

# MON4000

## Dual-channel, Multi-band Down-converter

### Features

- Covers all common cellular frequency bands
- Frequency range 400 MHz to 4000 MHz
- Wide IF bandwidth
- Excellent dynamic range
- VITA-49 output over dual GbE streams
- Two independently tuned or phase coherent receivers on a single Eurocard
- Reconfigurable decimation filtering

### Description

The MON4000 is a multi-band radio frequency (RF) front-end device (FED). It provides two independent channels of RF-to-bits conversion for up to six selectable RF bands. These bands are chosen at time of manufacture from any of the bands allocated to cellular radio signals and for which appropriate 3x3 mm surface acoustic wave (SAW) filters are available. Output data are provided on two gigabit Ethernet (GbE) ports in VITA-49 format for direct compatibility with many signal processing platforms.

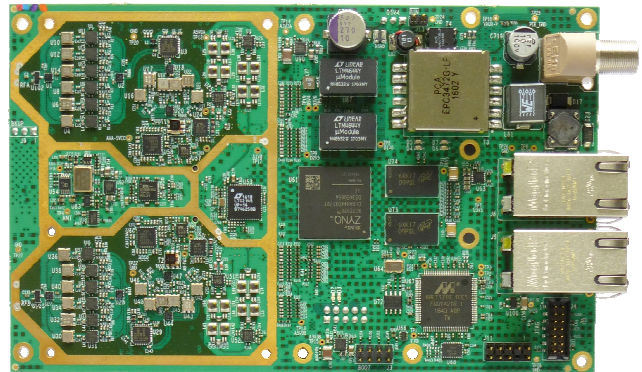
To minimise cabling the MON4000 operates from a power-over-Ethernet (PoE) supply. Alternatively it can be powered by a 12 V auxiliary supply.

An on-board GPS receiver provides time stamping for the sampled signals and is also used to stabilise the on-board reference oscillator to provide excellent frequency accuracy and stability.

The high-IF sampling capability of the MON4000 permits the use of a single stage down-converter, whilst maintaining good RF performance, which in turn minimises the design complexity and reduces size and power consumption. A wide range of gain control is available to tailor the down-converter to the prevailing signal conditions; high gain provides the best noise figure, whilst reducing the gain improves the 1 dB compression point.

The two receiver channels may be independently tuned or, with an external link, may share the same local oscillator for phase-coherent operation. Multiple cards may also be synchronised to form larger phase-coherent arrays.

Digitised signals are digitally filtered and decimated by a flexible and reconfigurable baseband processor. The standard build makes provision for a range of output rates to suit the signals of interest, but many

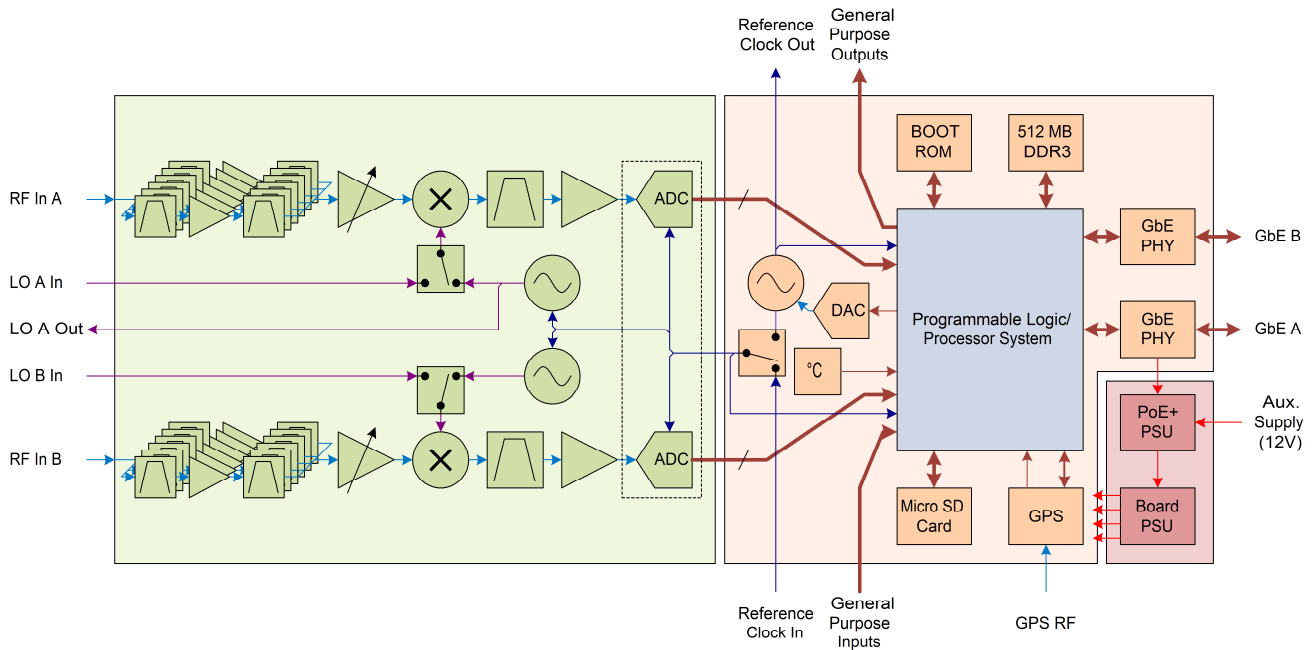


other custom options are possible. The decimated signals are packaged in standard VITA-49 frames for transport to the host computer or signal processor.

### Specification

| Parameter                           | Value                   |
|-------------------------------------|-------------------------|
| Rx input frequency range            | 400 to 4000 MHz         |
| IF Bandwidth                        | > 20 MHz                |
| Rx noise figure (max gain)          | < 8 dB                  |
| Rx gain control range               | > 40 dB                 |
| Phase noise @ 2000 MHz              |                         |
| 10 kHz offset                       | < -100 dBc/Hz           |
| 100 kHz offset                      | < -105 dBc/Hz           |
| 1000 kHz offset                     | < -125 dBc/Hz           |
| Input gain compression              |                         |
| Maximum gain                        | > -40 dBm               |
| Minimum gain                        | > -10 dBm               |
| IF ripple (compensated)             | ± 1 dB                  |
| RF image rejection (band dependent) | Min 30 dB<br>Max >70 dB |
| IF rejection                        | > 60 dB                 |
| Reference frequency                 | 102.4 MHz               |
| Power consumption (typ)             | 14 W                    |
| Size                                | 160 x 100 mm            |

# MON4000 Block Diagram



## Available Frequency Bands

The most common frequency bands are listed in the table below (all values in MHz). Others are available, if your band of interest is not shown, please contact MAC Ltd to discuss your requirements.

| Band | System   | Min (MHz) | Max (MHz) |
|------|----------|-----------|-----------|
| A    | LTE DL   | 791       | 821       |
| B    | LTE UL   | 832       | 862       |
| C    | GSM UL   | 880       | 915       |
| D    | GSM DL   | 925       | 960       |
| E    | GSM UL   | 1710      | 1785      |
| F    | GSM DL   | 1805      | 1880      |
| G    | UMTS UL  | 1920      | 1980      |
| H    | UMTS DL  | 2110      | 2170      |
| I    | ISM/WiFi | 2400      | 2483      |
| J    | LTE UL   | 2500      | 2570      |
| K    | LTE TDD  | 2570      | 2620      |
| L    | LTE DL   | 2620      | 2690      |

## Output Sample Rates

The standard output rates that are supported by the MON4000 include those listed in the table below, together with the signal bandwidth carried at each rate. Other rates are available on request.

| Rate (MSps) | BW (MHz) | Rate (MSps) | BW (MHz) |
|-------------|----------|-------------|----------|
| 30.72       | 20       | 15.36       | 10       |
| 25.6        | 20       | 12.8        | 10       |
| 25.0        | 20       | 7.68        | 5.0      |
| 22.0        | 16       | 6.4         | 5.0      |
| 20.0        | 17       | 3.2         | 2.5      |

## Further Information

The information in this data sheet is subject to change without notice. For further information, to place an order or to discuss custom firmware development please contact MAC Ltd at the address below.



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