

MACE ARMOR

Quick Start Guide

VERSION 8 (JUN 2026)

If you have questions or comments, please contact us at support@bssim.com**.**

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Date	Author	Notes
5 Sep 2024	Tom Ball	Document Rewrite
12 Mar 2025	Tom Ball	Removal of live links due to email filters blocking
13 Mar 2025	Tom Ball	Removal of more live links
22 Apr 2025	Tom Ball	Addition of downloadable sample data
29 Apr 2025	Tom Ball	Addition of keyboard shortcuts (mouse mat)
19 May 2025	Tom Ball	Rebranding
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8 Jun 2026	Tom Ball	Added online learning links and BSI Documentation Browser info

Recommended System Specifcations

We recommend the following system specifications when running both MACE and ARMOR:

- 64GB of RAM
- 8-core/16-thread (or better) running at 4.5+GHz boost speed
- nVidia 4070 or better (4080 or 4090 if using an AR/VR headset) with 12GB+ of VRAM
- Windows 11
- Solid state storage: The ARMOR terrain system relies on the random seek time benefits of an SSD and will not operate effectively from a spinning hard drive (non-SSD).

Sources of Help

Support

If you have any trouble with the steps or any further questions after reading this document, please contact **support@bssim.com**

Installed Documentation

Once MACE is installed all documentation is available from the **BSI Documentation Browser** which is installed by default with all MACE installs. All documentation should be linked from the browser, however the source documents (pdf) are available in the following directory:

C:\Program Files\Battlespace Simulations\BSI Documentation Browser_site\files

Online Learning Resources

There are links to all our learning resources on our website: https://www.bssim.com/learning/

YouTube Channel

Our YouTube channel contains multiple videos including a **tutorial playlist** (https://www.youtube.com/playlist?list=PLa0gPXcTHmLFIjPqmDI9ify9NwigpFAu_) on various aspects of the software. This playlist contains multiple videos both narrated and/or captioned that explain how to do specific things in BSI software from the very basic setup to more advanced functions.

Some key videos are:

Download, Install, License, Setup:

- Downloading and Installing MACE
- Licensing MACE - Activating a temporary or permanent MACE license
- Setting Up MACE Data Paths - Directing MACE to the data it uses for the elevation and mapping

The Basics:

- Starting MACE and ARMOR: Basic startup, load, and start mission in MACE and 3D display in ARMOR
- MACE Users Manual Tutorial 2: How to add platforms, basics of platform and waypoint properties, changing route speeds and altitudes, moving grouping and deleting, creating basic integrated air defence system (**if you watch nothing else to get started, watch this!**)
- Making ARMOR Terrain: how to use the GIS drive provided with a MACE purchase to generate 3D ARMOR terrain

Self-Paced Learning Material

BSI provide facilitated training courses for our software. If you would like to obtain the Slide Pack associated with the course so that you can conduct your own self-paced learning, this can now be downloaded from https://www.bssim.com/learning

Downloading MACE & ARMOR

There is a tutorial video for **downloading MACE** on the BSI YouTube Channel – Tutorial Playlist – Link: *https://youtu.be/5FMFq3ndRFg?si=DlfZtlq1AZrvB5qf*

Request BSI Software Download Site Account

You will need an individual account to login to the BSI downloads site. The BSI download site is accessible at: *https://downloads.bssim.com/*

Click the **"Request an Account"** button (Figure 1) and enter your information to have an account generated. Please check your Spam folder for confirmation e-mail.

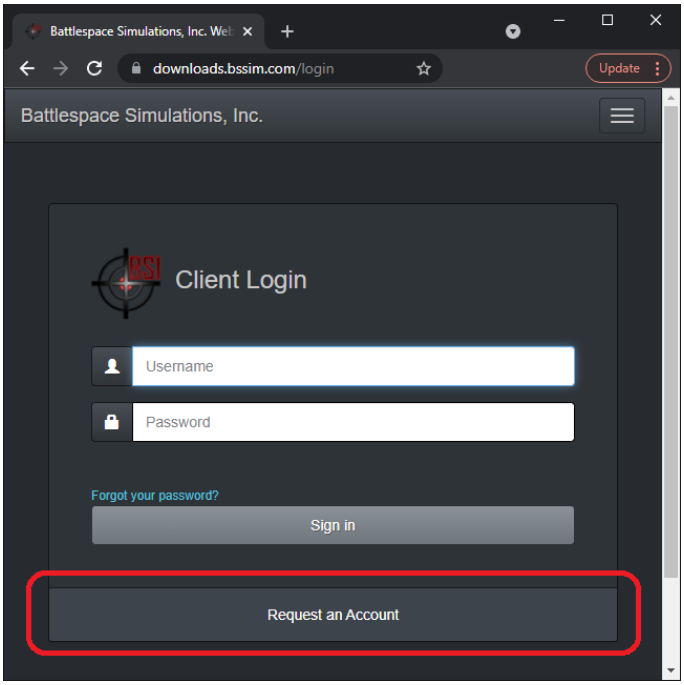


Figure 1: Requesting a BSI Software Download Account

MACE and ARMOR Versions for Download

Once you have a BSI Downloads account you can access the portal to download the software.

There are two versions of MACE & ARMOR available for download at any given time:

1. **Production Release** (fully tested and documented)
    a. Download the **latest MACE Production Release** from here: *https://downloads.bssim.com/file/d/MACE/*
    b. Download the **latest ARMOR Production Release** from here: https://downloads.bssim.com/file/d/ARMOR/ARMOR_Production_Builds/- Choose most up to date folder - Ensure you download both the **.exe** and all the **.bin** files

2. **Pre Production Release** (can range from early Alpha to late Beta/Release Candidates position in our development cycle).
    a. Download the **latest MACE Pre-Production Release** from here: *https://downloads.bssim.com/file/d/MACE_Pre-Production_Daily_Builds_(Alpha)/*
    b. Download the **latest ARMOR production release** from here: *https://downloads.bssim.com/file/d/ARMOR/ARMOR_Pre-Production_Builds/* - Ensure you download both the **.exe** and all the **.bin** files (Figure 2)

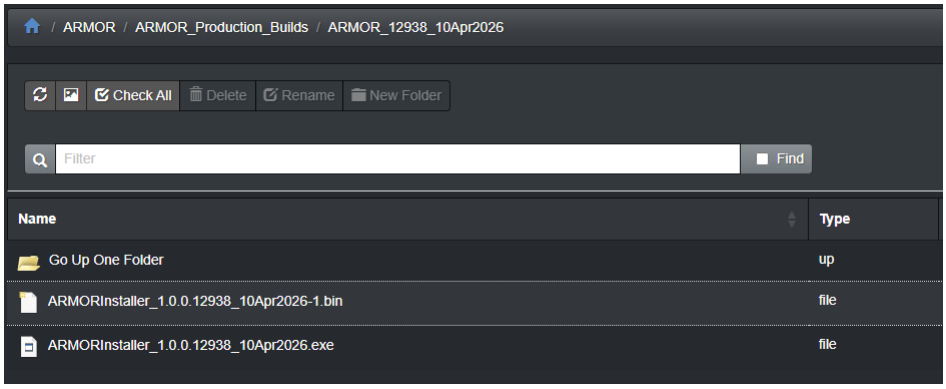


Figure 2: The ARMOR installation files on the downloads site

Note: The Pre-Production builds are NOT for use in operational or established training environments; they are posted for the purposes of evaluation and collaboration with our customers.

Installing MACE

There is a tutorial video for **Installing MACE** on the BSI YouTube Channel – Tutorial Playlist – Link: *https://youtu.be/5FMFq3ndRFg?si=vrStdmwlg9RcwwAs*

To install MACE:

1. Double click the MACE installer .exe file
2. Press 'Yes' if the windows user account control dialogue box appears
3. Read and accept the license agreement
4. Unless you have a good reason not to, install mace in the suggested directory
5. The components for installation will be pre-selected for you
6. Allow the installation sequence to finish

Installing ARMOR

To install ARMOR:

1. Ensure you have downloaded the ARMOR Installer .exe files and all the .bin files to the same folder
2. Double Click the ARMOR Installer .exe
3. Press 'Yes' if the windows user account control dialogue box appears
4. Read and accept the license agreement
5. Unless you have a good reason not to, install ARMOR in the suggested directory
6. The components for installation will be pre-selected for you
7. Allow the installation sequence to finish

Licensing MACE & ARMOR

There is a tutorial video for **licensing MACE** on the BSI YouTube Channel – Tutorial Playlist – Link: *https://youtu.be/KPTtXnSAUIQ?si=dFQW1RKDnzWN5MtR*

Temporary Evaluation License

If you are evaluating MACE BSI will provide a time limited software license key that is 'locked' to the machine on which mace is installed. When you launch MACE for the first time, you will be presented with a license dialog (Figure 3).

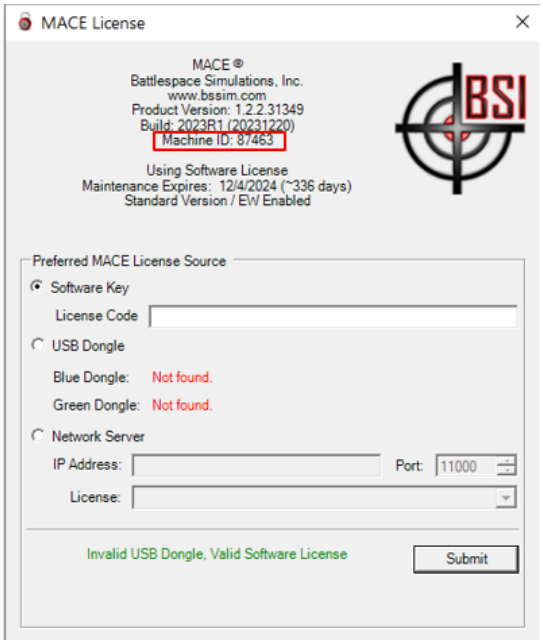


Figure 3: MACE License Manager

To license MACE:

1. Send your BSI contact or **support@bssim.com** the **'Machine ID'**
2. BSI will send back a software license key (a string of text)
3. Copy and enter the license key text in the **'License Code'** text field
4. Click '**Submit**'.

If the license is valid, MACE will be launched.

Purchased License

If you have purchased MACE, you should have received a blue (Keylok) dongle from BSI. These come pre-programmed and all you need to do is plug the dongle into a USB port in your MACE computer.

There is also a network license server option – more information on licensing is contained within the MACE_Licensing.pdf which is contained within **C:\Users\Public\Documents\MACE\documentation** alongside all other manuals and documentation.

ARMOR License

When running ARMOR on a computer, a valid license is usually provided by a locally running MACE using a software key, a USB dongle, or the BSI license server. If you wish to license on a different PC from MACE please consult the licensing section of the **ARMOR User Manual.**

Downloading Supporting Data for MACE and ARMOR

MACE and ARMOR require supporting data:

- MACE runs on an enterprise level GIS system to create the 3D combat environment; it requires elevation data to do this.

- ARMOR is a 3D visualization engine and requires 3D Terrain Tiles data to render the combat environment.
- MACE can read the ARMOR terrain tiles data and use is as the elevation source
- Optionally: MACE can read multiple different imagery formats (e.g. GeoTiff, MrSID, ecw, MBTiles)

Customers who have purchased MACE will be given a GIS Terrain Drive which contains an offline Open Street Map server, Worldwide GeoTif Imagery, elevation data, land usage data and other data for constructing terrains.

If you are evaluating, you do not have this but you can download some data from the BSI Software Download site (***https://downloads.bssim.com/***)

1. **ARMOR TERRAIN DATA:** Various pre-generated ARMOR terrain can be downloaded from *https://downloads.bssim.com/file/d/Data-Unrestricted/ARMOR/Terrain/*
    a. Each of the folders in here contains terrain for different regions – you will need at least 1 – if you are following the MACE tutorials you should get Sardinia!
    b. The terrain is in 7zip format and will need to be unzipped using 7-Zip (https://www.7-zip.org/)
    c. BSI suggest you create a Terrain folder on your fastest hard drive and then create a subfolder for each terrain area – (e.g. C:\ARMOR Terrain\Sardinia and C:\ARMOR Terrain\Spain)

2. **(Optional) OTHER ELEVATION DATA:** Although MACE can read ARMOR elevation you may wish to download other data sources just to use with MACE alone. On the downloads site there is:
    a. **DTED-0** installer downloadable from: https://downloads.bssim.com/file/d/Data-Unrestricted/Elevation/- run the MACE-DTED_installer.exe file
    b. **CDB Worldwide MERIT 90m** from https://downloads.bssim.com/file/d/Data-Unrestricted/Elevation/- unzip using 7z

    After downloading and unzipping this elevation data, you will need to configure your MACE's Elevation Data Paths to point to the folders where you placed this elevation. If you download both DTED0 and CDB Data Sets, they should be placed in separate folders or sub-folders.

    For instructions on how to configure your data paths, please refer to the **'Installing Map/Chart/Imagery Data and Elevation Data'** section of your MACE User's Manual or the online **Setting the MACE elevation Data Paths tutorial** – Link: *https://youtu.be/F428mmt4Cu4?si=-49tKHduJ6oHxg2K*

3. **(Optional) MACE IMAGERY:** MACE can use various imagery formats; If you are evaluating and want to have imagery on your MACE map for the areas of the sample and tutorial missions (Sardinia and Olympia USA) you can download the sample imagery installer **MACE-Imagery_Installer_04Apr2025.exe** from: *https://downloads.bssim.com/file/d/Data-Unrestricted/Imagery/*

    After downloading, run the installer and it will install imagery in a default location that is already mapped **in the MACE System Settings> Data Paths > Hi Res Imagery**
    For instructions on how to configure your data paths, please refer to the **'Installing Map/Chart/Imagery Data and Elevation Data'** section of your MACE User's Manual or the online **Setting the MACE elevation Data Paths tutorial** – Link: *https://youtu.be/F428mmt4Cu4?si=-49tKHduJ6oHxg2K*

Getting Started with MACE

All of MACE's User's Manuals are accessible from the MACE User Interface. On the **Quick** Menu, you can hover over the **'Help'** item and you will see a list of all the manuals available to you (Figure 4):

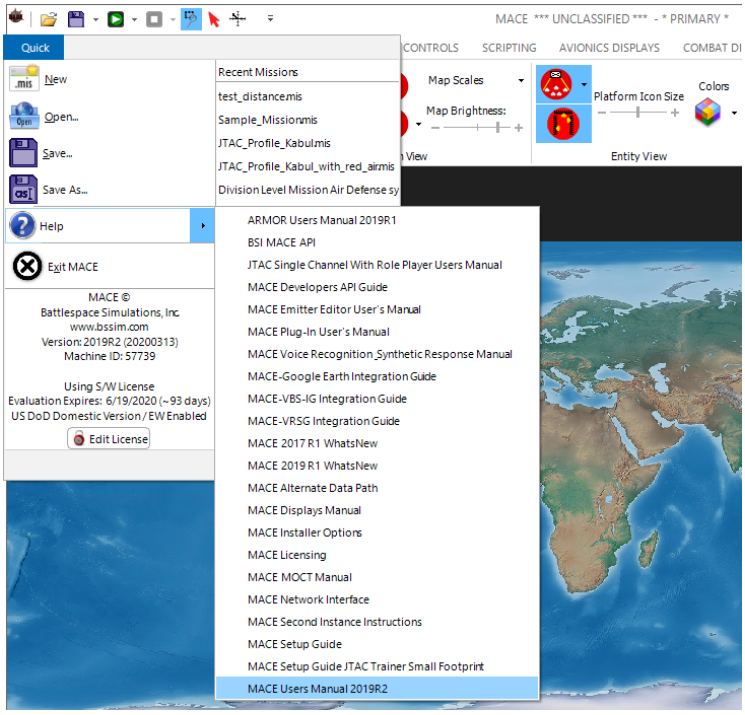


Figure 4: Quick Menu - Help Files

The main resource for you when getting started is the **MACE User's Manual**. There is a **Tutorials** section that we highly recommend for new MACE users.

In addition, there are a series of tutorial videos available on our **YouTube Channel tutorial playlist** – Link:

https://youtube.com/playlist?list=PLa0gPXcTHmLFljPqmDI9ify9NwigpFAu_&si=F6YkhmTTnWvRBTsN

We recommend the following online tutorials to help you get setup:

1. **Setting the MACE elevation Data Paths** – MACE requires you to direct it what elevation data to use for its 3D environment. If you are evaluating you set MACE to use the elevation data (e.g. DTED or CDB) **and/or** ARMOR terrain data you downloaded from the BSI software download site (Section 0). These instructions are also covered in the **MACE Users Manual** - **Starting MACE for the First Time** section – Link: *https://youtu.be/F428mmt4Cu4?si=-49tKHduJ6oHxg2K*

2. **MACE Tutorial 2** – this is the video version of **MACE Users Manual – Tutorial Part 2: Building a Simple Mission** section. It covers basic mission building, setting, moving, deleting platforms and waypoints, saving, loading, and building an integrated air defense system – Link: *https://youtu.be/-CMbP0NqhpQ?si=5UWLhKbtvcSpFgaH*

Configuring MACE to Control ARMOR

To use ARMOR with MACE there is some minor configuration to ensure that MACE has been properly configured to communicate with the ARMOR. To configure MACE to communicate with ARMOR:

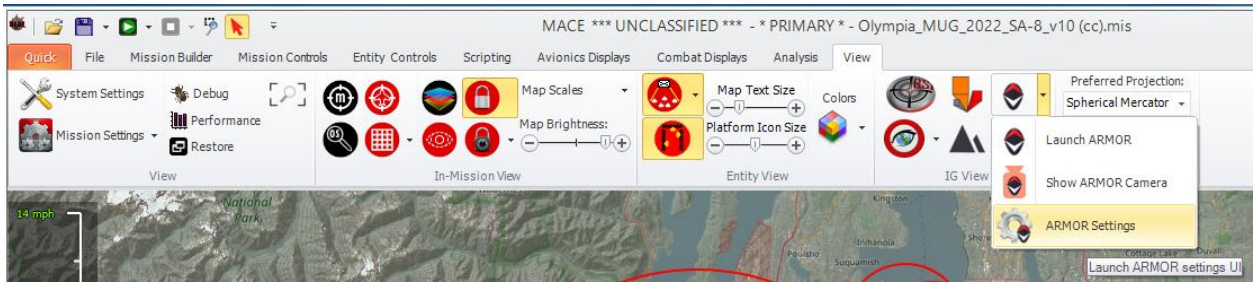


Figure 5: MACE-ARMOR Plugin

1. On MACE's View tab in the IG View section look for the ARMOR icon (Figure 5)
2. Open **ARMOR Settings**

Setting the ARMOR Executable Path (Usually not required)

1. Select the **'Connection Settings'** Tab (Figure 6)
2. If you have installed ARMOR in the default location the ARMOR path should already be correct; however, if no path is shown:
    a. Press the **[ARMOR Path]** button
    b. Navigate to the installed ARMOR location. By default, the directory is *typically "C:\Program Files\Battlespace Simulations\ARMOR"*.
    c. Select the **ARMOR.exe** file and press the Open button.

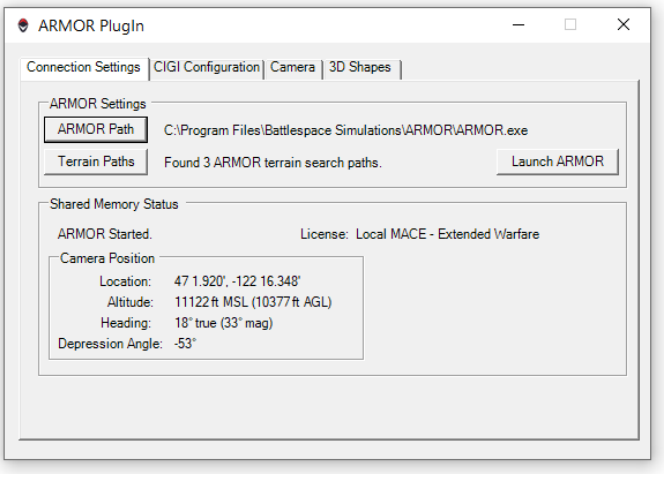


Figure 6: MACE-ARMOR Plugin Connection Settings

Setting ARMOR Terrain Data Path

1. ARMOR needs to be 'pointed at' ARMOR terrain files; if there are no terrain paths 'found' or you want to add new terrain locations:
    a. Press the **[Terrain Paths]** button to open the Terrain Configuration (Figure 7)
    b. Select the Browse button on the next available search path row.
    c. Select folders that contain ARMOR terrain (if you have none see Section 0 for how to download terrain) - You may select a master terrain folder that contains subfolders with different terrain regions)
    d. Once successfully selected, you should see an indication of the number of tiles found for that terrain set.
    e. Use the **[X]** button at the top right of the window to close the Terrain Configuration Window

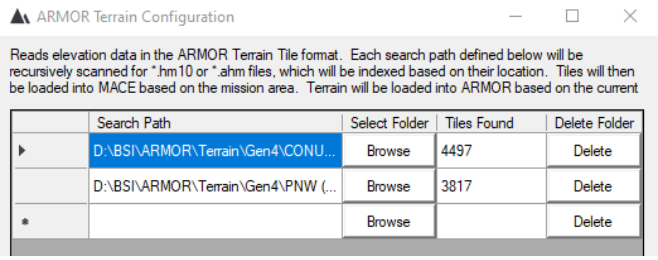


Figure 7: ARMOR Terrain Paths Selection

📄 **Note** that when the ARMOR Terrain Configuration window is open, any mapped terrain tiles will be highlighted on the MACE map as white or green tiles. This indication will go away then the terrain configuration window is closed.

CIGI Settings

1. ARMOR communicates with MACE via CIGI – Select the **'CIGI Configuration'** Tab (Figure 8)
2. For a Local running ARMOR pressing the **[Reset Default CIGI Configuration for Local ARMOR]** will set up all the settings in MACE to work with a fresh install of ARMOR

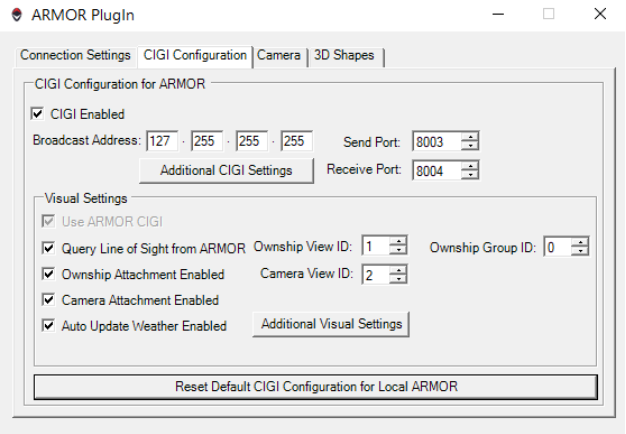


Figure 8: MACE-ARMOR Settings - CIGI Settings

Check MACE Is Using ARMOR as the Primary Terrain Source

MACE can use multiple sources of elevation data and you are able to prioritize which data should be used if present. ARMOR terrain is usually the best source of elevation data for MACE when using it with ARMOR (They will be perfectly correlated).

To check the MACE Terrain Source Priority

1. Select the **'View'** tab in MACE
2. Open **[System Settings]**
    a. Select the **'Data Paths'** Tab in System Settings
    b. Select the blue **[Elevation Data]** button on the left hand side under **'Data Type'**
    c. Click and drag the ARMOR row up to the top of the list to make it Priority 1
    d. If you have downloaded other elevation sources (e.g. CDB and DTED) you can map them here by:
        i. Clicking **[Configure]** on each line
        ii. Selecting the folders that contain the elevation data.
    e. You can click and drag each row to place it in order or priority for MACE to use. Typically: PRI-1 ARMOR, PRI-2 CDB, PRI-3 DTED
3. Close System Settings

Launching ARMOR

With the ARMOR paths configured properly (in section 2), to launch armor: press the **[Launch ARMOR]** button either:

- On the MACE-ARMOR Plugin **'Connection Settings'** tab (Figure 9)
  OR
- From the ARMOR Plugin Dropdown menu on the MACE View tab (Figure 10)

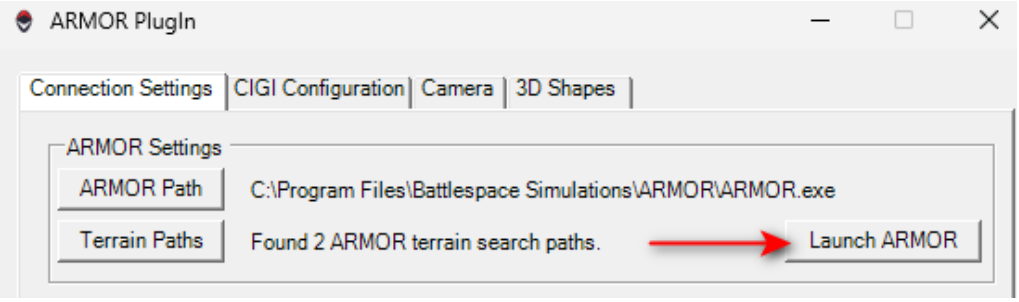


Figure 9: Launching ARMOR from the MACE-ARMOR Plugin

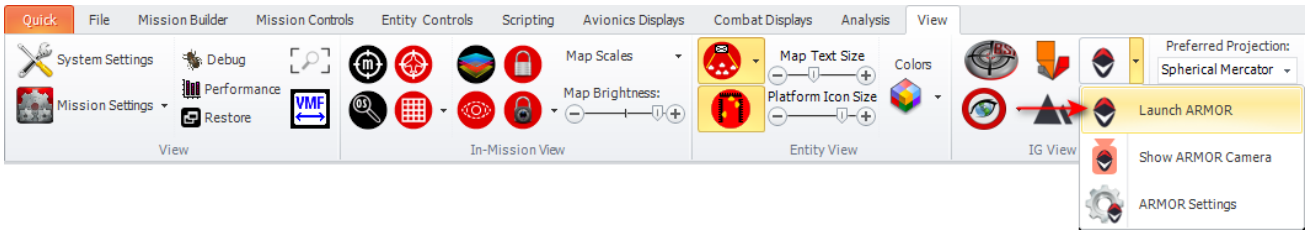


Figure 10: Launching ARMOR from the ARMOR dropdown menu (MACE Visual Tab)

The ARMOR Loading Sequence

When ARMOR fist launches, a loading screen is shown (briefly) requesting the user to "Launch MACE or configure ARMOR with a stand-alone license". If ARMOR was launched from the MACE-ARMOR Plugin, ARMOR will take a second or two to detect a local ARMOR license (Figure 11) provided by the running instance of MACE and move to the next loading screen.



Figure 11: ARMOR checking for license

Once a local license has been detected, ARMOR will proceed to load global data (Figure 12)

Note: Terrain Caching on Updated Installed
If there is a new terrain or often when ARMOR has been updated to a new version, a terrain caching process may start (the length of the process depends on the size of the terrain databases).



Figure 12: Starting ARMOR Screen – Terrain caching or loading global data

After the terrain data load, ARMOR will load the mission data from MACE (Figure 13). If there is no mission loaded in MACE, but ARMOR terrain (elevation) is mapped, ARMOR will transition between terrain areas every few seconds.



Figure 13: ARMOR loading mission data

Quick ARMOR Controls

With ARMOR as the selected (in focus) application, you can use the mouse and keyboard to navigate the scene, display overlays, attach to entities etc. The most common navigation keys are shown below but you should consult the ARMOR Users Manual for full details on how to use ARMOR. BSI Recommend using the 3D-Connexion 6 degrees of freedom controller for navigation of the 3D environment.

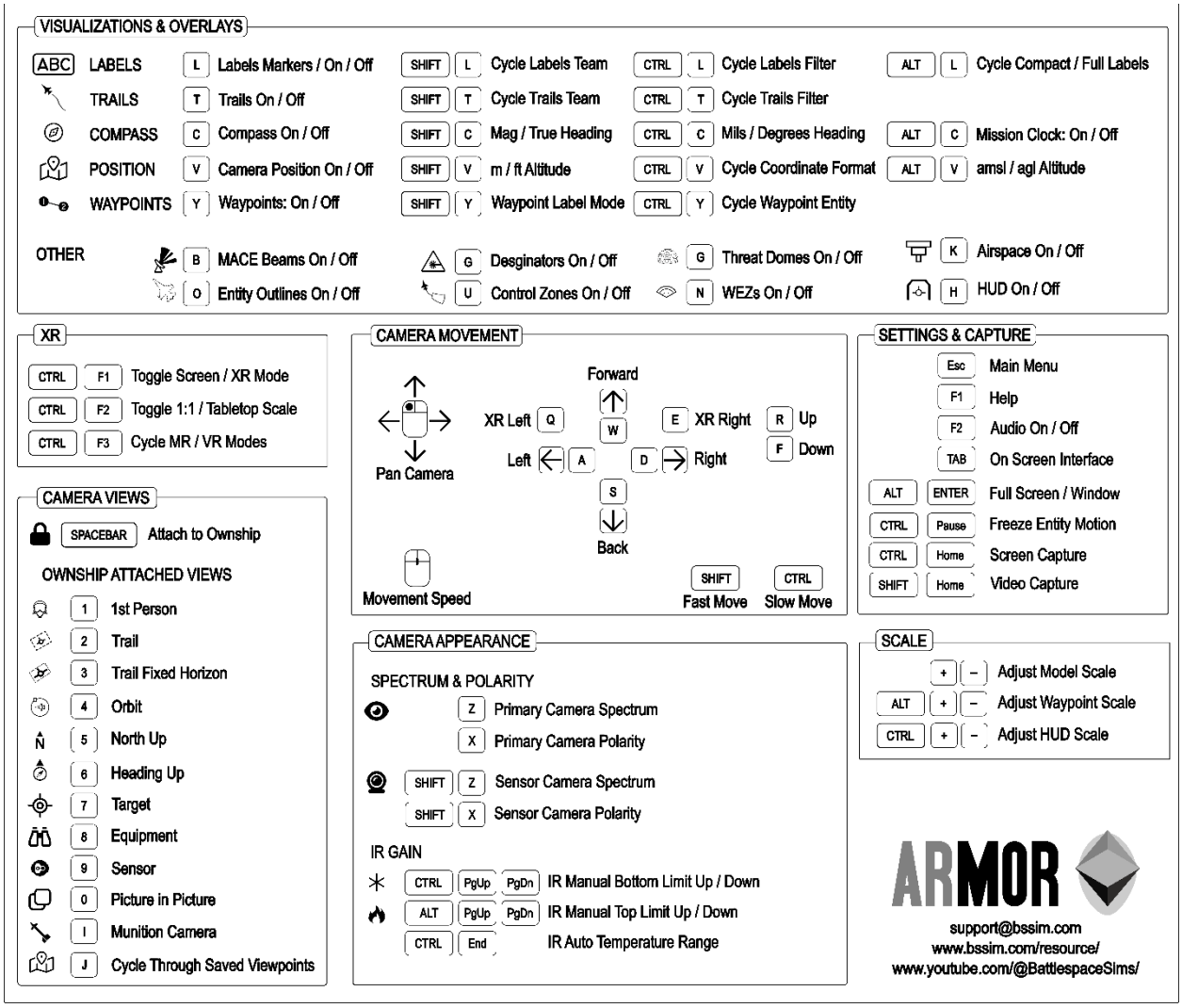
Common Navigation Controls

The primary keys used to support navigating the ARMOR scene include:

<Space Bar> Attach/Detach from the selected entity or locked entity (top lock) in MACE.	**Left Mouse Button Click and Drag** Pans the ARMOR Camera	**<WASDRF>** Keys & **<Arrow>** Keys Camera navigation keys
<0-9> Numeric Keys – Change camera modes	**<Z>** Cycle current spectrum* **<SHIFT+Z>** Cycle Sensor spectrum	**<X>** Cycle current polarity **<SHIFT+X>** Cycle Sensor polarity
** Cycles spectrum on the Sensor camera if attached and in Sensor attach mode. Otherwise, cycles spectrum for the Display camera.*		
<Alt> & **<Enter>** Switch between full screen and windowed mode		**<J>** Jump to stored viewpoints
<F1> On screen help menu	**<TAB>** Primary on screen interface (OSI)	**<ESC>** Configure ARMOR settings

Other Keyboard Shortcuts

The most commonly used overlay shortcut keys by function is shown below:



Thank you and if you require further support

Thank you and please don't hesitate to reach out to us (**support@bssim.com**) if you need help or would like to schedule a screen-sharing session for additional one-on-one training.

Best Regards,
The BSI Team