Eltav's Wireless Monitoring—VDR/TDVR

A typical actuator Installation

The Operator's Device

The VD

Eltav's Success

The Eltav Wireless Valve Monitoring System has consistently proved itself in all industrial installations.

Overview

The VDR (Valve Device Router) collects reported data from up to 32 associated VDs and wirelessly transfers the information to the next VDR. The TVDR (Tunneling VDR) is the last-hop VDR that passes on all the collected data from the string of VDRs to the site network for processing and analysis.

Operation

The VDR network acts as a relay that transmits messages, received from remote VDRs, through a ZigBee wireless network, until they reach a TVDR.

One or more TVDR(s) are connected to the Eltav Gateway using TCP/IP communication, thus facilitating bi-directional, redundant communication between all VDRs and the site network.

ZigBee mesh technology is implemented ensuring the required routing redundancy for very high communication reliability. The TVDR generates a wireless heartbeat message, over fixed periods, and broadcasts it between the VDRs for mapping routes and diagnosing communications performance.

In the event of a unit failure, the mesh technology automatically reroutes communication with the relevant VDs (or VDRs) thus ensuring continuing network communications.

An operator can use an OD to communicate with VDs, VDRs and TVDRs for installation, configuration and maintenance purposes.

Configuration

The VDR has one connector for an external power supply while the TVDR has two additional connectors: a USB port for testing and maintenance and a TCP/IP port for network connection.

System Configuration

The Eltav Wireless Valve Monitoring System consists of the following components:

VD (Valve Device)

Installed on the valve (or actuator) and reports on valve status (by measuring stem angle) at predetermined times or whenever a deviation in stem angle is detected.

VDR (Valve Device Router)

Collects reported data from all associated VDs and wirelessly transfers the information to the next VDR on a "mesh" topology.

TVDR (Tunneling VDR)

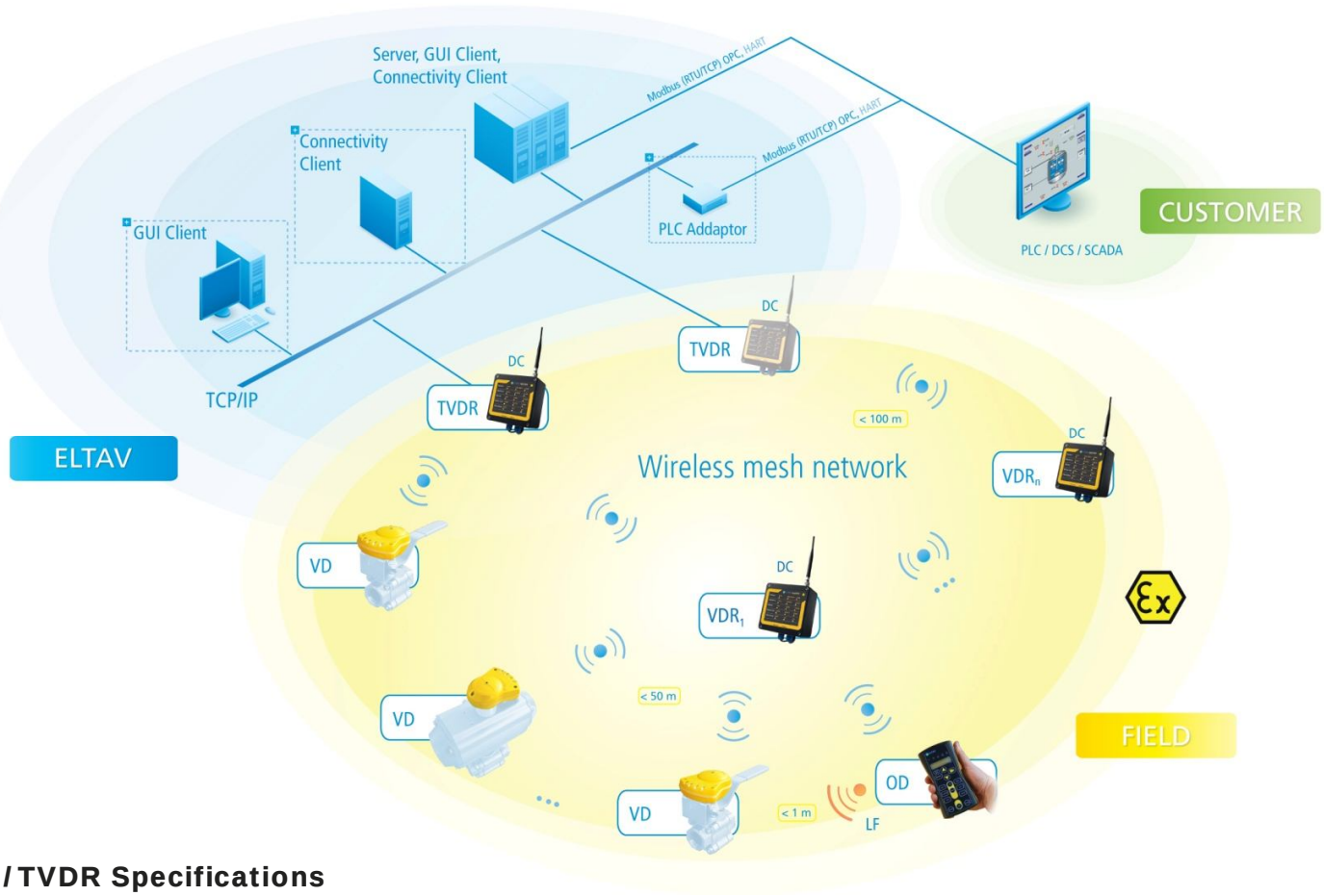
Last-hop VDR that transfers collected data from VDRs to the Eltav Gateway. Several TVDRs can be connected, via TCP/IP, to the Eltav Gateway (thus ensuring full redundancy and avoiding a single point of failure).

Eltav Gateway

An industrial computer running the EMS package used to manage the Eltav Network, and the OPC Server which establishes the interfaces to the OPC data clients and/or PLCs.

OD (Operator Device)

A hand-held device, that enables the operator to communicate with the Eltav System and its devices, using wireless communication. The OD also delivers messages to operators, reports on performance and is used to support installations, configuration, provisioning and maintenance.



VDR/TVDR Specifications

General	
Network architecture	VDRs and TVDRs provide a full self-recovery mesh architecture.
VDR/TVDR max transmitted power	+16 dBm (+ additional antenna gain)
Antenna	External, 20 cm, folding +5dBi with Male N Type connector
VDs per VDR	32. Will be increased in next VDR generation.
VDRs per network	Practically limitless
TVDR	From Zigbee domain to Ethernet TCP/IP and back. Transfer of wireless data to Gateway.
VDR	From Zigbee to Zigbee domains. VD range extender.
TVDRs per network	Not limited
TVDR connection	Two Glands C1 & C2 3 pin terminal block for DC 5 pin terminal block for Ethernet
VDR connection	Two Glands C1 & C2 3 pin terminal block for DC
Control	Internal jumper and/or LF command from OD.
Indications	14 colored LEDs on Front Pannel
Mounting	On wall by special installation bracket
Receiver sensitivity	-97 dBm typical.
Communications	
Communication range router to router	Open space – about 200m. Indoors, in non-obstructed environment – about 100 m.
Power	
Backup supply	2.2 AH Li-Ion rechargeable battery. VDR standby – to 30 hours TVDR – 8 hours Battery charged when unit is powered (also in OFF).
DC supply	VDR 7-36 V / 10W max. TVDR 7-36 V / 10W max.
ATEX	CE Ex II 3 GD Ex n IIC T4 / NEC 500-Class I, Division 2, Groups A&B T4; NEC 505-Class I, Zone 2, AEx n, IIC T4

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