# Twin Photon Source for Quantum Innovation!

CLEO/LASER FOCUS WORLD
INNOVATION AWARD
2014 Honorable Mention

*First worldwide self-contained Entangled Photon Pair Source*

**AUREA Technology offers the first worldwide self-contained high-brightness Entangled Photon Pair Source at telecom wavelengths, ideal for quantum information technologies.**
With only 5 mW pump laser, it performs a spectral brightness of more than $10^5$ photons/s/pm!
This innovative high-brightness photon-on-demand source is very well designed. It is a very easy -to-use complete system. It also provides a convenient front-panel display and easy-to-use PC Graphical User Interface managed via its fast USB connection. Moreover, DLL libraries are also provided for LabVIEW, C++, and Visual basic user interface development.

Entangled photons have appeared to be a promising way for both demonstrating quantum physics principles, and new quantum information applications. For example, entangled photons allows the development of Quantum Key Distribution protocols over few hundreds of kilometers.
In biological imaging applications, entangled-photon light source allows yielding original dispersion -free measurements. Hence, the manipulation of the non-classical properties of such photon source have great potential for the development of very new quantum applications.

## Features

- Photon-on-demand
- Very high brightness
- High wavelength stability
- Integrated 775 nm pump laser source
- Easy-to-use Graphical User Interface
- High-speed USB 2.0 interface
- LabVIEW and C++ DLL libraries

## Applications

- Quantum Optics
- Quantum Cryptography
- Quantum Computer
- Quantum Teleportation
- Quantum Tomography

## Options

- 2-channels fiber output
- Heralded photon source
- External pumping laser
- Integrated dual photon detector
- Pulse pumping mode

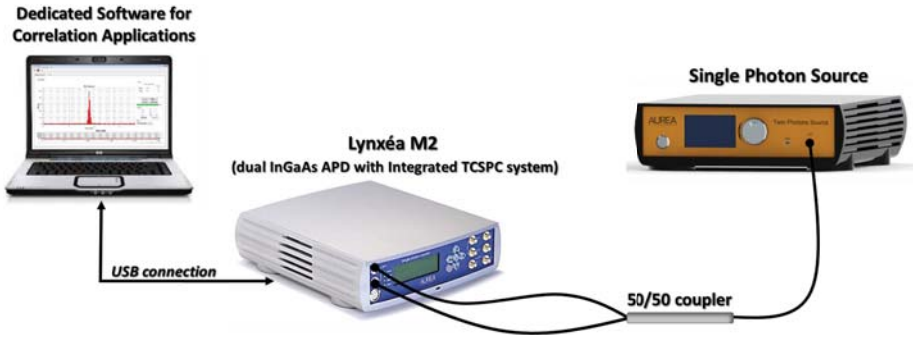
## Principle

. Twin photon are generated using Spontaneous Parametric Down Conversion (SPDC) in Periodically PoledLithium Niobate PPLN waveguide (Quasi Phase Matching-QPM),

. An integrated 775 nm pump laser generates a pair of photons at 1550 nm.
External pump laser is also applicable.

. High brightness emission is then achieved.

| Typical Specifications | |
|---|---|
| Wavelength | 1550 nm (1300 nm is also available) |
| Effective Spectral Brightness | > $10^5$ pairs/s/pm |
| Spectral emission bandwidth | 6 GHz (48 pm) - 7 THz (50 nm)<br>(lower bandwidth on demand) |
| Wavelength stability | 5 pm |
| Wavelength range tunability | 10 nm with external pumping |
| Wavelength tunability resolution | 10 pm |




Photon pair correlation measurement

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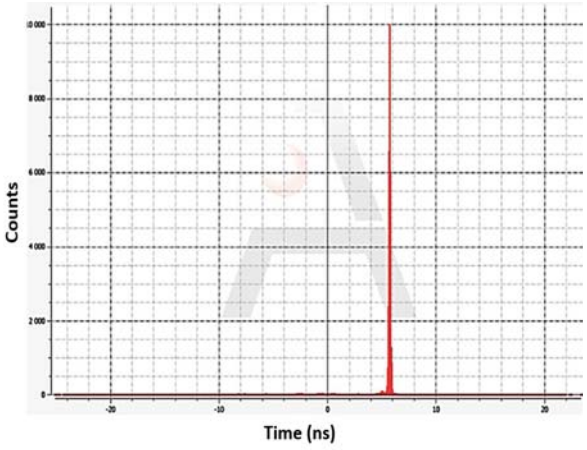
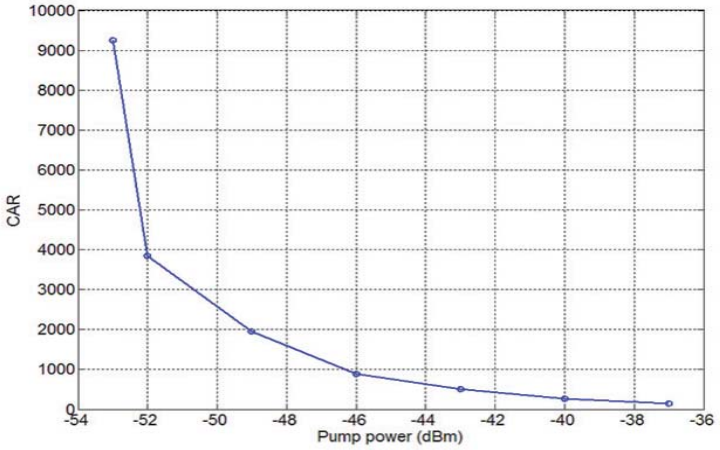
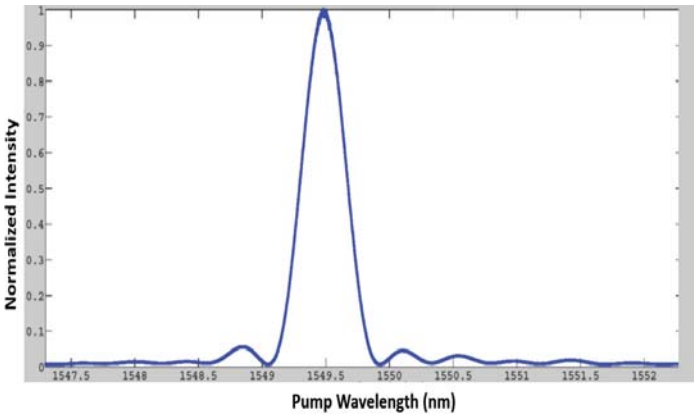
### Photon correlation peak for -52 dBm pump power




### Coincidence-to-Accidental Ratio (CAR) versus pump power




### Second Harmonic Generation versus Wavelength




### Connectors

| | |
|---|---|
| **Data transmission** | Mini USB 2.0 type B |
| **Optical output** | PM FC/APC |
| **Optical laser pump input** | PM FC/APC (in option) |
| **Electrical trigger input** | SMA (in option) |

### Electrical, Mechanical and Environmental

| | |
|---|---|
| **Power supply** | 110 – 230 VAC |
| **Power consumption** | < 10 Watts @ 5 VDC |
| **Dimension (LxWxH)** | 330 x 285 x 86 $mm^3$ |
| **Weight** | 5 Kg |
| **Operating temperature** | + 10°C to + 30°C |
| **Storage temperature** | - 40°C to + 70°C |

### Other available Photon Counting modules

AUREA Technology provides a large portfolio of high-performance Single Photon Counting and Time-Resolved Single Photon Counting modules from 400 to 1700 nm.

### Ordering Information

**TPS_XX_Y_Z**

- XX: 13: 1300 nm output; 15: 1550 nm output
- Y: I: Internal pump; E: External pump; D: Dual pump (Internal & External)
- Z: P: Internal pulse pump

### Contact Information

For more information contact us at info@aureatechnology.com