



Texas Instruments Elevates Code Composer Studio™ with Eclipse Theia

Case Study

Texas Instruments' (TI) Code Composer Studio™ (CCS), a trusted integrated development environment (IDE) for embedded TI processors, has long been central to real-time application development. With the latest version of CCS, TI made a strategic shift by adopting the [Eclipse Theia](#) framework, introducing a modern, web-based architecture. This transition enhances flexibility, future-proofs development workflows, and supports both desktop and cloud environments for embedded systems.



Meeting the Challenges of Modern Embedded Development



Embedded systems require highly specialised tools that can handle the complexities of real-time development, debugging, and optimisation. For years, Code Composer Studio has met these needs across TI's microcontroller, processor, wireless connectivity and radar products. By transitioning to Theia, CCS now addresses the evolving developer requirements, offering a streamlined, cloud-ready IDE for both local and remote development.

A key innovation is the dual deployment model. On the [download page](#), users can either download an installable desktop version or launch the cloud-based version directly. Both provide the same features, highlighting Theia's ability to support both desktop and cloud-based development simultaneously. The cloud-based version even connects seamlessly to local hardware, auto detecting

boards and demonstrating the flexibility of Theia in handling both local and remote development environments.

Moreover, the web-based CCS is fully integrated into the TI online ecosystem, streamlining workflows by allowing users to search for devices, explore example projects, and more.

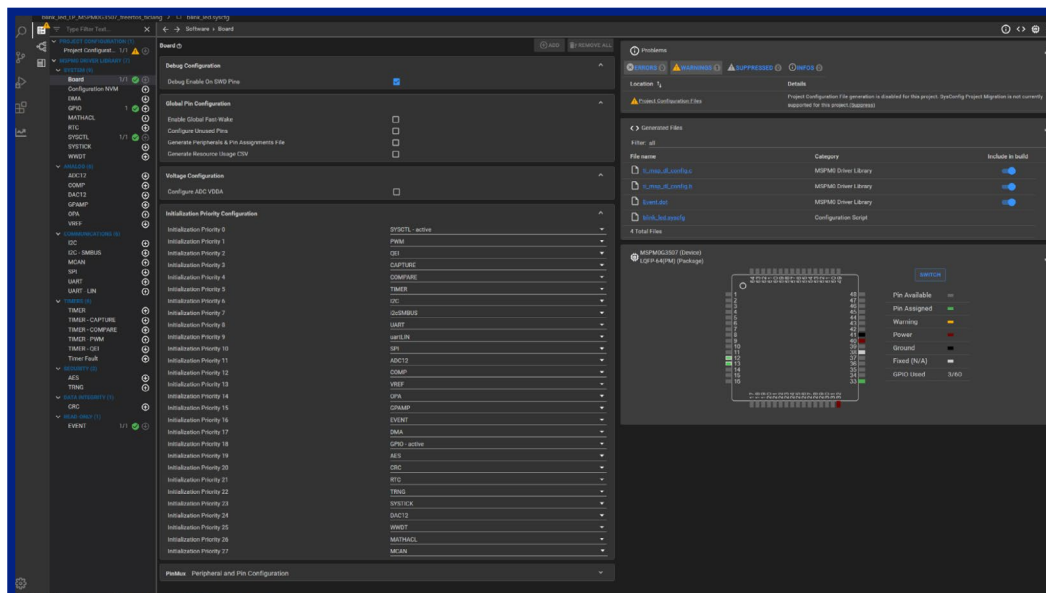
Powerful Features, Enhanced Flexibility



Whether on the desktop or in the cloud, CCSv20 maintains critical capabilities such as real-time debugging, performance analysis, and optimised compiler support while leveraging Theia's advanced customisability to deliver a smooth, tailored user experience.

CCSv20 features custom views — like the EnergyTrace™ view or advanced configuration view, SysConfig (see screenshot below) — leveraging the flexibility of the

Theia platform to provide a specialised experience for domain-specific use cases, such as embedded development.

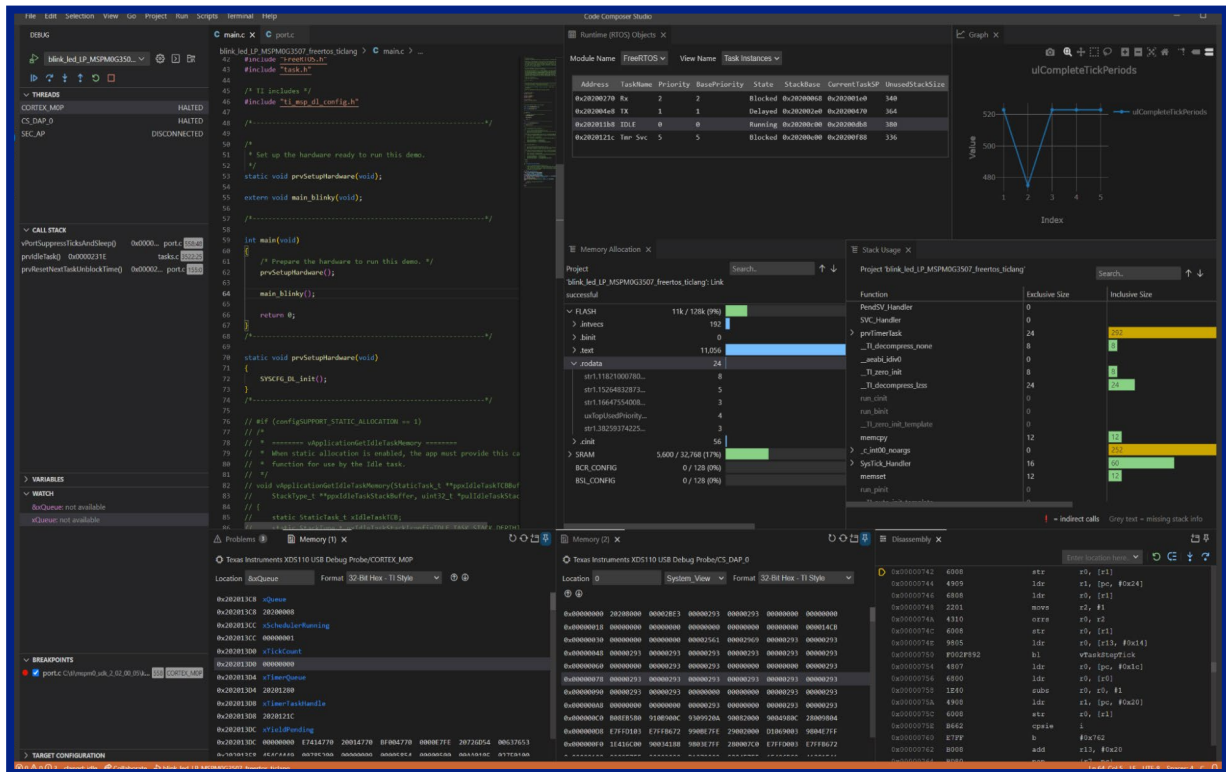


Advanced configuration view (SysConfig) in Code Composer Studio v20

Key Innovations for Developers

Building on Theia, Code Composer Studio introduces a host of advanced features that streamline development for embedded systems:

- Optimised C/C++ Compiler:** Developers benefit from real-time feedback and powerful code optimisation specific to TI's hardware, with the ability to integrate Theia's extensions and workflows for an even more tailored experience.
- Integrated Debugging:** One of CCS's most critical functions, real-time debugging, has been improved with Theia's customisable architecture, providing powerful visualisation tools to easily monitor performance and troubleshoot bottlenecks.



The tailored debugging views in Code Composer Studio v20

- Cloud-Enabled Development:** The web-based framework allows developers to access CCS from anywhere, eliminating the need for bulky installations and enabling remote collaboration.
- For more insights about CSS v20 Theia, [check out this video](#) for a great demonstration of the tool in action:

Why TI Chose Eclipse Theia



TI's decision to adopt Eclipse Theia as the foundation of its new IDE architecture highlights several strategic benefits:

- **Dual Flexibility:** Theia's architecture allows CCS to operate as both a desktop and cloud-based tool, facilitating remote development, faster deployments, and future scalability.
- **Customisable UX Design and Tool Creation:** Theia's modular architecture lets TI design a user experience (UX) that's tailored to the specific needs. This allows TI to build custom workflows and interfaces, ensuring that their tool fully supports the unique requirements of embedded development without being constrained by external limitations.
- **Future-Proof Technology:** The shift to Theia ensures that CCS remains sustainable and capable of integrating new technological advancements. It positions the tool as a forward-thinking solution in embedded development, adapting to the rise of web-based IDEs without sacrificing the power of traditional desktop tools.
- **Seamless Integration with TI Ecosystem:** CCS continues to offer seamless integration with TI's hardware platforms, from microcontrollers to high-performance processors. The flexibility provided by Theia allows for a more customised and efficient development environment, adapting to the needs of various TI product lines.
- **Full Control over the Tool:** Thanks to Theia's commercially friendly license and vendor-neutral governance, TI retains full control over their tool's evolution. The modular nature of the Theia platform allows for deep customisation without the need to fork the core codebase, providing flexibility and autonomy for future innovation.
- **Easy Migration:** CCS projects are compatible with previous versions enabling a smooth migration to Theia.

A Collaborative Success in the Eclipse Ecosystem



TI has long been a key player in the Eclipse ecosystem. Building on its previous contributions to [Eclipse CDT](#) (C/C++ Development Tooling), TI's adoption of Theia further strengthens this relationship, making them a valued part of the Theia community. Code Composer Studio Theia also adopts CDT for certain parts of the tool, allowing for cloud-based C/C++ development capabilities. The community is pleased to see TI continue this tradition, enhancing Theia with valuable insights and feedback.

Conclusion

By transitioning Code Composer Studio to Eclipse Theia, TI is shaping the future of embedded development tools. This modernised IDE, available for free with no licensing fees, provides developers with a robust, cloud-ready platform that meets the demands of today's and tomorrow's embedded real-time systems. TI's embrace of Theia ensures that Code Composer Studio remains a leader in embedded development, offering the flexibility and power that engineers need to innovate.



Get Involved in the Eclipse Theia Community

The diverse and vibrant Eclipse Theia community is actively building on a stable and robust platform, and warmly invites everyone with an interest in Theia to join the community. All areas of interest are welcome, from strategic to technical to user experience. To help members share insights, expertise, and experiences, the community hosts an annual virtual conference called [TheiaCon](#).

To learn more about Eclipse Theia and get involved:

- Read more about [Eclipse Theia](#) and its [features](#)
- Read adopter stories from [Arduino](#) and [logi.cals](#)
- Download [Theia IDE](#) to explore Theia's capabilities
- Join the [weekly developer call](#)
- Join the [Eclipse Theia community on GitHub](#).

For more information about the Eclipse Cloud DevTools ecosystem:

- Visit the [working group website](#)
- [Contact us](#) about membership



About the Eclipse Foundation

The Eclipse Foundation provides our global community of individuals and organisations with a business-friendly environment for open source software collaboration and innovation. We host the Eclipse IDE, Adoptium, Software Defined Vehicle, Jakarta EE, and over **420+** high-impact open source [projects](#).

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