Vertiv™ Avocent® ACS800 Advanced Console System
Serial Console Appliance
GUIDE SPECIFICATIONS

1.0 GENERAL

1.1 Summary

This specification shall define the electrical and functional characteristics for a small form factor serial console appliance. The serial console provides remote access to the serial interfaces of connected target devices.

The serial console shall serve as a single point for access and administration of connected devices, such as serial consoles of IT equipment, modems, and power devices. The console system shall support secure remote data center management and out-of-band management of IT assets from any location worldwide. The serial console shall provide secure local (console port) and remote (IP and dial-up) access. The console system should run the Linux operating system with a persistent file system in Flash memory that can be upgraded with a local file on a computer connected to the serial console device.

1.2 Standards

The serial console shall be designed in accordance with applicable sections of the current revision of the following documents. Where a conflict arises between these documents and statements made herein, the statements in this specification shall govern.

Emissions and Immunity:

- FCC Class A
- CE Class (EU)
- ICES-003 (Canada)
- VCCI (Japan)
- RCM (Australia)
- Customs Union (CU)
- KCC (Korea)

Safety:

- UL (USA)
- cUL (Canada)
- EN-60950 (EU)
- CB
- Customs Union (CU)

- UL 60950-1 2nd ED (Cellular related)
- cUL 60950-1 2nd ED
- IEC 60950-1 2nd ED (Cellular Related)
- EMC/Radio Compliance (Cellular Related)
- FCC Part 15 Class B
- FCC Part 22, 24, 27

Network (Cellular Related)

- PTCRB

1.3 System Description

1.3.1 Modes of Operation

The serial console shall remain in a continuous mode of operation upon booting that facilitates remote virtual connections and internal functions as initiated by users.

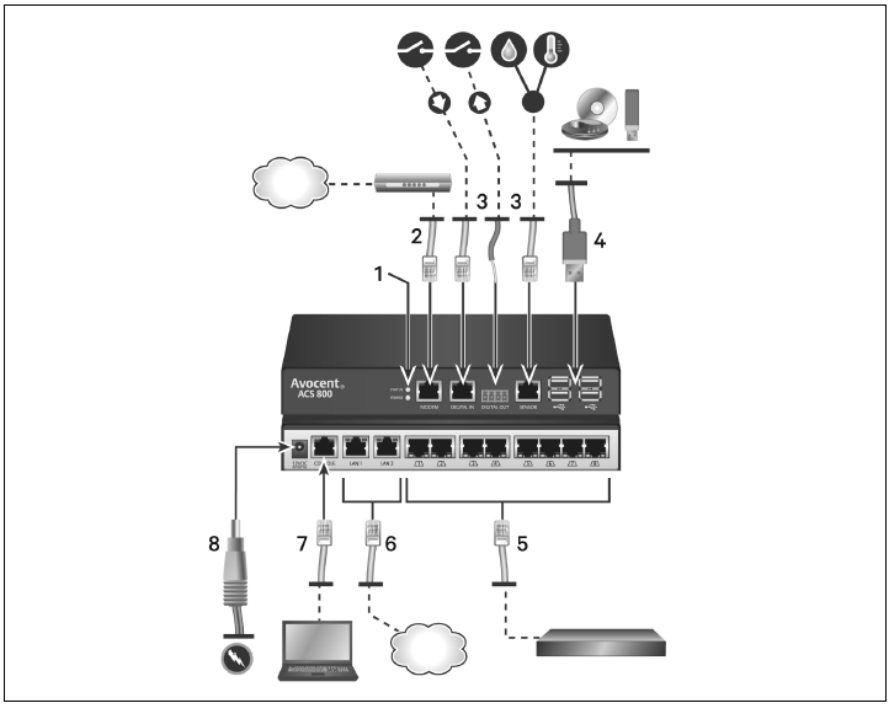
Secure access shall be made available through the following local (analog console port) and remote (digital IP, cellular, and dial-up) options:

- LAN/WAN IP network connection.
- Dial-up to a factory-configured internal modem (optional) or a modem connected to one of the serial or USB ports.
- Target device connected via a Telnet, SSH v2, or Raw connection to a target device.
- Console system console connection (as an administrator) via local terminal or from a computer with a terminal emulation program that is connected to the console port.

More than one administrator shall be allowed to log into the console system and have an active CLI or web UI session.

1.3.2 Device Overview (all options shown)

The serial console shall support the following interfaces:



Item	Description
1	LEDs. The STATUS LED is green when the console system is fully booted up and initialized. The Power LED is green when power is being supplied to the console system
2	Modem port for internal v.90 analog modem (not available on some models)
3	Sensor port for a 1-Wire environmental sensor. Support for complete Vertiv™ Liebert® SN family of sensors including temperature, humidity, leak, and door sensors. Digital Input and output ports for customized inputs (Ex. leak, pressure, or dry contact sensors).
4	USB ports for supported USB devices and USB serial console hosts. The USB ports (Version 2.0) shall meet the HID Power Device standard, version 1.0 or later
5	RJ45 Serial ports (connection to target devices) with support for CAT 5e or CAT 6 cables. All serial ports are multi-protocol and user selectable with RS485, RS422, and RS232 pinouts
6	LAN ports. Built-in 10/100/1000 copper Ethernet interfaces
7	Console port for connecting a terminal or workstation. The console system is configured using a terminal or terminal emulator with session settings of 9600, 8, N, and 1, with no flow control
8	Power supply input. The system accepts a 12VDC input and employs an external power supply of AC (or DC) power connections

1.3.3 Power Options

Input Voltage

Input voltage specifications of the serial console shall be:

- **Device Input**: 12 VDC via 2.5mm barrel female input connector.

Input Voltage

The serial console shall include an external power adapter.

- **External AC/DC Power Adapter (power brick):** 100–240 VAC, 50/60 Hz Input, 12 VDC/40W Output with 2.5mm barrel plug.

External Power Adapter

The serial console shall include a C13-C14 power jumper cable (10A/250V rated).

1.4 System Specifications

1.4.1 Hardware Specifications

The serial console shall include the following hardware specifications:

Item	Description
CPU	Dual-core ARM Cortex-A9 MPCore with CoreSight
Memory	• 1GB DDR3L RAM • 16GB eMMC Flash
Interfaces	• 2 Gigabit (10/100/1000BT) Ethernet interfaces on RJ45 • 1 RS-232 serial console port on RJ45 • 4 RS-232 serial ports on RJ45 (Target ports) • Serial ports selectable between RS-232/RS-422/RS-485 • 4 USB 2.0 Ports on Type A connector • Environmental sensor port on RJ45 (1-wire) supporting Liebert SN sensors • 4 digital-in ports • 4 digital-out ports
Power	External AC/DC Power Adapter (power brick) 100 VAC - 240 VAC, 50/60 Hz Input, 12 VDC Output

Power Usage	• Nominal voltage 120VAC:
	  • Typical 0.13A, 6.2W
	  • Maximum 0.47A, 28W
	• Nominal voltage 240VAC:
	  • Typical 0.10A, 7W
	  • Maximum 0.29A, 28W

Dimensions (W x D x H)	8.4W x 7.2D X 1.2H in (21.3 cm x 18.3 cm x 3.0 cm)
Weight	2.4 lbs

1.4.2 Functional Specifications

The serial console shall provide the following functionality:

(More information on the specific implementation details, configuration, and usage of each functional element can be found in the serial console User guide, Command Line Reference guide, and/or Application Programming Interface guide.)

1. **Operating System**

- Yochto project-based Linux

2. **Accessibility**

- Zero Touch Provisioning (ZTP)
- In-band (Ethernet) and out-of-band (dial-up/cellular modem) support
- Optional built-in v.92 analog modem
- Optional built-in 4G/LTE cellular modem
- Local Console Port for device management
- USB 2.0/3.0 ports for use with USB peripherals and as serial console target ports.

3. **Availability**

- Automatic Ethernet or Cellular failover (using a second GbE port or 4G/LTE interface for failover)
- Support for multiple-routing tables
- External AC/DC power supply design
- Dual GbE Ethernet support
- USB support

4. **Security**

- Preset security profiles-secure, moderate, and open
- Custom security profiles with ability to restrict specific protocols, IP services, and TCP ports
- IPSec VPN with Third-Party certificates
- IPSec with NAT traversal support
- X.509 SSH certificate support
- SSHv1 and SSHv2
- TLS 1.3
- Local, RADIUS, TACACS+, LDA/AD authentication
- Two-factor authentication (RSA SecurID and 3rd party authentication challenge tokens)
- One-Time Password (OTP)
- Local, backup-user authentication support
- PAP/CHAP and Extensible Authentication Protocol (EAP) authentication (for dial-up lines)

- Group authorization:
    - TACACS+, RADIUS, and LDAP
    - Port Access
    - Power Access
    - Appliance privilege
- IP packet and security filtering
- User-access lists per port
- System event syslog
- IP forwarding support
- Secure factory defaults
- Strong password enforcement

5. Console Management

- Sun break-safe (Solaris Ready Certified)
- Break-over SSH support
- Off-line data buffering - local and remote (NFS/Syslog/ Vertiv™ Avocent® DSView™ management software)
- Level-based Syslog filters
- Time stamp and rotations for data buffering
- Support for unlimited simultaneous serial sessions on the same port with the ability to view (port-sniff) and toggle between sessions
- Configurable event notifications for all major areas of functionality
- Configurable event destinations
    - Syslog
    - SNMP Trap
    - Email
    - SMS
- Customizable, global time zone support
- Multiple and customizable user levels of access

6. Port Access

- Directly by server name or device name
- CLI Command
- TCP port alias
- Simultaneous Telnet and SSH access
- HTTP/HTTPS

7. System Management

- Configuration wizard in Web for first-time users
- Auto-discovery for automatic deployment
- Command line interface (CLI)
- Linux Shell access
- RESTful API
- Web Management Interface (HTTP/HTTPS)
- SNMP v2 and SNMP v3
- Internal temperature sensor

8. Cabling

- CAT-5 compatible adapters for simpler cabling
- Autosensing for Cyclades and Cisco pin-outs for serial ports
- Autosensing for baud rate
- Auto portname discovery

9. Upgrades

- Regular firmware uploads available online at no charge
- TFTP support for network boot
- Use of 3rd party

10. Power Device Management

- Automatic power device (PDU and UPS) discovery.
- Integrated ability to manage and control PDUs from Vertiv and 3rd party vendors – view data such as device status, power consumption, power factor as well as control outlets (on/off/cycle) (if PDU is capable).
- Support the following PDU types:
    - Avocent/Cyclades - PM family
    - Vertiv - Vertiv™ MPX family
    - Geist - Vertiv™ Geist™ PDUs, all families
    - SPC - SPC power control device family
    - Raritan - PX G2 family
    - APC - Vertiv™ Geist™ rPDU2 family
    - ServerTech - SeverTech and ServerTech Pro2 families
    - Eaton - ePDU G3 family

- Integrated ability to manage and control UPS from Vertiv™ Liebert® GXT4 and Vertiv™ Liebert® GXT5 views data such as device status, power consumption, power factor as well as control outlets (on/off/cycle).

1.5 Environmental Conditions

1. Ambient Temperature

- **Operating:** 14°F to 140°F (-10°C to 60°C)
- **Storage:** -4°F to 158°F (-20°C to 70°C)

2. Relative Humidity

- **Operating:** 20% to 80% non-condensing
- **Storage:** 0% to 95% non-condensing

3. Altitude

Altitude shall have no effect on the operation of the serial console.

4. Audible Noise

The serial console shall be a fan-less system that employs passive cooling. As such, the device shall not emit audible noise.

1.6 User Documentation

The specified Serial console system shall be supplied with a Safety Instruction and Warning Sheet and a printed copy of the quick start guide. The user manual shall be downloaded from the web and includes installation instructions, a functional description of the equipment with block diagrams, safety precautions, illustrations, step-by-step operating procedures, and general maintenance guidelines.

A separate Command Line Reference guide shall be available to outline the operation of the internal CLI.

A separate Application Programming Interface guide shall also be made available to outline the functionality exposed via the RESTful API along with instructions on access and use.

Additional user guides and technical information shall be available online.

1.7 Warranty

1.7.1 Standard Warranty

The serial console shall include a standard Avocent 90-day/2-year product warranty with the following terms:

The vendor shall warrant to the first person, firm, association, or corporation for whom the serial console is originally installed for users that this product is and will be free of defects in material and workmanship for a period of 90 days from the date of purchase by the user. The user shall have the option to register the product at any time within 90 days of the date of purchase to ensure warranty support and access to product updates during the 90-day warranty period. If the user registers the product within 90 days of purchase, the warranty period shall be automatically extended at no additional charge to a period of 24 months from the date of purchase. The warranty period for government customers and customers located in Europe shall be 24 months without the requirement to register.

1.7.2 Uplifted Hardware Maintenance

The serial console vendor shall offer uplifted support agreements for serial console products. The customer shall be given the option to purchase 1-, 2- or 4-year terms of uplifted hardware support at silver or gold levels. Each level provides benefits such as extended tech support hours, faster guaranteed support times, and hardware replacement (RMA).

The manufacturer's website shall provide more information and currently available programs.

1.8 Quality Assurance

1.8.1 Manufacturer Qualifications

More than 30 years of experience in the design, manufacture, and testing of serial console systems shall be required. The manufacturer shall be certified to ISO 9001:2008.

1.8.2 Mean Time Before Failure

The product shall have a Mean Time Before Failure (MTBF) of greater than 340,000 operational hours at 25°C and 135,000 operational hours at 40 °C (based on Telcordia SR332 standards, Ground Benign, Controlled).

1.8.3 Factory Testing

Before shipment, the manufacturer shall fully and completely test the system to ensure compliance with the specification.

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1.8.5 Firmware Releases

The serial console shall have regular firmware releases made available online to support new features, update libraries, address bugs and update security elements (including CVE mitigation).

2.0 PRODUCT

2.1 Fabrication

All materials and components making up the serial console shall be new, of current manufacture, and shall not have been in prior service except as required during factory testing.

2.1.1 Indicators and Controls

Serial Port Status Indicators

The serial console shall include two LEDs for each serial port that illuminate either green or yellow. These LEDs shall be incorporated into the RJ45 connector of each serial port.

Green LEDs shall indicate the status for the physical connection with a serial port, remote connectivity (when applicable), and data transfer. Yellow shall LEDs indicate whether a serial port is being monitored along with the alert level (emergency, alert, or none) of a monitored target.

The LEDs shall operate in the manner indicated in the following table:

State	Description for Green LEDs	Description for Yellow LEDs
Off (not illuminated)	No physical connection	No data buffering
On (solid green or yellow)	Device is physically connected to the serial port	Data buffering is enabled for the serial port
Slow blink	SSH or Raw session is active	Alert level is active
Fast blink	TX or RX data activity	Emergency level is active

System Status Indicators

The serial console shall include LED system-level status indicators signifying when the system has been fully booted and initialized as well as the operational status of each installed power supply.

The system level indicators shall be the System indicator, P1 power indicator, and P2 power indicator.

The STATUS LED is green when the console system is fully booted up and initialized. The P1 and P2 LEDs indicate an active power supply. P1 is green when Power Supply 1 is on. P2 is green when Power Supply 2 is on.

2.2 Communication Options

2.2.1 Local Serial Console Port

A console port (serial RS-232) shall be provided on the rear of the serial console device, with an RJ-45 connector. This connector shall enable access to the built-in Command Line interface and Linux shell environment of the serial console.

2.2.2 Remote Access

The serial console shall be provided the means to remotely manage the configuration of the device by the following means

- Auto-discovery for automatic deployment (Zero-Touch Provisioning)
- Command line interface (CLI) via SSH/Telnet
- Linux Shell access via SSH/Telnet
- RESTful API via TCP/IP networks
- Web Management Interface (HTTP/HTTPS)
- SNMP via TCP/IP networks
- Configuration wizard in Web for first-time users (via IP – HTTP/HTTPS)