Data Sheet no. 1.56/1

Remote Diagnostics and Access Module,

Type RDA 23,

and the HIGHVOLT On-Line Service

Application

What is the difference between a HV test field designed 25 years ago and one that you have to design or to upgrade today?

The parameters of the necessary HV generators for AC, DC or impulse voltages are more or less unchanged, because the test voltage levels are not remarkably changed and also no different types of test voltages are standardized. Also the basics for grounding and electromagnetic shielding have not been modified. Finally there are no new principles of the overall design of a HV test laboratory or test field.

The great difference in HV test field design is caused by the tremendous progress of information technology, digital electronics, programmable logic controllers (PLC) and computers. On the one hand computers, PLC's and digital measuring devices from the modern control and measuring system of a HV test system (field level) are described by the Catalogue Sheets 1.52/1 and 3.51/1. On the other hand such a test system cannot be considered as isolated from the modern organization of a production or research process (process level) any longer. This means it must be connected to the local area network (LAN) of the user for data exchange (e.g. the test parameters of the test object from a data base via LAN to the HV test system control and vice versa the test results back to the data base).

The connection of the LAN can be extended to one of a wide area network (WAN, preferably INTERNET). This enables the data exchange with other companies of a group or with the HIGHVOLT Service Center (Fig. 1). The latter supports the user with technical instructions, software updates and effective trouble shooting.

The "remote diagnostics and access module" type RDA 23 is the necessary interface between a HIGHVOLT computer control and LAN-ETHERNET. It is the basis for the integration of a HV test system into the modern world of communication.
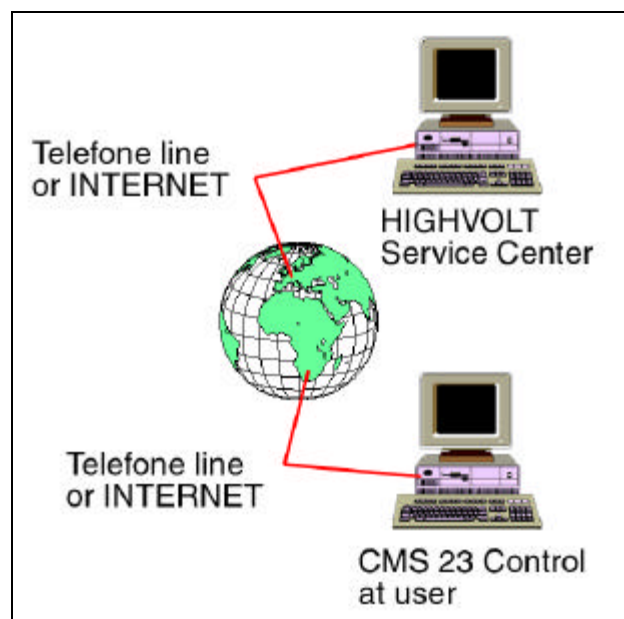

Fig. 1: INTERNET connection to the HIGHVOLT Service Center

LAN and WAN Connection by RDA module

The ETHERNET is the most common basis for LAN. It is a "non-deterministic" bus, where all partners may communicate to each other, but the connections are stochastic and without pre-given sequence time. An ETHERNET connection is used inside the HV test system between the control computer and the PLC in the switching cubicle (Fig. 2 and 3). The RDA 23 module realizes the connection to the LAN of the test field, laboratory or company.

Public communication networks (telephone), mobile phones and INTERNET represent variations of the WAN. In case of telephone, a point-to-point communication between two computers is realized, whereas INTERNET enables access to any point of the world which is connected. Both are available for controls of HV test systems. The connection to the public communication system and the application of the TCP/IP protocol (Transmission Control Protocol / Internet Protocol) offers all modern functions of communication. Optionally the web-server integrated in the control system enables the representation of the actual status of the HV test system (as well as the actual test results) as a page in hypertext mark-up language (HTML) which can be displayed via INTERNET. There is the possibility to send e-mails or short message service (sms) depending on any criteria of the test or any situation of the test system.
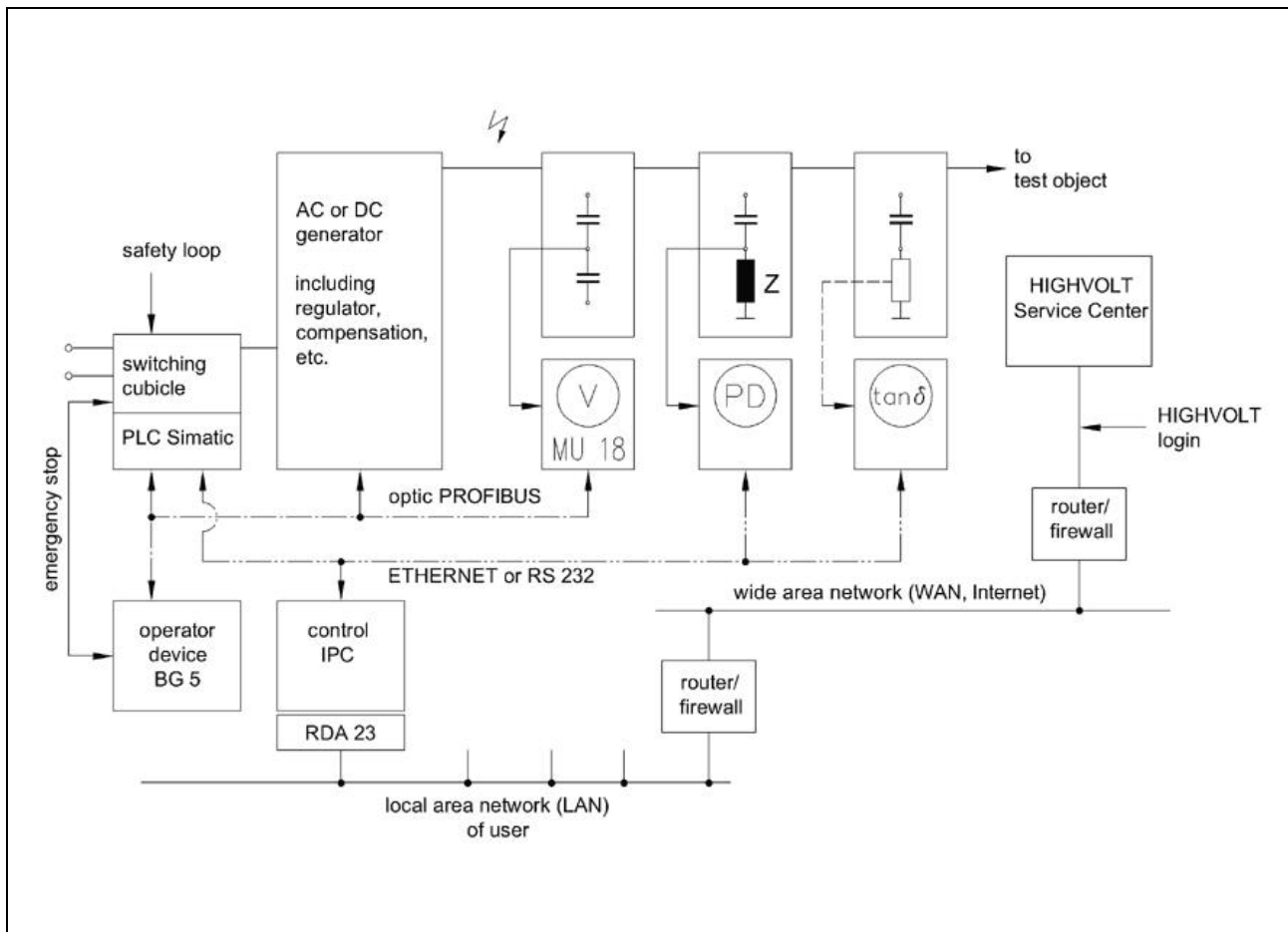

Fig. 2: Example of a computer controlled test system

Remote diagnostic and access module, type RDA 23

The LAN/WAN connection by the RDA 23 module is an integrated component for each advanced computer control of the HIGHVOLT type CSM 23 (Fig. 1 and 2). Optionally it can be supplied for the computer control type CSM 22, too. The *RDA 23 module* is applicable for all kinds of HV test systems for AC, DC and impulse voltages as well as for high and impulse current test systems. But it is not limited to new test systems, it is applicable in all cases when HIGHVOLT upgrades an existing test system by a new control. It can simply be added to a computer control with PLC's of the type SIMATIC S7. Last but not least there is also an application for mobile HV test systems. In that case the WAN connection must be realized by a mobile phone.

Technical requirements for the use of RDA23
(Not part of the delivery, to be provided by the customer.)

- For connection to customer's network an optical ETHERNET interface 100Mbit, plug type SC is provided. The necessary optical fibres for connection to the local area network are not part of the delivery, another (not optically separated) connection is not allowed due to EMV reasons.
- The Internet connection to the HIGHVOLT On-Line Service is established by using the VPN (virtual private network) protocols. Company networks usually establish the connection to the INTERNET via routers and are protected by Firewalls. Both the used routers in the local area network as well as the firewalls have to support the VPN protocols.
- Please inform your administrator about the planned connection of the control and measuring system to the local area network in order to obtain the hard- and software requirements until commissioning of the system.

The remote diagnostics and access module, *type RDA 23*, is an optical ETHERNET interface (of 10 or 100 MBit, depending on the configuration of the HV test system) and a special software package for the industrial personal computer (IPC) of HIGHVOLT test equipment controls types CSM 23 - optionally CSM 22.
The *RDA 23 module* is applicable
- for the connection to a local area network (LAN) and for using of all network resources (e.g. data bases, printers, file servers, etc.);
- for the control of the HV test system by a computer different from the IPC of the control system;
- for the connection to the HIGHVOLT Service Center as described below.
The connection between the LAN and WAN (preferably INTERNET) must be realized according to the local conditions under the responsibility of the user.
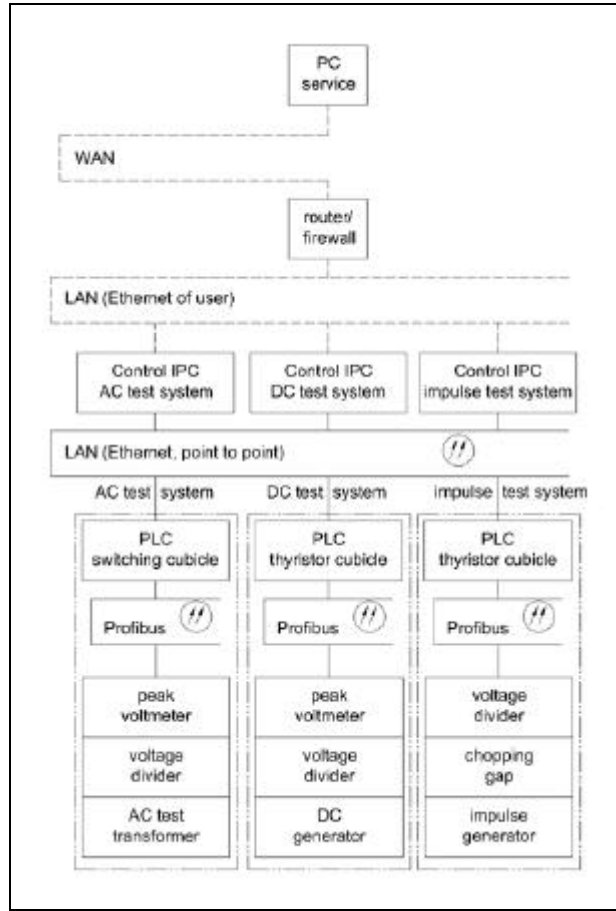

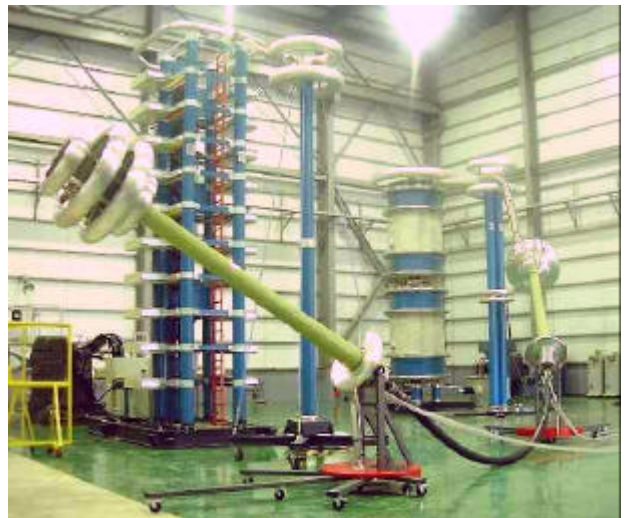Fig. 3: LAN and WAN connections of a test field with three different HV test systems

Fig. 4: HV test field for type testing of cables (courtesy of CWCO, Taiwan)

4. The HIGHVOLT On-Line Service

The availability of a HV test system depends not only on its reliability, but also on a fast and reliable service. Therefore HIGHOVLT has started its on-line Service Center with a special server connected to HIGHVOLT's LAN. The user of a HIGHVOLT test system or a HIGHVOLT computer control may contact that Service Center for any kind of support.

In case of failures, misoperation or software updates of the computer control system of a test system, HIGHVOLT will connect its Service Center to that control system for clarification of the problem and troubleshooting. This can be done by software modifications or updates via INTERNET, but also by hints to the user for countermeasures, small repairs or by mailing of spare parts.

The following procedure of communication with the HIGHVOLT Service Center is recommended:

1.) By email to „rdasupport@highvolt.de", the user shall supply a brief description of the problem to the HIGHVOLT Service Center.

2.) The HIGHVOLT Service Center transfers the request to the related specialist who will supply the necessary recommendations by an answer email.

3.) In case that it is helpful to know the status of the HV test system, the answer contains the information that the computer control (types CMS 23 or 22) of the test system shall be connected via the RDA 23 module, user's LAN and INTERNET to the HIGHVOLT Service Center at a certain time. The data security is guaranteed by applying username and password by the user (both supplied with the Technical Documents of the test systems or with the answer of the specialist).

4.) After the user has established this INTERNET connection, HIGHVOLT overtakes the control of the test system and analyses the status of the test system by special diagnostic tools.

5.) As the result of the analysis countermeasures to overcome the problem will be recommended.
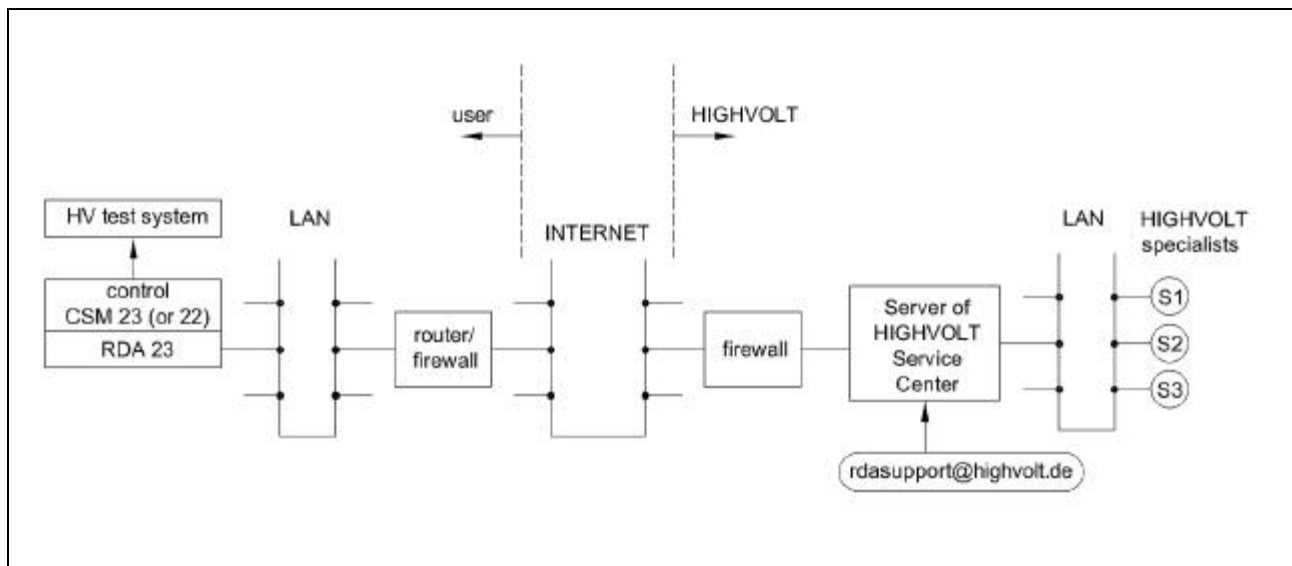

Fig. 5: Structure for the remote support by the HIGHVOLT On-line Service Center

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