

VISUAL BASIC Versus WonderWare Intouch as an HMI

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INTRODUCTION

Operator control computers run a program with graphic screens and popup windows that allow the operator to control process systems. These operator interface programs are referred to as Man Machine Interfaces (MMI) or Human Machine Interfaces (HMI). We will call the operator interface programs HMIs.

HMIs consist of four major components. These components are:

1. Communication drivers.
PCs speak a different language than PLCs. In order for the two to communicate with each other a translator is needed just like a Russian conversing with an American needs a translator. The communication driver is that translator. Each different type of PLC and each different type of communication network requires a specific communication driver. A system like the one at Riviana's Instant Plant requires 3 or 4 different drivers.
2. The data collector.
The data collector gathers data from and sends data to the PLCs on the network. It does this by scanning the database to determine which data needs to be updated and then initiates the data transfer using the device drivers to perform the actual communication. Data gathered from the PLCs is placed into the database and data that has been entered by the operator is sent to the PLCs. The data collector transfers the data based on configuration data in the database.
3. The database.
The database is the reference for both the data collector and the data display windows. Both real time data and configuration data is stored in the database. The real time data is the process data from the production line (via the PLC) and the configuration data consists of data devised by the programmer when the application was designed. The configuration data specifies what data is to be collected, where it is located, how often the data is to be collected, where the data will be placed, how it will be scaled, low and high limits, etc.

4. The data display.

The data display(s) consist of Windows & popup windows. The operator interacts with the graphics on the popup windows to monitor and control the process system. The graphics are tied to the database by “tags” which point to specific data in the database. When a change is made by the operator or the PLC, it is displayed on a graphic window and the data is stored in the database.

VISUAL BASIC AS AN HMI

Of the four items in an HMI, Visual Basic has two right out of the box.

The first item is Visual Basic’s inherent ability to create windows with automated graphics. Visual Basic is a programming language designed to create programs with powerful graphical interfaces such as is used in most Windows programs. In fact Visual Basic has many of the same tools that you will see in any Windows program. Since most of those programs are developed using Visual Basic. Examples are drop down menus, slider bars, dropdown selector bars, tool bars, file icons etc.

The second item is the database which is called the Jet Engine. The Jet Engine is the core of the Microsoft Access database. The Jet Engine in Visual Basic has the same power as Access to handle data but it does not have the operator interface windows that Access has. In the Parijat HMI the data tables, windows and code required for the Jet Engine to do what it has to do are already in place.

The remaining two items are supplied by Parijat Controlware (located in Houston Texas), they are the communication drivers and data collector.

The communication drivers have been developed by Parijat Controlware and are sold individually. There are about 40 drivers available and these include drivers for all of our existing systems. The driver for the ControLogix PLC is under development and should be completed before we have need for it.

The data collector is an integral part of the HMI development package that Parijat Controlware has developed and sells. Unlike WonderWare Intouch it is not limited to a certain number of TAGs based on licensing fees. The only limit on the TAGs is the machines ability to deal with huge quantities of data in an acceptable time period.

COMPARISON TABLE

	Visual Basic HMI	Wonder ware Intouch
Type of program.	A very popular programming language from MicroSoft.	Proprietary, only used for operator interfaces in industry. Uses proprietary VB type scripting.
How can it be used as an HMI?	Parijat Controlware has developed an HMI package based on Visual Basic that they use in their integration projects and sell.	Designed specifically to be an HMI.
How is it sold?	As a package that end users can develop or by having Parijat fully develop the HMI for a specific application.	As a package that the end user can develop.
How many tags are allowed?	Unlimited by license.	60K by license for the licenses that we have.
Who can support the products?	Parijat Controlware and System integrators familiar with Visual Basic. The Automation Group has 5 Visual Basic programmers. There is an abundance (several thousands) of folks familiar with VB in Houston.	Standard Automation and System integrators familiar with WonderWare Intouch.
What will happen upon changing to Visual Basic	F-Line will be the first to be converted by replacing ControlView. The remaining production lines that are not currently automated will be added to the HMI upon automation.	The existing system for G-Line will be left in place for a indefinite time. B-Line is less than ¼ complete and can go either way. Process water will remain independent.
How many colors can be assigned to a graphic?	Unlimited, assigned in code during run time.	Five, pre-assigned during development on a sequential numeric chart.

	Visual Basic HMI	Wonder ware Intouch
How much does the development package cost?	\$3999.00 per development package with unlimited Tags plus Visual Basic 6.0 at \$279.99.	\$9950.00 per development package with 60K tags. (Project engineering has 1 and maintenance has 1.)
How much will it cost to have 3 development packages.	Three development packages and Visual Basic 6.0. 3 X \$3999.00 + 2 X 279.99 = \$12,556.98	Addition of 1 development license = \$9,950.00 .
How much are the communication drivers?	Control Logix \$999.00 A.B. TCP/IP \$799.00 A.B. DH+ KTX \$799.00 A.B. DH+ SS-5136-SD \$799.00 Total = \$3396.00	They are a part of the standard package.
How much does the run time license with I/O cost?	Licenses are not required by Microsoft. Parijat charges \$400/PC	\$4,400.00 Runtime with I/O, 60K tags per computer. (Riviana has 3 Runtime licenses with I/O, 2 at G-Line and 1 spare..)
How much does the run time license without I/O cost?	Licenses are not required by Microsoft. Parijat charges \$400/PC	\$3,500.00 Runtime with I/O, 60K tags per computer. (Riviana has 2 Runtime licenses without I/O, 1 at G-Line and 1 spare.)
How much does a license cost for a read only HMI?	Licenses are not required by Microsoft. Parijat charges \$400/PC	\$995.00 per computer. (We have 2 read only licenses.)
How much is the annual support?	Pay by the hour as required at \$85.00 per hour. Upgrade Visual Basic (new cost is \$279.99).	\$7,778.00 for existing licenses including the InSql database. (Our prior years support contract was for \$2300.00.) Includes unlimited phone support and 8 hours on location. \$125.00 per hour on site after 8 hours.
Training?	Two day class \$699.00	Beginner class 4 days \$2,000.00 Advanced class 3 days \$1,500.00
What are the expected cost starting 1/1/01 through 12/31/01	3 X \$3999.00 + 2 X \$279.99 + \$999.00 + 3 X \$799.00 + 2 X \$699.00 = \$17,350.98	\$9950.00 + \$2,000.00 + \$1,500.00 + \$7,778.00 = \$21,228.00
What are the expected cost starting 1/1/02 through 12/31/02	\$0.00	<u>\$7,778.00</u> (annual maintenance)