



## Process Control HMI Upgrades

Application Note

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### **General Description**

Automotive Powertrain facilities make engines, transmissions, transaxles, and CV joints utilizing highly complicated automated manufacturing lines. These lines fabricate, move and assemble a wide assortment of components –ranging from minuscule screws and springs, to large machined transmission cases and engine blocks –utilizing a complex integration of material-handling technologies, robotics, CNC machines, sensors, and control logic. The human-machine interface (HMI) is the focal point for system designers to implement operating commands, change configurations, monitor manufacturing performance, alarm system malfunctions, and perform diagnostics. A typical Powertrain manufacturing system has as many as 65 HMI's on a single production line.



### **Problem**

When considering total system availability, production cycle time, tool wear, or system diagnostics, the HMI is a critical component. When HMI's become obsolete and can no longer be supported or serviced, they must be replaced. The cost of HMI replacement is much more than the initial hardware price. It also includes the cost of HMI mounting, application programming and debugging of the new displays with the control logic, and training of line operators and the skilled tradespeople that perform system maintenance.

### **Solution**

When the Ford Van Dyke facility decided to replace 46 older PanelMate HMI's, like those originally supplied through C-H or Modicon, they carefully evaluated all the HMI's on the market today. Ford concluded that the C-H PanelMate Power Pro HMI units represented the lowest total replacement cost -- by a wide margin. The underlying reason for their conclusion stems from the C-H philosophy to maintain product compatibility and upgradability with new model introductions. In Ford's case, the new Power Pro units maintain the original form factor, eliminating panel fabrication costs. In addition, all the original application software can be reused, minimizing both the configuration efforts by Ford and the total conversion time.

Yet, Ford can implement advanced software enhancements that are standard Power Pro features. Because the final, upgraded, installation maintains the same look and feel as the original, training of the operator's and maintenance technician's was also nearly eliminated. In the end, Ford chose C-H above all HMI competition.

**For More Information**

For additional application details and a Ford reference, contact:

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**Summary**

This project saved Ford \$156650, or \$2610 per HMI. See details below.

Cutler-Hammer Upgrade Fixed Cost:	Competition Upgrade Dept. Cost:	Cutler-Hammer Savings Fixed Cost:	Dept. Cost:	Fixed Cost:	Dept. Cost:
No Fixed cost application software is upward compatible.	60 units - 1/2 hour per unit (worst case) to convert old application software version to new version. Skill set to do upgrade: Engineer 60 x 1/2 x \$125.00 = \$3750	40 hours to create a standard for Operator Interface Application on new system. Skill set to do upgrade: Engineer 40 x \$125.00 = \$5000.00	60 units - 16 hours to create specific application per unit. Skill set to do upgrade: Engineer 60 x 16 x \$125.00 = \$120,000	\$5,000	\$116,250
No cost because New PanelMate units fit in old cut-outs.	60 units - 1 hour to uninstall old PanelMate and Install new PanelMate and download application. Please note: PanelMate units do not require enclosure modification Skill set to do upgrade: Electrician 60 x 1/2 x \$60.00 = \$1800	16 hours for planning of Enclosure Modification required for new unit and unit installation. Skill set to do upgrade: Engineer. 16 x \$60.00 = \$960.00	60 units - 4 hours to uninstall old unit and install new unit. Main reason for delay is caused by Enclosure Modification required for new unit. Skill set to do upgrade: Electrician and Fabricator to modify panel cutout. 60 x 4 x \$60.00 = \$14,400	\$930	\$12,600
No time - Same system		Operator Training Class Onsite 26 operators 3 shifts - 4 hours to train operator on new system and application. Cost of 3 Class = \$3600.00 26 x 4 x \$50.00 = \$5200.00		\$8,800	
No cost: Software is similar to previous version Formal Class not Required	6 Electricians - 2 hours to review upgrades to development software. System still based on original concepts in 1986 version. 6 x 2 x \$60.00 = \$720.00	6 Electricians - 3 days for a Operator training course Onsite Note: cost covers engineer Cost of Class = \$3600.00 6 x 24 x \$60.00 = \$8,640		\$7,920	
No cost: Software is similar to previous version Formal Class not Required	2 Engineers - 2 hours to review upgrades to development software. System still based on original concepts in 1986 version. 2 x 2 x \$125.00 = \$500	2 Engineers - 3 day class Note: Class cost covered in Electrician training 2 x 24 x \$125.00 = \$6000		\$5,500	
			SUB TOTALS	\$28,150	\$128,500
			TOTAL		\$156,650