

Product information

Video indoor station sky™ IVW2221-015x



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Scope of delivery

- 1 x IVW2221-015x
- 1 x adaptor plate of the IVW2221-015x
- 1 x product information
- Accessories sheet for installation (1 x release bracket, 2 x fastening screws, 2 x dowels, 1 x jumper terminating resistor)
- Accessories sheet for user (1 x instruction manual, 1 x release bracket)

Safety instructions

General safety regulations

! Attention! Mounting, installation, commissioning and repair of electrical devices has to be carried out only by qualified electricians. The current standards for the installation of door communication systems must be observed!

When working in systems with 230 V mains voltage, the safety requirements according to DIN VDE 0100 must be observed.

When installing TCS:BUS systems, the general safety regulations for telecommunication systems according to VDE 0800 must be observed:

- separated cabling of heavy and low current lines,
- minimum distance of 10 cm for common cabling,
- use of separators between heavy and low current lines in shared cable ducts,
- use of standard telecommunication lines, e.g. J-Y (St) Y with 0.8 mm diameter,
- existing lines (modernisation) with deviating cross sections can be used in compliance with the loop resistance.

Installation – protective measures

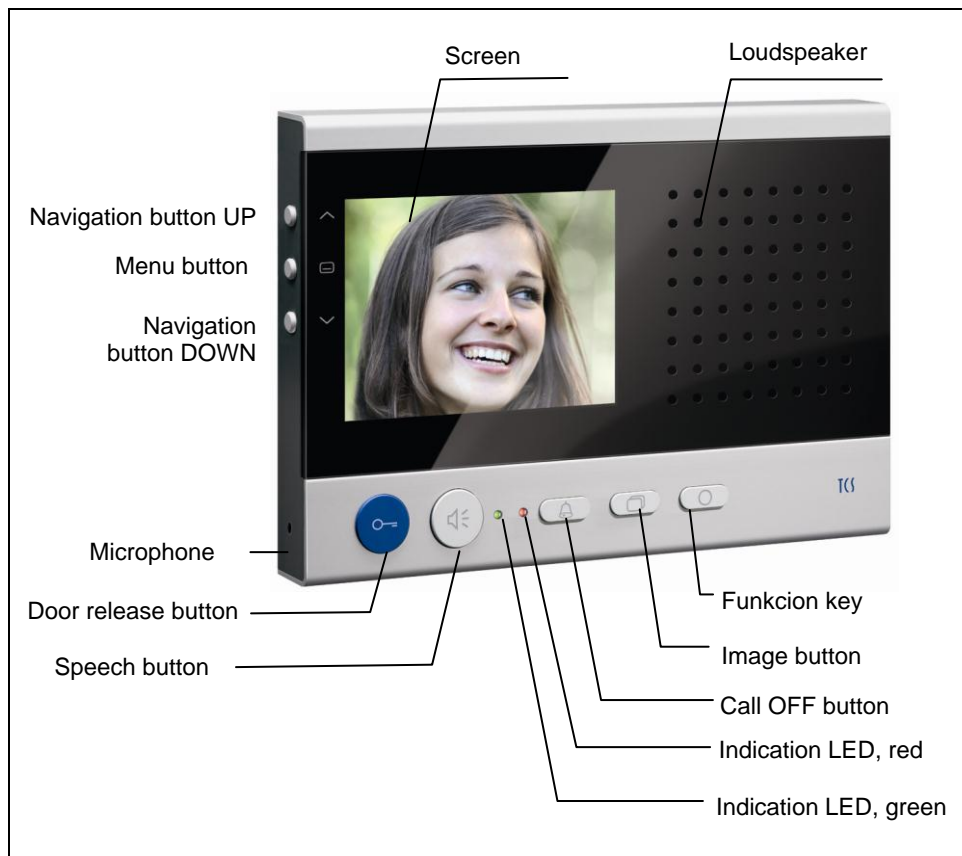
! With suitable requirements to protect against lightning, it has to be ensured that a voltage of each 32 V DC is not exceeded.

Terms









Main door call	Door call from the door with the main serial number (according to serial number sticker at the device and the package). Main door calls for front-door stations with \leq door call AS-border and $>$ door call AS-border can be realised.
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Sub door call	<p>Call from a front-door station, with different buttons different ring tones can be generated at an indoor station.</p> <p>Thus the ring tone distinguished by the used serial number. The indoor station occupies an area of five serial numbers: Serial number SN (according to serial number sticker), SN+1, SN+2, SN+3, SN+4. Each of these serial numbers generate a different ring tone.</p> <p><i>Programming the bell buttons of the front-door station with a sub door call can be realised via Service Device and config™.</i></p>
On-Screen-Display (OSD)	<p>Menu, which is shown on the screen and activated with the menu button of the device.</p>

Device overview



Indication and operating elements

	Name	Function
	Screen	<ul style="list-style-type: none"> display of the video image indication of ring tone parameters and image parameters via OSD
	Indication LED, red	<ul style="list-style-type: none"> is ON: call OFF is activated flashes OFF: door release automatic or call diversion is activated
	Indication LED, green	<ul style="list-style-type: none"> is ON: incoming door call or internal call, speaking is activated blinks 3 x: indication voice channel/video channel is busy permanent: new images are recorded or un-read short messages
	Door release button	<ul style="list-style-type: none"> open the door (= preset ex works) end speaking trigger light switch function*
	Speech button	<ul style="list-style-type: none"> call acceptance, speaking activated, simplex communication end speaking
	Call OFF button	<ul style="list-style-type: none"> ring tone stopper end speaking, if IVW2221 is configured as simplex communication device (with device configurator configo™)
	Image button	<ul style="list-style-type: none"> activation of the video image switch-over between different cameras
	Function key	<ul style="list-style-type: none"> switch lights (= preset ex works) control function 8 (OSD control function menu, if necessary) internal calling (OSD internal call menu, if necessary) door release automatic call diversion

	Menu button	<p>Shortly press **</p> <ul style="list-style-type: none"> • call main menu (in stand-by mode) • select parameters for modification (when image parameter menu, ring tone parameter menu, time setting are activated) • confirm the selection (if main, internal call or control function menu and short message indication are activated) • call menu image parameters (when the video image is activated) • select parameters for modification • directly to the indication <i>image buffer</i> or <i>short messages</i>, if new recorded images or short messages are not seen and the green LED is blinking <p>Press long (longer than 4 s)</p> <ul style="list-style-type: none"> • activate / deactivate central image buffer
	Navigation button UP	<p>Shortly press</p> <ul style="list-style-type: none"> • increase the value of the selected parameters (if the image parameter menu or the ring tone parameter menu is activated) • one entry in the list up (if the internal call or control function menu is activated) • one menu point to the left (if the main menu is activated) • show next image (if image buffer mode, reproduction are activated) • store image manually (if the video image is activated) • increase conversation volume (if speaking is activated, but the video image is deactivated) <p>Press very long (longer than 8 s) + navigation button DOWN:</p> <ul style="list-style-type: none"> • load initial setting



Navigation button DOWN

Press shortly

- reduce the value of the selected parameters (if the image parameter menu or the ring tone parameter menu is activated)
- one entry in the list down (if the internal call or control function menu is activated)
- one menu point to the right (if the main menu is activated)
- store image manually (if the image is activated)
- reduce conversation volume (if speaking is activated, but the image is deactivated)

Press long (longer than 4 s)

- delete image (if the image buffer mode, reproduction are activated)

Press very long (longer than 8 s) + navigation button UP:

- load initial setting

* if the light switch function is activated in the front-door station

** Button is working different, if a permanent image activation is configured on customer requirement. This performance feature can be activated resp. deactivated in the EEPROM.

Short keystroke: call up the main menu

Long keystroke (> 4 s): activation / deactivation of the image buffer

Long keystroke (> 8 s): call up the image setup menu

Intended use

- IVW2221 are video indoor stations with color display for hands-free talking and simplex communication. They are suitable for the use in building communication systems as well as in combined audio / video systems.
- The operation is realised via buttons and the On-Screen-Display.
- The video indoor station IVW2221 is suitable for surface-mount indoors.



The video indoor station IVW2221 always has to be installed on a wall outlet one gang box or a flush-mount box, because the device does not provide space for cabling.

Short description

- hands-free talking / manually controlled simplex communication can be activated
- blue door release button
- button for call acceptance resp. reversing key speak / listen, when simplex communication is activated
- 1 function key, ex works: allocated with control function / alternative allocation can be activated: internal call, door release automatic, call diversion, light, call up control function menu or internal call menu / can be adjusted with configo™
- image button to activate the video image resp. to switch-over between different cameras
- menu button for activation, control of the OSD menu
- 2 cursor buttons to navigate and adjust the OSD
- 13 polyphonic ring tones can be selected, can be adjusted via OSD
- acoustic and optical call distinction between front-door, flat door and internal call
- acoustic door call distinction, per bell button 4 different ring tones
- acoustic door call distinction for 2 doors
- ring tone mute with optical indication
- OSD based: max. 10 internal calls and max. 10 control functions with name can be triggered / adjustable with configo™
- OSD based: operation of the central image buffer (FVM1000-0400)
- ring tone volume can be adjusted in 8 steps via OSD
- conversation volume can be adjusted in 8 steps via OSD
- brightness, contrast, color saturation can be adjusted via OSD
- 1 parallel call can be activated with configo™
- max. 10 short messages can be received and indicated
- optical indication for new stored images in the central image buffer (FVM1000)
- optical short-term memory of door calls
- optical indication of a busy line when a voice connection is established
- optical indication for unread short messages
- the device is equipped with a connection for floor push button
- audio privacy function and automatic call cut OFF

Mounting and installation

Installation height

For an optimal viewing angle, we recommend an installation height of 1.60 m (top edge of the device).

Notes

Attention!



The video indoor stations have to be installed and removed only voltage-free!



When **mounting the mounting plate** on uneven ground, please do not over-tighten the screws as it can cause a deformation of the mounting plate. Thus, you may not be able to snap on the device or the secure contacting may be affected.

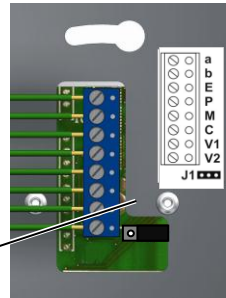
Installation and connecting the lines

Installation

The indoor station always has to be installed on a flush-mount socket or a wall outlet one gang box.
Position the adaptor plate on the socket / box.

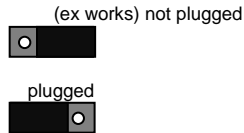
Connecting

- Connect the lines to the plugable terminal according to the labelling. (Therefore, the terminal can be removed.)
- Put the terminal on the contacts.



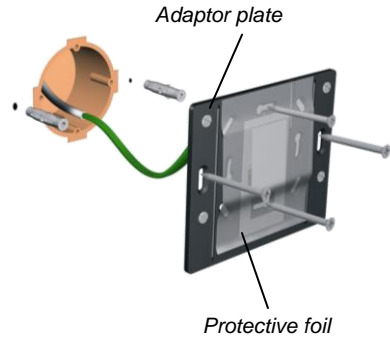
Setup the indoor station as end device

- Put the terminating resistor J1 on the two left contacts, if the device is installed at the end of a TCS:BUS video strand.



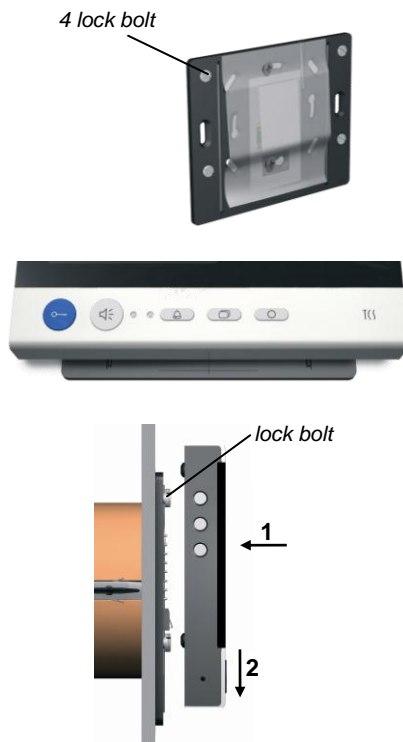
Install the adaptor plate

- Do use the adaptor plate only as tool to mark the holes.
- Do not use the adaptor plate as drilling template!
- Install the adaptor plate directly on the flush-mounted socket or on the wall (left and right) with the 2 included screws.
- The protective foil serves to conserve the contact reliability and prevents e.g. an overpainting. The foil can be removed during the installation of the adaptor plate. Remove the foil only before installing the device!



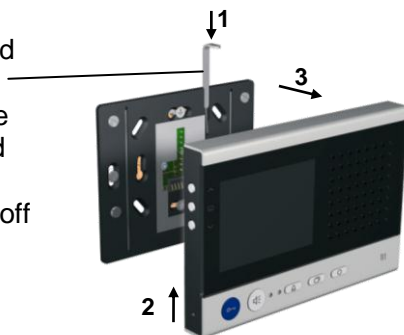
Install the device

- Remove the protective foil.
Take the device into both hands.
Put it on at the adaptor plate.
- Press the device flat onto the adaptor plate (1) and push the device carefully vertical downwards (2), until the holes in the back of the device slide over the lock bolts.
- Push down the device until the stop.

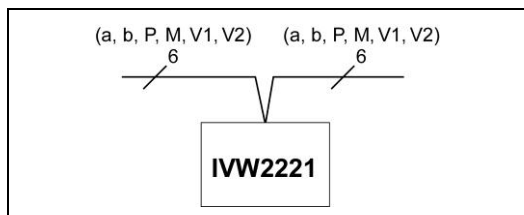


Deinstall the device

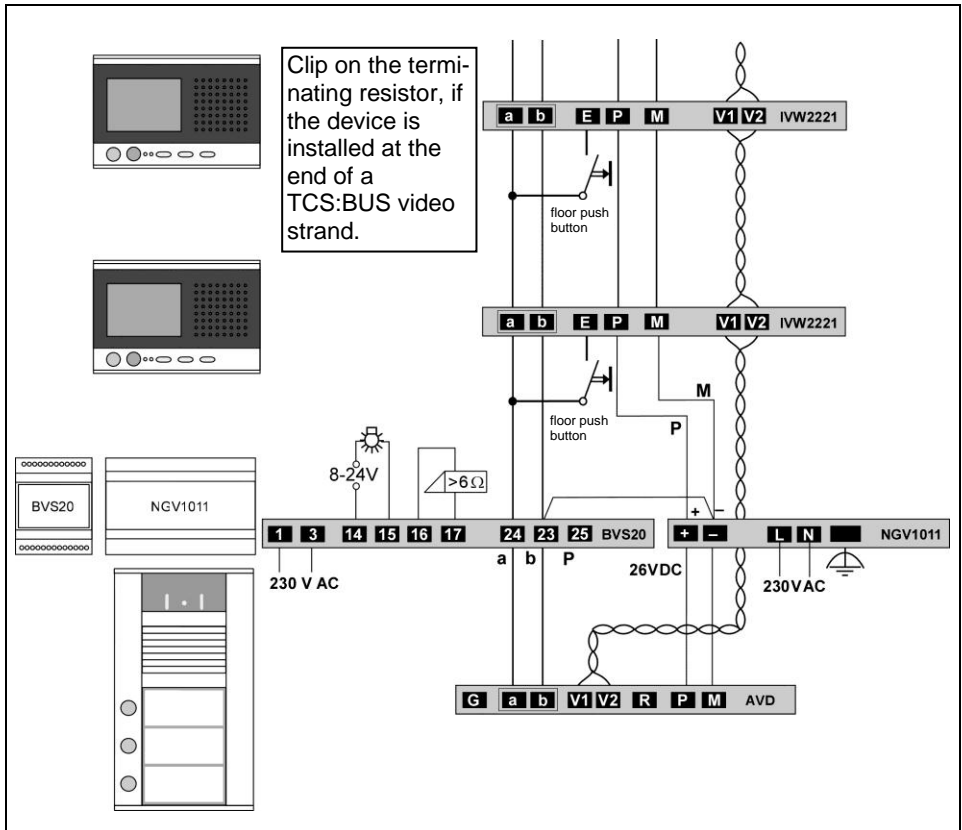
- For deinstalling the device you need the included unlocking bracket.
- Insert the unlocking bracket into the opening in the adaptor plate behind the device (1).
- Push up the device (2) and draw it off forwards you (3).



Connection diagram

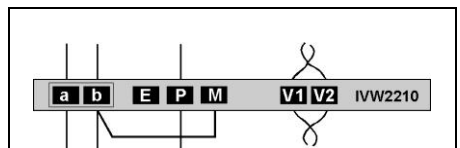


Wiring diagram



5-wire special operation

If only 5 wires are available to connect the device, that the M-wire cannot be connected, it is possible to use the 5-wire special operation.



! The installation of a wire bridge between the wires b and M is only permitted when special conditions are observed. For an optimal solution for your project please contact our Hotline.

Commissioning



First install the system completely, than connect it to voltage!





- V1 and V2 must not be connected to the P-, a- or b-wire.
- When connecting the video wires V1 (+) and V2 (-) the polarity is to be observed.
- Check the a-, b- and P-wire against each other for short-circuits.
- Switch on the power supply.

Error detection and indication

Errors are signaled optically and acoustically:

- single error tone when pressing any bell button and
- permanent flashing of both LEDs.

The optical error indication stays active until the error is corrected.

Error causes	indication error modes	error tone	clearance
a- and P-wire interchanged or short-circuited	 both LEDs flash		exchange a- and P-wire or remove short-circuit, device is in stand-by mode again
a- or M-wire: not connected or not supplied			connect a- resp. M-wire or check power supply, device is in stand-by mode again
button sticks (pressed longer than 15 s)			free button at the IVW2210 or at the floor push button, device is in stand-by mode again

Settings

Preset times

length of call	2 min
remaining conversation time after pressing the door opener	4 s
image switch time	80 s

blinking period of the green LED, if • “video/speech channel is busy“ when pressing the speech button or press- ing the image button	3 s	3 x blinking
internal stand-by time	ca. 30 s	
floor door release time	ca. 30 s	
timeout menu ring tone parameter	10 s	
timeout menu image parameter	10 s	

Configuration options

Function	manual	TCSK-01	configo™ <i>as of version 1.6.x</i>
fixed simplex communication	–	–	x
simplex communication to the front- door station	–	–	x
ring tone volume	menu	–	x
ring tones for door calls, sub door calls, internal calls and floor calls	menu	–	x
call diversion	–	x	x
door release automatic	–	x	x
10 internal calls via OSD	–	–	x
10 control functions via OSD	–	–	x
internal call via function key	–	x	x
control function 8 via function key	–	x	x
reset switching lights	–	x	x
parallel allocation	–	x	x
floor door release function on / off	–	–	x
automatic hands-free talking after internal call on / off	–	–	x
define video AS threshold and door call AS threshold	–	–	x
image activation by floor call	–	–	x
allocate short message groups	–	–	x
image buffer FVM1000 always blocked	–	–	x
image buffer (in comfort mode) FVM1000 on / off	–	–	x

* cannot be shown as text in the display

Programming the function key with the Service Device

The indoor station is acting as a simplex communication device. The commands “9” have to be used for configuring comfort simplex communication devices (see *product information Service Device*). A programming with the commands “9” has to be initiated with the command *95#Ser.-No.# one-time only. Then the programming of the function key is to be realised with the Service Device.

initiation	* 95 # Ser.-Nr. #
call diversion	* 90 # Ser.-Nr. # ZielSNr #
door release automatic	* 91 # Ser.-Nr. #
internal call	* 92 # Ser.-Nr. # IntSNr #
control function 8	* 93 # Ser.-Nr. #
reset light switch function	* 94 # Ser.-Nr. # 0 #
parallel allocation	* 99 # Ser.-Nr. # ParSNr #

Note: Deactivation of the parallel allocation corresponds to the parallel allocation to serial number 0.

Ser.-No. = serial number of the indoor station which is to be configured new

DestSNo. = serial number of the destined indoor station, to which the call is to be redirected

IntSNo. = serial number of the destined indoor station, which is to be called intern

ParSNo. = serial number of the indoor station, to which the indoor station that is configured new is to be allocated

General information to the OSD menu

- The navigation in the OSD menu, in the image buffer indication and Live image is realised with the navigation buttons UP and DOWN.
- The OSD menu *main menu* can be switched on, if no Live image is shown and if the indoor station is in stand-by mode, that means that no voice connection is established and no door call has come in.
- Symbols in the OSD menu are only shown if the respective function was configured. In delivery state, not all possible functions are configured.

- The live image is activated by pressing the image button or the speech button or when a door call is received.
- The OSD menu or the image buffer indication is switched off automatically after 10 s, if no button is pressed. Or: Press the function key to leave the menu.
- The live image ends automatically after 80 s without any operation, by ending the communication or when a video channel is used by another device (not in case of a voice connection).

Main menu



symbol
main menu

symbol of the
selected menu























pictogram bar
for parameter selection

selected parameter

Symbols and their meaning

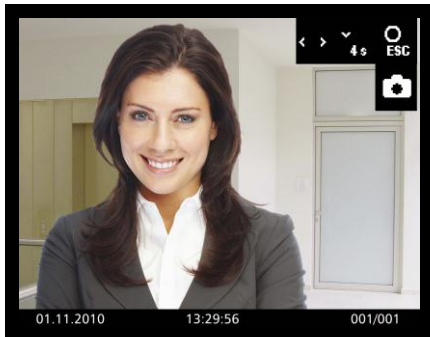
symbol	meaning
	ring tone selection for door calls <= AS threshold
	ring tone selection for door calls > AS threshold
	ring tone selection for internal calls
	ring tone selection for floor calls
	ring tone selection for sub ring tone 1

symbol	meaning
0...9	indication of adjusted values as number
	Label for call setting menu
	image buffer; automatic image recording activated = green, deactivated = red
	menu send internal call
	menu send control function

 ring tone selection for sub ring tone 2	 menu for time setting of the image buffer menu
 ring tone selection for sub ring tone 3	 main menu
 ring tone selection for sub ring tone 4	 menu short messages
 ring tone volume	 screen to read a short message
 set contrast	 delete short messages
 set brightness	 set date
 set color saturation	 set time
 label camera for fading in the AS address	 delete image buffer (all stored images)
 call diversion activated	 animated hourglass as progress indicator
 door release automatic activated	 no stored images in the FVM1000
 ring tone mute activated	 set conversation volume

Help function

To simplify the operation of the device, symbols are faded-in in the upper right corner when calling the live image, the main menu and the sub menus. The symbols indicate, which button are available in the respective screen. The fade-in ends automatically after 5 s or at the first keystroke.



symbol	meaning
^ v	navigation buttons UP, DOWN can be used to operate within the menu.
OK	menu button can be used to confirm.
ESC	function key can be used as cancel button.
v 4 s	navigation button DOWN can be pressed and hold for 4 s.

Internal calls and control functions

The plain texts, which should appear in the selection menu, can be set exclusively with the configuration software configo™. Internal call destinations or control processes can be entered there as plain text. 10 internal calls and 10 control functions can be send via the OSD menu.

Simple

By any triggering, the identical control protocol is send. There is no indication of the state of the device, which is to be switched. The serial number and the control function number can be configured as parameter. Thus, it is possible to automatically generate the own serial number of the video indoor station IVW2221.

ON/OFF

Alternating, two different control protocols with the same serial number are sent. One control function number is intended for switching-on and one for switching-off. Via two different symbols, which appear interde-


pendently in front of the list entry, the latest switched status can be seen. Here, the two control function numbers as well as the serial number can be configured, whereby the device-individual serial number can be created, if required.

enocean

This function is realised identically to the IMM1100 to make sure that an enocean radio interface FBI4200 can be connected. It can be also used to indicate switching states without influencing these itself. When triggering the list entry, a control function with configurable serial number is sent. The control function number can be selected freely (0 to 200 is possible). Independent from sending the protocols, the receiving of control protocols with the configured serial number causes the switch-over of states, which is indicated under b) by symbols in front of the list entry. Thus, the control function numbers 01 and 03 realise the state OFF and the numbers 02 and 04 the state ON.

Sending a control function

Triggering the control function can have three different effects:

- A control protocol is sent (no indication in the menu).
 - Two different control protocols are send alternately (indication in the menu with red/green point). The color of the point shows the triggered switching process, but not the actual state of the device which is to be switched.
 - A control protocol is sent and the execution of the switching process is indicated in the menu by a red/green point.
-
- Press the menu button. Select the symbol *Send control function* . Or call up the menu with the function key, if the device is configured accordingly.
 - Select the required function with the navigation buttons UP or DOWN.
 - Trigger by pressing the menu button. An acknowledgement tone sounds. The OSD is switched off after 5 s (or switches back to the live image).



Send internal call

- Press the menu button. Select the symbol “Send internal call”. Select the required call destination with the navigation buttons UP or DOWN.
- Trigger a call by pressing the menu button. An acknowledgement tone sounds. The OSD is switched off (or switch-back to the live image).
- If the call is accepted at the called indoor station, another acknowledgement tone sounds.






Receive an internal call

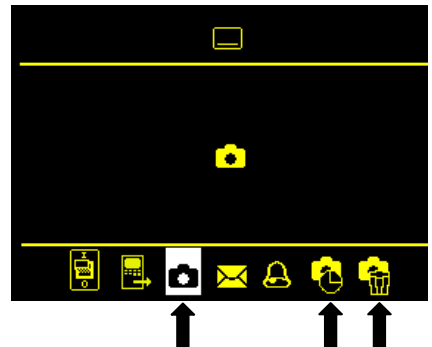
- If the indoor station receives an internal call, whose sender includes its serial number, the serial number is indicated.
- If the name of the calling indoor station is programmed (via configuration software configo™), the name is indicated.



External image buffer

Images (or image sequences) can be stored with the external image buffer FVM1000. The number of images is limited to 64 per device. The oldest image is overwritten.


- Make sure that also the video indoor station IVW2221 is ready for operation.
- Set the operation mode *comfort mode* at the **FVM1000**:
- Close the programming mode. Thus, the video indoor station IVW2221 detects the FVM1000, an acknowledgement tone sounds.
- The symbols *image buffer* , *time setting*  and *delete image buffer*  are shown in the main menu.



Note: The **automatic** image storage is not activated.


Activate / deactivate the automatic image storage

Activate

- Press the menu button longer than 4 s. An acknowledgement tone sounds. The main menu is faded-in for 3 s. The symbol *image buffer*  changes its color from red to green.

When receiving a door call, an image is stored automatically.

Deactivate

- Press the menu button again longer than 4 s. An acknowledgement tone sounds. The main menu is faded-in for 3 s. The color of the symbol *image buffer*  changes from green to red.



Symbol in the live image:
automatic image storage is activated

Store images manually

When video is activated, an image can be stored manually.

- Shortly press the navigation button UP.
- A successful storage is indicated by a faded-in symbol (with date, time and number).
- The green LED blinks as long as the image has not been viewed.




View stored images

If the green LED is blinking, new images were stored:

- By pressing the image button, the image is shown immediately.

If the green LED is not blinking:

- Press the menu button. The main menu appears.
- Select the symbol *image buffer*  to show the image.
- Browse through all new stored images with the navigation buttons UP or DOWN.

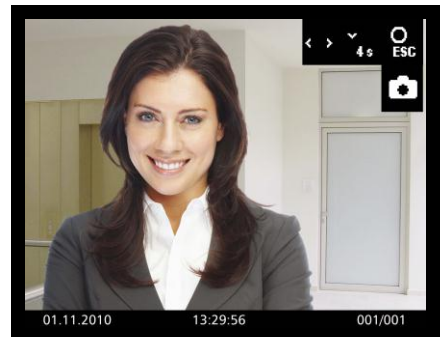

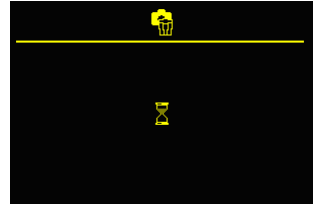


Image with date, time, image number
of all stored images

Note: The symbol  appears, if another indoor station is currently accessing the image buffer, a door call comes in or a voice connection already exists.


Delete a stored image

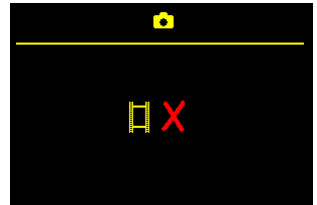
- To delete the shown image, press the navigation button DOWN for 4 s, until an acknowledgement tone sounds. The image will be deleted. The image stored before is shown.



Delete all stored images

In the external image buffer, all images allocated to the indoor station can be deleted completely.

- Press the menu button. The main menu appears.
- Select the symbol *Delete image buffer* .
- Confirm the selection by pressing the menu button.
- Depending on the number of images, the deletion process can take a few seconds.




Indication *empty storage*

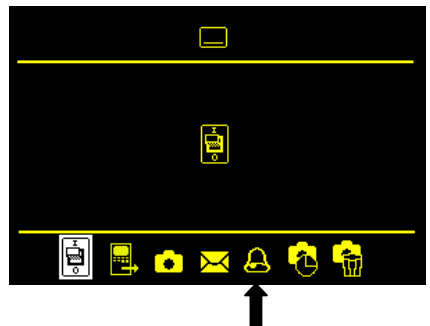
If all stored images of the allocated serial number have been deleted in the FVM1000 or no stored images are available when a call comes in, the information “empty storage” is faded in for 4 s, before the switching to the main menu.

Set ring tone parameter


Call up menu ring tone parameter

(in stand-by mode)

- Press the menu button, the main menu appears.
- Press the navigation button RIGHT (or LEFT), to get to the symbol *ring tone parameter* .
- Press the menu button again to call up the menu ring tone parameter.




Set ring tone volume

- Press the navigation button RIGHT (or LEFT), the symbol *ring tone volume*  is pre-selected.
- Press the navigation button UP or DOWN, to regulate the volume. The level of the ring tone volume (1 to 4) is indicated in the display.

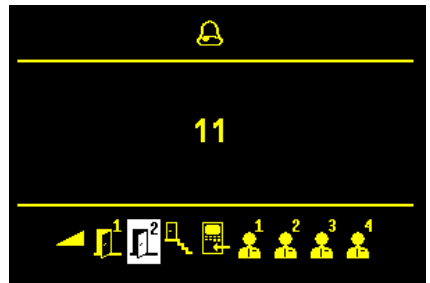
While selecting the adjusted ring tone is reproduced in the selected volume and stored.



Ring tone selection

- Press the navigation button UP or DOWN to get to the symbol *ring tone selection*  (e.g. for door 2).
- Press the navigation button UP or DOWN to select the ring tone. The number of the ring tone (e.g. 11) is indicated on the display.

When selecting a ring tone, the ring tone is reproduced and stored.



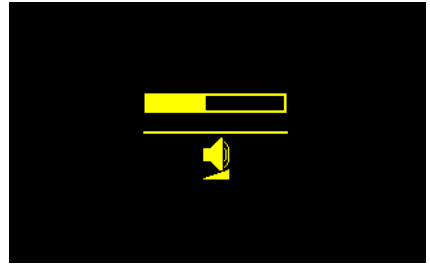
Set conversation volume

... when a voice connection (to the door) exists:

- Press the menu button during a voice connection. The menu to set the image parameter and the symbol to set the conversation volume are displayed.
- Press the navigation button UP or DOWN to adjust the value. The setting immediately has an effect on the established voice connection. The value is stored.




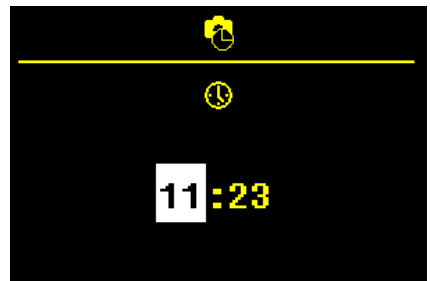
- ... when internal voice connection exists:
- After the sender of the internal call was displayed, the menu to set the internal conversation volume is indicated.
 - Press the navigation button UP or DOWN to adjust the value.



Setting date and time of the image buffer

This dialog only appears, if the use of an external image buffer and the permission to set date and time has been released in the EEPROM.

- Press the menu button.
The main menu is faded-in.
- Select symbol *time setting image buffer*  via the navigation button.
- Confirm the selection by pressing the menu button.
- The menu **date** is indicated.
- The marked number can be changed with the navigation buttons UP or DOWN.
- By pressing the menu button, the entry of the parameter will be closed and the system moves to the next parameter automatically.
- If the *day* setting is closed, the system moves to the **time** setting.
- The marked number can be changed with the navigation buttons UP or DOWN.
With the menu button you can switch over to the next position.
- By pressing the menu button again, the setting is finished.



Set image parameter







Symbols in the live image

The symbols in the live image are faded-in for 10 s when image activation is active (after pressing the image button or after receiving a door call) or for 3 s after pressing the speech button.

- Press the image button or the speech button to switch on the live image.



The symbols for ring tone stopper, door release automatic, call diversion and image buffer mode are only indicated if the function is activated.




 05	Image from camera AS-address (e.g. with AS-address 05)			Ring tone mute
	Call diversion activated	or	 	door release automatic activated
	automatic image storage is activated; menu image buffer is active			

Set contrast, brightness and color saturation

- Press the speech button or the image button. The image of the video front-door station appears.
- Press the menu button. The menu for the settings is faded-in.
- Press the menu button again to switch-over to the next image parameter.
- Press the navigation button UP or DOWN to regulate the value of the image parameter.



The change can be seen immediately in the video image.

	contrast
	brightness
	color intensity

Reload factory setting

Only all settings made manually can be reset to the factory setting.

- Press the navigation buttons UP and DOWN simultaneously for 8 s.
- An acknowledgement tone indicates the successful closure.

Selecting a camera by stepping with the image button

- Eventually press the image button or the speech button to switch on the live image of the last selected camera. When receiving a door call, the live image of the calling video front-door station (camera) is switched-on.
- Press the image button again to switch over to the next video front-door station or camera.

Short messages

- The video indoor station IVW2221 can receive short messages via the TCS:BUS, store those and display them if required.
- Max. 10 short messages can be stored.
- The received message can include max. 95 characters.


Read short messages

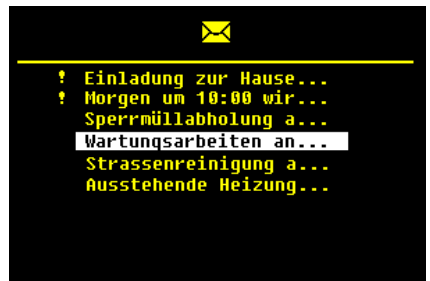
If the green LED blinks, new short messages were recorded:


- Press the menu button to directly access the menu *short messages*.

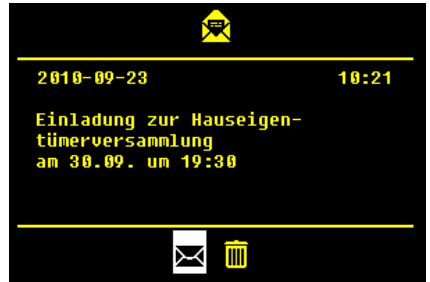
New, unread messages are labelled with an exclamation mark.

If the green LED does not blink:

- Press the menu button.
- Select the symbol *short messages* .



- Select the required message with the navigation buttons UP or DOWN.
- Confirm the selection by pressing the menu button.
You can read the message now. It includes the message text as well as date and time it was sent.
- Select the symbol short messages , confirm the selection by pressing the menu button or to get back to the menu short messages.



Delete short messages

Read short messages can be deleted by the user. If more messages were received than can be stored, the oldest messages are overwritten automatically.



Technical data

supply voltage:	+24 V ± 8 % (power supply and control unit)
housing:	aluminium and plastics, (colors such as in the price list)
dimensions (in mm)	
Housing:	H 104 mm x W 153 mm x D 16 mm
for mounting:	H 104 mm x W 153 mm x D 20 mm
weight	410 g

acceptable ambient temperature:	-5 °C to 40 °C
input current (stand-by)	I(a) = 0.03 mA, I(P) = 8.5 mA
max. input current:	I(Pmax) = 210 mA

video module	TFT color module
screen diagonal	8.9 cm (3.5 inch)
resolution	320 x 240 Pixel, RGB
video signal input	symmetric 1 Vss FBAS,
floor input	asymmetric 1 Vss FBAS

Video 6-wire technique necessary!

General to the conduit in TCS video systems

6-wire operation

The 6-wire operation is the standard operation mode. Video operation, where two separated masses (b und M) are used.

The conduit of the lines is defined by the structural conditions and is only limited by length.

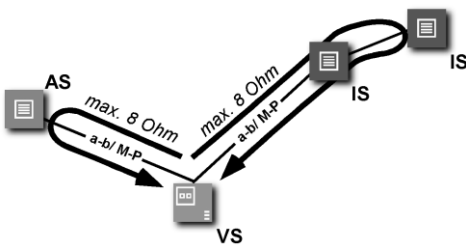
- Please observe when selecting the length of the lines: the loop resistance a-b and M-P must not exceed 8 Ω (table 1).
- Loop resistance > 8 Ω: plan multiple wiring of the strands (double twisted lines).
- optional strand or star shaped wiring
- Do not use more than 20 video indoor stations per strand. For systems with more video indoor stations plan to use video distributors (FVY1200, FVY1400).
- Up to 64 front-door stations (16 of them video front-door stations) and almost an unlimited number of indoor stations can be connected within one system polarity-free (a/b | polarity-free only in 6-wire operation). Thus a suitable power supply and control unit is to be used.

Table 1: Loop resistances

Length of the line a-b/ M-P in m	Line diameter	
	0.6 mm	0.8 mm
	Loop resistance in Ω	
10	1.28	0.71
20	2.55	1.43
30	3.83	2.14
40	5.10	2.86
50	6.38	3.57
60	7.65	4.29
70		5.00
80		5.71
90		6.43
100		7.14

Principle loop resistance

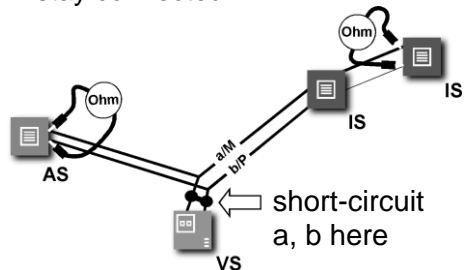
None of the devices (AS, IS or FE) should be further than **8 Ohm** away from the power supply and control unit (VS).



8 Ohm:
 ca. 65 m distance AS-VS by 0.6 mm diameter
 ca. 115 m distance AS-VS by 0.8 mm diameter

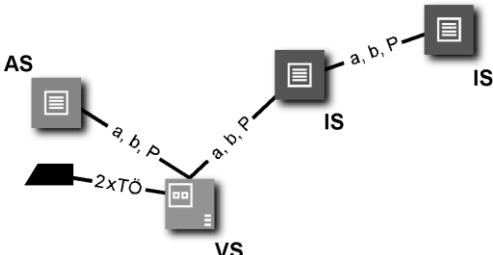
Measurement loop resistance

- Switch off the 230 V / 50 Hz of the VS.
- Install a-b short-circuit at the VS.
- All other devices are not disturbing the measurement and can stay connected.





AS front-door station,
 VS power supply and control unit,
 IS indoor station,
 FE extended function






Max. number of IVW2221 in 6-wire operation

small /medium-sized systems	max. number IVW2221	 <p>AS front-door station VS power supply and control unit IS Indoor station</p> <p>Note: The number of the front-door stations that can be connected is limited and is described in the respective product information!</p>
VBVS05	12	
larger system	max. number IVW2221	
BVS20 + NGV1011	60	

FAQ

error pattern	possible causes	our suggested solution
The video image is black and white.	The color saturation control of the indoor station is set to a minimum.	Adjust the contrast or color saturation control.
	The transmission level of the video BUS is too low.	At many components of the video BUS (e.g. FVY) the transmission level can be adjusted. Please see the product information of the active transmission components.
	The light intensity does not reach the minimum value of 10 lux. Thus, the camera switch over to black and white.	The camera module of the front-door station is very insensitive to light. Please arrange for a sufficient illumination or use external cameras.

<p>The colors of the video image are too bright or the image in general is too bright.</p> 	<p>The color intensity control of the video indoor station is turned on too much</p>	<p>Reduce the color intensity.</p>
	<p>The brightness control is turned on too much.</p>	<p>Reduce the brightness.</p>
	<p>The level of the video signal is too high.</p>	<p>Reduce the level of the video bus (e.g. rotary control on the camera board). This only works, if the bus termination at the video indoor station or at the active extended function is inserted correctly (e.g. FVY).</p>
	<p>The terminating resistor at the end of the strand is not inserted.</p>	<p>Please insert the terminating resistor.</p>
<p>Colors video image are without contrast.</p> 	<p>The level of the video signal is not high enough.</p>	<p>The connection line of a surface-mounted camera was extended impermissible.</p>
		<p>The cable length between two active video components was exceeded impermissible.</p>
		<p>Video level loss can be regulated via the rotary control in active video components (see product information of the components.)</p>
		<p>Please check if the number of allowable video indoor stations per line was not exceeded.</p>
	<p>The terminating resistors are not inserted correctly at the video distributors.</p>	<p>Remove the terminating resistors at the relevant components. Only the last video component in one strand needs a terminating resistor.</p>

<p>In one building block with multiple indoor stations, only one indoor station shows black lines on the video image.</p> 	<p>Image interferences due to transition resistance.</p> <p>Image interferences due to near disturbing sources like external power supplies or other electric appliances, which are not shielded.</p> <p>Distortion due to compensation currents caused by potential differences.</p>	<p>The P-wire is not connected correctly.</p> <p>The connection contacts are not completely fixed.</p> <p>Relocate the video distributor or any other passive assembly package.</p> <p>Please check the line installation and try to install active components on one potential.</p>
<p>Distorted image</p> 	<p>No accurate video signal due to interchanged video wires.</p>	<p>The video BUS is not reverse polarity protected.</p> <p>Please interchange the wires V1 and V2.</p>
<p>The image "rolls".</p> 	<p>The video signal cannot be synchronized.</p>	<p>Please check, if all wires of the video-BUS are connected.</p> <p>If necessary please adjust the video level.</p>
<p>Multiple contours occur.</p> 	<p>Image reflections occur so called "ghost images", due to open lines</p>	<p>The video strand is not connected.</p> <p>Please insert the terminating resistor in the last device of the strand.</p>
<p>Contours of the second image are visible.</p> 	<p>Two video sources interfere.</p>	<p>Please remove the second video source from the line.</p> <p>Connect the second video source, if necessary, via a video switch to the existing TCS:BUS.</p>
<p>No image. Image</p>	<p>No signal present.</p>	<p>Connect the monitor in front of the</p>

switch button does not respond by pressing.		video switch and check whether a signal is available here.
		Measure the voltage between P and b. The voltage usually is about 24 V. If this is not the case; please check the BUS-power supply.
	Not both wires of the video BUS are connected.	Please check the connection of the pluggable terminal.
Video image turns white after a while. Switching the supply power off and on again, the signal will reappear. The video image turns white again after a while.	Thermal defect of the outdoor camera.	A wire of the video BUS short-circuits the P- or the b-wire. This causes an impermissible increased current. Please check the wiring for shorts.
		The camera is defect.

Cleaning



Avoid water from entering the device!
Do not use any abrasive detergents!

Clean the device with a dry or slightly wet cloth.
Remove stronger stains with a mild household cleaner.

Conformity



The declarations of conformity are available under www.tcsag.de, Downloads, trade information.

Information on disposal



The adjoining symbol shows, that the device has to be disposed separately from domestic waste. The materials used are recyclable. Please do help protecting our environment and dispose the device via a collection point for electronic scrap.



Dispose the parts off he packaging in collecting tanks for cardboard and paper resp. platics.

Warranty

We offer a **simplified processing** in case of warranty for electricians.

- Please note our **conditions of sale and delivery**, download from www.tcsag.de, Downloads, trade information and included in our current price list.
- Please contact the **TCS HOTLINE**.

Spare parts

Short text	Article number
Key front-door / indoor station (screw driver, hexagon key AD3 for countersunk screws with Pin, win:clip™ key, release bracket sky)	E32649
IVW2221 mounting plate (adaptor plate, complete and accessory kit installation)	E32650

Service

Please send your questions and inquiries to

hotline@tcsag.de

Hauptsitz

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