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# PCIe card Decimator D4 spectrum and signal analyzer

## Ideal for integration into small spaces

**The Decimator D4 spectrum and signal analyzer is a fourth-generation spectrum measurement and analysis card, providing high-end performance at a low price.**

It can function as either an independent spectrum analyzer in a satellite, cable or terrestrial network, or can easily be integrated into a satellite terminal, equipment enclosure or as part of a larger measurement network.

With a very low noise floor and large dynamic range, it is well-suited to measure any type of satellite, cable or terrestrial wireless carrier, including very small carriers, beacon signals and for carrier monitoring applications.

Decimator accepts all signals from 1.5 MHz to 6.5 GHz and input power levels ranging from –110 to +5 dBm. RBW varies from 1 Hz to 15 MHz. The Decimator can be connected to an external 10 MHz reference for improved frequency accuracy and stability. All data communications with the Decimator occurs via the built-in Ethernet port.

The signal analysis engine demodulates and decodes the MPEG transport-stream-based DVB-S/S2/S2X signal and provides signal characteristics, modulation accuracy, power measurements, and constellation display to view the digital modulation quality.

The card measures only 4.2" x 6.875" x 0.8" and is ideal for integration into small spaces. It can be installed in any enclosure or computer chassis. It is a half-size PCI express (PCIe) card and can be installed in an available computer PCIe slot, providing power to the card.

The HTML5–based user interface allows the D4 to be operated from all browsers and on all platforms, including Android and IOS devices. No additional software is required. The GUI is very easy to use and operates like most traditional spectrum analyzers. It provides user-selectable colours for markers and traces, allows storage of multiple traces and provides measurement reporting.

Decimator has a publicly available API for integration into third-party network monitoring systems.

## Specifications

### Overview

- Full satellite L-band, standard C band, plus cable and wireless bands from 1.5 MHz to 6.5 GHz
- Built-in carrier monitoring
- External 10 MHz reference or internal reference
- Web browser or API control
- SNMP status interface
- Installs in half-size PCIe slot or equipment enclosure
- Custom design versions supporting other frequency bands or form factors available upon request

## Add-on options

| | |
|---|---|
| **Spectator software** | • Enhanced Carrier monitoring for a single Decimator |
| **Detector software** | • View multiple signal constellation displays on a single screen |

## Physical interfaces

| | |
|---|---|
| **RF Inputs** | • SMA, 50 ohms |
| **Control** | • RJ-45 |
| **Reference** | • SMA, 50 ohms |
| **Power** | • PCIe or 3-pin Molex connector |
| **Mechanical** | • Half size PCIe card<br>• 4.2" x 6.875" x 0.8" |

## Measurement speed[3]

| | |
|---|---|
| **500 MHz span, 1 MHz RBW** | • 200 ms |
| **200 MHz span, 30 kHz RBW** | • 630 ms |
| **80 MHz span, 100 kHz RBW** | • 170 ms |
| **3.5 MHz span, 8 kHz RBW** | • 90 ms |

## RF input

| | |
|---|---|
| **Input frequency range** | • 1.5 MHz to 6.5 GHz |
| **Usable dynamic range** | • -110 to +5 dBm (aggregate) |
| **Noise floor** | • -160 dBm/Hz typical at min atten<br>• -140 dBm/Hz typical at max atten |
| **Phase noise (worst case at 3 GHz)** | • -80 dBc/Hz at 1 kHz offset<br>• -95 dBc/Hz at 100 kHz offset<br>• -125 dBc/Hz at 1 MHz offset |
| **Maximum safe input** | • +15 dBm |

## Measurements

| | |
|---|---|
| **Amplitude accuracy** | • ±0.5 dB (at 25°C)1<br>• ±1.0 dB (0 to 55°C) |
| **Frequency accuracy** | • ±2.6 ppm (internal) or as per external reference |
| **Frequency resolution** | • 1Hz |
| **Resolution bandwidth** | • 1 Hz to 15 MHz |
| **Analysis bandwidth** | • up to 260 MHz |

## Spurious

| | |
|---|---|
| **Images** | • < -55 dBc (typical) |
| **Aliasing** | • < -55 dBc (typical) |
| **DC offset** | • < -30 dBc (typical) |
| **Averaging** | • up to 255 averages |

## Other specifications

| | |
|---|---|
| **Reference input** | • 10 MHz, -5 dBm to +13 dBm, +3 dBm to +13 dBm (auto-sensing) |
| **Control interface** | • TCP/IP, API, SNMP, HTTPS |
| **Power requirements** | • PCIe or 12/3.3 to 5 Vdc, 18W max |
| **Operational temperature** | • 0 to 55°C |

## Modes of operation

- Raw Snapshot Mode: # of IQ time samples approx. 192 million
- Linear Power/Bin (4096 samples, up to 255 averages)
- Log Power/Bin (4096 samples, up to 255 averages)
- Raw IQ Samples — Fractional decimation supported
- Selectable Spectral Inversion
- Programmatic measurement and control over Ethernet based API

### MODCODs supported

| | |
|---|---|
| **DVB-S** | • **QPSK** ½, 2/3, ¾, 5/6, 7/8 DVB-S2:<br>• **QPSK** ¼, 1/3, 2/5, ½, 3/5, 2/3, ¾, 5/6, 8/9, 9/10;<br>• **8PSK** 3/5, 2/3, ¾, 5/6, 8/9, 9/10;<br>• **16APSK** 2/3, ¾, 4/5, 5/6, 8/9, 9/10;<br>• **32APSK** ¾, 4/5, 5/6, 8/9, 9/10 |
| **DVB-S2** | • **QPSK** ¼, 1/3, 2/5, ½, 3/5, 2/3, ¾, 5/6, 8/9, 9/10;<br>• **8PSK** 3/5, 2/3, ¾, 5/6, 8/9, 9/10;<br>• **16APSK** 2/3, ¾, 4/5, 5/6, 8/9, 9/10;<br>• **32APSK** ¾, 4/5, 5/6, 8/9, 9/10 |
| **DVB-S2X** | • **QPSK** 13/45, 9/20, 11/20;<br>• **8APSK** 5/9L, 26/45L, 23/36, 25/36, 13/18;<br>• **16APSK** 1/2L, 8/15L, 5/9, 26/45, 3/5, 3/5L, 28/45, 23/36, 2/3L, 25/36, 13/18, 7/9, 77/90;<br>• **32APSK** 2/3L, 32/45, 11/15, 7/932APSK 2/3L, 32/45, 11/15, 7/9 |

Notes

1. Measurement conditions: 10 averages, input level between -8 dBm and -68 dBm, 3 sigma.
2. Resolution bandwidths auto or manual adjustable.
3. Expected rates with 10 averages, speed optimization.
4. All specification at 25°C unless otherwise noted and are subject to change without notice.
5. Specifications are stated for performance up to 3 GHz.

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