ÅAC Microtec™ Virtual System Integration (VSI) equipment

- Key enabler for lowering project costs and risks

- Distributed integration of payloads and sub-systems reduces travel and on-site integration time

- The only integration tool that is fully compatible with Space Plug-and-Play Avionics (SPA)

- Remote power control for off-site engineers developing on-site hardware

Virtual System Integration lowers costs and risks

Virtual System Integration (VSI) is used for distributed assembly, integration and testing (AIT) over the internet. VSI enables device simulation over provided interfaces and allows several teams in different locations to work on the same hardware. In addition, VSI can also scan pass-through traffic and generate user logs that can be viewed through a web interface on the VSI equipment. Figure 1 shows ÅAC Microtec VSI equipment.

Very powerful development tool – unique support for SPA

VSI is the only integration equipment that fully supports the SPA protocol, making it a very powerful develop-

ment tool. Many across-the-board project development gains can be won. ÅAC Microtec VSI equipment:

- Cuts costs by reducing the need to ship engineering models between subsystem suppliers

- Reduces risks by allowing the integrator to perform regular integration tests on off-site hardware (including classified payloads)

- Enables distribution of updated mission simulation software

- Reduces the need for physical access to the real hardware, a critical and frequent bottleneck

- Reports connected device voltages and currents to other locations

Connecting spread-out devices

Figure 1 shows how integration via the SPA protocol is achieved. This example illustrates a Rapid Integration Architecture™ (RIA) and an SPA-compatible onboard computer located at an integration facility (Location 1) and three remote locations (2-4). Location 2 and 3 have different subsystems. Location 4 is a software developer working from home on on-site hardware. The VSI equipment handles the translation between the various SPA networks and Ethernet. By providing local SPA interface drivers and power, it effectively resembles a distributed power control unit (DPCU). DPCUs are flexible, compact high-density modules that distribute power and data via standardized interfaces in embedded plug-and-play
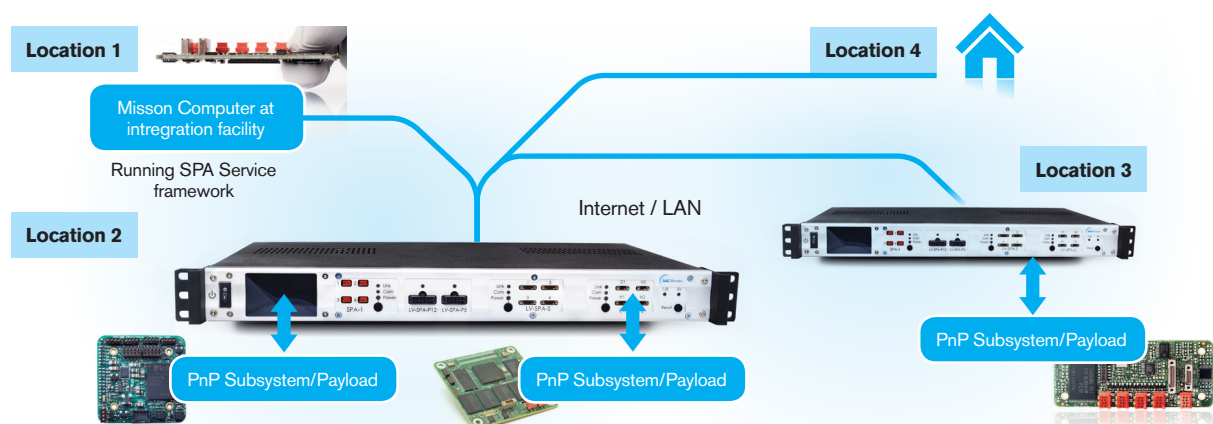

FIG. 1. Virtual System Integration achieved using the SPA protocol. The VSI equipment provides local SPA interface drivers and power, imitating a distributed power control unit (DPCU). A software developer working at home (Location 4) can, for example, remotely control power to subsystems such as that at Location 3.

compatible systems. This remote power control allows the developer in Location 4 to power cycle the subsystem at Location 3 after new software has been downloaded to the device.

A local RIA/SPA-compatible device negotiates with the VSI equipment, which extracts the SPA proto-col traffic and forwards it over the internet or a local area network (LAN) to the SPA-compatible data manager running on the mission computer at the integration facility. This approach permits multipoint connectivity and hence Virtual System Integration

of RIA/SPA devices. It also allows distributed data, network, and processor managers, all of which are an important part of the SPA standard.

Wide range of front panel interfaces

Figure 2 shows ÅAC Microtec VSI equipment and its front panel interfaces. The display allows certain criti-cal functions to be run directly from the unit. Users simply type in the IP addresses of remote devices to which they want to connect. One example of such a key function is the reporting of voltages and currents drawn on connected devices to other locations.

FIG. 2. VSI front panel interfaces.

Labels: ON/OFF button · Display · 4 × SPA-1 · Status LED · 1 × LV-SPA-P12 · 1 × LV-SPA-P5 · Status LED · 4 × LV-SPA-S · Status LED · 3 × LV-SPA-U (Device) · 1 × LV-SPA-U (Host) · Status LED · Reset button

Technical specifications – Virtual System Integration equipment

KEY PARAMETERS

Communication	1 × Ethernet
	4 × SPA-1 (I2C)
	3 × LV-SPA-U Host (USB)
	1 × LV-SPA-U Device (USB)[1]
	4 × LV-SPA-S (SpaceWire)[1]
Output power	1 × LV-SPA-P5 (5 VDC, 15 W)
	1 × LV-SPA-P12 (12 VDC, 36 W)
Input power	90-265 VAC, 400 W
HMI	Web management interface and logging
	1 × LCD touch-screen user interface
	11 × status LEDs

Dimensions	1U 19" rack mechanical design (431.8 × 254.5 × 43.8 mm)
Weight	2.2 kg
Temperature (operational)	0 to 40°C

[1] Functionality not released at time of print.

ORDER INFORMATION

Part number	Item	Description
104209	VSI equipment	Virtual System Integration equipment

For more information, please contact:

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