



A Display Worth A Thousand Words - BBBBB (Bonus)

The High Performance HMI Handbook

By Bill Hollifield, Dana Oliver, Ian Nimmo, and Eddie Habibi

Reviewed by Nick Sands

Once there was an empty place on the bookshelf waiting for HMI books. Now that place is getting crowded. One of the new books is The High Performance HMI Handbook by Bill Hollifield, Dana Oliver, Ian Nimmo, and Eddie Habibi. Hollifield, a principal consultant at PAS for 7 years with 27 years at Union Carbide and Dow, has a BS in Mechanical Engineering from Louisiana Tech and an MBA from the University of Houston. Oliver, also a PAS principal consultant with 18 years of chemical industry experience including Honeywell and Union Carbide, has a ME degree from Texas A&M University and is a member of the ISA 101 committee. Nimmo, president and a founder of User Centered Design Services, served 10 years as a senior engineering fellow with Honeywell, was a founder and program director for the Abnormal Situation Management Consortium, and worked for 25 years for Imperial Chemical Industries in the UK. He has an electrical and electronic engineering degree from Teesside University. Habibi, the CEO and founder of PAS, has an engineering degree and an MBA, and has previous experience at Schlumberger and Honeywell.

In the introduction the authors state an important warning: HMI design can be a touchy subject. Many people resist changes to their displays. The problems with many current HMIs evolved with the technology. Good practices were developed for panel boards. The same practices were applied to DCS displays, with controller groups and process lines in different colors replicating panel or P&IDs. Some systems offer 3D shapes, animated motors, and dancing flames. The authors highlight these as examples of bad practices. An airplane HMI is given as an example of what is possible in an HMI. Some of the characteristics of a high performance are listed, including good navigation, display hierarchy and limited use of color.

The first step, of the authors seven step process, is to adopt an HMI philosophy that documents the design principles and a style guide with the implementation details for a specific control system. The authors rail against the use of P&ID like representations of the process in displays and the use of too many numbers and too few trends. Indicator bars and profile lines are recommended. The practice of mostly gray scale graphics is one that often generates resistance. The authors provide many specific recommendations for displays. They also provide specific examples of the level 1 through level 4 displays in their recommended hierarchy, which is essential to the high performance HMI. The second step is to assess and benchmark the existing graphics against the philosophy.

The next two steps are to determine specific performance objectives for the control of the process and to perform task analyses to identify the control actions needed to achieve the objectives. This information is used in step 5, the design and implementation of the displays, using the philosophy and style guide. Step 6 is to commission the displays and complete training. The final step is to continue to reassess and maintain the HMI performance. Beyond this process, the authors provide guidance on control room design and the layout for the operator consoles. The goal of the well designed HMI is to increase the operator's situational awareness.

The book is well designed for the subject, with many color illustrations to show the do's and don'ts of displays. The authors, though they advocate gray scale, often state black and white views on HMI design. Still, The High Performance HMI Handbook is an excellent practical guide to a better operator interface with just a few extreme views in the mix and only a little sales pitch in the appendix. HMI design is an important part of every control system and this book is a must for every automation professional (BBBBB). It is available from Amazon for ~\$130.