5 Critical Questions to Ask Before Choosing a New HMI/SCADA Software System

A Special Report From

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In the industrial automation software industry, there is one thing as sure as zeros and ones. It is the reality that at some point your operation will likely need to update its system. And an essential aspect of that project will be choosing a new HMI/SCADA software system.

The reasons for installing a new HMI/SCADA system are many. Among the most common reasons for shopping for a new SCADA software product:

- Your operation has outgrown an existing product’s capabilities.
- The existing SCADA system is proving too expensive and you are tasked to find a high quality yet cost-effective solution.
- The existing SCADA software is virtually obsolete and has stopped being supported by the manufacturer.
- Your SCADA platform is glitchy and is not reliably functioning.
- The client wants to install a more user-friendly interface for its end users.
- There is specific functionality and/or features needed that your current system does not adequately provide.
- You are tasked with building a process control system for a brand-new operation.

Of course, these are just some of the many reasons for choosing a new SCADA system. But whatever your motivation to replace an existing SCADA system with a new one, there are some essential questions one must ask before choosing a new software package to control and monitor your automation system.

What follows are the most vital questions you should consider before selecting a new HMI/SCADA platform:

1.

Does the SCADA software do everything you need it to do?

This is a huge issue in the SCADA industry. Believe it or not, there are SCADA system developers who start building control systems before even considering whether the HMI/SCADA product is the best one for the project. Yes, integrators, like many software engineering professionals, can be creatures of habit and stick with the one or two automation software systems they have typically used for many years.

But with so much innovation happening and new products with user-friendly features coming onto the market, it is more important than ever to do your homework before choosing a default software out of habit.
For example, your control system project might require the ability to perform real-time historical playback, or to easily run simulations during development, or the customer might require that a certain color flash for various alarms on the HMI in a specific way. SCADA software developers can save themselves a lot of time and effort by doing their homework before making a software match not made in heaven.

Often, the true value of a SCADA product is found in the nitty gritty details of the features it offers its users. In addition to all the core SCADA functionalities, look for the tools that can make your system run quickly, safely and efficiently. Among the more useful and user-friendly features to look for:

- Historical Playback to Screen
- Shared graphical notes
- I/O Tabular to monitor the value of every point whether used in graphics or not
- Detailed troubleshooting insight into communications in real time
- Independent control using one to multiple monitors
- Networked and Standalone configurations
- Graphical legends and status screens configurable by the developer
- Easily design-able HMI layouts so you can quickly and easily change the way you present your HMI Station to users
- A built-in Simulator tool that you can run during development so you can feel confident your distributed system will work as you designed it

When weighing the pros and cons of a SCADA software, it is vital to consider the immediate and long-term implications of your decision. It is thus recommended that integrators examine all their options and, rather than just default choose SCADA packages with which they have worked in the past, explore new and existing products that might be the best fit for your automated control system.

2

Is the system’s price the best value in both the short- and long-term?

In today’s cost-conscious economic reality in which cost is a key consideration at every level of industry, it is imperative to evaluate the details of the pricing packages offered by different SCADA products.

To start, you should estimate the number of individual I/O tags your project will need to run on the server. Many SCADA products charge significantly more as more tags are incorporated in your system. You should also determine the estimated Development Runtime and Runtime needs for your project and what the product costs are associated with each.
Another important price consideration is the cost of technical support and software upgrades. The support options are vital, as there can be hidden costs associated with multi-tier pricing models as opposed to flat-rate support pricing. Ideally, you will want to be able to have access to an actual human being who can talk you through an issue that may be proving difficult to resolve on your own.

One line item you typically won’t see on a SCADA software product’s price sheet might be one of the most important cost considerations: Reliability. For example, there may be a SCADA software that allows you to quickly and cheaply develop a control system, but if the system has bugs or other problems requiring constant fixing and attention, there can be significant extra costs down the road. “You need to ask how much time you’re going to need just to maintain the system and how reliable it is overall,” says Mike Kirk, Director of Software Engineering for Nucleus Command Systems. “Reliability is a major part of the cost.”

Beware of not-so-apparent additional costs. A telltale sign that a SCADA product is going to run up in price is when the product’s pricing sheet includes a bevy of add-ons that you are required to buy separately to do the things you want. If cost is a concern, then it is advisable to select a SCADA product that has most additional features built-in to the actual system at no extra cost.

3

**Does the software offer a user-friendly HMI graphical experience?**

Most clients across all industries tend to be looking for a system that has a very simple, straightforward look and that displays easily all the processes in a user-friendly manner.

Some projects might require background screens that are black so that red and green graphics will display more readily. Or they might need various elements to flash or rotate or animate in a certain way that is specific to their industry. Many industrial automation clients today inevitably want some aspect of a “wow” factor in the visual development and presentation.

There are instances where it will be important that a system allows for the ability to import unique graphics that can be manipulated in the HMI display during development. Make sure you know whether this is important to the end users of your system.

We suggest that you download a free trial of a SCADA software if there are free development licenses and then play around with the product. Also watch the product videos, read the help content, and if it seems pleasurable to use, and it works as they claim, then keep working with it. Finally, don’t be distracted by flash and glam of high-end graphical HMI displays when at the end of the day it will be the ease of use, functionality and reliability that will mater the most when it is in production.
4

Can the SCADA system communicate with your system’s hardware and other devices?

It seems almost too obvious to mention, but anyone who has had to design, develop and install a runtime control system project will attest that it is imperative that a SCADA system’s communications protocols can communicate with your hardware.

It is important to note that Open Platform Communications (OPC) protocol should only be used if you don't have the native drivers, or can't work around with another globally accepted protocol, such as Modbus TCP or DNP3. Yes, it's expensive if you have to buy the in-between server, and it's slower because it's in the middle of the stream. This is not an ideal situation for development or a runtime environment.

You will discover, however, that some SCADA systems offer only an OPC connectivity to their system. The problem with this is that it is too limiting. In the real world you will encounter industrial automation systems that feature a blend of modern and older, legacy system hardware, much of which will not support OPC. So do your homework to make sure your system will be able to transmit its vital data in real time without interruptions of communication breakdowns.

Mike Kirk, Director of Software Engineering for Nucleus Command Systems, who has over twenty years of experience building control systems. “With the proper communications configuration within a SCADA system, it will run incredibly fast and easy because every protocol will be configured through the same interface.”

The key is to know what communication protocols are essential to the functioning of your system – among the most common are Allen Bradley PLC legacy, Allen Bradley PLC modern, Siemens Step 7, GE/Emerson SRTP, Modbus TCP, OPC DA client, DNP3, and MQTT.

5

Will the system allow you to expand and upgrade as your operation evolves?

The best SCADA systems are ones that feature an architecture that will be able to adapt as technologies change over time. You want to ensure that system upgrades are executed seamlessly without any service interruptions. It is also advisable to envision a future environment in which your process control system expands. The ability for a system to support large amounts of data, and to allow you to develop system updates without causing the system to slow down or even crash is absolutely essential. Your system today might be a small to medium size project. But in a few years your operation may grow and the demands on the SCADA system will increase. Will your SCADA product be able to stand up under this expansion?
Summary

Not all SCADA systems are created equal. Nor do all charge equal fees for licensing, support and add-on functionalities. Further, some SCADA systems might look good on the surface, but as you examine them more closely you may find that the system in fact does not suit the needs of your control system project.

The key to making the right choice is to do your homework, take your time exploring various options and a product’s features, ensure that the system can scale as your operation grows, and always keep in front of mind whether the SCADA system overall is a perfect match for the unique needs of your operation.

About Nucleus Command Systems

Nucleus Command Systems offers a world-class suite of custom SCADA software and services. Its core product, Nucleus Developer, is a unique SCADA system with features and functionality typically not found in most other products. Customers benefit from Nucleus Developer’s flexibility, reliability, affordability, speed and ease-of-use.

Nucleus began over 20 years ago as a SCADA solution for mass transit systems worldwide, enabling the safe and efficient transportation of millions of people every day. The latest version of Nucleus Developer – loaded with groundbreaking tools such as a Simulator, Historical Playback-to-Screen, Network and Standalone Configurations, I/O Tabular and Customizable HMI Layouts – has been enhanced to provide a cost-effective, turn-key solution for virtually any industrial application.

You can download a free development license for Nucleus at www.nucleuscommand.com and discover the power of the Nucleus Developer platform at no cost. Or feel free to contact our team at sales@nucleuscommand.com to learn more about Nucleus, our flexible pricing options, and our no-cost control system design offering for select clients.