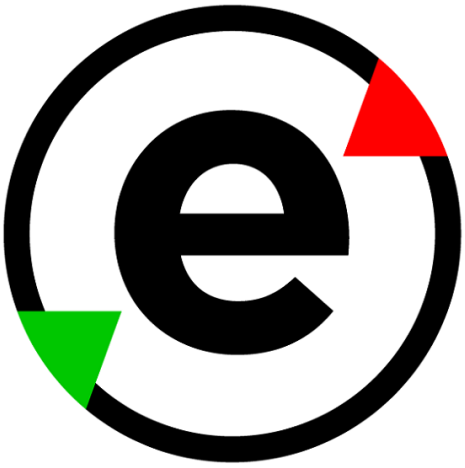

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1 INTRODUCTION

1.1 About eSMART

The eSMART-building brings together all of an apartment's basic functions on one wall-mounted touchscreen. They can also be accessed remotely via a smartphone application.

- **Videophone**;
- **Heating regulation**, room-by-room;
- **Energy consumption monitoring** in real-time with consumption history (electricity, heating and hot water);
- **Lighting, blind and socket management** (optional);

The touchscreen offers many advanced interactive communication features:

- the possibility to set and monitor energy targets;
- local area information, weather, news and public transport information;
- leave messages (virtual sticky notes) and edit the family diary;
- the possiblity to receive information from the property management company or concierge.

eSMART systems work with modules which offer advanced Power Line Carrier (PLC) technology and which are located behind standard electrical equipment (e.g. sockets and switches). Therefore, no electrical switchboard intervention or bus line is required. Fully upgradeable, the systems can be supplemented freely with other eSMART modules and products that use radio Z-Wave technology.

The eSMART-building system meets current energy regulations and allows apartments to be eligible for class B in accordance with table 2 of the Swiss standard SIA 386.110, for heating regulation (individual room-by-room regulation with communication, taking into account the absence of occupants). The product can be upgraded to class A by adding sensors. Please contact us for for more information.

1.2 Purpose of this document

This comprehensive description aims to detail the provision, installation, operation and services of the basic eSMART-building system which allows:

- building access management with the installation of a telephone entry system and digital keypad. The main door(s) can be opened using the touchscreen, which also displays the videophone image (**electricity** bundle);
- heating regulation for each room in every apartment which allows the occupant to modify the desired temperatures on the wall-mounted touchscreen (**heating** and **electricity** bundle);
- meter consumption display and monitoring (not supplied) for water, hot water, heating and electricity, in real-time and per period for each location (**heating**, **sanitaire** and **electricity** bundle);
- light and/or socket management for each room without any need to modify existing or planned switches (**electricity** bundle);
- remote home management via smartphone.

The entire system is compatible with a remote monitoring service which allows:

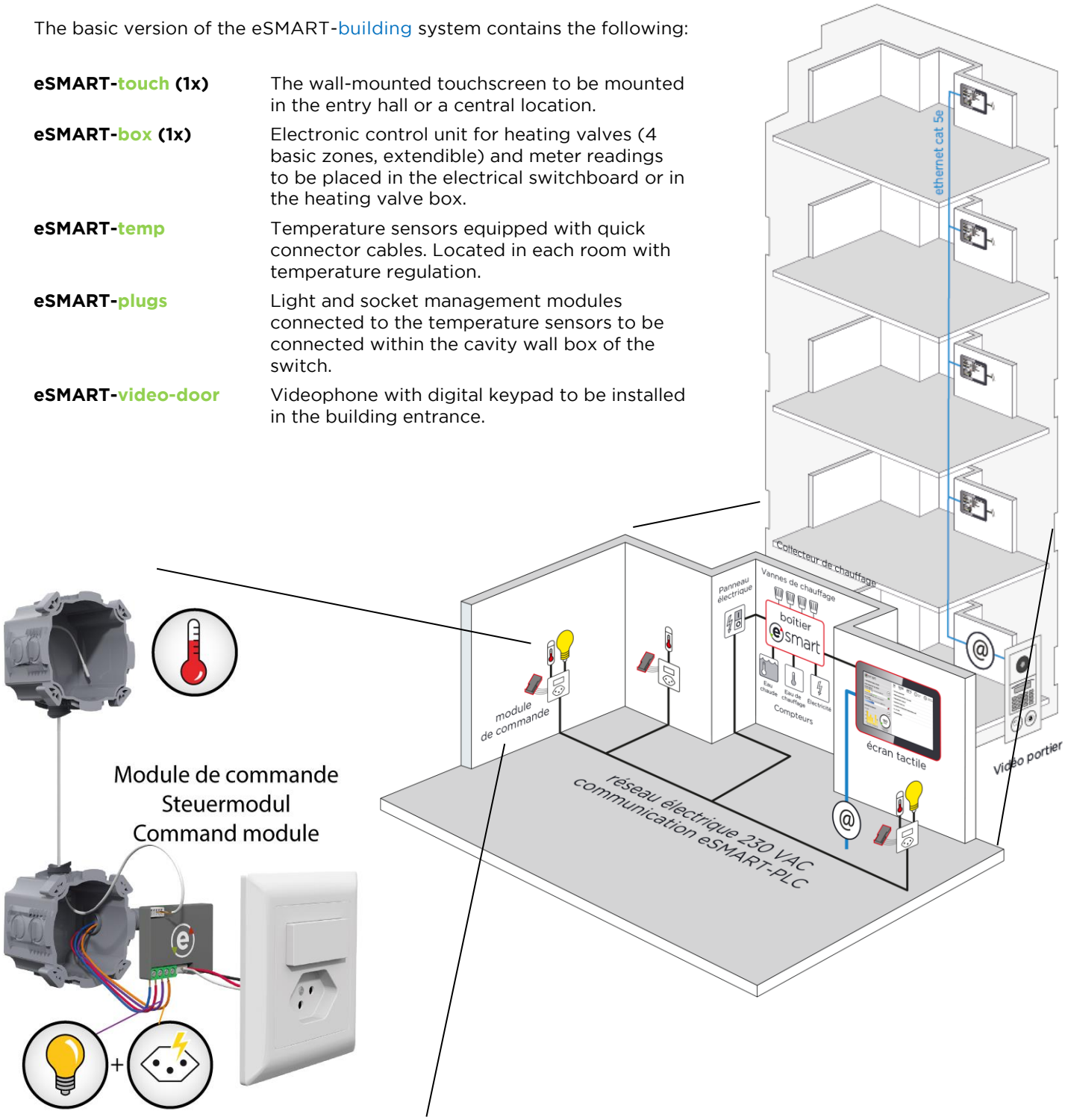
- consultation and exportation of energy consumption data (water, hot water, heating and electricity) by apartment;
- communication with the touchscreens around the apartment;
- monitoring of heating systems (optional, not described here).

2 SYSTEM COMPONENTS AND PRINCIPAL DIAGRAMS

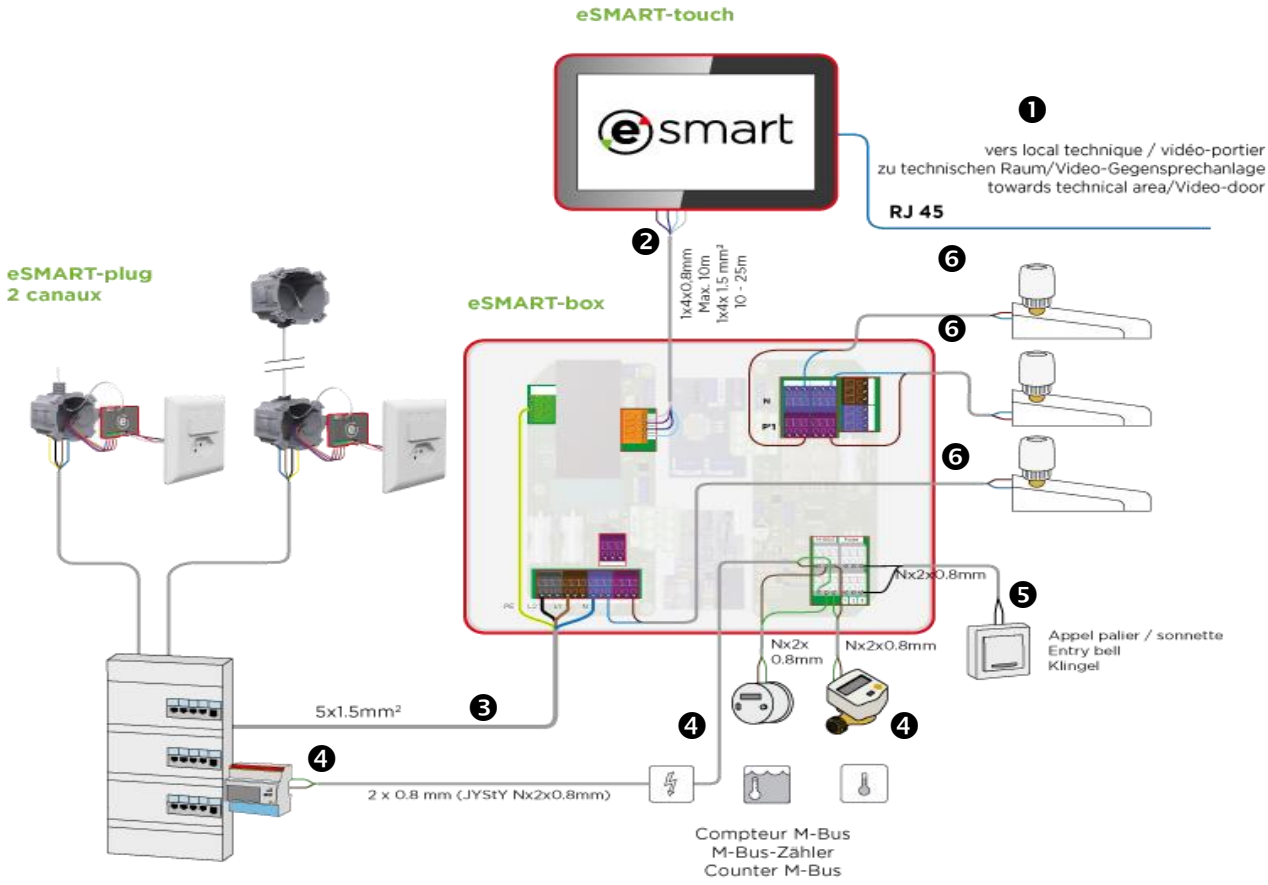
2.1 Materials supplied

The basic version of the eSMART-building system contains the following:

eSMART-touch (1x)	The wall-mounted touchscreen to be mounted in the entry hall or a central location.
eSMART-box (1x)	Electronic control unit for heating valves (4 basic zones, extendible) and meter readings to be placed in the electrical switchboard or in the heating valve box.
eSMART-temp	Temperature sensors equipped with quick connector cables. Located in each room with temperature regulation.
eSMART-plugs	Light and socket management modules connected to the temperature sensors to be connected within the cavity wall box of the switch.
eSMART-video-door	Videophone with digital keypad to be installed in the building entrance.



2.2 Apartment wiring diagram



⚠ Recommendation: In case of a self consumption community install the electricity meter in the basement of the building

❶ **eSMART-touch <-> Technical area.** An RJ45 type cable: Cat5e UTP cable or higher Maximum distance 100m.
Videophone functions, information, updates and smartphone access.

❷ **eSMART-touch <-> eSMART-box.** 1x4x0.8mm cable. Maximum distance: 10m or 1x4x1.5 mm²: 10m->25m.
Power and communication between the touchscreen and the box. For distances longer than 10m, please contact eSMART.

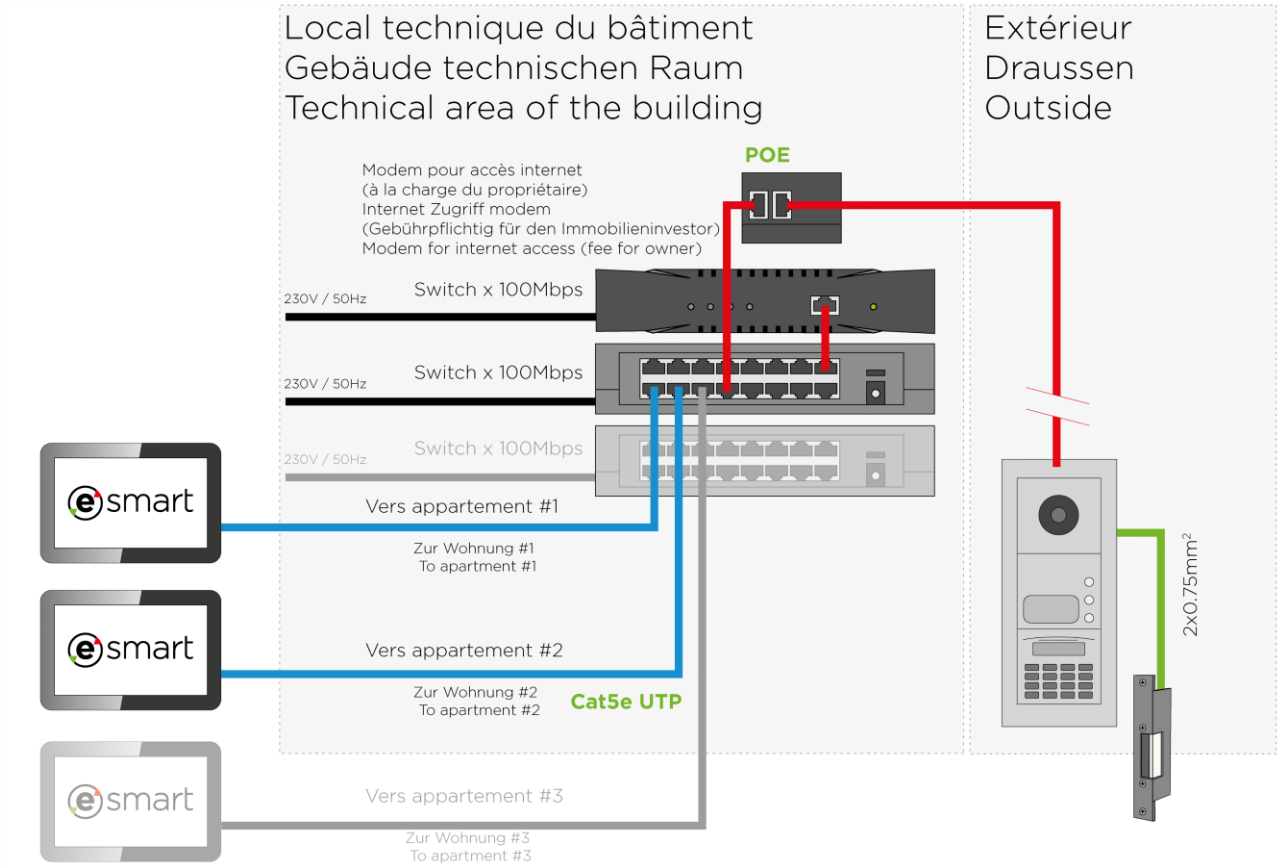
❸ **eSMART-box <-> Electrical switchboard.** Three-phase 5x1.5 mm² cable
eSMART box power and communication via the electricity supply and eSMART plugs. Connection to a three-phrase circuit breaker or not (e.g. kitchen or washing machine).

❹ **eSMART-box <-> M-Bus Meters.** JYSTY 2x2x0.8mm cable. Maximum distance: 350m.
Electricity, heating, cold water and hot water M-Bus meter readings by the system.

❺ **eSMART-box <-> Apartment doorbell.** 2x0.8mm cable. Maximum distance: 25m.
The screen sounds when the doorbell rings and the volume can be adjusted.

❻ **eSMART-box <-> Heating valves.** Flexible PVC 2 x 0.75mm² cable.
Thermoelectric valve control management for floor heating.

2.3 Technical area diagram (building)

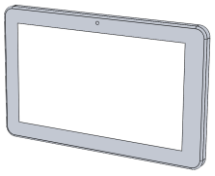


Please note: The eSMART-building system requires an internet connection (Recommended: Internet Connexion Download: min. 50Mbit/s; Upload : min. 10Mbit/s.) which must be provided by the owner of the building. The number of switch ports will depend on the number of apartments in the building to be connected.

2.4 eSMART-touch (touch screen)

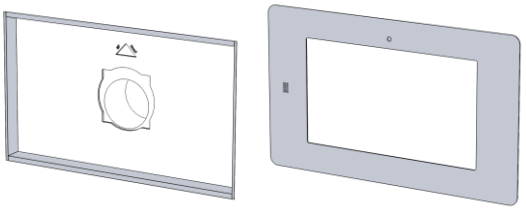
The eSMART-touch is the apartment's tactile dashboard (10") It is a focal point for home information and monitoring. The client can choose between two types of wall fitting:

a) Exposed wall fitting
Screen dimensions: 285 x 165 x 14 mm.
Free space on the left: min. 30 mm.



You will need 1 cavity wall box (HSB Weibel) size double ENC 2x1 for the connection at the back (horizontal position).

b) Integrated within the wall
Cavity wall box required: 291 x 177 x 25mm.



You will need 1 cavity wall box size 78 x 78 x 58mm for the connection at the back.

General: You will need the connections ❶ and ❷ (see diagram on previous page) to install the touchscreen.

2.5 eSMART-box (electronic box)

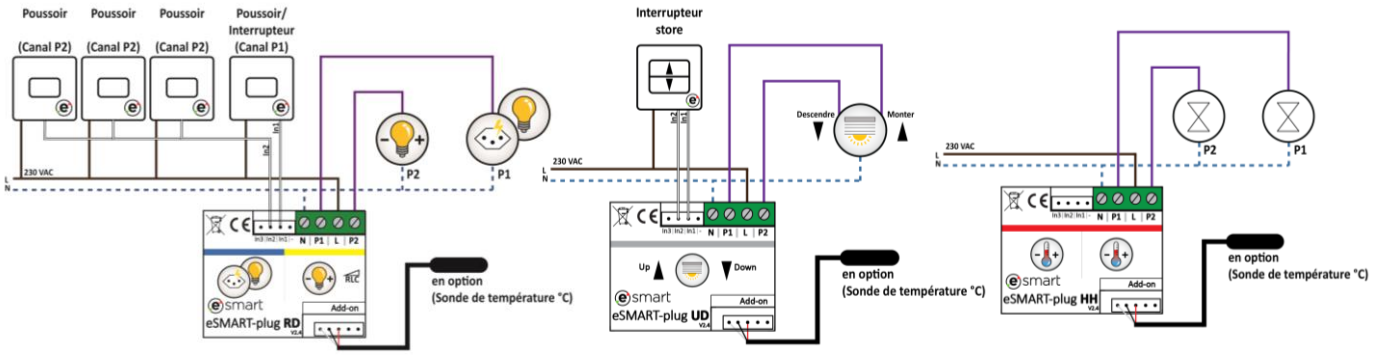
The eSMART-box technical box manages the heating valves (4 basic zones, extendible) and meter readings. It should generally be placed in the heating manifold and connected to the electrical switchboard.
Dimensions: 150 mm x 200 mm x 75 mm

2.6 eSMART-plugs and additional features

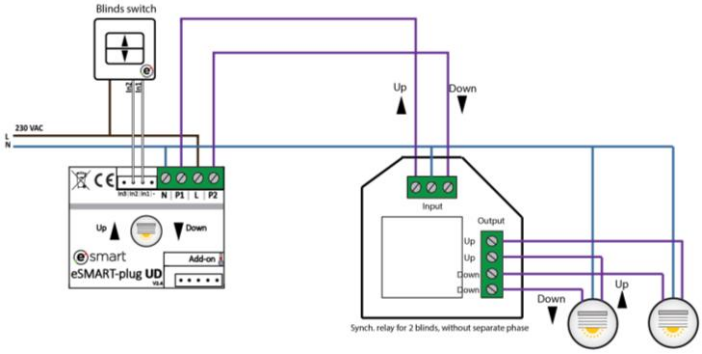
The eSMART-building system is ever evolving and its new features can be integrated easily. Updates can be downloaded without any need to change existing modules nor the command interfaces.

Module type	Imagery	Notes
Additional heating module eSMART-plug-hh (heat/heat). Maximum 2 x 10A.		If more than 4 heating regulation zones
Additional double lighting module (rr) eSMART-plug-rr (relay/relay). Maximum 2 x 10A.		1 lamp/socket + 1 lamp/socket
Additional double lighting module (rd) eSMART-plug-rd (relay/dimmer). Maximum 1 x 10 A (relay) / 1 x 150 W (dimmer).		1 lamp/socket + 1 lamp with varied intensity
Additional double lighting module (dd) eSMART-plug-dd (dimmer/dimmer). Maximum 2 x 150 W (dimmer).		For 2 lamps with varied intensity
Blind or shutter module (ud) eSMART-plug-ud (store). Maximum 2 x 10A per up and down channel		For up, down, position and direction.
Extension lamp driver module eSMART-analog (2 inputs + 2 outputs). 0..10V / 1..10V variations.		To be connected onto eSMART-plug.

2.6.1 Examples of eSMART-plugs and eSMART-temp wiring



Please note: You will need a live and neutral power supply for each module. The connector for the switch/button inputs (IN 1, 2, 3) allows the 230 VAC entries to be read. The temperature sensor is connected to the 'add-on' connector.

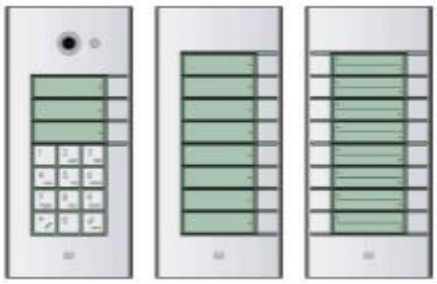


⚠ Use only synchronising relays for blinds without separate phase (see illustration above).
Product reference: AK-TR2/7AEMZ (2 blinds) and AK-T3/9AEMD (3 blinds) or similar.

3 DETAILS OF FEATURES

3.1 Videophones

The entry hall panel is equipped with 6 call buttons and a digital pad as standard. This allows the door to be opened by entering a four-digit code + #. An entry pass/badge option can be made available. 8 or 16 button extensions possible with identical dimensions.



Videophone characteristics:

Element dimensions 100x210x29mm (LxHxD)

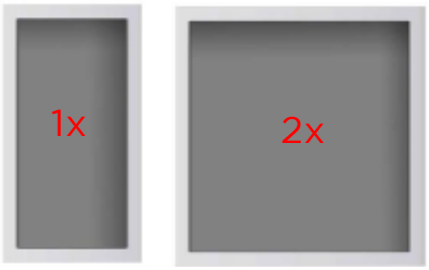
Operating temperature: -20 to +55ºC

Protection: IP 50 / IP 53 with a rain cover, in case of exposure to humidity or rain, it is necessary to provide a rain protection.

Signalling protocol: SIP

Videophone cavity:

Dimension of cavity element 1x:	125x235x46mm (LxHxD).
Dimension of cavity element 2x:	225x235x46mm (LxHxD).
Cavity measurements 1x:	110x220x50 ±5mm (LxHxD).
Cavity measurements 2x:	210x220x50 ±5mm (LxHxD).
Cavity measurements 3x:	335x220x50 ±5mm (LxHxD).
Cavity measurements 4x:	460x220x50 ±5mm (LxHxD).



3.1.1 Technical details (videophones)

The videophone is connected to the technical area of the building via a Cat5e cable and is powered by a Power-over-Ethernet cable. You will need a rack (19-inch min. 600 x 600 x 9 units high). A computer unit is to be installed in the technical area. It contains:

- One or more 100Mbps switches (according to number of apartments/buildings), provided by eSMART;
- One PoE 802.3af power supply provided by eSMART;
- One internet router, to be provided by the building owner, in addition to the internet connection.

The strike plate (not supplied) should work on 12 V, it will be connected to videophone in accordance with the manufacturer's recommendations using a 2x0.75mm² cable.

1) Powered-NormallyClosed mode: The videophone constantly powers the strike plate at 12V DC, when there is a request for the plate to be opened; the videophone cuts the plate's power.
2) Powered-NormallyOpen mode: when the videophone requires the plate to be opened, it powers the plate at 12V DC, the plate is not powered at other times.

3.1.2 Technical details (apartment doorbell)

As an option, the apartment's call button/doorbell can be connected to the eSMART-box (electronic control unit) in each apartment via a 2 x 0.8mm cable, up to a maximum distance of 25m. In this case, you will require a tube between the entrance and the heating manifold cabinet.

3.2 Heating regulation, room-by-room

The eSMART-building systems manage each apartment's heating in four distinct zones (extendible via eSMART-plug-hh modules) thanks to its temperature sensors which measure the room temperature in each zone in real-time. The control system is included in the eSMART-box electronic control unit which electronically manages, in bang-bang mode, the standard heating valves (ABN-F-230NC or ABN-F-230NO) provided by the heating engineer.

A temperature sensor eSMART-temp is placed in a flush box and connected to the eSMART-plug behind the switch.

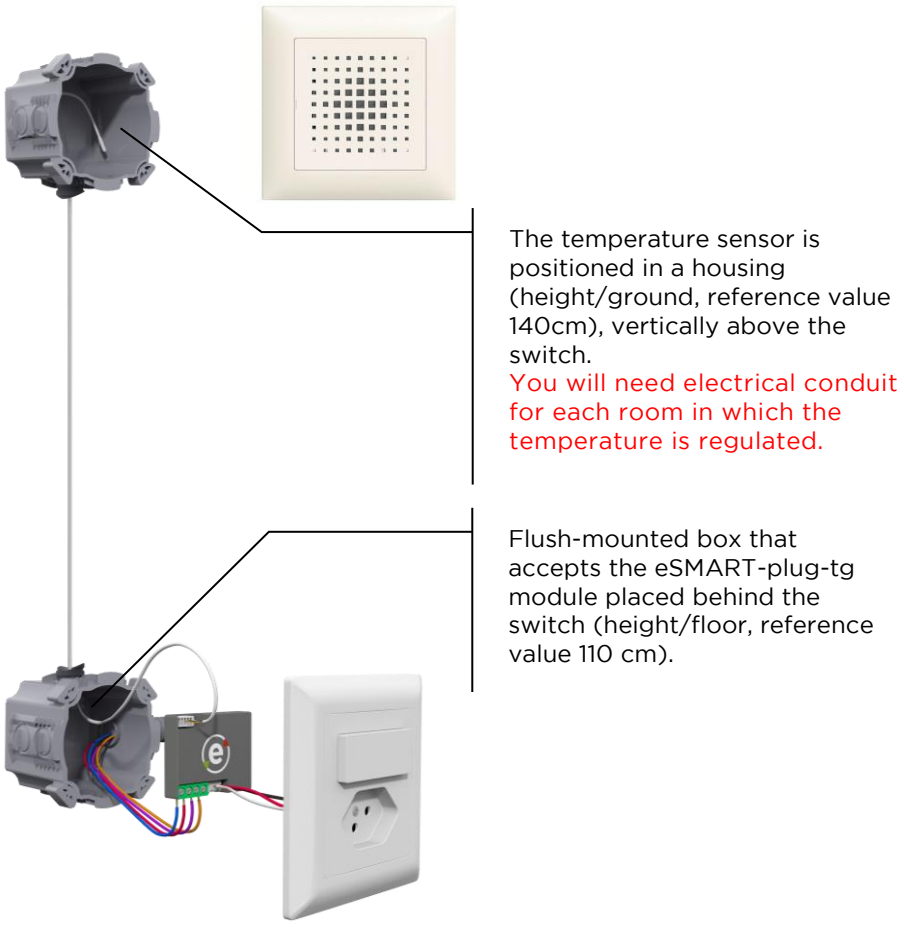
Supply voltage:	230 V AC/50 Hz.
Connections:	Screw terminal, conductor cross-section max. 1.5mm^2.
Level of protection:	IP20 EN 605029.
Power absorbed:	0.3W.
Permissible room temperature:	-25°C +45°C.

3.2.1 Technical details (eSMART-plug and eSMART-temp)

Provide a connecting tube (distance, reference value 30 cm) vertically above the switch of each regulated room (heating zone) and the flush box of each sensor.

a) eSMART recommends the use of cavity wall boxes size 78 x 78 x 58 mm.
Example: AGRO art. no. 9918/E-no. 372 002 929

b) Fit the cavity wall box which will house the temperature sensor with a set of perforated liner, e.g. Feller or similar.
Example: Feller EDIZIOduo colore 920-3070.F.61



3.3 Energy consumption monitoring device

The system provides a global overview of an apartment's energy consumption. The energy meters are read with the help of the eSMART-box via an integrated M-Bus interface. The basic system can read the following meters via their primary addresses thanks to compatible M-Bus meters.

Electricity Address M-Bus: 1	EMU	Allrounder 3/75
		Professional 3/5 + 3/75
	Hager	ECM381D
	Optec	M3PRO 80 MID + M-BUS 261261
		ECS3-63 CP M-Bus
	Schneider	IEM3135
Hot water 1 Address M-Bus: 3 **Hot water 2** Address M-Bus: 4 **Cold water 1** Address M-Bus: 5 **Cold water 2** Address M-Bus: 9	TECHEM	m-bus S III
		Modularis
	Aquametro	Saphir Modularis
	GWF	+m^2
		Unico 2
	NeoVac	Modules M-Bus Modularis
		TMP-A^2
	Diehl	Corona E
	Siemens	WFZ31
	Sensus	Residia M
	Wehrle	ETW-EAX

Heating 1 [1] Address M-Bus: 2 **Heating 2** [1] Address M-Bus: 8	TECHEM	Compact IV S
	Aquametro	Sensostar U^2
		Amtron Sonic D^2
		Amtron S3/S3+^{2}
		Amtron E-30
	Siemens	WFM533
		UH-50
		WSM506, 515, 525
	Kamstrup	Multical 602
	Landis+Gyr	T230^2
		UH-50
	Metrona	XS 2^2
	GWF	CF51
		UltraMaXX^2
	Ista	UltraMaXX^2
	NeoVac	Supercal 739 Superstatic 749/789
	Zenner	Zelsius C5 Multidata

⚠ Meters must be installed, addressed and commissioned.

Other types of meter: **calculations to be approved** in advance with eSMART.

[1] Pulse input not supported
[2] Measure every 15 Minutes

3.3.1 Technical Details (eSMART-box)

The meters are connected to the eSMART-box electronic control unit by M-Bus cables, two wire telephone cable (JYstY N*2*0.8mm)
Maximum connection distance: 350m.

4 PROPERTY MANAGEMENT – REMOTE MONITORING SERVICE

4.1 Remote property management interface

The entire system is compatible with a remote monitoring service. Property management companies and concierges can access the apartment screens via a secure personal area: http://webplatform.myesmart.net.

This service allows you to:

1) consult and export accurate energy consumption data for each apartment (electricity, hot water, heating);
2) take remote meter readings for each apartment: access to electricity data, heating (kWh), cold and hot water (m^3) per building and apartment for interim service charge billing;
3) export an Excel file detailing annual service charges by period;
4) receive technical alerts should an error be detected with the meter, therefore allowing you to ensure billing accuracy and avoid any potential disputes;
5) (property management companies and concierges) to send messages to residents will they will receive directly on their touchscreens;
6) monitor heating systems (optional, no description is provided in this document).

4.2 Warranty

During the two-year warranty period, which commences on the date of delivery, the company responsible for the supply and installation of the eSMART-building is required to remedy any difficulties which may arise, at their own cost, to ensure maintenance of the materials, preserving them in their original state.

eSMART provides a remote diagnostics service which offers assistance during setup or remedies for specific problems which may occur.

5 FURTHER INFORMATION

For any technical questions, please contact:

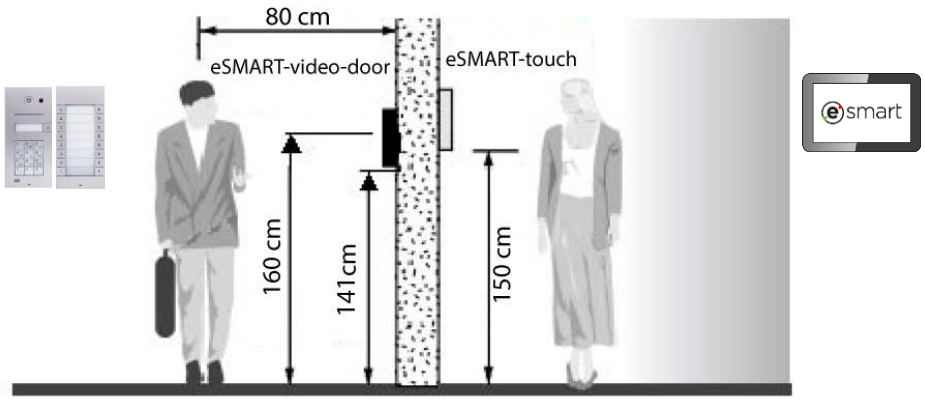
eSMART Technologies SA
Support & After Sales Department
Chemin de la Rueyre 118
CH-1020 Renens
Phone : +41-21 552 02 04
Mail : support@myesmart.com
Web: www.myesmart.com

6 APPENDIX – COMPARISON OF WIRING/MATERIALS, ESMART-BUIDLING VS. TRADITIONAL SOLUTION

	Item	Bundle	Location	Quantity
Materials **to be removed** from the quote				ALSO REQUIRED
1.	Standard thermostatic sensors	Electricity	In every room with temperature regulation	x no. rooms with temperature regulation
2.	Standard heating regulators	Chauffage	In the heating manifold of each apartment	1 per apartment
3.	M-Bus master device	Chauffage	In the building communal areas (often in the basement)	1 per building
4.	Videophone / audiophone (street)	Electricity	At the building entrance	1 per building
5.	Videophones / audiophones (intern.)	Electricity	At the apartment entrance	1 per apartment
option	Visitor chime	Electricity	At the apartment entrance	1 per apartment
Cables/tubes **to be removed** from the quote				NOT REQUIRED
1.	Cables/tubes between the *standard thermostatic sensors* (a.1) and the *heating regulator* (b.1)	Electricity	In every room with temperature regulation	x no. rooms with temperature regulation
2.	*M-Bus riser* cables/tubes	Electricity	From the M-Bus master device to all the apartments	1 per building
3.	Wiring needed for the audiophone (street and internal) or videophone (street and internal)	Electricity	From the entrance to all the apartments	1 per apartment
Materials **to be added to** the quote				ALSO REQUIRED
1.	Interactive **eSMART-touch** screen (videophone, energy use measure, heating control zones, etc.)	eSMART	At the apartment entrance	1 per apartment
2.	**eSMART-box** electronic control box standard heating regulator	eSMART	In the heating manifold of each apartment	1 per apartment
3.	**eSMART-video-door** vidéoportier	eSMART	At the building entrance	1 per building
4.	**eSMART-plug** Modules + **eSMART-temp** temperature sensors	eSMART	In the light switch cavity wall box of each room with temerature regulation	x no. rooms with temperature regulation
5.	Rack (60x60cm) for the installation of switch/router	Electricity	In the building communal areas (often in the basement)	1 per building
Cables/tubes **to be added** to the quote with **eSMART**				ALSO REQUIRED
1.	Tubes between the **eSMART-temp** temperature sensors verticle to the switches at +30 cm + cavity wall box with perforated cover.	Electricity	In every room with temperature regulation	x no. rooms with temperature regulation
2.	Videophone wiring -> Switch/Router and risers in the apartments (RJ45 cat.5)	Electricity	From the building entrance and then to all the apartments	1 entry - communal area + 1 per apartment
3.	1x4x0.8mm tubes/cables between **eSMART-box** and **eSMART-touch**	Electricity	Between the entrance hall touchscreen and the heating manifold	1 per apartment
option	Tubes/cables 1x2x0.8mm between the hallway call button/bell and **eSMART-box**	Electricity	Between the entry bell and the heating manifold	1 per apartment

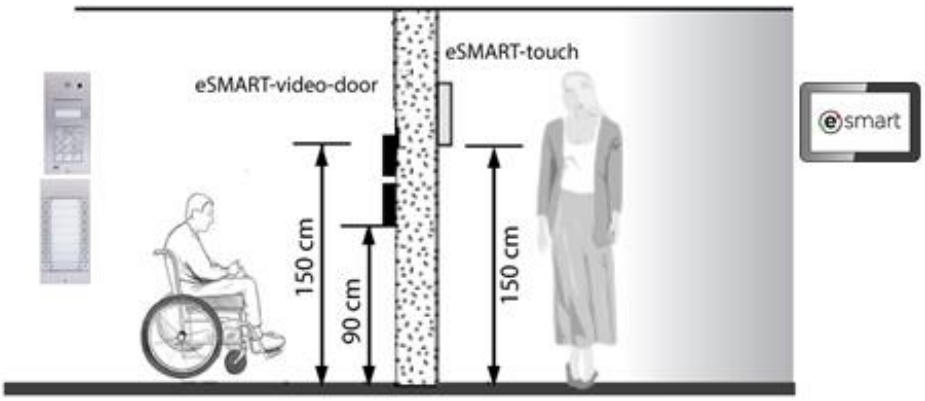
6.1 Mounting heights

Standard mounting:

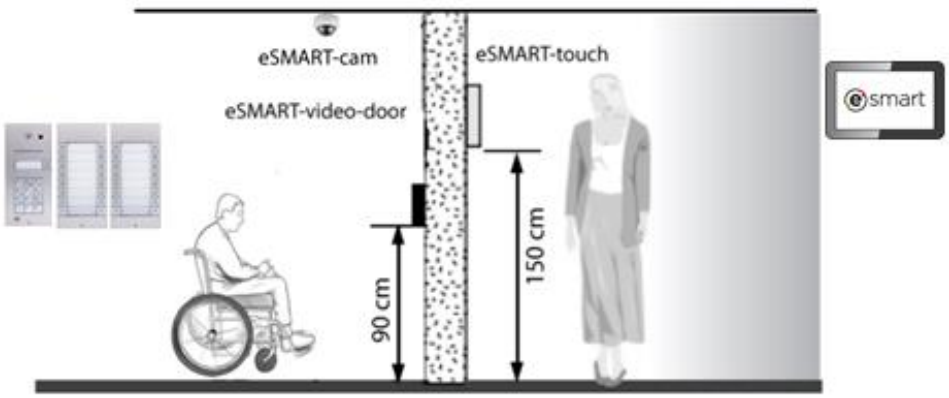


Mounting adapted to the SIA 500 standard:

Variant with video-door above the call buttons:

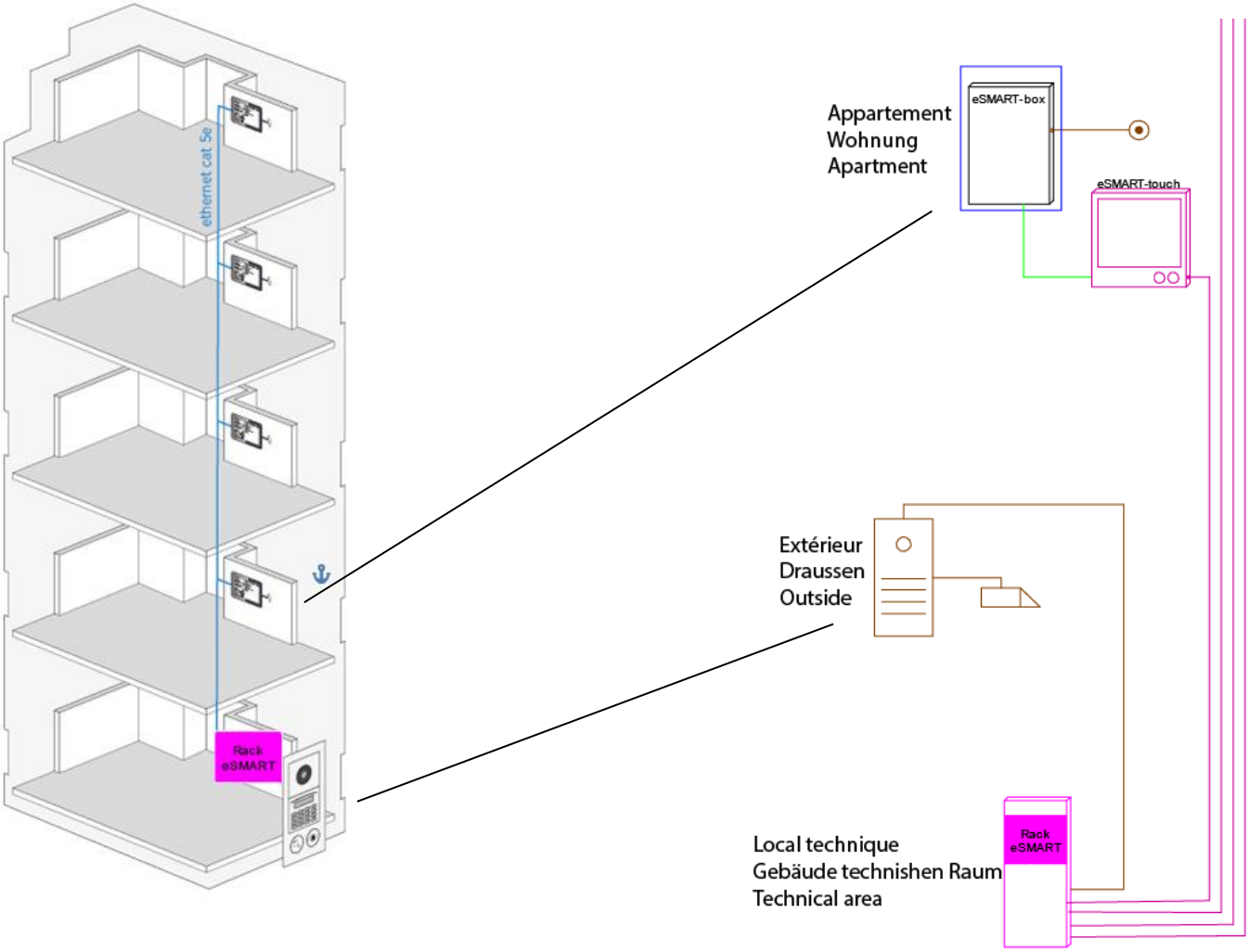


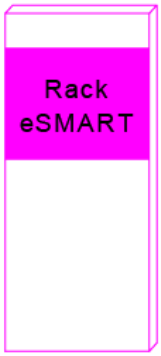
Variant with video-door and call buttons next to each other + ceiling camera*:



*The camera can also be fixed on the wall.

6.2 Example of wiring in apartments





1.40m

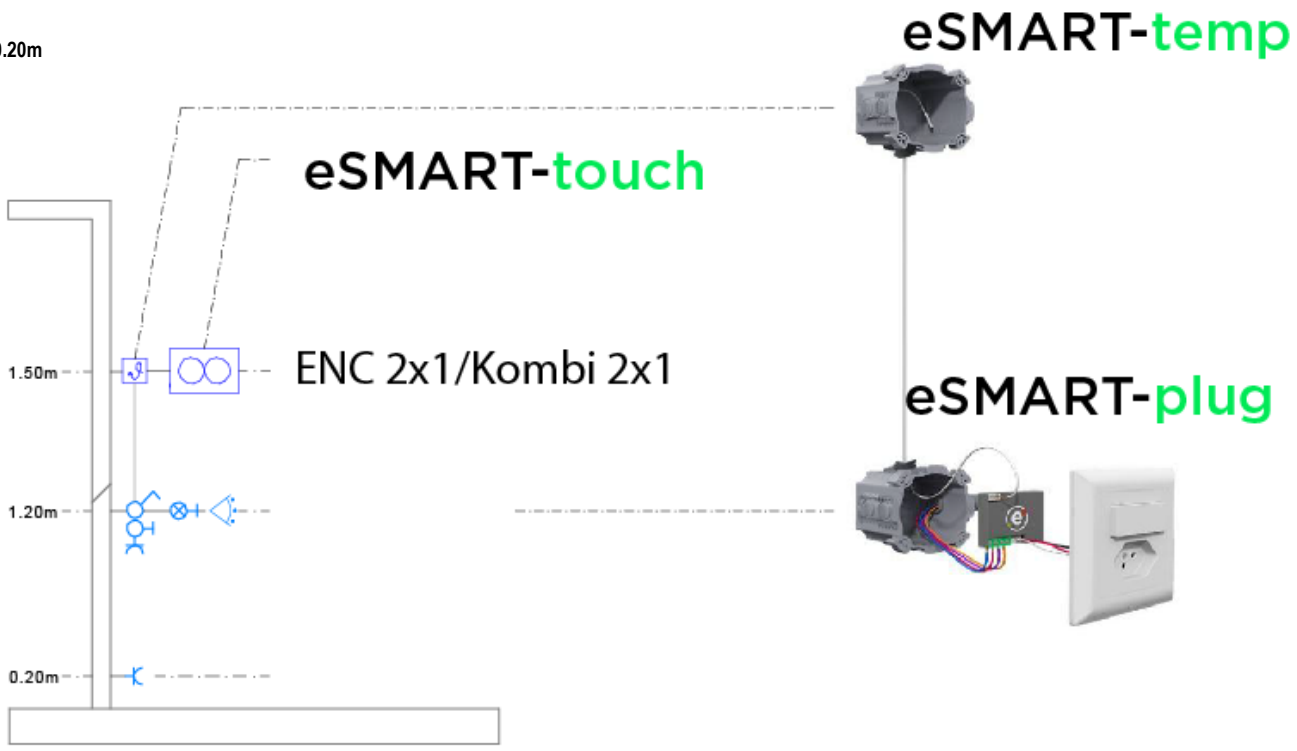
Switch + router

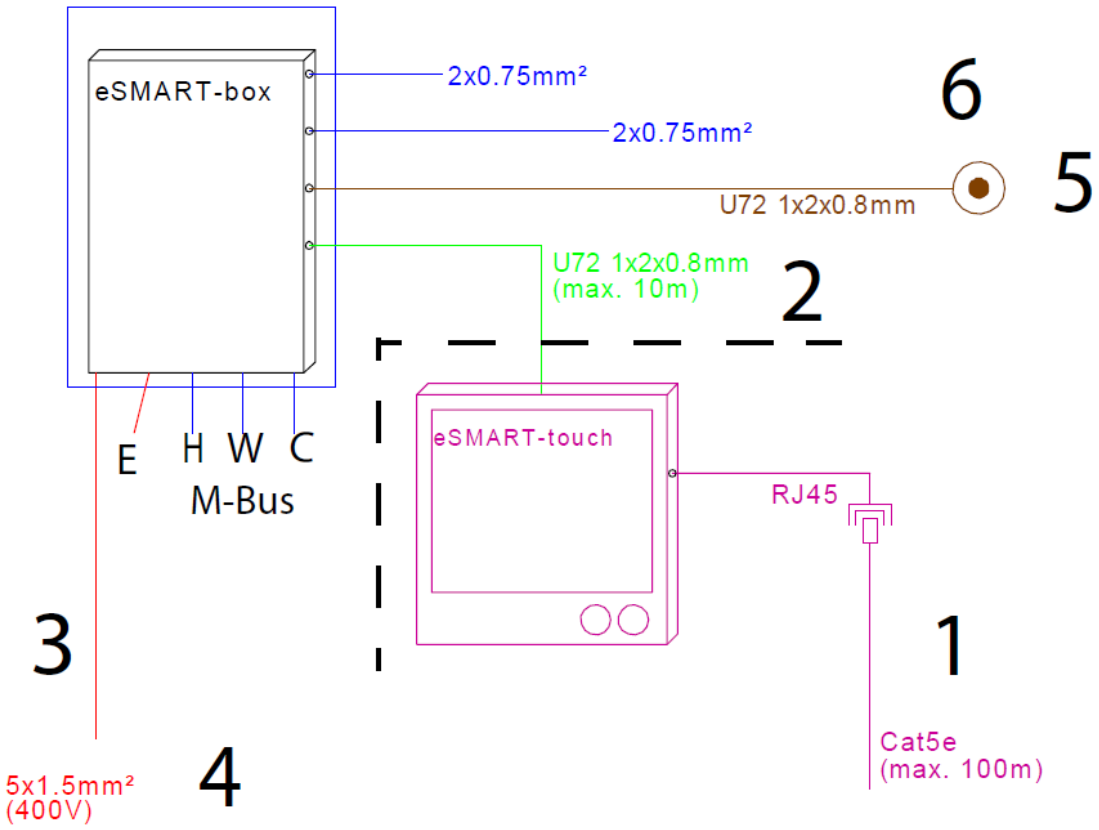
Vidéo-portier
Türsprechstelle
Video-door

Sonnette
Entry bell
Klingel

1.10m

0.20m





E : Compteur électrique / Stromzähler / Electric meter
H : Compteur chauffage / Heizungszähler / Heating meter
W : Compteur eau chaude / Warmwasserzähler / Hot water meter
C : Compteur eau froide / Kaltwasserzähler / Cold water meter

❶ **eSMART-touch <-> Technical area.** RJ45 (or higher) Cat5e UTP cable. Maximum distance: 100m.
Features: videophone, news and information, updates and smartphone access.

❷ **eSMART-touch <-> eSMART-box.** 1x4x0.8mm cable. Maximum distance: 10m
or 1x4x1.5 mm²: 10m->25m.
Power and communication between the touchscreen and the Box. For distances longer than 10m please contact eSMART.

❸ **eSMART-box <-> Electrical switchboard.** Three-phase 5x1.5mm² cable
eSMART box power and communication via the electricity suuply and eSmart plugs. Connection to a three-phrase circuit breaker or not (e.g. kitchen or washing machine).

❹ **eSMART-box <-> M-Bus Meters.** JYSTY 2x2x0.8mm. Maximum distance: 350m.
Electricity, heating and hot water M-Bus meters are read by the system.

❺ **eSMART-box <-> Apartment doorbell.** 2x0.8mm cable. Maximum distance: 25m.
Allows the screen to ring when the apartment doorbell is rung and to adjust the volume.

❻ **eSMART-box <-> Heating valves.** Flexible PVC 2 x 0.75mm² cable.
Thermoelectric valve regulation control for underfloor heating.