



X-SIGHT BRIDGET

Bridge deformation measurement

FEATURES

- Aimed at static bridge measurements
- Zoom lenses provide flexibility for wide range of bridges
- High 60Mpx resolution ensures precise measurements
- Equipped with an accelerometer and a gyroscope
- Comes with a stable surveying tripod

SOFTWARE

- X-Sight Bridget DIC

SUPPORTED OPERATING SYSTEMS

- Win 11 64bit / Win 10 64bit
- Win Server 2019 / Win Server 2022

Latest Release on date of purchase



**MEASURE DEFLECTION AND STRUCTURAL DEFORMATION
FROM A SAFE DISTANCE – WITHOUT COMPLEX
INSTALLATION OR REFLECTIVE TARGETS**

OVERVIEW

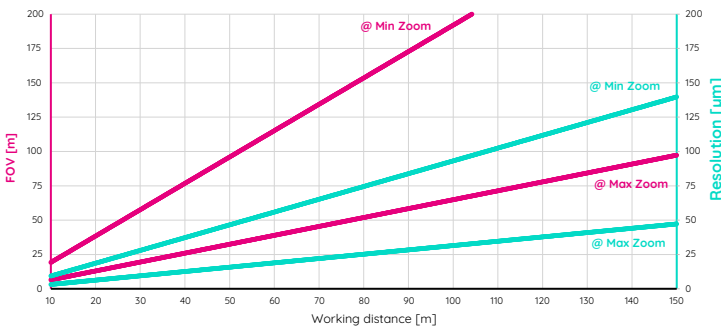
The X-Sight Bridget is a flexible system for static bridge measurements. By combining three 20 MPx cameras with zoom lenses, it supports a wide range of fields of view (FOVs) while maintaining the required spatial resolution. This enables precise deflection measurements in real time or during post-processing. The post-processing workflow provides robust evaluation tools, making the system ideal for model-simulation verification and straightforward structural monitoring.

The system is housed in a durable enclosure and includes an integrated gyroscope for tilt measurements. The package includes a stable surveying tripod to ensure stable measurements in harsh terrain.

The Bridget DIC software enables thermal compensation during measurements, allowing accurate evaluation of real structural deflections.

MEASURING AREA AND WORKING DISTANCE

Measuring area sets the achievable resolution of the DIC system. The smaller the area, the better the resolution, and vice versa. The optical system does not have any maximum or minimum measuring area, as this value depends on the optical hardware used for the particular experiment. With the help of zoom lenses the user can achieve multiple FOV's from a single position which provides a lot of flexibility. The following graph shows the range of FOV based on the working distance and the applied zoom.



RESOLUTION

The resolution of the system is deduced from the captured FOV. The chart below shows the dependency of the resolution based on the FOV and at which working distances can this be achieved. The working distance range mentioned refers to the working distance range* between zero zoom and fully zoomed lens.

| FOV | Working distance* [m] | Resolution [µm] |
|-----|-----------------------|-----------------|
| 30 | 24-73 | 14.5 |
| 50 | 39-122 | 24 |
| 100 | 79-243 | 48 |
| 200 | 158-487 | 97 |

SAMPLING RATE

The sampling (frame) rate depends on the camera resolution and the throughput of the data bus used to transfer images to the PC. Frame rate can be partially increased by reducing the image size.

| Model designation | Frame rate at full resolution [Hz] | Frame rate at half resolution [Hz] ¹⁾ | Maximal Frame rate [Hz] ²⁾ |
|-------------------|------------------------------------|--|---------------------------------------|
| BRIDGET | 5 | 10 | 22 |

¹⁾For the Half Resolution column, an image height of 1836 px is assumed.

²⁾For the Maximum Sampling Rate column, an image height of 780 px is assumed.

MECHANICAL INTERFACE

The cameras are mounted on a rigid metal frame. The two outer cameras can be adjusted by $\pm 15^\circ$ for proper alignment. The assembly is enclosed in a durable steel housing that protects the internal components, which include a 4-port USB hub, internal cabling, an accelerometer, and a gyroscope.

The base plate features a 3/8" threaded hole for mounting a 3-axis tripod head with micrometric knobs for precise adjustment. An integrated bubble level enables quick setup. The head attaches to a surveying tripod via our custom adapter. Both the tripod head and the surveying tripod are included with the system.

PC CONNECTION

Cameras connect to the measurement PC via USB 3.0. To ensure a stable link, we recommend using a dedicated PCIe USB 3.0 card or a Thunderbolt interface in the measuring PC. USB camera cables are supplied at a standard length of **3 m** and can be extended using active optical extenders (not included).

MEASURED DATA TRANSFER (I/O)

X-Sight Bridget system can be equipped with an AD/DA converter (not included) with two single-ended ± 10 V outputs and either eight single-ended or four differential inputs. **INPUT** of external data to X-Sight Bridget DIC software (force, temperature, pressure) is possible via following options (requires Device Input software module - DI).

- **Digital**
DOLI Binary, MODBUS, HP VIDEO, TCP/IP, RS232
- **Analog**
Auxiliary AD/DA converters

Multiple ways exist to **OUTPUT** the measured data to an external software.

- **Digital**
DOLI Binary, MODBUS, HP VIDEO, TCP/IP, RS232
- **API**
Alpha API (JSON), MRT API
- **Analog**
Auxiliary AD/DA converters
- **Pulse Incremental**
Quadrature encoder-like pulse communication with the use of a **PULSEGEN** device

The API communication allows the Bridget to operate remotely. For more info, check out the **Communication Options** document.

POWER CONNECTION

The X-Sight Bridget is powered by 24 VDC input via standard RJ45 cable. Image data transfer is handled by a single USB-B 3.0 to USB-A 3.0 cable connected to the PC.

OPERATION CONDITIONS

The X-Sight Bridget system is designed for outdoor applications under supervision. Do not allow the unit to get wet.

| Conditions | Permissible value |
|-------------|-------------------|
| Temperature | 5-40 °C |
| Humidity | 30-70 % |

This equipment is compatible with Class A of CISPR32. In a residential environment, this equipment may cause radio interference.

This product complies with EU Directive 2002/96/EC.



PACKAGE CONTENTS

X-Sight Bridget is delivered in a dust-proof transport case containing all measurement components except for the tripod and PC. The tripod is supplied separately as part of the system package.

Transport case dimensions: 464 × 366 × 176 mm
 System dimensions on tripod: 900 × 430 × 400 mm
 Weight: approximately 15 kg



▲ X-Sight Bridget dust-proof case

| Item | No. of pieces |
|-----------------|---------------|
| Dust-proof Case | 1 |
| Camera | 3 |
| Lens | 3 |

| SW Module | Point | Anchor | Line | Bend line | Bridge tool |
|------------|--|--------|------|-----------|-------------|
| DEFLECTION | • | • | • | | |
| BLD | | | | • | |
| BT | | | | | • |
| PP | Post-processing of recorded measurements (different probes or layouts) | | | | |
| LVD | Color value distribution along Bend Line | | | | |
| BV | Bridge visualisation tool | | | | |
| DI* | Possibility to input auxiliary signals (digital and analog) | | | | |

* Expansion software module available for Bridget DIC

| | |
|----------------------|---|
| Tripod + head | 1 |
| Power supply | 1 |
| Cameras data cable | 1 |
| 6 + 2.5 mm Allen key | 1 |
| Lens cleaning cloth | 1 |
| Installation USB | 1 |
| USB license key | 1 |

SOFTWARE AND MEASURING PROBES

The X-Sight Bridget is based on the core **DEFLECTION** module for 2D displacement measurement and includes the **BLD, LVD, BT, BV, and PP** software modules.

The system can be **optionally extended** with DI (Device Input) for auxiliary signal acquisition.

Note: **Strain computation is not supported.**

MEASURING PROBES



POINT PROBE is a basic measuring probe for displacement determination.



ANCHOR POINT allows the isolation of displacements of other probes from displacements of the Anchor Point. It is intended for use with other probes.



LINE enables dual-position angular-twist and displacement measurements.



BEND LINE is a probe designed to measure displacements and deflections along a curve, enabling real-time visualization of the deflection distribution.



LINE VALUE DISTRIBUTION provides a colourful strain visualization feature during real-time measurement.

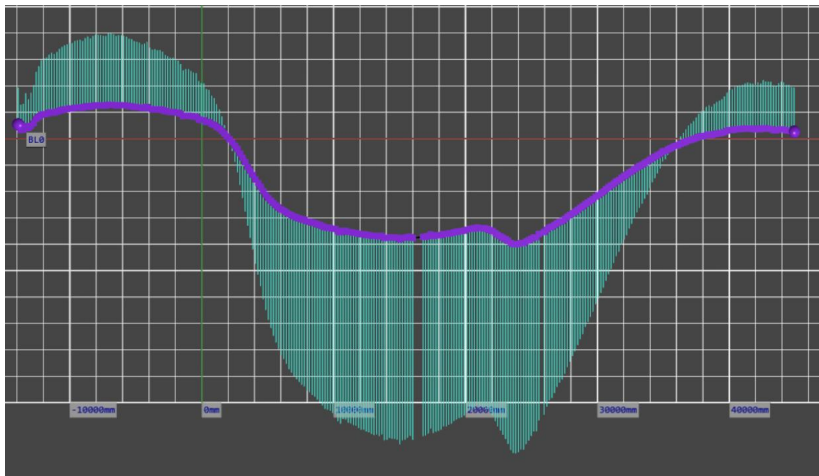
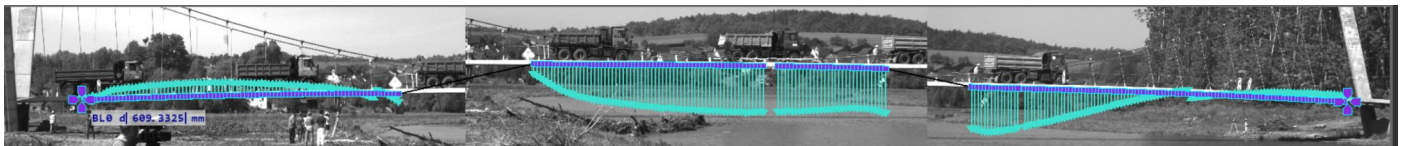


BRIDGE TOOL is a series of consecutive rectangles placed on repeating patterns of measured objects of known dimensions. Allows measuring deflection and sway.

BRIDGE VISUALISATION TOOL (BV)

Bridge Visualization Tool is an integrated part of the Bridget DIC software and enables real-time visualization and analysis of measured data within a single interface. The tool allows synchronized display of results from the Bridget measurement system together with additional supplementary cameras, for example cameras positioned underneath the bridge structure. This provides a comprehensive overview of the bridge behavior from multiple measurement locations simultaneously.

Advanced features such as data filtering further improve the accuracy and reliability of the measured results during load testing and structural monitoring. Functionality allows the thermal compensation data fits during few minutes of measurement to measure mechanical deflections in real time.



▲ Bridge visualisation tool

SYSTEM REQUIREMENTS

| System requirements | System requirements Recommended |
|---------------------|--|
| CPU | Intel/AMD 2GHz 2-core (>3000 points - Average CPU Mark *) Intel/AMD 4GHz >8-core (>4000 points - Single Thread Rating **) |
| GPU | NVidia/AMD/Intel OpenGL 3.0 1024x768px (>300 points ***) NVidia/AMD/Intel OpenGL 3.0 1920x1200px (>5000 points ****) |
| Memory | 8GB 32GB DDR4 |
| Disk | 8GB HDD free 1TB SSD / M.2 |
| Ports | 1x USB (HW key), 1x USB 3.0 (cameras); (Optional) 1x USB for peripheral data transfer device (Optional) 1x Ethernet Port of MODBUS or TCP/IP communication |
| Operating System | Windows 11 64-bit ***** or Windows 10 64-bit ***** Windows Server 2019 ***** or Windows Server 2022 ***** |

* MID CPU BENCHMARK www.cpubenchmark.net

** HIGH-END CPU BENCHMARK www.cpubenchmark.net

*** MIDLOW GPU BENCHMARK www.videocardbenchmark.net

**** HIGH-END GPU BENCHMARK www.videocardbenchmark.net

***** Latest Release on date of purchase