

Figure 1: Design and layout of the device

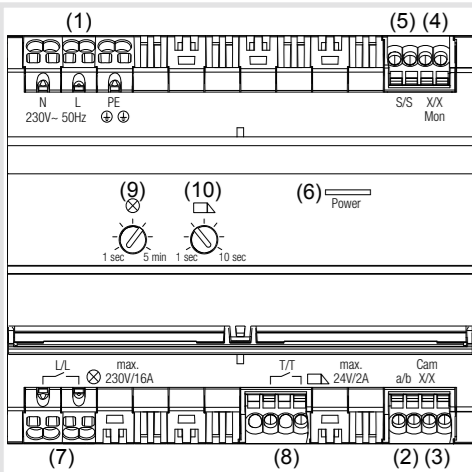
RED011X
Bus line power supply with relay RMD

OFF Device is not ready for operation. There is no operating voltage present.
GREEN Device is ready for operation.
RED The device is overloaded or has short circuited.

Safety instructions

Electrical equipment may only be installed and assembled by a qualified electrician in accordance with the relevant installation standards, guidelines, regulations, directives, safety and accident prevention regulations of the country.
When working on systems with a 230 V AC power connection, comply with the safety requirements of the country.
Failure to comply with these instructions may result in damage to the device, fire or other hazards.
These instructions are an integral component of the product and must be retained by the end user.

Design and layout of the device



- Phase, neutral conductor and PE connection for floating output **L, N, PE**
- a/b** connection for i2 audio devices
- X/X Cam** connection for 2-wire outdoor stations
- X/X Mon** connection for indoor stations, Video indoor stations and floor stations
- S/S** connection for additional infeed
- Operating/overload LED **Power**
- Contact for lighting **LL**
- TT** Contact for door release
- Potentiometer for lighting switch-on time
- Potentiometer for door release unlocking time

Function

Device for centrally supplying the 2-wire and i2 Audio bus subscribers.

- Correct use**
- Supply of the bus components with SELV bus low voltage protected against polarity reversal
 - Mounting on DIN rail
 - Not compatible with door communication systems of other manufacturers

Product characteristics

- Electronic overload and short-circuit protection
- Electronic overheating protection
- All connections with plug-in terminals.
- Contact for door release with adjustable unlocking time and for manipulation protected door release
- Contact for lighting with adjustable switch-on time

Operation/overload LED Power (6)

For display of current operating state.

- OFF Device is not ready for operation. There is no operating voltage present.
- GREEN Device is ready for operation.
- RED The device is overloaded or has short circuited.

If an overload or short-circuit is detected, the bus voltage is switched off. The device attempts to switch on again every 10 seconds. After troubleshooting, the LED remains illuminated in red for up to 10 seconds.

- When switching on the line power supply (start phase) the LED is illuminated in red for 8 seconds.

Information for electricians

Installation and electrical connection

⚠ DANGER!
Touching live parts in the installation environment can result in an electric shock!
An electric shock can be lethal!
Before working on the device or load, disconnect all associated circuit breakers. Cover all live parts in the area!

When installing door communication systems, comply with the country-specific regulations for telecommunications systems e.g.:

- Separate routing of power and door communication cables
- Partitions between power and door communication cables in shared trunkings.
- Use of standard telecommunications' cables, e.g. J-Y (St) Y with 0.8 mm diameter.

- Bus cables**
- J-Y(ST)Y or A-2Y(L)2Y Use wrapped wire pair. Recommendation: white/yellow
 - CAT Use wrapped wire pair. Recommendation: orange/white

Avoid interference!
The 13-MHz video carrier frequency used for two-wire video door communication systems can cause reciprocal interference with other devices, such as radios, routers and WLAN devices.

- Only use shielded cables corresponding to the qualities recommended in this manual.
- It is essential to comply with the applicable regulations during planning and installation.
- Route cables, wire the devices, and in particular implement shielding and earthing measures as described below.

Installing the device

- Clip device onto DIN rail. The operating voltage connection (1) must be at top.

The device will heat up during operation. Observe maximum operating temperature. Ensure that adequate heat dissipation is provided.

Connect power supply

- The lead is protected by a 16 A circuit breaker.
- Connect equipotential bonding conductor to connection **PE** (1).
- Connect the phase to connection **L** and the neutral conductor to connection **N** (1).

Connect door release protected against manipulation

- For manipulation protection, connect the door release to the contact **TT** (8).

or:

- In the case of multiple outdoor stations, the door release must be controlled 2pole (manipulation protection). Connect one pole to the door release contact of the outdoor stations and the second pole to the door release contact **TT** (8) of the line power supply.

The door release lead must not be inserted through the outdoor station in order to protect against manipulation.

- Turn potentiometer for door release unlocking time **TT** (10) to the desired position.
- The door release contact (8) can also be switched without an incoming call.

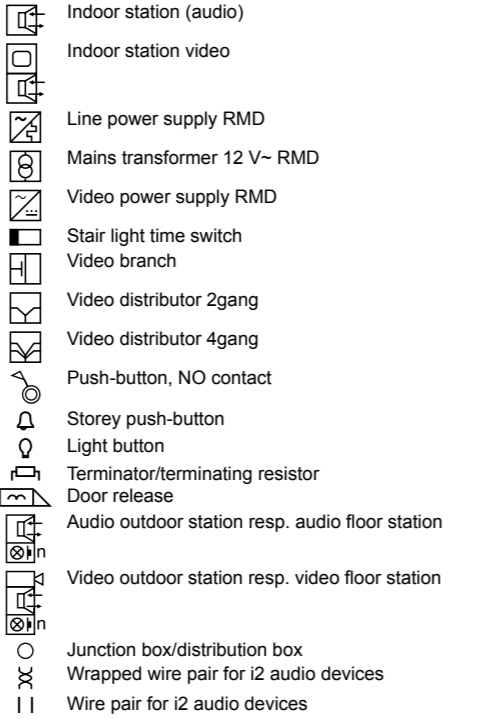
In multiple-door systems it is only possible to unlock a specific door release without an incoming call with indoor stations comfort and not via coupled lines.

Connect contact for lighting

- Connect contact **LL** (7) for switching lighting or for activating a staircase light time switch with switch-off pre-warming.
- Turn potentiometer for switch-on time **LL** (9) to the desired position.

During activation of a staircase light time switch, the switch-on time must be set to minimum (1 sec).

Switching symbols and elements of the circuit diagrams



Connection and installation

The wiring diagram below shows a 3-tenant house by way of example. Indoor stations, outdoor stations and accessory products can be extended or reduced for other properties in the same way. Indoor stations, door stations and accessory products can be extended or reduced for other properties in the same way.

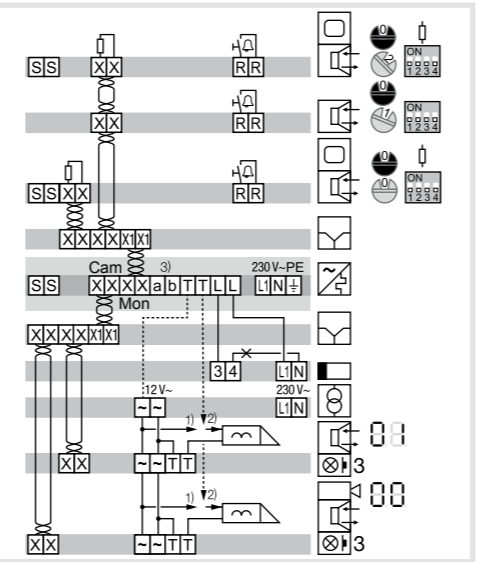


Figure 2: 1 audio and 2 video indoor stations, as well as audio and video outdoor stations

Types of installation

Video installation

The video for a 2-wire system can be installed in various ways (Figure 3 ... 6).

Through installation

In the case of a through installation, wiring through occurs from one indoor station to the next indoor station each with its own cable.

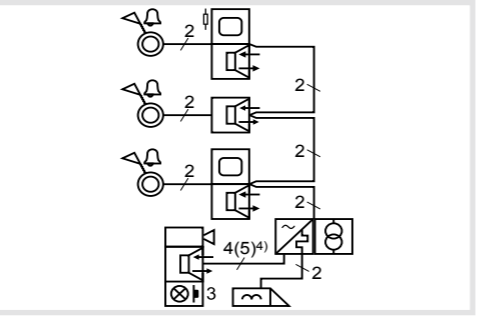


Figure 3: Video through installation

Video star installation

In a video star installation, video distributors have to be used.

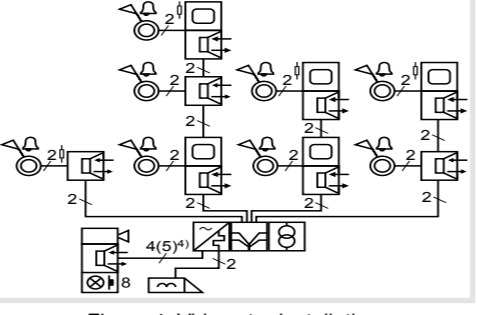


Figure 4: Video star installation

Video stub installation with branches

In stub installations with video branches, no return line is needed.

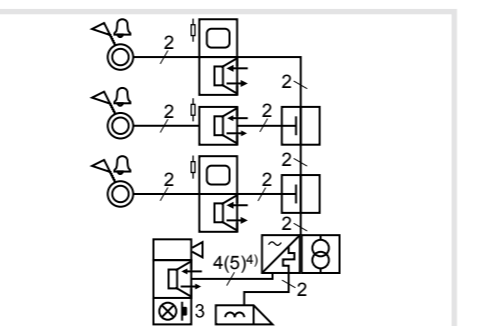


Figure 5: Video stub installation with branches

Stub installation without distributor

In a stub installation without a video distributor (to and from wires in a cable), wrapped cables (e.g. J-Y(ST)Y or CAT) must be used in pairs.

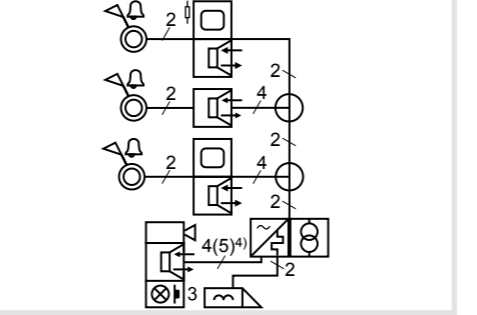


Figure 6: Video stub installation without distributor

Audio installation

The audio for a 2-wire system can be installed in various ways (Figure 7 ... 9). No video distributor is required in a pure audio installation.

Even for a system with audio indoor stations, we recommend routing the cables and the number of devices in the same way as for a system with video indoor stations. This makes a video refitting possible.

Audio through installation

In the case of a through installation, wiring through occurs from one indoor station to the next indoor station each with its own cable.

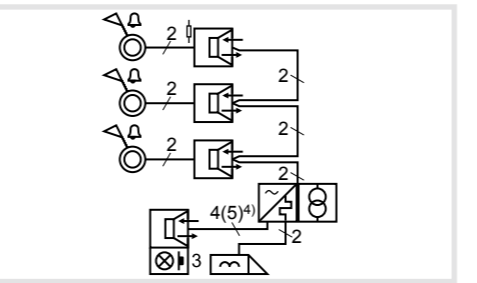


Figure 7: Audio through installation

Audio star installation

Star installations are wired starting from a point and moving outwards in a star shape.

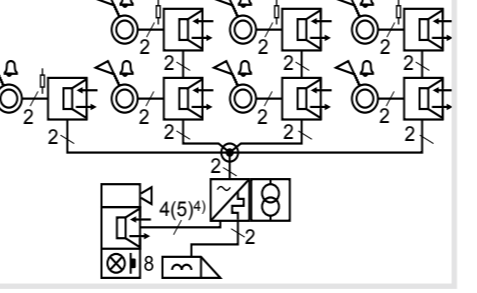


Figure 8: Audio star installation

Audio stub installation

In a stub installation, wiring continues from the stub points.

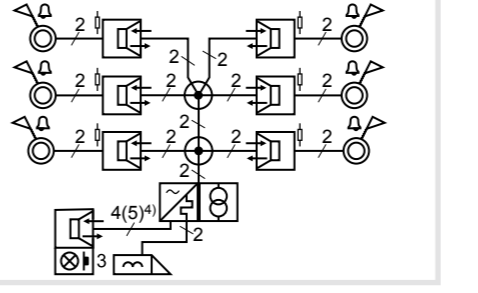


Figure 9: Audio stub installation

Connect outdoor stations

- Connect the main video or audio outdoor stations to terminals **X/X Cam** (3). 0 to 9 is adjustable as the main door address.

Connecting audio indoor stations, video indoor stations and floor and apartment stations

- Connect 2-wire line to terminals **X/X Mon** (4), e.g. audio indoor stations and video indoor stations as well as floor stations.
- Connect necessary additional power supplies (Table 3) from video indoor stations to the terminals **S/S** (5).

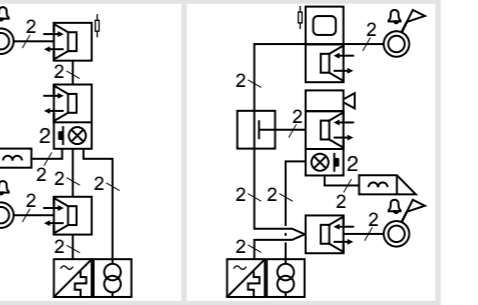


Figure 10: Installation audio/video floor station

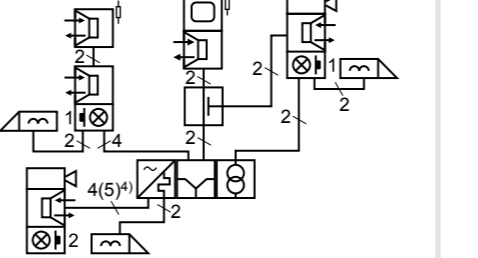


Figure 11: Installation audio/video apartment stations

- Floor push-buttons must be illuminated separately.
- Floor stations must not be installed at the end of a line (branch).

Floor stations and apartment stations can only call indoor stations in their own line (branch) (Figure 10 and 11). For floor stations or apartment stations, A ... F is adjustable as floor address.

Connect optional devices

- Connect required i2 audio devices, e.g. switching relay and PBX interface, to the i2 audio line **a/b** (2).
- Alternatively, it is possible to connect audio components on the 2-wire bus **X/X** via an audio output coupler, e.g. PBX interface per apartment.

Door release protected against manipulation

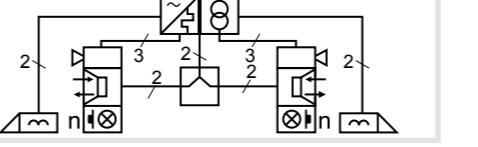


Figure 12: Door release with manipulation protection

The video distributor is not required in audio outdoor stations.

Planning a system

The number of audio and video indoor stations of a system is dependent on the number of outdoor stations. Additionally connected i2-BUS components (e.g. switching relay, PBX interface etc.) are evaluated as 2 audio indoor stations.

The number of audio indoor stations is limited to 16 per branch. If there are video indoor stations in the branch, then the number is reduced to a maximum of 8 indoor stations.

With video distributors additional branches can be distributed up to maximum expansion on the video line.

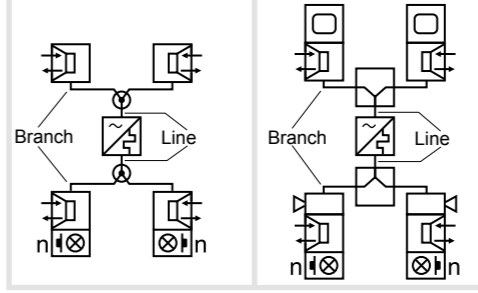


Figure 13: 2-wire - Audio/video lines and branches

Number of subscribers on n outdoor stations	1	2	3	4	n	13	14	15	16	
Outdoor stations	1	2	3	4	n	13	14	15	16	
Indoor stations	32	30	28	26	34-(n x 2)	8	6	4	2	
Branches audio min.	>16=2					1				
Branches video min.	4	2, >16=3		1						

Factors that need to be considered in systems with video distributors

Video distributors and branches are available as flush-mounted and RMD versions. They can be used for branching, distributing or coupling (outdoor stations) the video bus cable.

- Terminate unused connections (X/X) by attaching a terminator.

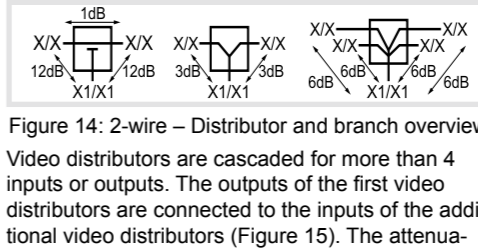


Figure 14: 2-wire - Distributor and branch overview

Video distributors are cascaded for more than 4 inputs or outputs. The outputs of the first video distributors are connected to the inputs of the additional video distributors (Figure 15). The attenuations of the video distributors are added together.

The table shows the number of video distributors, their attenuation and their space requirements in a distributor.

Lines	Required video distributors		Attenuation	DIN rail
	2gang	4gang		
2	1	-	3 dB	1 module
3-4	-	1	6 dB	2 module
5	1	1	9 dB	3 module
6	2	1	9 dB	4 module
7	-	2	12 dB	4 module
8	1	2	9 dB	5 module
9-10	-	3	12 dB	6 module
11	1	3	12 dB	7 module
12-13	-	4	12 dB	8 module
14	1	4	12 dB	9 module
15-16	-	5	12 dB	10 module

Table 2: 2-wire - Distributor cascading

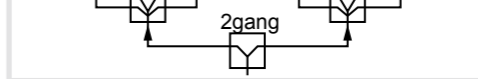


Figure 15: 2-wire - Distributor cascading example

Calculating attenuations

The attenuation on a system with 4 video indoor stations will be calculated here by way of example. The attenuation per branch must not exceed 40 dB. The cable attenuation is 2 dB per 10 m.

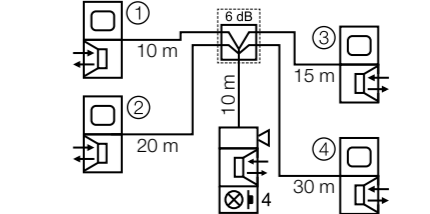


Figure 16: 2-wire - Apartment examples

- Apartment ①, distributor attenuation: 6 dB
Cable attenuation: 10 m + 10 m = 20 m
20 m x (2 dB / 10 m) = 4 dB
- Apartment attenuation ①: 4 dB + 6 dB = 10 dB
- Apartment attenuation ②: 6 dB + 6 dB = 12 dB
- Apartment attenuation ③: 5 dB + 6 dB = 11 dB
- Apartment attenuation ④: 8 dB + 6 dB = 14 dB

Measurement of loop resistance

The loop resistance per line/branch must not be exceeded (Table 3). Installed branch, distributor and clamping points must be measured respectively.

- Disconnect entire intercom system.
- Short-circuit the 2-wire video bus cable to be measured on the line power supply or on the end device and measure the resistance on the other end of the line.

When measuring the door release cable, the door release contacts **TT** must also be bridged.

Cable length, attenuation and loop resistance

Cable type/diameter	Max. cable-length	Max. loop-resistance
Maximum cable length from line power supply to audio and video indoor stations		
J-Y(ST)Y 0.6 mm	75 m / 150 m ⁵⁾	8)
J-Y(ST)Y 0.8 mm	150 m / 150 m ⁵⁾	8)
CAT 0.5 mm	50 m / 100 m ⁵⁾ / 150 m ⁵⁾	8)
Maximum cable length from line power supply to video outdoor stations		
J-Y(ST)Y 0.6 mm	75 m	8)
J-Y(ST)Y 0.8 mm	150 m	8)
CAT 0.5 mm	50 m	8)
Cable from door release/lighting to the transformer ST320 with door release current consumption 1 A (0.5 A)		
J-Y(ST)Y 0.6 mm	30 m; 60 m ⁷⁾ (60 m; 120 m ⁷⁾)	3.5 Ω / (7 Ω)
J-Y(ST)Y 0.8 mm	50 m; 100 m ⁷⁾ (100 m; 200 m ⁷⁾)	3.5 Ω (7 Ω)
CAT 0.5 mm	20 m; 40 m ⁷⁾ (40 m; 80 m ⁷⁾)	3.5 Ω (7 Ω)

- Cable length for video indoor stations with additional infeed
- With wire doubling on additional infeed
- With wire doubling
- The cable length per branch must not exceed 200 m per branch from the outdoor station to the indoor station. The attenuation of 40 dB and the loop resistance of 15 Ω must not be exceeded per branch (including distributor).

Table 3: 2-wire - line data

Wire doubling of the 2D bus cable is not permitted.

All connected bus cables and, if available, the longest bus coupler line must not exceed the cable length of 1000 m.

For parallel switched indoor stations or additional secondary signal units, the cable length for 2 devices must be reduced to 50 % and for 3 devices to 33 % due to the current consumption.

Single-sided earthing of the cable shield in the distributor increases interference resistance.

A large number of clamping points/conductors, which may also be soiled, increase the transition resistance, leading to faults.

For information on wiring multiple outdoor stations or larger multi-line systems, refer to the system manual or, on the Internet, to www.elcom.de.

If interference occurs in telecommunications systems, radio services or other systems during the operation of existing video door communication systems, measures for shielding and earthing the cables and for filtering must be implemented.

- For this purpose, connect all of the drain wires of the cables in a star shape using a terminal.
- Connect all drain wires to the PE rail in the distribution box.

Technical data - performances

Operating voltage	230 V~
Frequency	50/60 Hz
Standby current consumption	< 0.3 W
Output voltage idle mode / full load:	
- Terminals X/X	26 V / 23.5 V
- Terminals S/S	28 V / 27.2 V
Total output current X/X, a/b, S/S	max. 1.25 A
Power dissipation P _v	4.1 W
Door release contact	NO contact potential-free
	max. 24 V/2 A
Door release unlocking time	1 ... 10 s
Contact for lighting μ contact, NO contact potential-free	max. 230 V~/16 A
Contact minimum load	approx. 15 W
Switching capacity of contact for lighting	
- incandescent lamps	2300 W
- HV halogen lamps	2300 W
- electronic transformers and Bi-mode transformers	1500 VA
- Conventional transformers	1500 VA
- Retrofit LED lamps	440 W
- dimmable energy saving lamps	440 W
- compact fluorescent lamps with EVG	22 x 20 W
- fluorescent lamps with EVG	1000 W
- fluorescent lamps uncompensated	1100 W
- Fluorescent lamps parallel compensated	1000 VA / 130 μF
- Fluorescent lamps lead-lag circuit	1000 W
- Mixed loads until the smallest maximum load possible	
Light switch-on time	1 s ... 5 min
Protection class	I
Degree of protection	IP 20
Relative humidity	0 ... 65% (no condensation)
Operating temperature	-5 ... +45°C
Storage/transport temperature	-20 ... +60°C
Door communication connecting terminals for conductor diameter	0.5 ... 0.8 mm
Power connecting terminals	1.5 ... 2.5 mm ²
Width (RMD)	6 modules
Dimensions W x H x D	106 x 90 x 67 mm

Conventional and electronic transformers must be loaded in accordance with the manufacturer's specifications.

The performance data includes power dissipation of 20 % for conventional transformers and 10 % for electronic transformers.