Technical specification of GHz burst repetition rate femtosecond laser

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|  | **The subject of the procurement** | **GHz burst repetition rate femtosecond laser** |
| Following tasks to be realized with galvanometric scanning system | * High-precision laser micromachining and volumetric modifications in transparent materials. |
| * Ready for 24/7 operation |
| * The system should generate 1030 nm output beam with possibilities of second (2H), third (3H), and fourth (4H) harmonic generations |
| * Adjustable burst mode up to GHz region for applications such as selective ablation, deep engraving, surface polishing, and functionalization |
| * Adjustable pulse repetition rate and pulse duration to optimize for different materials and processes. |
| * Compatible with Direct Machining Control system |
| * Integration with existing galvanometric scanning systems and RTC control boards. |
| **Technical features of GHz burst repetition rate femtosecond laser** | | |
| Optical Characteristics | | *- Wavelengths:*   * *Fundamental: 1030 nm* * *Second harmonic (2H): 515 nm* * *Third harmonic (3H): 343 nm* * *Fourth harmonic (4H): 257 nm*   *- Pulse Repetition Rate: must be adjustable up to 2 MHz, with burst mode options up to GHz region*  *- Pulse Duration: Must be tunable tunable at least in the range of 250 fs and 1 ps.*  *- Output Power: Maximum output power of at least 120W at 1030 nm with > 50% efficiency for the second harmonic and > 20% for the third harmonic.*  *- Burst Mode Capability: Must support burst mode with both nanosecond and picosecond pulse separation, configurable to create a set of pulse sub-packets for enhanced control in material processing.*  *- Beam Quality (M²): Must be lower than 1.2.*  *- Polarization: Must be vertical for the fundamental wavelength* |
| Performance and Stability | | - *Power Stability*: Output power stability should be within 1% over 8 hours of continuous operation.  - *Pulse Energy Stability*: Stability of pulse energy must be <0.5% (RMS). |
| Control and Interfaces | | - Must be compatible with analog, TTL, and Ethernet-based controls.  - The system should provide interfaces for external synchronization and control, supporting flexible repetition rate tuning and burst shaping  - Must be supplied with control software that allows adjustment of pulse repetition rates, burst configurations, and harmonic switching. |
| Accessories | | - Delivery with all necessary cables, connectors, and manuals in English.  - The system must include all necessary optical components for harmonic generation (2H, 3H, 4H) and mounting fixtures.  Include power supply, cabling, and other connectors required for operation. |