# HUMAN MACHINE INTERFACE (HMI) FOR TROUBLESHOOTING & SAFETY

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**ARTICLE TAKEAWAYS:**

- Use your HMI for troubleshooting to cost effectively get your equipment up and running
- Increase operator safety with HMI
- HMI is easily justified for small to large systems

"It's a simple machine just use buttons, switches and pilot lights" – old thinking that has been replaced with Human Machine Interface (HMI) for many important reasons. HMI has become the standard interface for operator control on new and upgraded plant equipment and process control systems. Simply, a HMI is a central control system that communicates operator inputs and receives real time data and feedback from a PLC logic controller.


A HMI provides an important visual of what is going on inside the control system. In addition to being very user friendly, it can increase productivity, make troubleshooting easier, and provide increased safety to the operator.

Their use can be as simple as replacing push buttons, selector switches, pilot lights, timer and counter displays, to displaying machine status and process flow of products moving down assembly line. HMIs record important production information including cycle counts, times, and recipes for different processes. Entering data to change all sorts of equipment parameters and getting feedback from that information and then applying that information is easily accomplished with HMIs.

It is also an easy way to see multiple events in real time. Machine faults and alarms can be displayed and history can be recorded. Alarm messages can be simple or detailed. Help screens can be added that can detail startup and shutdown instructions which are very helpful when you have operators that work on many different machines.

**Troubleshooting**

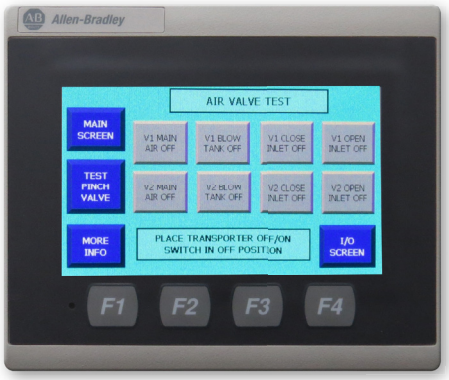
All operators appreciate HMIs for their ability to run the machine and control a process. However, troubleshooting equipment faults, calibrating and testing failed and new replacement components are often over looked as significant HMI benefits.

Operator controls and some maintenance controls can also be programmed on HMI screens which removes the need for a laptop, software, and connectivity. This makes it much easier to troubleshoot I/O issues, by energizing outputs to test coil and solenoids or read if the input device is on or off from HMI test buttons.

To begin troubleshooting, start with the information screen that provides basic information: manufactures name, contact information, phone numbers, email address, machine type, and drawing or serial numbers.

Sometimes the best place to solve the problem is at the source of the problem. Hunting down original hardcopy manuals and finding the correct one is not always easy. However, your HMI includes a very helpful screen: manual operation of outputs to test solenoids and coils.

Let's say we operated a solenoid to move a cylinder in manual mode and that cylinder used positon sensors. If we can see the I/O modules displayed, then the maintenance personnel can see if the output is on or off and that the positon sensor is also on or off.


Along with being able to manually operate output devices some added logic can be programmed to not allow movement to avoid potential damage.

**Safety**

Being able to troubleshoot machine issues without placing personnel at risk is a key benefit of your HMI.

Manual operation of solenoid bypass on control valves presents the risk of being inside machine safety zone. Additionally, there is a risk of arc flash from opening control panels doors to connect to the PLC or looking at PLC module points for on or off I/O.

When there is need to connect to a laptop and use software to communicate with the PLC, this can be done by easily and safely by having a port connection on the outside of the control panel to interface with the PLC.

For example an Ethernet or serial communication and added receptacle for laptop power lowers risk to personnel by not opening control panels. Manual operation and reading I/O can easily be done from HMI screens and keeps unauthorized personnel out of unsafe areas.

**Remote Access**

HMI also gives you the ability to remotely access your machine using the Web. Using Web access, machine manufactures can remotely connect to your equipment and help to troubleshoot your machine issues without having to make an on-site visit. Remote access is extremely cost effective and a big time saver.

**HMI Feedback**

Using feedback from your HIM can greatly assist you with machine troubleshooting. Sometimes this feedback is enough to be relayed to an outside person for getting the answers you need to get your equipment up and running.

Service calls can be over $1000 per day. Being able to minimize this cost with the assistance from your HMI is a big help and easily justifies installing a HMI on equipment from small to large systems.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