Ax9150 Universal Machine Interface vs. Industrial PLC

Improve your manufacturing productivity with Memex's Complete Solution

On the surface, an apple is like a tennis ball: both are spherical and colourful. That's where the comparison ends. It's only when you dig deeper and look at the differences between them that the true story comes out.

Customers have asked how a Memex Ax9150 Universal Machine Interface (UMI) compares to a typical Programmable Logic Controllers (PLC). In answering, we are faced with the same dilemma as the apple to tennis ball. Both the UMI and PLC have digital inputs and outputs, but that is where the comparison ends.

A PLC is only a hardware component, whereas the Memex Ax9150 UMI is a full system of hardware, firmware, software applications and configuration tools designed to connect to any machine.

The Memex Ax9150 UMI is part of a comprehensive OEE+DNC production monitoring and control system that ties the Shop Floor to the Top Floor.

A PLC has no operator interface and cannot be used with just any machine. In contrast, the UMI is specifically designed to connect with ALL machines. And although the UMI collects most data automatically so that operator input is not mandatory, such input is often used to further increase the system's functionality, an option not easily accomplished without expensive custom services for a PLC. Feature chart on reverse side.

Memex's UMI-based comprehensive production monitoring system consists of the following components:

1) Ax9150 UMI with Ax2200 for Ethernet communications.
2) Mx2000 handheld HMI unit.
3) AxConfig software for logic ladder setup, configuration and communications traffic direction (driver).
4) Production OEE machine monitoring software.
5) AxERP interface to bi-directionally connect the shop floor to the top floor.
6) AxEmail alert system to catch small problems before they become big ones, and allow operators to problem-solve.
7) AxDNC for CNC part file transfer, including large amounts of memory stored at the machine with a file system.

To re-create the Memex Productivity system with just a PLC collecting digital I/O points is virtually impossible: you would have to add an HMI plus advanced configuration and custom code development services. Moreover, the cost of developing a PLC-based system for use as an OEE shop floor interface historically has cost $15,000 - 20,000+ per machine and has required extensive, support services, and is most often a non starter for a company due to the overall cost of the project.

Compare this reality with the $4,000 per machine cost (installed) of the UMI — **it is now affordable.**
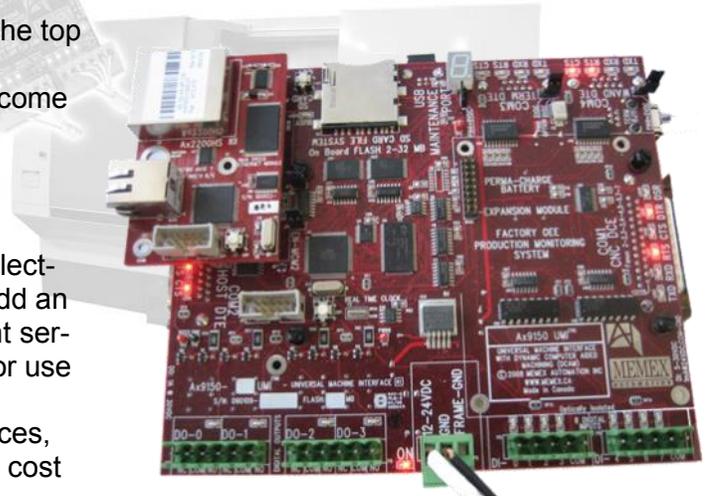
Manufacturing **E**xecution **R**eal-time **L**ean **I**nformation **N**etwork

MERLIN is a Manufacturing Operations Management System for the communication and execution of work orders for the shop floor to top floor.

The Memex UMI approach is a better approach than a PLC-based solution:

- More cost-effective at **1/4 the price** of a PLC-based system, a 75% savings.
- Requires **no PLC programming**: simply configure the desired parameters.
- Allows for 8 signal inputs, 4 outputs, 4 serial ports, automatic data collection.

- 2-way link to ERP, embedded DNC support, email support, logic ladder.
- Automated OEE; 20 downtime reasons, 20 reject reasons, operator interface.
- All in **one complete solution package** for the enterprise, from one vendor.

A complete solution for OEE machine monitoring requires more that PLC hardware. Memex incorporates a toolset of essential components into a robust OEE Productivity Solution package. The effective price per machine of a complete end to end UMI system is in the range of $4,000 per machine, installed, where a comparable PLC-based solution including custom coding, configuration services & non-native 3rd party pieces can cost upwards of $20,000 per machine.

Features and Functions	Universal Machine Interface		PLC-based solution	
Functionality Expected In An OEE Initiative	**Memex Ax9150 UMI**	**Cost $/Machine**	**Industrial Programmable Logic Controllers - PLC's**	**Cost * $/Machine**
Hardware with hardwired inputs to connect to any machine directly.	**Supported** with 8 digital inputs 3 - 30 volts DC syncing or sourcing, 4 groups of 2, onboard memory.	$2,000	Model-dependent; may require additional hardware, additional boards & more; 8 to 16 inputs, 110 or 220V.	$400-2,000
Physical mounting on machine	Magnetic mount anywhere.	Included	Rack-mounted, power supply & more.	$50-400
OEE real-time dashboard software.	**Supported** with Memex Intelligent	$500	*Not Supported* – requires major cus-	$3,000
DNC software to load programs to a machine.	**Supported** with latest DNC	$250	*Not Supported* – requires custom	$500-1,000
Ethernet with IP-addressable at the machine, available on the corporate network.	**Supported** natively, available OPC connections & wireless.	Included	Ethernet addressable at the PLC, but requires components, configuration.	$500
Configuration software, count rejects and classify their root causes in real-time.	**Supported** natively with OEE and configuration software toolkit.	Included	**Supported** through I/O - requires HMI, additional configuration, Ladder	$395-3,000
Send email or SMS alerts in real-time to any-one, anywhere within the enterprise.	**Supported** with Email alerts and smtp server access, OPC compliant.	Included	*Not Supported* Will require 3rd party software integration & OPC driv-	$1,650
Automatically collect data on up to 20 user-defined downtime reasons.	**Supported** natively with OEE configuration software toolkit.	Included	**Requires** advanced configuration, model dependent, digital outputs.	$250-1,500
Outputs to control stack lights or load / unload robots, etc.	**Supported** with 4 digital outputs 2 contacts per output, dry contact	Included	Model-dependent - may require additional hardware.	$250-1,450
Additional communications ports.	**Supported** 4 serial ports, USB port, HMI handheld port, surge pro-	Included	Model-dependent - may require specific components & custom code.	$150-1,500
Multiple modal states, that are user-definable, such as maintenance (scheduled, or unscheduled), setup, production hold, and more.	**Supported** natively with OEE and configuration software toolkit.	Included	**Not Supported** natively - will require advanced configuration, HMI & code creation. Reduces other functionality.	$650-1,500
User defined downtime reasons that are presented automatically to the operator, if required, when the machine is in an idle state.	**Supported** natively with Mx2000 HMI handheld device at machine.	$500	*Not Supported* natively - will require advanced configuration, HMI and software programming services.	$1,000-1,500
Work order selection and parts per cycle editing, derived from the customer's ERP system and sent in real-time.	**Supported** natively with ERP Interface toolkit.	$250	*Not Supported* Will require 3rd party software integration and 3rd party HMI hardware.	$1,000-1,500
Automatic counting of good parts and reject	**Supported** natively with OEE	Included	*Not Supported* Will require 3rd	$1,000-1,500
Send the work order results back to the customer's ERP system for automatic data collection accuracy resulting in better costing.	**Supported** natively with ERP Interface toolkit.	Included	*Not Supported* Will require 3rd party software integration and 3rd party HMI hardware.	$1,000-1,500
Installation services of hardware equipment.	2 to 4 hours per machine	$500	2 to 4 hours per machine	$500
Software Programming Services of PLC	Not required - a configurable toolkit	Included	16 to 32 hours per machine	$2,000-4,000
TOTAL Estimated cost per machine *		**$4,000**		**$15,000 to $28,000**

* Estimated Costs for equivalent functionality.