

10 Questions you should ask your Test Solution Provider

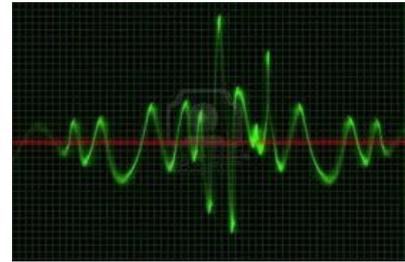
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(A Peak Group Company)**

1. Interface knowledge to the Unit Under Test (UUT)

Very low power analogue (uA)

Care has to be taken to ensure that noise is not introduced and the measurement is a true representation of the signal. Any attention needs to be minimized and calibration of the system may be required to allow for this.



Very High Power (3 Phase 415VAC/125A to DC 28V/1000A)

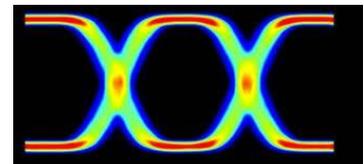
Protection of the user is paramount and requires understanding of not just isolation when required but protecting against long discharge times.

High Current DC presents its own challenges, although the voltage itself may not be dangerous, equipment can very quickly be destroyed and/or present a fire risk if correct precautions are not taken.



RF signal quality

Quality of interconnections, cabling and termination must be considered to ensure that signal quality is not degraded through attenuation or reflections.



Optical

From simple ON/OFF measurements of LEDs to more complex machine vision care must be taken to ensure that external factors do not influence tests. Repeatability of tests is critical, allowance has to be made for varying orientation and position of object to be tested.



Physical (Haptic)

Replicating human interaction with the unit under test presents one of the most challenging interfaces to replicate.

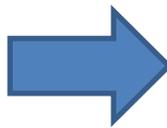
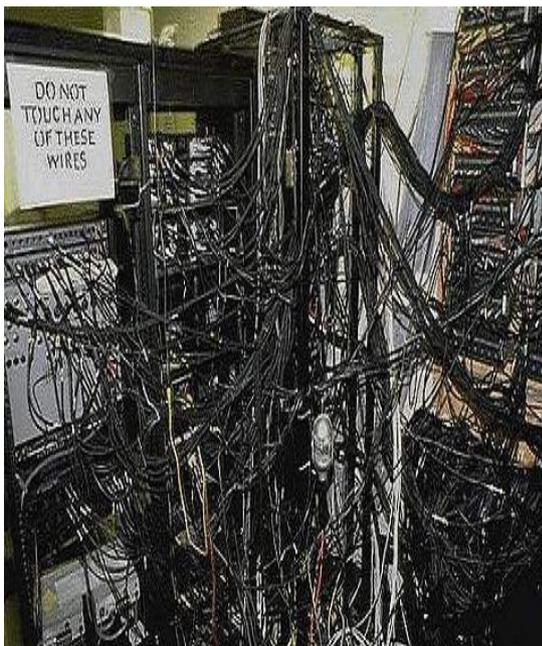


2. Electrical Interface knowledge to the Unit Under Test (UUT)

Typically a Test System will incorporate adaptors to allow multiple UUTs to connect quickly, easily and most importantly reliably to the Test System.

Peak has used Mass Interconnection solution from Virginia Panel Corporation (VPC) since Peak was founded in 1984 and is the sole UK distributor. There are other systems on the market but VPC continues to have the most reliable solution with the widest range of options for contacts (Power, Signal, High Speed, RF, Optical, Vacuum, etc.) in several different form factors.

When moving from a development or desk based test station to a Test System the aim is to go from a tangle of wires to a structured solution that is easy to service and repair.



3. COTS vs BESPOKE Software



VS



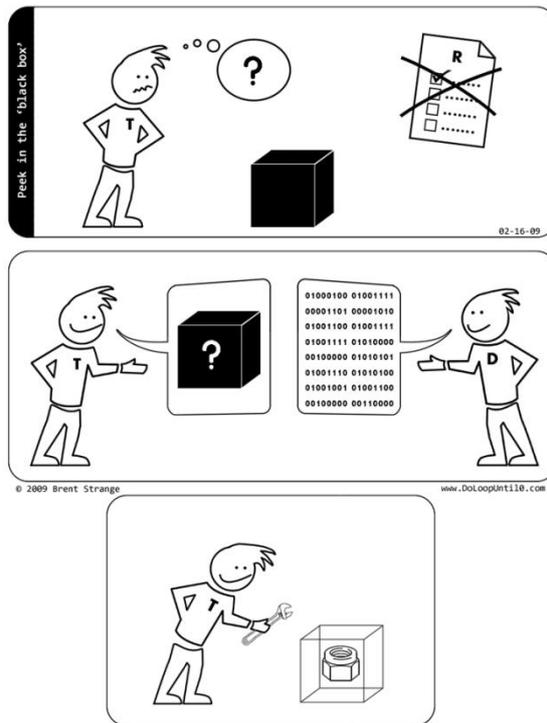
The software vendor may choose to develop a bespoke solution specifically for you using low-level tools. While this has some benefits in that the solution provided looks and behaves exactly how you want, it may mean that the development time may be longer and the costs higher than if commercial-off-the-shelf (COTS) components were used. Most test and measurement solutions have a bespoke element about them, whether it is taking measurements using instruments from different vendors or providing application-specific graphical front-ends.

However, many COTS tools exist for a variety of use cases which can improve productivity, expandability and code reuse – which effectively leads to reduced cost and risk. For example, for a production test solution the software could be completely written from the ground up using NI LabVIEW or Microsoft .NET. However, by using NI TestStand instead – many elements of the software such as test sequencing and report generation are “ready-to-run” out of the box. It is then possible to plug in bespoke components and productivity enhancing toolkits from many other vendors to get the solution you require.

If a software vendor suggests that they would need to write your entire application without using established tools or frameworks always ask for the rationale behind the decision. There may be legitimate reasons for the decision or it could be a lack of skills. If the latter, it could mean that you end up funding a “reinvent the wheel exercise” with all the associated costs and risk.

4. Who owns Software IP?

Some software vendors can be very protective of the code that they develop. In some cases this may be justified, if a component is being licenced for use rather than developed specifically. In this case, there is generally more than one customer for the product and this provides a means to reduce overall cost and to provide additional features based on the feedback from multiple users. However, for bespoke developments – not releasing source code or intellectual property rights could be a method to extract more money from you, the customer, at a later date.

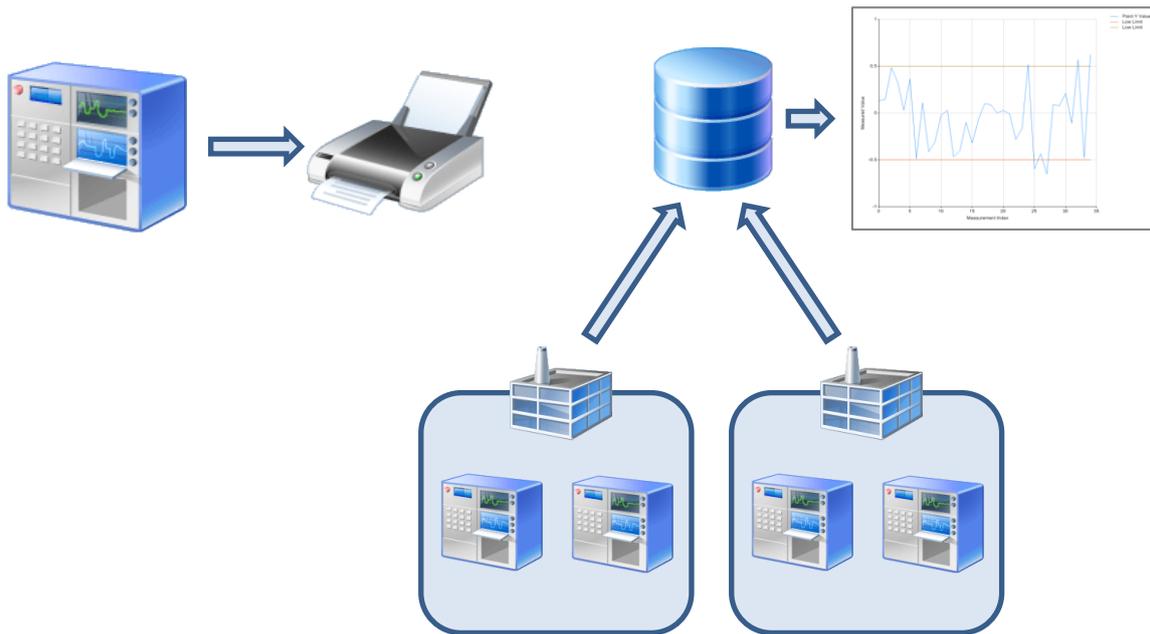


Even if there is no intention from the supplier or no need from the customer – not having source code can be a risk moving forward. For example, if a piece of software is being used to make measurements of a critical process and the computer running that software happens to “fall-over” then you either have to rely on your own backups (which hopefully you have made!) or returning to the software vendor. That vendor may want to charge you for the privilege to get access to your own software or worse still they may have disappeared completely or been acquired by a new business which may not be willing to help.

By maintaining control over bespoke software, you – as the customer, can mitigate these risks. It also gives you the option to use internal resources or other software vendors to enhance an application rather than begin tied to the original authors. It always makes sense to maintain a good relationship with the original developers, since they will be best place to provide support and updates – however being solely dependent on them is risky.

If a software vendor refuses to hand over source code or intellectual property rights, always ask for justification. Are they trying to hide poor code or sloppy development practices? Are they likely to charge exorbitant rates for future updates?

5. What happens to my Data?



Most test and measurement solutions produce data. This may be in the form of production test results, data files containing raw measurement data or a printed pass/fail ticket. When specifying your requirements, you should be mindful about what information you want from your data. For example, if putting a production test system together – it may be tempting to provide a visual GO/NO GO (Pass/Fail) status as to whether the Unit-Under-Test has passed all the appropriate tests. While this may solve the immediate need for an operator to determine whether a unit has passed or failed, it does not provide any scope for expansion. If data is logged, collated and stored in a centralised location it then becomes possible to extract other useful information; Production managers may want to know the First Pass Yield Rate such that they can see how well the manufacturing process is performing; Engineers may want instant access to measurement data or aggregate data across multiple runs to enable them to improve product design.

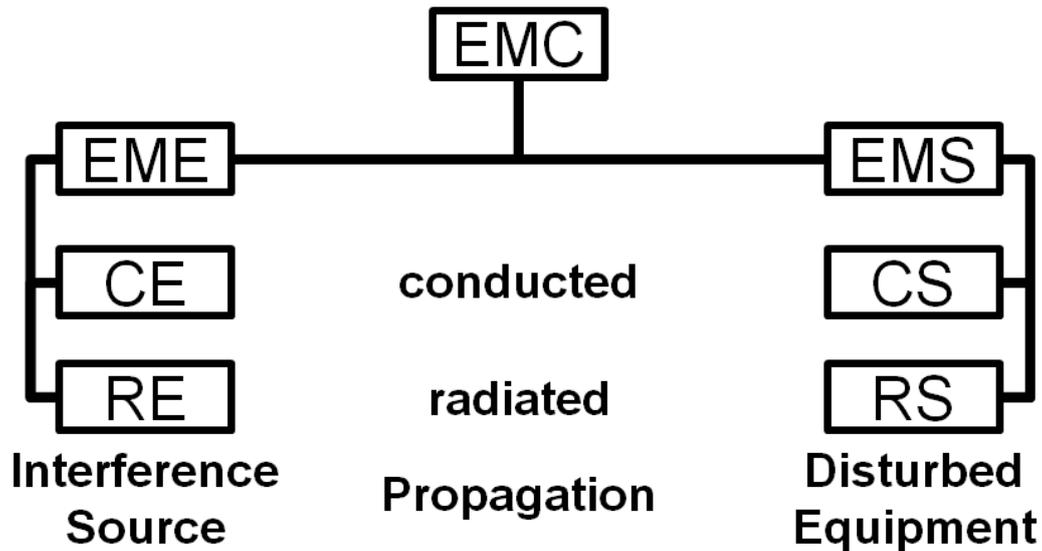
When engaging with a software solution provider, be sure that they understand your short-term goals as well as your long-term strategy. While it may not be an initial priority, the ability to make data driven decisions can have extremely positive effects in streamlining processes, improving quality and reducing costs. The software vendor should have experience of dealing with similar systems and be able to provide examples of how they have worked with other customers to achieve these benefits. Depending on your budget and timescales, the initial solution may be limited in scope – however it should never limit the potential to expand the capabilities in future.

6. How Safe is your system?

- Panel/Door Interlocks with integrated emergency stops both local and remote as required
- Motion control
- High Voltage or Current
- At least SIL level 2, more up to highest level 4 depending on application
- Peak use an independent UKAS approved agent where CE Marking is required
- Understanding and meeting your company procedures and requirements



7. EMC Precautions



Emissions

Peak design and build practices ensure that Peak Test Systems are within required EMC regulation limits regarding conducted interference. Consideration has to be made for RF Radiation and correct use EMC gaskets at the Test System and Adaptor levels.

Susceptibility

Peak's use of its own design and build, Mains Distribution Unit ensures that all of the following considerations are dealt with protecting your sensitive instrumentation that typically represents 60-70% of the total system cost.

- Power isolation, filtering and conditioning?
- Do you need transient protection?
- Phase protection on 3 phase systems

8. How much is sub-contracted?



- Ability to repeat build with same processes
- Wide skill set and expertise
- Consistent Documentation
- Project Management

There will always be an element of sub-contracting, but these should be ancillary requirements not core competencies.

Peak only sub-contracts 3 elements

- Sheet Metal
- Painting and Finishing
- CE Marking

9. Future Proofing



This is always a delicate balancing act, especially for generic systems. Too little future proofing and the test solution is quickly out of date, too much and initial investment cost is too high.

Peak's approach is to have a modular system that can easily be added to as required, key focus is on providing expandability for minimal cost. Primary considerations are

- Physical size of system
- Size of mass interconnect interface
- If PXI based, size of PXI rack

Having scope for expansion with these elements is achieved with minimal cost increase.

10. Ask your engineers and operators



Get feedback from all your engineers and operators, try and keep the initial questions open and then move to closed questions, for example

Open questions

- What do you like about the current test system
- What don't you like about the current test system
- What would you change about the current test system
- What would you like to see in the new test system
- Etc.

Closed questions

- Do you prefer to sit or stand or support both
- Do you like a touch screen or prefer keyboard and mouse
- Etc.

Always remember that the operators use the system day after day and are often a source of great end user feedback. The happier they are using the system the more productive they will be and more welcoming of the new system.