Com Solution

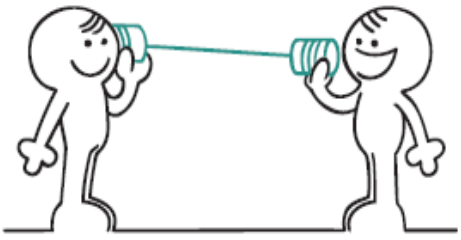
MADE IN GERMANY

USER GUIDE

ComS² the next generation

Model/Types

> Motorola UHF
> Motorola VHF



simply communicate

These are the original English instructions
March 2022 l Version 1.00e

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Note on the user manual

For your own safety, read the operating instructions!
In addition to safety information, you will also find comprehensive information on the functions and correct use of the device!

Symbols

Warning of electrical voltage
This symbol indicates that hazards
to life and health of persons due to electric voltage.

Warning
The signal word indicates a hazard with a medium
medium level of risk which, if not avoided, may result in death
or serious injury.

Caution
The signal word indicates a hazard with a low level of
low degree of risk which, if not avoided, may result in a minor
or moderate injury.

Information
Notes with this symbol help you to perform your
carry out your activities quickly and safely.

Follow instructions
Notes with this symbol indicate that the operating instructions
must be observed.

Security

Read these instructions carefully before commissioning / using the device and always keep the instructions in the immediate vicinity of the installation site or on the device!

Warning
Read all safety notes and instructions.
Failure to observe the safety notes and instructions may result in electric shock, fire and / or serious injury. Keep all safety notices and instructions for future reference. The appliance is not intended for use by children under 16 years of age or by persons with reduced physical, sensory or mental capabilities or lack of experience and / or knowledge are not suitable for use.
Children are not allowed to play with the device.

- Do not operate the device in potentially explosive atmospheres.
- Do not operate the device in an aggressive atmosphere.
- Only use the device in a dry environment.
- Do not operate or handle the device with wet or damp hands.
- Never insert objects or limbs into the device.
- Do not cover the device during operation.
- Do not sit on the device.
- The device is not a toy. Keep children and animals away.
  Only use the device under supervision.
- Before each use, check the device, its accessories and connecting parts for possible damage.
  possible damage. Do not use defective devices or device parts.
- Make sure that all electrical cables outside the device are protected from damage
  (e.g. by animals). Never use the device in the event of damage to electrical cables
  or the mains connection!
- The power connection must comply with the specifications in the technical data appendix.
- Insert the power plug into a properly fused power outlet.
- Select extensions of the mains cable taking into account the technical data.
  Roll out the extension cord completely.
  Avoid electrical overload.
- Before carrying out maintenance, service or repair work on the device, unplug the power cord
  from the mains socket by grasping the mains plug.
- Switch off the device and remove the power cord from the mains socket, when you are
  not using the device.
- Never use the device if you notice damage to the power plug or power cord.
  If the power cord of this device is damaged, it must be replaced by the manufacturer
  or its customer service department or a similarly qualified person in order to avoid hazards.
  Defective power cords pose a serious health hazard!
- Replace the device fuse only with an equivalent type (3.15A/T 250V 5x20mm).
  When replacing the fuse, disconnect the device from the mains!
- Make sure that the air inlet and air outlet are free.
- Danger due to HF radiation. The device generates high power RF energy during transmission.
  Make sure that the antennas are mounted with appropriate safety distances to persons.
  Only use suitable antenna cables. When mounting the antenna outdoors or on roofs,
  observe the necessary lightning protection. If necessary, contact a specialist company.

Caution
Risk of injury due to improper mounting
The device is intended for mounting in a 19" equipment rack. Operation outside of a suitable device rack/enclosure may result in injuries due to the protruding parts of the front panel.

Note
There are no user-serviceable parts inside the unit. Maintenance or service may only be performed by trained personnel.

Intended use

Use the device exclusively as a radio interface in connection with communication systems or audio interfaces in compliance with the technical data.

- Do not set up the device on wet or flooded surfaces.
- Do not place any objects, such as items of clothing, on the device.
- Do not use the device outdoors.
- Unauthorized modifications such as additions or conversions to the device to the device are prohibited.
- Any operation or handling other than that specified in these instructions is inadmissible. Non-compliance will void any liability and warranty claims.

Personnel qualification

Persons using this device must:

- be aware of the hazards that arise when working with electrical equipment environment.
- have read the operating instructions, in particular the chapter on safety and understood them.

Maintenance activities that require the housing to be opened may only be carried out by authorized specialist companies or by CS Com Solution.

Residual risks

Warning of electrical voltage
Work on electrical components may only be carried out by an authorized specialist company!

Warning of electrical voltage
Remove the mains plug from the mains socket before carrying out any work on the unit! Unplug the power cord from the mains socket, by grasping the power plug.

Warning
Dangers may arise from this device if it is used improperly or not as intended by untrained personnel!
Observe the personnel qualifications!

Warning
The device is not a toy and does not belong in children's hands.

Warning
Danger of suffocation!
Do not carelessly leave the packaging material lying around.
It could become a dangerous toy for children.

Behavior in an emergency

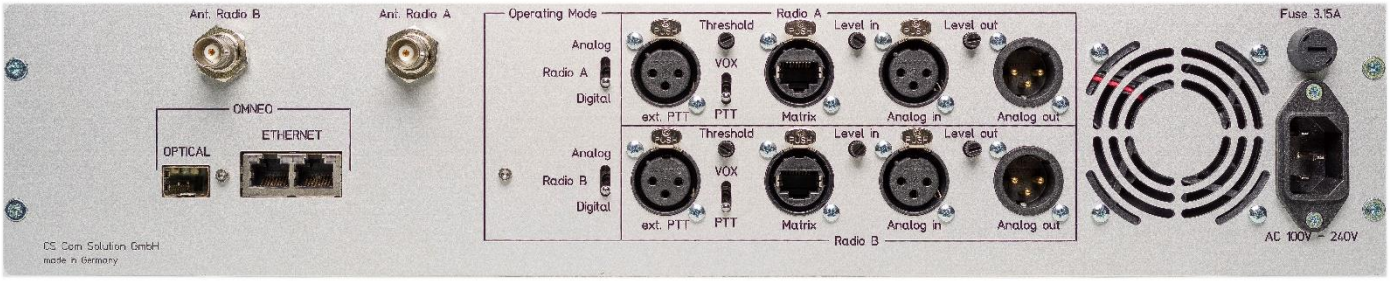
1. Switch off the device.
2. In an emergency, disconnect the device from the mains supply:
   Disconnect the connection cable from the mains socket,
   by grasping the power plug.
3. Do not reconnect a defective device to the power supply.

Information about the device

The ComS² serves as interface for the connection between radio systems and audio / communication systems. You can choose between two operating modes.
In the classic analog variant, the signals are transferred or picked up at the connections in line level.
The keying of the radio base stations can be both via an external PTT switch (not included) and via the integrated VOX - recognition (audio threshold switch).
The sensitivity of the VOX detection can be adjusted via a regulator.
In the digital operating variant, the transfer takes place as a Dante protocol.
When connected to a DANTE audio system, the base stations are also keyed via VOX recognition or external PTT switch.
In addition to the DANTE protocol, the OMNEO protocol from RTS is also supported.
This allows a direct connection to RTS intercom systems (ODIN, ADAM-M). A PTT is programmed directly in the RTS software as a GPO. Thus, only a network connection is necessary. The ComS² is equipped with two base stations that can be operated completely independently of each other. Mixed operation (analog and digital) is also possible.
The following radio modes are possible:

- Simplex — Intercom between base station and radio
- Semi Duplex — The 1st base station is used only for transmitting, the 2nd base station for receiving only.

Device Illustration



Transport and Storage

Note
If you store or transport the device inappropriately, the device may be damaged.
Observe the information on transporting and storage of the device.

Transport
Observe the following notes before each transport:
• Switch off the device.
• Unplug the power cord from the power outlet by grasping the power plug.
• Do not use the power cord as a pull cord.

Storage
Observe the following storage conditions when the device is not in use:
• dry and protected from frost and heat
• in a place protected from dust and direct sunlight
• protected from dust penetration with a cover, if necessary
• do not place any other devices or objects on top of the device, to avoid damage to the device

Assembly and Installation

Assembly instructions
Mount the device in an appropriate device rack/housing.
The device requires 2 height units. Ensure that there is sufficient heat dissipation at the rear of the device.
Use all four screw holes for this. For mobile applications, the use of slide rails in the equipment rack/housing is recommended. If necessary, contact your housing manufacturer for this.

First Steps

Thank you for choosing a device from CS Com Solution GmbH.
In this manual you will find detailed information about the ComS² radio interface and its handling in the different operating modes. The pin assignments of the individual connectors (pin assignment) can be found in the appendix.

This manual is intended exclusively for technicians / engineers and trained personnel.

For the operation and programming of the base stations please use the manufacturer's documentation.

For further information, please contact our service support:

CS Com Solution GmbH
Paradiesstrasse 208a
12526 Berlin
Germany

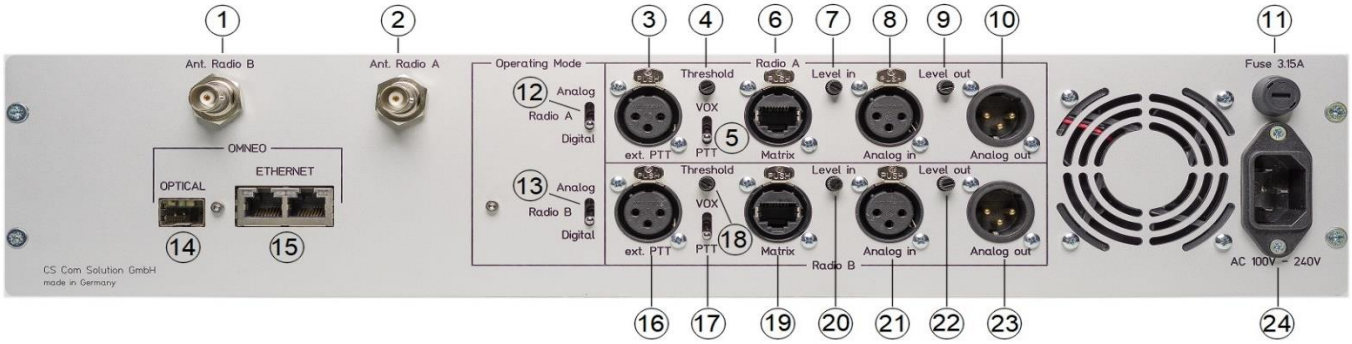
e-mail: info@cs-comsolution.de
phone: +49 30 322 93 16 - 30

Connection overview

Front:

1 → Base station A
2 → Base station B
3 → Power switch

Rear:



1 → RF connection base station A
2 → RF connection base station B
3 → external PTT input radio A
4 → Sensitivity setting Voice recognition (VOX) Radio A
5 → Switch VOX or PTT operation Radio A
6 → Matrix connection for analog intercom connection (RTS ZEUS) Radio A
7 → Setting NF Level Analog in Radio A
8 → NF - Analog in Radio A
9 → Setting NF level Analog out Radio A
10 → NF - Analog out Radio A
11 → Device fuse (3.15A)
12 → Operating mode switch Analog or Digital (OMNEO / DANTE) Radio A
13 → Operating mode switch Analog or Digital (OMNEO / DANTE) Radio B
14 → Optical connector OMNEO / DANTE (GBIC is not included)
15 → Ethernet connection OMNEO / DANTE
16 → external PTT input radio B
17 → Switch VOX or PTT operation Radio B
18 → Sensitivity setting Voice recognition (VOX) Radio B
19 → Matrix connection for analog intercom connection (RTS ZEUS) Radio B
20 → Setting NF Level Analog in Radio B
21 → NF - Analog in Radio B
22 → Setting NF level Analog out Radio B
23 → NF - Analog out Radio B
24 → Power connection (AC 100 – 230V)

Never switch on the device without the corresponding antennas are connected to both RF connectors.

Analog Mode

For operation in analog mode, the two changeover switches (***12*** Radio A and ***13*** Radio B) must be set to Analog. If you want voice-controlled keying of the radio, set the switches ***4*** and ***17*** to VOX. You can adjust the threshold level for the respective radios using switches ***5*** and ***18***. For external keying up, set switches ***4*** and ***17*** to PTT. You can use the PTT sockets (***3*** and ***16***) to key the radios accordingly via an external switch (not included) or an external switching contact.
The pin assignment of the PTT socket can be found in the technical appendix.
The "4-wire" connection is made for radio A via the inputs / outputs (***8*** and ***10***) and for radio B via the inputs / outputs (***21*** and ***23***). The levels were set to +6 dBu, corresponding to 1.55 V (effective). The level can be changed by +/- 6dB via the Level in (***7*** and ***20***) and Level out (***9*** and ***22***) controls. The matrix connectors (***6*** and ***19***) allow an RJ45 connection between the ComS² and an RTS matrix (e.g. ZEUS). The matrix connector contains the 4-wire inputs and outputs as well as the external PTT connector. The pinout can be found in the technical appendix.

The programming of the corresponding frequencies and radio settings is done via the manufacturer software of the radios. This is available as an option and is not included in the scope of delivery. The customer is responsible for compliance with the country-specific requirements of the telecommunications authorities.

Of course, it is possible to operate one radio in analog mode and the other radio in digital mode (OMNEO / DANTE).

Digital Mode (OMNEO / DANTE)

In order to operate the ComS² in digital mode, you must set the two switches (*12* Radio A and *13* Radio B) to digital.

OMNEO:

When using the OMNEO protocol, it is recommended to set switches *4* and *17* to PTT.
This gives you full control via the RTS software and allows you to trigger the keying of the radios via GPO directly from the call station.

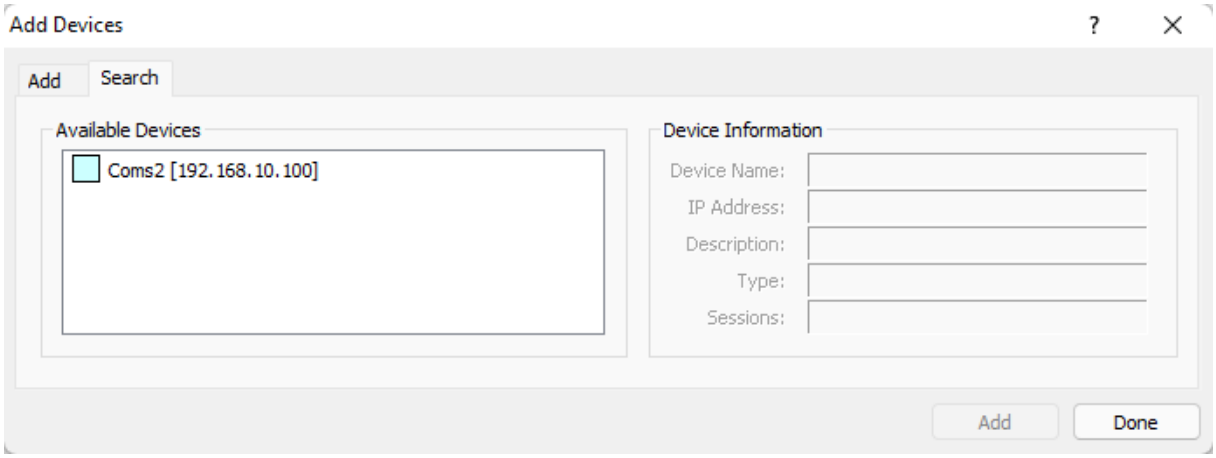
In order to find the ComS² device via OMNEO, the ComS² should be located in the same IP address range as the other devices (RTS ADAM, ODIN...).

The ComS² is delivered with the following IP address:

IP: 192.168.10.100
Subnet: 255.255.255.0

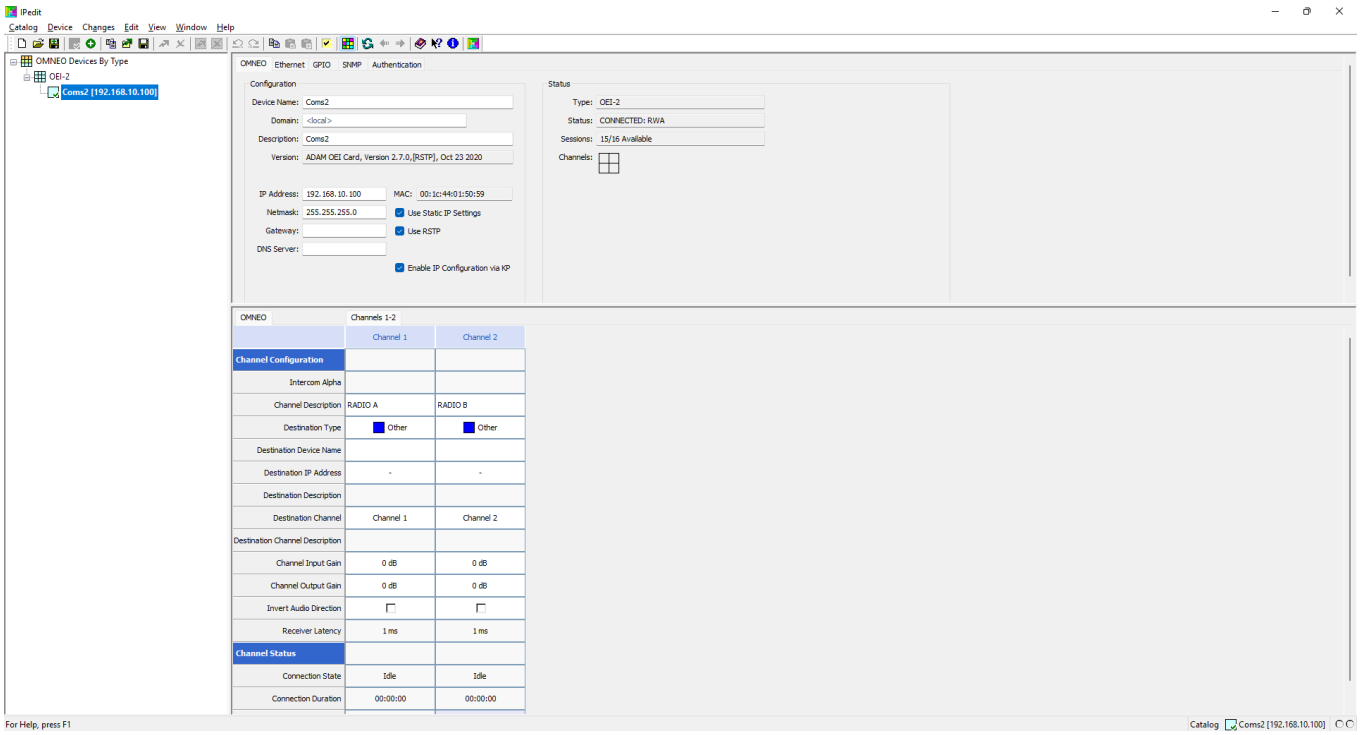
To change the IP address, proceed as follows:

Establish a network connection between your PC and the ComS² (Ethernet port).
On the PC, assign a fixed IP (192.168.10.90).
Now open the RTS software IP-Edit. Via "Device Add" a window opens.
The ComS² should now be displayed under Available Devices.



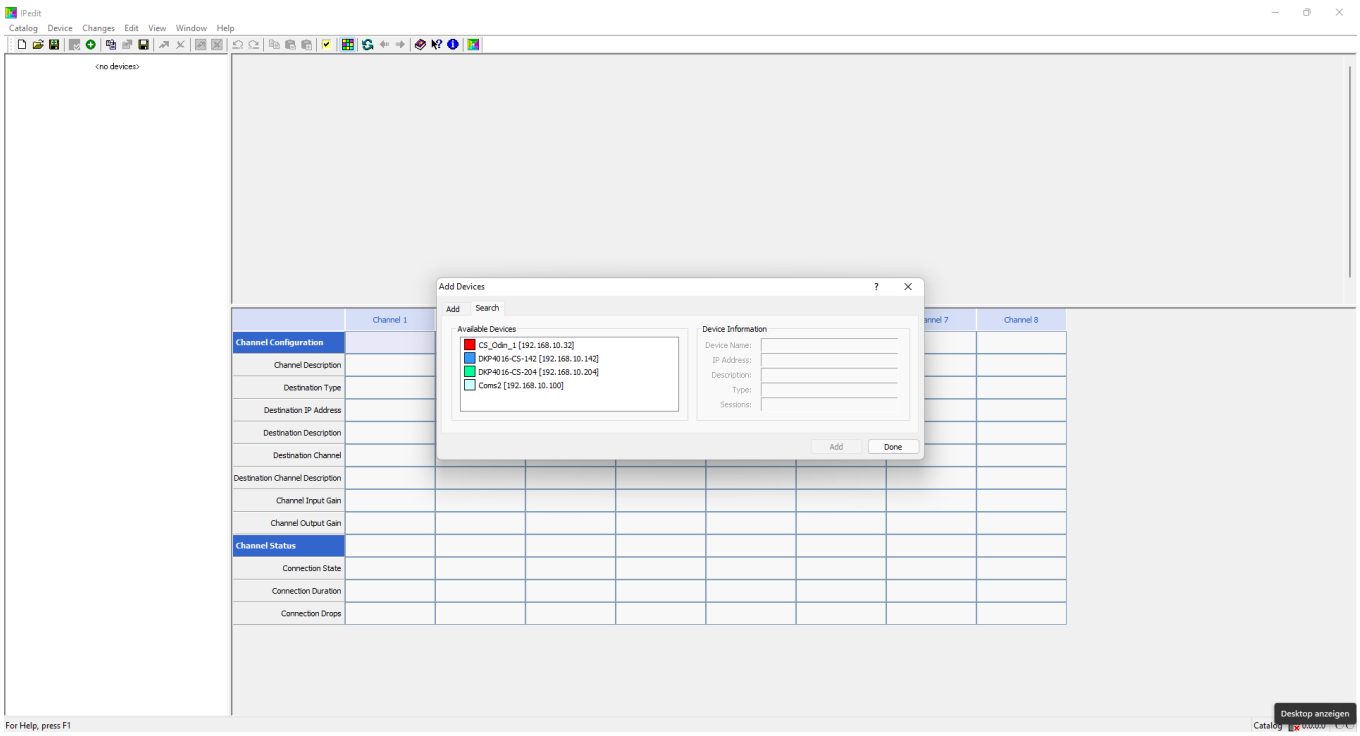
Click the Device and then click Add.

The ComS² is now displayed in the Device Browser as follows. Under the "OMNEO" tab, you can now set the desired IP address.

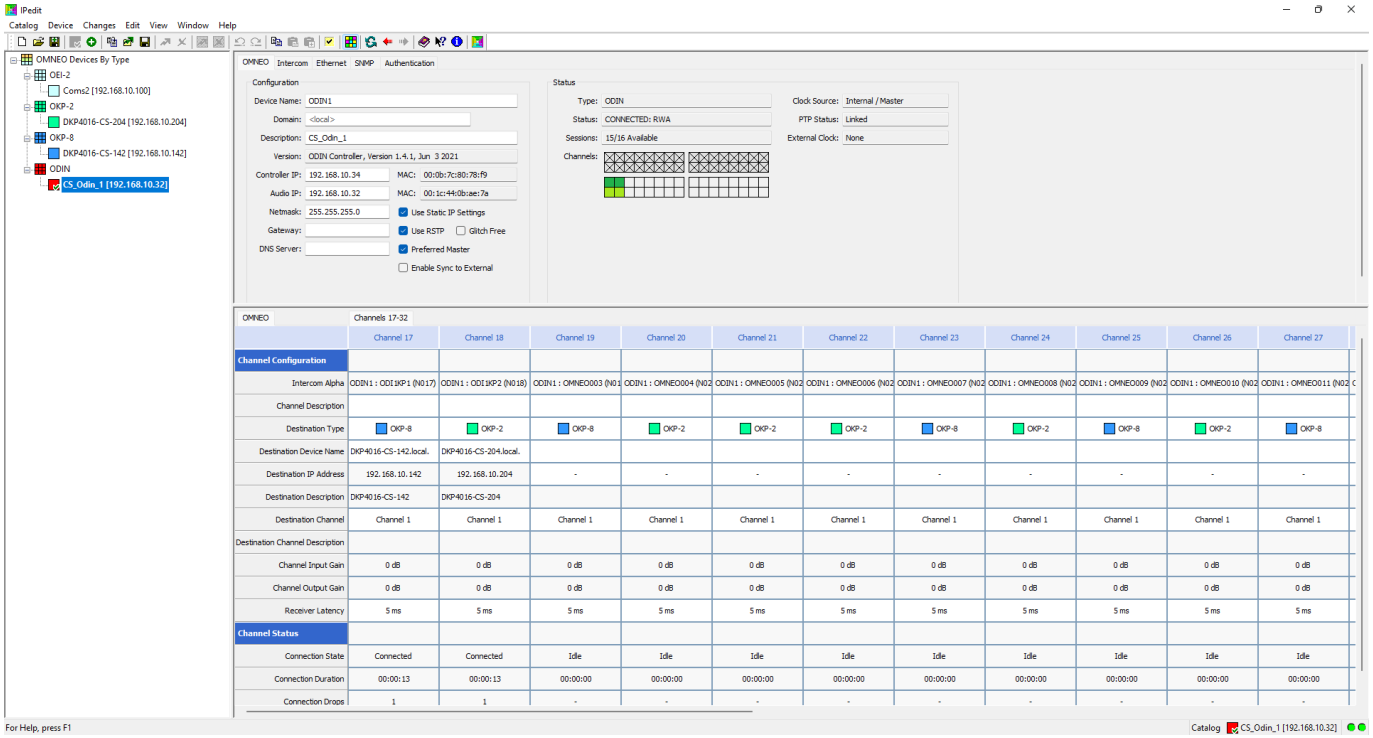


Now that you have changed the IP to your desired range, close IP-Edit and put the PC back in range as well and start IP-Edit again.

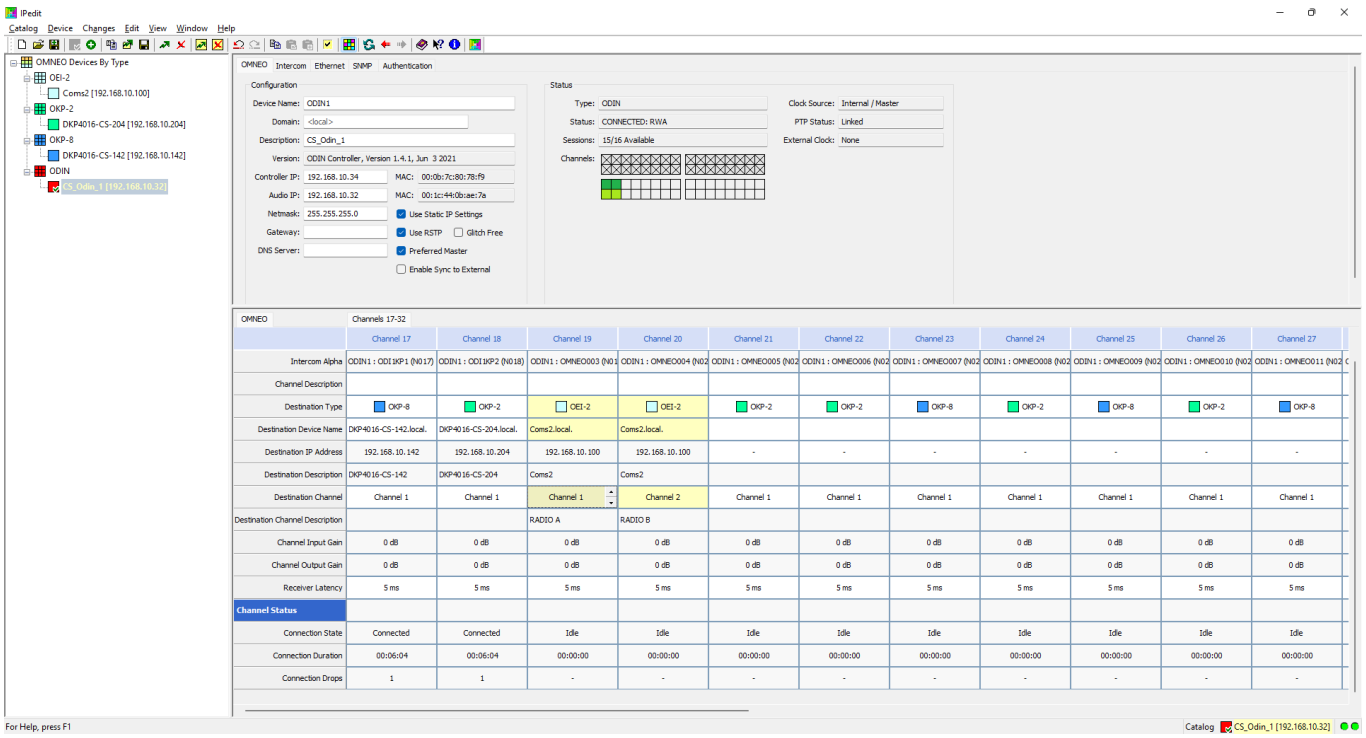
Via Device Add you should now see all OMNEO Devices that are in your network. In this example an ODIN is used as matrix with two intercom stations (DKP4016) and one ComS².



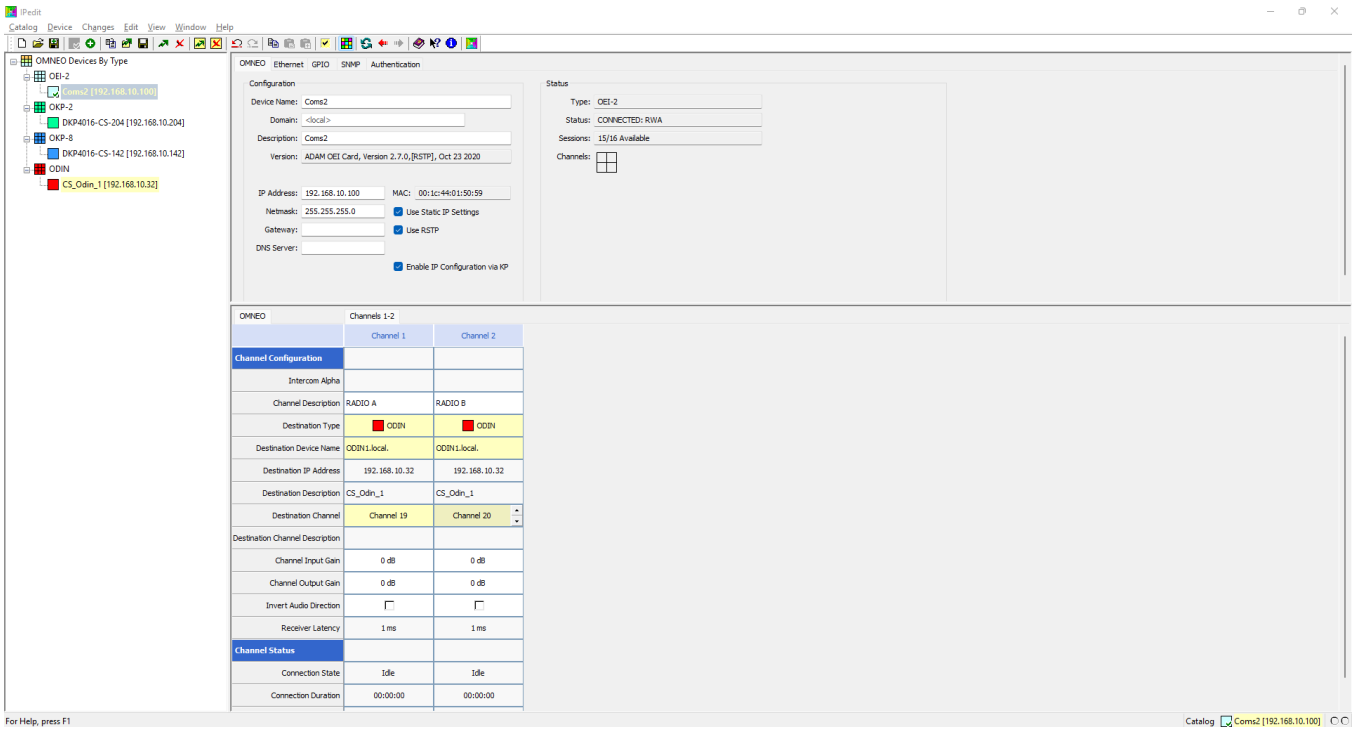
Now add all desired devices via the Add function and connect the Intercom stations to the desired ports on the matrix.



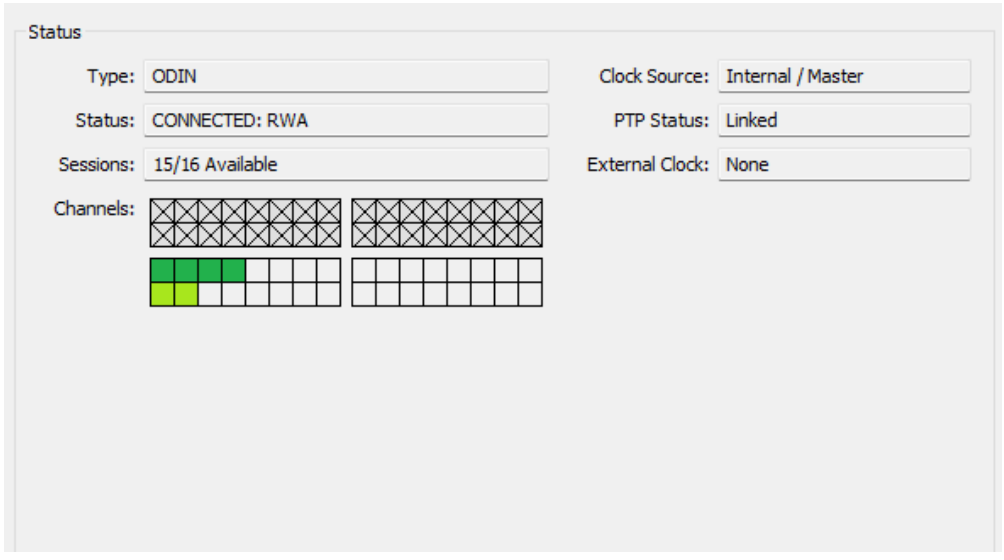
Then connect the ComS² to the desired ports of your matrix for Radio A and Radio B respectively.



Also, in ComS² create the two ports of the Odin



In the overview all connections should now be established (channel green)



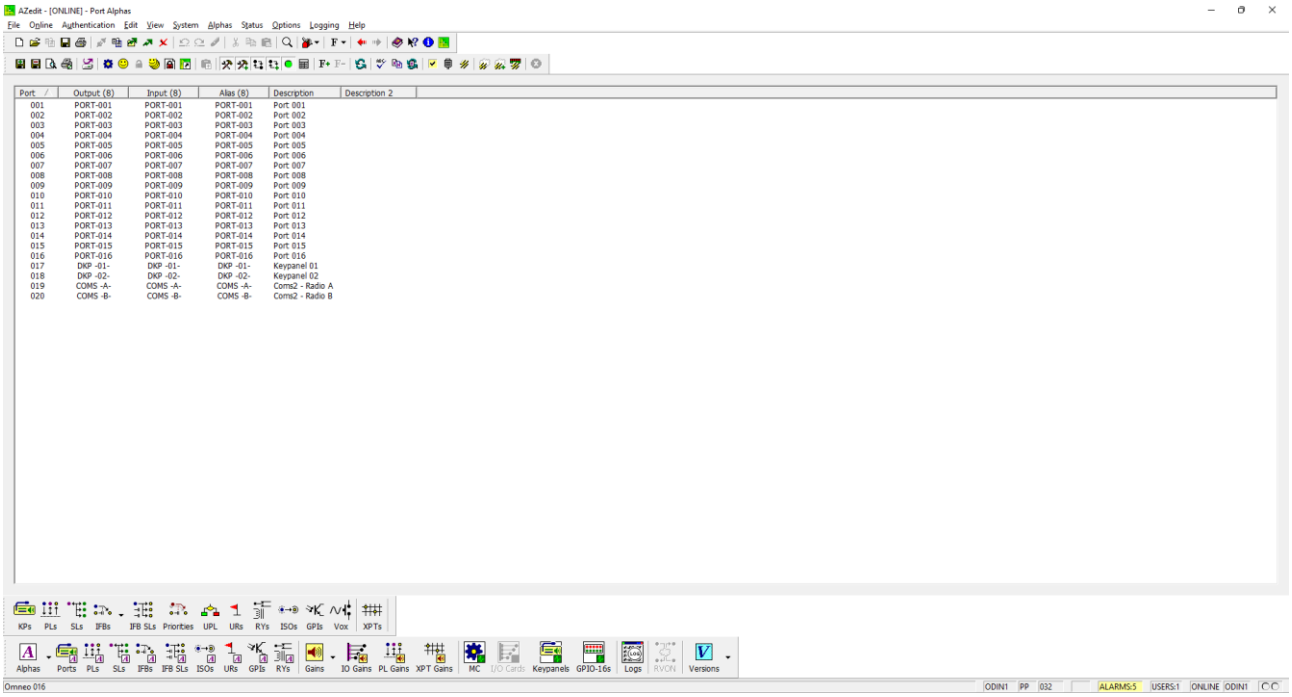
Now you can configure the intercom units according to your requirements.

To do this, switch to the AZ-Edit software.

In the following example, one button each for radio A and radio B is programmed on each intercom unit.

1. under Alphas, name the routed ports as follows:

   Intercom station 1: DKP -1-
   Intercom station 2: DKP -2-
   ComS² Radio A: COMS -A-
   ComS² Radio B: COMS -B-



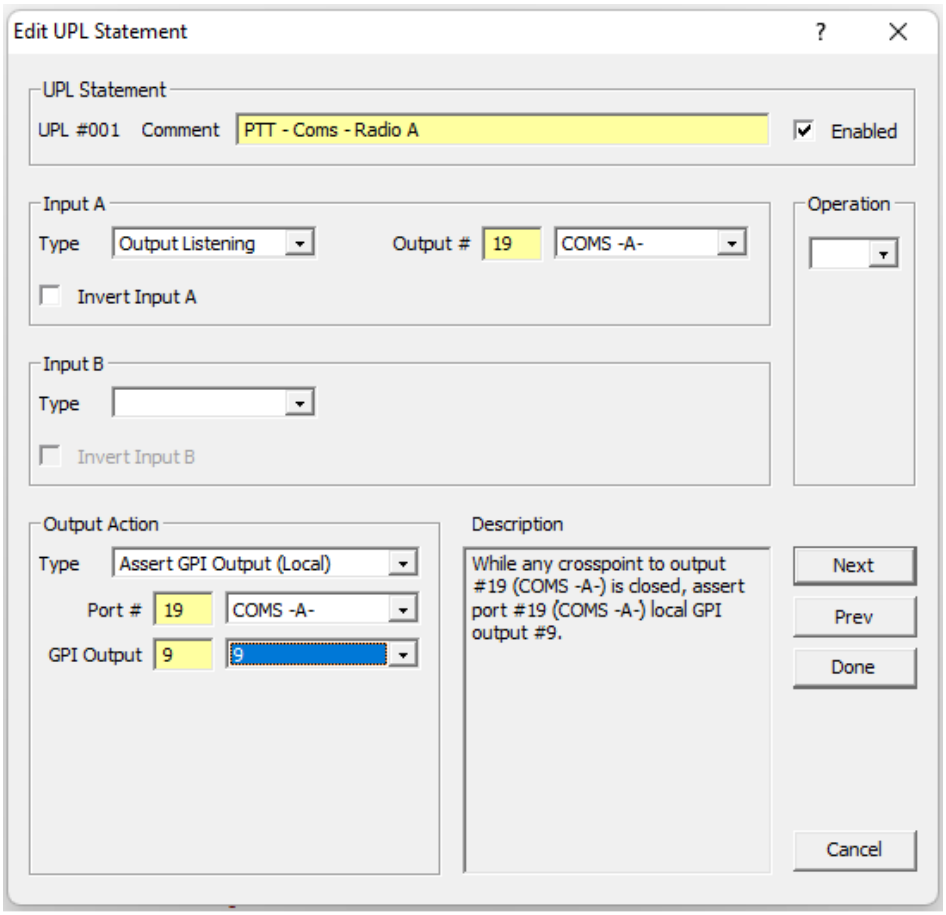
2. PTT keying via matrix

   Open the UPL tab and click on the next free logic.
   In the window, now enter a user-defined name for the Radio A keying.

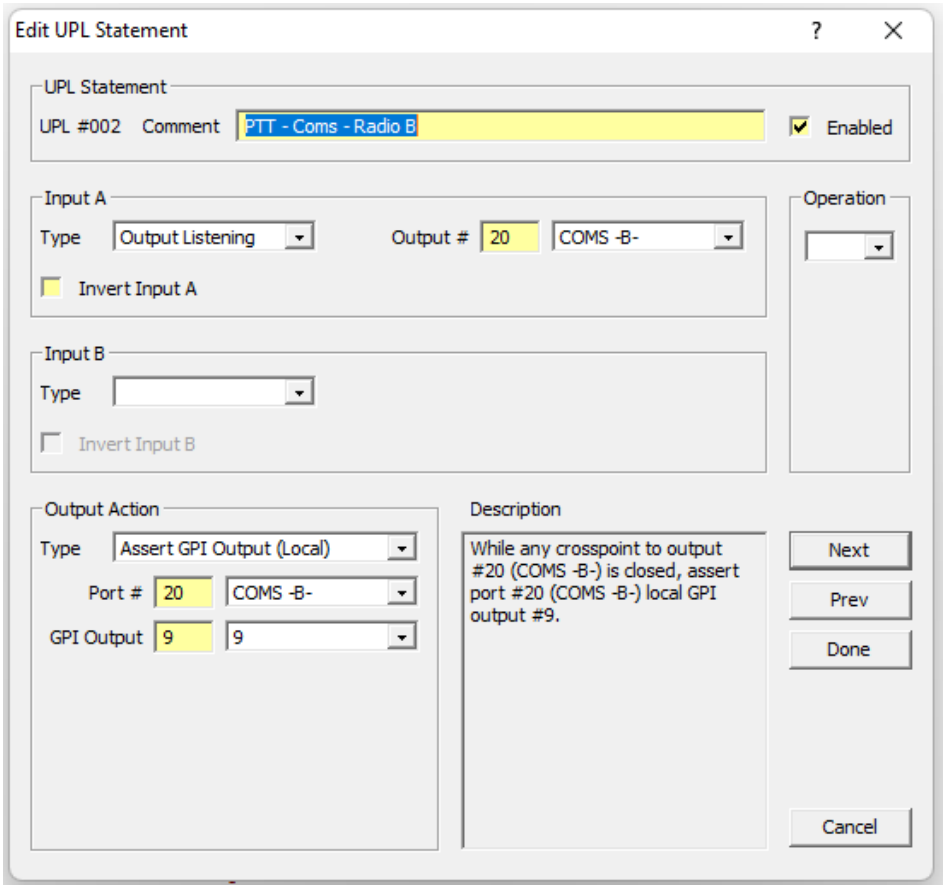
   e.g.: PTT -COMS- RADIO A

   For Input A select the type "Output Listening" and port "COMS -A-".
   For Output Action, select type "Assert GPI Output (Local)" and port "COMS -A-".

   IMPORTANT: the GPI Output must be set to "9"!



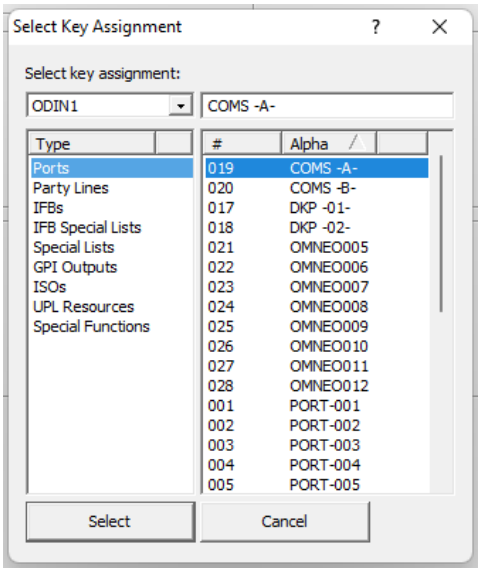
Now repeat the steps for radio B



3. Now select the first intercom station under the "KP" tab

   ➔ DKP -01-

   Right-click on a free button and select "Change Assignment".
   In the window select "COM -A-" for the ports.



   In the Listen Level of the key the function AT (Auto Follow) should be programmed and to enable keying in "latch disable" should be deactivated.

   For radio B repeat the steps on the next free key with port "COM -B-".

4. For the second intercom station, proceed in the same way as described under point 3.

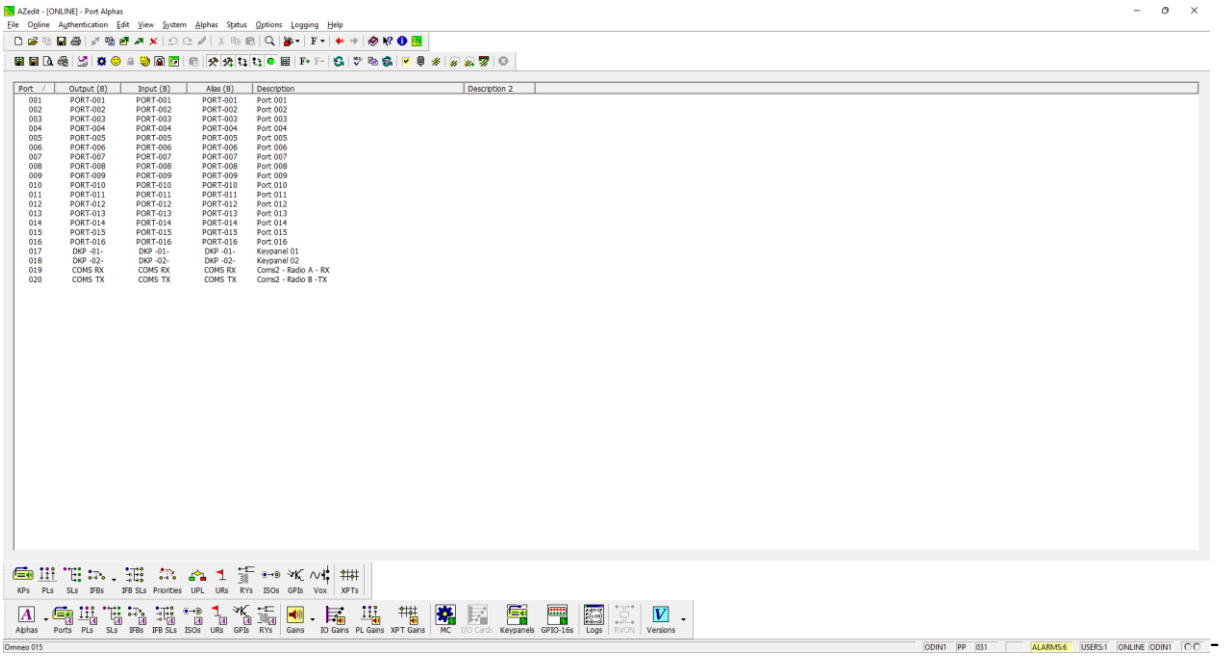
   After "activating" the changes, you can now communicate via the Intercom stations with the respective radio separately in simplex mode.

Semi-Duplex operation

If you want to use the ComS² in semi-duplex mode, the following additional settings must be made:

- The settings in the IP edit area remain the same.
- Radio A is operated in RX mode and Radio B in TX mode
- Under Alphas, name the routed ports as follows:

  Intercom station 1: DKP -1-
  Intercom station 2: DKP -2-
  ComS² Radio A: COMS RX
  ComS² Radio B: COMS TX



- Audio Routing RX to TX
  For Semi-Duplex the audio routing must be changed so that the handheld radios can hear each other.

  Open the UPL tab and click on the next free logic.
  (Delete logic of simplex programming)

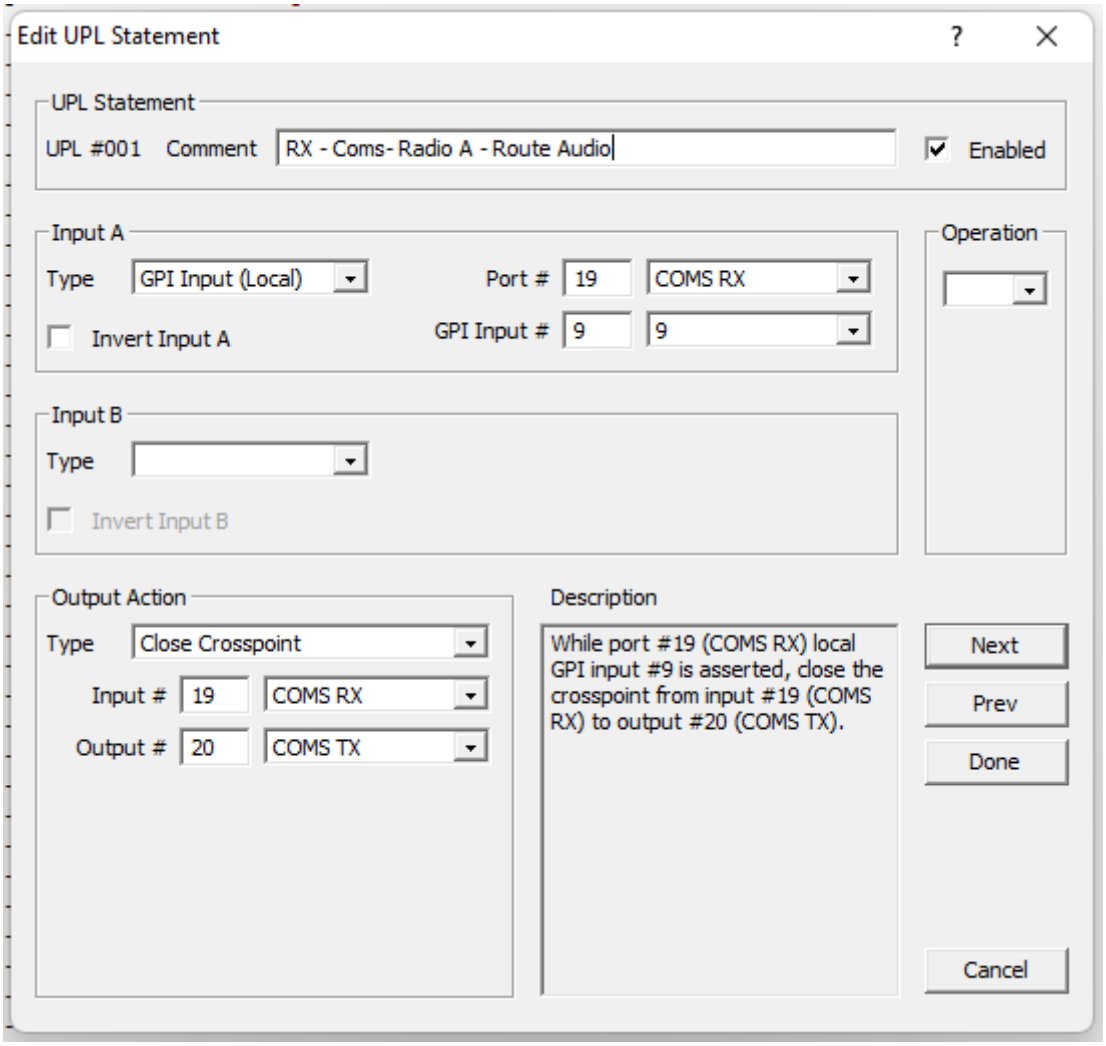
  Now enter a user defined name for the audio routing in the window.

  E.g.: RX - Coms - Radio A - Route Audio

  Select for Input A the type "GPI Input (Local)" and port "COMS RX".

  IMPORTANT: the GPI Input must be set to "9"!

  Under Output Action select type "Close Crosspoint" and ports
  Input: „COMS RX"
  Output: „COMS TX"



- PTT Keying via Matrix

  Open the UPL tab and click on the next free logic.

  In the window you now enter a user-defined designation for the Radio B keying.

  e.g.: PTT - Coms - Radio B – TX

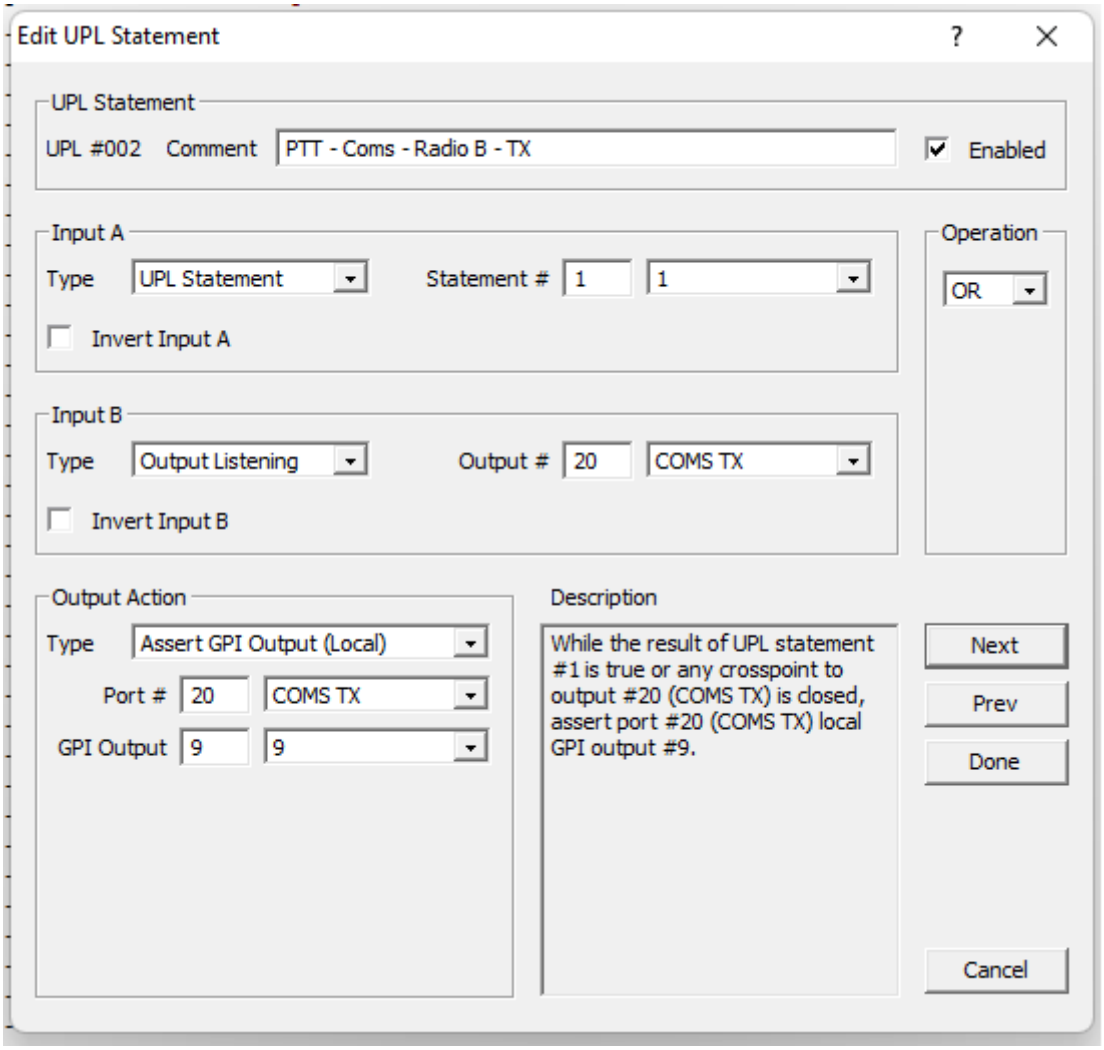
  Select the type "UPL Statement" for Input A
  and statement "**1**" → **number of the route audio logic**

  Operation must be set to "OR"

  Select the type "Output Listening" for Input B
  and Output "Coms TX“

  Under Output Action select the type "Assert GPI Output (Local)" and the port "COMS TX".

  IMPORTANT: the GPI Output must be set to "9"!



- Now select the first intercom station under the "KP" tab.

  ➔ DKP -01-

  Right-click on a free button and select "Change Assignment".
  In the window select "Coms TX" for the ports.

- In the Listen Level of the key the port must be programmed to "Coms RX" and to enable keying in "latch disable" should be disabled.

- Alternatively, the key can also be renamed by a key label

DANTE:

When using the DANTE protocol, it is recommended to set the switches ***4*** and ***17*** to VOX, because GPIO control is not possible via DANTE. Alternatively, an external PTT can be connected. For an external PTT set switches ***4*** and ***17*** to PTT. Using the PTT sockets (***3*** and ***16***) you can key the radios accordingly via an external switch (not included) or an external switch contact.
The pin assignment of the PTT socket can be found in the technical appendix.

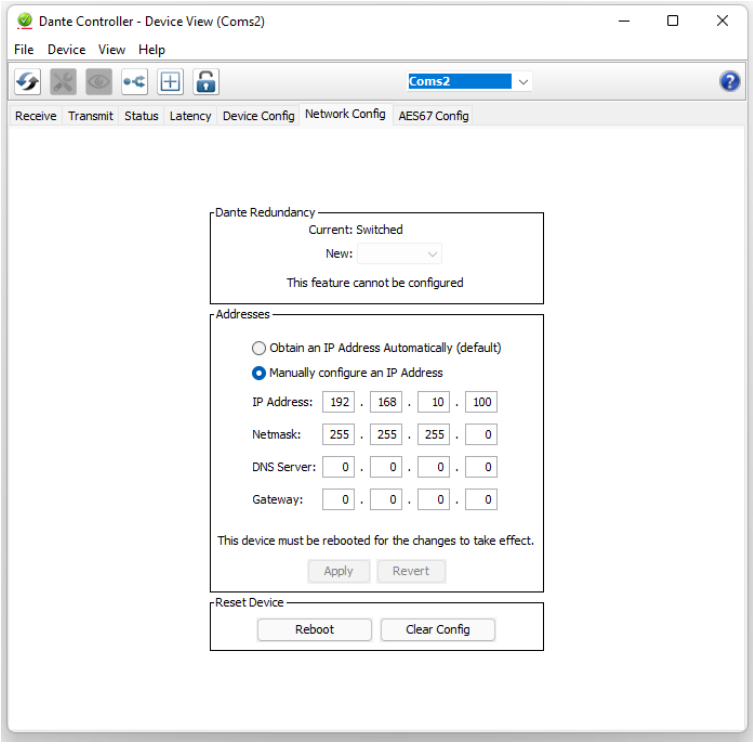
To find the ComS² device via DANTE, the ComS² should be located in the same IP address range as the other DANTE devices.

The ComS² is delivered with the following IP address:

IP: 192.168.10.100
Subnet: 255.255.255.0

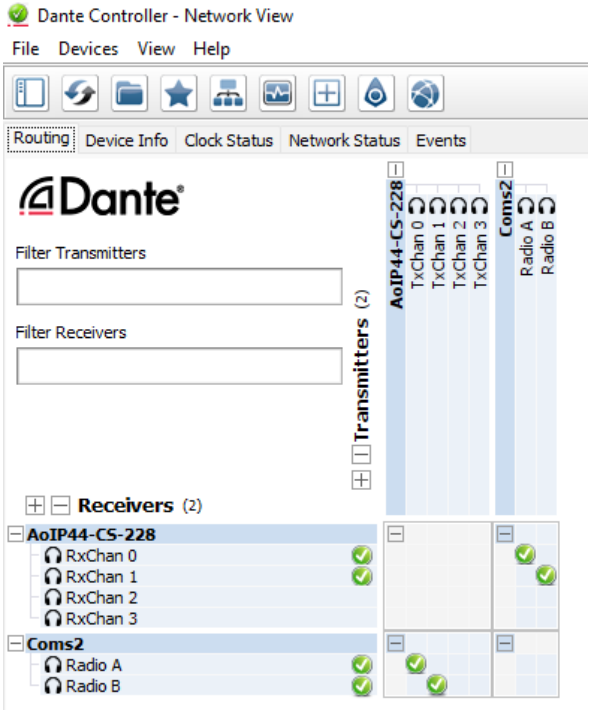
To change the IP address, proceed as follows:

Establish a network connection between your PC and the ComS² (Ethernet port).
On the PC, assign a fixed IP (192.168.10.90).
Now open the Audinate software Dante Controller.
Double click on ComS² and select the "Network Config" tab in the window.



Now that you have changed the IP to your desired range, close the software and also put the PC back in range and restart Dante Controller.

You should now see all the DANTE Devices that are on your network. In this example a Glensound AoIP44 is used as audio interface and a ComS².



Here you can now freely route the DANTE channels.

Setting up the base stations

The programming of the corresponding frequencies and radio settings in the base stations is done via the manufacturer software of the radios. This is available as an option and is not included in the scope of delivery.

The customer is responsible for compliance with the country-specific requirements of the telecommunications authorities.

The ComS² is designed for continuous operation with 5 watts transmitting power
of the base station each.
In case of higher transmitting power, it must be ensured that sufficient ventilation / air conditioning is provided.

The base stations can be operated in analog mode as well as in DMR mode.

For further information, please contact the manufacturer.

Errors and Malfunctions

- ComS² is not recognized in IP-Edit
  IP in wrong range

- ComS² keying via OMNEO does not work
  Switch 5 / 17 are set to VOX or GPI output is not set to 9

- ComS² no audio paths via OMNEO / DANTE
  Switches 12 / 13 are set to Analog

Technical Appendix

Pin assignment rear panel:

PTT (*3* / *16)*

XLR - Female

Pin 1	NC
Pin 2	PTT +
Pin 3	PTT -

Analog in (*8* / *21)*

XLR - Female

Pin 1	NC
Pin 2	Audio +
Pin 3	Audio -

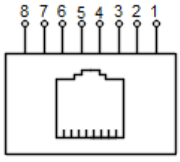
Analog out (*10* / *23)*

XLR - Male

Pin 1	NC
Pin 2	Audio +
Pin 3	Audio -

Matrix (*6* / *19)*

RJ45



Pin 1	GPI -
Pin 2	GPI +
Pin 3	Audio from Matrix +
Pin 4	Audio to Matrix +
Pin 5	Audio to Matrix -
Pin 6	Audio from Matrix -
Pin 7	PTT +
Pin 8	PTT -

Technical data:

Voltage range	100 – 240V VAC	
Frequency range	50 – 60 Hz	
Power consumption	max 200W (Radio TX power 25W)	
Ambient temperature	Normal operation	0°C – 50°C
	Continuous operation	0°C – 35°C
Dimensions	Height	2 HE (88 mm)
	Wide	19 zoll (448 mm)
	Deep	385 mm
	Weight	8 kg

Service:

Our service is at your disposal at the following addresses and numbers.

Com Solution

CS Com Solution GmbH
Paradiesstrasse 208a
12526 Berlin
Germany

e-mail: info@cs-comsolution.de
phone: +49 30 322 93 16 – 30