Instruments

# Monochromator for fiber-coupled light source

Any fiber-coupled light source can be attached to this compact, software-controlled fiber-to-fiber monochromator, e.g. a LED or laser-pumped plasma light source can be connected.
The high light throughput results in a flexible, tunable point light source with high luminance at the output fiber.
Thanks to a magnetic-kinematic holder, the optical grating can easily be changed by the user. A number of gratings are available, optimized for the UV, VIS or NIR / MIR wavelength range, which can be exchanged in just a few steps thanks to a factory pre-adjustment. Depending on the fiber core diameter, bandwidths between 0.8 and 28 nm are possible.

A motorized filter wheel for up to 5 order sorting filters and a motorized shutter are integrated. Optionally, the 102-FF can be equipped with a high-speed shutter, which allows reproducible switching times of down to 10 ms.
The wavelength is selected from a PC or laptop via an USB interface. Easy-to-use software is included. External control and integration into your overall system are possible via LabVIEW™, Python, etc. as well as via direct ASCII commands.

## Key Features

- Flexible, tunable point light source with high radiance
- Compatible with any fiber-coupled light source
- Simple change of gratings
- Integrated motorized filter wheel and shutter

# MountainChromator 102-FF Datasheet

Version 01

## Specifications

| | |
|---|---|
| Optical Input | SMA-connector for multi-mode fibers up to 1.5 mm core diameter |
| Focal length | 101.6 mm (4") |
| Aperture | f/2.7 (for fiber with NA = 0.22) |
| Wavelength range | 190 nm – 5.5 µm |
| Bandwidth | 1 - 20 nm FWHM* (see table 1) |
| Grating | 50x50 mm², mounted on adjusted holder for quick and easy change. Various gratings available (see table 2) |
| Order sorting filters | Up to 5 filters, ½ inch, standard set (3 filters for UV-VIS-NIR) included |
| Reproducibility | typ. 0.1 nm* |
| Scanning speed | 100 - 300 nm/s* |
| Interface | RS-232 via USB-C connector<br>(USB-C on USB-A cable included) |
| Options connector | Trigger In, Trigger/Busy Out, one additional Input and Output (TTL),<br>+5 V/GND via 6-pol M8 sensor/actuator connector |
| Software | LabVIEW™-GUI;<br>Direct control via RS-232 ASCII commands |
| Dimensions | 291 mm (l), 182 mm (w), 124 mm (h)<br>Weight: 4 kg |
| Power supply | Wall plug 12 V DC, 2.5 A (included),<br>power consumptions ca. 5 W |

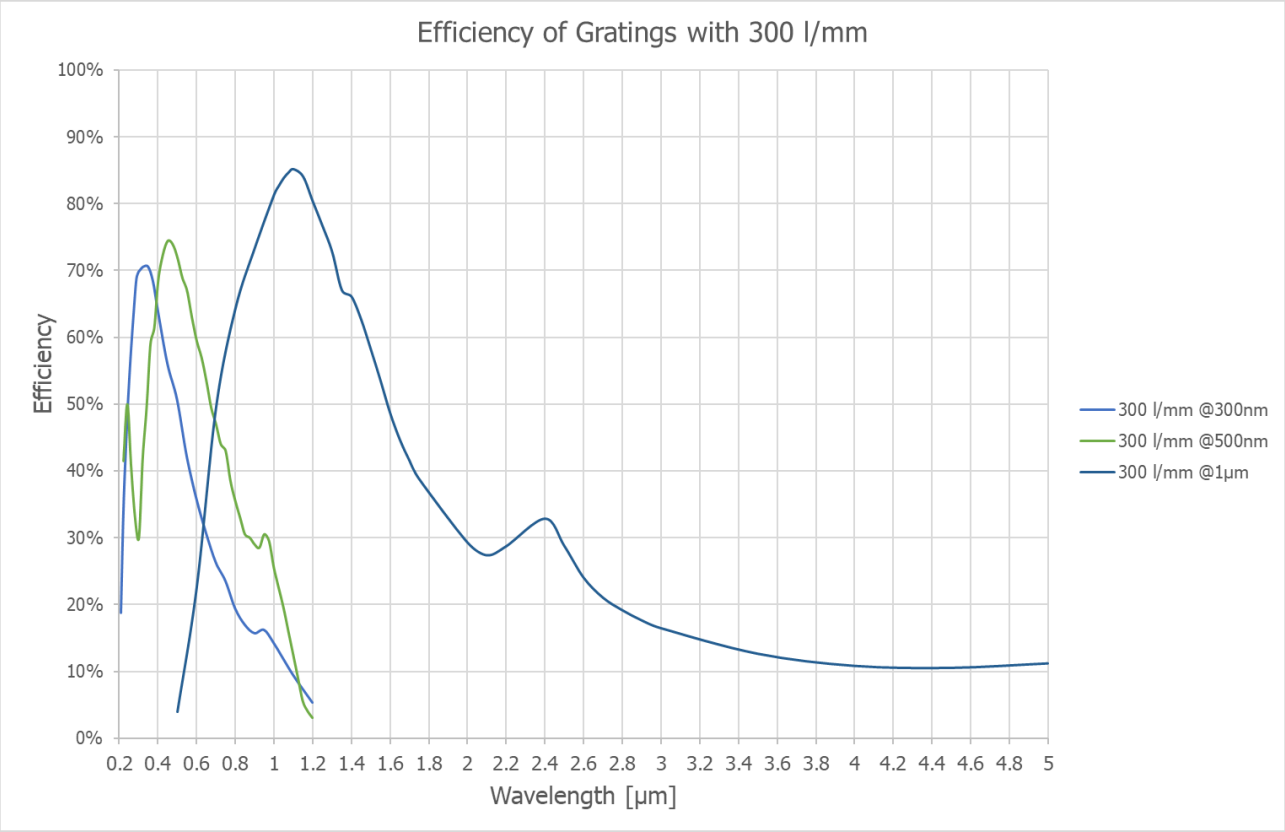
* Depending on fiber core diameter and grating

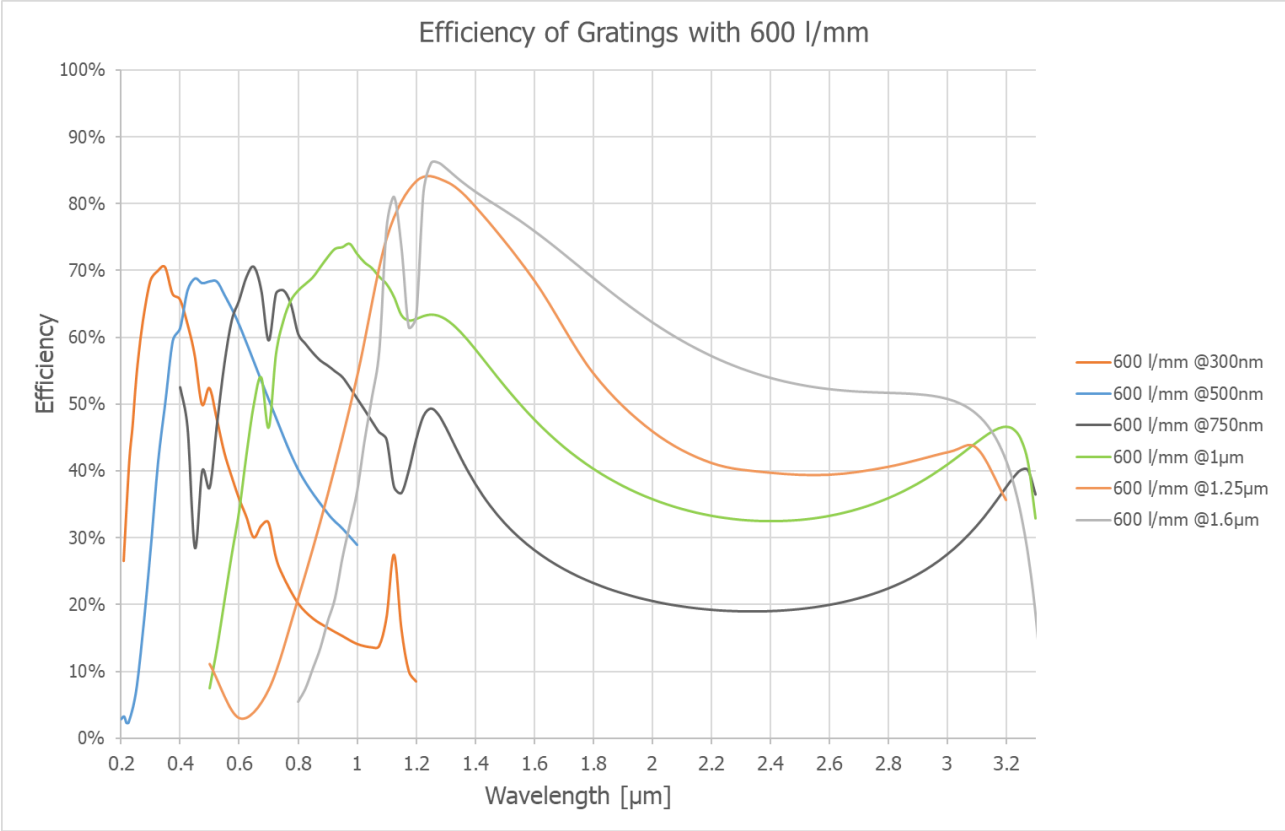
## Table 1: Bandwidth of light from the output fiber

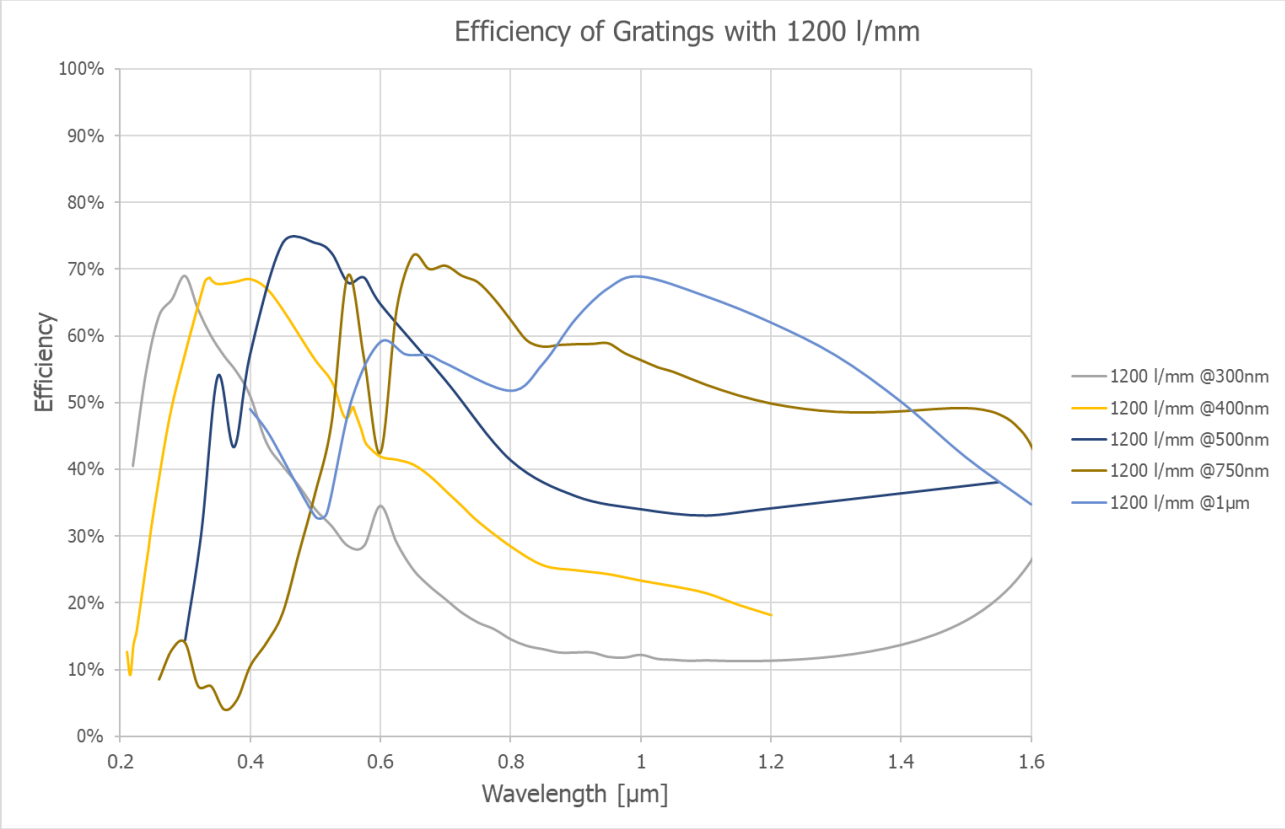
| Fiber core diameter [µm] | Lines per mm of the grating | | | | | |
|---|---|---|---|---|---|---|
| | 300 | 600 | 1200 | 1800 | 2400 | 3600 |
| 200 | 8.0 nm | 4.0 nm | 2.0 nm | 1.3 nm | 1.0 nm | 0.7 nm |
| 400 | 12.4 nm | 6.2 nm | 3.1 nm | 2.1 nm | 1.6 nm | 1.0 nm |
| 1000 | 28.0 nm | 14.0 nm | 7.0 nm | 4.7 nm | 3.5 nm | 2.3 nm |

## Table 2: Available gratings

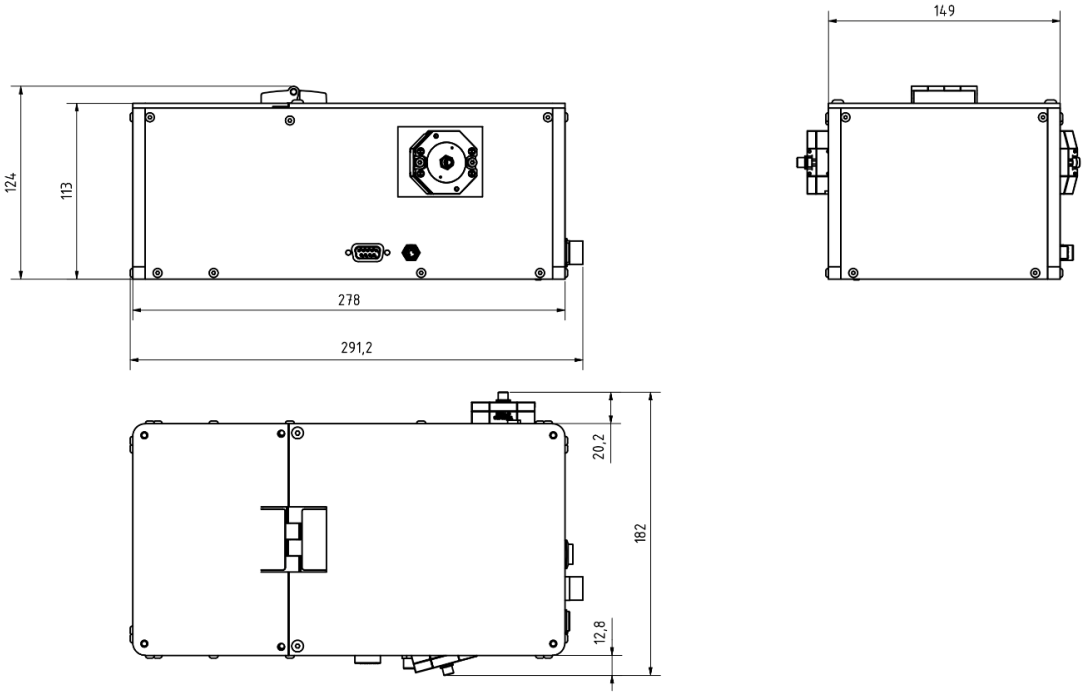
| Lines per mm | Blaze wavelength/ maximum [nm] | Wavelength range [nm] |
|---|---|---|
| 300 | 300 | 230 – 1200 |
| 300 | 500 | 230 – 1200 |
| 300 | 1000 | 500 – 5000 |
| 600 | 250 | 200 – 1200 |
| 600 | 300 | 230 – 1200 |
| 600 | 400 | 230 – 1200 |
| 600 | 500 | 250 – 1500 |
| 600 | 1000 | 500 – 3300 |
| 600 | 1250 | 700 – 3300 |
| 600 | 1600 | 800 – 3300 |
| 1200 | 250 (holographic) | 200 – 1200 |
| 1200 | 300 | 230 – 1200 |
| 1200 | 400 | 230 – 1200 |
| 1200 | 500 | 230 – 1200 |
| 1200 | 750 | 400 – 1600 |
| 1200 | 1000 | 400 – 1600 |
| 1800 | 250 | 200 – 1000 |
| 1800 | 250 (holographic) | 200 – 1000 |
| 1800 | 450 (holographic) | 200 – 1000 |
| 1800 | 500 (holographic) | 200 – 1000 |
| 2400 | 250 (holographic) | 200 – 800 |
| 2400 | 450 (holographic) | 200 – 800 |
| 3600 | 300 (holographic) | 200 – 520 |


Efficiency of Gratings with 300 l/mm
Efficiency
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0.2 0.4 0.6 0.8 1 1.2 1.4 1.6 1.8 2 2.2 2.4 2.6 2.8 3 3.2 3.4 3.6 3.8 4 4.2 4.4 4.6 4.8 5
Wavelength [µm]
300 l/mm @300nm
300 l/mm @500nm
300 l/mm @1µm


Efficiency of Gratings with 600 l/mm
Efficiency
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0.2 0.4 0.6 0.8 1 1.2 1.4 1.6 1.8 2 2.2 2.4 2.6 2.8 3 3.2
Wavelength [µm]
600 l/mm @300nm
600 l/mm @500nm
600 l/mm @750nm
600 l/mm @1µm
600 l/mm @1.25µm
600 l/mm @1.6µm




## Dimensions:




About us

Mountain Instruments is a brand of Mountain Photonics GmbH.
We aim at adding value to our customers by offering technical service, product development and in-house products.

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