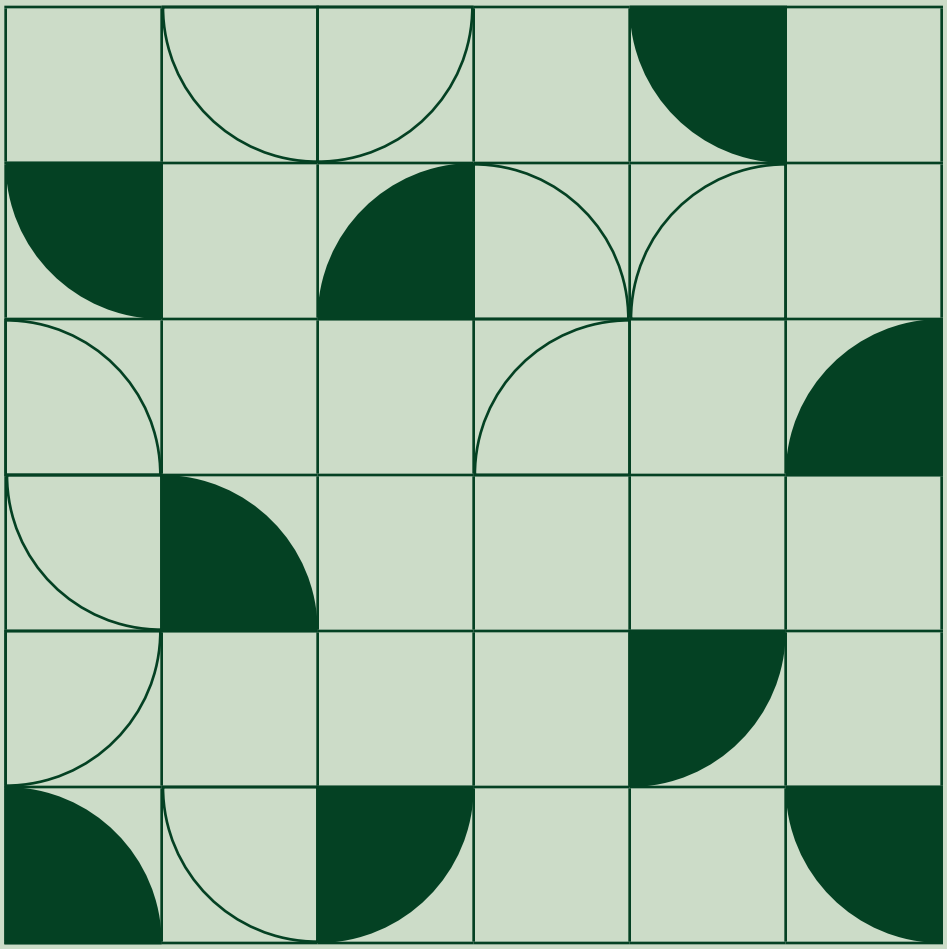
WHITE PAPER

Validation at Any Location

3 Musts for Uninterrupted Testing



02 OVERVIEW

IF YOU MEASURE IT, AUTOMATE IT

03 DO EVERYTHING ONCE FOR EVERYONE

CHALLENGE THE STATUS QUO

05 CONCLUSION

NEXT STEPS

REFERENCES

Overview

If 2020 has shown us anything, it's that the line between work and home has become incredibly blurry, dissolving the means for compartmentalizing our lives. How do we do validation at home? And not just until the pandemic is over, but long-term, sustainably—do we have a plan to translate the lab to the kitchen table, or the home office, or the garage?

Let's take a moment to reset and prepare for a new and different way of testing. In this paper, we'll explore some top tips for setting up labs and infrastructure—not just to address 2020's immediate concerns, but to make validation testing more accessible than ever. Because who knows what will come next? Whatever it is, let's be ready.

If You Measure It, Automate It

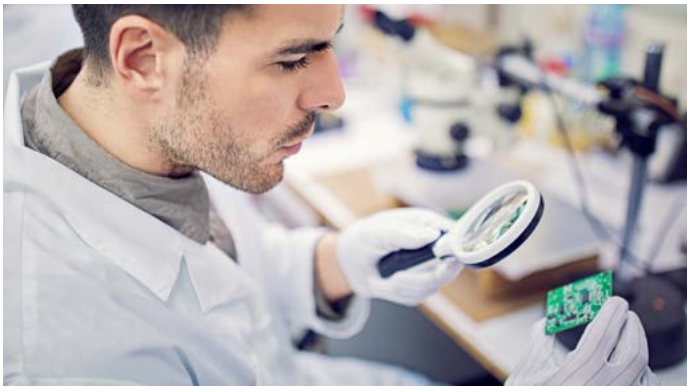
When you're not physically present with your DUT, quick, one-off manual measurements become a monumental task. You need data to continue your validation work, but what if going into the office isn't an option? Additionally, sometimes you can't bring equipment home because of power requirements or safety or government regulations. The answer? Automation.

For more than 40 years, NI has had a passion for automation, and that's evident in our products. High-channel-count, multimeasurement systems have long been prime candidates for removing the manual, person-in-the-loop element and putting software in charge. And measurement systems such as PXI, CompactRIO, and CompactDAQ provide a modular approach to I/O. Modules are tied together by a backplane that provides a shared timing source without the need for Standard Commands for Programmable Instrument (SCPI) commands or a deep knowledge of individual measurement communication.

FIG 1 PXI, CompactRIO, and CompactDAQ are inherently automated and offer modular I/O.

Historically, simple one-and-done measurements haven't required automation, but working remotely means that all measurements—regardless of complexity—are automation candidates. A measurement system that you can remotely log into, fully loaded with all required instrumentation, puts flexibility at your fingertips, no matter the distance between you and your DUT. You need a chassis of instruments that are fully programmable using LabVIEW, or configurable with FlexLogger™ software, so that you can make nimble measurements and ensure that you have your data when you need it.

Do Everything Once for Everyone



As engineers, we're hands-on, and although we can accomplish quite a bit remotely, at some point, someone has to go in and change out components on a board, move probes, swap out a DUT, or change measurement equipment so that testing can continue. Colleagues around the globe agree that we need a minimum standardization level in which one or two people on-site can play a cross functional role for multiple teams. Sharing a common testing approach reinforces familiarity across engineering teams and leverages consistent equipment and methodology, requiring fewer people to return to site to make changes that benefit several teams.

This only works if the standardization addresses multiple types of testing—from firmware test to electrical test to data logging. The modular NI platform makes it uniquely suited for this level of standardization because you can swap modules based on specific test needs, keeping the approach and software interface consistent no matter what. This means that you can build a knowledgebase that translates from team to team and makes skillsets highly transferrable, thereby breaking down team silos and helping fewer people make a larger impact upon returning to site. And through it all, software is the critical bridge for accessing equipment at home. The NI Enterprise License Program gives everyone in your organization software access, so that testing can continue even as a team member makes hardware changes on-site.

Challenge the Status Quo

While it's tempting to think of this pandemic as an anomaly, realistically, our current work practices may become the new norm. Even as work-from-home orders lift, we likely will never work in exactly the same way as before, so it's time to update our mindset accordingly. We need to shake the temptation to "wait until life is normal again" before we move forward, as many leading tech companies have already announced that the future "normal" will look different.

Let's start thinking about how we'll accomplish our next milestones. If you need budget, ask. If there are collaboration challenges, let's address them. Now more than ever, it's time to be bold in justifying ROI. Here's how:

01 Embedded Software Test (HIL)

While hardware-in-the-loop (HIL) is an automotive and aerospace mainstay, countless other organizations stand to benefit from it. Any company that's dealing with ever-increasing lines of code—from a white-good manufacturer to a medical-device producer—is consequently growing more dependent on quality testing, whether they know it or not. If you release a faulty product, you'll (at best) take a financial hit, and at worst, create a safety or environmental disaster. However, HIL goes beyond just finding software bugs. Software engineers can use it to iterate more quickly and gain almost instant feedback on new features or implementation methods. Using HIL as both a design and V&V test tool dramatically increases its ROI.

02 At-Home Measurement Systems

Let's assume that you're cleared to bring a DUT (maybe a compact printed circuit board) home to perform validation: The next question is, How? It's obviously impractical to bring all of the lab equipment with you. Not only would you have a trunk full of instruments, but many of us would have trouble finding space for this equipment at home. Again, the modular NI platform offers a compelling alternative: One chassis can hold a full suite of instrumentation in a convenient footprint, literally fitting an entire lab in a box on your desk. For simpler applications, a compact scope can easily make the trip home without demanding desk space.

It's time to get creative. Our competitors stand ready to outperform those who believe they'll pick up where they left off when the pandemic is over. Now is the time to embrace the new normal with innovative, high-ROI testing.

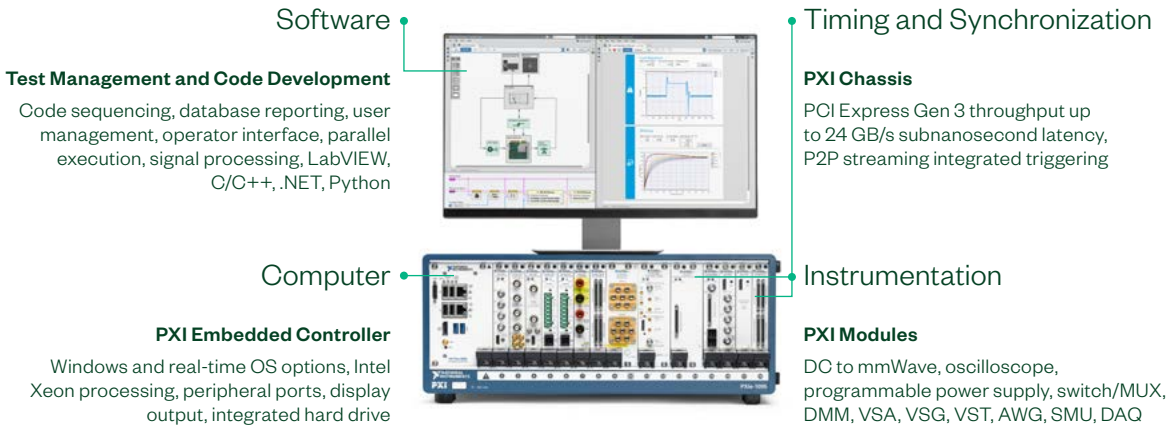


FIG 3 NI's modular PXI products offer instrumentation for virtually any measurement.

Conclusion

As engineers, our jobs center around innovation, and that doesn't change—even in challenging times. We need to plan for a future that will likely look markedly different than the one we'd imagined. Quite frankly, the world needs what we, as engineers, have to offer. And aligning productivity to the engineer without coupling the engineer to their location gives companies access to global talent for unprecedented levels of innovation. By boldly approaching validation in this way, we can minimize location factors and uncover untold freedoms in our work. During the COVID-19 pandemic, we've all been looking for positive outcomes. The current situation may be just the motivator to transform how we think about validation, ushering in a new era of productivity on our terms. Now's the time to question whether we're doing something because it's always been done that way, or because it's the BEST way. Let's capitalize on this opportunity to change the status quo.

Next Steps

See How HIL Spans Industries

Choose the Right DAQ System

Learn How to Standardize

Learn How HIL Increases Testing Fidelity and Maximizes Innovation

References

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