



VR-Link 5.9 Release Notes

This release note contains the following release-specific information for VR-Link 5.9.

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Systems Supported and System Requirements

For information about platform and system support, see the Product Specifications & Dependencies page on the MAK website at: <https://www.mak.com/mak-one-specs>.

For hardware requirements, see <https://www.mak.com/mak-one/support/help/hardware-recommendations>.

VR-Link for C# supports all Windows compilers.

VR-Link for Java supports all compilers and operating systems. VR-Link for Java requires Java 9.

Compiler Compatibility on Windows

MAK provides versions of product releases that have been compiled with different versions of Microsoft Visual C++. MAK ONE products built with VC 14 and later are binary compatible and will work together. When you run MAK ONE products together on the same computer, for example, the Logger and VR-Vantage, we strongly recommend that you run versions compiled with the same compiler or binary compatible compilers.

Disk Space Requirements

A full installation of VR-Link requires approximately 1.5 GB of disk space on Windows or 2 GB on Linux.

License Manager

VR-Link 5.9 uses FLEXlm 11.17.1. You must install the license management software to run VR-Link.

The MAK License Manager files are not part of the VR-Link installer. You can download them from the MAK ONE Product Downloads page (<https://www.mak.com/mak-one-downloads>).

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>.

RTI Support

We recommend using the latest version of the MAK RTI. However, VR-Link should work with other RTIs that conform to the HLA 1.3 specification, the IEEE 1516 SISO DLC API, or HLA Evolved, and are built using the same compiler as your version of VR-Link.

When using the MAK RTI, remember to make sure that VR-Link can find your FED file, and optional *rid.mtl* file, by either putting them in the directory from which you are running, or by setting the environment variable to the directory that contains them.

New Features and Updates

VR-Link 5.9 has the following new features and updates.

- To account for the "flatter" menu structure of Windows 10 and Windows 11, the Start menu links to VR-Link and its associated applications now display the version information. The documentation and tools are in versioned subfolders, and there are also versioned shortcuts on the Start menu to access the folders.
- You now install PDBs, which supply data to inform the callstack.log file, are now installed using an executable. This is easier than manually unzipping and putting the files in the `./bin64` directory.
- All MAK ONE *log* and *dmp* files are now saved in a central location. The default is `C:/MAK/logs`, which you can change by using the `MAK_LOG_DIR` environment variable to specify a different path.
- VR-Link—and therefore all MAK ONE products—now supports the NETN FOM (NATO Education and Training Network Distributed Simulation Federation Object Model) and uses it as the default FOM. It is an extension of the RPR FOM 2.0. (The old 2.0 publication will not work.)
- Refactored the IFF API (Identification, Friend or Foe). This provides improved support for the functionality in MAK ONE products, ensuring a more authentic representation of real-world IFF usage. For example, the simulation of Mode 5 is more accurate.
- VR-Link now uses OpenJDK 21 to build the Java libraries. Java 9 is the supported version.
- Changed the `DtObjectPublisher::tick` call to return a value, which allows users to know whether it resulted in a message being sent.
- Added a measure that detects when there is network spam, which can cause performance degradation. The application outputs a warning when the number of PDUs sent per second exceeds the threshold.
- The VR-Link installer now respects the `MAK_INSTALL_DIR` environment variable when setting the default path for the install. For details on using this variable, please refer to the [MAK ONE Installation Guide](#).
- The VR-Link Code Generator now defaults to a dark mode interface. To use light mode instead, open the Configuration menu and then choose Toggle Dark Mode to unselect it.

Fixed Bugs

Table 1. Fixed Bugs

Key	Summary	Release Notes	Fix Version/s
VRL-200	DtReflectedAggregate does not have a constructor that takes a Repository	Added constructors to DtReflectedAggregate for both DIS and HLA that take a state repository as an argument.	VR Link 5.9, VR Link IPB16
VRL-262	VR-Vantage crashes when you connect it to VR-Forces via an HLA connection	To prevent crashes in VR-Vantage when connecting with the HLA protocol, changed static bool needExtendedAttribute(const DtStateRepository& stateRep, in vrfExtObjects/extendedAttributeEncodeHLA.h to do a dynamic rather than static cast and check the return.	VR Link 5.9
VRL-414	Java crash on ExerciseConnection.close()	Fixed an issue that could cause crashes when running Java.	VR Link 5.9, VR Link 5.8.1
VRL-417	Java IFF - data type for myAircraftID is incorrect	Corrected the data type for myAircraftID in the Java API.	VR Link 5.9
VRL-424	File handles are not being closed when reading FOM and MIM in Exercise Connection	Made a fix to ensure that file handles are closed when FOM objects are deleted.	VR Link 5.9, VR Link 5.8.1, VR Link IPB16
VRL-436	Thread handles are being leaked	To resolve crashes when connecting to HLA Evolved, threads now close the thread handle when they are deleted.	VR Link 5.9, VR Link 5.8.1, VR Link 5.4.1g, VR Link IPB16
VRL-450	C# Code Generator has incorrect padding for "VariableDatumSet" parameter in Data interactions	Added octetBoundary functions for array and fixedRecord datatypes in C#. This allows those datatypes to dynamically find the octet boundaries of either the array element, or the largest field in a fixed record.	VR Link 5.9, VR Link 5.8.1
VRL-454	Update MAK-VRLExt FOM Module so its compatible with PitchRTI	The new MAK-VRLExt-2_evolved.xml FOM module supports the PitchRTI by including an interaction class table.	VR Link 5.9, VR Link IPB17
VRL-464	Default to use new experimental IFF in HLA Evolved	Updated all examples to load in the new IFF FOM modules and replaced any references to version 2.9 with version 2.0/3.0.	VR Link 5.9, VR Link IPB17

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix Version/s
VRL-475	Remove erroneous duplicate enumerated types from array data type areas in some MAK_RPR1 FOMs	Removed erroneous, duplicate enumerated datatypes.	VR Link 5.9, VR Link 5.8.1
VRL-487	Update VR-Link to use new VRF FOM Modules	VR-Link examples now load MAK-VRFAggregate-4_evolved.xml and MAK-VRFExt-9_evolved.xml by default, rather than the older versions.	VR Link 5.9, VR Link IPB17
VRL-497	Update Data Interactions Example API documentation	Added additional instructions to the setData example.	VR Link 5.9, VR Link IPB18
VRL-545	Typedef compiler warning in netnVariantStructs.h	Created MAK-VRFAggregate-6_evolved and renamed the attribute to ActivityDescription. This was required to keep it distinct from an attribute in the NETN_Aggregate class.	VR Link 5.9, VR Link IPB18
VRL-555	Change name of Activity attribute in VrfAggregateEntity class	Changed the VrfAggregateEntity class's "Activity" attribute to ActivityDescription so they do not collide to deconflict it from the NETN_Aggregate class's "Activity" attribute.	VR Link IPB19
VRL-579	Use MAK-VRFAggregate-6_evolved.xml in all examples	Updated the example and default connection settings for VR-Link applications to match VR-Forces.	VR Link IPB19
VRL-749	Unnecessary Print in backend console	Removed inadvertent info-level debug output which caused unnecessary console spam for the VR-Forces simulation engine.	VR Link 5.9

Feature List

Table 2. Feature List

Key	Summary	Release Notes	Fix Version/s
VRL-253	Add DIS Spy to VR-Link installation	DIS Spy is now included with VR-Link.	VR Link 5.9
VRL-338	NETN FOM Mapper	VR-Link—and therefore all MAK ONE products—now supports the NETN FOM (NATO Education and Training Network Distributed Simulation Federation Object Model) and uses it as the default FOM. It is an extension of the RPR FOM 2.0. (The old 2.0 publication will not work.)	VR Link 5.9, VR Link IPB17
VRL-368	DtObjectPublisher::tick should return a value to indicate if an update was sent	Changed the DtObjectPublisher::tick call to return a value, which allows users to know whether it resulted in a message being sent.	VR Link 5.9, VR Link IPB16
VRL-394	Add "spam" detection to VR-Link	Added a measure that detects when there is network spam, which can cause performance degradation. The application outputs a warning when the number of PDUs sent per second exceeds the threshold.	VR Link 5.9, VR Link IPB16
VRL-407	Installer should respect MAK_INSTALL_DIR environment variable	The VR-Link installer now respects the MAK_INSTALL_DIR environment variable when setting the default path for the install. For details on using this variable, please refer to the MAK ONE Installation Guide.	VR Link 5.9, VR Link IPB16
VRL-408	Deprecate RPR 1.0 and RPR 2 draft FOMS in VR-Link	VR-Link now supports the NETN FOM (NATO Education and Training Network Distributed Simulation Federation Object Model) and uses it as the default FOM. It is an extension of the RPR FOM 2.0. (The old 2.0 publication will not work.)	VR Link 5.9
VRL-419	Refactor IFF API	Refactored the IFF API (Identification, Friend or Foe). This provides improved support for the functionality in MAK ONE products, ensuring a more authentic representation of real-world IFF usage. For example, the simulation of Mode 5 is more accurate.	VR Link 5.9, VR Link IPB16
VRL-455	Minidumper Enhancements	DMP files now save automatically, even if users are unable to respond to the error message prompting them whether to save one. Callstack.log files, which populate with useful information when the needed PDUs are present in the ./bin64 directory.	VR Link 5.9, VR Link IPB17
VRL-456	MAK VR-Link weather classes/module	Created classes to support the METOC FOM for weather. Added extensions to the FOM to support weather features in MAK ONE applications.	VR Link 5.9, VR Link IPB17

Table 2. Feature List (continued)

Key	Summary	Release Notes	Fix Version/s
VRL-457	Add VR-Link HLA Support for Aircraft lighting	Added HLA support to enable VR-Vantage applications to display more aircraft lights.	VR Link 5.9, VR Link IPB19
VRL-458	VR-Link support for Airfield lighting	Added support for lighting at airfields.	VR Link 5.9, VR Link IPB18
VRL-459	Add VR-Link support for Maritime Lighting	Added support to enable VR-Vantage applications to display surface watercraft lights.	VR Link 5.9, VR Link IPB18
VRL-462	Create new NETN Ext FOM Module	Added extensions to the NETN FOM to support VR-Forces entity classes.	VR Link 5.9, VR Link IPB17
VRL-466	NETN FOM Mapper - Add support for MAK leaf classes	Added support for MAK extensions to the NETN FOM. These extensions include object classes and attributes.	VR Link 5.9, VR Link IPB18
VRL-467	NETN FOM Mapper - optional switch to publish MAK leaf classes	Added a function to the DtNetnFomMapper class, "setUseMakNetnExtensions(bool)". This flag defaults to "True" to publish that MAK extended NETN classes for the corresponding entity types. If this flag is set to "False", the NETN classes are used instead of the MAK extended classes.	VR Link 5.9, VR Link IPB17
VRL-468	IFF Interrogation/Interactive mode [HLA Evolved]	HLA Evolved support for interactive mode by adding API to send and receive Interrogation messages.	VR Link 5.9, VR Link IPB17
VRL-480	IFF Interrogation/Interactive mode [DIS]	DIS support for interactive mode by adapting the API created for HLA Evolved to send and receive Interrogation messages.	VR Link 5.9, VR Link IPB19
VRL-482	Add Lethal paramter to IFF Interrogation Interaction	Added a MAK_Interrogation subclass with an additional "Lethal" parameter with a Boolean datatype.	VR Link 5.9, VR Link IPB17
VRL-483	Create Autotests for the new IFF Interaction classes	Created autotests to check the new IFF Interaction classes.	VR Link 5.9, VR Link IPB17
VRL-499	METOC DIS Support	Added a new custom PDU type to transmit the METOC weather data.	VR Link 5.9, VR Link IPB19
VRL-500	Aerodrome DIS support	Added DIS support for Aerodrome and Runway features.	VR Link 5.9, VR Link IPB19
VRL-502	Create Autotests for the new IFF Interaction classes	Created autotests to check the new IFF Interaction classes.	VR Link 5.9, VR Link IPB19

Table 2. Feature List (continued)

Key	Summary	Release Notes	Fix Version/s
VRL-509	Add missing Aerodrome lights	Added additional light attributes to the MAK-Aerodrome-1_evolved.xml FOM Module and made the associated code changes.	VR Link IPB18
VRL-510	Update Aerodrome classes to use NETN FOM Mapper	DtAerodromePublisher and DtReflectedAerodromeListHLA classes now use the FOM mapper to get a list of object class handles that they should publish/subscribe, rather than having them be hard-coded.	VR Link IPB18
VRL-511	Update Runway classes to use NETN FOM Mapper	Added using the NETN FOM mapper for the DtRunwayPublisher and DtReflectedRunwayList.	VR Link IPB18
VRL-513	DIS Support for NETN attributes	Added new attribute records for NETN attributes to support DIS protocol.	VR Link 5.9, VR Link IPB19
VRL-516	Add NETN attribute autotests	Created autotests to check the new NETN attributes in testEntityObj.cxx.	VR Link 5.9, VR Link IPB18
VRL-521	Add Aerodrome attribute autotests	Created autotests to check the Aerodrome attributes in the new MAK-Aerodrome-1_evolved.xml FOM for HLA1516e.	VR Link 5.9, VR Link IPB18
VRL-522	[DIS] Add RPR 3.0 Lethal IFF Interrogation	This supports the improved IFF features in VR-Forces.	VR Link 5.9, VR Link IPB19
VRL-539	Add VR-Link Support for Emitter extensions	Added additional data to the RadarBeam class to support upgrades for the Javelin.	VR Link IPB19
VRL-556	Add additional Maritime lighting attributes	Added support to enable VR-Vantage applications to display more surface watercraft lights and control the intensities.	VR Link IPB19
VRL-561	Add VR-Link DIS Support for Aircraft lighting	Added DIS support to enable VR-Vantage applications to display more aircraft lights.	VR Link 5.9, VR Link IPB19
VRL-575	New function to find central MAK Log directory	All MAK ONE log and dmp files are now saved in a central location. The default is C:/MAK/logs, which you can change by specifying a different path using the MAK_LOG_DIR environment variable.	VR Link IPB19
VRL-578	Add VrfWeatherAreaIdentifier to all MAK METOC Classes	Updated MAK-METOC FOM module to give each MAK METOC subclass an additional VrfWeatherAreaIdentifier attribute, which is a UUID datatype. This supports VR-Forces, which requires an additional identifier to associate separate METOC objects with a single WeatherArea object.	VR Link IPB19
VRL-595	Add MAK Internal attributes to MAK_LandSurface class	Added additional attributes to the METOC extensions to cover features specific to VR-Vantage and VR-Forces.	VR Link IPB19

Table 2. Feature List (continued)

Key	Summary	Release Notes	Fix Version/s
VRL-600	Create "MAK_TimeAndDate" PDU	Added a PDU to support the new "MAK_TimeAndDate" object class in the MAK-VRLExt-3_evolved FOM Module. This object class allows MAK ONE applications to set the Date and Time of day for a simulation, the advancement speed, and a boolean to indicate whether the sun position should be locked to the observer or not.	VR Link IPB19
VRL-601	DIS support for emitter extensions	Added attribute records to support emitter extended attributes. (The MAK_RadarBeam class is defined in MAK-DER-1_evolved FOM module.)	VR Link IPB19
VRL-606	Add Ground Vehicle Lighting Record for DIS	Added support for ground vehicle lighting in DIS by creating an attribute record for the relevant attributes.	VR Link IPB19
VRL-607	Add Maritime AIS record for DIS	Added a DIS attribute record for the AIS data associated with surface watercraft.	VR Link IPB19
VRL-614	Move away from Java 8	VR-Link now uses OpenJDK 21 to build the Java libraries. Java 9 is the supported version.	VR Link 5.9
VRL-626	Add WeightOnWheels attribute to Physical FOM module	For HLA, added support for the Weight On Wheels attribute. (This is already supported in DIS.)	VR Link 5.9, VR Link IPB19
VRL-645	Implement Add and Remove Callbacks for WaitList in DtReflectedObjectList	Implemented Addition and Removal callbacks for the waitlist, which allows VR-Forces to be notified at the time an object is removed. This provides the ability to do cleanup of extended data and break associations.	VR Link 5.9
VRL-657	Change default Federation name to "MAK-One-2024"	To prevent FOM conflicts, the default federation name is now versioned to match the version of MAK ONE products that it's compatible with.	VR Link 5.9
VRL-677	Extend remaining Physical Entity classes to add UUID	Because VR-Forces now uses the NETN UUID attribute for most physical entity classes, we created subclasses to add UUIDs in the MAK-Physical FOM Module: MAK_Radio, MAK_Sensor, MAK_Expendables, and MAK_Supplies.	VR Link 5.9
VRL-689	Add higher levels of Memory dumping to DtMiniDumper	Added new enum DtMiniDumpType to easily organize what information is included in the dump files. Introduced new environment variables for outputting more information to the dump file: - MAK_MINIDUMPER_DUMPSIZE_MAX: Provides the most information in the dump file. This is large. - MAK_MINIDUMPER_DUMPSIZE_MIDI: Provides mostly useful information with it being a fraction of the size of max. In addition, changed the default dump type from TinyDump to MiniDump, which by default provides more useful information than the TinyDump.	VR Link 5.9

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-Link and other MAK ONE products, access the MAK ONE Product Support Knowledge Base:

<https://www.mak.com/knowledge>.

If the problem you are experiencing is not addressed in the knowledge base, contact support for assistance: <https://www.mak.com/mak-one/support/portal>.