1..4)
value = 0/1 (0 = reset, 1= set)

Set example:
s ext 3=0 => reset external output 3

Get response:
-> 1 0 1 0 (output 1=reset, output 2=set, output 3=reset, output 2=set)

1.1.14 Status

Get all status and alarm flags.

Syntax ‘get’ command: g sta↵

Get response:
-> xx xx xx xx xx see **Error! Bookmark not defined.** for detailed information

1.1.15 Current window (optical module)

Since optic module revision 2, current alarms are detected by monitoring 4 different currents with a AD-converter. This is for UL and DL.
By starting the software the very first time, default values for low and high limits of a current range are stored non volatile. Each value can be changed manually.

Get current window low/high limit:

Syntax ‘get’ command: g cwl↵ or g cwh↵

Get response:
-> current
low: 028 018 003 002 018 000 009 007
high: 048 028 010 008 028 002 015 013
avg: 039 024 009 007 020 000 015 007

Both get commands deliver the same result. The first row contains the lower limits, the second row the higher limits and the third row the actual measured value.

Set current window low/high limit:

Syntax ‘set’ command low limit: s cwl *index=value*↵
Syntax ‘set’ command high limit: s cwh *index=value*↵

index {1...8}
value {0...255}

index: 1=ADC channel 1 on RX board, ..., 4=ADC channel 4 on RX board,
5=ADC channel 1 on TX board, ..., 8=ADC channel 1 on TX board
value: t. b. d.

1.1.16 Place amplifier command

Syntax 'get' command: g amp↵
Syntax 'set' command: s amp *index*=*value*↵

index {1..3}
value {0,1}

Index: 1 = Amplifier 1, 2 = Amplifier 2, 3 = Amplifier 3
value: 0 = declare amplifier as 'not placed', 1 = declare amplifier as 'placed'

This command serves to configure an amplifier as placed or not placed. It will be necessary when there is a system with less than three amplifiers, for example a 2 Band system with GSM and DCS, being the UMTS amplifier not placed.
Example:

s amp 1=1 => configure amplifier number 1 as not placed

The program can now skip addressing the Amplifier 1 whereas if configured as placed it would generate an error on ground of no response from absent amplifier.

Note: This adjustment is stored non volatile. So it's a permanent adjustment.

1.1.17 Power down amplifiers

Syntax 'get' command: g pwd↵
Syntax 'set' command: s pwd index=value↵

index {1..3}
value {0,1}

index: 1 = Amplifier 1, 2 = Amplifier 2, 3 = Amplifier 3
value: 0 = power on amplifier 1 = power down amplifier

This command will shut down or switch on a Amplifier. It is only stored in RAM, so after a power down, the amplifier is always switched on.

1.1.18 Desired amplifier temperature

Syntax 'get' command: g dtt↵
Syntax 'set' command: s dtt=*value*↵

value {40...74 (°C)}

Example:
s dtt=50 => sets the maximum amplifier temperature to 50°C

Get response:
-> 050

Note:
The desired amplifier temperature will only be controlled precisely when the integral control mode is being activated. Then the control algorithm will cause the fan to rotate at it's optimal speed to keep the amplifiers at the temperature setting or lower.

1.1.19 Temperature

Syntax 'get' command: g tmp↵

Response for remote unit:

In the remote unit there are four more temperatures measured. In addition to these temperatures there are also given out some supplementary data. Most of them are only debug info. The only data the user may be interested in is the current fan rotation and the current temperature control mode.

Response Example

-> +30 +45 +51 +50 +45 °C

the temperatures refers to:

PicBoard / Optic (*:	30°C
Power supply:	45°C
Amplifier 1:	51°C
Amplifier 2:	50°C
Amplifier 3:	45°C

*) It depends on the revision of the optic, from rev 2 on, the temperature refers to sensor sitting in the optic module

1.1.20 Amplifier software version

Syntax 'get' command: g tsw↵
Gets the software version of the Amplifiers

Response example:
AMP 1: 1.4
AMP 2: 1.4
AMP 3: 1.4

1.1.21 Get optical power

Syntax 'get' command: g opw↵

Response:
UL Opt.Power[dBm] DL Opt.Power[dBm]

Response Example:
+14.5 +21.0 dBm => UL Power = 14.5 dBm, DL Power = 21.0 dBm

1.1.22 Amplifier output power

Syntax: g tpw↵

Response:
aaa bbb ccc

aaa refers to AMPLIFIER 1 output power
bbb refers to DCS output power
ccc refers to GSM output power

Response example:
+20.0 +23.5 +28.5 dBm => AMPLIFIER 1 power output = 20.0dBm
=> DCS power output = 23.5dBm

=> GSM power output = 28.5dBm

1.1.23 Amplifier status

Syntax: g tst↵

Response:

b1 b2 b3 b4 b5 b6

b1, b2 two bytes Amplifier 1 status
b3, b4 two bytes Amplifier 2 status
b5, b6 two bytes Amplifier 3 status

Status byte flags:

Status byte 1: S7 S6 S5 S4 S3 S2 S1 S0
Status byte 2: 0 0 0 0 0 S2 S1 S0

Status byte 1:
S0, S2, S3, S4, S5, S7: Not used
S1: Temperature Shut Down
S6: Shut Down

Status byte 2:
S0,S1 : internally used
S2 : Amplifier alarm

Response Example:

40 00 00 04 00 00 => Amplifier 1 amplifier shut down on ground of over temperature
Amplifier 2 amplifier alarm
Amplifier 3 amplifier OK

1.1.24 Amplifier power offset

1.1.24.1 Set power offset

Set an offset for the measured power.

Syntax 'set' command: s tpo *x*↵
$x \in \{-99...+99\}$ step size is 0.5 dBm

Example:
A offset value of –5 means, to the measured power of e. g. 31dbm is –2.5 dBm added.
So the displayed result is 28.5 dBm.

1.1.24.2 Get power offset

Read the values written by the set command.

Syntax 'get' command: g tpo↵

Response example:
AMP 1: err
AMP 2: -07
AMP 3: +01

Amplifier 1 in this example is either not placed or the command is not implemented.

1.1.25 Amplifier power slope

1.1.25.1 Set command

Set the slope of the power graph. To adjust the power detector according to the signal, the amplifier has to operate, a 'fine tuning' may be necessary.
For a CW signal the optimise value is about 82, for CDMA it is at 218.

Syntax 'set' command: s tps *x*↵
x ∈ {0...255}

1.1.25.2 Get command

Read the values written by the set command.

Syntax 'get' command: g tps↵

Response example:
AMP 1: err
AMP 2: 218
AMP 3: 082

Amplifier 1 in this example is either not placed or the command is not implemented.

1.1.26 Gain compensation offset for the Amplifier

1.1.26.1 Set compensation offset

Set an offset for the gain compensation. This value represents a voltage added to the regular gain compensation value.

Syntax 'set' command: s tgo *x*↵
x ∈ {-99...+99} one step is 5V/1023 ~ 4,8mV

1.1.26.2 Get compensation offset

Read the values written by the set command.

Syntax 'get' command: g tgo↵

Response example:
AMP 1: err
AMP 2: -15
AMP 3: +20

Amplifier 1 in this example is either not placed or the command is not implemented.

1.1.27 Fan Rotation

Normally the fan rotates with a speed depending on the measured temperatures and the adjusted desired temperatures. For measurement and develop purposes a static fan speed can be adjusted.
After a new power up, this adjustment is lost it works in automatic mode.

1.1.27.1 Set static fan rotation

Syntax 'set' command: s sfr=*x*↵

x ∈ {15..100} one step is 1% of max. fan speed

The following command will switch of the static fan speed mode (same result as power down).
s sfr=-1↵

1.1.27.2 Get static fan rotation

Read the fan speed and the fan operating mode.

Syntax ‘get’ command: g sfr↵

Response examples:
-> FAN speed: 000% mode: auto
-> ok!
-> FAN speed: 050% mode: static