ILS series

Frequency-stabilized laser systems dedicated to atom cooling and trapping

iXblue presents a new generation of compact and agile intelligent laser systems (ILS) offering a precise control of the laser amplitude, phase, and absolute frequency with fast tunability. Such high-performance laser systems exploit laser-cooled quantum manipulation techniques on an industrial scale. The laser architecture is based on the utilization of slave lasers, frequency-locked to a master laser whose frequency is stabilized on an atomic transition using saturated absorption spectroscopy.

WIDE VARIETY OF CONFIGURATIONS AVAILABLE

- Up to 4 independent frequency-stabilized laser heads operating at 780.23 nm
- Tunability frequency range up to 1 GHz
- Sideband generation
- Fast beam extinction and power modulation
- Phase-locking of laser outputs
- Power splitting 1>3 or 1>6 output fibers per laser head, with independent power control.

LASER SYSTEMS EQUIPPED WITH DEDICATED ELECTRONICS THAT OFFER

- Ultra low noise
- Excellent robustness (continuous frequency locking demonstrated over several weeks)
- User-friendly operation (automatic frequency locking)
- Ultra-low noise microwave synthesizer available upon request

HIGH RELIABILITY, FIBERED LASER TECHNOLOGY

The ILS systems are based on C-band fibered telecom optical components (i.e seed lasers), a proven robust and reliable technology. The laser light at telecom wavelength (around 1560 nm) is amplified and frequency-doubled to generate the required wavelength (at 780 nm). This approach gives access to a wide variety of high performance fibered optical components, originally developed for high-bit-rate optical communication systems.

FEATURES

- Fibered components: no optical alignment required
- Extreme optical and electrical performances
- Compliance with Telcordia qualification procedures (extended temperature range)
- High reliability

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TECHNICAL SPECIFICATIONS

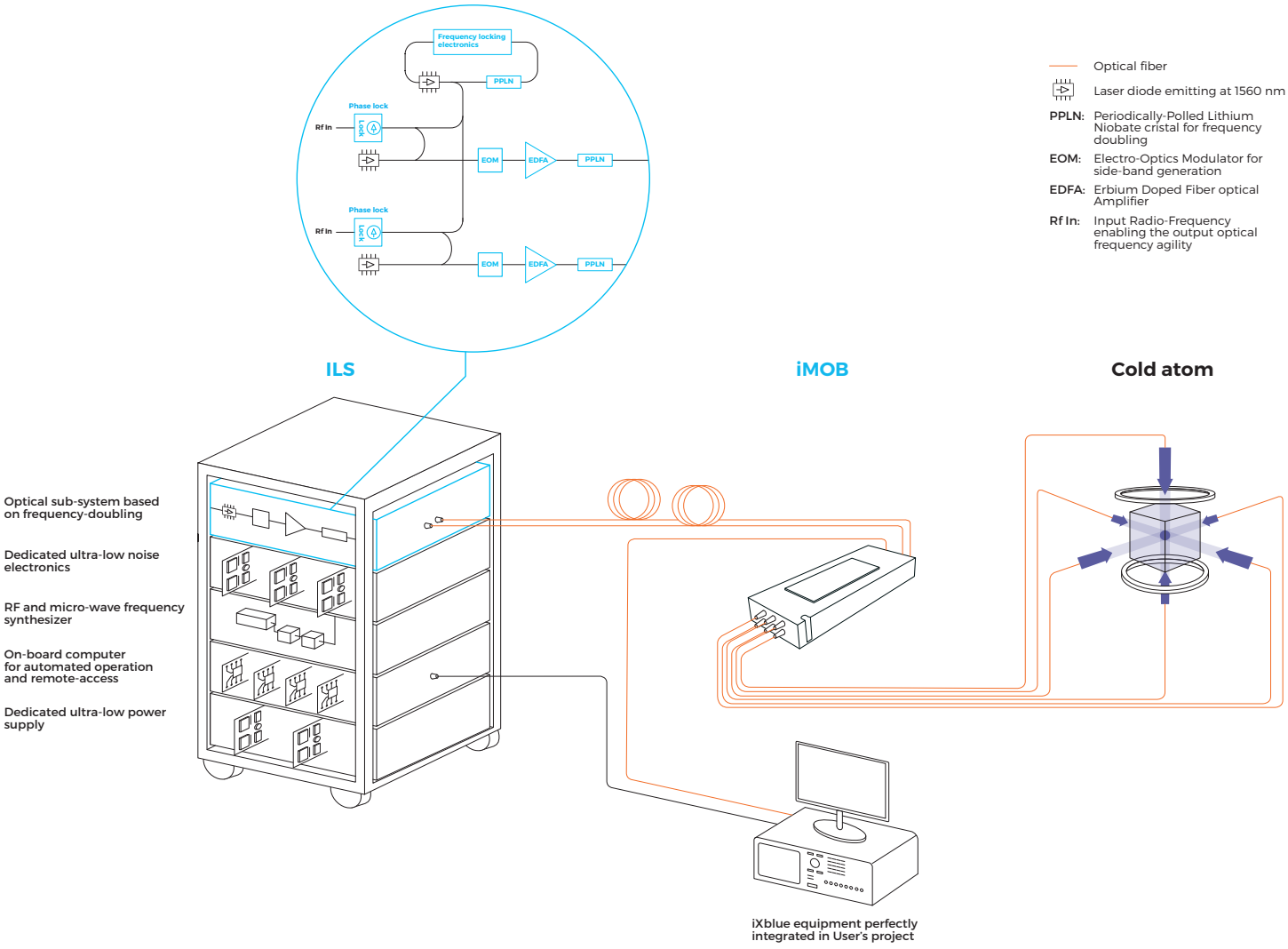
Optical Characteristics

Operating wavelength	780.23 nm (D2 line of 87Rb and 85Rb)
Output power	> 300 mW per laser head (direct use for atom manipulation)
Linewidth	< 60 kHz
Tunability range	up to 1GHz
Sweeping rate	> 250 MHz/ms typ.
Polarization	30 dB typ.
Beam quality	TEM∞ M2 < 1.1
Rise/fall time	< 1 µs
Frequency stability	< 100 kHz rms at 1 day

General Characteristics

Dimensions	19" rack, 500 mm depth, from 6 to 14U, depending on the laser configuration
Supply voltage	100-240 VAC, 50-60 Hz
Electrical power consumption	< 250 W typical, depending on the laser configuration

EXAMPLE OF CONFIGURATION



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