# 3 INSTALLING THE BRICKSTREAM® 3D+ SMART DEVICE ON-SITE

## SMART DEVICE ACCESSORIES

The proper installation and use of the Brickstream® 3D+ Smart Device requires accessories that provide a way to mount the Smart Device and network connectivity using a Power-over-Ethernet (PoE) switch or PoE injector. The following section provides an overview of the different PoE devices and mounts that are available for use with the Brickstream® 3D+ Smart Device.

NOTES

*If VPN routers are required, Brickstream recommends using Cisco Small Business RV180 with the Smart Device implementation.*

### Powering the Brickstream® 3D+ Smart Device

Industry standard 802.3af PoE connections (with CAT5e Ethernet cable) are supported to facilitate the combined power and network connection to the Brickstream® 3D+ Smart Device.

CAUTION

**Power output of the selected PoE switch(es) must minimally support 7 W typical power for each connected Smart Device, but must be rated for up to 12.95 W maximum per Smart Device.**

TIP

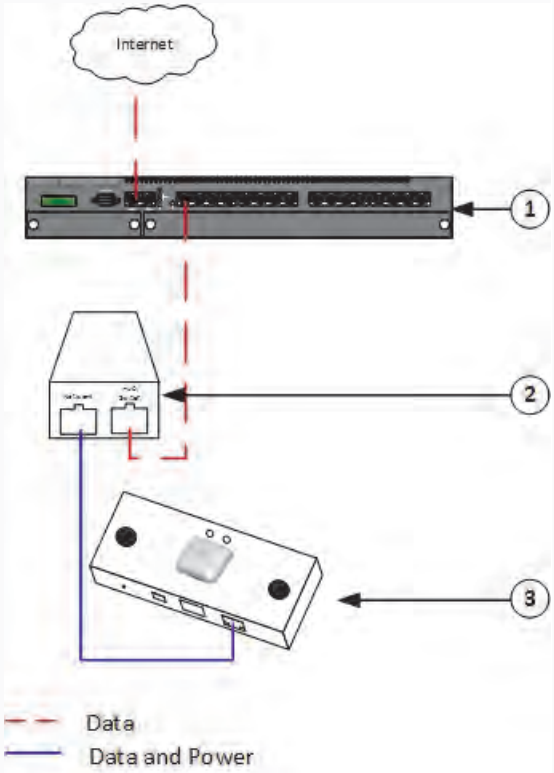
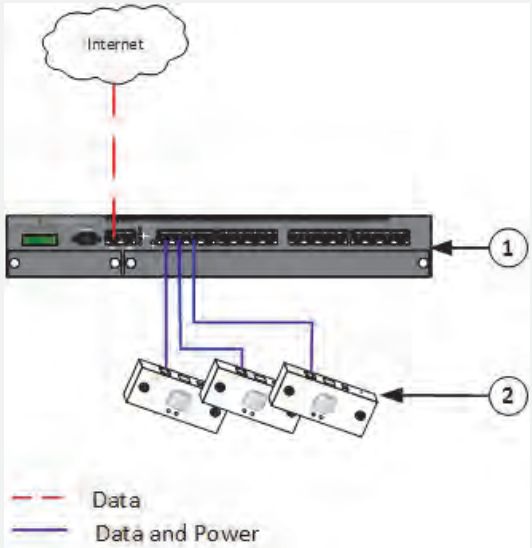
*When selecting from the PoE options, for each Smart Device you will connect to the PoE, allow 12.95 W in the power budget calculation as described in the PoE's documentation. The Brickstream® 3D+ Smart Device is PoE Class 3, so the PoE must support Class 3 or higher.*

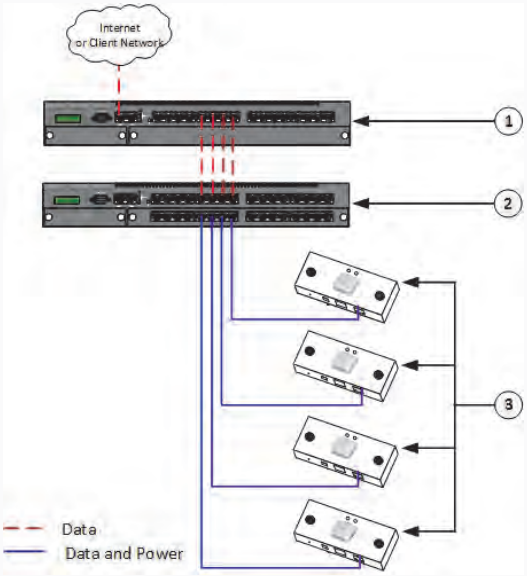
*Ensure network lights are lit on the Ethernet port of the Brickstream® 3D+ Smart Device after connecting all cables. This ensures the physical connectivity of the network.*

NOTES

*All connections use standard CAT5e or higher Ethernet cables. No special cables are necessary.*

The following table describes how to connect the Brickstream® 3D+ Smart Device to the network/ PoE cables using one of the following methods.

| Option | Connect Using... | Diagram | Legend |
|---|---|---|---|
| 1 | Single-port PoE injector | Figure 43: Connection with Single-port PoE Injector<br>  <br> | 1 Ethernet switch<br>2 Single-port PoE Injector<br>3 Brickstream® 3D+ Smart Device |
| 2 | Endspan PoE switch | Figure 44: Connection with EndSpan PoE Switch<br>  <br> | 1 PoE switch<br>2 Brickstream® 3D+ Smart Devices |

| Option | Connect Using... | Diagram | Legend |
|---|---|---|---|
| 3 | Multi-port midspan PoE injector | Figure 45: Connection with Multi-port Midspan PoE Injector   | 1 Ethernet switch<br>2 Multi-port PoE Injector<br>3 Brickstream® 3D+ Smart Devices |

## Mounting a Smart Device

The type of lens that is used in the Brickstream® 3D+ Smart Device or the placement of the Smart Device will determine what type of mount will be used to support your installation. Refer to *Appendix B: Smart Devices/Lens Selection Tables* on page 57 to ensure that you have the appropriate lens for each installation height and door width.

### Mount Guidelines

The following is a description of the basic mounting guidelines for installing the Brickstream® 3D+ Smart Device.

TIP

*It is important to work with your sales engineer to determine optimal coverage, placement, and mounting.*

- Customer-provided mounting brackets should attach to the Smart Device using male ¼”-20 thread per inch bolts
- Mount at a height between 30 cm (1 ft) higher than the tallest person to be tracked, and up to 9.5 m (31.2 ft) with the appropriate lenses
- Smart Device must be within 30 cm (1 ft) radius of the specific Smart Device installation specification measurements
- Smart Device must be mounted within 5 cm of specified height range supported by the size of lenses used
- X and Y tilts must be within 1 degree of specification
- Mount in a downward-looking orientation and level in both tilt and yaw such that it is looking straight down, if possible, for optimal system performance
- Avoid including a side wall in the Smart Device’s field of view, if possible
- Avoid the Smart Device’s field of view looking through a glass wall or large window, if possible
- Brickstream recommends that Smart Device installed over a door should be slightly rotated 5 degrees especially if permanent mats are installed under the direct view of the Smart Device
- At installation sites where 0 degree downward-looking mounting is not possible, mounting at an angle is supported up to 10 degrees with the basic license
- Additional license key required for mounting angles greater than 10 degrees
- Mount in such a way that the area of interest is positioned at, or very close to the center of the Smart Device field of view
- Mounting bracket or mounting holes should provide adequate space to allow for one 10/100BaseT CAT5e cable to be run above the mounting location
- Maintenance loops of CAT5e cable at least 1 m (3 ft) should be bundled and stored in the ceiling above the mounting location when using recessed mounting brackets
- Allow clearance for hanging signs
- If you cannot see both stereoscopic lenses of the Smart Device when looking up at it from the area you want to monitor, the view is obstructed and requires adjustment to surrounding objects, adjustment to Smart Device installation height, or use of the Obstructed View Calculator (available from your Brickstream representative)
- Avoid Smart Device placement that includes swinging/glass doors in the Smart Device’s field of view
- The Smart Device installed at an entrance or exit for counting applications should be mounted so that you can see the complete doorway from the lens. The coverage model should cover the

entire entryway corridor, following the rule of thumb for coverage of 20% door and 80% floor, as shown in the following figures

- It is critical that there is a clear chokepoint — a point which all traffic you wish to be measured is forced through — to ensure accurate count data

**Figure 46: Smart Device Orientation - Top View**

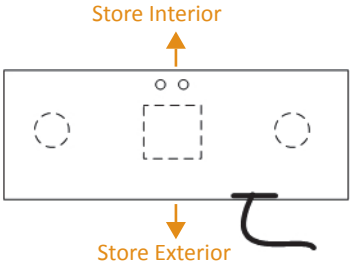
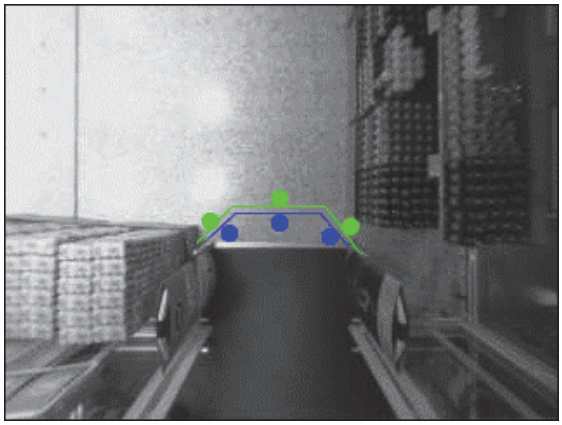



**Figure 47: Sample Coverage Area**



## Mount Types

Mount types required for each Smart Device installation at a site are identified in the Site Installation Specification. The following is a description of each mount type that can be used with the Brickstream® 3D+ Smart Device.

| Mount Type | Application | Examples |
|---|---|---|
| Surface | Used for non drop-ceiling environments, drop-ceiling environments, or environments in which you want minimal disturbance to ceilings. Use the supplied ¼-in. (6.35 mm) machine bolt to apply the Smart Device to the mount using the standardized camera mounting hole in the center of the back of the Smart Device before attaching the mount to the desired surface. | **Figure 48: Surface Mount** (Click to interact with drawing) |
| Recessed | Used for aesthetically pleasing, low-profile mounting in a drop ceiling. Available as X-axis tilt or Y-axis tilt. Requires reinforcement with lightweight backer board, such as Luan plywood. | **Figure 49: Recessed Mount** (Click to interact with drawing) |

| Mount Type | Application | Examples |
|---|---|---|
| Pendant with RAM mount | Used in situations where the mount must fully articulate both X axis and Y axis, by applying the RAM mount to a CCTV pole and then applying the Smart Device to the RAM mount's universal camera mount. | Figure 50: RAM Mount |

# INSTALLING THE SMART DEVICE

The following steps provide the recommended work flow for the installation process. For details pertinent to a specific circumstance, contact your Brickstream Sales Engineer or Technical Support.

TIP

*To ensure accurate calibration, allow the Smart Device to acclimatize for at least one hour before installation.*

1. Ensure that a site survey is performed by qualified technicians to determine where cables should be dropped in consideration of lens coverage specifications. The site survey outcome provides information to build a site design with a Specification document and Bill of Materials (BOM) identifying:
   - Types of Smart Devices required to meet the coverage needs for the areas of interest
   - Size of lenses required for each area of interest, based on ceiling height, clearance, and other considerations, such as those described in *Mount Types* on page 48
   - The number of Smart Devices required to adequately cover all areas of interest
   - Installation positions, as defined by at least two measurements from permanent fixtures in the coverage area, such as walls.
   - Installation mounts that are needed
2. Verify that there are no obstructions preventing mounting in the desired location.
3. Run the CAT5e Ethernet from the PoE source to each installation position.
4. Unpack mounting hardware.
5. Carefully unpack all Smart Devices and inspect for physical damage prior to installation.

CAUTION

**Do not press on any of the lenses as the slightest shift in orientation can compromise calibration, resulting in inaccurate tracking.**

6. For each recessed mount, perform *Installing a Recessed Mount* on page 50.

7. For each surface mount, perform *Installing a Surface Mount* on page 50.

## Installing a Recessed Mount

Follow these steps to install a Brickstream recessed mount:

1. Remove from the ceiling the tile that is to be used for the mount location.
2. If the tile material requires reinforcing, apply backer board to the tile where the recessed mount will be installed, trimming the backer board for exact fit.
3. Measure the distance from the edge of the tile to the center of the Smart Device location.
4. Use the Recessed Mount Cutting template included at the end of this document to ensure correct size and shape for cutting the tile and backer board.
5. Cut through tile and backer board following the line drawn from the template.
6. Insert the recessed mount.
7. Insert the Smart Device into the mount, using the screw provided to secure it in the slot.
8. Connect the CAT5e Ethernet cable.

TIP

*Also connect the GPIO now if this site requires it.*

9. Secure the mount to the tile with the provided hardware.
10. Use twine or wire to secure the recessed mount to a permanent structure inside the ceiling, such as a beam.
11. Make any final adjustments to the position of the mount in the tile.
12. If necessary, adjust the tilt of the Smart Device in the mount using the screw and degree markings on the mount.

## Installing a Surface Mount

Follow these steps to install a Brickstream surface mount:

1. If you are installing the surface mount on tile, remove from the ceiling the tile that is to be used for the mount location.
2. If the tile requires reinforcement, apply lightweight plywood (e.g., Luan in the US) as a backer board to the tile where the recessed mount will be installed, trimming the backer board for exact fit.
3. If the surface mount will be applied onto solid surface, apply the surface mount directly to the solid surface.
4. Connect the CAT5e Ethernet cable.
5. Secure the mount to the surface with the hardware provided.

## LED Boot Sequence

The following is the normal startup (boot) sequence for a Brickstream 3D+ Smart Device.

1. Access the Smart Device web interface to verify that the area of interest is properly displayed.

TIP

*For detailed information about calibrating and configuring the Brickstream® 3D+ Smart Device, refer to the* ***Brickstream® 3D+ Smart Device Basic Configuration Guide****.*

# A BRICKSTREAM® 3D+ SMART DEVICE SPECIFICATIONS

The following tables provide specifications for the Brickstream® 3D+ Smart Device.

## Network Specifications

Bandwidth requirements for the Brickstream® 3D+ Smart Device are at their highest during and immediately following device installation.

NOTES

*During solution delivery the initial bandwidth requirements can be greater due to the need to access the Brickstream 3D+'s browser-based user interface, as well as capturing and transmitting a period of raw video during validation to ensure configuration accuracy. An average of approximately 128 kbps per Smart Device is needed initially during configuration and validation.*

For optimal network performance Brickstream recommends a high-speed DSL or T1 connection, or better. To minimize bandwidth requirements on an on-going basis, Brickstream 3D+ transmits analytics data in configurable increments, with independently configurable data capture and transmission rates to reduce network overhead. Semi-random distribution of data packets decreases spikes in network demand. On an on-going basis, each Smart Device only requires about 0.05 kbps of bandwidth for analytics..

| Item | Specification |
|---|---|
| Cabling | Category 5e (CAT5e) or better |
| Ethernet | Single channel 10/100 Mbps Ethernet or higher |
| Power | IEEE 802.3af PoE Type 1, Class 3 |
| Addressing | DHCP or Static IP |
| Protocols | TCP/IP, DHCP |
| Time Synchronization | SNTP, Daytime Protocol, Proprietary |
| Data Delivery | HTTP, SMTP, FTP |

| Item | Specification |
|---|---|
| Secure Data Delivery | HTTPS, FTPS[a] |
| Software Upgrade | TFTP, HTTP |

a. FTPS is different than SFTP. Brickstream does not currently support the SFTP protocol.

## Technical Specifications

| Item | Specification |
|---|---|
| Device Dimensions | 76 x 152 x 38 mm<br>3 x 6 x 1.5 in. |
| Lens Options | Ranges from 2.0 mm to 6 mm supporting heights from 2.4m to 12m (8 ft up to 39 ft) |
| Enclosure | White powder-coated, die-cast aluminum. Black available by special order. |
| Field Upgradable | Supports software upgrades over TFTP |
| Power | PoE (Class 3, Type 1 PD, 12 W max) |
| Power Consumption | 7 W typical, 12 W rated maximum |
| Weight | 1.1 pounds/0.5 kg |
| LEDs | 2 multi-state RGB |
| Emissions Compliance | Complies with CE rules and Part 15 Class A of FCC Rules |
| Operating Temperature | 0° to 45° C<br>32° to 113° F |
| Storage Temperature | -30° to 60° C<br>-22° to 140° F |
| GPIO | Supports up to three inputs/outputs for pulse alert delivery and receipt |
| Memory | 512 MB RAM<br>512 MB NAND Flash ROM |
| MicroSD Support | 4 GB and 16 GB<br>Not removable or swappable |
| Operating System | Linux |
| Physical Ports | USB 2.0, Digital I/O, RS485 |
| Certifications | FCC Part15 Class A, cUL<br>CE mark<br>CE Class A<br>UL, CB |

## Lenses

| Specification | Monochrome Stereo Lenses |
|---|---|
| Function | Behavior analytics |
| Quantity | 2 |
| Focal Length Options | 2.0 mm<br>2.5 mm<br>3.0 mm<br>3.9 mm<br>5.7 mm |

| Specification | Monochrome Stereo Lenses |
|---|---|
| Image Sensor | 752 x 480 pixels<br>Wide VGA<br>High Dynamic Range (HDR) |
| Resolution | 0.4 megapixels |
| Pan/Tilt/Zoom[a] | N/A |
| Video Streams[b] | N/A |
| Video Compression | None |
| Frame Rate | N/A |

a. Initial release supports pan and tilt. Zoom functionality will be provided in a future release.
b. Pan and tilt on Streams 2 and 3 can be adjusted through the ONVIF API.

## Logical Port Specifications

The following logical ports are the default configuration for the Brickstream® 3D+ Smart Device.

| Default Port | Protocol | Direction | Default Data[a] |
|---|---|---|---|
| TCP 2010 | HTTP | Outbound | XML data, time synchronization, diagnostics/logging |
| TCP 21 | FTP | Outbound | Validation video |
| TCP 990 | SFTP | | |
| UDP 69 | TFTP | Outbound & inbound | Software upgrade |
| TCP 80 | HTTP | Inbound | Software upgrade, web-based configuration utility |
| TCP 443 | HTTPS | Inbound | |
| ICMP | | Inbound | Ping |

a. All listed port numbers are configurable.

## LED Functionality

This section provides a detailed explanation of the LED light functions on the Brickstream® 3D+ Smart Device.

| Status LED | Illumination | Indication |
|---|---|---|
| 1 | Blinking amber at three-second intervals | Connected with neither the time sync server nor the data server |
| | Blinking green at three-second intervals | Connected to time sync and/or data servers |
| 2 | Red | Operating with factory-default IP address (192.168.1.7) |
| | Progressive[a] | Indicates whether the Smart Device has reverted back to its default factory settings and is also used with the manual reset button. |

a. See *Resetting the Brickstream® LIVE Smart Device* on page 65.

## Shipping Weight

This section provides shipping weight for the Brickstream® 3D+ Smart Device and its accessories.

| Item | Shipping Weight | |
|---|---|---|
| | Boxed | Unboxed |
| Brickstream® 3D+ Smart Device | | |
| Surface Mount | | .048 kg / 1.7 oz |
| RAM Mount | | 10.9 oz |
| Recessed Mount, 9 in. | .737 kg / 26 oz | .377 kg / 13.3 oz |

## Part Numbers

# B SMART DEVICES/LENS SELECTION TABLES

For detailed planning information, see the *"Planning the Solution Design"* chapter in the *Brickstream® LIVE Advanced Installation Guide*. Use the following tables to determine which lens type is appropriate for your installation.

## ABOUT COVERAGE WIDTHS

The coverage widths shown in the following tables include an extra meter from the coverage widths shown by default in the Excel spreadsheet. This increased coverage assumes that there are walls bordering each side of the coverage width. Having walls on each side of the coverage area allows additional coverage because an individual's center of mass can never be completely against the wall. In fact, it is typically at least half a meter from the wall.

**Figure 51: Additional Coverage Illustrations**

# BRICKSTREAM 3D+ STEREO LENS COVERAGE

The following tables provide the coverage measurements based upon the installation height for each type of Brickstream 3D+ stereo lens:

- *Brickstream 3D+ 2.0 mm Stereo Lenses*
- *Brickstream 3D+ Stereo 2.5 mm Lenses*
- *Brickstream 3D+ 3.0 mm Stereo Lenses*
- *Brickstream® LIVE 3.9 mm Stereo Lenses*
- *Brickstream 3D+ 5.7 mm Stereo Lenses*

NOTES

*All measurements are in meters, except for lens sizes which are in millimeters (mm).*

## Brickstream 3D+ 2.0 mm Stereo Lenses

The following measurements apply for only the 2.0 **mm lenses:**

| Lens Size (mm) | Smart Device Installation Height (m) | Coverage Area | |
|---|---|---|---|
| | | Width (m) | Height (m) |
| 2.0 | 2.4 | 1.6 | 1.1 |
| | 2.5 | 1.8 | 1.3 |
| | 2.6 | 2.0 | 1.4 |
| | 2.7 | 2.2 | 1.6 |
| | 2.8 | 2.4 | 1.7 |
| | 2.9 | 2.6 | 1.9 |
| | 3 | 2.8 | 2.0 |
| | 3.1 | 3.0 | 2.2 |
| | 3.2 | 3.2 | 2.4 |
| | 3.3 | 3.4 | 2.5 |
| | 3.4 | 3.6 | 2.7 |
| | 3.5 | 3.8 | 2.8 |
| | 3.6 | 4.1 | 3.0 |
| | 3.7 | 4.3 | 3.1 |
| | 3.8 | 4.5 | 3.3 |
| | 3.9 | 4.7 | 3.4 |
| | 4 | 4.9 | 3.6 |
| | 4.1 | 5.1 | 3.8 |
| | 4.2 | 5.3 | 3.9 |
| | 4.3 | 5.5 | 4.1 |
| | 4.4 | 5.7 | 4.2 |

## Brickstream 3D+ Stereo 2.5 mm Lenses

The following measurements apply for only the 2.5 **mm** stereo **lenses:**

| Lens Size (mm) | Smart Device Installation Height (m) | Coverage Area | |
|---|---|---|---|
| | | Width (m) | Height (m) |
| 2.5 | 3.5 | 2.9 | 2.1 |
| | 3.6 | 3.0 | 2.2 |
| | 3.7 | 3.2 | 2.3 |
| | 3.8 | 3.3 | 2.4 |
| | 3.9 | 3.5 | 2.6 |
| | 4 | 3.7 | 2.7 |
| | 4.1 | 3.8 | 2.8 |
| | 4.2 | 4.0 | 2.9 |
| | 4.3 | 4.1 | 3.0 |
| | 4.4 | 4.3 | 3.2 |
| | 4.5 | 4.5 | 3.3 |
| | 4.6 | 4.6 | 3.4 |
| | 4.7 | 4.8 | 3.5 |
| | 4.8 | 4.9 | 3.6 |
| | 4.9 | 5.1 | 3.8 |
| | 5 | 5.2 | 3.9 |
| | 5.1 | 5.4 | 4.0 |
| | 5.2 | 5.6 | 4.1 |
| | 5.3 | 5.7 | 4.2 |
| | 5.4 | 5.9 | 4.3 |
| | 5.5 | 6.0 | 4.5 |

## Brickstream 3D+ 3.0 mm Stereo Lenses

The following measurements apply for only the 2.9 **mm stereo lenses:**

| Lens Size (mm) | Smart Device Installation Height (m) | Coverage Area | |
|---|---|---|---|
| | | Width (m) | Height (m) |
| 3.0 | 4 | 2.9 | 2.1 |
| | 4.1 | 3.1 | 2.2 |
| | 4.2 | 3.2 | 2.3 |
| | 4.3 | 3.3 | 2.4 |
| | 4.4 | 3.4 | 2.5 |
| | 4.5 | 3.6 | 2.6 |
| | 4.6 | 3.7 | 2.7 |
| | 4.7 | 3.8 | 2.8 |
| | 4.8 | 4.0 | 2.9 |
| | 4.9 | 4.1 | 3.0 |
| | 5 | 4.2 | 3.1 |
| | 5.1 | 4.3 | 3.2 |
| | 5.2 | 4.5 | 3.3 |
| | 5.3 | 4.6 | 3.4 |
| | 5.4 | 4.7 | 3.5 |
| | 5.5 | 4.8 | 3.6 |
| | 5.6 | 5.0 | 3.7 |
| | 5.7 | 5.1 | 3.8 |
| | 5.8 | 5.2 | 3.9 |
| | 5.9 | 5.4 | 4.0 |
| | 6 | 5.5 | 4.1 |
| | 6.1 | 5.6 | 4.2 |
| | 6.2 | 5.7 | 4.2 |
| | 6.3 | 5.9 | 4.3 |
| | 6.4 | 6.0 | 4.4 |
| | 6.5 | 6.1 | 4.5 |

## Brickstream® LIVE 3.9 mm Stereo Lenses

The following measurements apply for only the 3.9 **mm stereo lenses:**

| Lens Size (mm) (Sheet 1 of 2) | Smart Device Installation Height (m) | Coverage Area | |
|---|---|---|---|
| | | Width (m) | Height (m) |
| 3.9 | 4.7 | 2.9 | 2.1 |
| | 4.8 | 3.0 | 2.2 |
| | 4.9 | 3.1 | 2.3 |
| | 5 | 3.2 | 2.3 |
| | 5.1 | 3.3 | 2.4 |
| | 5.2 | 3.4 | 2.5 |
| | 5.3 | 3.5 | 2.5 |
| | 5.4 | 3.6 | 2.6 |
| | 5.5 | 3.7 | 2.7 |
| | 5.6 | 3.8 | 2.8 |
| | 5.7 | 3.9 | 2.8 |
| | 5.8 | 4.0 | 2.9 |
| | 5.9 | 4.1 | 3.0 |
| | 6 | 4.2 | 3.1 |
| | 6.1 | 4.3 | 3.1 |
| | 6.2 | 4.4 | 3.2 |
| | 6.3 | 4.5 | 3.3 |
| | 6.4 | 4.6 | 3.4 |
| | 6.5 | 4.7 | 3.4 |
| | 6.6 | 4.8 | 3.5 |
| | 6.7 | 4.9 | 3.6 |
| | 6.8 | 5.0 | 3.7 |
| | 6.9 | 5.1 | 3.7 |
| | 7 | 5.2 | 3.8 |
| | 7.1 | 5.3 | 3.9 |
| | 7.2 | 5.3 | 4.0 |
| | 7.3 | 5.4 | 4.0 |
| | 7.4 | 5.5 | 4.1 |
| | 7.5 | 5.6 | 4.2 |
| | 7.6 | 5.7 | 4.2 |
| | 7.7 | 5.8 | 4.3 |
| | 7.8 | 5.9 | 4.4 |

| Lens Size (mm) (Sheet 2 of 2) | Smart Device Installation Height (m) | Coverage Area | |
|---|---|---|---|
| | | Width (m) | Height (m) |
| 3.9 | 7.9 | 6.0 | 4.5 |
| | 8 | 6.1 | 4.5 |

## Brickstream 3D+ 5.7 mm Stereo Lenses

The following measurements apply for only the 5.7 mm stereo lenses:

| Lens Size (mm) (Sheet 1 of 2) | Smart Device Installation Height (m) | Coverage Area | |
|---|---|---|---|
| | | Width (m) | Height (m) |
| 5.7 | 6 | 2.8 | 2.0 |
| | 6.1 | 2.8 | 2.1 |
| | 6.2 | 2.9 | 2.1 |
| | 6.3 | 3.0 | 2.2 |
| | 6.4 | 3.0 | 2.2 |
| | 6.5 | 3.1 | 2.3 |
| | 6.6 | 3.2 | 2.3 |
| | 6.7 | 3.2 | 2.4 |
| | 6.8 | 3.3 | 2.4 |
| | 6.9 | 3.4 | 2.5 |
| | 7 | 3.4 | 2.5 |
| | 7.1 | 3.5 | 2.6 |
| | 7.2 | 3.6 | 2.6 |
| | 7.3 | 3.7 | 2.7 |
| | 7.4 | 3.7 | 2.7 |
| | 7.5 | 3.8 | 2.8 |
| | 7.6 | 3.9 | 2.8 |
| | 7.7 | 3.9 | 2.9 |
| | 7.8 | 4.0 | 2.9 |
| | 7.9 | 4.1 | 3.0 |
| | 8 | 4.1 | 3.0 |
| | 8.1 | 4.2 | 3.1 |
| | 8.2 | 4.3 | 3.1 |
| | 8.3 | 4.3 | 3.2 |
| | 8.4 | 4.4 | 3.2 |
| | 8.5 | 4.5 | 3.3 |
| | 8.6 | 4.5 | 3.3 |
| | 8.7 | 4.6 | 3.4 |

| Lens Size (mm) (Sheet 2 of 2) | Smart Device Installation Height (m) | Coverage Area | |
|---|---|---|---|
| | | Width (m) | Height (m) |
| 5.7 | 8.8 | 4.7 | 3.4 |
| | 8.9 | 4.7 | 3.5 |
| | 9 | 4.8 | 3.5 |
| | 9.1 | 4.9 | 3.6 |
| | 9.2 | 4.9 | 3.6 |
| | 9.3 | 5.0 | 3.7 |
| | 9.4 | 5.1 | 3.7 |
| | 9.5 | 5.1 | 3.8 |

# C TROUBLESHOOTING BRICKSTREAM® LIVE SMART DEVICES

## TROUBLESHOOTING FTP CONNECTIONS

The following errors may occur when configuring the FTP delivery options.

| Error | Cause |
|---|---|
| Failed to connect 36 | Incorrect Server IP Address |
| Failed to connect 64 | Incorrect Port Number |
| Failed to connect 530 password not accepted | Incorrect Username and/or Password |

## RESETTING THE BRICKSTREAM® LIVE SMART DEVICE

The Brickstream® LIVE Smart Device has a small reset button just to the left of the USB port that allows you to do the following tasks:

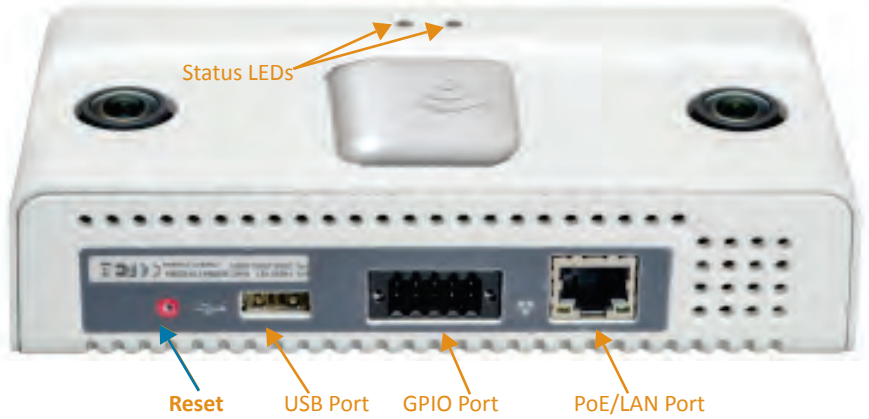
- Reset the Smart Device network configuration by resetting the IP address of the Smart Device to 192.168.1.7.
- Reset all Smart Device parameters and the network configuration to factory defaults, deletes all zones, and resets the license code.
- Disable loading and running the current software, force-boot with the factory-installed software upgrade via TFTP.
- Reset Privacy Options.

CAUTION

**Resetting the device can cause data loss. To avoid accidental loss of data, make sure that if you have not performed a reset on a Brickstream® LIVE Smart Device before, be sure to call your Brickstream contact person to walk you through resetting the Smart Device in the safest manner.**

Refer to *Figure 52* to complete the following steps to perform a reset.

**Figure 52: Smart Device Reset Location**




The following steps describe how to reset the Brickstream® LIVE Smart Device:

1. Insert a paper clip into the reset button on the Brickstream® LIVE Smart Device and depress the button until the desired color illuminates on LED 2, then release the button. Use the following chart to determine how long to hold in the reset button.

NOTES

*LED 2 shows a sequence of colors depending on how long you depress the Reset button. For example if you want to disable booting of the current interface by depressing the button for 8 seconds, during this time LED 2 turns green, then amber, and finally red.*

| Function | 3 Seconds | 6 Seconds | 9 Seconds | 12 Seconds |
|---|---|---|---|---|
| Reset IP address to 192.168.1.7 | X | X | X | X |
| Restore factory default settings | | X | X | X |
| Delete configured zones | | X | X | X |
| Reset licensing | | X | X | X |
| Disable booting the current software | | | X | X |
| Update software via TFTP from upgrade.brickstream.local and 192.168.1.18 | | | X | X |
| Reset all privacy options[a] | | | | X |
| LED color | Green | Amber | Red | Green/ Amber cadence |

a. Available in future release of Brickstream® LIVE Smart Device.

2. The desired LED color illuminates and stays lit for 10 seconds, during which time you must press and release the Reset button again to confirm the action. After confirming the action, the Smart Device executes the action and reboots the Smart Device.

# TROUBLESHOOTING FIRMWARE UPGRADES WHEN USING A TFTP SERVER

If you have trouble downloading the file, complete the following steps to test the TFTP Server install.

1. Open a MS-DOS prompt and navigate to any directory that is in your system path (e.g. c:\window\system32).
2. Issue the following command “tftp -i <PC IP Address> <Source Filename> <Destination Filename> . If the command is successful, you will see “Transfer Successful: ##### bytes in ## seconds, ###### bytes.

NOTES

*The source filename and destination filename must be different.*

# TROUBLESHOOTING LOW-CEILING INSTALLATIONS

The accuracy of the Brickstream smart device can be compromised if the smart device is installed on a ceiling less than Brickstream's minimum supported mounting height of 2.4 m. The main issue with installing at a height below Brickstream's minimum supported mounting height of 2.4 m is the distance between the smart device and the objects being tracked has to be at least 30 cm. If the object being tracked is less than 30 cm away from the smart device, the accuracy can be compromised.

## Relocation Solution

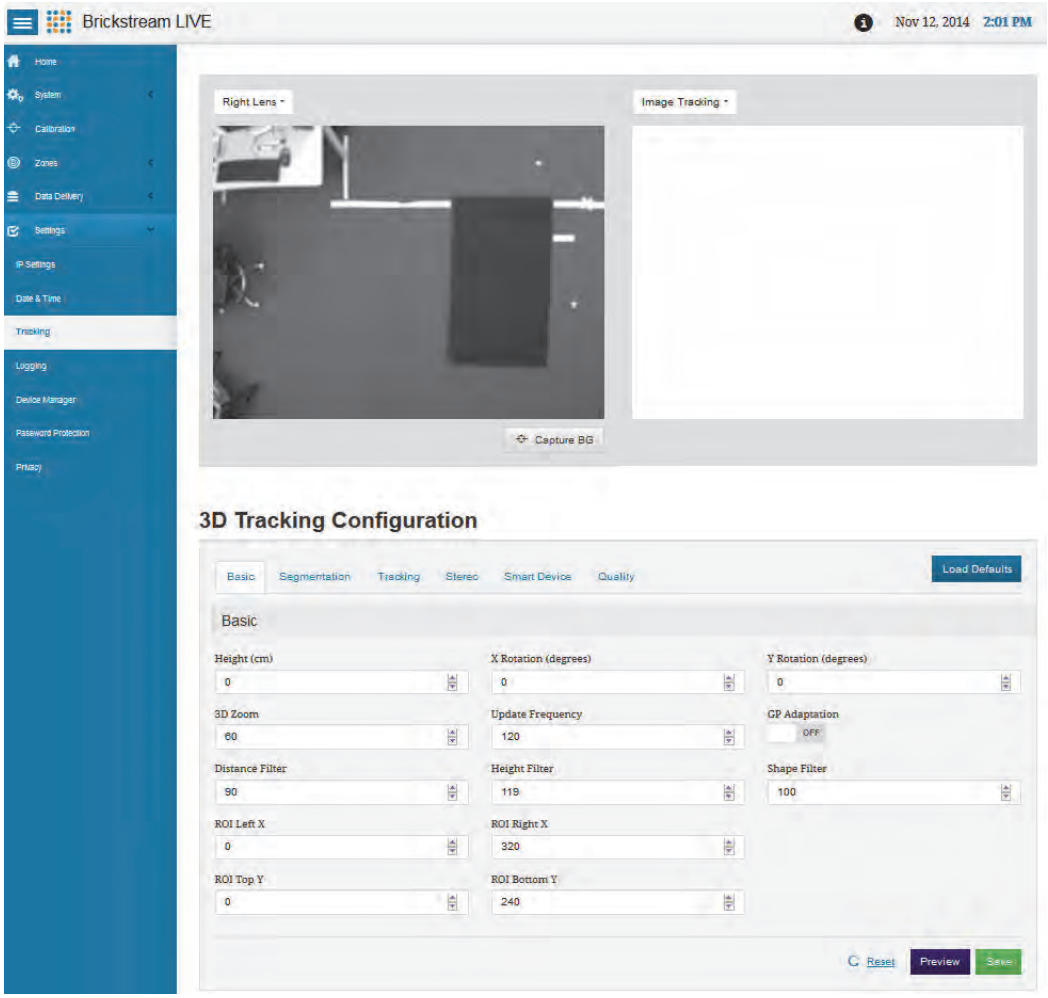
Consider an alternative, higher camera placement that allows the same flow of traffic. Another mounting option that may provide more distance between the smart device and the objects being tracked is the recessed mount. Refer to *Mount Guidelines* on page 46 for more information.

## Tracking Configuration Solution

If you cannot relocate the Smart Device to a higher installation location with a view of the same flow of traffic and the Smart Device is mounted within 10% of the minimum recommended mounting height of 2.4 m, follow these steps.

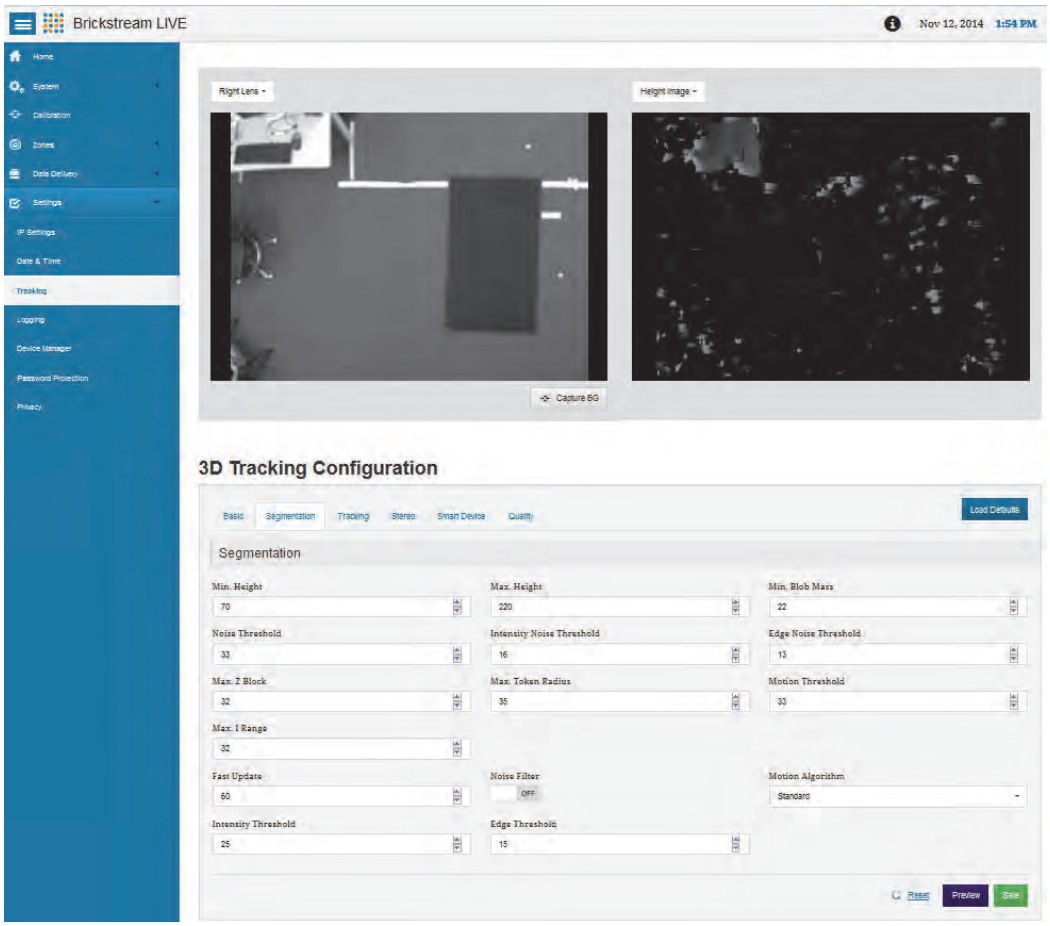
1. Access the **3D Tracking Configuration** page.
2. On the **Basic** tab decrease the **Distance Filter** in cm to accommodate shorter tracks.

**Figure 53: Basic Tab of 3D Tracking Configuration Page**




3. Select **Height Image** from the list above the right image pane.

Figure 54: Segmentation Tab of 3D Tracking Configuration Page




4. If light gray patches on the **Height Image** are observed in the area to be tracked, click the **Stereo** tab, reduce **Surface Validation Diff.** ratio to a minimum of .1 (default value is 1.0) and/or increase **Surface Validation Size** up to a maximum to 500 pixels (default value is 200).

CAUTION

**The Surface Validation settings should only be adjusted as a last resort on validation failures when the system is reporting noisy or incorrect disparity readings. Over-adjusting these values can negatively impact accuracy.**

5. Leave the **Max Disparity** setting at the default of 32 pixels for a mounted height of 2.4 m.
6. Verify that the pink percentage on the **Calibration** page is still in an appropriate range after making the adjustments.

# RESOLVING INOPERABLE BRICKSTREAM DEVICE ISSUES

The following topics will help you troubleshoot problems you may experience with Brickstream devices. Please review these topics before submitting a Support ticket or RMA form to Brickstream.

## Power Issue

Follow these steps to troubleshoot Smart Device power issues.

1. Determine if the device will power on at all.

| IF... | THEN... |
|---|---|
| The device will power on | Go to the Connectivity Issue topic. |
| The device will not power on | Try a different Power-over-Ethernet (POE) source. If it still doesn't power on, contact Brickstream Technical Support for additional assistance. |

2. Verify if the device ever worked.

| IF... | THEN... |
|---|---|
| The device previously worked | Identify the changes that were made that may have caused it to stop working. |
| The device never worked | |

## Connectivity Issue

Follow these steps to troubleshoot Smart Device connectivity issues.

1. Determine if you can connect to the device on the IP address that you believe it to reside on.

| IF... | THEN... |
|---|---|
| You can connect to the device | Try to browse to the IP address. If the Brickstream LIVE web interface displays, connectivity is not the root issue. Go to *Firmware Issue* on page 74. |
| You cannot connect to the device | Perform a manual reset to green so the IP address resets to 192.168.1.7, as described in *Resetting the Brickstream® LIVE Smart Device* on page 65. |

CAUTION

**Please ensure that you are on a 192.168.1.xx network then attempt to connect to that IP address. If not, see *Connecting a Smart Device with Default IP to a Custom Network* on page 70**

2. If you still cannot access the Smart Device, record the sequence and display of the lights on the Smart Device when the Smart Device is powered on after you have performed in the preceding steps.
3. Call Brickstream Technical Support to receive additional assistance based on these findings.

### Connecting a Smart Device with Default IP to a Custom Network

Use the following steps to connect to the default IP address location of the new Brickstream® LIVE Smart Device.

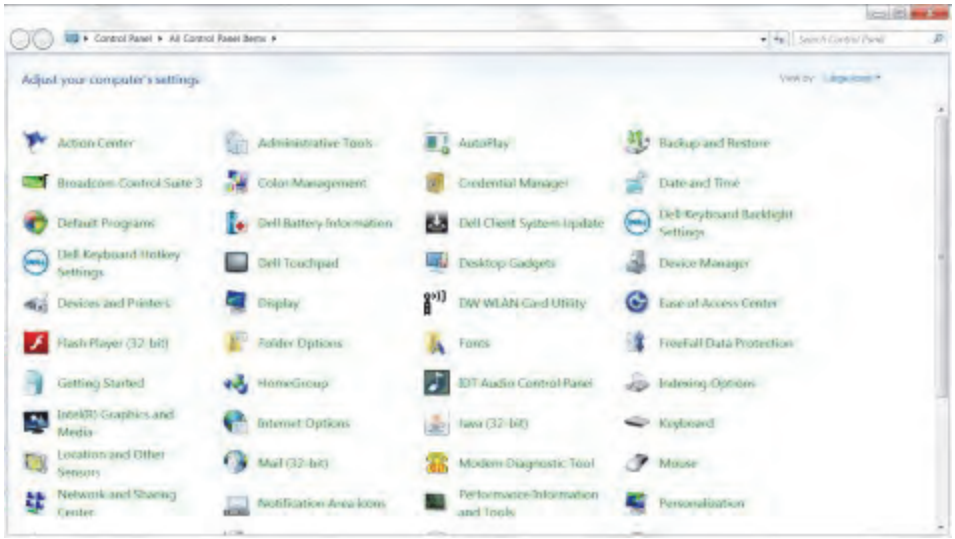
1. Turn on your PC, if it is not already powered.
2. Disconnect the CAT5e Ethernet cable from your PC.
3. Disable any wireless connections that you may have.

NOTES

*No other network connections may be active during this process.*

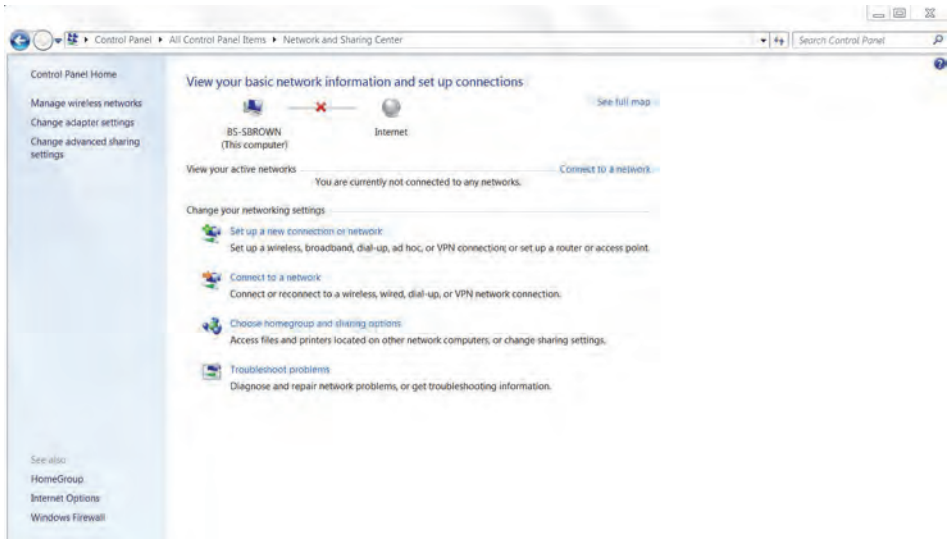
4. Click the **Start** icon and select **Control Panel** from the desktop of your PC. The **Control Panel** opens.

Figure 55: Control Panel



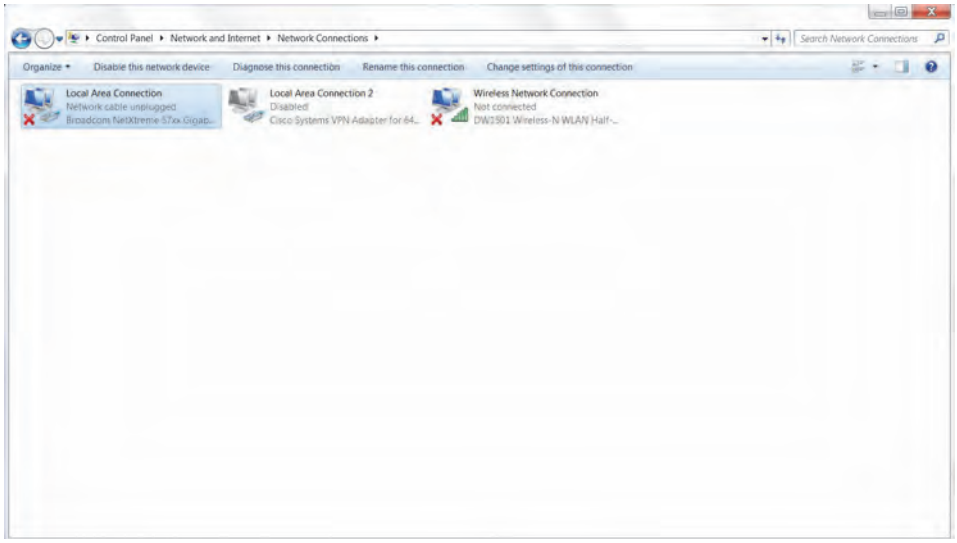

5. Double-click **Network and Sharing Center**. The **Network and Sharing Center** opens.

Figure 56: Network and Sharing Center



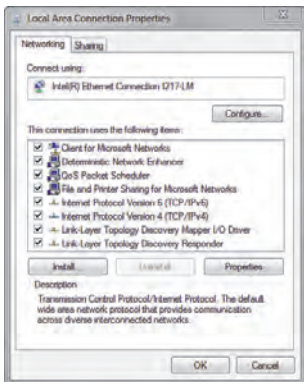

6. Click **Change adapter settings** in the left upper pane. The following window opens.

**Figure 57: Change Adapter Settings Window**




7. Click **Wireless Network Connection** and then click **Disable this network device**.
8. Right-click on **Local Area Connection** and choose **Properties**. The **Local Area Connection Properties** dialog box opens.

**Figure 58: Local Area Connection Properties Dialog Box**

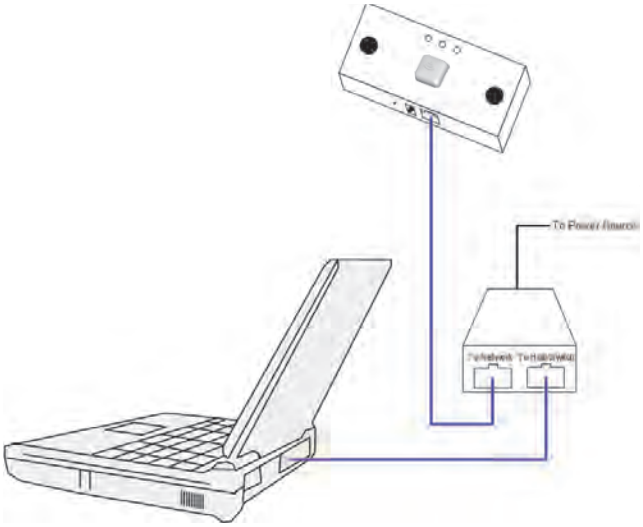



9. Select **Internet Protocol Version (TCP/IPv4)** and click **Properties**. The *Internet Protocol Version (TCP/IPv4) Properties* dialog box opens.

**Figure 59: Internet Protocol Version (TCP/IPv4) Properties Dialog Box**

10. Take note of the current settings in this window so that you can change them back after you set the network parameters on the Brickstream® LIVE Smart Device.
11. Select **Use the following IP address**.
12. In the **IP address** field type a new IP address in the range of 192.168.1.x where x is not 7 or 10. The last digits of your PC's IP address should be different from that of the Smart Device (i.e., Brickstream® LIVE Smart Device = 192.168.1.7 and PC = 192.168.1.11). The **Subnet Mask** field will be automatically populated with 255.255.255.0.
13. Click **OK**. The **Internet Protocol Version 4 (TCP/IPv4) Properties** dialog box closes.
14. Click **Close**. The **Local Area Connection Properties** dialog box closes.
15. Connect the Brickstream® LIVE Smart Device to your PC as shown and described in the following figure.

**Figure 60: Brickstream® LIVE Smart Device Connection to Your PC**



16. Plug the PoE injector to a power outlet.
17. Plug a CAT5e Ethernet cable from the port of the Smart Device to the **To Network** or **LAN/DC** port of the PoE injector.
18. Plug a CAT5e Ethernet cable from the **Hub/Switch** or **LAN** port of the PoE injector to the Ethernet port in your PC.

## Firmware Issue

Follow these steps to determine whether the root cause is a firmware issue.

1. If the Smart Device has been manually reset to RED (as described in *Resetting the Brickstream® LIVE Smart Device* on page 65), follow the instructions to reload firmware to the Smart Device as described in *Installing the Brickstream® LIVE Smart Device Firmware on Factory Direct Smart Devices* on page 81.
2. What firmware version is currently on the device? Verify the version of firmware that the Smart Device is running by checking the Release number displayed in the footer of the Brickstream LIVE web interface. Contact Brickstream Technical Support with this information to receive additional instructions.

# ADJUSTMENTS TO TRACKING CONFIGURATION

This section is designed for advanced users who configure standard counting installations.

CAUTION

**Changing any settings on the 3D Tracking Configuration page can drastically impact the accuracy and functionality of the Brickstream® LIVE Smart Device. Do not make changes on this page without the guidance of Brickstream Technical Support.**

## Tracking Issues

Follow these steps to troubleshoot Smart Device tracking issues.

1. Set the Smart Device to the default values on the **Calibration** page and recalibrate automatically to ensure there is not an issue because the settings were changed.
2. Have a person stand under the device after recalibration and determine if they appear to be displayed with the correct height, within a few centimeters.
3. If the height display is incorrect, manually calibrate the Smart Device as described in step 9 of *Automatically Calibrating a Setting Smart Device Height and Rotation* on page 53.
4. If manual calibration does not address the issue, see *Advanced Troubleshooting of Tracking Issues* on page 74.

## Advanced Troubleshooting of Tracking Issues

Before attempting this procedure, be sure you have completed all steps of *Tracking Issues* on page 74.

1. Record the percentage of pixels that display in pink (undefined) and in good condition.
2. Have a person stand under the device after recalibration and determine if they appear to be displayed in the percentage of pink pixels.
3. If the Calibration page displays in pink pixels, capture a right lens image and a left lens image from the device following the instructions in step  and send these images along with the Height Image data through a RMA request.

## Troubleshooting Under-Counting Issues with Patterned Mats

This topic provides instructions to resolve under counting issues when a Brickstream® LIVE Smart Device has trouble counting due to a patterned mat blocking the line of view.

### Problem

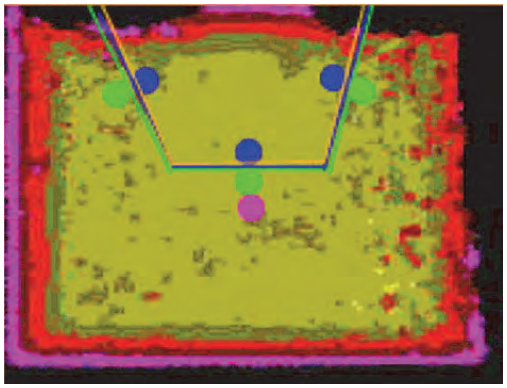
Certain types of patterned floor mats and flooring patterns that are within the line of view of a Brickstream® LIVE Smart Device can prevent the Smart Device from capturing all tracks and therefore under-count traffic. When viewed on the **Calibration** page, the flooring may appear to float higher than floor level.

### Solution

Follow these steps to prevent under counting due to patterned mats.

1. Ensure the Smart Device is calibrated properly and that person heights are generally within a 160cm - 180cm range in the **Height Map** in the right pane of the **Counting Zone Manager** page. The following figure shows a desirable height map, indicated by the predominance of yellow and dark yellow.

Figure 61: Example of Good Height Map



2. If there is a horizontally repeating pattern, twist the Smart Device by 5 to 10 degrees if tracks are being dropped from the Smart Device's view due to the patterns in a floor mat. This interrupts the horizontally repeating pattern.

Figure 62: Horizontally Repeating Pattern

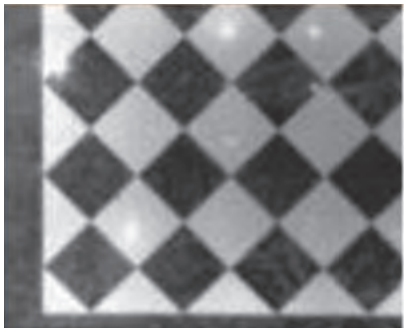
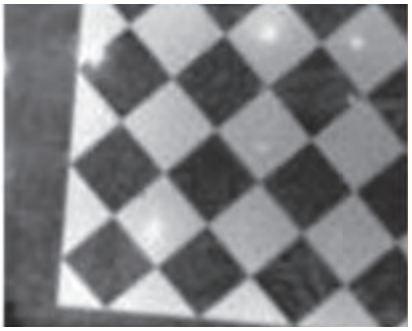


Figure 63: Interrupted Patter Following Twisting Smart Device



3. Check the **Height Image** on the right pane of the **3D Tracking Configuration** page if it is not possible to twist the Smart Device. The floor area should be mostly black, as shown in *Figure 64*. If there are large white patches on the color as shown in *Figure 65*, the smart device is viewing the floor as being higher in the view, which will interfere while counting. If no white patches exist, skip to step 12.

**Figure 64: Good Height Image**

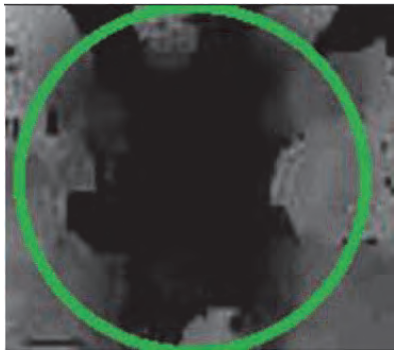
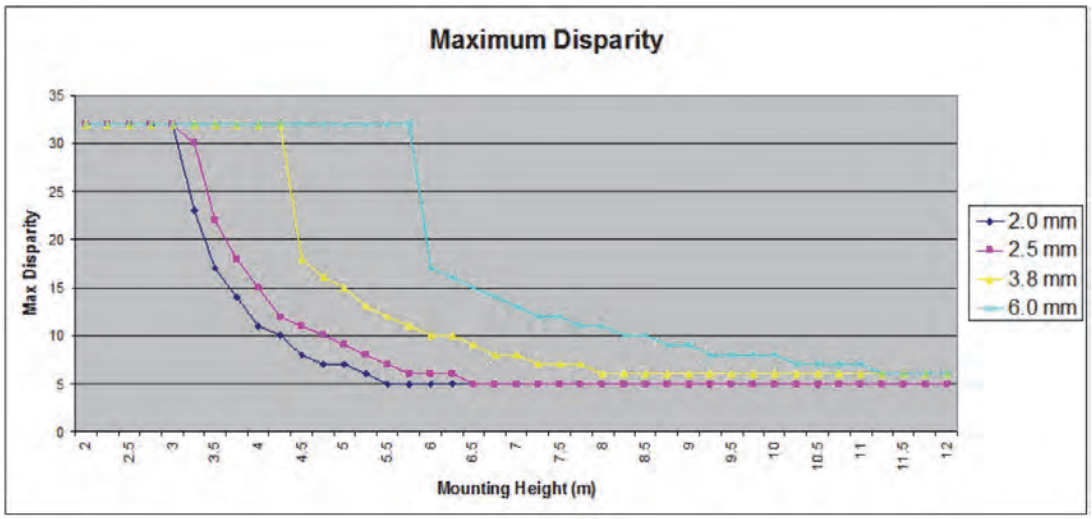


**Figure 65: Bad Height Image**

4. If the tracks are being dropped in the area where white patches exist, go to the **Stereo** sub-tab of the **3D Tracking Configuration** page and adjust the **Max. Disparity** according to the chart in *Figure 66*. The **Max Disparity** setting will help the Smart Device ignore noise created by the floor mat which it interprets as being close to the lens.

**Figure 66: Maximum Disparity Chart**




5. Save the changes.
6. Capture a new background on the **Calibration** page.
7. If the white patches still exist on the **Height Image** and if the device is still under-counting, adjust the **Surface Validation Diff.** setting on the **Stereo** sub-tab from 1.0 to 0.5 .
8. Click **Preview**.

9. Use the following table to determine your next action:

| If... | Then... |
|---|---|
| If the white patches are no longer present | Save the settings and capture a new background. |
| If the white patches are still present | Adjust the setting gradually down to 0.1 and preview until white patches are removed. |
| If the Surface Validation Diff setting at 0.1 does not remove the white patches | Adjust the Surface Validation Size setting gradually from 200 to 500 and preview. |

10. Save settings when white areas are no longer present.

11. When the **Surface Validation Size** and **Surface Validation Diff** settings are over-adjusted, measured person heights can be affected. In the **Height Image** on the **3D Tracking Configuration** page, a person's shoulders and head should be visible in the image as light areas at the top of each person as they walk through the scene, similar to *Figure 67*.

| Field | Description |
|---|---|
| Surface Validation Size | By increasing this value, the smart device measures a larger area around each pixel to verify and set the smoothness of the area around it. |
| Surface Validation Diff. | On a surface, the measurement of distance between the Smart Device and the surface is actually determined by the results of many measurements. Some of these measurements are discarded in order to address variance. By decreasing this setting, more erroneous data is removed from the measurement to arrive at a smoother surface reading. |

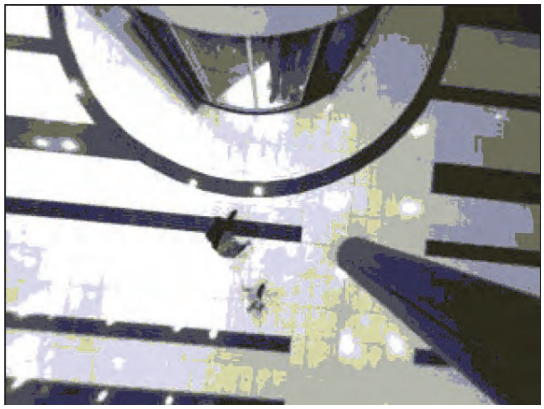
**Figure 67: Height Image Examples**

12. Adjust the following settings if the white patches are not present in the **Height Image** and the Smart Device is under-counting.

| Sub-Tab | Field | Description |
|---|---|---|
| Segmentation | Min. Blob Mass | Set this parameter to the lowest recommended setting of 16. Reducing this setting will result in the Smart Device tracking what it interprets as smaller objects within its view. |
| Tracking | Min Obj Mass | Set this parameter to the lowest recommended setting of 180. Reducing this setting will result in the Smart Device tracking what it interprets as smaller objects within its view. |

Which settings to adjust depends on the circumstances of the problem. When these two settings are over-adjusted, the segmentation of people becomes less defined, as observed in the **Segmentation** image, selected the right pane menu. In *Figure 68*, multi-colored segments are closely grouped, which is an indication that segmentation is good. If these segments are not closely grouped and they are poorly defined, the under counting problem worsens.

**Figure 68: Correct Segmentation**



13. Save the settings and capture a background.
14. If the tracks are being lost when people are walking into the scene close together, select the **Couples** setting for the **Counting Method** on the **Calibration Settings** page.
15. Change both the **Max. Z Block** and **Max. I Range** settings on the **Segmentation** sub-tab of the **3D Tracking Configuration** page to 32.

| Field | Description |
|---|---|
| Max Z Block | Reducing this setting increases the number of vertical parts people are broken into for analysis by the device. By reducing this setting, the device is more likely to track people who walk together closely. |
| Max I Range | This is a measure of pixel intensity. Increasing this setting will allow the device to group more pixels together based on their intensity and reduce the likelihood of under counting. |

16. Save settings and capture a background.
17. If the problem persists, set the **Max. I Range** to the recommended maximum of 64.
18. If accuracy issues still exist after the preceding changes have been made, adjust the **Person Radius** setting on the **Tracking** sub-tab.

| Field | Description |
|---|---|
| Person Radius | The Smart Device views each person as a shape similar to a cylinder. When you lower this setting, you are instructing the Smart Device to shrink the size of the cylinder it interprets as a person. The result is that more objects are tracked as people. The opposite effect will be observed when this setting is increased. |

19. When couples counting is enabled, the **Person Radius** setting is automatically changed from 34 to 28. If the Smart Device is over-counting (i.e., double counting), this setting can be increased back to 34. If the Smart Device continues to under-count, lower the **Person Radius** setting to 22.

**20.** Save settings and capture a background.

**21.** If problems still persist, attempt to manually set and visually verify calibration parameters.

# RESOLVING HIGH UNDEFINED DISPARITY DURING CALIBRATION

If a Brickstream® LIVE Smart Device displays in pink 80-100% (high undefined disparity) and will not calibrate, then complete the following steps to attempt to manually calibrate the Smart Device.

1. Modify the Height field manually on the Calibration page of the smart device's Web application so that it is the actual mounting height of the smart device.
2. Capture the background.
3. Go to the **3D Tracking Configuration** page.
4. Click the **Quality** tab.
5. Change the **Undefined Threshold** field value from 50 to 100.
6. Return to the **Calibration** page and check the **Show Height** checkbox to verify if people are being tracked.

NOTES

*Typically, undefined disparity issues are caused by shiny, marble floors or reflective walls.*

7. Change the height of the Smart Device manually until the height of adults appear in 160-180cm, if they are being tracked.
8. Let the device run until several people pass through the count zone (ideally at least 50 arrivals and exits) then go to the **Counting** page and check the **Height Map** to verify if the height map looks good and colors are in the mustard yellow range.
9. If the **Height Map** does not show predominantly the mustard yellow range, clear the height map and redo steps 6 through 8 if the height map is incorrect.

# CAPTURING IMAGES FOR ADVANCED TECHNICAL SUPPORT

Go to the **3D Tracking Configuration** page of the Smart Device. The initial video displays, and images are generated for the right lens view and the left lens view, both of which are available for about 10 seconds. Capture images from both the right lens and the left lens as follows:

1. Change the address to (http://*<ipaddress>*/rightImage.jpg) once the video displays. An image from the right lens displays.
2. Right-click the image and select **Save Image As** or **Save Picture As** (depending on which browser you use) to store your image.
3. Open the file you just saved to verify if you can see the image.
4. Return to the **3D Tracking Configuration** page and click the drop down arrow list box underneath the image and select Left Lens from the list option.

5. Change the address to (http://*<ipaddress>*/leftImage.jpg) once the video displays. An image from the left lens displays.
6. Right-click the image and select **Save Image As** or **Save Picture As** (depending on which browser you use) to store your image.
7. Open the saved files to verify if you can see the images.
8. Email these images to your Brickstream representative and await further instructions.