

AVAT VIRTUAL SERVICES

Industry 4.0 – the digital age has begun

AVAT VIRTUAL SERVICES FLEXIBLE, MODULAR, AND SERVICE-ORIENTED

Reliable remote-service tools reduce travel, engine maintenance and downtime. This drives down service expenditure, safeguarding the plants cost-efficiency.

Cogeneration-plant manufacturers and service providers for large gas engines are under increasing pressure to offer their customers end-to-end solutions. In addition to commissioning, maintenance and related services, they must now provide efficient engine management, remote maintenance and monitoring.

Their portfolios need to address both newly constructed cogeneration plants and improvements and upgrades of existing ones. Ensuring the long-term availability of replacement parts for engines, subsystems and electronic components is vital – as is providing reliable standby and 24-hour emergency services, 365 days a year.

To meet these diverse needs, service engineers require access to engine operating data at all times and from any location. Digital data exchange and maximum protection against unauthorized access can both be achieved with a single solution – AVAT VIRTUAL SERVICES.

Our services for yours

We do not just supply hardware and software and leave the rest to you. Our comprehensive services support your implementation project from start to finish:

- Free-of-charge test phase
- Requirements analysis and consulting provided by experienced specialists
- Pre-configuration of AVAT VPN-ROUTERS
- Efficient on-site installation and commissioning
- Implementation of AVAT CONNECT
- Testing to ensure reliable connectivity to the portal

AVAT VIRTUAL SERVICES THE BENEFITS IN BRIEF

- Rapid remote diagnostics by means of secure VPN connections
- AVAT VPN-ROUTERS compatible with all leading controllers
- Stable, reliable data connections
- Central overview of all plants and engines maintained
- Customizable multi-client support
- Qualified status and fault reports
- Effective planning of on-site maintenance and service deployments
- Less travel, reduced engine maintenance and downtime
- Lower service costs
- Increased plant cost-effectiveness
- Quick and easy upgrading
- Attractive terms and conditions

HIGH PERFORMANCE PARTNER

We have been a trusted partner to the gas-engine industry for 25 years and also the manufacturer of TEM-Evo engine controllers – deployed in thousands of cogeneration plants.

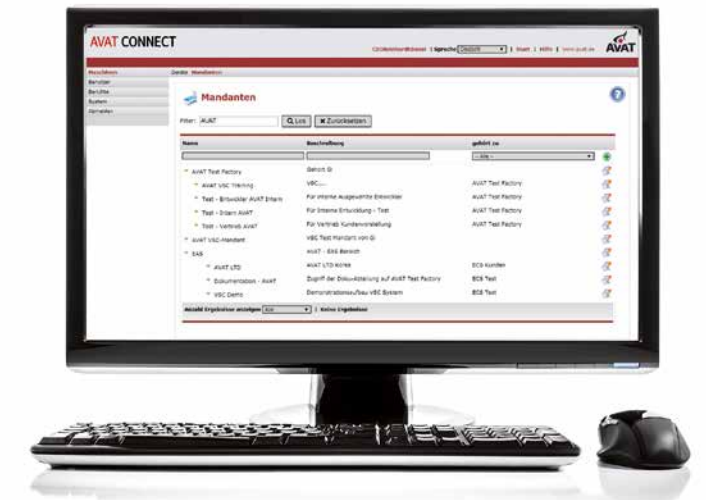
- Technology leader in control systems for large gas engines and cogeneration plants
- More than 8,500 engine controllers in operation worldwide
- Extensive experience gained from projects with a total exceeding 12,500 MW installed electric power
- Smart solutions featuring process and control automation for multiple commodities – for sustainable energy generation and distribution



AVAT VPN-ROUTERS

High-speed connections for reliable operation.

- Optimized for openECS and TEM-Evo engine controllers, and can be connected to other engine and industrial control systems
- Internet access via a network, WAN interface or modem (analog, ISDN, mobile telephony up to 4G/LTE)
- Secure connectivity via OpenVPN and integrated firewall
- Rapid installation (mounted on top hat rail)
- Network availability greater than 99%
- High-performance data center in Germany, with redundant connectivity



AVAT CONNECT

AVAT CONNECT acts as an intelligent communications platform with integrated user and device management, connecting maintenance engineers with control systems for engines and cogeneration plants via AVAT VPN-ROUTERS.

- Simple configuration of AVAT VPN-ROUTERS without the need for specialist IT skills
- Central overview and task-based management of all users and devices, custom-configurable
- Customizable multi-client support with definable, user-specific rights
- All communications between controllers and users take place via outbound connections (to the rendezvous server), guaranteeing secure data transmission from end to end

We offer exclusive AVAT VPN-ROUTERS for openECS and TEM-Evo engine controllers. Device drivers developed and optimized by AVAT for the controller interfaces ensure rapid and reliable connections. This makes first-time implementation or upgrading from analog modems extremely simple – the routers support plug-and-play installation. At the same time, configuration and administration can be customized to specific needs.

A SMART SOLUTION – MODULAR COMPONENTS FOR SEAMLESSLY INTEGRATED SERVICES

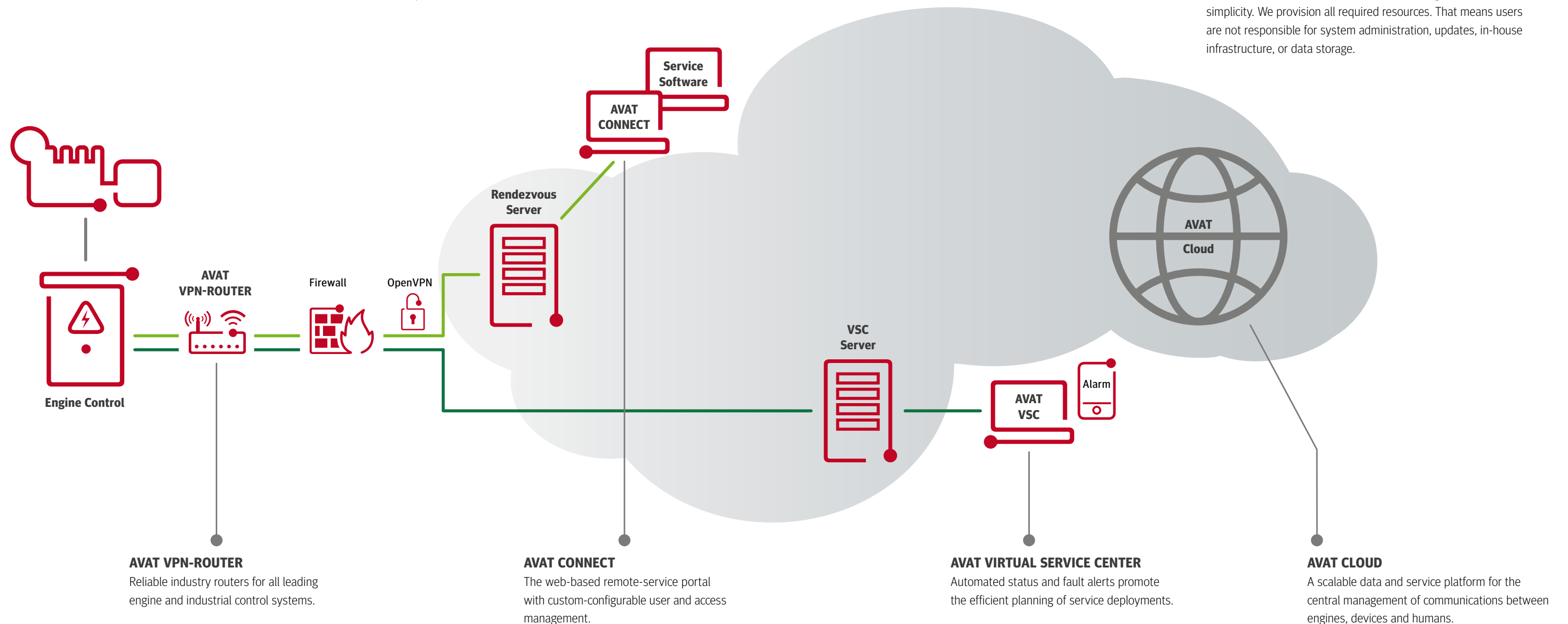
AVAT VPN-ROUTERS, AVAT CONNECT and the AVAT VIRTUAL SERVICE CENTER are not mutually dependent, and can be implemented individually. Deployed together, they form an unrivalled end-to-end solution that enables access to engines and cogeneration plants from any location.

To enable secure data exchange via Internet-based services, AVAT VPN-ROUTERS are connected on-site to the engine controllers. After successful authentication, the routers connect to AVAT CONNECT and establish a secure VPN link. Internet access is either via the operator's existing broadband network infrastructure or directly via a mobile device.

AVAT CONNECT acts as a rendezvous server. Registered users can access the engines they maintain worldwide via this server, and perform remote tasks via a suitable service software tool. Comprehensive data and user management features can be custom-configured in line with task-based requirements at any time.

Service engineers automatically receive relevant status and error notifications in real time via the AVAT VIRTUAL SERVICE CENTER. This information enables them to decide immediately whether an on-site deployment is necessary, or whether the fault can be resolved remotely.

We not only offer hardware and software for man-machine communications. In addition, the AVAT Cloud provides a scalable platform for central data management. Corresponding services are already available from the AVAT Cloud. They are highly scalable and able to meet changing workloads and requirements. The result is intelligent, state-of-the-art services. However, the most significant benefit is simplicity. We provision all required resources. That means users are not responsible for system administration, updates, in-house infrastructure, or data storage.



CENTRAL DATA MANAGEMENT SCALABLE AND FUTURE-PROOF

In light of growing requirements, reliable service solutions are indispensable. To avoid wasting valuable time on the road, maintenance engineers require online access to their customers' equipment. Customers expect them to continuously monitor their plants – and at the same time, to provide maximum protection against unauthorized access. All these needs are met by a single system. It enables anywhere access to all operating data – via an office PC, a tablet or smartphone.

AVAT VIRTUAL SERVICE CENTER (VSC)

Detailed information on entire engine pool in real time.

- Continuously updated engine output data summarized for each cogeneration plant and operator
- Customized automatic generation of status messages and daily reports
- Central planning, control and monitoring of services



Automatic status notifications and daily reports

- Connection status
- Operating status
- Output and engine speed
- Operating hours with recommended timing of maintenance work in accordance with predefined service intervals

Qualified alert management

- Automatic warnings, and notification of faults, status changes or scheduled maintenance by e-mail
- Customizable alert profiles for each e-mail recipient
- Freely configurable times for employee standby shifts

AVAT CLOUD YOUR KEY TO BIG-DATA

A critical success factor for tomorrow's service models is the availability of large quantities of data residing in co-generation plants and controllers. Outputs, engine speeds, the number of system starts, temperatures, pressures, voltages, fill levels, actuator and valve status are continuously monitored. All this operating data is stored and, to some extent, evaluated in the controllers themselves, and displayed via web-based tools.

Operators and service providers make active use of data from controllers installed on site. Visualizations showing how engine and plant data change over time are an efficient tool for extending ser-

vice life and improving maintenance. Patterns are recognized rapidly by means of automated analytics processes, enabling the early identification of potential problems – and potential improvements.

- Continuous condition monitoring of the entire engine pool
- Systematic early fault recognition and engine optimization
- Predictive maintenance and replacement planning
- Continuous forecast of availability and profitability
- Long-term storage of operating logs, history and parameters

E²SERVICE THE openECS SERVICE TOOL

This software for forward-looking service engineers provides visualization functionality and enables continuous remote access to engine controllers from any location. E²SERVICE clearly displays engine behavior and relevant data. The views it offers are optimized to support typical tasks, such as commissioning, adjustment of controller settings, troubleshooting and maintenance. The operating log provides context information, filters, and search functionality. Parameters are used to provide online help plus save, restore and compare functions.



Depending on the application and authorization, E²SERVICE enables the following operations:

- Parameterization
- Commissioning
- Starting and stopping the engine in manual mode (local)
- Switching between manual and automatic mode (local ↔ remote)
- Acknowledging alarms and faults when the cause of the alarm/fault has been eliminated
- Testing of signals and actuators

