TEST BENCH GATEWAY BROCHURE

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CHALLENGES FACED BY CUSTOMERS:

Managing an RF test bench poses several challenges:

- **Heterogeneous Instruments:** Test benches comprise various instruments with different communication protocols (LAN, USB, RS232, etc.).
- **Complex Software Integration:** Integrating these instruments into a cohesive system requires significant time and effort to standardize communication protocols and ensure reliability, speed, flexibility, and scalability.

SOLUTION:

AMCAD developed the Gateway Unit to streamline test bench management:

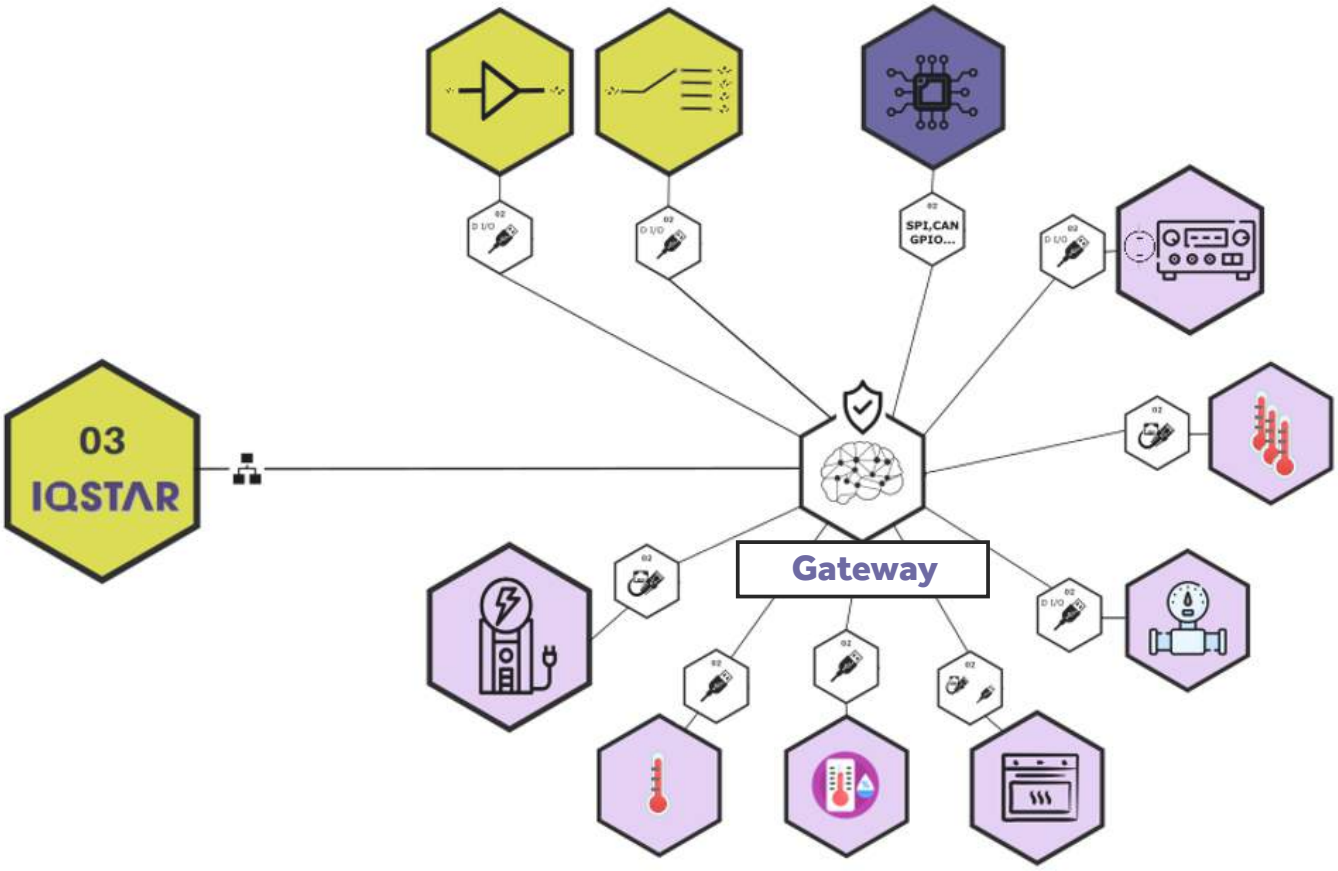
- **Standardization:** The Gateway unit standardizes communication protocols, making them homogeneous for high-level control software. The Gateway transforms nonstandard hardware control commands into standard SCPI commands to facilitate the software communication protocol.
- **Gateway Functionality:** Multiple connection hubs and gateways facilitate communication between instruments
- **Low-Level Standardization:** Standardizes communication between specific accessories and instruments connected to the test, reducing software developer workload.
- **Real-Time Monitoring:** Monitors instrument functionalities in real time, enabling predictive maintenance and performance monitoring.
- **Flexibility:** Allows for easy addition of specific functionalities via an intermediate broker without disrupting software logic.

MAIN FEATURES :

- **8 Channels:** Drives up to 8 instruments in a compact 3U rack.
- **USB Front Ports:** Two USB ports for sensor connectivity.
- **Instruments Synchronization:** Ensures synchronization among connected instruments.
- **Rugged Design:** Built to withstand demanding test environments.
- **Ethernet Communication:** Enables seamless integration with high-level control software using SCPI commands.
- **Third-Party Driver Compatibility:** Compatible with various third-party instruments such as UPS, power supplies, temperature controllers, and environment measurement devices.

THIRD PARTY DRIVERS

- **UPS :** APC...
- **Power supply :** R&S NGP800, TDK GENESYS+...
- **Temperature control :** LAUDA,CLMATS...
- **Environment measurement :** FAHD36,ALMEMO THK,CENTER ONE PTR90,TC32...



AMCAD integrates on-demand control and monitoring of vital parameters of your own instruments and sensors, to monitor and track the operation of your test bench without polluting the communication bus with your high-level control software.

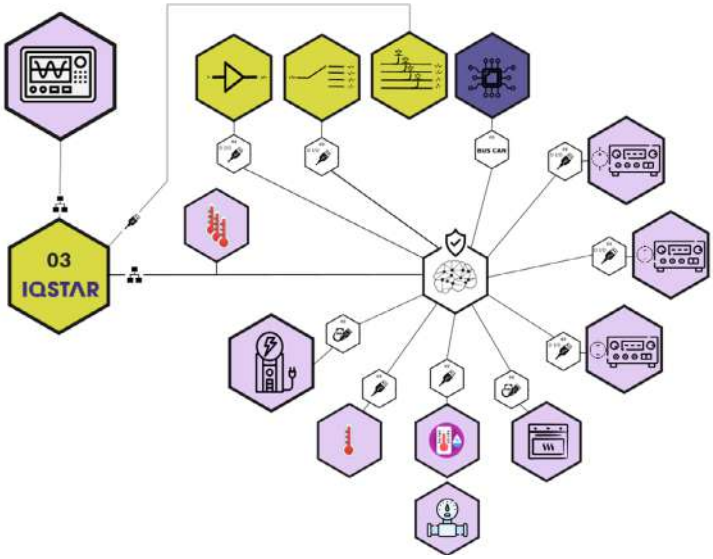
Gateway Unit instruments drivers

	Description
	• **RMA-101-35G :** Wideband power amplifier from AMCAD
	• **RMSW-201-26G8CH :** 8 channels measurement unit from AMCAD • **RMSW-202-18G4CH :** 4 channels measurement unit
	• **IQSTAR :** software used to perform tests on Microwave and RF circuits from AMCAD
	• ***NGP8X4 :*** power supply 4 channels 800W from R&S • ***GENESYS+ :*** power supply 1 channel from TDK-LAMBDA
	• ***SRT5KRMXLW :*** Smart UPS from Schneider Electric
	• ***ZTD700FS :*** 1 channel Thermocouple device ALMEMO from AHLBORN
	• ***TC-32 :*** multi-channel thermocouple measurement device from DIGILENT
	• ***FHAD36RAS :*** Temperature and humidity device ALMEMO from AHLBORN
	• ***PTR90* & Center One :** vacuum sensor from PENNINGVAC • ***93707709* :** 2/2 way solenoid valve from BURKERT
	• ***XT950W* :** thermostats for temperature control from LAUDA • ***IN550XTW* :** thermostats for temperature control from LAUDA • ***TMT80* :** Oven from CLIMATS

USE CASE EXAMPLE 1

Test bench for RF Multi-channel Amplifiers

- Frequency range : 2GHz to 26.5GHz.
- DUT RF input maximum power : 12dBm.
- DUT RF output maximum power measurement : 30dBm.
- PNA-X network analyzer
- RF Switch Matrix
- Up to 8 parallel channels for a single system under test
- 12 power supplies available
- UPS that prevents interruption of power
- Emergency stop system
- Embedded protections and monitoring
- Temperature control
- Power, Voltage, Current, Temperature... monitoring
- Dedicated DUT wiring and digital protocol



Application example

This test bench is dedicated to test multi-channels Power Amplifiers for Space application; connected to active antenna arrays.

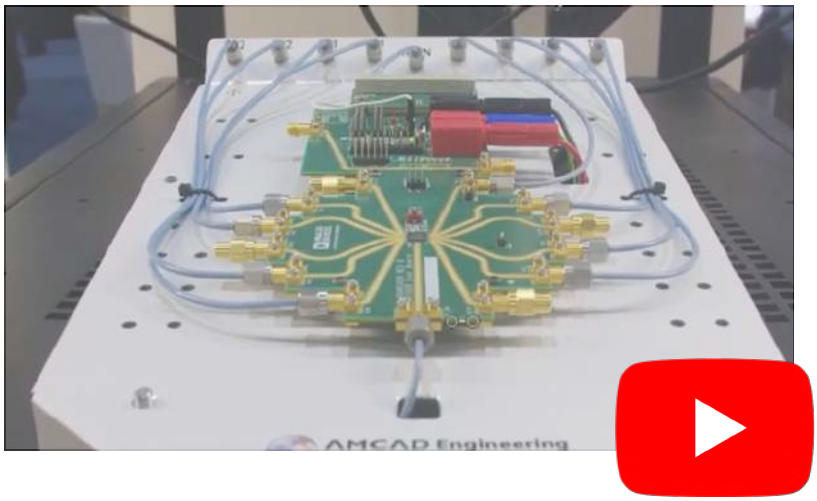
Designed to speed-up the measurements for system qualification during the production

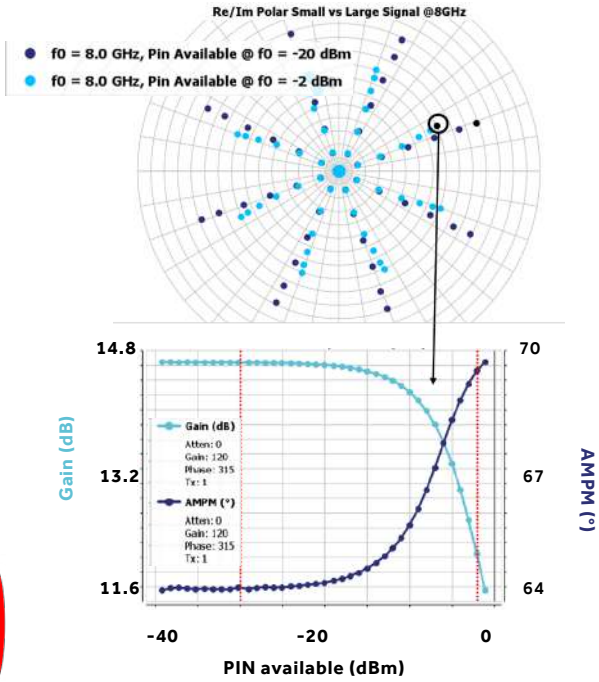
USE CASE EXAMPLE 2

Test bench for RF beamformer

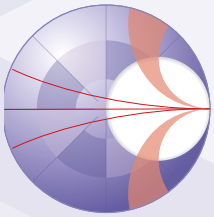
- Automated measurement sequence on 4 Rx & 4 Tx paths
- DUT control
- Gain & phase ctrl on each Tx & Rx paths
- Live monitoring of vital parameters
- Temperature control
- Active Load Pull capabilities of 4 Channel Tx paths to evaluate VSWR effect on coupling effects between the different channels
- IQSTAR SW solution for complete and turn-key automation
- Easy Measurement data analysis using the Whiteboard SW tool

https://youtu.be/7TYbZC2eVsA





Beamformer nontinearmeasurement example



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