

## 1200-G-PCS-AO

### Operational Description

#### 1. Introduction

The MobileAccess 1200 Add-on module is a high power module, supporting a single frequency band (low or high). It is designed to be integrated with a host RHU 1000 module. The RHU 1000 module provides the following functionality for both units:

- Optical interface (to the BU)
- RF interface (to antennas)
- Control signals

Note: The units are integrated through a simple external cable between corresponding ports.

#### 2. 1200-G-PCS-AO Interfaces

##### 2.1 Front Panel

The 1200-G-PCS-AO front panel includes the power connection and status LEDs. (The RS-232 connector is reserved for MA service personnel).

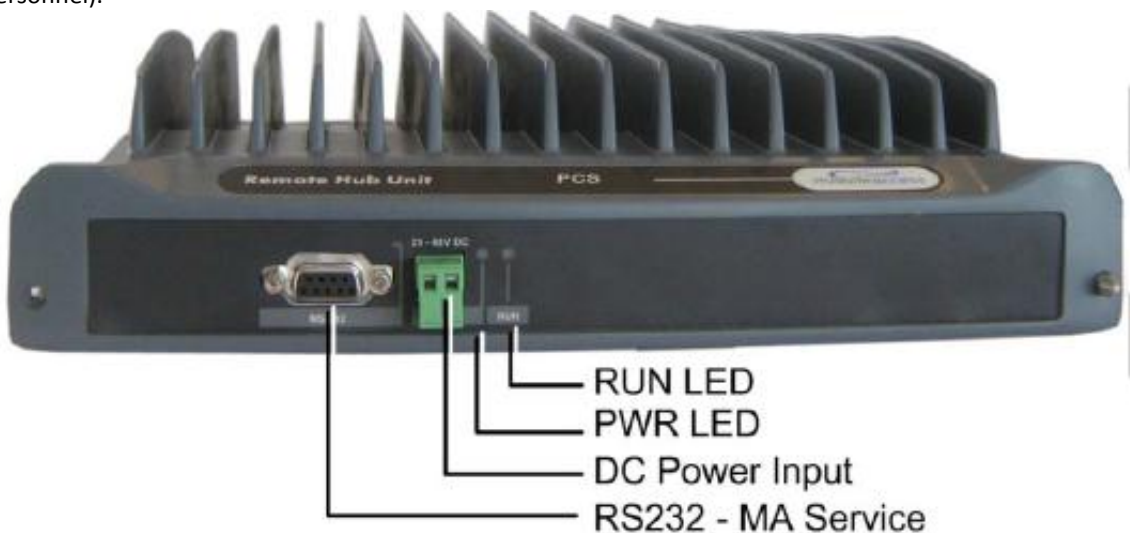


Figure 1. 1200-G-PCS-AO Front Panel

Table 1

1200-G-PCS-AO Front Panel Indicators

LED	Description
<b>RUN</b>	Blinking Green - indicates that the RHU is in normal operating mode.
<b>PWR</b>	Steady Green - Power ON

Table 2

1200-G-PCS-AO Front Panel connectors

<b>RS232</b>	Servicing connector to be used by MA service personnel for maintenance.
<b>PWR</b>	DC Power connection. 25 to 48VDC

## 2.2 Rear panel



Figure 2. 1200-G-PCS-AO Rear Panel

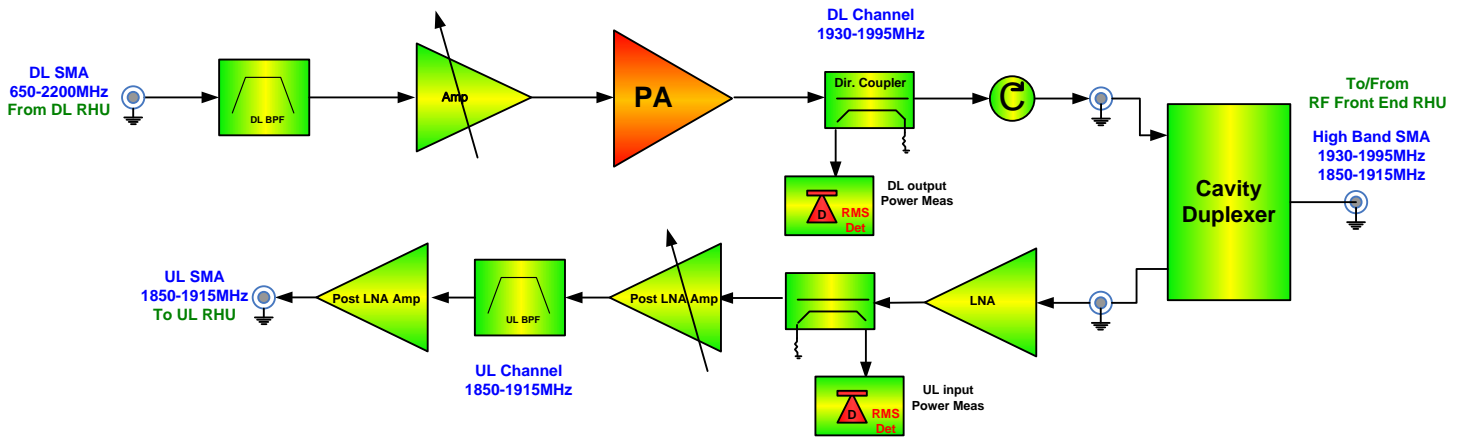
Table 3

1200-G-PCS-AO Rear Panel connectors

<b>Add-on Control:</b>	Transmits the control signals between the MA1200 module and the MA850/MA860 and MA2000 RU modules. <b>From</b> – receives control signals from the MA2000 RU. Connected to the MA2000 RU <b>Add-on Control</b> connector. <b>To</b> – feeds control signals to MA850/MA860 (in configurations that include MA850/MA860)
<b>DL, UL:</b>	Transmit the RF signals to- and from- the MA1200 add-on module. These ports are connected to the corresponding ports on the MA 2000 rear panel: DL to DL, UL to UL.
<b>High:</b>	Service RF output port. Connected to combiner/splitter to be combined with other services supported by the MA2000 system.

### 3. 1200-G-PCS-AO Operational Description and Power Protection Mechanisms

#### 3.1 Simplified Block Diagram



#### 3.2 Operational Description

The 1200-G-PCS-AO is connected to RHU (Remote Unit) thru 2 coaxial cables one to DL SMA and other to UL SMA. The other side, High Band SMA, is the Antenna Port which is connected to the SCU.

The DL path is filtered by DL BPF, then gain is adjusted at the adjustable gain Amp, then amplified by Power Amplifier. At this stage the signal is passed thru coupler and isolator to the Antenna port thru Cavity Multiplexer. The sampled and detected signal is used for output power adjustment.

The UL path starts at the right side, High Band SMA port (Antenna port that comes from SCU). It is amplified by adjustable gain LNA then post LNA amplifier, to the UL Band Pass filter, then it passes to the RHU thru a splitter and an Amplifier. The signal going thru UL SMA port to RHU where it is added to the signals that pass thru optics to head end. UL path has a coupler and a detector immediately after LNA, where the detected signal is used for UL limiter to protect the input from strong interferences.

In addition to this, the unit consists of Power Supply section that feeds all the parts and digital control area that manages all indications and alarms, communications etc.

#### Over Power Protection Mechanism

Since there are signal paths, the system has two different protection paths as well.

1. UL Input signal protection.
2. DL Output signal protection

#### **UL Input signal protection – UL Limiter**

UL Path can face a strong input signal that comes from passing by mobile phone users. If this mobile phone, from some reason is located too close to antenna, there might be need of protection. This protection is implemented by Input limiter. The UL detector is calibrated, during production phase to measure the UL input signal. This calibration is stored into the unit. When a signal appears at the antenna port, and this signal is stronger than the threshold of -40dBm, the LNA gain is reduced to protect the input stages of the Add On. When the strong interfering signal is reduced, or disappeared, the Limiter is released.

#### **DL Output signal protection – DL Limiter**

DL Path detector is also calibrated during the production phase, so it could read the output power level. During the life of the system, the output power is measured and compared to the required output power. When, from some reason, the output signal trying to rise above the required output signal level, the gain is reduced by adjustable gain amplifier that is located before the PA stage, in order to keep the output power that was defined at the commissioning stage. When the strong signal is reduced back, the Limiter is released, and the output power returns to the required level.