

Notification



# VARIODYN<sup>®</sup> D1 devices and accessories



Installation Instruction

798683.GB0 06.2019

## 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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#### 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 2012/19/EU (WEEE), after being dismantled, electrical and electronic equipment is taken back by the manufacturer for proper disposal.

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# 1 General /Application

The VARIODYN<sup>®</sup> D1 system is as a modular expandable version as well as the VARIODYN<sup>®</sup> D1 Comprio is assembled with various components in accordance with the specific building requirements. This means that special solutions can be implemented economically and effectively for buildings of different sizes and for various alarm tasks.

The VARIODYN<sup>®</sup> D1 system / VARIODYN<sup>®</sup> D1 Comprio can have appropriate devices and accessories added to it in order to plan and set up a building-specific sound system for emergency purposes (SEP) or a voice alarm and public address system (VA/PA system).

# 1.1 Related Documents

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

Part No.	Description
798661.GB0	System design principles for Voice Alarm Systems
798662.GB0	Operation Instruction for the VARIODYN® D1 System
798663.GB0	Installation Instruction for the VARIODYN® D1 System
798664.GB0	Commissioning Instruction for the VARIODYN® D1 System and VARIODYN® D1 Comprio
798666.GB0	Operation Instruction for the VARIODYN <sup>®</sup> D1 Comprio
798667.GB0	Installation Instruction for the VARIODYN® D1 Comprio
798678.GB0	Commissioning Instruction VARIODYN <sup>®</sup> D1 Networking



## Additional and updated Information

The described features, specifications and product related information in this manual correspond to the date of issue (refer to date on the front page) and may differ due to modifications and/or amended Standards and Regulations of the System design, Installation and Commissioning. Updated information and declaration of conformity are available for comparison on the www.esser-systems.comor www.hls-austria.com homepage.

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# 2 Standards and Directives

A sound system for emergency purposes (SEP) or a voice alarm and public address system (VA/PA system) as defined by the standards DIN VDE 0833-4 and TRVB 158 S must consist of components that satisfy the standards of the series DIN EN 54. It must be ensured that these components interact together in a manner appropriate to the function.



For detailed information on standards and directives for Emergency audio system (EAS) or Voice alarm systems (VAS), see documentation (Part No. 798663.GB0).



## Danger – Electric shock!

Assembly and installation work may only be performed when the system is de-energised (voltage free).

#### **ESD / EMC preventive measures**

Before handling electronic modules, always take suitable precautions to prevent static electricity.

#### Protective and functional earth

For the device to function properly, the network side protective earthing (PE) connection must be connected to the correct terminal. The functional earth (FE) must also be connected to the PE rail.

#### **Neutral conductor**

As a rule, it must be ensured that the neutral conductor is properly connected.

- In particular, for three-phase connected devices in VARIODYN<sup>®</sup> D1 cabinet systems, suitable
  protection must be provided <u>against overvoltage</u> caused by a break in the neutral conductor and
  the phase shift which may result from this.
- For single-phase connected devices, suitable protection against overcurrent must be ensured to guard against the consequences of a break in the neutral conductor (usually caused by the operator).

#### Commissioning

A complete function test must be performed on the system upon completion of the commissioning as well as after every change to the customer data programming.

# 3 Devices and accessories

Intrasystem devices such as loudspeakers, loop isolator modules, remote call stations and modules incl. accessories, as well as connections, are described in this documentation.

Other approved appliances such as loudspeakers acc. to EN 54-24, standard loudspeakers or 'Active Beam Steering Systems' are listed in the voice alarm and public address system product group catalogue.



Building-specific special solutions should be agreed with the technical sales consultant (TSC) during the project planning.

# 3.1 6 W Loudspeaker with Loop Isolator Modul (LIM)



The loudspeaker with LIM (loop Isolator Module) complies with the requirements of the standard EN-24 and is operated on the Loop of the VARIODYN® D1 System. The LIM module allows to isolate loop segments with short circuits.

Fig. 1: Loudspeaker with LIM (Part No. LSC-506.LIM)

The max. number of Loudspeaker with LIM or single LIM per loop must meet the corresponding Power Amplifier (PA) specification. Loudspeaker and LIM module are interconnected by factory default and may be connected directly to the loop.

## With transformer: 100 V / 70 V line

		Red wire plus	s tapping	Black	
100 V	0.75 W	1.5 W	3 W	6 W	Com
70 V	0.375 W	0.75 W	1.5 W	3 W	Com
IMP (Ω)	13 K	6.7 K	3.4 K	1.7 K	

## **Opening angle**

		Horizontal	Vertical
1 octave pink noise	500 Hz	180 °	180 °
1 octave pink noise	1 kHz	180 °	180 °
1 octave pink noise	2 kHz	166 °	166 °
1 octave pink noise	4 kHz	50 °	50 °

## Frequency response @ 100 V / 4 m / 1/3 oct. smoothing



Fig. 2: Frequency diagram



For additional information refer to documentation (Part No. 798677).

# 3.2 Loop Isolator module (LIM)

Loudspeakers within the VARIODYN<sup>®</sup> D1 system are connected by means of redundant cabling using loop technology (with standardised cable monitoring). The loop isolator module is required for this. The LIM isolates functional areas from areas in which a short-circuit has occurred. This ensures complete loudspeaker functionality on the loop at all times.



Fig. 3: Type 1 - (Art.-Nr. 583342)

The following amplifiers are approved for operation in combination with loop isolator modules (LIMs):

Amplifier	Maximum number of LIMs	Max loop length including spur lines
2XD250	40	1000
2XD400	64	1000
4XD250B	25	500
4XD300	40	1000
4XD500	50	1000



- No other amplifiers are approved for combination with LIMs
- Observe the maximum number of LIMs and the loop length for the amplifier used
- 20 % power reserve per amplifier should be planned in
- The maximum load is different for each amplifier and should be determined in consultation with the Technical Support

The maximum distance between two Loop Isolator Modules (LIM) in the ring depends on the selected cable crosssection. The distance can be configured for specific projects using the values in the following table.

Cable cross-section	Max. distance
2.5 mm <sup>2</sup>	165 m
2 mm²	130 m
1.5 mm <sup>2</sup>	100 m
1 mm <sup>2</sup>	66 m
0.5 mm²	33 m
0.25 mm <sup>2</sup>	16.5 m



The factory recommendation is a configuration with 1.5 mm<sup>2</sup>  $\triangleq$  max. distance 100 m.

## Loop technology (schematic)

The loudspeakers are connected to the control unit (e.g. DOM or VARIODYN<sup>®</sup> D1 Comprio) and switched to the final amplifier output via the two line relays. The loop is constantly monitored for short-circuit, fault to ground and interruption. A loop takes up the connection terminals for two standard loudspeaker circuits (outbound and inbound connection of the loop).



#### Fig. 4: Loop technology

- Î
- Up to 4 loops per DOM4-8 or DOM4-24 control unit
- Up to 500 W power per loop
- Up to 5 spurs with more than one loudspeaker per loop (including EOL)
- Cable leads can be wired in parallel to increase the cable cross-section Do not route outbound and inbound loop conductors in the same cable or the same conduit
- Maximum loop length 1000 m including connected spur lines (observe cable cross-section).
- Install LIMs at the start and end of the loop. Maximum distance to DOM 10 m
  - For performance calculation, use 3 watts per LIM
  - Twisted loudspeaker cable 2 x 1.5 mm<sup>2</sup> or communication cable
     I-Y (St) Y n x 2 x 0.8 mm or comparable can be used for the loop. Note the building-specific power requirements and permitted cable length!

The current loop configuration can be displayed using terminal program r. To do this, go to "opmode config".



Commissioning / configuration may only be performed by qualified experts!



For more information, refer to documentation (Part No. 798663.GB0 and 798664.GB0) chap. Configuring / Installing / Querying a loudspeaker loop.

# 3.3 Surge Protector Module (Part No. 583332)

In EN 54-16-compliant systems, the surge protector module must be used for connecting lines that are run to external contacts and are longer than 3 m, in order to protect 12 inputs and outputs. The connection cable is included in the delivery.



Fig. 5: Surge protector module and accessories



Fig. 6: Connection of surge protector module

## Usage example

The universal interface module (UIM) has 48 contact inputs and outputs. These are divided into 4 blocks, with 12 inputs/outputs each.

The overvoltage protection module can be used to secure 12 inputs and outputs (1 block). It is used in place of signal cable 12 (Part No. 583401.21).

# 4 Digital call stations and Key Modules

The call stations are designed for redundant use and are set up or installed in a table/console in a room with a suitable climate. In critical areas (e.g. due to moisture, cold, mechanical load), suitable measures must be taken to protect the call stations. If necessary, an alternative installation site may be required.

The digital call stations DCSx RE and DCS plus as well as fire brigade digital call stations (DCS1,7 or 12) are connected to the DAL bus of the control units (= DOM or VARIODYN<sup>®</sup> D1 Comprio). The ETCS remote call station is connected via the LAN/Ethernet network. The digital key module (DKM or DKM plus) expands a Digital call station with 18 programmable keys.

Part No.	Description	Туре	Number of keys
583502.RE	Digital call station	DSC2 RE	1
583501.RE	Digital call station	DCS15 RE	12
583520	Digital call station	DCS plus	12
583527	Digital call station	ETCS	1
583504.RE	Digital Call Station Fire	DCSF1 RE	1
583505.RE	Digital Call Station Fire	DCSF7 RE (only for Austria)	7
583503.RE	Digital Call Station Fire	DCSF12 RE	12
Accessories			
583506	Digital Key Module	DKM18 for redundant call stations DCS	18
583526	Digital Key Module	DKM plus	18
583507	Installation kit for redundant call	station DCS2 RE, DCS15 RE und DKM18	
584960	FIBS installation kit Callstation D	CSF1/12	
584961	Housing for one FW - Callstation	DCSF1/12	
584962	Housing for two FW - Callstation	s DCSF1/12	
583396	POWER OVER ETHERNET SW	ITCH (PoE Switch)	



Fig. 7: DCS15 RE with DKM18



Fig. 10: DCSF7



Fig. 8: DCS plus with DKM plus



Fig. 11: Housing for one FW - Callstation DCSF1/12



Fig. 9: ETCS with DKM plus



Fig. 12: DCSF12

# 4.1 Digital call station DCS2 and DCS15 redundant

The DCS is used to select loudspeaker circuits and to transmit voice announcements and various messages. Up to four digital remote call stations can be connected to a DOM via a standard Cat5 cable (up to 300 m). Each remote call station can transmit and receive different voice calls and/or control signals in the system at the same time. For redundant operation, two Cat5 cables and two DAL connections per remote call station are required. Larger distances are possible with FOC cabling. With suitable FOC converters, the DCS can be expanded with up to six DKM18 key modules.

The microphone is acoustically monitored at all times. The DCS15 RE also provides an external audio input and output for connecting audio devices such as CD players.



Fig. 13: Digital call station

# 4.1.1 DCS ⇔ DKM18 Mechanical Connection

Remove the rubber profile  $\mathbb{O}$ . Insert the metal connection  $\mathbb{O}$  and affix it with the enclosed screws  $\mathbb{O}$ . Then insert the rubber profile  $\mathbb{O}$  again.



Fig. 14: Connection of DCS → button module DKM18 (backview)

# 4.1.2 DCS ⇔ DKM18 Connection

Extension cables  $\bigcirc$  (included in the DKM scope of delivery) for connection DKM18 to DCS15 and to the next key module DKM18  $\bigcirc$ . DAL cable  $\bigcirc$  for DAL connection of the control units (= DOM or VARIODYN<sup>®</sup> D1 Comprio) 0.



Fig. 15: DCS15 with button module DKM18 (example)



Fig. 16: rear view DCS connectors

- ① RJ11 connector to connect a key module DKM18
- ③ MAIN connections to the control unit
- ⑤ BACKUP connections to the control unit
  - Chinch audio IN connector (external audio source) and audio OUT (external audio device)



Up to six modules can be connected.

To ensure correct function and prevent damage to the devices:

Only operate the digital key module DKM 18 (Part No. 583506) at call stations (Part No. 5835xx.RE) with redundant DAL!

# 4.1.3 DCS ⇔ control unit - connection

Use a CAT5 patch cable, max. 300 m or alternative J-H (St) H 4 x 2 x 0,6 mm, max. 150 m to connect the DAL connection of the call station ③ and a DAL connection of the DOM ④.

Redundant call stations are equipped with 2 DAL connections. Use for connecting DAL connection/MAIN.

Use a CAT5 patch cable, max. 300 m or alternative J-H (St) H 4 x 2 x 0,6 mm, max. 150 m to connect the DAL connection / BACKUP of the redundant call station and additional control unit (= DOM or VARIODYN<sup>®</sup> D1 Comprio). Redundant operation on control unit (= DOM or VARIODYN<sup>®</sup> D1 Comprio) is not possible!



Fig. 17: Connection of the call station terminal to the DOM using patch cable CAT5



Fig. 18: Connection of the call station to the control unit via fibre optic cable (FOC)



Detailed information on the fibre optic converter and the required external power supply see chapter 5.

# 4.1.4 Installation kit for DCS and DKM (Part No. 583507)

This installation kit is used for in-wall installation / table mounting of communication units DCS2 RE, DCS15 RE and DKM18.





In-wall installation (example)



Fig. 20: Installation dimensions in mm



# 4.2 Digital call station DCS plus and Key Module DKM plus

The DCS plus is used to select loudspeaker circuits and to transmit voice announcements and various messages. Up to four digital remote call stations can be connected to a DOM via a standard Cat5 cable (up to 300 m). Each remote call station can transmit and receive different voice calls and/or control signals in the system at the same time. For redundant operation, two Cat5 cables and two DAL connections per remote call station are required. Larger distances are possible with FOC cabling. With suitable FOC converters, the DCS plus can be expanded with up to six DKM plus key modules.

The microphone is acoustically monitored at all times. The DCS plus also has an external audio input and output for connecting audio devices such as CD players.



Fig. 21: Front view of DCS plus and DKM plus



Fig. 22: Rear view of DCS plus and DKM plus

# 4.3 Digital call station ETCS and Key Module DKM plus

ETCS offers a 7" / 17,78 cm touch screen for display and operation which provides a user-friendly interface. The LED are used for status indications which include microphone fault, system fault and connection states of two redundant cables. A red button with cover can be configured for emergency announcement. The gooseneck microphone is replaceable and monitored by ETCS. The loudspeaker can be used for pre-listening audio files locally and intercom between the call stations.

ETCS is prepared for redundant cable connection to the Ethernet network and can be powered via Ethernet cable from a PoE adapter (Part No. 583396) or with an optional power supply. Up to three DKM key modules can be connected.

ETCS provides an external audio input and output which can be used for connecting audio devices such as CD players etc.



Fig. 23: Front view of ETCS and DKM plus



Fig. 24: Rear view of ETCS and DKM plus

# 4.3.1 Microphone, tilt angle and barrier strip



Fig. 25: The lock screw of the microphone



Fig. 26: Call station and DKM plus with metal base



Fig. 27: Mounting example - call station with installed barrier strip

## Install the microphone

Place the gooseneck microphone into the relevant connector and secure with the connection nut. Loosen the bonding and also tighten the lock screw ① using an Allen key so that the microphone cannot be accidentally removed.

Then set up the enclosed wind protection and position the microphone.



The call station ETCS does not support handheld microphones!

## Adjust tilt angle 2

The tilt angle of the call station can be increased using the enclosed metal foot ③.

- Place the two rubber feet into the guides of the metal foot.
- Attach the metal foot onto the digital call station from below using the two countersunk bolts.
- If the digital call station is used in conjunction with a key module, then the metal foot enclosed with the DKM plus must also be installed.

## Barrier strip

The installed barrier strips ④ on the call stations or on the key module prevent the engaged connecting cable being disconnected.

- Insert the connecting cable and guide the enclosed barrier strip under the connector locks of the devices.
- Use two screws to fix the barrier strip on the back of the device.

# 4.3.2 DCS plus / ETCS ⇔ DKM plus - mechanical connection

The mechanical connection (5) is included in the scope of delivery for the DKM plus and is installed onto call station and call station using the enclosed eight cylinder head screws.



Fig. 28: Mechanical connection of call station to DKM plus (rear view)

# 4.3.3 DCS plus ⇔ DKM plus - connection

Extension cables (6) to connect to the call station or to next DKM plus key module. Up to six key modules can be connected. DAL cable (7) to connect to the DAL connection of the first control unit (= DOM or VARIODYN<sup>®</sup> D1 Comprio) (8) and the redundant DAL connection of the second control unit (9).



6

(10)

Fig. 29: Call station with DKM plus (example)



Fig. 30: Rear view DCS plus connectors

- RJ11 connector to connect a key module DKM plus
- 3.5 mm connector audio input (external audio source) and audio output (external audio device)
- ⑧ + ⑨ BACKUP and MAIN connections to the control unit

# 4.3.4 ETCS ⇔ DKM plus - connection

Extension cables <sup>®</sup> with ferrite core to connect to the call station or to next DKM plus key module. CAT5 patch cable <sup>⑦</sup> for connecting to the Ethernet connection of the primary DOM or POE switch <sup>®</sup> and Ethernet connection of the redundant DOM or POE switch <sup>®</sup>. Up to three key modules can be connected.



Fig. 31: Call station with DKM plus (example)



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EN 54-16 conformity is only guaranteed if the patch cable with ferrite core is used!

# 4.3.5 DCS plus ⇔ control unit - connection

Use a CAT5 patch cable, max. 300 m or alternative J-H (St) H 4 x 2 x 0,6 mm, max. 150 m to connect the DAL connection of the call station (13) and a DAL connection (14).

The call stations are equipped with two DAL connections. Use for connecting DAL connection / MAIN. Use a CAT5 patch cable, max. 300 m or alternative J-H (St) H 4 x 2 x 0,6 mm, max. 150 m to connect the DAL connection / BACKUP of the redundant call station and an additional control unit (= DOM or VARIODYN<sup>®</sup> D1 Comprio). Redundant operation on <u>one</u> control unit (= DOM or VARIODYN<sup>®</sup> D1 Comprio) is not possible!



Fig. 33: Connection of the DCS plus to the control unit using patch cable CAT5



Fig. 34: Connection of DCS plus to control unit via fiber optic cable (FOC)

# 4.3.6 ETCS ⇔ control unit - connection



Fig. 35: Connection of the ETCS to LAN

# Ethernet (100 Mbit)

Maximum cable length = 90 m between two devices. A longer cable length can be realised using standard LAN repeaters (option).

PIN	Assignment
1	TX +
2	TX -
3	RX +
4	Not assigned
5	Not assigned
6	RX -
7	Not assigned
8	Not assigned

Fig. 36: Ethernet RJ45 connector (yellow)

The ETCS can be used in PA/VA mode or in PA mode (without voice alarm). For use in **PA/VA mode**, it is possible to supply power via the POE switch (Part No 583396). To do so, use a patch cable <sup>(15)</sup> for the connection from the ETCS to the POE switch and a patch cable <sup>(16)</sup> for the connection from the POE switch to the DOM.



EN 54-16 conformity is only guaranteed if the POE switch is correctly earthed and the patch cable/supply line of the POE power supply with ferrite core is used!



Fig. 37: Connection of the ETCS via a POE switch to the control unit

If the ETCS is used in **PA mode**, no POE switch is required. The ETCS (17) is directly connected to the DOM using a patch cable (18). An external 24 V DC power supply unit is required for the ETCS is required for this direct connection.



Fig. 38: Connection of the ETCS remote call station to the control unit with external power supply Only for use in PA mode!

4.3.7 In-wall installation / table mounting



Fig. 39: Installation dimensions of the call station und DKM plus

The DCS plus digital call station can be installed into a control panel, for example. The securing of the devices can also be carried out using the enclosed adhesive tape (19) if necessary.





Fig. 40: Fixation of the adhesive tape (Example)

Fig. 41: In-wall installation (example)



Fig. 42: Rear view (example)



Fig. 43: Side view of the In-wall installation (example)

# 4.3.8 Inserting the paper strips

Insert the enclosed paper strips and protective films  $^{\textcircled{0}}$  into the call station or DKM plus.



Fig. 44: Insert paper strips



An exact cut-out is required, as the frame of the call station overlaps only slightly.

# 4.4 Digital Call Station Fire (DCSF)

The Digital Call Station Fire (DCSF) are connected via the DAL-Bus of the control unit (= DOM or VARIODYN<sup>®</sup> D1 Comprio). The colours of the cables and terminals are according to specification EIA/TIA-568B.

PIN1 PIN8					
	PIN	Assig DOM	gnment DCS / DCSF	Terminals	(A) and (B)
	1	RX +	TX +	3	white / orange
	2	RX -	TX -	4	orange
	3	GND	GND	5	white / green
	4	TX +	RX +	2	blue
	5	TX -	RX -	1	white / blue
	6	GND	GND	6	green
	7	+ 24 V DC	+ 24 V DC	7	white / brown
	8	+ 24 V DC	+ 24 V DC	8	brown
				Ô	Cable shielding

Fig. 45: DAL bus RJ45 connector (blue)

# 4.4.1 Standard connection

The standard connection is via a DAL connection of the control unit with a blue CAT5 patch cable, or with the DCSF7 via the connection terminal (A). Alternatively using the cable type J-H (St) H 4 x 2 x 0,6 mm. Observe the maximum cable lengths!



Fig. 46: Connection example DCSF1/12 or DCSF7 (for Austria)

# 4.4.2 Redundant connection

For a redundant connection additionally use a CAT5 patch cable, max. 300 m or alternative J-H (St) H 4 x 2 x 0,6 mm, max. 150 m to connect the DAL connection / BACKUP of the redundant call station and an additional control unit. On the DCSF7 RE additionally wire the connecting terminal (B) according to the table.



Fig. 47: Connection example DCSF1/12 or DCSF7 (for Austria)



The DCSF1/12 can also be mounted in the housings for FD call stations (Part No. 584961 or 584962)

For additional information and accessories, see the product group catalogue.

# 4.4.3 Specification – DCS / DKM / DCSF

Audio output				
Nominal level	:		0 dBu	
Output level	:		< 6 dBu	
Transmission range	:	20 22000 Hz		
Harmonic distortion	:		< 0.1 % @ 1 KHz	
Signal-to-noise ratio	:		> 60 dB	
Output impedance	:		220 Ω @ 1 KHz	
Audio input				
Nominal level	:		0 dBu	
Output level	:		< 6 dBu	
Transmission range	:		20 22000 Hz	
Harmonic distortion	:		< 0.1 % @ 1 KHz	
Signal-to-noise ratio	:		> 95 dB	
General		DCS	DCSF1/12	DCSF7
Microphone	:		Electret, cardioid diagram	
Swan-neck	:	250 mm		-
Transmission range	:	100 15000 Hz	200 1	2500 Hz
Loudspeaker power	:	2 W		1W
Sample rate	:		48 kHz	
AD/DA-converter	:	24 Bit		
Current consumption	:	max. 260 mA	max. 260 mA	max. 150 mA
		(Part No. 583501.RE)	(Part No. 583353.RE)	
		(Part No. 583502 RE)	(Part No. 583504 RE)	
Current consumption DKM		(Fait NO. 303302.ICL)	(Part No. 505504.1CL)	3)
Ambient temperature	:		-5 °C +55 °C	<i>)</i>
Storage temperature	:		-10 °C +60 °C	
Air humidity	÷	15 % .	90 % rel. hum. (non-conde	ensina)
Housing			metal	
Color	:	black, similar to	black, similar to	
		RAL 9005	RAL 9005	red, similar to
		grey, similar to	BAL 7037	KAL 3000
		(Part No. 583501.RE /	(Part No. 583503.RE /	RAL 9002
		583502.RE / 583506)	583504.RE)	
Weight	:	approx	<. 1.6 kg	2 kg
Dimensions (W x H x D)	:	123 x 71 x 180 mm	134 x 40 x 196 mm	200 x 300 x 55 mm
		(Part No. 583501.RE /	(Part No. 583503.RE /	
Crestientien	_	3833UZ.KE/ 5835Ub)	583504.KE)	
Specification	•		EIN 54-16	

# 4.4.4 Specification – DCS plus / ETCS and DKM plus

Audio output		DCS plus	ETCS
Nominal level		: 0 dBu	0 dBu +/- 0,5 dBu
Max. output level		: ≤ 6 dBu	5 dBu @ Line input level = 0 dBu, Line output volume = 20
Transmission range		20 2	22000 Hz
Harmonic distortion nominal level	at	: ≤ 0,1 % @ 1 KHz	0,15 % @ 1 KHz
Signal/Noise ratio		: ≥ 90 dB, A-weighting	85 dB, A-weighting
Output impedance		: 210 Ω	
Audio input			
Nominal level		: 0	dBu
Transmission range		: 20 2	20000 Hz
Harmonic distortion nominal level	at	: ≤ 0,1 % @ 1 KHz	0,15 % @ 1 kHz
Signal/Noise ratio		: $\geq$ 90 dB, A-weighting	85 dB, A-weighting
General specification	1		
Operation voltage		:	24 V DC
Current consumption		: ≤ 50 mA	max. 0,25 A
Power consumption		:	max. 6 W
Microphone		: Electret, uni-directional	uni-directional
Gooseneck		: 40	0 mm
Transmission range		: 60 20000 Hz	20 Hz 20000 Hz
Loudspeaker		: 2	2 W
Sample rate		: 48	3 KHz
AD/DA converter		: 24 Bit	32 Bit
Ambient temperature		: -5 °C .	+45 °C
Storage temperature		: -10 °C	+45 °C
Air humidity		: 15 % … 95 % rel. h	um. (non-condensing)
Housing		: N	letal
Color		: black, simila	ar to RAL 9005
Weight		: approx.1,42 kg	approx.1,65 kg
Dimensions (W x H x [	D)	: 200 × 50 × 200 mm	200 × 50 × 200 mm
Specification		: EN	54-16

General specification		DKM plus
Current consumption	:	≤ 50 mA
Ambient temperature	:	-5 °C +45 °C
Storage temperature	:	-10 °C +45 °C
Air humidity	:	15 % 95 % rel. hum. (non-condensing)
Housing	:	Metal
Color	:	black, similar to RAL 9005
Weight	:	approx.1,22 kg
Dimensions (W x H x D)	:	200 × 50 × 200 mm
Specification	:	EN 54-16

# 4.5 Digital call stations for non-security-relevant applications

The DIGIM<sup>\*1</sup> digital call stations serve for transmitting voice announcements. A total of 40 of these call stations can be connected in parallel. Only one AF input is used for this. The call stations have a +6 dB AF amplifier with volume control as well as an integrated limiter for the output level and special circuit for eliminating switch-on noises. Depending on the features, the DIGIM call station has 1 or 4 programmable keys. It is connected to a 9-pin D-SUB socket.



These call stations are <u>not</u> approved for safety-relevant announcements, such as alarms and evacuation announcements.



Fig. 48: DIGIM 1



Fig. 49: DIGIM 4





## Fig. 50: Wiring Digital call stations DIGIM



For additional information and technical data about the DIGIM call station, see the product group catalogue and manufacturer documentation.

<sup>&</sup>lt;sup>\*1</sup> These call stations may only be available in specific countries

# 5 Fibre Optic Converter (Multimode)

The Fibre Optic Converters (FOC) (Part No. 583316.21 and 583317.21) allow a connection via DAL bus between the digital DCS call stations or the Universal Interface Module (UIM) and a VARIODYN<sup>®</sup> D1 control unit (DOM or Comprio) via fibre-optic cable (FOC). The fibre optic connection increases the possible line length to up to 2000 m as compared to copper cables or when use in connection with them.

The FOC converters are connected between the digital call station DCS or the UIM and the control unit and connected via corresponding patch cables. Installation of the FOC converter (OIM – Part No. 583316.21) takes place on the rear cabinet wall on a 32.5 mm mounting rail. The power supply is provided via the patch cable to the control unit.

The fibre optic converter (DCS-O Part No. 583317.21) is connected to the digital call station (DCS) or the UIM via a patch cable. Due to the bidirectional data connection, two fibre optic cables are required. A 24 V DC power supply is required, plug-in power supply (Part No. 583315.02).



1	DAL interface to DOM		
2	DAL interface to DCS / DCSF / UIM		
3	Connection power supply → DC-plug 5,5 x 2,1 mm	- + positive polarity	
4	Duplex SC-plug for fibre optic cable		
(5)	Power supply (Part No. 583315.02) for fibre optic cor	overter (Part No. 583317.21)	

## Wiring

Due to the bidirectional data connection, two fibre optic cables of type multimode 50/125  $\mu$ m GI, 62.5/125  $\mu$ m GI are required. The fibre optic cable can be connected using commercially available plugs, type Duplex SC.



Fig. 52: Connection fibre optic converter

# 5.1.1 Specification LWL-Converter

Power supply	:	24 V DC
Current consumption	:	approx. 500 mA @ 24 V DC
Ambient temperature	:	-5 °C +55 °C
Storage temperature	:	-10 °C +60 °C
Air Humidity	:	15 % 90 % rel. hum. (non-condensing)
Housing	:	metal
Colour	:	grey, similar to RAL 7016
Weight	:	approx. 125 g
Dimensions (W x H x D)	:	115 x 55 x 25 mm
Specification	:	EN 54-16

# 5.2 Time-Control-Module (TCM)

This module serves to synchronise the system time of a VARIODYN<sup>®</sup> D1 system via GPS (global positioning system). The TCM is connected to VARIODYN<sup>®</sup> D1 control unit (DOM or Comprio) and the system time (of the GPS zone) is automatically set. In the case of networked control units, this time setting is accepted by all other control units in the network.

This option allows accurately timed, automated announcements (e.g. bell systems in schools), time-controlled volume adjustments (e.g. reduced night volume at train stations), or precise time-logging of announcements or fault messages.



Fig. 53: Set with TCM, antenna, and adapter cable

1	Time-Control-Modul (TCM)
2	Antenna
3	Adapter cable

## Configuration

The control unit automatically detects a configured, connected TCM module.

However, if a communication connection with a service PC was previously established via the TWI interface, it first has to be stopped with the "exit" command; otherwise the module cannot be detected automatically.

## Monitoring

Failure or errors in the TCM as well as interference with reception in the GPS signal are detected and reported.

## Position of the GPS antenna

The antenna must be positioned with the greatest possible visual range to the sky in order to receive a signal from as many GPS satellites as possible. Examples of suitable positions are close to a window or, even better, directly on a roof. The received signal is transmitted from the antenna to the receiver via a coaxial cable. With optimal reception, the maximum cable length from the antenna to the receiver is:

Cable type	Range		
RG174	max. 33 m		
RG58	max. 66 m		

## Wiring

The module is connected either directly via a patch cable (max. 10 m) to the TWI interface or with the enclosed adapter cable to the 9-pin DSUB socket of a control unit (cannot be combined with the contact interface module CIM).

# 5.2.1 Specification – TCM

:	24 V DC
:	ca. 500 mA @ 24 V DC
:	-5 °C +55 °C
:	-10 °C +60 °C
:	40 $\%$ 90 $\%$ rel. hum. (non-condensing)
:	metal
:	grey, similar RAL 7016
:	approx. 125 g
:	55 x 25 x 115 mm
:	EN 54-16
	· · · · · · · · · · ·

# 5.3 Alarm transponder

The alarm transponder (Part No. 583535) for VARIODYN<sup>®</sup> D1 provides two monitored relay outputs for the control units (= DOM or VARIODYN<sup>®</sup> D1 Comprio). It operates independently and is activated and supplied with power by the control units. A fault in the relay outputs is automatically reported to the DOM or UIM or the VARIODYN<sup>®</sup> D1 Comprio.



Fig. 54: Alarm transponder (Part No. 583535)

## System requirements

Control unit	System software		
DOM	from Version V3.09		
UIM	from Version V04.01		
VARIODYN <sup>®</sup> D1 Comprio	from Version V3.0		

## System restrictions

- max. 4 alarm transponders per control unit
- max. 10 optical alarm devices (Part No. 766410 ... 766414 or 766420 ... 766423) per relay output

The alarm transponder including the enclosed connection resistors is connected to the control units and installed in the equipment cabinet of the VARIODYN<sup>®</sup> D1 system. The optional modular housing for hat rail installation (Part No. 788603.10) is available for this



For additional information refer to documentation alarm transponder (Part No. 798675).

## 5.3.1 Specification – Alarm transponder

External power supply

Operating voltage	:	10 V DC 28 V DC
Current consumption	:	max. 120 mA @ 24 V DC
Quiescent current	:	approx. 12 mA @ 24 V DC
Relays		
Contact rating	:	30 V DC / 1 A
monitoring relay	:	10 kΩ ± 40 %
Ambient temperature	:	-10 °C +50 °C
Storage temperature	:	-25 °C +75 °C
Protection rating	:	IP 40 (in housing)
Weight	:	ca. 28 g
Dimensions (W x H x D)	:	82 x 72 x 20 (mm)
Declaration of conformity	:	DoP-21057130701

# 5.4 Connection Board 4 IN - 2 OUT

The Connection Board (Art. No. 583369) provides four inputs and two outputs in combination with special connection cables and is used in conjunction with DOM Flex application 1-24 (see documentation 798663). In this application a control unit (= DOM or VARIODYN<sup>®</sup> D1 Comprio) can be operated via only one amplifier channel. The connection board is supplied in a module housing for DIN rail mounting and installed in the VARIODYN<sup>®</sup> D1 system's built-in cabinet.



Fig. 55: Connection Board (Part No. 583369)

## System requirements

Control unit	
DOM	
VARIODYN <sup>®</sup> D1 Comprio	

System software ab Version V3.04R001 ab Version V3.04R001



Fig. 56: Wiring example → four DOM, each with an amplifier channel

# 5.4.1 Specification – Connection Board

Power supply via system connector VARIODYN® D1 (no external connection)

Ambient temperature	:	-5 °C +50 °C
Storage temperature	:	-10 °C +55 °C
Weight	:	ca. 95 g
Dimensions (W x H x D)	:	90 x 87 x 43 (mm)

# 5.5 Contact Interface Module (CIM)

The contact-interface-module (Part No. 583341.21) is used via CAT 5 cable to a control unit (= DOM or VARIODYN<sup>®</sup> D1 Comprio) as the interface for the connection of 8 control contacts.



Fig. 57: Contact Interface Module (CIM)

## Initialisation

The control unit automatically detects a configured, connected TCM (GPS) module. The properties and response behaviour are programmed with the programming and service software Designer D1.

#### **Control contacts**

The 8 control contacts can be individually programmed either as inputs or outputs. The reference potential for the control contacts is available at the GND terminal.

## Monitoring

A fault or failure of the module is detected and reported.

Contacts 1–4 can be programmed for monitoring the connection line using the input function. The connected line is monitored for short-circuit or line break.

#### Wiring

The module is connected directly via a CAT 5 patch cable (max. 10 m) to the TWI interface or with the enclosed adapter cable to the control unit.



Fig. 58: Wiring contact-interface-module (Part No. 583341.21)

# 5.5.1 Specification – CIM

Inputs	:	max. 24 V DC
Outputs	:	24 V DC / 50 mA (monitored)
Ambient temperature	:	- 5 + 55 °C
Storage temperature	:	- 10 + 60 °C
Air Humidity	:	15 90 % rel. hum. (non-condensing)
Housing	:	metal
Colour	:	grey, similar RAL 7016
Weight	:	approx. 310 g
Dimensions (W x L x D)	:	105 x 40 x 105 mm
Specification	:	EN 54-16

# 5.6 TWI-RS232 adapter (Part No. 583386.21)

# System connections $\rightarrow$ fire alarm system

A control unit (= DOM or VARIODYN<sup>®</sup> D1 Comprio) can be integrated with ESSER fire alarm systems via the TWI interface using the TWI-RS232 adapter.



Fig. 59: Wiring example – control unit via TWI-RS232 adapter to a serial essernet<sup>®</sup> interface (SEI)



Observe permitted torque (max. 0.4 Nm) of the terminals!

# 5.6.1 Specification TWI-RS232-Adapter

Specification : EN 54-16

# 5.7 VARIODYN<sup>®</sup> D1 to ESSER FACP via SEI

The ESSER Fire Alarm Control Panels can be connected using the serial essernet<sup>®</sup> interface SEI1 or SEI2. See documentation (Part No. 798819 or 798821) for further information.



Fig. 60: Wiring example ESSER FACP

1	ESSER fire alarm control panel (FACP)
2	Serial essernet <sup>®</sup> Interface
3	TWI-RS232 adapter (Part No. 583386.21)
4	Loudspeaker
5	Call stations
6	Control unit (= DOM or VARIODYN® D1 Comprio)
$\overline{O}$	Power amplifier (PA)

## Features

- The VARIODYN<sup>®</sup> D1 system can be controlled by the fire alarm control panel via this connection.
- Common faults in the VARIODYN<sup>®</sup> D1 system are reported to the fire alarm control panel and can also be reset via the external operating panels.
- The connection between the two systems is constantly monitored for short-circuit and interruption.
- The system time and the date of both systems are automatically synchronised (received from FAS → DOM or DOM → FAS - depending on selection).



## Activation via control zones

- The activation is carried out via control zones within the essernet<sup>®</sup>, in order to transmit the
  information for the activation of an alarm circuit to the DOM. For this purpose, corresponding
  activations of control zone outputs are achieved via zone inputs and are sent via the SEI to the
  DOM in the ESSER FACP. The 'Control zone activated/triggered' status is assessed by the
  DOM.
- When using control zones, one output per control zone e.g. output of an essernet<sup>®</sup> transponder (Part No. 808611.10) is required in the FACP.

# 5.8 FO-Switch (Part No. 583394.11) and SFP transceiver modules (Part No. 583392.11, 583393.11)

With the devices, an Ethernet network and a redundant connection between the VARIODYN<sup>®</sup> D1 nodes are established in a ring structure. In the event of an FO fibre breakage, further communication continues via the existing ring.



Further information about FO Switch, see manufacturer documentation and documentation (Part. No. 798674.11).

In the LWL-Switch (Part No. 583394.11) the following modules can be used:

- SFP transceiver module (Part No. 583392.11), suitable for multi-mode fibres 50/125 μm or 62.5/125 μm.
- SFP transceiver module (Part No. 583393.11), suitable for single-mode fibres 9/125 μm.



- The latest FO Switch (Part No. 583394.11) is not backwards compatible with previous versions (Part No. 583392 and Part No. 583393)!
- For instructions on how to build a FO network with the latest FO Switch (Part No. 583394.11) see documentation (Part. No. 798674.11).

The devices are installed in the Ethernet network, as shown in the figure. During configuration the ring line must be open at one point. If the function of the ring line is checked and ensured, the section can be closed.



Fig. 61:Redundant Ethernet with DOM or VARIODYN® D1 Comprio

The power supply for each FO switch is provided by the optional power supply unit for fiber optic converter (Part No. 583315.02) or the ext. power supply DCU 2403 (Part No. 805683).

## Features

- 6 Ethernet connections (monitored, max. 1000 Mbps)
- One relay for the forwarding of fault messages, contact load 24 V DC / 1 A
- 2 duplex LC connections
- Redundant 24 V DC power supply

# 5.8.1 Specification FO-Switch and SFP transceiver modules

		FO Switch (Part No. 583394.11)			
Operating voltage	:	12 48 V DC			
Power consumption	:	15 W			
Data transmission speed	:	14880 / 148800 / 1488000 bps (Ethernet / Fast Ethernet / Gigabit Ethernet)			
Ambient temperature		0 °C 70 °C			
Type of protection	:	IP 30			
Dimensions (w x h x d)	sions (w x h x d) : 46 x 1		2 x 99 mm		
Specification :		Listed in the VAR EN 54-16 sy	Listed in the VARIODYN <sup>®</sup> D1 Comprio EN 54-16 system certificate		
		SFP transceiver module (Part No. 583392.11)	SFP transceiver module (Part No. 583393.11)		
Transmission distance	:	max. 2 km (LWL)	max. 30 km (LWL)		



Refer to VAS product group catalogue for additional accessories.

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# Honeywell

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