VARIODYN® D1 Networking

GB Commissioning Instruction

Intended purpose

This products may only be used for the applications outlined in the catalogue and in the technical description, and only in conjunction with the recommended and approved external devices and components.

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The information contained in this documentation is provided without warranty.

Safety-related user information

This manual includes all information required for the proper use of the products described.

In order to ensure correct and safe operation of the product, all guidelines concerning its transport, storage, installation, and mounting must be observed. This includes the necessary care in operating the product.

The term 'qualified personnel' in the context of the safety information included in this manual or on the product itself designates:

- project engineers who are familiar with the safety guidelines concerning fire alarm and extinguishing systems.
- trained service engineers who are familiar with the components of fire alarm and extinguishing systems and the information on their operation as included in this manual.
- trained installation or service personnel with the necessary qualification for carrying out repairs on fire alarm and extinguishing systems or who are authorised to operate, ground and label electrical circuits and/or safety equipment/systems.

Symbols

The following information is given in the interest of personal safety and to prevent damage to the product described in this manual and all equipment connected to it.

Safety information and warnings for the prevention of dangers putting at risk the life and health of user and maintenance personnel as well as causing damage to the equipment itself are marked by the following pictograms. Within the context of this manual, these pictograms have the following meanings:

Warning - Designates risks for man and/or machine. Non-compliance will create risks to man and/or machine. The level of risk is indicated by the word of warning.

Note - Important information on a topic or a procedure and other important information!

Standards and guidelines - Observe configuration and commissioning information in accordance to the national and local requirements.

Hazard warnings on the system components

Warning – risk source.

Warning – dangerous electrical voltage.

Dismantling

In accordance with Directive 2002/96/EG (WEEE), after being dismantled, electrical and electronic equipment is taken back by the manufacturer for proper disposal.

Table of contents

1 General / Application

This documentation is for consultants, network planners, installers and maintainer people planning and installing a VARIODYN® D1 network using Protocol 10. It defines and describes networking requirements, how audio is distributed, used protocols and how the network is controlled. The document requires basic knowledge about networks.

The VARIODYN® D1 System works with 2 different network address ranges - one (native VLAN) for the control communication between modules (DOM, SCU) or server applications (PAMMI Plus, PC) and one (VLAN) for the audio streaming between the devices.

1.1 Associated Documents

These documents are intended for qualified technicians or trained installers and contain all of the important information needed for assembling and installing VARIODYN® systems. Additional information on assembly, operation, commissioning, and configuration can be found in the following documents:

Part No.	Name
798661.GB0	Planning Principles for Voice Alarm Systems
798662.GB0	Operating Instruction VARIODYN® D1 System
798663.GB0	Installation Instructions for the VARIODYN® D1 System
798664.GB0	Commissioning Instructions for the VARIODYN® D1 System and VARIODYN® D1 Comprio
798683.GB0	Installation Instruction System VARIODYN® D1 devices and accessories

Additional and current information

The features, specifications and product information described in this documentation are correct at time of printing (see cover for date); however the information specified in this document may differ slightly from the actual product as a result of product changes and/or changed standards and guidelines in the planning, installation and start-up.
Updated information and conformity declarations are available for reference on the website www.variodyn-D1.com.

VARIODYN ® D1 Systems are registered trademarks in Germany.

2 Communication Network

The control communication works over UDP between the VARIODYN® D1 modules (DOM, SCU) and over TCP between server applications (PAMMI Plus, PC) and modules.
Default IP range for the device communication is 192.168.1.xxx / 255.255.255.0.
The use of different subnets and routers (gateways) is allowed.

Important is to assure broadcasts via network devices (switches, routers) as VARIODYN ® D1 is using this feature to send out status messages.
In networks with VLAN enabled this communication is running within the Default (native) VLAN.

3 Audio Streaming Network

The audio broadcasting in VARIODYN® D1 is done via Multicasting within VLAN 3. Routers or managed switches have to be configured to proper transport VLAN 3 packets in tagged mode (transparent / trunk mode) or VLAN handling is completely disabled.
Either the routers / switches have enabled IGMP Snooping, or broadcast the multicast addresses to all ports or statically route the multicast IP addresses.

The multicast IP address range used by VARIODYN® D1 is 224.1.1.x – 224.1.250.x. Therefore the system assigns system numbers to each communication device (DOM, SCU). These system numbers are assigned by configuration. The configuration is statically done once at installation time, and repeated if hardware changes or extensions are done.

Based on this system numbers there is a direct mapping to the used multicast IP addresses. Each system address reserves 8 multicast IP addresses of the 224.1.xx.xx address range (must not be changed). On top of the IP Protocol the UDP protocol is used, to provide ports:
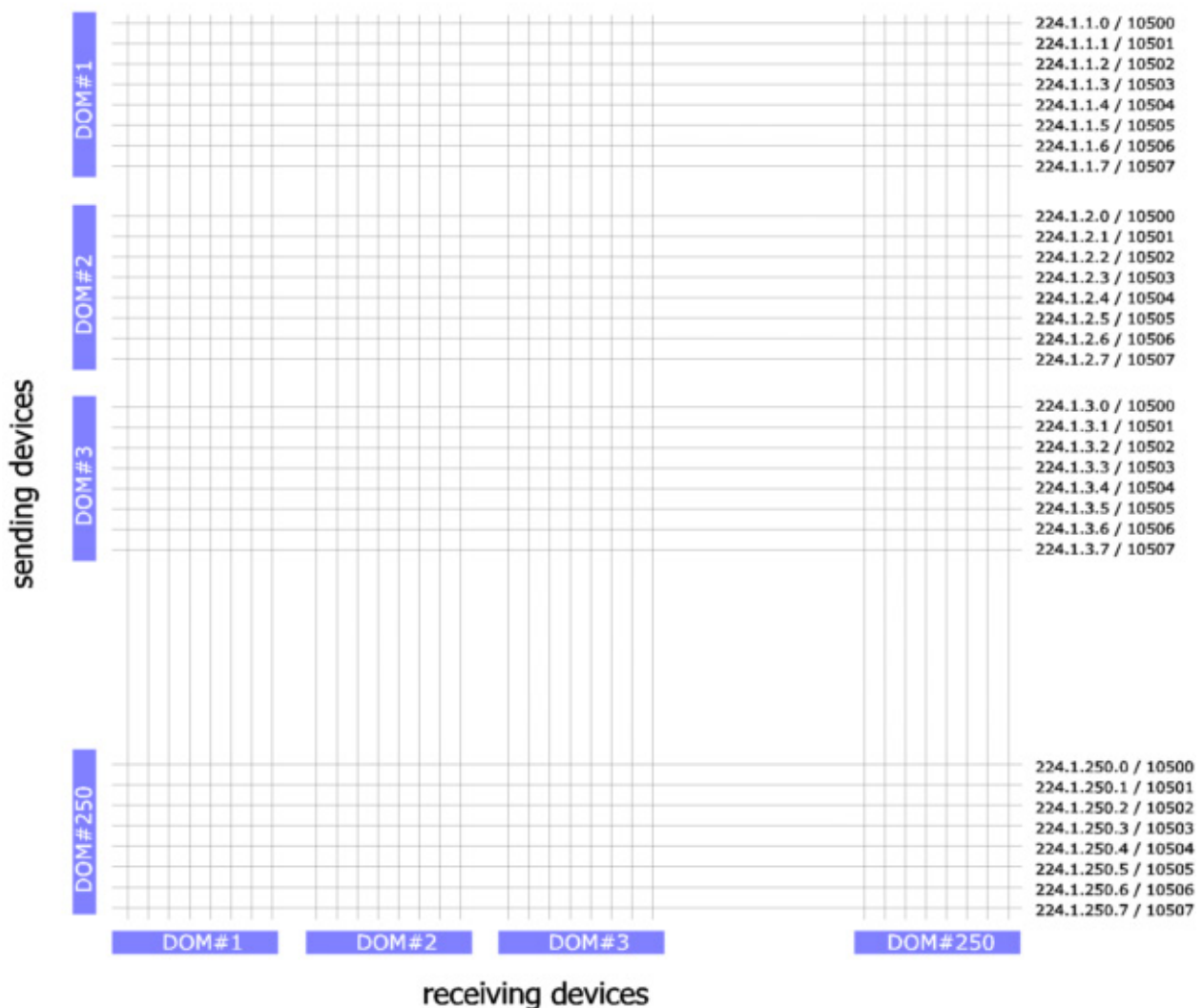
If needed, VLAN handling for audio streaming can be disabled. In this case activate DiffServ / DSCP on the routers / switches and make sure to handle QoS according to RFC 2474.

3.1 Latency

Latency is the time of delay between the original source signal and the output signal after processed and transmitted via the network (Microphone to loudspeakers). Latency in the VARIODYN ® D1 network is around 32 ms.

3.2 Bandwidth

Each audio channel (multicast stream) from a DOM device requires a network bandwidth of 500 kb/s.

3.3 Quality of Service

Because or Audio network delivery demands a max. packet jitter, we need QOS to avoid audio distortion.
Default method is using VLAN priority (5) for Audio transfer. If VLAN is not possible (and no Daisy Chaining of DOM devices is used) you can also use layer 3 based QOS according to RFC 2474.

3.4 Networking requirements

To ensure quality of service for audio data over Ethernet it is recommended to set up following parameters at Ethernet level as:

- ≥ 100 Mbit/s

- flow control off

- full duplex required

- Switches must support QOS for at least two priority levels, level 5 must be high level (audio), normal application data should be transported as low level.

- Switches must support dynamic IP multicast version 2 handling.

- For ring redundancy, a max. reconfiguration time of 100 ms is mandatory to avoid disruptive audio glitches, preferred X-Ring or ERPS.

Notes

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Technical changes reserved!