

New Industrial Ethernet Protocol: CC-Link IE Field Basic



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There are a multitude of industrial protocols to handle communication between devices for Industry 4.0. One new protocol designed to connect your factory floor is CC-Link IE Field Basic, and TI just added support for it on Sitara™ processors.

The CC-Link family comprises deterministic open-architecture network protocols that enable communication between devices from numerous manufacturers, much like other popular protocols such as PROFINET and Ethernet/IP. [Figure 1](#) illustrates typical applications for the CC-Link family. In this blog post, I'm only going to focus on CC-Link IE, which contains the industrial Ethernet (IE)-based members of the family.

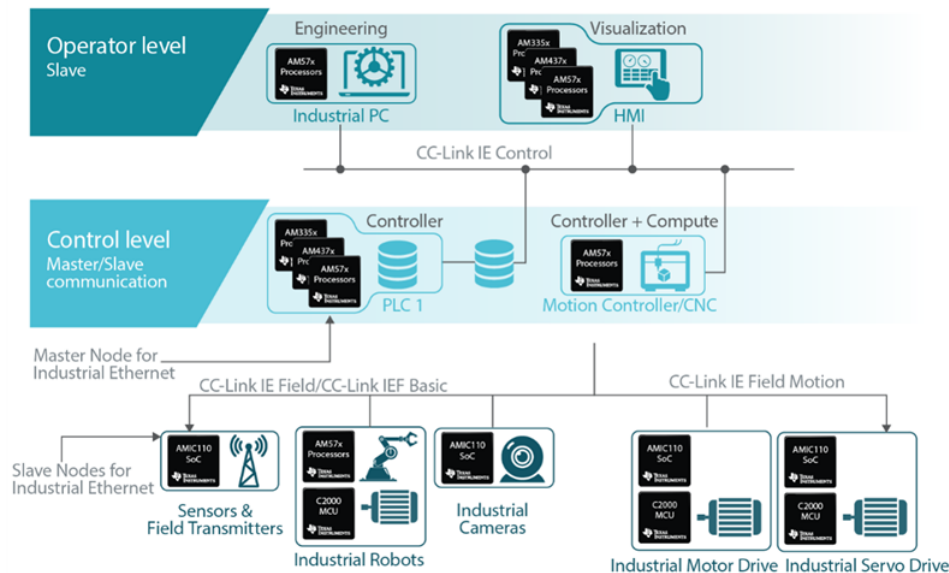


Figure 1. Typical CC-Link IE Use Case

CC-Link IE offers 1Gbps communication in a star, line, mixed star and line, or ring setup, and comes in five different versions: CC-Link IE Control, CC-Link IE Field, CC-Link IE Field Basic, CC-Link IE Field Motion and CC-Link IE Safety.

CC-Link IE Field Basic (CC-Link IEF Basic) is implemented through software alone and does not require a specialized media access controller (MAC). CC-Link IEF Basic enables CC-Link IE’s deterministic network capabilities on existing devices with 100Mbps Ethernet ports. This means that you won’t have to make any hardware changes, including rewiring, to your existing system.

Since CC-Link IEF Basic operates on a 100Mbps port and is a pure software solution, you’ll lose the 1Gbps speeds of CC-Link IE and be limited to a star topology. However, you will gain the flexibility of bringing CC-Link IE to many more applications.

CC-Link IE Field Basic on TI Devices

TI’s latest reference design for industrial communications, the [CC-Link IE Field Basic Master and Slave Reference Design](#), makes use of the programmable real-time unit-industrial communication subsystem (PRU-ICSS) to showcase the Sitara device portfolio’s ability to run both the master and the slave station communications for CC-Link IE Field Basic. Although the reference design highlights the ability to run CC-Link

IEF Basic on the PRU-ICSS, it can also run on the standard Ethernet (common platform Ethernet switch) ports available on the processors; TI validated both ports through testing with the CC-Link IE Field Basic conformance tool. The reference design employs the PRU-ICSS because it was designed to handle multiple industrial communication protocols all on the same device. This design is part of TI's processor software development kit (SDK), for both [TI-RTOS](#) and [Linux](#), and can run on any Sitara device including the AM57x, AM437x and AMIC110, in addition to the AM335x in the reference design.

How will you use CC-Link IE Field Basic in your design?

Additional Resources

- Access free software for the reference design for your preferred Sitara device through the [Processor SDK](#).
- Order the [AM3359 Industrial Communications Engine \(ICE\) development board](#) used in this design for \$189.

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