

TruPulse 2002 nano

Edmund Part:
18306



Edmund
optics worldwide



Greater
flexibility



Superior
quality



Increased
productivity



Improved
profitability

+ Applications

- | | | | |
|------------|-------------------|-------------------------|------------------------|
| ▪ Ablation | ▪ Engraving | ▪ Precision Cutting | ▪ Thin Film Patterning |
| ▪ Cleaning | ▪ Marking | ▪ Scribing | ▪ Thin Film Cutting |
| ▪ Drilling | ▪ Micro-Machining | ▪ Solar Cell Processing | ▪ Welding |

TruPulse 2002 nano is ideal for:

- 01** High quality marking
With pulse duration 3-2000ns



- Black mark anodized aluminum
- White marking metals

- 02** High quality drilling & cutting
With peak energy 1.25mJ



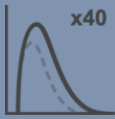
- Cutting metals & ceramics
- Drilling holes down to 30µm

- 03** High quality micro-machining
With peak power $\geq 10\text{kW}$



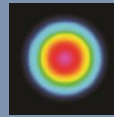
- Engraving metals
- Surface texturing

TRUMPF



PulseTune Functionality (EP Series)

- Up to 48 optimized PulseTune waveforms
- Single shot to 4 MHz pulse repetition frequency



Beam Quality (Z Type M² ≤ 1.6)

- Higher peak power and pulse energy with only minor increase in spot size and good depth of focus

+ Laser Characteristics

Parameters		
Central emission wavelength	nm	1059 - 1065
Nominal average output power	W	20 (adjustable 0-100%)
M ²		≤1.6 (1.3 typical)
Collimated beam diameter	mm	7.5 standard (other collimators available)
PulseTune waveforms		48
Maximum pulse energy	mJ	1.25 (3% rms stability)
Maximum peak power	kW	≥10 (14 typical)
Pulse duration range	ns	3 – 2000 (see waveform table)
Pulse repetition frequency (PRF) range	kHz	1 – 4000 (see waveform table)
CW mode (with modulation)	kHz	YES (1 - 100)
Red alignment laser mode	mW	0.3

+ System Integration Details

Parameters		
Cooling		Air
Beam delivery cable length	m	3
Laser module dimensions	mm	347 x 201 x 95
Power supply voltage	V DC	24± 2
Power supply requirement	W	250
Operating temperature range	°C	0 to +45
Relative humidity range		5-95% RH (non-condensing)

Terms and Conditions

All product information is believed to be accurate and subject to change without notice. A complete product specification will be issued on request and also at time of order acknowledgement. The user assumes all risks and liability whatsoever in connection with the use of the product and its application. These lasers are designed as products for incorporation or integration into other equipment.

INVISIBLE LASER RADIATION
AVOID EYE OR SKIN EXPOSURE TO
DIRECT OR SCATTERED RADIATION
CLASS 4 LASER DEVICE

Wavelength: 1040 – 1200 nm
Pulsed output - Max average power < 60W
Max pulse energy < 2.0mJ
Repetition freq. 1–1000kHz
Pulse duration 1ns – 500ns
CW Output power < 60W
IEC EN 60825-1:2014

Component for Incorporation
This device is intended as a
component for incorporation into
a laser product, and as such
requires additional features for
Laser Safety and to comply with
IEC EN 60825-1 and
21CFR1040.10

VISIBLE LASER RADIATION
AVOID DIRECT EYE EXPOSURE
CLASS 3R LASER DEVICE
(ALIGNMENT PURPOSES ONLY)

Wavelength 630-670nm
OUTPUT < 5mW CW
IEC EN 60825-1:2014

Parameters		Description
Laser		TruPulse 2002 nano (FK10-EP)
Collimator		F75 removable beam expanding collimator without flange
Break-out-board		G4 Break-out board
RS232 Cable		9 pin to 9 pin RS232 Cable
Control Cable		I/O Control Cable
Power Supply Cable		Standard 24VDC Power Supply Cable

***Edmund Part does not include a power supply**

To learn more about our TruPulse nano Fiber Laser products visit our website: www.trumpf.com/s/trupulse-nano

Pulse Waveform Table

Waveform	PRF ₀ (kHz)	PRF _{max} (kHz)	Max. pulse energy, E _{max} (mJ)	Typ. FWHM pulse duration at E _{max} (ns)	Pulse duration at 10% (ns)	Typ. peak power at E _{max} (kW)
0	20	1000	1.00	40	241	14
1	25	1100	0.80	35	221	14
2	27	1200	0.74	33	202	14
3	29	1350	0.70	31	177	14
4	30	1500	0.67	29	161	14
5	32	1700	0.63	28	144	14
6	34	1850	0.60	27	131	14
7	36	2000	0.56	25	118	14
8	37	2173	0.54	26	113	14
9	39	2380	0.52	26	103	14
10	41	2500	0.49	26	100	14
11	43	2777	0.47	27	90	14
12	45	3125	0.44	26	80	14
13	48	3846	0.42	27	65	13
14	51	4166	0.39	27	58	13
15	54	4166	0.37	27	60	13
16	57	4166	0.35	27	55	14
17	61	4166	0.33	27	50	13
18	65	4166	0.31	15	45	13
19	70	4166	0.29	27	40	14
20	76	4166	0.26	15	36	13
21	83	4166	0.24	28	33	13
22	90	4166	0.22	25	30	13
23	100	4166	0.20	22	26	13
24	115	4166	0.19	19	23	12
25	140	4166	0.16	16	20	12
26	170	4166	0.13	12	16	11
27	215	4166	0.09	12	13	10
28	290	4166	0.07	9	10	10
29	395	4166	0.05	5	7	11
30	500	4166	0.04	4	5	11
31	715	4166	0.03	3	3	11
32	20	900	1.00	62	220	13
33	20	900	1.00	66	245	12
34	20	800	1.00	70	270	12
35	20	600	1.00	78	320	10
36	20	600	1.00	81	350	10
37	20	600	1.00	85	390	9
38	20	500	1.00	90	440	8
39	20	500	1.00	95	490	8
40-55	Not specified					
56	17	400	1.25	20	625	14
57	17	300	1.25	22	825	13
58	17	240	1.25	26	1025	11
59	17	200	1.25	28	1225	9
60	17	170	1.25	30	1425	8
61	17	155	1.25	34	1625	7
62	17	135	1.25	43	1825	7
63	17	120	1.25	47	2025	6

Note: The laser operates at discrete pulse repetition frequencies (PRF) associated with multiple integer clock cycles. The resulting difference between "permissible" frequencies may become noticeable above 2 MHz. Frequencies at which the laser will operate above 2 MHz are: 2.000, 2.082, 2.173, 2.272, 2.380, 2.500, 2.631, 2.777, 2.941, 3.125, 3.333, 3.571, 3.846 and 4.166 MHz. In software mode (internal trigger) the laser will automatically round to the next frequency up if the demanded PRF is not one of these discrete values. For example, if the demanded frequency is 3.2 MHz, the laser will operate at 3.333 MHz, not 3.125 MHz. In hardware mode (external trigger) the laser will jitter between the two permissible frequencies above and below the demanded PRF. The 'Laser_Has_Pulsed' monitor signal is available only for waveforms where PRF_{max} ≤ 1 MHz.

Pulsed Fiber Laser Specification

Pulse Waveform Shapes

