

OTP²

A standardized Functional Test Platform Approach

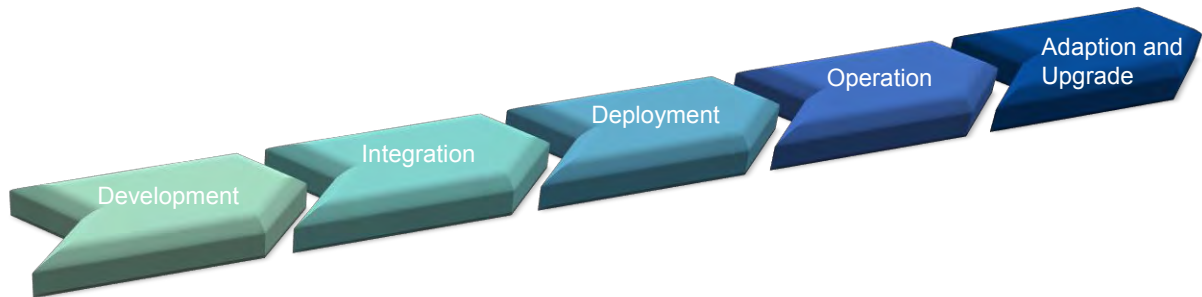
Test Engineers are today faced with a complex set of requirements for the test systems they develop and deploy:

- Fast development and deployment of test systems and test applications
- High test execution speed
- Minimization of downtimes and unscheduled maintenance
- Adaptability to changing requirements
- Operation at remote sites
- Generation of value from functional test
- Minimized total cost of ownership

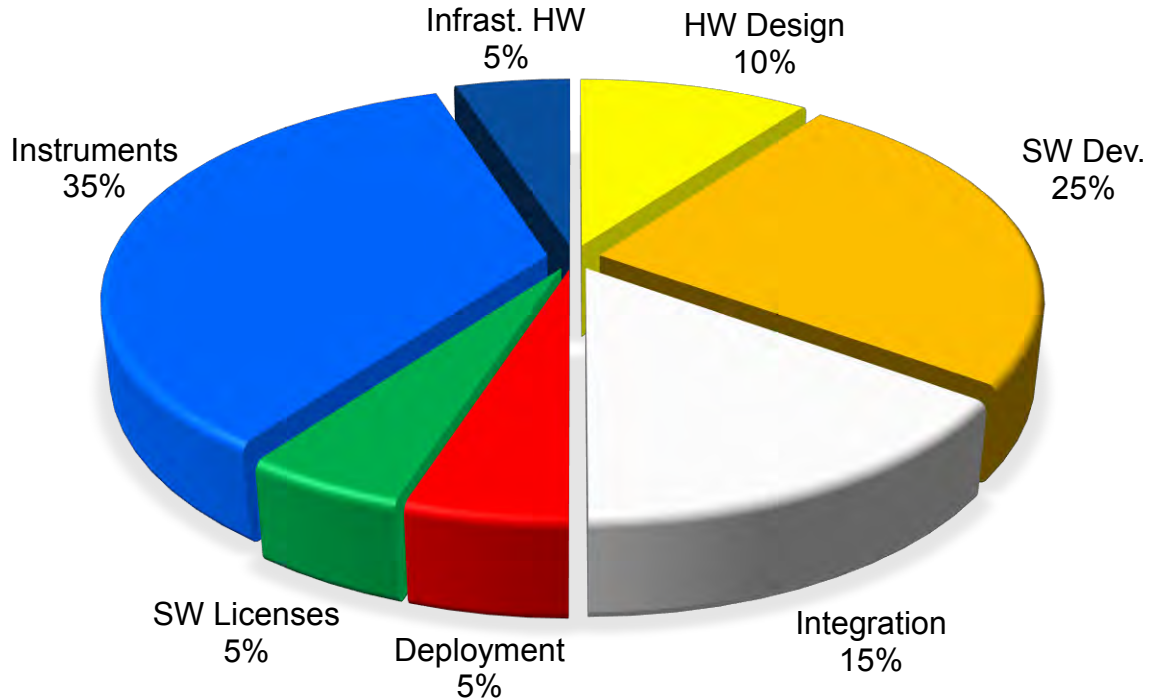


Test System Lifecycle

When considering options for your next generation Functional Test System, it is essential to evaluate the whole system lifecycle and the associated costs and efforts.



New Custom System Cost Distribution



Faster System Development Cycles

To speed up development cycles and reduce development efforts for new Functional Test Systems - **Reuse is Key:**



- Define a core set of test methods (measurement functions and stimulus capabilities)
- Define a family of test systems sharing hardware- and software architecture
- Use commercially available system architectures and building blocks as a starting point
- Focus on modularity of hardware and software, use commercial test sequencers
- Try to implement product specific electronics in the test adapter, not in the system

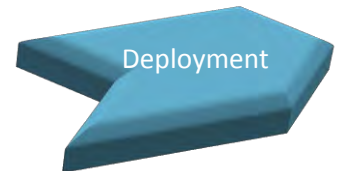


Quality and Speed of Deployment at Target Site



Starting points for an efficient deployment:

- Training of deployment personal on a standard architecture
- Use of standardized deployment procedures and verification steps
- Automated system verification tools
- Use of standardized training materials for local system support personnel
- Structured approach for deployment of new test applications including automated SW-distribution tools



Minimized Downtimes and unscheduled Maintenance

Benefits of a standardized system:

- Maintenance personnel can efficiently be trained on standard system design. Acquired knowledge can be reused on multiple systems
- Structured and automated debugging tools can be implemented to support efficient location of the root cause of a problem
- Defined sets of spare parts can be used across multiple systems
- Remote and onsite support by the system integrator can efficiently be provided along with automated test tools (SW remote access required to minimize reaction times)
- Implementation of a scheduled maintenance and calibration regime



Adaptability to changing Requirements

Requirements for Functional Test Systems regularly change over time. For a long service life of the system, adaptability is key.

- The system must be modular to allow for upgrades and changes
- Upgrades often need to be integrated at the deployment location
- Travel cost for upgrades at remote destinations are a major cost driver and need to be minimized
- After the upgrade, the integrity of the system needs to be re-evaluated

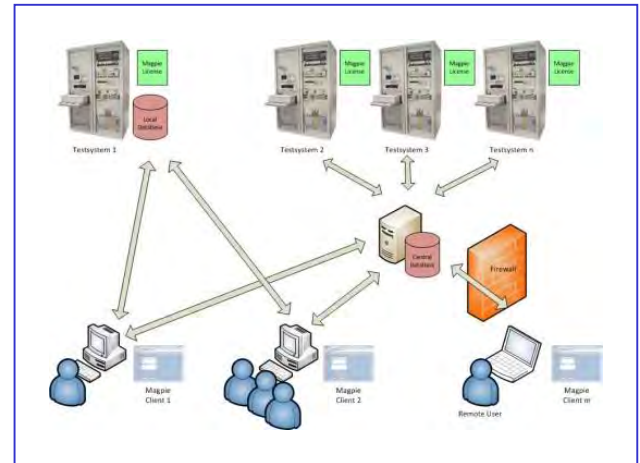
Standardized Systems provide a lot of potential for cost savings over the lifetime of a system



Creation of Value from Functional Test

Functional Test Systems need to add value to the manufacturing process:

- Stored test results can enable and speed up repair of the defective DUTs
- Traceable test data allows for efficient evaluation of field returns
- Statistic parameters derived from test results support optimization of the upstream manufacturing processes



OTP²

LXinstruments Open Test Platform redefined



The OTP² platform supports both LXI and PXI based systems.

- The LXI platform excels when it comes to best measurement performance at lowest cost
- PXI based systems provide highest measurement and switching speed and are a very good fit for automated high volume manufacturing applications
- Hybrid combinations of LXI and PXI instrumentation allow for an optimization of the working point

LXI based OTP² systems are ideal for applications that

- see a high mix of different products being tested on the same system
- require high measurement accuracy
- benefit from floating measurements and galvanic isolation
- require measurements and stimulus @ higher voltages and currents
- where the reduction of test application development cost is a high priority

Target Markets: Industrial Automation, Aerospace/Defense,
Medical

PXI based OTP² systems are ideal for applications that

- require the shortest possible test time in high volume manufacturing environments
- benefit from a small system footprint e.g. for integration under a conveyor belt
- mainly require single ended ground referenced measurements @ max 150V
- allow for an investment in test engineering to optimize test execution time

Target Markets: Automotive, Sensors, general high volume manufacturing

Efficiency through Reuse and Open Standards:

- Architecture based on Industry Standards
 - LXI/PXI Instrumentation
 - Virginia Panel Fixture Interface
 - Use of commercial Test Sequencers (NI TestStand, Keysight Test ExecSL)
 - Test Step Libraries based on IVI Drivers
 - MySQL Database
- System scalability from compact to high performance
- Reuse of existing building blocks in HW and SW



OTP² Scalability

Scalability



Micro OTP



Midi OTP

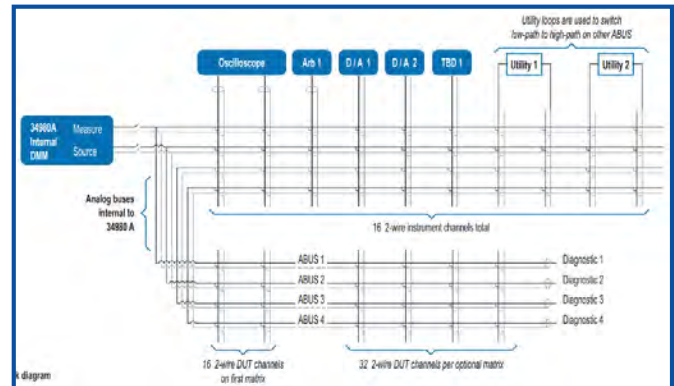


Maxi OTP

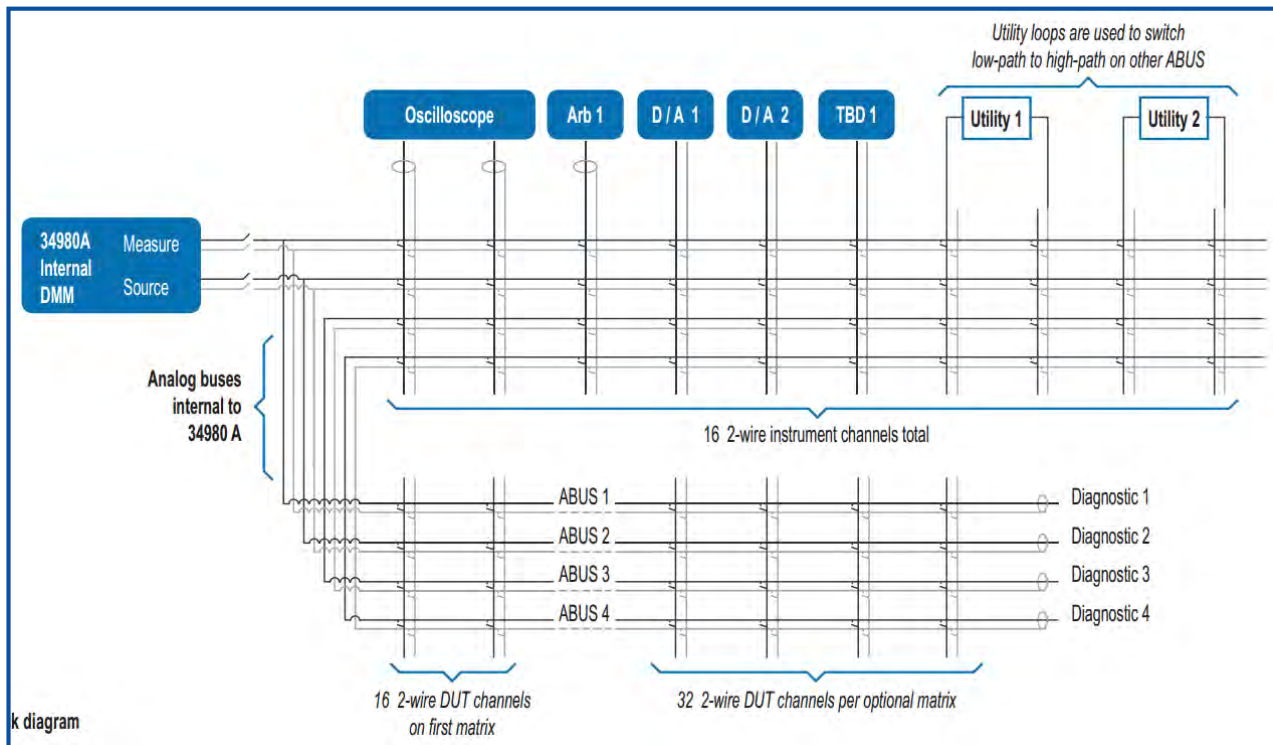
OTP² LXI Matrix Concept



- Four 2-wire analog busses
- 1A / 300V switching capability with >15MHz bandwidth
- Robust armature relays (3-5ms switch time)
- 16 Instrument channels for analog stimulus & response
- DUT channels can be extended in multiples of 32 channels



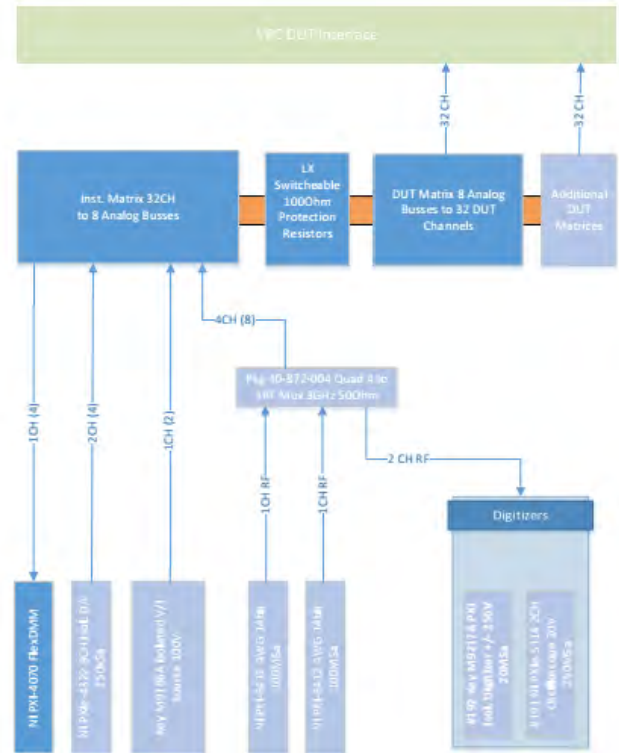
OTP² LXI Matrix Concept



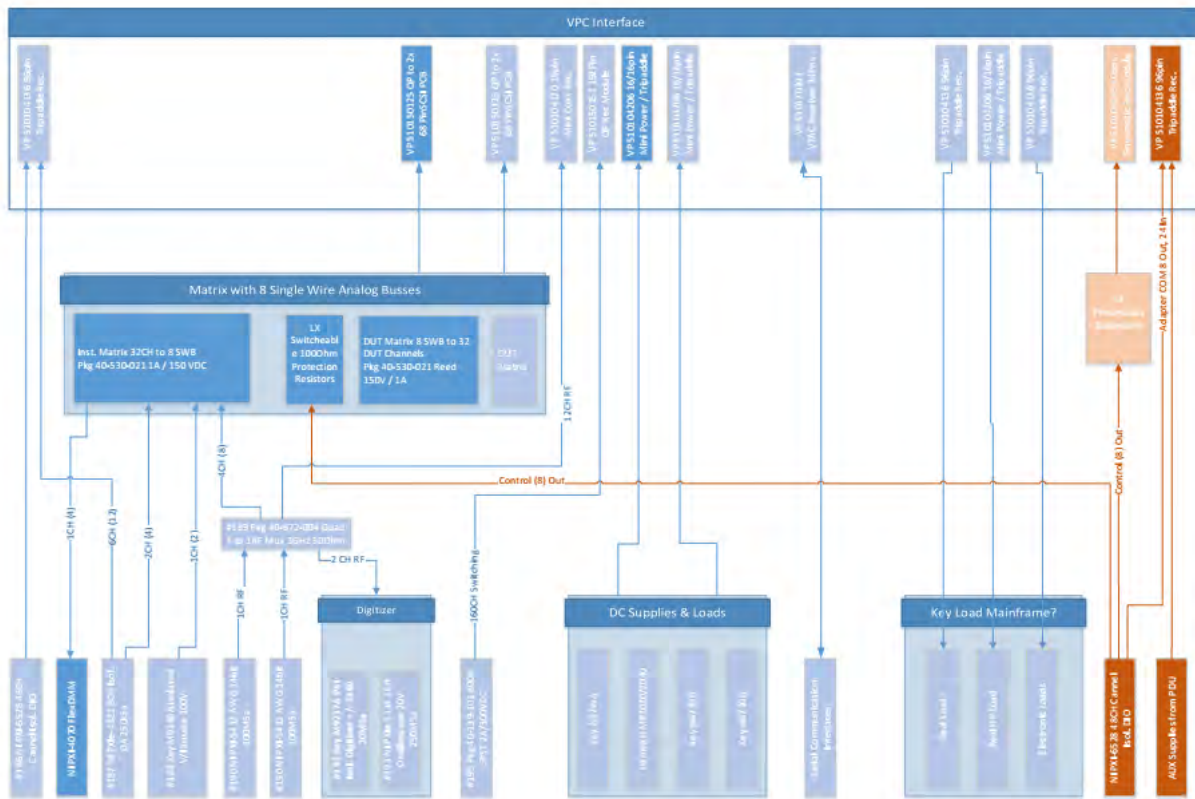
OTP² PXI Matrix Concept



- Eight single wire analog busses
- 1A / 150V switching capability
- Fast reed relay matrices (500us switch time)
- 32 single wire instrument channels for analog stimulus & response
- DUT channels can be extended in multiples of 32 channels



OTP² PXI HW Architecture



LXinstruments Test Software Suite

The Software Engine for OTP² and other FCT Systems

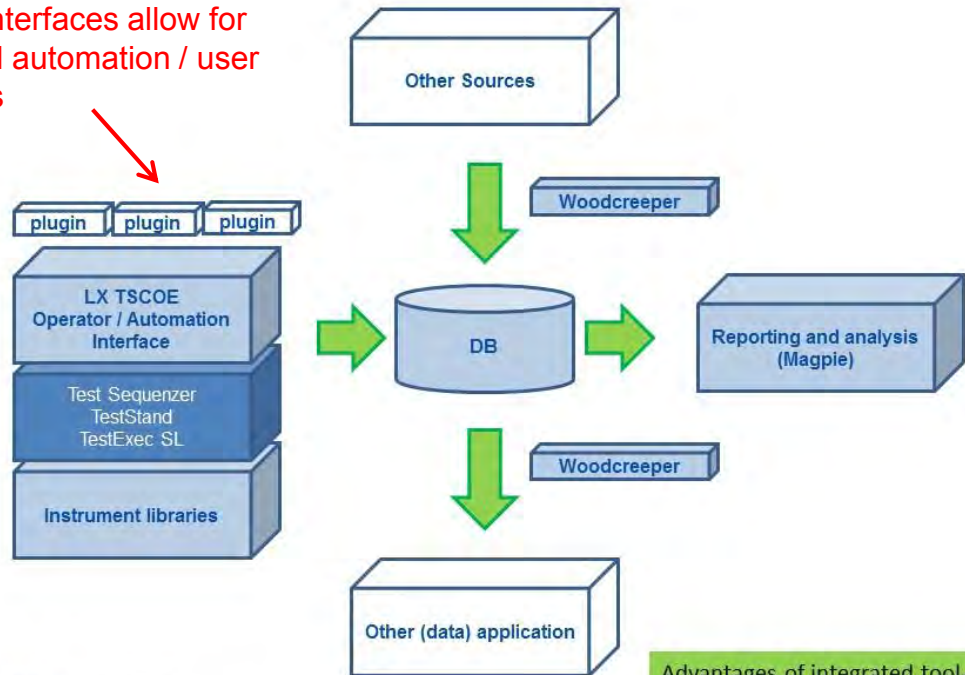


Software Modules:

- LXinstruments TSCOE modular Operator Interface
- MySQL Test Database
- LXinstruments Magpie Data Retrieval & Reporting Tool
- Commercial Test Sequencer TestStand / Test ExecSL
- IVI based Test Step Libraries
- VISA Hardware Interface Layer



Defined software interfaces allow for customisation of all automation / user and data interfaces



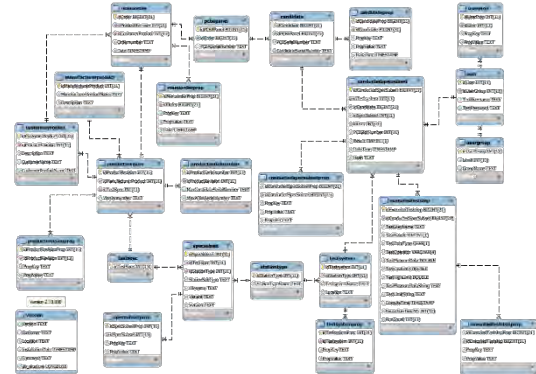
- Standard Test Sequencer (NI or Keysight)
- Standard LXinstruments software
- Custom

Advantages of integrated tool-chain:

- reduced workload
- reduced risk
- standardisation -> quality

A standardized MySQL Database (optional MS SQL Server) is used to store all test results and test system related data.

- Product Base Data
- Test Specifications and TestSpec Management
- System Administration Data
- Test Results and Parameters
- User Rights Admin

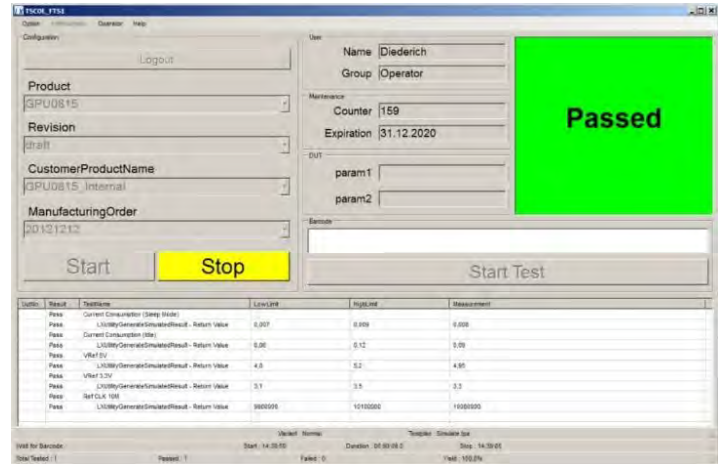


TSCOE Operator Interface



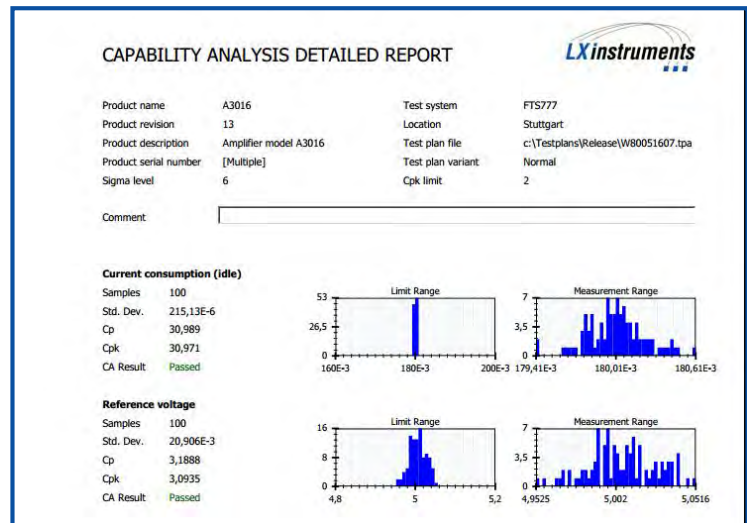
TSCOE is the Interface for Operator Interaction and Automation Tasks

- TSCOE encapsulates the operator from the test sequencer
- Language definition files support the implementation of local language GUI versions
- A highly customizable graphical User Interface provides just the required information
- Administrative functions are available after password protected login



LXinstruments Magpie provides all the functionality needed to administrate and evaluate the Test Database

- Product, User and Test Spec Administration
- Powerful Data Filtering
- Predefined Test Data and statistic reports
- Password protected database manipulation
- Repair station functions
- Database interface API functions for interaction with 3rd party software



Customers are seeking quick answers to their urgent questions:

- A system concept proposal as a starting point for discussion rather than an empty sheet of paper
- Building blocks that can be mixed and matched based on the customers requirements
- An immediate budgetary price to play around with different system configurations
- A modular standard approach that still leaves room for customization
- Assurance that today system platform can cope with tomorrows requirements

Your guide through the configuration of OTP systems provides:

- Condensed LXinstruments expertise regarding the integration of FCT systems
- List of all building blocks available as a standard product
- Immediate prices including hardware, integration, wiring and related software
- Estimate on required rack space
- Estimate on delivery time for the entire system

Please inquire with LXinstruments for customization and anything that you do not find in the configurator.