



VR-Engage 2.0.2 Release Notes

This release note contains the following release-specific information for VR-Engage 2.0.2.

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Systems Supported and System Requirements

For the most up-to-date information about systems supported, see the MAK ONE Product Specifications & Dependencies page on the MAK web site at: <https://www.mak.com/mak-one/support/help/specs>. For hardware requirements, see <https://www.mak.com/mak-one/support/help/hardware-recommendations>.

VR-Engage 2.0.2 is available for the platforms listed in Table 1.

Table 1. Platforms supported

Operating System	Compiler
Windows 10	Microsoft Visual C++ 15.0 (64-bit)



The MAK data package contains data that the VR-Engage application requires. See "The makData Package and Product Compatibility" on page 5.

3D Video Cards Supported

VR-Engage 2.0.2 supports NVIDIA graphics cards that support OpenGL 4.5 or above. While we support NVIDIA Quadro cards, we strongly recommend GeForce cards. If you use a Kepler Series Quadro card, read the instructions in "Using Kepler Series Quadro Cards" on the facing page. VR-Engage does not support AMD (formerly ATI) graphics hardware.



VR-Engage strives to provide the best 3D scene quality possible and cutting edge visualization effects. To provide this functionality, VR-Engage takes advantage of OpenGL features that may not be supported on older video cards. When this is the case, you can disable these features, allowing VR-Engage to run in 3D modes.

OpenGL 4.5 is the minimum requirement for rendering a 3D scene in VR-Engage. For the best visual quality and highest performance, you should use the most recent NVIDIA GeForce card. The minimum recommended card is the 9xx series.

Some laptops have an NVIDIA graphics card and an Intel graphics card. You must configure your computer to use the NVIDIA card. To do so:

1. Open the NVIDIA Control Panel (in the System Tray).
2. Select Manage 3D Settings.
3. Select Global Settings.
4. Select Preferred Graphics Processor.
5. Select High-performance NVIDIA Processor.



You should always try to use the latest drivers available for your video card.



If you use an external monitor with your laptop and your laptop is not using the NVIDIA graphics card when running VR-Engage, try setting the main display to be the laptop's built-in monitor instead of an external monitor.

Using Kepler Series Quadro Cards

There is a known issue with the Quadro drivers on Kepler series Quadro cards. NVIDIA says it's related to the fact that the default profile optimizes for a fixed eyepoint (for applications like CAD). To run on these cards, you must change the global profile for the driver, as follows:

1. Open the NVIDIA Control Panel.
2. Select the Manage 3D Settings page.
3. Select the Global Settings tab.
4. In the list of driver profiles, select Workstation App - Dynamic Streaming.

We are working with NVIDIA to have their drivers recognize our applications and apply this profile automatically. In the meantime, for Kepler series Quadro you must make this change manually.

Disk Space Requirements

A full installation of VR-Engage requires approximately 4 GB of disk space, and an additional 50.3 GB for the complete MAK data package. If you also install VR-Forces 5.0.2, that requires at least 4.3 GB of disk space for VR-Forces and the VR-Engage add-ons. (If you install the toolkit and the API documentation for VR-Forces as well, that takes approximately 5.9 GB.)

Licensing

The VR-Engage application requires a VR-Engage run-time license in order to run. Internally, VR-Engage relies on VR-Vantage capabilities for its 3D visualization, VR-Forces capabilities for its ownship simulation, VR-Link for its networking, and so on, but these capabilities are built into VR-Engage and do not require separate run-time licenses of these MAK products.

MAK License Management

VR-Engage 2.0.2 uses FLEXlm 11.17.1. You must install the license management software to run VR-Engage. If you are upgrading from a version of VR-Engage that used an older version of FLEXlm, you must upgrade your license management files. You do not need a new license. Licenses are forward compatible.

The License Manager files are not part of the VR-Engage installer. You can download them at:

- Windows: [Windows License Manager Installer \(64-bit\)](#)
- Linux (VR-Forces only): [Linux License Manager Installer \(64-bit\)](#)

Installation of the license manager is covered in the *MAK ONE Installation Guide*, available online at <https://mak.com/mak-one-installation-guide>. Support is also available at <https://www.mak.com/mak-one/support/portal>.

VR-Forces Licensing Issues

With only a VR-Engage license, you can run VR-Engage, choose a terrain database to simulate on, create and place an entity, and control that entity. VR-Engage can only simulate and control a single entity at a time. When you "Change Role" and create a different entity to simulate, the entity you were previously simulating will be deleted and replaced by the new one.

If you are running a copy of VR-Forces on your network (which requires a separate VR-Forces license), then VR-Engage can interact with VR-Forces in a variety of ways:

- VR-Engage allows you to join a VR-Forces session and take manual control of one of the entities in the VR-Forces scenario. If you are controlling a VR-Forces entity, and then "Change Role" and ask to control a different entity, the original entity will still exist, as it is owned by VR-Forces.
- VR-Engage can initiate and receive changes to the terrain, for example, opening doors or destroying buildings. (VR-Forces acts as the dynamic terrain server).
- VR-Engage can reflect changes to time-of-day and weather that are published by VR-Forces.
- VR-Engage allows you to assign certain tasks to entities that are simulated by VR-Forces (for example, tell a subordinate to follow you, or move to a location you designate).

To simplify the startup workflow for certain use cases, VR-Engage gives you the ability to launch a VR-Forces back-end directly from the VR-Engage user interface, and to instruct VR-Forces to load and host a scenario of your choosing. This allows you to avoid separately launching VR-Forces from the start menu or command line, and automatically ensures that VR-Forces uses the same interoperability parameters as VR-Engage. A VR-Forces back-end license is always required to run VR-Forces, whether you launch it from the VR-Engage user interface, or launch it separately from the Start Menu or command line. If you do not have a VR-Forces back-end license available, VR-Engage does not allow you to launch VR-Forces and host a VR-Forces scenario.



When VR-Engage launches, it looks for a running VR-Forces and if it finds one, it connects to it. If it does not find one, it offers you the option to host and load a VR-Forces scenario, or start an Unhosted session. If you host a VR-Forces scenario, you will consume a VR-Forces license, which will prevent you from starting VR-Forces independently if you only have one license. If you start an Unhosted session, you can start or join a session only as an individual player; you cannot load and run a scenario.

Third-Party Libraries Supported

VR-Engage 2.0.2 uses the indicated versions of the following libraries:

- VR-Link 5.8
- Qt 5.15.2 (VC 15 and Red Hat 8)
- OpenSceneGraph 3.6.4
- Boost 1.63.0
- FreeGlut 2.4.0 (Windows), 2.6.0 (Linux)
- GL-Studio 7.0 (VC 15)
- DI-Guy 13.6 (development version)
- Triton 4.43
- Silverlining 6.20
- SpeedTree 6.3.2
- Oculus Rift Development Kit 1.26
- CDB API 2.2 (Windows), 2.1 (Linux)
- osgEarth 3.2
- CUDA 11.7

The makData Package and Product Compatibility

VR-Engage 2.0.2 is built against VR-Vantage 3.0.2, VR-Forces 5.0.2, and VR-Link 5.8. They use the shared makData 16 package.

MAK applications can share the same data package. A complete installation of the makData 16 package requires about 50.3 GB of space, including the supplemental data package. For instructions on installing the data, see "[Installing the makData Package](#)" in the *VR-Engage Users Guide*.

Network Compatibility

VR-Engage 2.0.2 is compliant with RPR FOM 1.0 and RPR FOM 2.0 and includes FOM mappers for many draft versions of the RPR FOM. It is compliant with RTIs that support the HLA 1.3 specification, the SISO DLC HLA API 1516 version of the IEEE 1516 specification (SISO-STD-004.1-2004), or HLA Evolved. MAK recommends HLA Evolved.

To use an RTI with VR-Engage, it must use the same operating system and be built with the same compiler.

VR-Engage 2.0.2 supports DIS 4, 5, 6, and 7, and can therefore interoperate with DIS applications of any of these versions. MAK recommends DIS 7.

Backward Compatibility

Support for MAK Data Logger Recordings

While VR-Engage 2.0.2 works with all recent versions of the MAK Data Logger, please know:

- Versions of the MAK Data Logger older than 5.5.1 (released in May 2018) have known problems with the encoding of DIS 7 Attributes, which can cause crashes in MAK products.

New Features and Updates

VR-Engage 2.0.2 has the following updates and new features:

- Built against VR-Forces 5.0.2, VR-Vantage 3.0.2, and VR-Link 5.8.
- There are a number of updates and improvements to the M2A3 Bradley IFV.
 - The Gunner role's display is now more accurate and also indicates the current direction of the turret.
 - Gunner and Commander players can now change the sensor mode using the Action menu.
 - A player in the Commander role can toggle between the out-the-hatch and Commander Independent Viewer (CIV) modes by pressing the **H** key.
 - The loadout is more accurate.
 - The engine torque is simulated better.
- The Commander Hatch role now includes binoculars. This role can be used on vehicles such as the M2A3 Bradley IFV, M1A2 Abrams, and GTK Boxer.
- Ground vehicles with more than one role now allow the player to change roles when they are embarked. They choose Switch Roles from the Action menu and then select the new role, or simply press the **[** or **]** key to cycle through the available roles.
- There are new ground vehicles that VR-Engage players can drive: Bushmaster PMV, M113 APC, M270 MLRS, M983 HEMTT Patriot Tractor, M1028 FMTV Canvas Cargo Truck, and Ural 4320.

For the features and updates included in the 2.0 release, see the [VR-Engage 2.0 Release Notes](#) (`./doc/VR-Engage2.0ReleaseNotes.pdf`). For the updates in the 2.0.1 release, see the [VR-Engage 2.0.1 Release Notes](#) (`./doc/VR-Engage2.0.1ReleaseNotes.pdf`).

Table 2. Fixed Bugs

Key	Summary	Release Notes	Fix Version/s
VRE-1534	M2A3 loadout is incorrect	Updated the M2A3 Bradley loadout as follows: armor piercing (230), high explosive (70), and 762mm (2000).	VRE-2.0.2
VRE-2439	Humans able to pass through vehicles	This is fixed. It was sometimes possible to walk through vehicles as a human player, especially with longer vehicles. A performance optimization was occasionally disregarding valid collisions with the vehicle.	VRE-2.0.2
VRE-2467	Engaging/disengaging sensor takes too long	Fixed to improve the speed when engaging or disengaging as a sensor operator.	VRE-2.0.2
VRE-2481	Incorrect munition chosen by CGF	Fixed to ensure that CGF simulation objects to fire the correct weapon as specified in the priorities list.	VRE-2.0.2
VRE-2516	Culling issues when Zoomed in VR	Corrected the zoom values to prevent culling problems.	VRE-2.0.1, VRE-2.0.2
VRE-2523	Adding Vortex Part to LAV	Fixed the LAV III APC's Vortex implementation, enabling users to add new Vortex parts to the vehicle.	VRE-2.0.2
VRE-2539	LLDR does not display target data unless mouse is moved	The target data now accurately displays without requiring mouse movement.	VRE-IPB16, VRE-2.0.1, VRE-2.0.2
VRE-2556	CLONE - Vegetation tiles pop in/out while looking around in binoculars	Fixed an issue where vegetation in the terrain would sometimes pop in and out unexpectedly and appear to be missing in spots when a user looked around with binoculars.	VRE-2.0.2
VRE-2561	Thrustmaster HOTAS X joystick mapping is broken	Fixed the controller mappings.	VRE-2.0.2
VRE-2571	Default reticle on Bradley is wrong	Corrected the reticle on the M2A3 Bradley IFV to be more accurate.	VRE-2.0.2
VRE-2577	Can't immediate create an entity after changing session	There was a problem where a user would create a new entity in VR-Engage, then switch sessions and try placing the same entity because it still appeared to be selected in the list. This wouldn't work and the user would have to select another entity and then the first one so that they could place it. This is now fixed, and an entity selected in one session is no longer selected when the user starts a new session. This ensures that the user can place the same entity without needing to select another one.	VRE-2.0.2

Table 2. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix Version/s
VRE-2578	Assert error when clicking back button while VRE is connecting	Fixed so that clicking the Back button while VR-Engage connects to a session does not cause an error.	VRE-2.0.2
VRE-2580	Bradley's Vortex model needs some tuning	Improved the M2A3 Bradley IFV's torque tables to more accurately simulate the actual engine.	VRE-2.0.2
VRE-2583	Trigger Events entry in Action menu should be Admin-only	Players can only trigger VR-Forces events if they are in Admin mode.	VRE-2.0.2
VRE-2584	Human heading incorrect in VR	Human players in VR would always start moving with a heading of zero when the player moves forward with the 'W' key, regardless of the direction they were actually facing. This is fixed.	VRE-2.0.1, VRE-2.0.2
VRE-2591	Remove NVG sensor mode option from M2A3 Commander and Gunner sights	Removed the night vision goggle sensor mode from the Commander and Gunner roles on the M2A3 Bradley IFV. The IR (white hot and black hot) modes as well as out-the-window continue to work as designed.	VRE-2.0.2
VRE-2592	Add sensor mode to action menu on M2A3 Commander and Gunner roles	You can now change the sensor mode using the Action menu for the M2A3 Bradley gunner and commander roles, in addition to the game controller.	VRE-2.0.2
VRE-2594	Mouse control in M2A3 Commander Hatch mode is too sensitive	Reduced mouse sensitivity for the Commander Hatch role on the M2A3 Bradley IFV.	VRE-2.0.2
VRE-2610	In extended VRE SMS, extended entities entity not available in VRE manager panel	Entities created in the SMS from an existing entity are now available in the VR-Engage Manager Panel in VR-Forces with the VR-Engage add-ons installed.	VRE-2.0.2
VRE-2623	Laser rangefinder in DtGunnerRangeLogic does not intersect entities	Fixed to allow for intersecting with entities.	VRE-2.0.2

Table 2. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix Version/s
VRE-2628	Lockdown mode doc/implementation mismatch	Modified the out-of-box configuration of the "enableAdminMode" parameter in playerStation.lua. Previously, it had been set to true in that file, which had the effect of making the Admin mode hotkey available for all app modes (admin, user, and lockdown). Removed the entry for this variable from playerStation.lua and modified the code such that, if this variable is not explicitly set in this file, then the default admin mode hotkey behavior as a function of application mode is as follows: -- lockdown: disabled -- user: enabled -- admin: enabled If the user does choose to set the value for "enableAdminMode" in playerStation.lua however, it affects all application modes.	VRE-2.0.2
VRE-2639	LAV gunner role missing black-hot IR sensor mode with SensorFX	Fixed to make black-hot IR sensor mode available in VR-Engage with SensorFX.	VRE-2.0.2
VRE-2650	Vortex vehicles drive through non-Vortex vehicles	Vortex vehicles now collide with non-Vortex CGF vehicles. This improves the realism for role players in Driver roles.	VRE-2.0.2
VRV-4308	When a window is closed, other open windows will flicker.	VR-Vantage no longer deletes cube map data for all windows when only one window or channel is shut down. This prevents the flickering in the windows or channels that are not closed.	VRV-3.1, VRV-IPB16, VRV-3.0.2, VRV-3.0.1b
VRV-4320	Runway lights on Rhone Valley float in air after reloading the terrain	Fixed the setup of the topo frame to ensure that the runway lights display correctly.	VRV-3.1, VRV-IPB16, VRV-3.0.2, VRV-3.0.1c
VRV-4330	Focus View in VR/MR culls terrain	VR-Vantage now accounts for the extremities of both eyes when calculating the frustum angles of the actual OSG camera used for culling. This fix was made primarily to support Varjo headsets.	VRV-3.0.2

Table 2. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix Version/s
VRV-4336	CIGI HAT/HOT Responses are wrong in geocentric	Fixed the calculation to use the real down vector to ensure that it works in geocentric terrains. Previously, the calculation only worked on projected terrains.	VRV-3.1, VRV-IPB16, VRV-2.8g, VRV-3.0.2, VRV-3.0.1a
VRV-4340	Creating objects that use a coord system converter are inadvertently creating (and initializing) a Magnetic Model instance	Decoupled DtWorldMagneticModel from the DtCoordinate system. Moved it to vrvCore and made it instance-able on DtDe and DtBaseConnection. Created a DtWorldMagneticModel in DtDeSharedState and registered it with DtDe.	VRV-3.1, VRV-IPB16, VRV-3.0.2, VRV-3.0.1b
VRV-4343	Procedural Building Roofs have lighting problems when indirect rendering is turned off.	Updated to use appropriate effect textures when indirect is not enabled.	VRV-3.1, VRV-IPB16, VRV-3.0.2, VRV-3.0.1c
VRV-4348	PVD Entity Heading Indicator is wrong when zoomed in.	Fixed the heading indicator in the 2D view to work regardless of the observer's zoom level. The application now correctly computes the heading indicator in topographic coordinates.	VRV-3.1, VRV-IPB16, VRV-3.0.2, VRV-3.0.1b
VRV-4376	Loading CDB terrain causes hang with 1 model in indirect rendering	Fixed a bug in the CDB loader that caused the application to hang if there is a feature in the top-level node/shape file.	VRV-3.1, VRV-IPB16, VRV-2.8g, VRV-3.0.2, VRV-3.0.1b
VRV-4385	Bind observers broken with offset	Fixed too ensure that bind observers view the desired offset.	VRV-3.1, VRV-IPB16, VRV-3.0.2
VRV-4388	Reverse name map in DtElementAttributeManager breaks down with same display name	Application no longer uses the elementId to displayName map for general purpose use, because it is valid only if there are no duplicate display names. The VR-Forces GUI can use duplicate display names. We now use the ElementAttribute instead of depending on the reverse map.	VRV-3.1, VRV-2.8g, VRV-3.0.2, VRV-3.0.1c
VRV-4409	SilverLining MultiView shader causes slowdown in VR/MR	Modified a function in SilverLining to improve the time it takes to toggle VR.	VRV-3.1, VRV-IPB16, VRV-3.0.2

Table 2. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix Version/s
VRV-4422	CDB Cache for elevation clamping is not created anymore	Fixed to ensure that directories are created in the cache, specifically files ending with .elev_cache.	VRV-3.1, VRV-3.0.2
VRV-4429	When view is magnified in VR some tiles will be incorrectly culled out.	Corrected the zoom values to prevent culling problems.	VRV-3.1, VRV-IPB16, VRV-3.0.2
VRV-4441	Landcover splatting with CDB terrains can be misaligned.	Fixed a bug that caused some imagery to be misaligned on CDB databases.	VRV-3.1, VRV-IPB16, VRV-3.0.2, VRV-3.0.1d
VRV-4454	Editing bullseye in VRF removes bullseye from selection toolbar	There was an issue where moving a Bullseye would cause it to disappear from the list in the Bullseye Selection toolbar. This is fixed.	VRV-3.1, VRV-IPB16, VRV-3.0.2, VRV-3.0.1d
VRV-4455	Adding a Channel creates new SpeedTree shader set which causes slowdown	SpeedTree now checks whether it should add a new shader set to ensure it does not create more than it should.	VRV-3.1, VRV-IPB16, VRV-3.0.2, VRV-3.0.1d
VRV-4459	DDM formatting was broken.	Fixed a bug the prevented coordinates from displaying in DDM format.	VRV-3.0.2, VRV-3.0.1d
VRV-4469	The Compass should not be rendered when there is no terrain loaded.	The compass now only displays when a terrain is loaded.	VRV-3.1, VRV-IPB16, VRV-3.0.2
VRV-4484	Allow Selection of Ghosted Objects (2D Only) does get applied for newly created aggregates	Fixed to ensure that newly created units recognize the setting of the Allow Selection of Ghosted Objects (2D Only) display setting.	VRV-3.1, VRV-IPB16, VRV-3.0.2, VRV-3.0.1d
VRV-4494	Increasing magnification and tilting your eyepoint causes some terrain tiles to display at a lower LOD	Restored the intended behavior: the application uses the current FOV to determine whether the distance to a tile should be reduced when using view magnification while constraining it to no less than a value specified by terrainMagnificationHighLodAngle.	VRV-3.1, VRV-IPB16, VRV-3.0.2

Table 2. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix Version/s
VRV-4503	LOD Scaling not working for articulated models	The application now considers the magnification factor when culling. This ensures that when the observer is zoomed in, they will see models correctly.	VRV-3.1, VRV-IPB16, VRV-3.0.2, VRV-3.0.1d
VRV-4522	Need to remove CIGI mapping to M113APC model definition that no longer exists	Removed mapping for TrackM113ArmoredPersonnelCarrier (entity type #3302). There is no longer a model that can be configured for use with CIGI.	VRV-3.1, VRV-IPB16, VRV-3.0.2
VRV-4524	Clean up spurious console messages.	Added code to suppress OSG notify during inset window creation.	VRV-3.1, VRV-IPB16, VRV-3.0.2
VRV-4525	Remove incorrect console message about FBO Deletion	Suppressed message to debug level.	VRV-3.0.2
VRV-4526	Creating a PVD window generates a warning on the console about a nullptr	Fixed the code to better handle the initialization pattern.	VRV-3.1, VRV-IPB16, VRV-3.0.2
VRV-4527	Correctly read ../data/Environment/Ocean/ocean-mask-texture.tif	Fixed how the image is read to resolve the issue that was causing the warning in the console.	VRV-3.1, VRV-IPB16, VRV-3.0.2
VRV-4552	Running the VR-Vantage examples requires cmake when it shouldn't	Fixed to allow users to build and run VR-Vantage examples without having cmake.	VRV-3.1, VRV-3.0.2
VRV-4598	DI-Guy returning from being invisible doesn't get initial update.	Fixed to ensure that the motion model performs the initial update when the fullUpdateNeeded flag is set.	VRV-IPB16, VRV-3.0.2

Known Problems

Problems can arise with any product. MAK has a knowledge base of the problems that we know about, which is always changing as new problems are identified and new solutions are found. To learn how to address known problems with VR-Engage and other MAK ONE products, click the Knowledge Base link on the Self Help Resources page: <https://www.mak.com/mak-one/support/help>.

If the problem you are experiencing is not addressed in the knowledge base, contact support for assistance: <https://jira.mak.com/servicedesk/customer/portal/1>.

VR-Engage also has the following known problems which will be addressed in future releases:

- While engaged in a pilot role, releasing a bomb on another entity's laser designator requires that you first match your laser code to that of the other entity. VRE-2405
- Mixed reality does not work with the Vive Pro. Virtual reality works correctly. VRE-1790
- If a human character is executing a plan and a player engages and then disengages, the character does not resume its plan. VRE-1777
- The Plug-ins Loaded page of the VR-Forces Plug-ins dialog box has been suppressed. Look at the `./bin64/vrfSim.log` file for a list of the loaded plug-ins. VRE-1481
- You cannot take control of a VR-Engage-controllable human entity that is currently performing a DI-Guy animation task indefinitely. VRE-261