

Remote Power Telemetry with Intel Power Consumption Measurement (iPCM)

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Introduction

This poster showcases an innovative solution for remote platform power measurement and validation.

- Replaces bulky, expensive, and complex conventional instruments with a small, inexpensive, highly accurate tool.
- Features plug-and-play functionality and seamless cloud-controlled operations for enhanced convenience.



Existing solution

- Requires time consuming setup and board wiring
- Complex hardware setup
- Requires expensive equipment
- Limited equipment availability
- Requires open-chassis for measurements



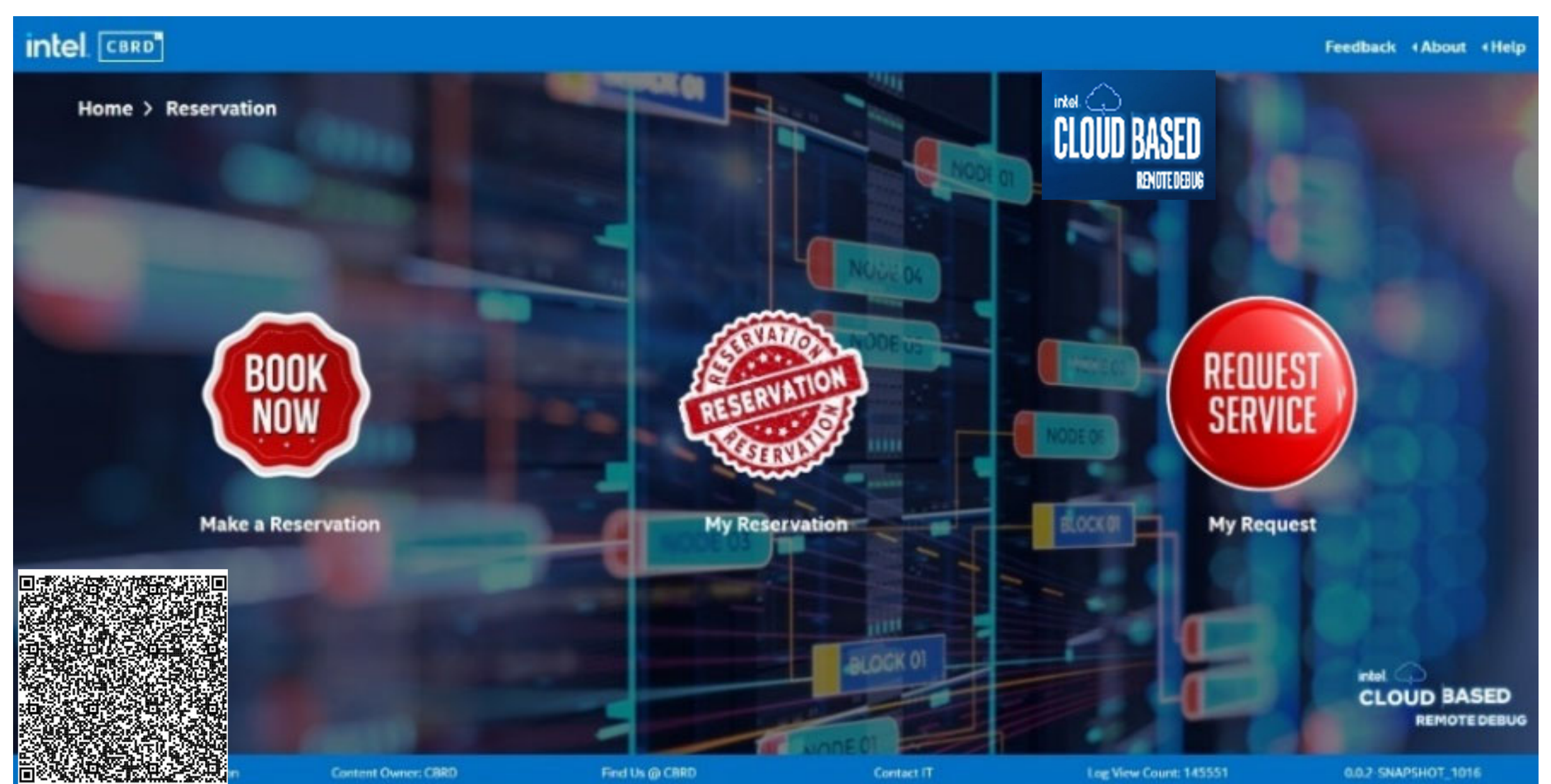
Intel Power Consumption Measurement (iPCM) solution

- Simple plug and play using a USB dongle.
- Works in all sleep states (S0, S3, S4, S5) and Connected Modern Standby (CMS)
- Proven accuracy (compared with NI DAQ measurement)
- Supports both open and closed-chassis measurements

Overview

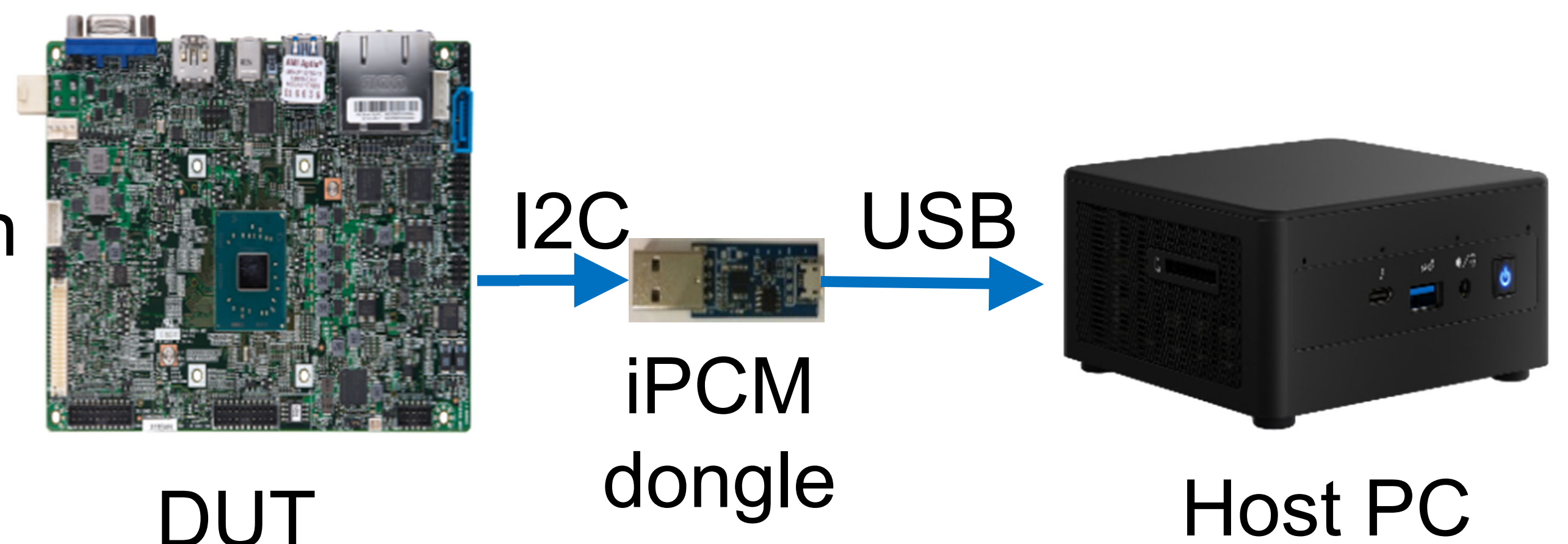
- **Deployment:** iPCM tool capability can be designed in and deployed on any platform to measure all desired platform power rails. The platform and iPCM readout can be accessed remotely via a cloud service.
- **Accuracy:** Accurate to within 3% of the conventional platform power measurement standard (from a National Instruments DAQ).
- **Efficiency:** Reduces debug and validation engineering hours, accelerating product time-to-market.
- **Accessibility:** This solution's low cost and complexity overcomes limited board accessibility and enhances design and debug self-sufficiency.
- **Unique Offering:** No current solution matches iPCM's remote debug capabilities, accuracy, price point, and ease of use.

- Connect the Device Under Test (DUT) to Intel's Cloud-Based Remote Debug (CBRD) Infrastructure and Service
- Connect a Power Distribution Unit (PDU) for remote power on/off control of the DUT.
- Connect a Host PC to the remote service.

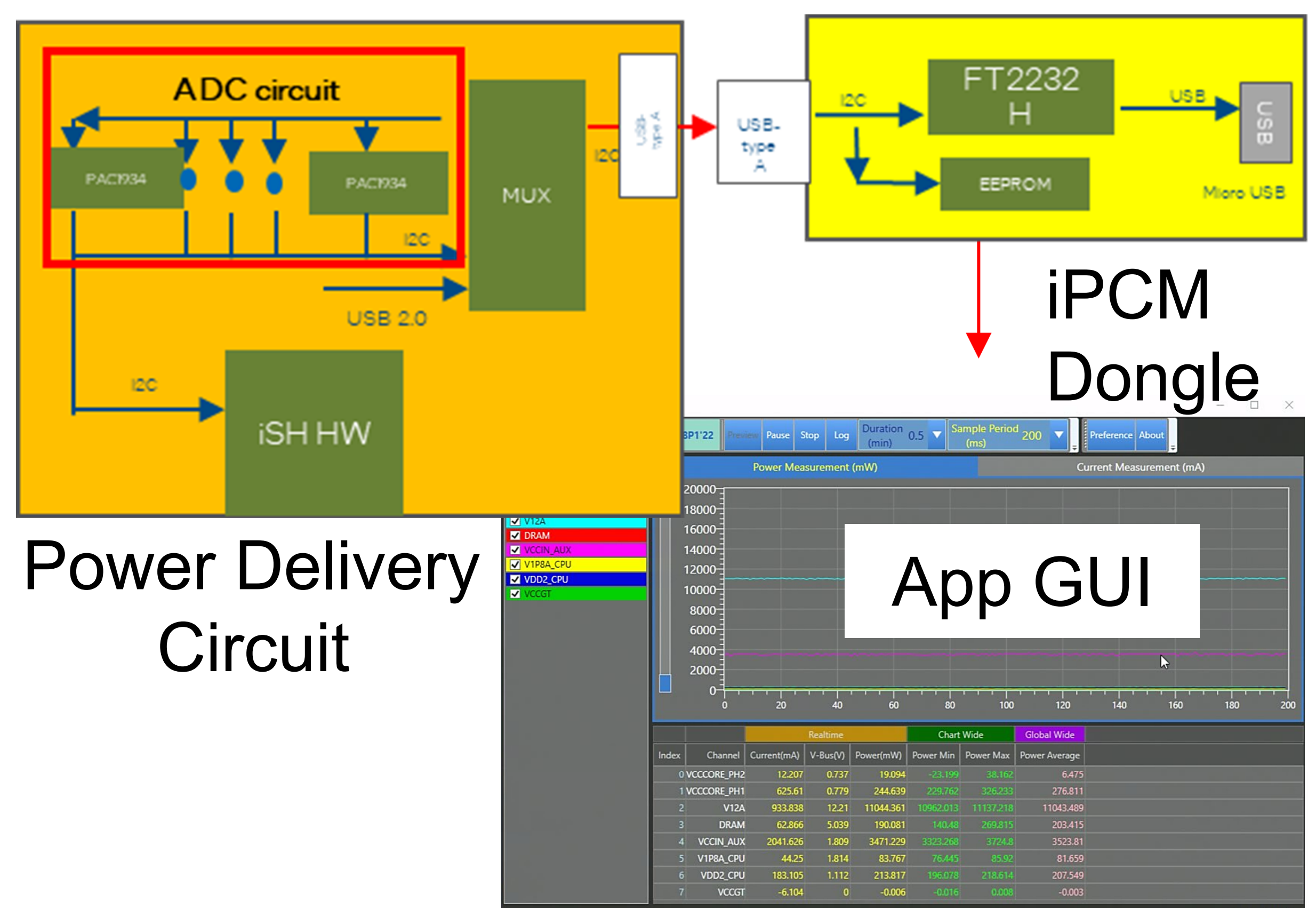


CBRD Remote Services

- The Device under test (DUT) connects to the host PC via an external iPCM USB dongle
- The iPCM application runs on the host PC



- Power meter and sense resistors are integrated into the DUT power delivery circuits
- iPCM application communicates via the USB dongle to capture data from the DUT.
- Measurement data is captured and displayed on the Host PC in the iPCM application GUI.



Results & Impact
- The iPCM-enabled design has made a significant impact on the power test and measurement methodology. - The overall test setup, configuration, and execution have become much simpler and less time-consuming. - With the added benefit of remote capability through the CBRD environment, the process is further streamlined. - Most importantly, the sensitivity and accuracy of this approach are proven to be comparable with conventional test instruments.

Key impacts include:

Power Test and Measurement	DAQ Tool	iPCM Tool + CBRD
Accuracy	within 1%	within 3%
Equipment	>\$20K (uses probers)	<\$2K (uses headers)
Requirements	Paper Spec (PDF)	Smart Spec (config file)
Test Method	Manual Interpretation	Fully Automated
Test Skills	Highly Specialized	Minimal Experience
Test Plans	Weeks (create new)	Days (reuse config file)
Test Execution	Months (variable)	Days (predictable)
Test Environment	Onsite	Onsite or Remote
Manpower	2-3 Engineers	1 Engineer

Summary
- This solution combines the Intel Power Consumption Measurement (iPCM) tool with Cloud-Based Remote Debug (CBRD) for simplified validation via remote services. - The iPCM tool uses analog circuitry for high-accuracy measurements, comparable to conventional instruments, without the need to wire the board with probe points. - The USB dongle plug-and-play setup works even on closed chassis systems with minimal effort through the iPCM application GUI -- reducing validation time from weeks, to days.

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