



Choosing Which Bus to Ride - BBB (Borrow)

Automation Network Selection by Dick Caro

Reviewed by Nick Sands

If you are working on the design of a new control system or an upgrade from an older control system, this book is a must read. Dick Caro, former chairman of the ISA SP50.2 (Fieldbus) committee is very knowledgeable and able to explain the features of the different automation networks, such as Fieldbus, DeviceNet, and AS-interface, so that many engineers with limited network experience can understand. The book is very much technical in nature, so the plot is thin, but the network information and history make it a quick read. (BTW, WISA's own ISA Fellow Cullen Langford chaired the Fieldbus committee for many years and is credited in the first chapter of this book.)

Caro's intent, at which I believe he succeeds, is to lay before the user the enough information to help them understand the features of the various networks and the decision making process. First he has to educate a reader (like me) enough to follow the rest of the book. This introduction to industrial networks covers such basics as the ISO/OSI seven layer model for network protocols (you will find yourself later noticing the same physical layers in several different networks), and the difference between a sensor bus, which transmits simple I/O, a field bus, which allows distributed configuration and intelligence, and a control network, which is used to connect multiple control systems and exchange large amounts of data. The author also explains some of the common terms, such as deterministic and latency, used to describe networks and the trend in OPC for data servers and clients.

The meat of the book begins in the network application section, where the author gives examples of typical applications for networks, and discusses the different networks that are suitable and why. He starts with the simplest application, a sensor network for several discrete devices like solenoids or position switches, and works through many other control applications like chemical processes, motor control, HVAC systems, and elevators. It is very interesting to learn how the features of a network meet the needs of the different applications. In some cases the network of choice is the network that is available as certain networks are supported more broadly by certain vendors. After reading this section the user has a better feel for the technology and an understanding of the author's position that there is no one network that does it all, not because of technology but because of politics.

The last big section of the book takes a different approach to the network selection question by giving the details of each network, including the physical layer and many features of the protocols. By necessity some of this information repeats that of the application section, but here the author give more detail on the history of each network, its development, its features, and a guess at its future.

This book does explain the features of automation networks, and help the reader understand the differences and how to make a selection, which is exactly what the author hoped to accomplish. It is a bit repetitious in places, but that is almost unavoidable given the topic. The main disadvantage for this book is that the audience is limited and the information may be out dated in a couple of years by changes in industry offerings. The book is not inexpensive at \$42, (ISA Member price) but if you can read the book without buying it, there are more timeless books available. For these reasons, I rate the book a borrow (BBB).