



Modelica Association News

International Modelica Conference 2023
October 10th, 2023



2000 – 2023

Open, coordinated standards and software
for system simulation

since 1997




since 2010



Functional
Mock-Up
Interface

Most successful MA standard: Supported by 180+ tools

since 2019



System Structure
& Parameterization

since 2019



Distributed
Co-Simulation
Protocol

since 2021



Functional Mock-up
Interface for
embedded systems

since 2000

Modelica Conferences

15th  Conference



Modelica Language - Progress and Compatibility

Modelica 3.6 released March 2023

- 3 MCPs
 - Undefined Modification
 - Selective Model Extension
 - Multilingual Support
- 277 Pull Requests
- Talk on Wednesday by Hans Olsson



Hans Olsson
(project leader)

Future - Modelica 3.7:

- Attempts to standardize
 - Encryption
 - Base Modelica
- Many minor improvements
 - Units, synchronous
- Q&A on Thursday



Modelica Standard Library

Currently no project leader (temporarily: Martin Otter)

Last release: **4.0.0 in 2020**

Since Jan. 2023 by Modelon Engineering, India (funded by Modelica Association):
organize/help fixing issues/pull requests.

Since Sept 2023 by LTX (partially funded via UPSIM project):

Nightly regression tests for MSL

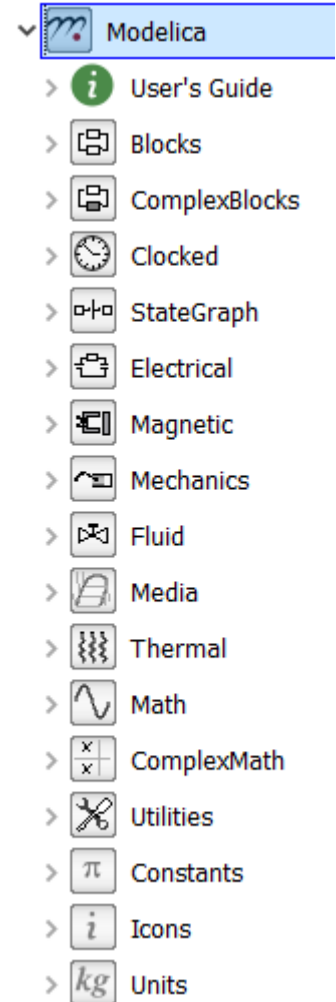
Goal is to automate the manual release tests


New main release planned: **4.1.0 in March 2024** (feature freeze: Jan. 2024)

Backward compatible release with bug-fixes and new features

(<https://github.com/modelica/ModelicaStandardLibrary/wiki/MSL-v4.1.0-release>)

Status: 91% complete (28 open, 308 closed)



- **FMI 3.0** released in 05/2022, **FMI 3.0.1** in 07/2023, fast adoption by **25+ tools**
- **FMI 3.0 implementers' guide** published in 03/2023
modelica.github.io/fmi-guides/main/fmi-guide/
- **FMI validation tools** available on fmi-standard.org/validation/
- **FMI compatibility information**
 - Replaces FMI Cross Check and is provided tools vendors
 - Participating tools are marked with  **Examples & Compatibility** and listed top on fmi-standard.org/tools/
- **Reference FMUs** on github.com/modelica/Reference-FMUs



Christian Bertsch
(FMI project leader)



Torsten Sommer
(Deputy FMI project leader)



Validate your FMUs

Whether you're exporting FMUs or troubleshooting a third party FMU - the following free tools help you to validate, test and debug your FMUs.



Altair Activate

by Altair

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0 21.0 22.0 23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0 31.0 32.0 33.0 34.0 35.0 36.0 37.0 38.0 39.0 40.0 41.0 42.0 43.0 44.0 45.0 46.0 47.0 48.0 49.0 50.0 51.0 52.0 53.0 54.0 55.0 56.0 57.0 58.0 59.0 60.0 61.0 62.0 63.0 64.0 65.0 66.0 67.0 68.0 69.0 70.0 71.0 72.0 73.0 74.0 75.0 76.0 77.0 78.0 79.0 80.0 81.0 82.0 83.0 84.0 85.0 86.0 87.0 88.0 89.0 90.0 91.0 92.0 93.0 94.0 95.0 96.0 97.0 98.0 99.0 100.0

★ Examples & Compatibility

Software environment for modeling, simulation and analysis of multi-disciplinary systems



MapleSim

by Maplesoft

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0 21.0 22.0 23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0 31.0 32.0 33.0 34.0 35.0 36.0 37.0 38.0 39.0 40.0 41.0 42.0 43.0 44.0 45.0 46.0 47.0 48.0 49.0 50.0 51.0 52.0 53.0 54.0 55.0 56.0 57.0 58.0 59.0 60.0 61.0 62.0 63.0 64.0 65.0 66.0 67.0 68.0 69.0 70.0 71.0 72.0 73.0 74.0 75.0 76.0 77.0 78.0 79.0 80.0 81.0 82.0 83.0 84.0 85.0 86.0 87.0 88.0 89.0 90.0 91.0 92.0 93.0 94.0 95.0 96.0 97.0 98.0 99.0 100.0

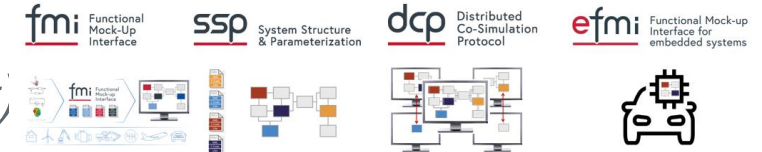
★ Examples & Compatibility

Modelica-based modeling and simulation tool from Maplesoft

FMI 3.0 is ready for usage now!

Agenda of “FMI User Meeting” on Tue, Oct 10

(Focus on the MA standards for model exchange and deployment)



- Welcome (5 Min., Christian Bertsch)
- **Status and outlook FMI Standard** (10 Min, Christian Bertsch)
- **Status and outlook SSP Standard** (5 Min, Pierre Mai)
- **Industrial user talks:**
 - Building Blocks for Simulation based Cooperation between Partners (15min, Hans-Martin Heinkel, Pierre Mai)
 - Linking Design Requirements to FMUs to create LOTAR compliant mBSE models (15min, Clément Coïc, Marcus K. Richardson et. al)
- **Status and Outlook eFMI Standard** (10 Min., Christoff Bürger)
- **General Q&A, Feedback and Ideas** (15 Min.)

Current development focus by the FMI Project

- **Layered standards** on top of FMI are currently in focus of development (→ talk on Wed, Oct 11)

In preparation by the FMI project:

- [FMI-LS-XCP](#): **XCP** support in FMUs
- [FMI-LS-BUS](#): **network communication** with FMI
- [FMI-LS-STRUCT](#): **multi-dimensional lookup tables** + parameter grouping
- **Work for FMI 3.1**
 - Focus on efficiency, especially when handling large binary or array data

FMI Design Meeting on Thu, Oct 12 (day after the conference)
open for guest – **get involved!**



- Release of Version 1.0.1 07/22
 - Minor clarifications in specification
- Introduction of SSP-Traceability as Standardized Layer
- F2F Planning Meeting 02/2023
 - Support for FMI 3.0
 - SSP for Architecture and Design of Virtual Systems
 - Additional Data
 - Simulation Control
- Next Steps
 - Deep Dive Sessions to finish open issues for new release 2.0 until end of 2022
 - Finalization of Release 2.0 planned for Q1 / 2024

News since last conference 2021

- **Website** in new MA design launched: <https://www.efmi-standard.org/>
 - Comprehensive introduction, and many newcomer resources
- **MAP eFMI Tool Releases:**
 - eFMI Container Manager (<https://github.com/modelica/efmi-containermanager>)
 - eFMI Compliance Checker (<https://github.com/modelica/efmi-compliancechecker>)
- **New Project Members:**
 - Altair Engineering Inc.
 - Institute of Vehicle Engineering CO LTD
 - Mercedes-Benz AG
 - Mitsubishi Electric Research Laboratories
- **eFMI® Tutorial at this conference** on Monday, Oct. 9
- **eFMI® forum at this conference**, open for guests, on Thursday, Oct. 12



Christoff Bürger
(project leader)

First commercial tool releases!

AUTOSAR Builder: IDE for modeling, testing and validation of in-vehicle embedded systems for the *AUTOSAR Classic & Adaptive Platforms*. Enables eFMI Production Code in AUTOSAR.

CATIA ESP: Embedded source code producer (ESP) on the 3DEXPERIENCE® platform. Enables generation of *safety-critical, realtime capable, MISRA C:2012 conforming* C code.

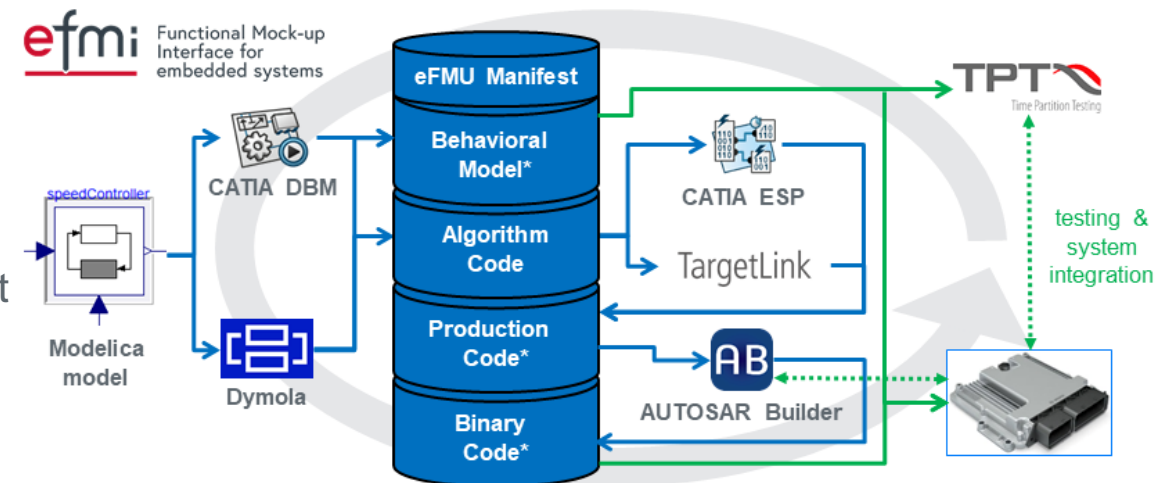
Dymola: Modelica IDE for the acausal, equation-based modeling and simulation of complex multi-domain physics. Enables generation of eFMI Algorithm Code from acausal controller and virtual sensor models in Modelica.

TargetLink: High-performance production code generator straight from *MathWorks® Simulink®/Stateflow®; ISO 26262, 25119 & IEC 61508 certified; AUTOSAR Classic & Adaptive Platforms* support. Enables generation of *safety critical, realtime capable, MISRA C:2012 conforming* C code.

TPT: Embedded software testing IDE (*MiL, SiL, PiL & HiL*); supports safety standards (e.g., *ISO 26262*), test assessment & requirements traceability. Enables eFMU *testing in most well-established automotive embedded ecosystems*.



Christoff Bürger
(project leader)





Project leader:
Christoff Bürger



Deputy project
leader:
Hubertus
Tummescheit



<https://efmi-standard.org/>

American Modelica Conference 2024

October 14-16, 2024

Storrs, Connecticut

Organized by:

NAMUG

UConn (local Organizer)

Modelica Association



UConn Innovation Partnership Building

The North America
Modelica Users'
Group

UConn

The logo for the Modelica Association, featuring a stylized 'm' with a red dot above it, followed by the text 'Modelica Association'.

Other Modelica conferences

- **Asian Modelica Conference 2024**

Recent proposal from iVH

Nov. 21-22, 2024 in Seoul, Korea

(not yet decided)

- **16th International Modelica Conference 2025**

No application yet.

If you would like to organize it (in Europe),
please contact board@modelica.org

Large Research Projects

2018 – 2021

ITEA project: **MOSIM**

Modular Simulation of Natural Human Motions

Budget: **10 Mill. Euro**

Leader: Thomas Bär (Daimler Buses)

2020 – 2023

ITEA project: **UPSIM**

Unleash Potentials in Simulation

Budget: **16 Mill. Euro**

Leader: Martin Benedict (Virtual Vehicle)

2018 – 2021

French project: **ModeliScale**

Modelica for large scale Cyber Physical Systems

Budget: **5.5 Mill. Euro**

Leader: Patrick Chombart (Dassault Systèmes)

2021 – 2024

German project: **PHyMoS**

Proper Hybrid Models for Smarter Vehicles

Budget: **4.5 Mill. Euro**

Leader: Oliver Lenord (Bosch)

Nov. 2023 – Oct. 2026 (formal approving soon expected)

ITEA Project: **OpenSCALING**

Open standards for SCALable virtual engineeriNG and operation

Budget: **10 Mill. Euro**

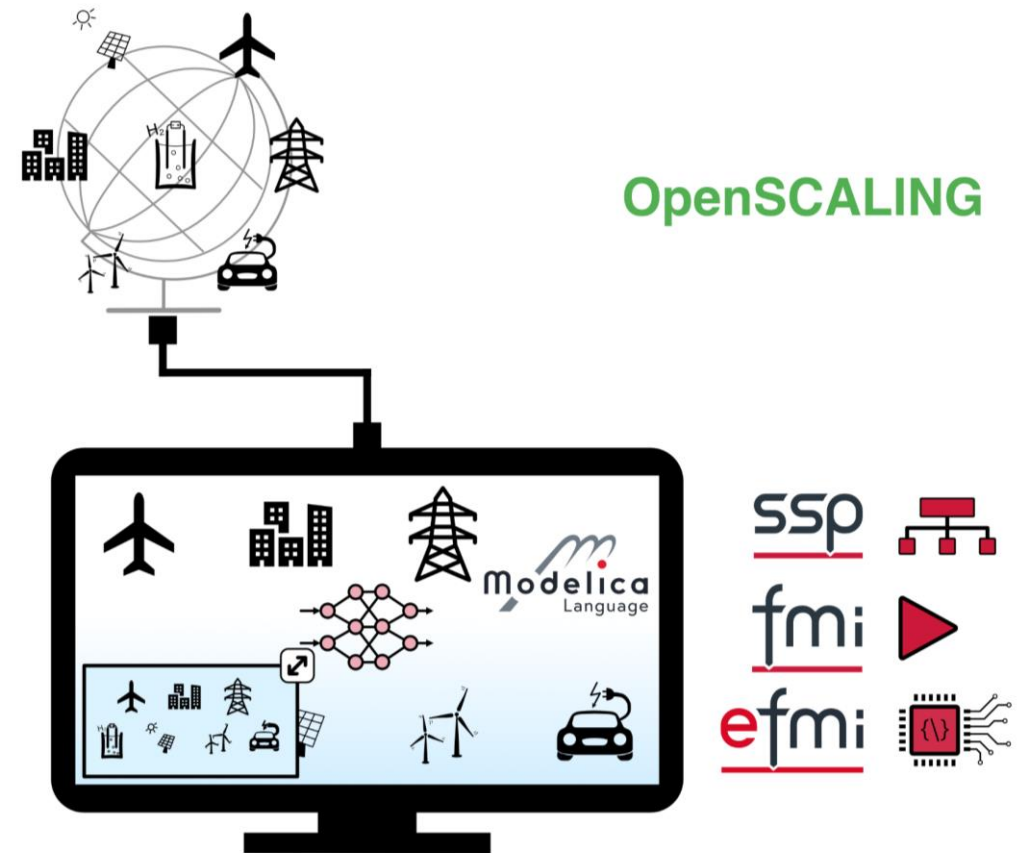
Leader: Oliver Lenord (Bosch)

Goal:

Improve MA standards with respect to

- Large Scale System Models
- Uncertainty Quantification
- Physically enhanced Neural ODEs
- Large Scale System Workflows

Industrial demonstrators in
energy, building, aviation, automotive domains
to reduce net greenhouse gas emissions



Contact: Oliver Lenord (Bosch), Martin Otter (DLR)

Current Modelica Association Board



Chair	Martin Otter
Vice-Chair	Martin Sjölund
Secretary	Michael Tiller
Treasurer	Jonas Eborn
Marketing	Hubertus Tummescheit
Quality and Processes	Francesco Casella
Technology	Torsten Blochwitz
Modelica Language	Hans Olsson
Modelica Libraries	Martin Otter (temp./vacant)
FMI	Christian Bertsch/Torsten Sommer
SSP	Jochen Köhler/Pierre Mai
DCP	Klaus Schuch
eFMI	Christoff Bürger/Hubertus Tummescheit

Modelica Association Board and Modelica Association Backoffice meets once every month

Modelica Association Backoffice – operated by



backoffice@modelica.org

Organized electronic votings on 5 standardization decisions and 3 new organizational members:

- BOEING
- ADC
- Shanghai Formal-Tech

Some of the activities at MA Backoffice:

- Websites redesign
- Invoicing organizational members
- Support conferences (Proceedings, Marketing)
- Prepare Annual Assembly Meeting
- Member administration (onboarding of new members)
- Filing of CLAs
- MA Merchandise: Spreadshirt-Shop online
- MAP Lib: MSL Testing



Sonja Gall
(contact person)



Leo Gall
(Board contact)

Ester Porcellato
(Websites, merchandise)
Matthias Schäfer
(MAP Lib testing)
**Luis Mariano de
Alejandro Villareal**
(Conference Proceedings)

YouTube



LinkedIn



Merchandise at Spreadshirt



Modelica Association Spreadshirt Shop with T-Shirts, hoodies, coffee cups and stickers

<https://ma-merch.myspreadshop.de/>

Product Preview



modelica Favicon black - Men's
Organic T-Shirt
20,99 €



modelica Favicon black - Women's
Organic T-Shirt
20,99 €



modelica Favicon white - Men's
Organic T-Shirt
20,99 €



modelica Favicon white - Women's
Organic T-Shirt
20,99 €



modelica Favicon white -
Stanley/Stella Unisex Organic Hoodie
38,99 €

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Thanks very much for making
this conference possible



TLK ENERGY



WOLFRAM



BOSCH

Invented for life



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Coordination of open standards and software does cost money. If you want to support the activities/projects with your company, please consider becoming a **Modelica Association organizational member**.

Meet the MA project leaders for a coffee break booth!



fmi:

Christian Bertsch

Tuesday 10:20 am – 10:35 am (@LTX booth)



efmi:

Christoff Bürger

Tuesday 10:20 am – 10:35 am (@LTX booth)

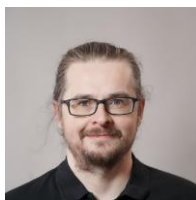
Wednesday 09:15 am – 09:30 am (@ DS booth)



Modelica Language:

Hans Olsson

Tuesday 03:00 pm – 03:30 pm (@LTX booth)



dcp:

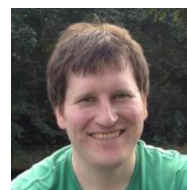
Klaus Schuch

Tuesday, 10:20 am – 10:35 am (@LTX booth)



Modelica Libraries:

Please talk to **Martin Otter**, if you are interested in Modelica Libraries.



Additionally, **Leo Gall** could give some more infos on Modelica Libraries.