

James Powell, P. Eng.

The benefits of a three-horse town: HART, Profibus, and Foundation Fieldbus

If you want to make it to the finishing line quickly, you need a fast horse. To make top times, however, it helps to have two or more high performance horses in the race. Competition brings out the best in performance, and nowhere is this truer than in the world of industrial protocols.

Currently the "Big Three" open digital protocols in process automation, HART, Profibus, and Foundation Fieldbus, are competing against one another. The fact that there are three open "standards" has often been seen as negative – would it not be beneficial to have just one standard? From a manufacturer's perspective, it would slash development costs considerably.

Competition, though, is a basic element of any free market economy. Competition ensures that customers pay the lowest possible price for the highest quality of goods and services. By forcing businesses or protocols to compete for customers, competition makes them more efficient, resulting in more innovation and improved quality. So, from an end

user's perspective, it is best to have these competing protocols.

Choices, Choices

Foundation Fieldbus uses the marketing message "Freedom to Choose." If there were just one open protocol, then end users would not have this freedom. They would not be able to evaluate the three protocols and decide which one best fits their applications. This selection provides an essential element of freedom to users.

Out of the three, HART – as the oldest communications protocol – is the easiest to use and has basic functionality but generally lacks automatic connection to the automation system. In contrast, Profibus is a complete solution with

high functionality and ease of use, meeting customers' automation needs from drives to instruments. Finally, Foundation Fieldbus, which is aimed at instrumentation, has moved control into the field. Of the three protocols, it has the highest functionality but is also the most complex – and the most expensive.

The choice of protocol really depends both on the application and the end user. An end user who is comfortable with HART might be frustrated by the complexities of Foundation Fieldbus. Likewise, someone who is comfortable with Profibus might be frustrated by the missing features in HART. Each protocol offers different features that will appeal to different users and applications.

The Benefit of Open Protocols

Open protocols have the benefit of not being proprietary and therefore many vendors can have input into their development. If there were only a single protocol available, the end user would be subject to the risk of politics within the governing body and good ideas could be lost.

To paraphrase the old saying, competition really does keep all groups on their toes, and if one group ignores a market segment, you can bet the other will not. Once a good idea is designed into one protocol, chances are that users of competing protocols will recognize its value and begin demanding it.

Despite their fierce competition, however, these three protocols have a great deal of interplay between them and cross-pollination occurs on a regular basis.

For example, for Foundation Fieldbus, interoperability was a recognized problem – one from which Profibus did not suffer. Foundation Fieldbus listened to the demands of its end users who requested the ability to place instru-

ments in protocol with other types of instruments and began working to fix this problem. The fact that Profibus was better at this functionality initiated changes at Foundation Fieldbus to prevent customers from jumping onto the Profibus bandwagon.

On the other hand, from the time it was launched, Foundation Fieldbus has had great device identification. Users benefited from this feature and encouraged Profibus to include it, which they have. Essentially, both protocols have improved due to their ongoing competition.

In fact, even the old dog HART has learned some new tricks from the other two protocols. Through increased testing standards, HART has dramatically improved its testing regimens with the release of HART 7.

And what might HART have to teach the others? HART was the first to use Electronic Device Descriptions (EDD) for accessing configuration and diagnostic data in field devices. Both Profibus and Foundation Fieldbus later adopted the same method, and since then, all three protocol groups have worked with each other to extend the EDD standard.

A Three-Horse Town

We have seen that having three competing communications protocols represents substantial benefits passed on to the consumer. Typically in the process instrumentation industry, however, HART, Profibus, and Foundation Fieldbus versions of a new product are released consecutively, spread out over the course of two or more years. This interval means that a large part of the market is not being served for a few years.

When Siemens began developing the world's first 78 GHz radar transmitter for solids level measurement, they



Figure 1: Monitoring facilities from the control room with industrial communications networks.



Figure 2: Siemens Sitrans LR560, the first transmitter to be released with all three communications protocols – also the first 78 GHz radar transmitter for solids level measurement.

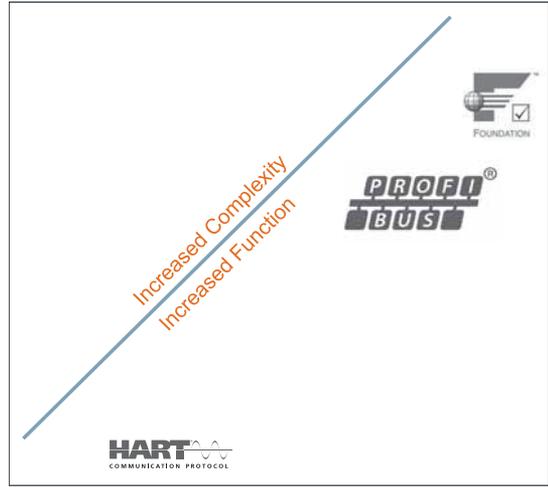


Figure 3: Diagram showing the range of communications protocols based on functionality and complexity.

wanted their entire customer base to have access to this revolutionary new instrument. In February 2011, the Sitrans LR560 was released with all three protocols available supporting Simatic PDM, AMS, and FDT such as PAC-Tware and Fieldcare. This is indeed a rare event and sets the bar exceptionally high for others to follow.

“As Siemens, we were able to reap the benefits of our vast amount of industrial communications expertise available in all three protocols,” commented Robert Brown, R&D Manager for Software in Peterborough, Canada.

It has become clear that we are now living in a three-horse town: HART, Profibus, and Foundation Fieldbus are here to stay. This competition will serve customers well, driving new innovation and making best practices the industry standards.

Siemens AG
 Industry Sector
 Sensors and Communications
 76181 KARLSRUHE
 GERMANY

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