Content

1 Glossary

CH	Audio channel (PCM bus audio frequency channel)
AF	Audio frequency (AF)
PA	Public address (PA)
LL	Loudspeaker line (LL)
IC	Intercom (IC)
All call	Announcement to a group of intercom stations (members respond via intercom)
IC Group	Everybody listens to everyone (conference). Switchover to selective call mode is configurable.
Devices	All technical equipment for recording or displaying of voice or controlling information is called device. External devices are for example call stations, loudspeakers, signal lamps or acoustic enclosures of thirdparty suppliers. Internal devices are functional units on modules or the CPU itself. This includes voice storage, tone generators and relays.
Source	The source is the device which initializes a voice connection or a controlling function.
Destination	The destination is the device which is the target of a voice connection or a controlling function.
Module	Modules are printed circuit boards. The modules are inserted into the system rack
Port	A single interface of a module is called a Port. Modules normally have 1 or 4 interfaces (ports)
Line	This term originates from intercom technique and describes a well-defined interconnection of two members. Derived from this, all the well-defined control information that an exchange can send or receive is called "lines". A *Line* has either status 0 or 1. Per *Port*, 120 omnidirectional lines are supported. Lines can be realised either as a switching voltage (analog technique) or as a data signal (digital technique), depending on the module type. That is, a *Line* describes the exchange of information with external components.
Addressing	Voice connections and controlling functions are programmed by using the addresses of the involved devices (source and drain). The address of the device is identical with the address of the interface (Port) of the module at which it is connected or it is internal assigned. The intrasystem addressing follows the scheme: M.P.L (Module.Port.Line)
Special line	Special lines are specific lines using specific controlling telegrams. Basically they are transmitted as a single line. They are supported only by a few programs to extend the transmission of controlling information on the own long distance lines.
Flag	A *Flag* is the internal counterpart of a *Line* and provides an internal memory cell for the exchange of information between programs. A *Flag* has either status 0 or 1. 254 *Flags* are available per System. Moreover, there is more information stored internally like audio channels, program identifiers and internal communication information. *Flags* are comparable to markers in process control technology. The following rules apply to every program: *Flag OR* activates the program *Flag NAND* suppresses the execution *Flag (OUT)* is activated if the program is activ

2 Program environment

The main window of the program consists of the following three areas (Online Functions, System Configuration and Description module). The module's Online Functions (left) and Description (right) can, depending on space requirements, be overlaid or hidden to one side.
The System Configuration consists of the following components: *System data, Call stations, Module rack* and *Programs*. These are each displayed as a sub-window in the open area of the main window.

All sub-programs used for configuration of the system are laid out as modal windows (inhibiting).

2.1 User rights and application instances

For **Installation** the Setup requires **Admin rights**. The program itself can be run on user accounts. The Setup sets the required structures to "Authorized User".

It is NOT possible to start multiple instances of an installation. It is possible to work with two programs by using a second installation in another directory. The last installation is the main installation. The links in the start menu, on the desktop and the shortcut list, as well as the .ICS file type are linked to this installation.

Note! Duplication by simply copying an installation is also possible. However, admin rights are required to ensure the smooth running of multiple installations. An installation by the Setup is always required in the case of user accounts!

2.2 Registered file types

Typ	**Icon**	
.ics		System file, binary file containing system configuration
.icsm		Monitor file, text file containing logged telegrams

2.3 Menus

Many menu items can be found on the toolbar.

Menu *File*

New system	Create a new system file.
Edit	Open and edit a system file.
Edit again	Open and edit a system file. Selection from list of recently opened files.
Read system data	Switch to the *Data transfer* dialog to read the configuration of a system.
Close configuration	Close the opened system file.
Save	Save the current configuration.
Save as	Save the current configuration in a new system file.
Export - Description tables	Export description lists for lines, flags and modules. (CSV format) The files are saved in the subdirectory \export\. The program creates 3 files.
Import	Import description lists for lines, flags and modules. (CSV format)
Quit	Closes the program.

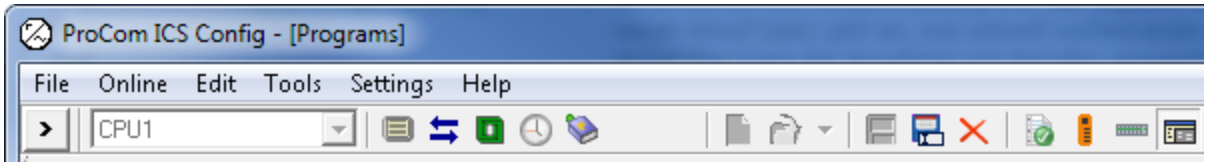
Menu *Online*	see Online functions
Monitor	Recording message traffic.
Data transfer	Transfer and activate the configuration files.
DVS Update	Update the CPU-Firmware.
Time	Transfer local PC time to the CPU.
Simulation	By simulating, messages can be sent to modules, telegrams from modules can be emulated, and flags can be switched.
Menu *Edit*	see System Configuration
System data	General data and preferences of the system.
Call stations	Manages the call stations of the system.
Module rack	Manages the hardware equipment of the system.
Programs	Manages the programming of the system.
Menu *Tools*	see Tools
Database editor	Direct access to the datasets (special skills required)
Offline monitor	external program for evaluation of recordings of telegrams.
Compare files	Byte by byte comparison of two program files
WAV Player	Playback of a *WAV File* from the /wav/ directory
Tone generator	external program for the generation of test tones.
Speech storage	Configuration dialog for testing and recording the *DSS1* (*Speech storage*)module.
Documentation	Creates an overview of the entire programming of a system. Print out of a labeling sheet at plug-in carrier width.
Plausibility	Inspection of the configuration for logical correctness. Inspection takes place only in the case of classic intercom connections and AllCall (group) calls within a local system!
Dependencies	Dependencies and version numbers of programs.
Menu *Settings*	see Settings
Preferences	Change the language and preferences of the program.
RS232 Settings	Settings of the serial interface.
Menu *Help*	
Help	This document...
Wiring	Pin assignment of the modules. (Displayed with the default image viewer)
Examples	Programming examples for typical use.
Info	Version and release information of the program.

2.4 Toolbar

Left side of the toolbar: see Online functions

	Show and hide the window area. (Online functions)
Monitor	Recording the message traffic.
Data transfer	Transfer and activate the configuration files
DVS Update	Update the CPU-Firmware.
Time	Transfer local PC time to the CPU.
Simulation	By simulating, messages can be sent to modules, telegrams from modules can be emulated, and flags can be switched.

Right side of the toolbar: see System configuration



New system	Create a new system file.
Edit	Open and edit a system file.
Save	Save the current configuration.
Save as	Save the current configuration in a new system file.
Close configuration	Close the opened system file.
System data	General data and preferences of the system.
Call stations	Manages the call stations of the system.
Module rack	Manages the hardware equipment of the system.
Programs	Manages the programming of the system.

3 Settings

The *Settings* menu provides dialogs for settings within the program and to determine standard values as initial values for system configuration.

3.1 ICS Settings

Sprache/Language

To set the desired language for the program environment. The dialog offers only those languages that are available in the database. German is the default language. Should a Help file not be available for the selected language, Help is opened in English.

Default

Customer	In the case of new systems, this is entered in the *Customer* field
Represent.	In the case of new systems, this is entered in the *Represent.* field
Originator	In the case of new systems, this is entered in the *Originator* field
automatic switch over to West European summertime	In the case of new systems, the Summer time changeover is set accordingly.
Adopt name of call station as address description	Station designations are added automatically to the *Address description* list
V100 Loudness	Initial values for the newly-created amplifier
Monitor Live	The display is cleared once the number of entries has been reached
Monitor Redirect file	In the case of long-term recording, a new file is created when the number is reached. The files are provided with timestamps.

Color

For better legibility of the list display elements in the *Monitor, Call stations* and *Programs* modules, the lines can be displayed in alternating colors. The desired color is set here.

Templates

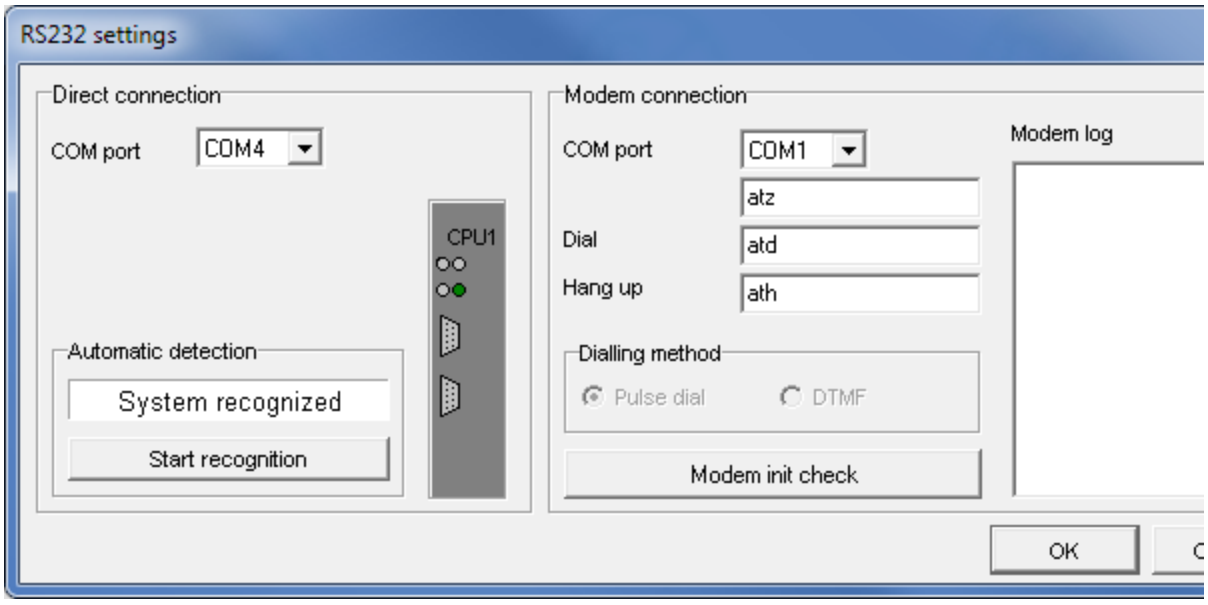
Templates are predefined groups of programs or information, which can be added to a configuration. When one or more *Templates* are activated, the *Tools* menu has the *Templates* sub-menu superimposed. When the selection is made, the *Templates* are added to the open system configuration in the manner in which they have been preset here.

At present, two *Templates* are available:

Template Night operation	The *Flag timing* program is created and pre-configured; the *Flag Night operation* is entered in the *Flag Description*. If *Menu visible* is selected, the *Flag Night operation* is already entered when an amplifier is created!
Template Fault indication	The specified *Flag* is entered as *Fault report flag* and in the *Flag Description*.

3.2 RS232 settings

The serial interface, which is to be used to communicate with the system, can be searched for or set by means of this dialog.



The COM-Port field offers the option of manually selecting the COM port of the PC/Notebook that is to be used.
A search can be made for a connected system by means of the Start recognition button.

For remote configuration by means of a modem, the COM port of the connected modem can be set in the Modem Connection Group, and the AT parameters of the modem in use can also be corrected manually. Initialization and selection can be tested by means of the *Modem init check* button.

4 Online functions

All functions that can communicate with a system via the serial interface are available here.

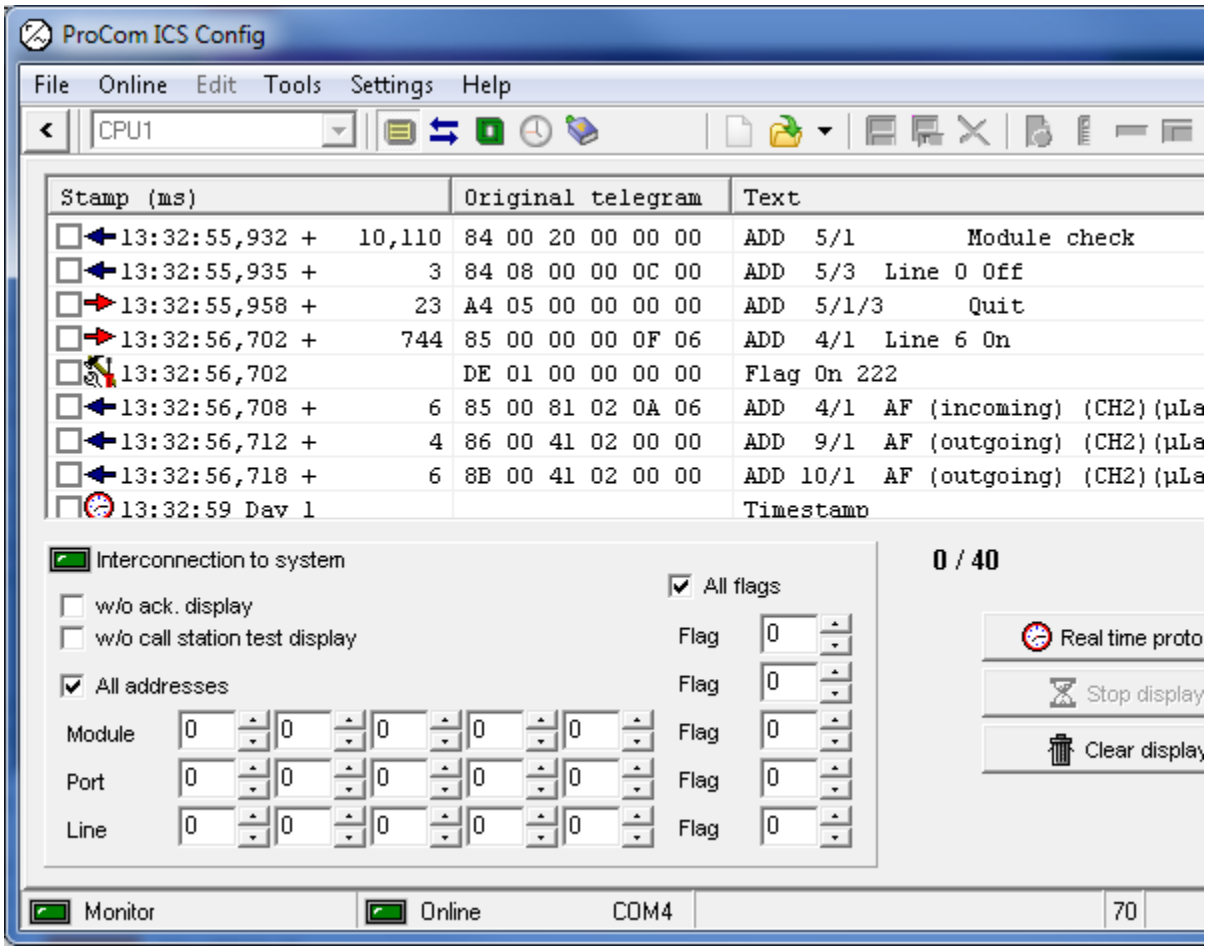
Important! The port of the interface must be set under *Settings - RS232-Settings*!

When connected to a system the selected online-module activates itself automatically. The state of the connection is displayed by LED elements in the modules.

It must be taken into consideration that when switching between the modules results in logon and log-off processes at the CPU of the system. Under certain circumstances these can result in delays, as the CPU must first activate the respective mode.

4.1 Monitor

The *Monitor* is an optimal aid for checking the system functions and logical program sequences. All telegram traffic between CPU1, the modules and the peripherals is displayed here. The telegram traffic can be stored.



Real time protocol activates / deactivates telegram recording.

Stop display stops the updating of the display position

Clear display clears the content of the display

Marking off resets all marking of entries that have been marked by selecting this checkbox in the left-hand column.
(In the case of the checkbox being selected, the lines are displayed in color.)

Save display stores the display in a file.

Redirect file For recording over an extended period of time. Data are written directly to a file.

Note! The number of entries in the list and per file can be specified under *ICS Settings* For performance reasons, an excessively high value should not be selected for the list! The data of a recording are additionally stored in a temporary file (ICS\temp\montemp.icsm).

Filter function

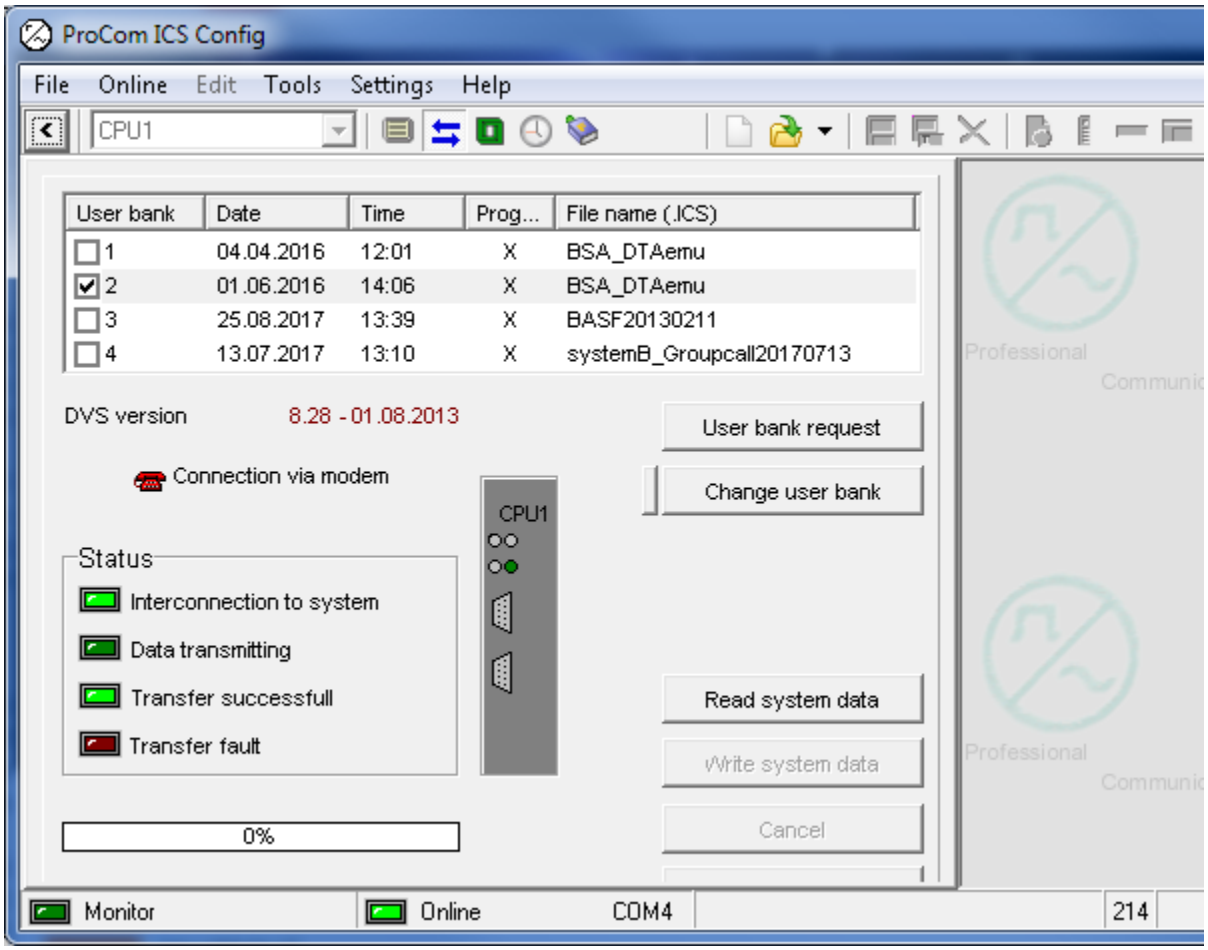
The telegrams issued can be limited via the filter function to a specific *Address, Line* or *Flag*.

By using the *Hide acknowledgments* and *w/o call station test display* selection fields, no acknowledgment to a telegram regarding module testing or intercom testing is transmitted.

The filter setting is transferred to the CPU and is evaluated actively by it!

4.2 Data transfer

This module is used to read and write a system program.



Userbank List

Each CPU can store 4 different programs. An icon of this program is displayed in the list. The timestamp is set at the time of the storage event, based on the system time of the system. The **Tick** in the checkbox marks the **active program**, which the system is running. This is not to be confused with the **Marking of a line** for a desired **Action**. Reading and writing is possible at any time without any adverse effect on the running system.

The display of the DVS version shows the firmware version of the system for information purposes.

User bank request	Updates the status list of the 4 user banks by a fresh reading of the status list
Change user bank	To activate another program, the desired line in the list must be marked. The *Change user bank* switch executes the command. The system reboots automatically and now runs the new program. A *Change user bank* to the active bank initiates a restart.
Read system data	Loads the program from the user bank of which the line is marked. This can also involve the active program. The read out depends on whether a program has already been opened for configuration in the *System data* component. If no program is open, then on completion of transfer, the program that has been read is transferred to the *System data* component automatically. Otherwise, the read program is parked. It can be saved immediately by means of the *Save as* button.
Write system data	opens the file selection dialog and transfers the selected program file to the user bank, which has its line marked. This cannot involve the active program. Writing takes place irrespective of whether a program is open for configuration in the *System data* component. **Important!** It is not possible to transfer the configuration opened for editing directly to the system. A path via a stored file is always required.
Save as	Stores a read and parked program in a file.
Edit	Opens a read and parked program for configuration in the *System data* component.

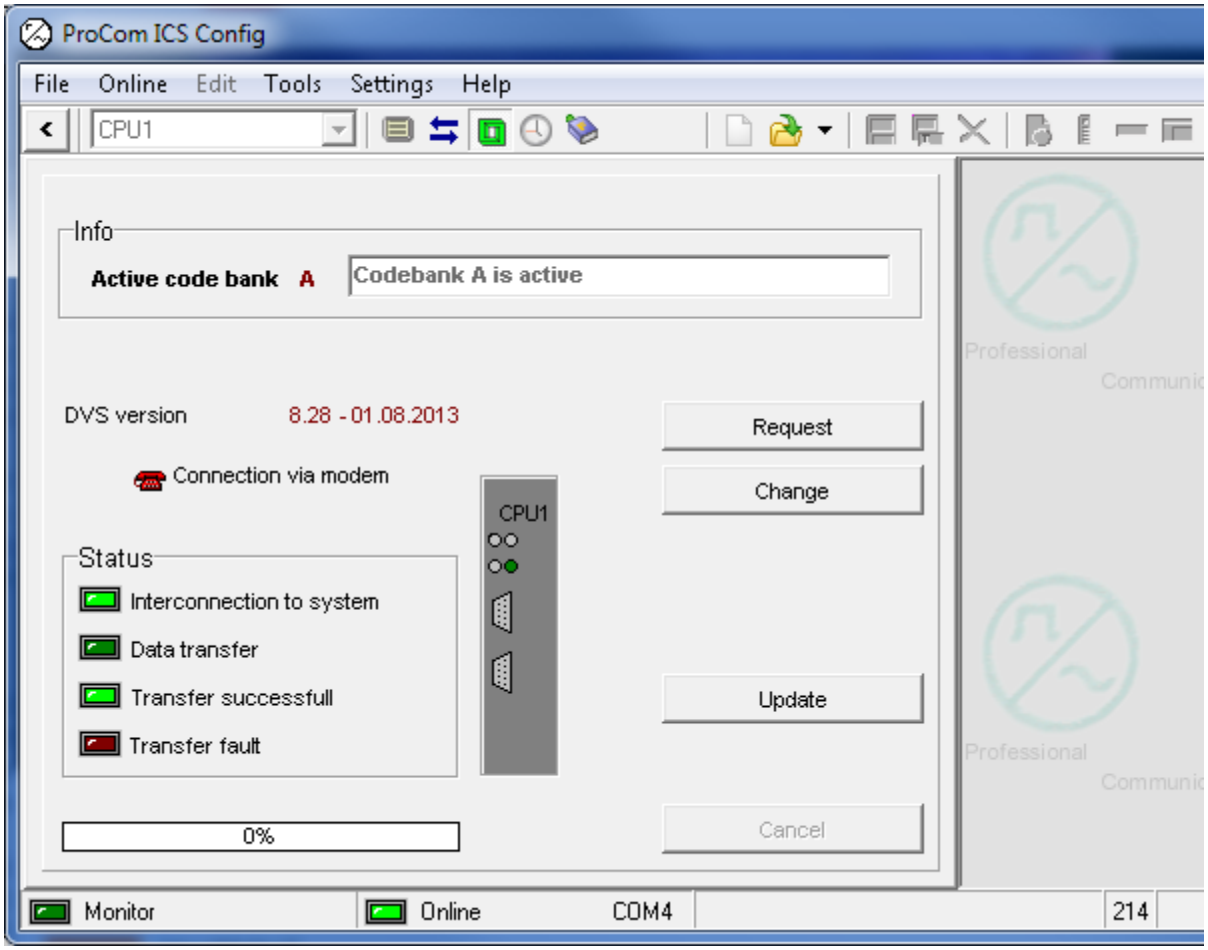
A read program is parked until it is read or written once more. At this time it is always possible to apply the data for configuration by using *Edit*.

Connection via modem

The button is used to connect to a dial-up / dedicated line via a modem connected to a PC/Notebook. The required settings are described under *System program* *Modem* and *RS232 settings*. Once a connection to the system via the modem has been established successfully, all the described functions are also available.

4.3 Firmware (DVS update)

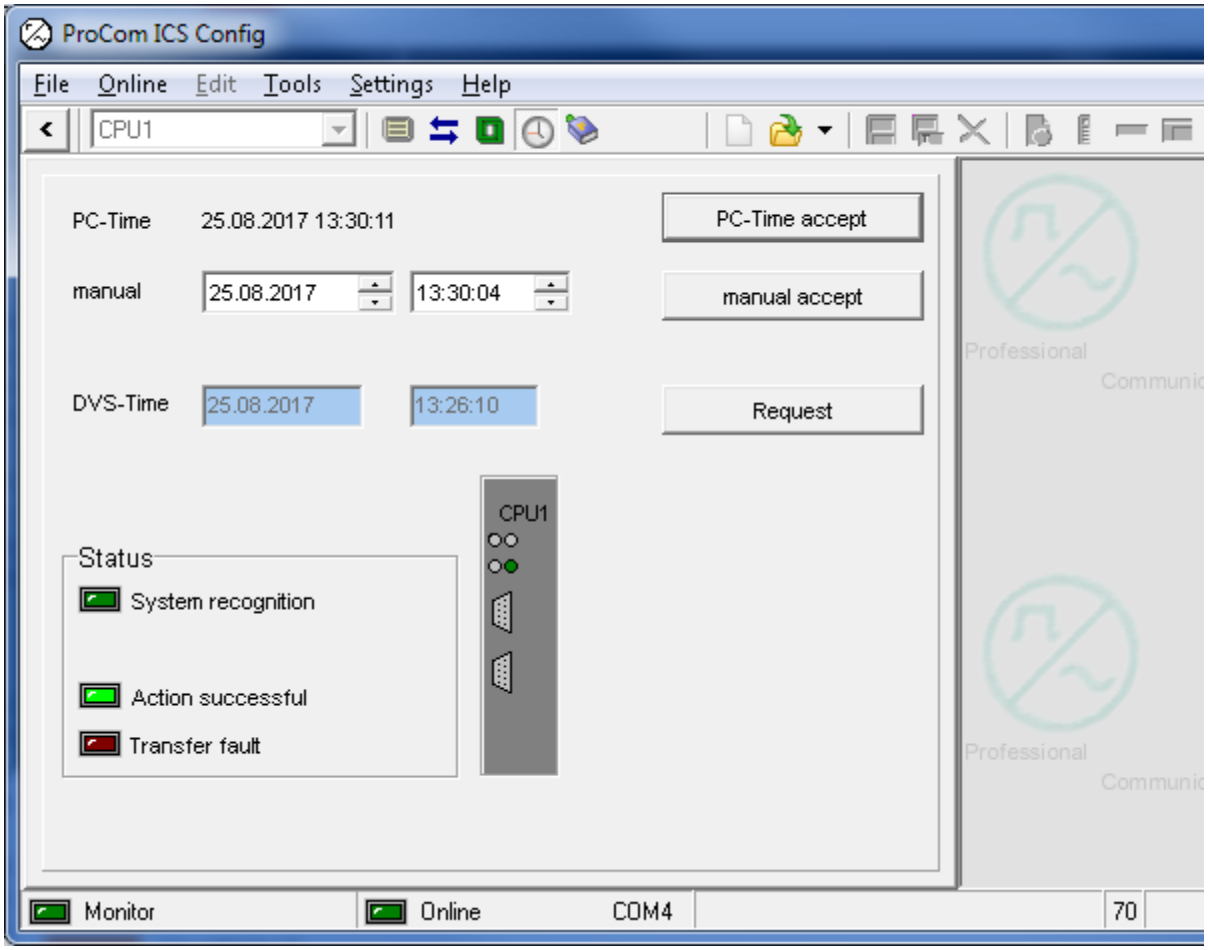
This module is used to update the firmware of the system CPU.



The system has two code banks. This offers the option of transferring new firmware to the inactive code bank while the system is running.

4.4 System time

This module is used to update the system time used by the system CPU.



PC-Time apply Sets the system time of the CPU to the PC/Notebook time.
Manual apply Sets the system time of the CPU to the manually entered time.
Request Reads the current system time of the CPU.

4.5 Simulation

This module is used to simulate telegrams on the system bus. In addition, modules can be tested.

5 Tools

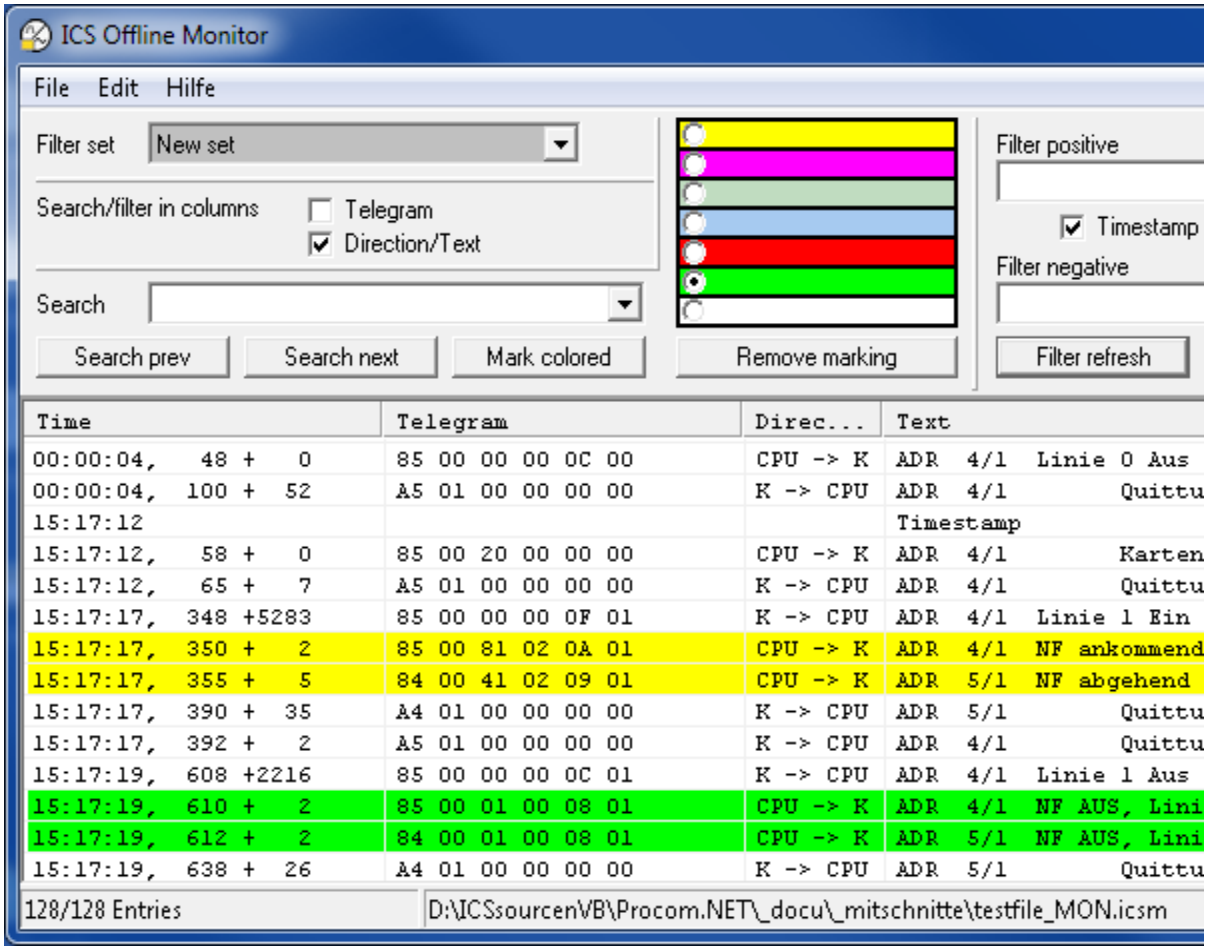
5.1 Database editor

The data of a system program are stored in a database during runtime. All programs and information are stored in datasets of 32 bytes each. Each block is identified by means of the program number in Byte 1. The Editor displays a copy of the database and provides direct access to the content. This means that any program can be changed without an input mask being required.

Background knowledge is essential!

5.2 Offline monitor

External program to display and evaluate records of telegram traffic. The *Offline monitor* replaces the previous internal file viewer. The *.icsm file extension is registered for the .exe program monitor in the operating system. Files with records can thus be opened directly by means of the file system.



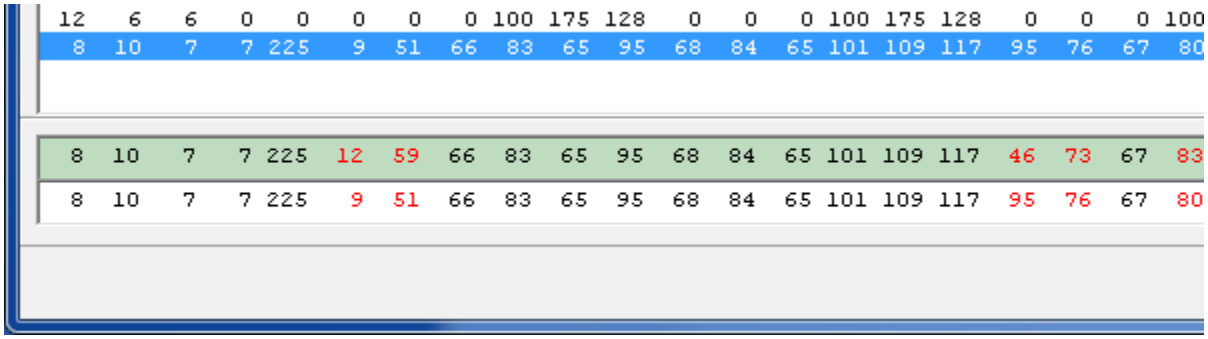
The *Offline monitor* of a range of filter, marking and search functions for analysis. Only specific datasets can be displayed or hidden by means of the positive and negative filters. Entries of interest can be marked specifically by clicking on the entry according to the selected color.

An explanation of the syntax for searches and filters is contained in the *Monitor*.

Search	It is possible to jump to specific matches by means of the *Search prev*/*Search next* switch. The *Mark colored* switch marks all matches with the selected color.
Filter positive	Only entries to which the filter string applies are displayed
Filter negative	Entries to which the filter string applies are not displayed. (Exclusion filter)
Measure time	Any entry can be set as a starting point for a time measurement by using the right-hand mouse menu. Movement of the cursor or marking of other entries calculates the temporal separation from the marked entry. This is displayed in the status line.

5.3 Compare files

Two configuration files can be investigated for differences by means of this dialog.

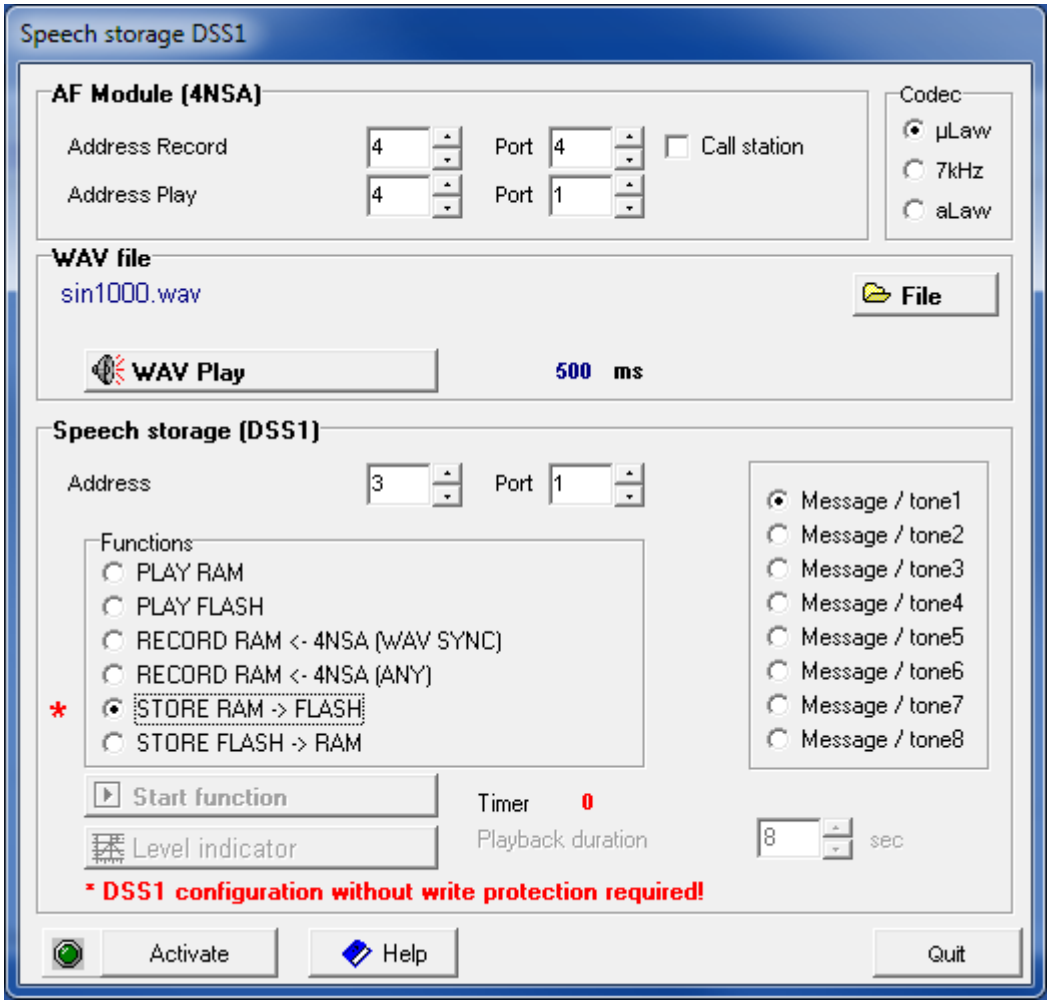


All datasets are displayed in the top two lists. Only those datasets for which there is no identical dataset in the other file, are shown in the middle two lists. The affiliation to File 1 is highlighted in green in all areas.

Marked datasets in the middle lists are transferred to the lower elements for direct comparison for direct comparison. Differences in bytes are identified in red here.

5.4 Speech storage

Recording, playback and testing of the *DSS1* (*Speech storage*) module



Note! Basically, a **recording** takes places by **analog** recording with standardized modulation by means of an **AF module**!

AF-Module (*4NSA*)

Address, *Record*	Address and port of the module via which the AF that is to be recorded is supplied. Source can be a station or any analogue device! In any case, the source must be fed by means of a cable in analog form to the port of the AF module!
Address , *Play*	Address and port of the module via which the AF is emitted
Call station	Specific telegrams are generated for the functioning of a station on the AF module.
Codec	Audio compression process to be used by the AF module (see 9.1) **The recording must take place using the compression process that is provided for the planned system.**
WAV file	Serves as the source of a WAV file, if this is selected by means of the *File* switch.

Speech storage (*DSS1*)

Address, Port	Address and port of the module *DSS1*

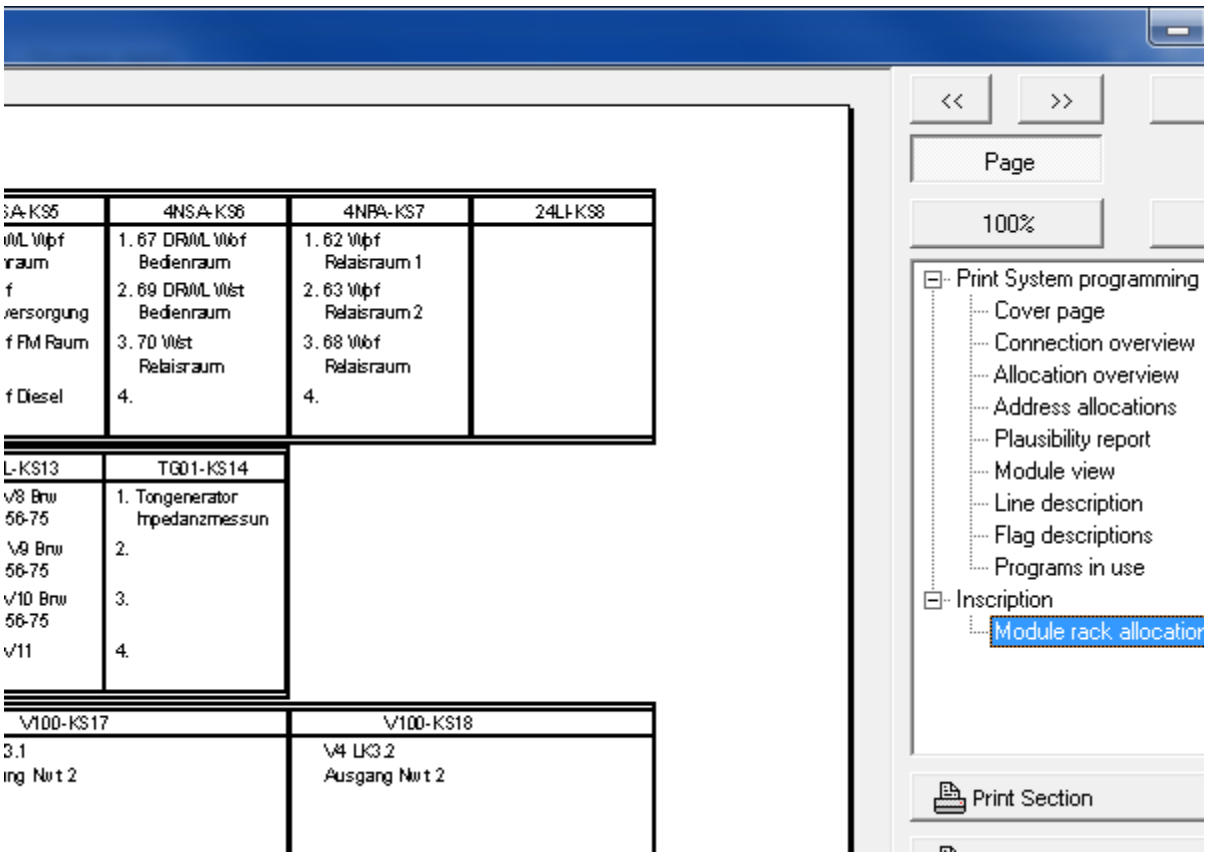
Functions

PLAY RAM	Playback from RAM
PLAY FLASH	Playback from FLASH
RECORD RAM <- 4NSA (WAV SYNC)	To record a *WAV file* with automatic starting of playback **Connection required between PC audio output and the AF module!**
RECORD RAM <- 4NSA (ANY)	To record any AF by means of the AF module
STORE RAM -> FLASH	To copy the RAM contact to the flash Attention! Write-protection of the flash cannot be active! (
STORE FLASH -> RAM	To copy the Flash content to RAM

Message / tone 1-8	Entry point to the memory in which recording or from which playback takes place. Depending on the length and the partitioning of the memory area, recordings of approx. 1x 60sec to 8x 8sec are possible.
Level indicator	The module uses Port 1 (*Audio channel* 26) for the visualization of *AF* on the BUS. Activation for **µLaw** takes place through *Line* 9 and for **aLaw** through *Line* 10. ADPCM (7kHz) is not available here!
WAV Play	Manually starts playback of the selected *WAV file*
Start function	Starts the selected function locally on the PC and online on the module
Timer	Display of the active time of an active activity
Playback duration	Duration of playback from RAM or Flash

5.5 Documentation

Preview and option of printing documentation regarding a configured system.



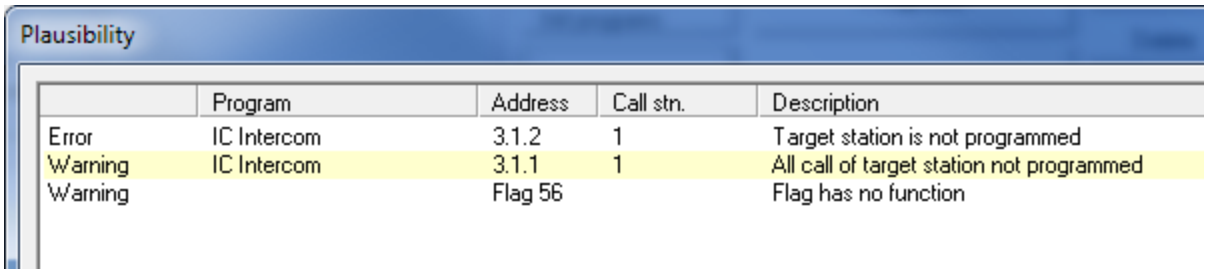
Documentation of a configured system consists of multiple components.

Cover page	with details regarding system designation and creation date.
Connection overview	provides a listing by *Station number, Name* and the associated connections including all occupied keys and their function, e.g. SR1, SR2 etc.
Allocation overview	provides the *Station number* associated with the address and port.
Address allocations	lists the descriptive texts of the module addresses.
Plausibility report	lists all possible faults of the plausibility test.
Module view	displays the equipped racks in graphic form.
Line description	lists all lines in use with their descriptions.
Flag descriptions	lists all *Flags* in use with their descriptions.
Programs in use	lists all programs with their IO conditions.
Module rack allocation	creates a labeling sheet of the precise size.

The *Print Section* button prints only the visible section while the *Print System programming* button prints complete documentation without *Module rack allocation*.

5.6 Plausibility

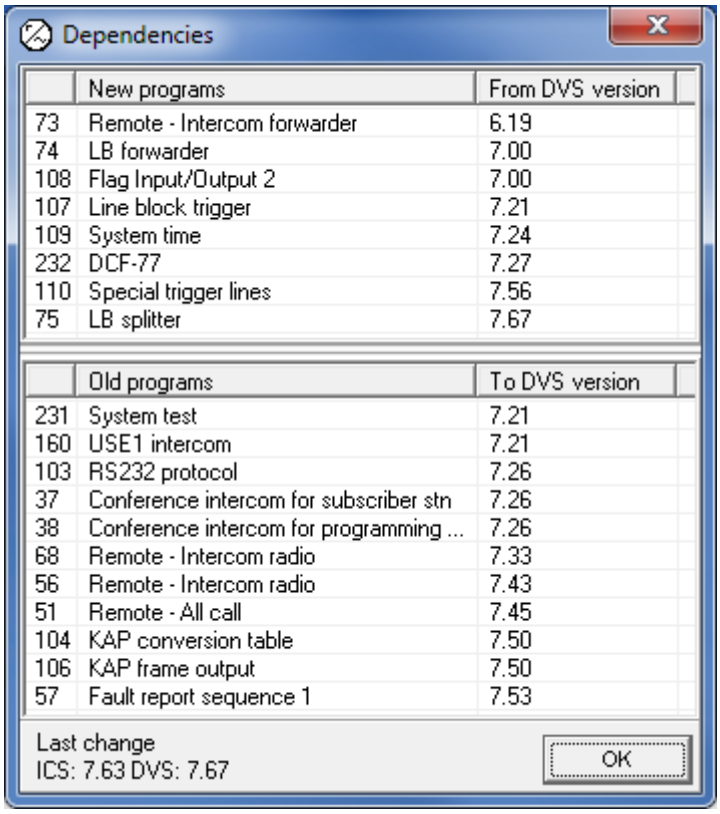
This dialog provides a detailed list of possible logic errors in the configuration. In doing so, **only local intercom connections and *Flags*** are taken into account. There are two types of messages: faults and warnings. Errors prevent the system from functioning faultlessly. Warning messages provide information.



A list of possible errors and notes.

Destination call station is not programmed	This message appears if a connection has been programmed from the call station indicated in the list to a non-existent call station or if the associated intercom program is missing.
AllCall of destination call station not programmed	This message appears if an association with an AllCall group has been specified in an intercom program but the triggering *AllCall* program is missing from the destination call station.
Flag has no function	This message appears if a *Flag* is only used in one program and thus has no function.

5.7 Dependencies



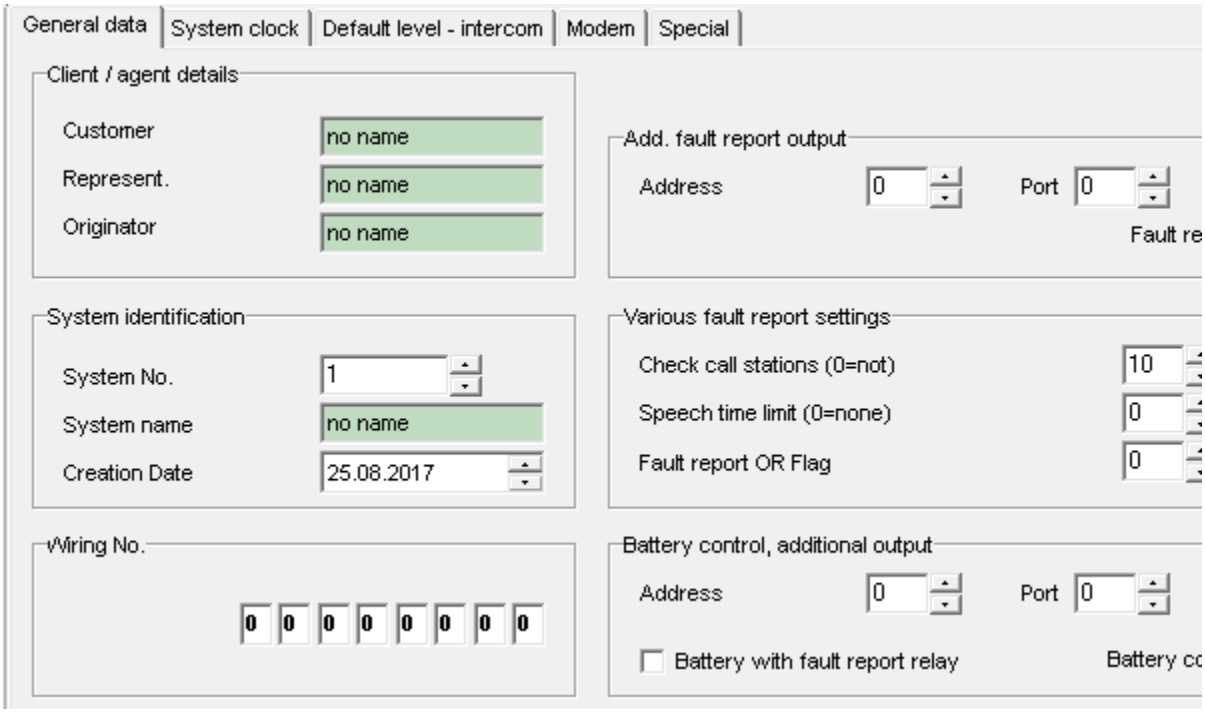
This forms shows the internal table of the previously archived version dependencies. When writing a configuration file in a system, all versions of the programs used are compared with the DVS version of the system. A warning appears in the event of a possible version conflict.

6 System programming

Opening an existing program of a system to (*Edit*) or creating a (*New system*) starts the system configuration with the *System data* component. This consists of 4 sub-pages for higher-level data and settings.

6.1 System data

General data



Client / agent details The input fields are partially preconfigured automatically and should be checked and adjusted. The editor can be stored under *Settings* - *ICS Settings* - *Default* as a default.

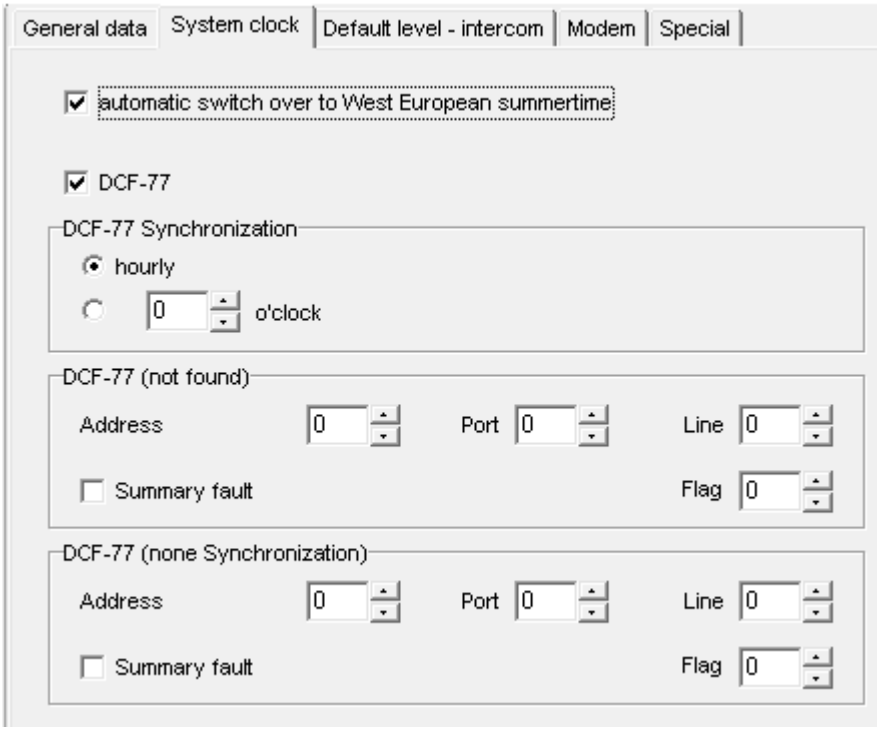
System identification The input fields are partially preconfigured automatically and should be checked and adjusted. In the case of new systems, the system date is entered automatically.

Add. fault report output	The standard fault report of a system is made by means of the *SV01* module. Should a general fault be processed in addition, this takes place by using a *Line* or *Flags*.
Check call stations (0=not)	Connected stations are interrogated at the programmed interval. If it is no longer possible to address a station, then an FSK fault report is triggered on the associated port of the 4NSA module and a related general fault report on the SV01.
Speech time limit (0=none)	Active intercom calls are disconnected after the specified time. It is only possible to continue the call for the set time once a new connection has been established.

Fault report OR Flag This *Flag* triggers an SV01 general fault if it is activated.

Battery control, additional output

System clock



automatic switch-over to West European summertime

Activates the internal correction of the system clock according to the official determination of Summer-/Winter-time change-overs.

DCF-77

The DVS-21 system clock can be synchronized with a *DCF-77* receiver. The following soft- and hardware versions are required:

Hardware	CPU1	(05.09.2007) manual change required
	DCF-77 Receiver	ProCom *DCF-77* Radio clock module
Software	CPU1	Firmware as from Version 7.27
	PIC	as from Version 5113
	ICS	as from Version 7.00 Rev.012

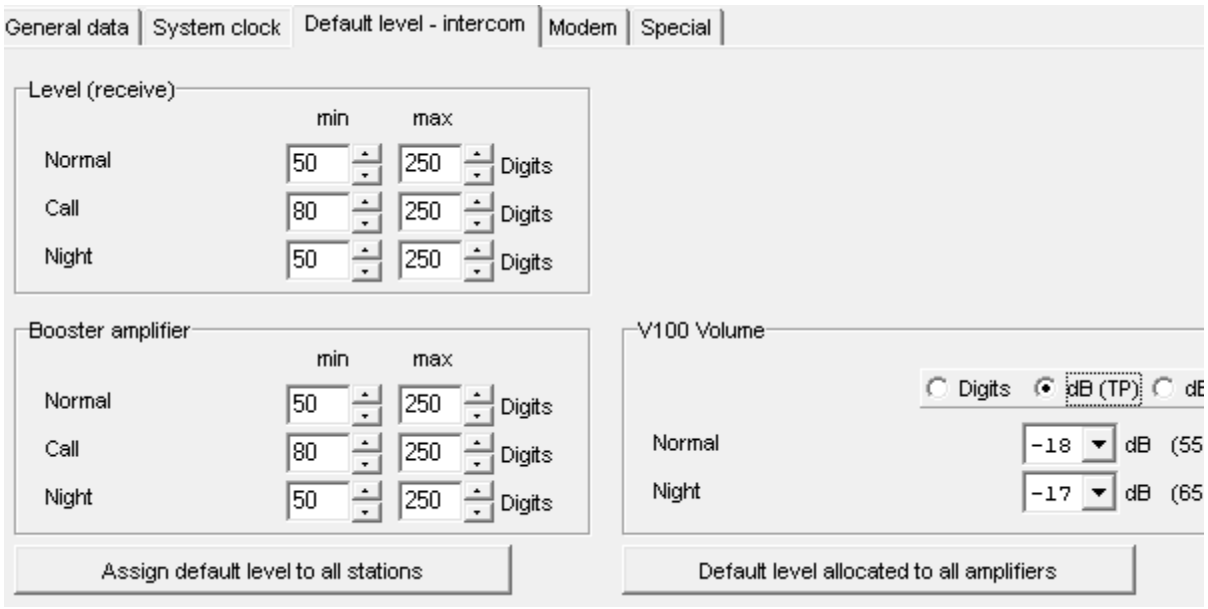
The *DCF-77* receiver is connected to the upper SUB-D9 port of CPU1.
The *DCF-77* option activates the function and is configured by means of the expanded dialog.

DCF-77 Synchronization	Synchronization takes place either hourly or at a fixed time, always on the hour.
DCF-77 (not found)	If the receiver is not connected or does not answer, a *Line* and/or a *Flag* switches for further use of this information. The *Summary fault* option triggers the internal genera fault.
DCF-77 (no synchronization)	The "*no synchronization*" report by the receiver switches a *Line* and/or a *Flag* for further use of this information. The *Summary fault* option triggers the internal general fault.

Note! The *DCF-77* receiver is deactivated during an active ICS session!

Tip! Synchronization of all connected systems can take place in conjunction with the System Time program and just one *DCF-77* receiver!

Default volume - intercom



There is an option of setting standard values for a level. These settings spare the need for unnecessary new entries when installing new stations, with the prerequisite that all your stations that are to be configured will use the same level throughout. The *Night* standard values are used as the default for speech settings as well as for amplifier configurations.

By using the All xxx Standard Level assignment buttons, all available stations and amplifiers are set to the specified standard level.

Definition of the level values

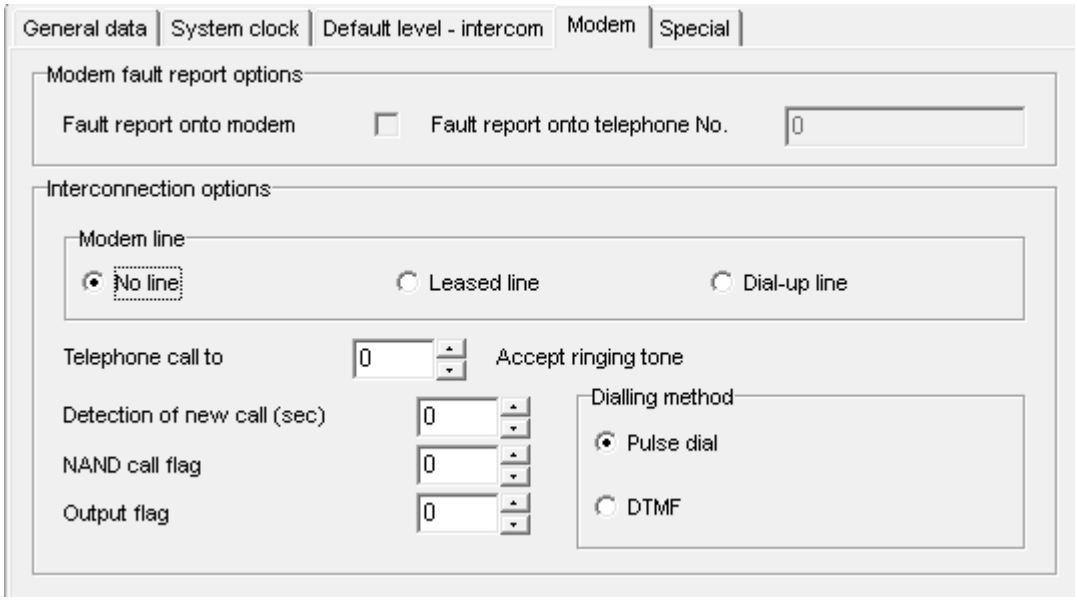
Normal-Level is the level that is used during a call

Call-Level is the level that is used when establishing a connection. Generally this level value is set higher, in order to gain the attention of the subscriber by a greater volume when first addressing him/her.

After a freely programmable *Intercom interval time* (no AF transmission, see Stations), the *Call-Level* is reactivated for a new call.

The min. and max. specifications are of significance for automatic volume adjustment and determine the bandwidth in which the level can vary. Should a fixed level be used, then the min. specification is used as a basis.

Modem



By specifying the modem settings for remote maintenance, the system can be configured and monitored remotely.

Modem fault report options (not supported)

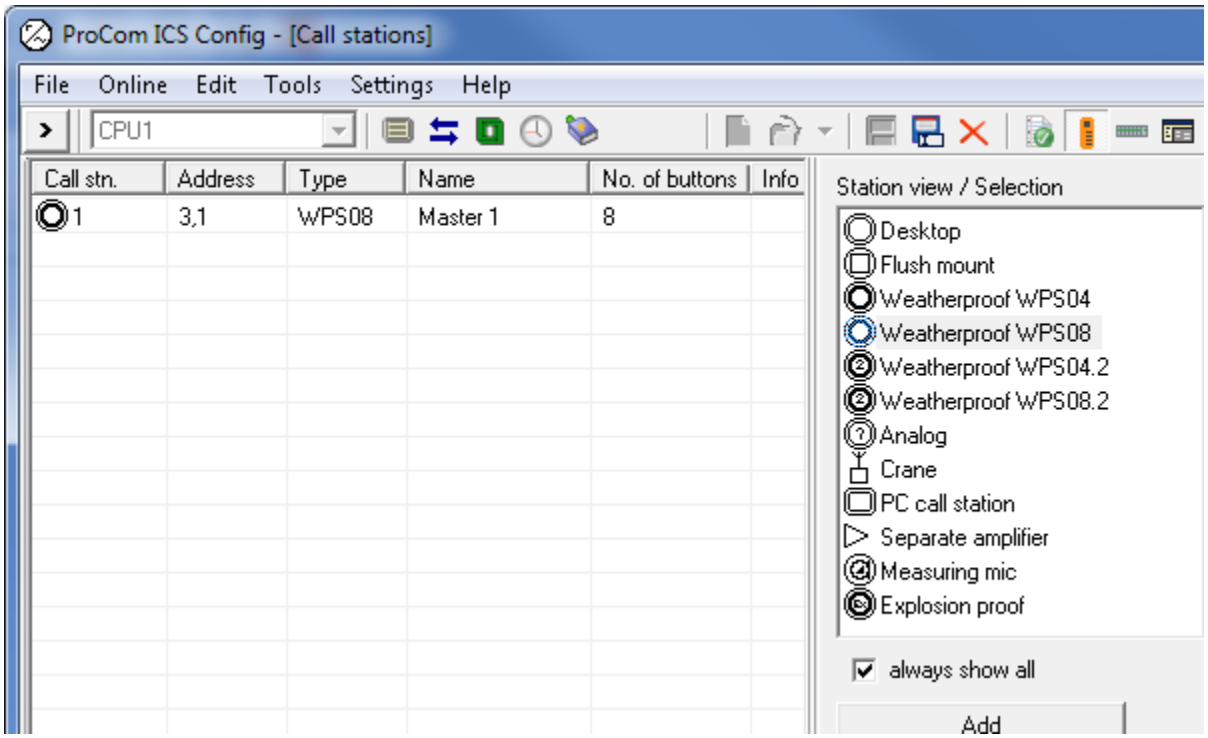
Interconnection options
The type of modem line and the dialing process must be specified. Number of rings until pick-up. The *Detection of new call (sec)* field specifies how rapidly the system can/may accept consecutive incoming calls. The acceptance of incoming calls can be blocked by means of the *NAND call flag* field. The *Flag (OUT)* is triggered if a connection is established successfully.

Special

This page enables special configurations for special cases. It is recommended that changes be made only by specialists!

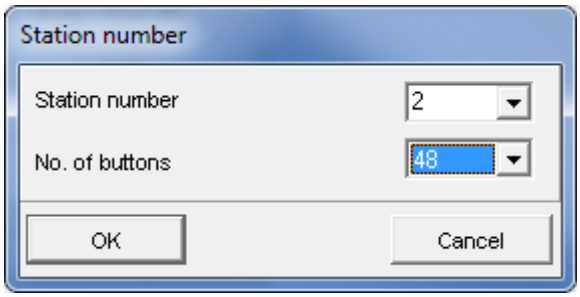
6.2 Call stations and devices

Overview of all the stations of a system.
The creation of new or the configuration of existing stations takes place here.



The *always show all* option lists all stations in the left-hand overview, or only the stations of the type marked in the right-hand selection.

Create Stations



All available types are listed in the right-hand selection list.

A double-click in the selection list or simply marking and using the *Add* button then opens a dialog by which the station number and number of keys can be specified. The next vacant number is suggested automatically as the station number. The "number of keys" field located below it contains the possible V that is available for the selected type of station.

Confirm the OK button to create the station in the desired setting. The Back button cancels the activity.

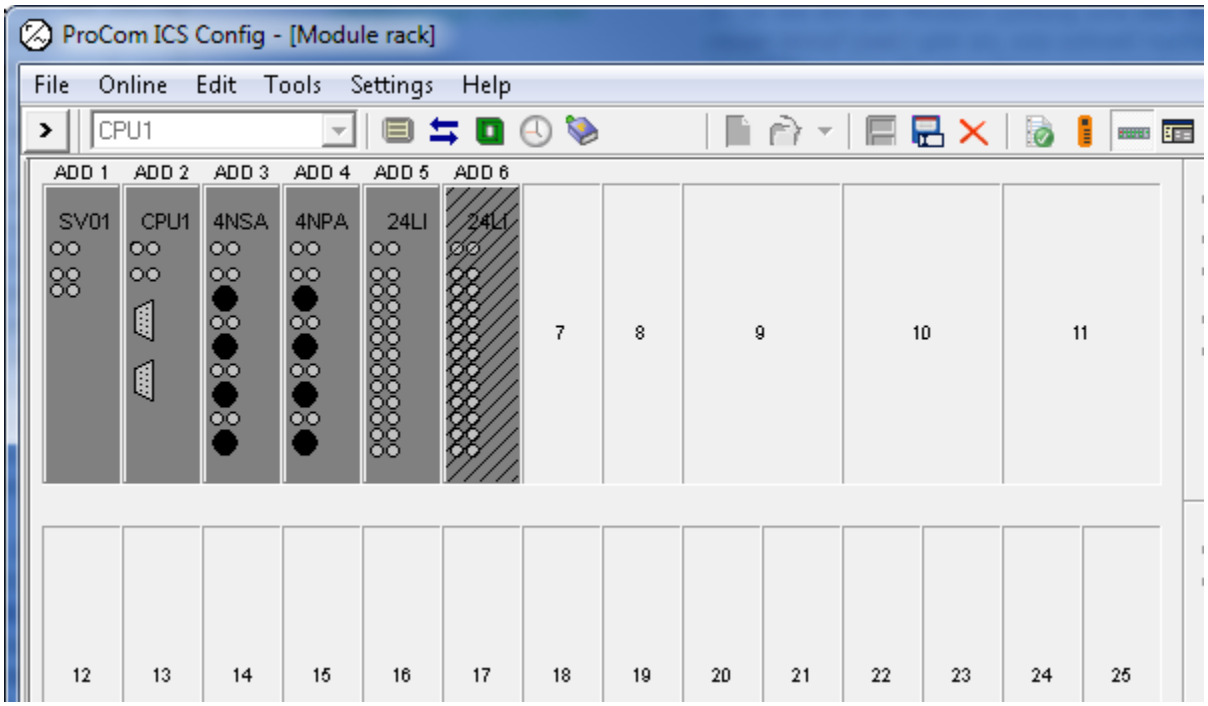
Station editing

All the available stations are listed in the left-hand overview.

A double-click in the selection list or simply marking and using the *Edit* button opens the configuration dialog. These dialogs are type-related and are explained in the *Call stations* section.

6.3 Module rack

Overview of all modules in a system. A new module is created or an existing one is configured here. Modules that are used by existing programs are shown in gray. Modules without any function/programming are shaded.



The first two positions are occupied by the *SV01* system power supply and the *CPU1* processor. If a redundant standby CPU is provided, then positions 1-4 are occupied (2xSV01, 2xCPU1).

Select module rack

The type of *Module rack* that is in use can be selected on the right next to the module area.

Type *Wiring* corresponds to the familiar usage and is suitable for older systems as well as special configurations. **It is essential to note that the item number may differ from the address in this type! The address must be specified separately.**

Type *BPxxx* must correspond to the rack in use in each case. The item numbers correspond to the address.

The type can only be changed if no module is assigned!

Add module

All the available modules are listed in the right-hand selection list. The module is added by marking and clicking on a vacant position. In the case of *Wiring* type a dialog opens in addition and request the address.

To move modules, mark the module by clicking and click on the new position. In the case of *Wiring* the move is only related to the position number. The *Address* must be adapted manually in the configuration. This is indeed only possible in the case of non-programmed modules. Already-programmed modules cannot be moved directly. It is recommended that a new module be placed and that the programming be adapted accordingly in the *Programs* module. If the module then has no function, it can be removed.

Configure module

Almost all modules can or must be configured. An operating mode must be selected according to the type or other specific values such as level and timings must be set.

The Configuration dialog can be opened by a double-click on the module after marking the module and using the *Configuration* switch, or directly by using the right-hand mouse menu via the module.

These dialogs are type-related and are explained in the *Modules* section.

Address description

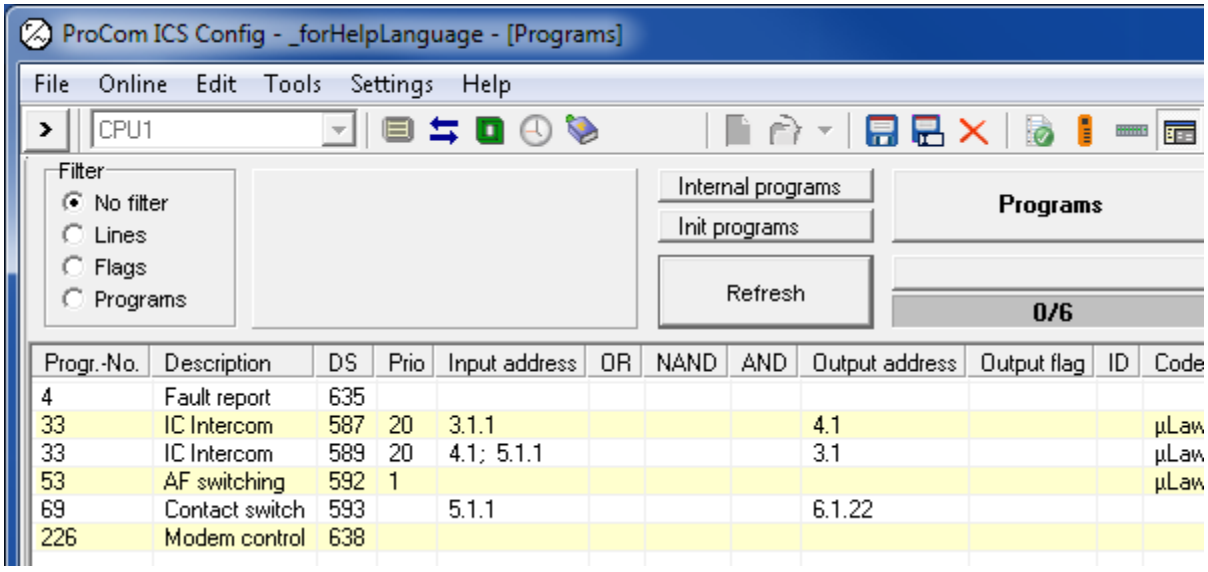
As a basis for internal documentation, enabling a matching label print-out to be generated and in the interests of legibility of the configuration to a third party, it is recommended that the function of the modules and/or connected devices or directions in the case of long-distance lines be shown in abbreviated form.

Power consumption

In order to provide information regarding a possible overloading of the *SV01* supply card, a current value is be stored for each module! Generally, this has to do with calculated values between idle and maximum current. The calculation is based on the boot and operating behavior of the respective module.
If the sum of all currents reaches the load limit of the specified supply module, a colored symbol is superimposed in the graphic of the *SV01*.

6.4 Program overview

Overview of all programs of a system.
New programs are created or existing ones are configured here. Certain programs are permitted for stations only. These are also listed here but can only be opened via the station!



The overview displays the programmed criteria and information regarding the individual programs in the form of extracts.

Add program

All available programs are shown in the scrolling selection list. The program dialog is opened by marking the desired program and using the *Add* button.

Having successfully performed the configuration and having left the dialog by means of the *Save* button, the program is created. The programs are explained in the *Programs* section.

Edit program

The dialog is opened by marking the program and using the *Edit* button, by using the right-hand mouse menu or by a double-click.

These dialogs are program-related and are explained in the *Programs* section.

Copy program

A program can be copied by marking it and using the Copy button or by means of the right-hand mouse menu. This is then helpful if multiple, very similarly-configured programs are required, which can the be adapted by changing the values.

Filter programs

Some tools are located in the header to filter the view according to various criteria. When filter criteria are specified, then only programs that use the criterion are displayed.

Example:

Filter	Displays
Address: 8; Port: 0; Line 0	all using Module 8
Address: 8; Port: 1; Line 0	all using Module 8 on Port 1
Address: 8; Port: 1; Line 2	all using Line 2 on Module 8.1.
Address: 0; Port: 0; Line 2	all using Line 2
Flag: 55	all using Flag 55

7 Modules

The correct specification of the hardware/firmware is important for the display of the input fields and for the treatment by the CPU!
The specification of the used codec is used exclusively for displaying the elements for level-setting.

Display and control elements:

LEDs

CLK	GREEN - FLASHING	System clock
I/O	GREEN - FLASHING (synchronous)	Direction of transmission: BUS <-- Module
	GREEN - FLASHING (alternately)	Direction of transmission: BUS --> Module

7.1 SV01

System supply and CPU monitoring with potential free fault message.
For switching tasks, two floating optocoupler inputs (AC/DC) and a configurable relay output are available.

Relay Configuration:

Fault indication	Relay is fault indication relay (no fault = closed contacts)
Available for free of disposal	The relay can be used arbitrarily. Switching status follows the line status. (Line 2 ON = relay contacts closed)
Available for free of disposal (inverse)	The relay can be used arbitrarily. Switching status, contrary to the line status. (Line 2 OFF = Relay contacts closed)

Line function:

Port 1:

Line 1 CPU -> M	Trigger fault indication, LED (RED) and relay (if option enabled)
Line 2 CPU -> M	Relay (if option unchecked)
Line 3 M -> CPU	Optocoupler 1
Line 4 M -> CPU	Optocoupler 2
Line 7 CPU -> M	Measurement output voltage (from firmware x115 and above)
Line 8 CPU -> M	Temperature measurement output (from firmware x115 and above)

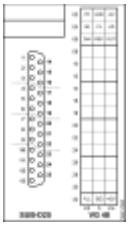
Port 2 - 4: without function

Display and control elements:

LEDs

+5V	GREEN - ON	Internal supply voltage is available
	GREEN - OFF	Failed internal supply voltage
-5V	GREEN - ON	Internal supply voltage is available
	GREEN - OFF	Failed internal supply voltage
U	GREEN - ON	Supply voltage available (48V)
	GREEN - OFF	Power supply failure (48V)
AI	RED - OFF	No malfunctions
	RED - ON	System reports a fault

Backplane connectors:



CC Center contact
NO Normally open contact
NC Normally closed contact
OC Optocoupler

7.2 CPU

Processor Unit

Init. for fault report lines in loop	Default: 200 (Main loop passes unit) Time in which the V25 attempts to initialize the supplementary error message-Line, before the error message program switches from init. to the idle state.
init. time for modules (sec)	Default: 10 Time for which the V25 pauses in rapid-blinking mode, if all modules are not in the system.
Standby CPU Interval (x131ms)	Default: 2 Time delay in which the V25 of a standby CPU waits until the "Life data ack." is sent. Required in standby-systems for differentiation of the CPUs.
Module check	Default: 0 (deactivated) Time in which the V25 sends test telegrams to the modules, in order to check them.
AF Delay (x131ms)	(Concerns only the Loudspeaker program) Time after which the *Public address* program switches the AF input. (after output and *Output flag*)

Address decoder

Activates use of the Module *Address decoder* for expansion of the addressable module addresses. Introduction of the backplane cancels the use of the *Address decoder*!

Clock-LEDs of modules

Sets the behavior of clock-LEDs of all programmed modules.
The initialization of the module at boot time is visualized by rapid flashing (fast blinking). LEDs of non-programmed modules are flashing, regardless of this setting!

Selection

Flash	LEDs always flashing
with test telegram	LEDs are off after init. phase, short flashing in case of test frames
always on	LED's are on after init. phase
always off	LED's are off after init. phase

E1 Clock synchronization

As from Hardware Version 6.01, the CPU is equipped with an external clock synchronization input. This enables synchronization with an external transmission technology clock. The default settings can be used for the most common applications. If required, adaptations can be made for line length, signal type and impedance.

Display and control elements:

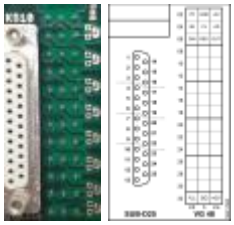
LEDs

	-	without function
	GREEN - ON	CPU operating
On/Stb/Al	YELLOW - ON	CPU operating (StandBy)
	RED - ON	Error

Connectors

COM 2	SUB-D top	Radio clock (DCF77) (as from HW v6.01)
COM 1	SUB-D bottom	Data transmission and monitoring with ICS

Backplane connectors:



Newer backplanes have 2 two-pole solder posts to the left of the SUBD-25 jack. Using this, the clock input be connected directly to the receiver (RXa/RXb) of a 4FTR with a 2Mbit attachment on Slot 3, Set 1. On backplanes without soldering points or for alternative wiring the contacts of the series 30 have to be used!

E1a Clock input

E1b Clock input

7.3 LCPU

Processor module for special tasks. (Not a replacement for the system CPU)

Additional Linux system for compute-intensive tasks and LAN connectivity.

- Connection and management of ProCom workstations BSA
- Warning travelers
- Automatic announcements
- VoIP connection (Voice over IP)
- ISDN with enhanced functionality

Additional slot for a 2Mbit or ISDN function-module

Configuration and terminal assignment of the modules (2Mbit, ISDN) can be found at 4FTR. The slot corresponds to Set 4

Note! In case of ISDN, one must distinguish between the classic attachment operation, e.g. with 4FTR, and the extended operation with Linux support. In **advanced ISDN operation** a modified function-module is to use. The processing is not executed by the Function-module, but by the Linux kernel. In this case, **Programming** of the DVS must be done to set **1**!

Display and control elements:

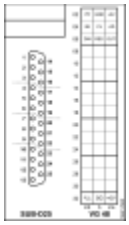
LEDs

B	-	without function
L	-	without function
↓	GREEN - FLASHING	Function-module reports incoming data
↑	GREEN - FLASHING	Function-module reports outgoing data
On	GREEN - ON	Function-module is ready
Al	RED - ON	Function-module reports a fault

Connectors

USB-M	USB-A	without function
USB-S	USB-B	without function
LAN	RJ45	Ethernet connector for data transfer and service

Backplane connectors:



RX a/b Function-module Set 4
TX a/b Function-module Set 4

7.4 4FTR

Carrier module (4-fold) to accommodate max. 4 module attachments.

Module attachments are available for the following purposes:

- E1-Attachment (2Mbit) for direct system internetworking, by DSL modem or transmission technology
- ISDN-Attachment for PA, IC and fault message calls over an ISDN network
- Uart-Attachment (RS232) for user-defined specific controls

In the configuration of module, the operating mode of the ports has to be selected according to the module assembly.

Firmware, BUS-CPU

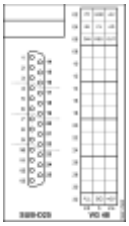
If it is a module with bus CPU, the option has to be activated! Modules of newer design (with bus CPU, recognizable by additional board and SMD assembly) do not have restrictions regarding the audio channel pool anymore. All dynamically allocated audio channels can be used. This will allow for AF switching between different modules and diverting of AF in case of direct forwarding.

Operation mode *E1 (2Mbit)*

Control channel

The transfer of control data can be done either in the channel 0 or 16. For non-transparent transmission systems, which do not allow for different re-use of their own service channel, channel 16 can be deployed.

Backplane connector:
RX Receiver
TX Transmitter



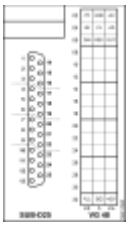
Operation mode *ISDN (S0)*

As of version 0106 max. 15 incoming call numbers, 15 permissions and 31 outgoing calls can be programmed.

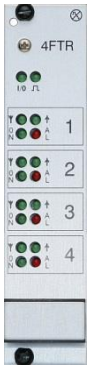
AF threshold value	Adaptation of the speech activity detection to the ambient noise
Speech pause	Time without any detected AF. After this time period, speech activity detection will disconnect
Time out	maximum call duration
Start after	Delay time to until speech activity detection becomes active
Acknowledgment	Output acknowledgment in case of successful PA from a voice recorder DSS1 instead of an acknowledgment tone. For this, more programs for the control flow needed. Further details can be found in the ISDN commissioning instructions!
Own call numbers	Entering the module MSN max. 15) and associated control lines. Corresponding additional priority lines are assigned automatically. The priority of a caller denoted under *Allowed call numbers* determines, which of the three control lines is initiated during a call. Direction of the line: M -> CPU
Allowed call numbers	Specify the call numbers of callers (max.15), which the module has to respond to. The selection of priority level determines, which of the three control lines is initiated during a call.
Outgoing call numbers	Lines and associated call numbers, which are called by the module when a line is initiated. Direction of the line: CPU -> M
Interval - Service call	Time in which the service manager must call back for acknowledgement. Otherwise, another notification occurs
Service call number	Phone number for service managers, who is invoked in case of failure of the system.

Backplane connectors:

RX Receiver
TX Transmitter



Display and control elements:



LEDs

↓	GREEN - FLASHING	Function-module reports incoming data
↑	GREEN - FLASHING	Function-module reports outgoing data
On	GREEN - ON	Function-module is ready
Al	RED - ON	Function-module reports a fault

7.5 4NSA

Audio Frequency (AF) interface module, serial, analog, for connecting four ProCom stations in 4-wire technology, including fuse, each with a modem interface electrically isolated and short circuit proof.

Level incoming AF input gain (from the external device to the module)
Level outgoing AF output attenuation (from module to external device)

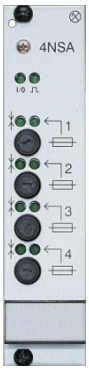
Operation mode

Modem (Master)	Operating as a transmission line (master)
Modem (Slave)	Operating as a transmission line (the opposite side master)
no Modem	with pure AF frequency, the modem can be disabled
AF controlling	Activation of self-monitoring and adjustment of the measurement interval. The monitoring is done by playing and receiving a measurement frequency via the speaker and the microphone unit. The initiation and evaluation of the received frequency is on the module.

Display and control elements:

LEDs

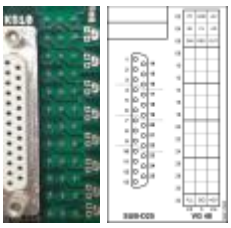
	GREEN - ON	Incoming connection is active
	GREEN - FLASHING	Outgoing connection is active
	GREEN - FLASHING (slow)	Faulty connection
	GREEN - OFF	Idle state
	GREEN - ON	Ready power supply (48V)
	GREEN - OFF	Fuse burn-out (48V)



Line fuses

	Microfuse of the supply voltage for connected devices

Backplane connectors:



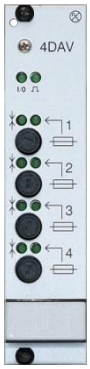
La/Lb	AF-Cable
+/-	Power feeding for connecting with 6 cores (3x2) When connected by four wires (2x2), there is the possibility of phantom feeding via Lab/Sab. There for, solder bridges must be closed at the corresponding set of the backplane. The voltage is thus switched to the midpoints of the transformers.
Sa/Sb	Modem cable

7.6 4DAV

Interface module for up to four ProCom stations with two-wire connection technology. The two-wire connection provides for the power supply (for station with internal 4W-amp), voice transmission and control information.
The power supply is fused and sustained short circuit proof. If the 25W amplifier within the station is used, additional feeding has to be provided. This energy supply is fused on the module as well.

Level incoming AF input gain (from the external device to the module)
Level outgoing AF output attenuation (from module to external device)

Display and control elements:



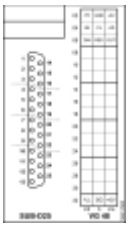
LEDs

	GREEN - ON	Incoming connection is active
⋇	GREEN - FLASHING (fast)	Outgoing connection is active
	GREEN - FLASHING (slow)	Faulty connection
	GREEN - OFF	Idle state
⇦	GREEN - ON	Ready power supply (48V)
	GREEN - OFF	Fuse burn-out (48V)

Line fuses

▭	Microfuse of the supply voltage for connected devices

Backplane connectors:



+	Supply +
a/b	Line
-	Supply -

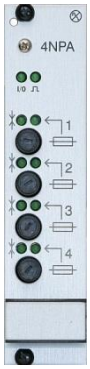
7.7 4NPA

Audio Frequency (AF) interface module, parallel, analog, for connecting four stations with V- and C- point, including fuse.

The module contains only AF-interface with power feeding. Controlling lines (keys) is done via the line module 24LI.

Level incoming AF input gain (from the external device to the module)
Level outgoing AF output attenuation (from module to external device)

Display and control elements:



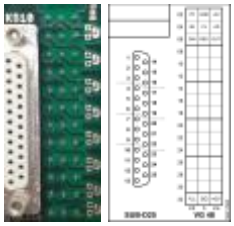
LEDs

	GREEN - ON	Outgoing connection is active
	GREEN - FLASHING (fast)	Incoming connection is active
	GREEN - FLASHING (slow)	Faulty connection
	GREEN - OFF	Idle state
	GREEN - ON	Ready power supply (48V)
	GREEN - OFF	Fuse burn-out (48V)

Line fuses

Microfuse of the supply voltage for connected devices

Backplane connectors:



La/Lb	AF-Cable
	Switching voltage for the playback amplifier
C	Normally it is connected to the mid Lab. (Close the first solder bridge at the corresponding set of backplane)
-V	Switching voltage for the microphone amplifier
+/-	Supply

7.8 4ZZA

Connection module for two exchanges, analog, 4-fold, with level adjustment of the systems.

Controlling is done by a switching a control voltage on the line. The polarity distinguishes between call and busy.

Level incoming AF input gain (from the external device to the module)
Level outgoing AF output attenuation (from module to external device)

Line function:
Port 1 - 4:

Line 1	<->	Call line	Polarity on the line: La/Lb = +/-
Line 2	<->	Busy Line	Polarity on the line: La/Lb = -/+

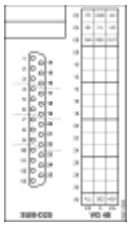
Display and control elements:

LEDs

	GREEN - ON	Incoming connection is active
✳	GREEN - FLASHING	Outgoing connection is active
	GREEN - OFF	Idle state
	GREEN - ON	Remote station is busy
X	GREEN - FLASHING	busy flag on

Backplane connectors:

La/Lb Line



7.9 DSS1

Digital memory for storing audio recordings and detection of frequencies

Note! Pay attention to the fixed audio channels list!

Operation mode *Speech storage*

The storage capacity is 60 seconds permanently in the flash and 60 seconds temporarily in RAM. Each area can be used separately in 8 segments. In segmented application, approximately 7.5 seconds per segment are available.

Record permanently stored:

- Recording is done with the tool Speech storage (Menu Tools - Speech storage)
- Playback is done manually by using control lines.

Temporary record during runtime

- Recording and playback is done manually by using control lines. (Save to RAM)

Note! For recordings, disable the *Flash write protect* option!

Line function:
Port 1 - 4: (all ports accessing the same memory area)

Line 1	M -> CPU Busy Line
Line 1,2,3	CPU -> M message number/block number (1-8)
Line 4	CPU -> M RAM (0), Flash (1)
Line 5	CPU -> M Playback
Line 6	CPU -> M Recording
Line 4+6	CPU -> M Copy RAM to Flash
Line 9	CPU -> M *audio channel 26 (**µLaw**)*
Line 10	CPU -> M level indicator for PCM bus *audio channel* 26 (**aLaw**)

Operation mode *DB-Radio*

Detection for radio magazines with free- and busy tone, four-fold.

Tolerance	Identification tolerance of an incoming frequency (unit + - 10Hz)
Threshold value	required level of incoming frequency to evaluate
Gaging Count	Required number of successful measurements (50ms/measurement)
Sound (free/busy) / Delay	Free and busy-tone generate Delay of the output (x 50ms) due to reception/transmission switching in radio magazine.

Line function:

Port 1 - 4:

Line 1 M -> CPU DSS1 Busy
Line 2 CPU -> M 420Hz, 1 sec (ringback tone)
Line 3 CPU -> M 420Hz, synchronized, 1 sec (busy tone)
Line 4 CPU -> M user-defined
Line 5 M -> CPU 1520Hz Receive
Line 6 M -> CPU 1750Hz Receive
Line 7 M -> CPU 2135Hz Receive

---

fixed audio channels:

Port 1 - Read Audio channel 26 (Record tone/message),
Port 2 - Read Audio channel 27 (Record tone/message),
Port 3 - Read Audio channel 28 (Record tone/message),
Port 4 - Read Audio channel 29 (Record tone/message),

Backplane connector: nonexistent

7.10 4IOS

Interface module, with floating in- and outputs.

The module has 4 ports, each with:

- 1 input (optocoupler)
- 1 input (optocoupler), debounced, for AF detection on 100V loudspeaker lines
- 1 output (relay with single-pole changeover switch)

The input optocouplers have a common base terminal (minus pole) for each port and may be switched independently by means of the plus potential. The voltage range of the inputs ranges from 24V to a max. of 60V.
The relay outputs may switch a max. of 1A at 80V DC or 0,8A at 125V AC. **Switching of large loads or consumers at mains voltage (230V) may only take place if an additional external fuse is used.**

Depending of the firmware of the module, the following operating modes are available:

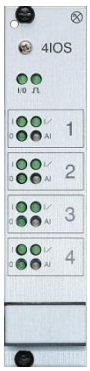
Operation mode *Default*

Acquisition of switching state, switching by means of relay, signaling by means of LED or loudspeaker line (LL) switching and monitoring.

Line function:
Port 1 - 4:
Line 1 M -> CPU Optocoupler 1
Line 2 M -> CPU Optocoupler 2 (entprellt)
Line 3 CPU -> M Relay
Line 4 CPU -> M LED Al RED
Line 5 CPU -> M LED Al GREEN

If Lines 4 and 5 have the same state, LED Al is OFF!

Display and control elements:



LEDs

I	GREEN - ON	Input voltage at Optocoupler 1 detected
I/	GREEN - ON	Input voltage at Optocoupler 2 detected
O	GREEN - ON	Output relays open
Al	RED - ON	Line 4 is switched on
	GREEN - ON	Line 5 is switched on

Operation mode *Safe transmit*

Transmission of safety-related status information by means of multiple systems by using an additional data link layer. (Transmitter)

Operating mode for the recording of status information, alarm contacts, etc.

Transmission takes place via each port by means of a line telegram (line) and two additional lines for verification of the state. The lines used for verification are clocked with variable timing. The state is captured by Optocoupler 1. If the optocoupler is switched on, the lines are synchronized for verification. Transmission and reception are displayed by a flashing green signal at LED AI.
(Synchrony = double flash, Differential mode by single flash)

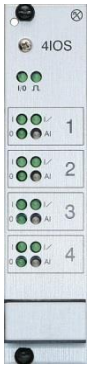
Timer (Toggle) (high) Clocking of the lines for verification (Factor 2 secs)
Timer (Toggle) (low) Clocking of the lines for verification (Factor 8 millisecs)

Total time = High + Low

Line function:
Port 1 - 4:
Line 1 M -> CPU Optocoupler 1
Line 7 M -> CPU Line for verification
Line 8 M -> CPU Line for verification

Optocoupler 2 and relays may be used independently for other applications!

Display and control elements:



LEDs

I	GREEN - ON	Input voltage at Optocoupler 1 detected
AI	GREEN - FLASHING (double)	Line synchronized for verification (input active)
	GREEN - FLASHING (single)	Line for verification in differential mode

Operation mode *Safe receiving*

Transmission of safety-related status information by means of multiple systems by using an additional data link layer. (Transmitter)

Operating mode for the output of recorded status information, alarm contacts, etc.

The switching state of the relay corresponds to the state of the acquiring optocoupler!

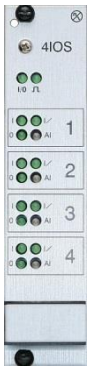
Timer (Debouncing) Time for debouncing of transmission latencies (factor 8 millisecs)
Timer (Alarm) (high) Delay time till triggering of alarm (factor 2 secs)
Timer (Alarm) (low) Delay time till triggering of alarm (factor 8 millisecs)

Total time = High + Low

Line function:
Port 1 - 4:
Line 3 CPU -> M Relay
Line 5 M -> CPU State error
Line 6 M -> CPU Wiring error
Line 7 CPU -> M Line for verification
Line 8 CPU -> M Line for verification

Optocoupler 1 and 2 may be used independently for other applications!

Display and control elements:



LEDs

O	GREEN - ON	Output relay closed
	GREEN - FLASHING (double)	Receive line for verification in synchrony (input active)
	GREEN - FLASHING (single)	Receive line for verification in differential mode
AI	RED - FLASHING	Wiring error, lines for verification not received
	RED - FLASHING (after receiving)	State error, verification does not match state information

Operation mode Safe receiving (inverted)

such as operating mode *Safe receiving*
Switching state of the relay is opposed to the state of the acquiring optocoupler!

Operation mode *Acknowledgment*

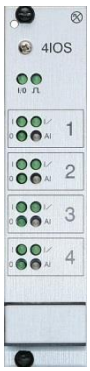
Generation of a voice acknowledgment in the event of a successful public address!
To detect the AF signals, Optocoupler 2 is connected to the 100V loudspeaker line. If the AF level is sufficient, a positive acknowledgment is provided by transmitting Line 2 and rapid flashing of LED I/.
The state is reset by ending the public address.
The module detects a public address by the relay closing with Line 3 and generates the voice acknowledgment if the level is sufficient. To switch the relay, e.g. for impedance measurement, without a voice acknowledgment being generated, Line 8 must be used.
Note Line 3 and Line 8 are OR linked.

Line function:
Port 1 - 4:

Line 2 M -> CPU Acknowledgment, voltage detected at Optocoupler 2 (100V loudspeaker signal)
Line 3 CPU -> M Relay (e.g. Loudspeaker line LL toggling)
Line 8 CPU -> M Relay (without acknowledgment)

Optocoupler 1 should **NOT** be used for other applications, as a reference to the voltage of the loudspeaker line (LL) would be required!

Display and control elements:



LEDs

I/	GREEN - ON	Input voltage detected at Optocoupler 2
O	GREEN - ON	Output relays closed
AI	GREEN - FLASHING (fast)	Acknowledgment, 100V loudspeaker signal detected

Operation mode *FAC Logic*

FAC = Fire alarm center

Secured activation of a fire alarm contact!
A complete module is required for each fire alarm contact.

A ProCom accessory module *FAC converter* is required!
In each case, the second jumper must be closed on each of the 4 ports on the backplane slot!

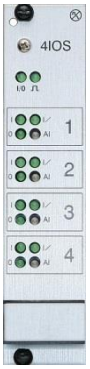
FAC Logic activates the FAC operation mode for all 4 ports

Line function:
Port 1:

Line 18	M -> CPU	Alarm triggered
Line 19	M -> CPU	System faulty
Line 17	M -> CPU	Idle state (Negation of the Line 18)
Line 20	M -> CPU	System OK (Negation of the Line 19)

Port 2 - 4, without function

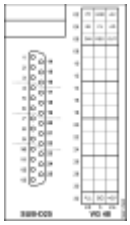
Display and control elements:



LEDs

AI Port 1	GREEN - ON	FAC Alarm
	RED - ON	Wire breakage, short circuit or other fault

Backplane connectors:



CC Center contact
NO Normally open contact
NC Normally closed contact
OC Optocoupler

7.11 24LI

Line module for driving 24 lines, including two-stage surge protection.
Connection of the lines (keys) of classical stations with separate AF and control lines. The AF-connection of these stations is via the analog module 4NPA.
Interface for any control tasks

In- and outputs are referenced to +0V of the system supply voltage (typ. -48v) without glavanic isolation. The absolute voltage range of the inputs is -24V to 60V. The output current is limitted to 150mA. In an overload condition the output will be switched off.

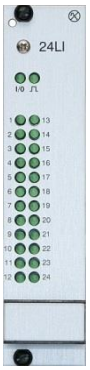
No configuration required!

Line function:
Port 1:

Line 1 - 24	M -> CPU	Detected input voltage
Line 1 - 24	CPU -> M	Output is enabled

Port 2 - 4, without function

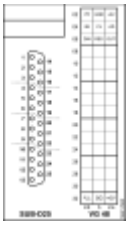
Display and control elements:



LEDs

	GREEN - ON	Detected input voltage
1-24	GREEN - FLASHING	Output is enabled
	GREEN - OFF	Idle state

Backplane connectors:



1 - 24 Lines

7.12 MI4M

Module for data acquisition and processing of 4 measuring microphones for automatic volume control of amplifiers.

The module can process up to 4 microphones independently or as a group. It requires using the program *Volume control - automatic*. There is also the configuration and calibration of control loops.

Parallel circuit of ports	During selection the ports are determined, which are summarized in the calculation. In addition, the type of output as respective mean or maximum value can be determined.
Calibration offset	Adjusting the measurement output to the real ambient noise in the immediate region of the measurement microphone. (Hardware default setting, change usually not required)
Integration time	determines the response of the measurement output to changes in ambient noise levels.

The measured values are recorded and calculated continuously. In normal operation, the output is only activated by enabling line 1, right at the beginning of a PA.

Line function:

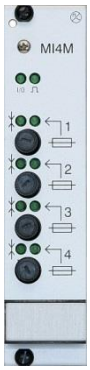
Port 1 - 4:

Line 1	CPU -> M	Measured value during PA
Line 9	CPU -> M	Measurement output permanently (Commissioning, *Volume control - automatic*) (Adjustment control by *Volume control - automatic* program is inactive during this time!)
Line 10	CPU -> M	Resetting the minimum and maximum values (Commissioning, *Volume control - automatic*)

Measurement telegrams for monitoring: (00 00 01 3x yy) x = Type, y =

Output during PA (Line 1)
0x30h Measured value averaged **(Criterion for program *Volume control - automatic*)**
0x31h present value
Output at startup mode (Line 9), Display directly in the program *Volume control - automatic*
0x33h Measured value averaged
0x34h present value
0x35h Maximum value (since last reset)
0x36h Minimum value (since last reset)
0x37h Calibration offset (for info)

Display and control elements:



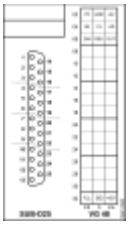
LEDs

	GREEN - ON	Measurement in progress
	GREEN - OFF	Idle state
	GREEN - ON	Ready power supply (48V)
	GREEN - OFF	Fuse burn-out (48V)

Line fuses

	Microfuse of the supply voltage for connected devices

Backplane connectors:



La/Lb Line
-24V/+ Power for measurement microphone

7.13 USE1 (RS232)

Interface module with a serial interface RS232 (Backplane connector). The module will be exclusively used with custom specific firmware for specific tasks.

Application: communication with other devices or PCs.

Operation mode Exchange interconnection

System connection by means of RS485 and impulse burning device (Custom-made product for opencast mining).

Attention! Only up to Hardware version 2 (not for new systems)!
Program *USE1 intercom* only up to DVS Firmware 7.21

Connection starts with audio channel	Preferential channel, by which the establishment of a connection is initiated
Own exchange No.	Unique system number in system network

Impulse burning device when slip rings are used in the cable path

No. of faulty telegrams	Number of faulty telegrams within 8ms until accessory burning Module attempts to burn the slip rings free.
Minimum time between burn pulses	Minimum interval in seconds between two burn impulses
No. of connections	Number of simultaneous connections

Operation mode *RS232 protocol*

Communication via serial RS232 interface.

Attention! (not for new systems)!
Program *RS232 protocol* only up to DVS Firmware 7.26

RS232 generally-used settings for a serial RS232 interface

Programming takes place by means of the *RS232 protocol* program.

Operation mode *Loudspeaker control* (AAG - Vossloh)

Communication via serial RS-232 interface with an automated announcement PC!

RS-232 hardware version
Firmware 0103LS (custom specific)

The interface parameters are preprogrammed (9600, 8, n, 1)

The USE1 module provides for control. The AF is received by an analog module 4NPA. Each PA destination is assigned an ID and a control line permanently.

Controlling timer	Timeout for maximum PA duration in seconds
Test announcement No.	Sending line 100 to Set of the USE1 module activates the test mode. By sending a line to port 3 or 4, the announcement with the corresponding ID will be requested.

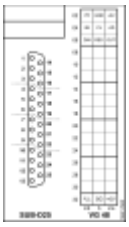
The USE1 module expects a life message every 60 seconds. A failure is signaled by the red LED (AL).

Display and control elements:

LEDs

↓	GREEN - FLASHING	Incoming data
↑	GREEN - FLASHING	Outgoing data
On	GREEN - ON	Announcement runs
Al	RED - ON	Life telegram missing

Backplane connectors:



TXD - Transmitter
RXD - Receiver
RTS - RTS signal
CTS - CTS signal
GND - Reference potential of the serial interface
+0V - Reference potential of the 48V power supply

7.14 V100

100W digital amplifier for public address (PA) and standby operation.

Amplifier No.	Unique ID of the amp in system
Module address	Own address
Loudness Normal	Volume/Level of the amplifier
Loudness Night	Volume/Level of the amplifier in Night operation
Flag OR	Activates the amplifier with a flag. The audio channel must be included.
Night reduction flag	Activates the night mode. The value in the field *Loudness Night* is used. To control with a time program see *Flag timing*.
Impedance flag	Linking-Flag to program *Impedance measurement*, by which automatic impedance checking of all amps is controlled
Acknowledgment	as from Firmware x129 a acknowledgment is generated (see here)
Call loudspeaker	Connection to a call station, in order to control a PA speaker The Address and the Port of the station must be specified in the supplementary field. *Interval time 0* always controls the amp *Interval time x* The amp is switched off when the call is accepted. It is reactivated once the *Interval time* has been exceeded.
Standby amplifier	Configures the amplifier for standby operation. In case of an assigned amp's malfunction, it takes over operation.
Standby amplifier-Address	Address of the standby amp that will take over in case of failure.

Line function:
Port 1:

Line 1 CPU -> M Loudspeaker line relay (LL-relay)
Line 2 CPU -> M Standby relay
Line 15 M -> CPU Error message (ADPCM (7 kHz) is not supported)

Port 2 - 4: without function

Impedance measurement

Impedance measurement up to module Firmware x128

Presetting *Frequency*	Measurement frequency
Presetting *Level*	Level at which measurement takes place
Online level	*Frequency* and *Level* are transferred to the amp
Start measuring	starts a reference measurement
Control measuring	starts a comparative measurement
Activate flag	activates the specified Flag for test purposes

The reference value of the measurement is only secured once it is stored in the configuration file. The configuration file must be transferred to the system, so that the impedance test can use with this value.

Impedance measurement as from module Firmware x129

Presetting *Level*	Level at which measurement takes place
Online level	*Level* is transferred to amp
Start measuring	starts a reference measurement
Control measuring	starts a comparative measurement
Activate flag	activates the specified Flag for test purposes

The reference value of the measurement is only stored in the configuration file when saved. The configuration file must be transferred to the system, in order for the impedance check to be performed using this value.

Line function Impedance measurement: (Control by program: *Impedance measurement*)
Port 1:

Line 3	CPU -> M	Indication that impedance is too high (red LED)
Line 4	CPU -> M	Indication that impedance is too low (red LED)
Line 5	CPU -> M	Start impedance measurement

Port 2 - 4: without function

Acknowledgment

Acknowledgment as from module Firmware x129

Threshold value	Threshold value for AF detection
Online level	*Threshold value* is transferred to amp

Line function Acknowledgment:
Port 1:

Line 2	M -> CPU	positive PA acknowledgment during a public address (such as 4IOS, 4LSL)
Line 3	M -> CPU	negative PA acknowledgment during a public address
Line 14	M -> CPU	positive PA acknowledgment after a public address (after 1 sec, for 2 sec)
Line 22	CPU -> M	on receiving Line 22, Line 2 (PA acknowledgment) is activated (forwarding of the acknowledgment in standby mode)

Port 2 - 4: without function

Determining the threshold
In order to determine the threshold, the amp can transfer its own level. The values are sent at one-second intervals and are displayed on a diagram. The program creates a recommendation for the threshold.

Recommended Programs

Public address:	*Public address* *PA remote/local*
V100-Impedance measurement:	*Impedance measurement* (Process control) *Flag timing* (periodic initiation of measurement) *Contact switch* (Switching of LL relay)

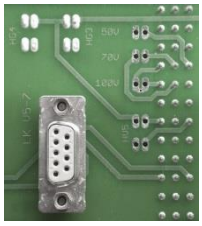
Display and control elements:

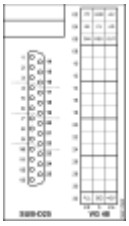
LEDs

On	GREEN - ON	Amp on, PA active
Al	RED - ON	Error (no power supply, overload, impedance error)
≈	GREEN - ON	Level display
≈	RED - ON	Overload display

Backplane connectors:

SPK1 1. Amplifier
SPK2 2. Amplifier
SPK3 3. Amplifier
SPK4 4. Amplifier





Connection V4 is connected only on the first segment of BPE07 (7-fold expansion)!

For use with *Standby amplifier* there is a 2-pin connection on the backplane to all amplifiers, to which the *Standby amplifier* switches its output. At each amplifier slot, this disaster line is segmented by solder bridges(**HV**x). They must be closed at the *Standby amplifier* and at those all amplifiers that are involved in the disaster plan.
On the backplane BPE07 (extension for 7 V100) the disaster line is segmented by more solder bridges (**HG** x). They have to be closed all or partially, but always in pairs.

This photo shows the solder bridges for use with *Standby amplifier*!

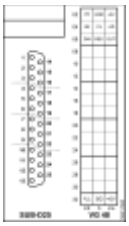
7.15 USE2

The Module supports various operation modes as used in analog telephony. The most important functions are feeding and the generation/detection of DTMF, pulse dialing and ringtone.

Operation mode *PBX*

Telephone interface with feed to switch on telephone devices

Level incoming	AF input amplification (from external device to module)
Level outgoing	AF output output attenuation (from module to external device)
Number of suffix digits	Number of DTMF suffix digits
Speech timer	Time after which the connection is disconnected compulsorily

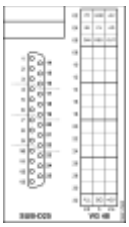


Backplane connectors:
T a/b - Line

Operation mode Telephone subscriber

Telephone subscriber operating on exchange or telephone system

Level incoming	AF input amplification (from external device to module)
Level outgoing	AF output output attenuation (from module to external device)
No. of calls	Number of rings until pick-up
Number of suffix digits	Number of DTMF suffix digits
Speech timer	Time after which the connection is disconnected compulsorily

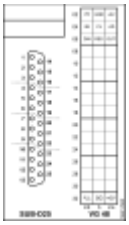


Backplane connectors:
T a/b - Line

Operation mode *Doorline*

Activation of a door intercom

Level incoming	AF input amplification (from external device to module)
Level outgoing	AF output output attenuation (from module to external device)
Number of suffix digits	Number of DTMF suffix digits
Speech timer	Time after which the connection is disconnected compulsorily



Backplane connectors:
T a/b - Line

Operation mode transparent

USE2 Firmware	PIC1: 2104d_lon4_ob5
	PIC2: 2211 beta
DVS Firmware	ab 7.23
ICS Version	7.00 Rev. 011

Transparent connection of analog telephone connections of Type *USE2*. (e.g. remote modem via 2Mbit line connected by means of telecommunications technology)

The connection can only be set up from the modem.

- Pick-up, the remote side engaged by closing the loop
- Set up AF channel
- Dialing by MFV (DTMF) via the opened AF channel

Recommended programs:
LB connection
LB forwarder

Note! The modem-side must be configured as master!

Info: 0 (without function)

Byte 1 (Hybrid): Byte 1 generated by the addition of the following values: (see also Hybrid balance)

Hybrid amplification	0 - 31
Filter active/bypass	32
negative overlap	128
positive overlap	128 + 64

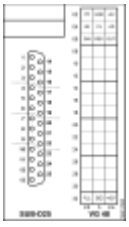
Call level	Value range 60 - 95 (1,9 - 4,6W at 1 kOhm) (Default 80 (3,2W at 1 kOhm)
Timer count	(no function)
Range (AF)	(no function)
AF frequency	0 (no function)

Hybrid balance (starting from the right on the circuit diagram)
The hybrid serves to separate transmitted and received signals in 2-wire connections.

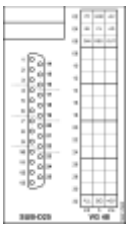
Bi-Quad Filter	Phase correction of lower to medium frequencies
P/Z Filter	Phase correction of medium to upper frequencies (1 = default)
Hybrid amplification	Level of the hybrid circuit
Polarization	Positive or negative overlapping
Level incoming	AF input amplification (from external device to module)
Level outgoing	AF output attenuation (from module to external device)
Auto-Online level	In the case of the option being active, a change in the filter always triggers the transmission as Online level automatically! This is merely an aid to filter adjustment. It is of no relevance in terms of the function!

Value set of Balance Circuit / *Value set of audio level*
Values that have been tested or determined in the laboratory are stored here.
They serve as the initial values for measurement.

The values of the limit, filter and switch can be transferred via the Online level!



Backplane connection (Modem):
T a/b - Line



Backplane connection (PBX):
T a/b - Line

Operation mode *LB*

LB = Local Battery, operation by means of a local battery without central supply (crank and field phones)

USE2 Firmware	2104e
DVS Firmware	>= 7.62

Activation, connection and tunneling of LB party lines via two modules *USE2*.

- LB Ringing tone recognition
- LB Ringing tone recognition, Regeneration
- Voice connection
- LB Repeater mode

Recommended programs:

LB connection
LB forwarder
LB splitter (Repeater mode)

Info: 0 (without function)

Byte 1 (Hybrid): Byte 1 is calculated by the addition of the following values: (see also Hybrid balance)

Hybrid amplification	0 - 31
Filter active/bypass	32
negative overlap	128
positive overlap	128 + 64

Call level: Value range 60 - 95 (1,9 - 4,6W at 1 kOhm) (Default 80 (3,2W at 1 kOhm)

Timer count: switch-off time after voice detection
Value 255 prevents a switch-off (Dedicated line)

Range (AF): Response threshold of voice detection

AF frequency: 0 (without function)

Hybrid balance (starting from the right in the circuit diagram)
The hybrid is used to separate the transmission and reception signal in 2-wire connections.

Bi-Quad Filter: Phase correction of lower to mid frequencies

P/Z Filter: Phase correction of mid to high frequencies (1 = default)

Hybrid amplification: Level of the hybrid circuit

Polarization: Positive or negative overlap

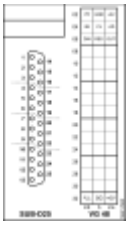
Level incoming: AF input amplification (from external device to module)

Level outgoing: AF output attenuation (from module to external device)

Auto Online Level: In the case of the option being active, a change in the filter always triggers the transmission as Online level automatically! This is merely an aid to filter adjustment. It is of no relevance in terms of the function!

Value set of Balance Circuit and *Value set of audio level*
Values that have been tested or determined in the laboratory are stored here.

The values of the limit, filter and switch can be transferred via the Online level!



Backplane connectors:
OB a/b - Party line

Operation mode *Motorola radio*

No support

Operation mode Announcement manager

Customer-specific! Connection of visual display workstations made by Vossloh via an analog telephone interface

A connection is set up with the desired PA target by means of a specific DTMF suffix (6 tones). A DTMF tone sequence is permanently assigned to a Line.

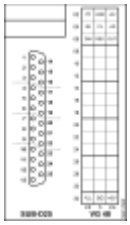
Assignment scheme:
(1=Set, 2=100, 3=10, 4=Vacant, 5=1, 6=Prio (not used))
Example:

101010	Port 1, Line 11
108090	Port 1, Line 89
211020	Port 2, Line 112

Level incoming	AF input amplification (from external device to module)
Level outgoing	AF output attenuation (from module to external device)
No. of calls	Number of rings until pick-up
Speech timer	Time after which the call is disconnected automatically

---

Backplane connectors:



T a/b - Line

Display and control elements:

LEDs

↓	GREEN - ON	Incoming call signal, voice signal detected
↑	GREEN - ON	Outgoing call signal
On	GREEN - ON	Connection active
Al	RED - ON	Error or invalid call signal (OB)

7.16 TG01

Tone generator for Impedance Measurement Module 4LSL

Impedance testing time Duration of impedance measurement

Note! Settings are no longer required as from 4LSL Firmware 4102!

Line function:
Port 1:

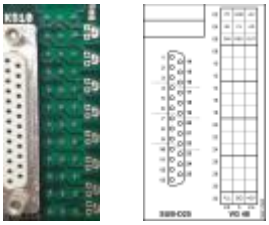
Line 5	CPU -> M	Begin measuring (Switch on tone generator)
Line 6	CPU -> M	Measurement completed (Tone generator off)
Line 7	CPU -> M	Begin measuring (Switch on tone generator)
Line 8	CPU -> M	Measurement completed (Tone generator off)
Line 6	M -> CPU	Ready to measure (Tone generator running) (Line 11 to 4LSL)
Line 8	M -> CPU	Ready to calibrate (Tone generator running) (Line 12 to 4LSL)
Line 33	M -> CPU	Earth leakage detected

Display and control elements:

LEDs

Test 1	GREEN - ON	Test signal active
Test 2	GREEN - ON	Supply voltage available
Al 1	RED - ON	No function
Al 1	RED - ON	Earth leakage or bridge missing on backplane

Backplane connectors:



M a/b - Output for 4LSL measuring frequency

Important! Close both bridges on Set 4 of the backplane!

7.17 4LSL

Measurement module for loudspeaker line (LL) monitoring (impedance, short circuit, line break), loudspeaker line toggling and voice acknowledgment when public address is made

up to Module Firmware 2106

AD Converter (U)	Voltage threshold at AD Converter of the voltage path
AD Converter (I)	Voltage threshold at AD Converter of the current path
Tolerance	permissible deviation from the measured reference values

as from Module Firmware 2110

Disable in case of short circuit	Loudspeaker relay is disabled if the impedance measurement detects a short circuit
AD Converter (U)	Voltage threshold at *AD Converter* of the voltage path
AD Converter (I)	Voltage threshold at *AD Converter* of the current path
Tolerance	permissible deviation from the measured reference values
Check measuring (twofold)	Verification by a 2nd measurement before a warning is issued

as from Module Firmware 4102

DVS Firmware	as from 7.60
ICS Version	as from 7.00 Rev. 036

Disable in case of short circuit	Loudspeaker relay is disabled if the impedance measurement detects a short circuit
AD Converter (U)	Voltage threshold at *AD Converter* of the voltage path
AD Converter (I)	Voltage threshold at *AD Converter* of the current path
Short circuit, emergency switch-off!	Emergency switch-off if a short circuit is detected during a public address
Enable after shortcut removal	Public address is only possible if an impedance measurement is made without a short circuit

Impedance measurement	Enable impedance measurement
Tolerance	Permissible deviation from the measured reference values
Check measuring (twofold)	Verification by a 2nd measurement before a warning is issued
Not disable if beyond load range	Loudspeaker line < 2,5W and >200W is not disabled when measurement is made
Temperature compensation	Selection or creation of an averaged temperature profile for compensation of temperature-related deviations

Temperature profile

The temperature profile consists of a day profile (red line) and a night profile (blue line).

The day profile is freely configurable. The night profile is reduced by the*Night time adjustment* correction value.

Day and night mode each begin at the time set in *Day* and *Night*.

Note! Operation with temperature compensation requires the *Flag timing* program to send the Module a timestamp every hour.

Online control

This dialog is used for active support at start-up and for the required setting and measurements.

All activities of the Module are displayed in real time. Errors, messages and states are indicated by LEDs and plain text messages. Measurement data is also displayed graphically.

After **Activation** of the online status, a version test of the module and DVS firmware takes place.

Activate	Activates the online status for this dialog
TG01 Address	Address of the tone generator TG01
Start measuring	Starts the measuring process by triggering the TG
Levelling	Starts the calibration process of the TG
Online level	Transfer of all values for voltage, current, tolerance, as well of the temperature profile to the system. **Important!** Values transferred online are not stored permanently! Values determined must be stored in the programming and transferred to the system!

Line function:
Input Line n
Port 1 - 4:

Line 1	CPU -> M	Night setback (Increase in response sensitivity by 10dB)
Line 3	CPU -> M	Public address, switching LL relays, potentially active measurements are parked
Line 4	CPU -> M	Level display for current and voltage display on (bar graph)
Line 9	CPU -> M	Individual processing: Measurement
Line 10	CPU -> M	Individual processing: Calibration

Port 1:

Line 8	CPU -> M	Impedance measurement takes place with the loudspeaker circuit disabled
Line 11	CPU -> M	Automatic measuring process
Line 12	CPU -> M	Automatic calibration process
Line 13	CPU -> M	Earth fault report from TG01 (Port Identification)
Line 14	CPU -> M	Pause automatic measuring process, proceed with current Port
Line 15	CPU -> M	One-off transmission of all status telegrams for online dialog, then controlled by Events

Output Line n
Port 1 - 4:

Line 1	M -> CPU	Connected load too low (when calibrating)
Line 2	M -> CPU	Positive PA acknowledgment
Line 3	M -> CPU	Negative PA acknowledgment, ON until next positive public address
Line 4	M -> CPU	Loudspeaker line on Port has earth fault
Line 5	M -> CPU	Short circuit at last measurement
Line 6	M -> CPU	No load at last measurement

Line 7	M -> CPU	Connected load too high (when calibrating)
Line 9	M -> CPU	Impedance error
Line 10	M -> CPU	No measuring signal
Line 11	M -> CPU	Completion message of automatic measuring process
Line 12	M -> CPU	Completion message of automatic calibration process
Line 13	M -> CPU	Port not correctly calibrated
Port 1:		
Line 8	M -> CPU	Display of information: "Impedance calibration takes place with loudspeaker line disabled"
Line 14	M -> CPU	A port with an impedance error, short circuit or line break
Line 15	M -> CPU	Any port with earth fault (Input Line 13)
Line 16	M -> CPU	Any port with impedance error, short circuit or line break

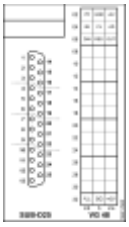
Display and control elements: (Normal mode)

LEDs

M	GREEN - OFF	no measurement
	GREEN - ON	measurement active
	GREEN - FLASHING (slow)	ON-LED ON: Measurement interrupted or pending due to priority of a public address, or blocked by Line 14. ON-LED OFF: S Safety lock active (2 sec)
ON	GREEN - OFF	no public address request
	GREEN - ON	Public address active, no acknowledgment
	GREEN - FLASHING (fast)	Public address active, positive acknowledgment
	GREEN - FLASHING (slow)	Public address denied due to short circuit
AL1+2	RED - OFF	Port is calibrated no fault
	RED - FLASHING (slow)	Measurement disabled due to insufficient load. (<2,5W)
AL1	RED - FLASHING (slow)	Measurement disabled due to excessive load (>150W) or no signal from TG01.
	RED - ON	Impedance error detected (Tolerance exceeded)

	RED - FLASHING	Impedance error detected (short circuit)
	RED - FLASHING (fast)	Impedance error detected (line break)
AL2	RED - ON	Earth fault detected

Backplane connectors:



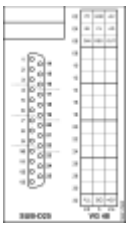
AMP a/b - Input from amplifier
SPK a/b - Output to the loudspeakers
M a/b - Measuring frequency input from TG01

7.18 4DSS

The module is designed to connect UZ-ELA modules. UZ-ELA = Control sub-center for loudspeaker system (German derivation "UnterZentrale für Elektronische LautsprecherAnlage").
All interfaces (RS485) are galvanic isolated, protected against overvoltage and overcurrent.
The UZ-ELA-module allows remote PA.
A 2W-amplifier is integrated.
External PA-amplifiers can be connected. The feedback of the loudspeaker cable to the 100V input enables the monitoring of the loudspeaker line.

The configuration of UZ-ELA modules is done with *Separate amplifier* in the menu *Call stations and devices*.

Backplane connectors:



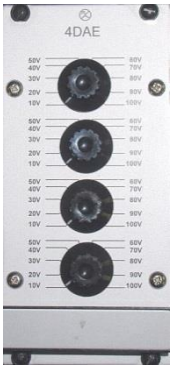
+/- - Power supply
a/b - Line

7.19 4DAE

Passive module for manual attenuation of 4 loudspeaker lines. This module acts within the programming as a placeholder for documentation purposes.

No configuration required!

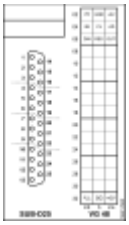
Display and control elements:



Switches

Rotary control switch for appropriate damping

Backplane connectors:



IN a/b	Input, from the amplifier
LK1 a/b	Output 1
LK2 a/b	Output 2
LK3 a/b	Output 3
LK4 a/b	Output 4

8 Call stations and devices

8.1 Overview

This category contains call stations and other devices like measuring microphones.
Stations are divided into two main groups. ProCom digital stations (own stations) and analog stations from other manufacturers (*Third Party* - Call stations).

Before call stations and devices are set in the programming the modules must be set in the page *Module rack*!

8.2 ProCom Call stations

There are ProCom call stations in the following configurations:

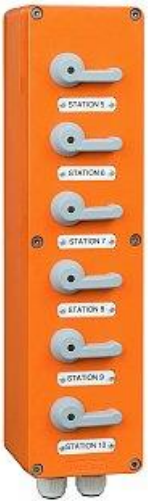
- as a desktop call station (DTA-xx) with 12 - 114 keys (4-wire technology)
- as a built-in call station (PMK) with 16 - 96 keys (4-wire technology)
- as a weatherproof outdoor call station (WPS-xx) with 4 - 8 toggles (2- and 4-wire technology) extension units with 6 toggles (AWC-06) up to a maximum of 38 toggles
- as a weatherproof emergency call station (WPS-PL) with 1 or 3 keys (Party line)

Call stations (extract from the delivery program)


DTA-30 (desktop call station)


WPS-04 (weatherproof)


WPS-08 (weatherproof)


AWC-06 (extension)

WPS-PL (Party line)

ProCom stations in 4-wire technology are connected to the *4NSA* modules (4 per module).
ProCom stations in 2-wire technology are connected to the *4DAV* modules (4 per module).
ProCom emergency call stations for the party line are connected at the module NSAPL (1-26 per module)

The arrangement of keys/toggles on ProCom stations can be found in Appendix "Station keypads"!

General data

Common adjustments like the identity, behavior and level of a call station.

Type	Differentiation in the connection technology (2-wire or 4-wire)
Module address, Port	Address and port to which the call station is attached
Name	Unique number of the device The number belongs to the pool of the call station numbers in the system and it must be unique. The button *Get* adopts a noted description from *Address description*.
Micro control	Sensitivity of the microphone pre-amplifier (adjustment range)
Intercom interval time	The levels for the call station and the additional amplifier can be adjusted automatically on the level *Call* by the first response after that the level *Normal* is adjusted and used as long as in the adjusted time is spoken.
Flag Night operation	Flag for the activation of the night operation. On activated Flag/L> the *Level Night* is adjusted. (an adjustment of time can be realized with the program *Flag timing*)
Level-Radio monitoring (**only Desktop**)	Level of play back signal which is provided via the monitor input Ma/b into the call station.
Booster amplifier	All ProCom call stations can be operated with a 25 W *Booster amplifier*. The weatherproof call stations (WPSxx) have a built-in amplifier. Into the *Desktop*- and *Flush mount*- call stations the external amplifier "BA-25" has to be additionally mounted.
Level Normal	Normal level of the play back
Level Call	Raised level by the first response (**only with *Intercom interval time***)
Level Night	Level during active *Flag Night operation*

Activate	Activates the online status for the dialog
Online level	Transmission of the values *Receive level, Micro control* and *Level-Radio monitoring*. **Attention!** Online transmitted values are not permanently saved! Measured values must be saved while programming and saved into the system.
Default Level	Sets all levels on the default values of *System data* *Default volume - intercom*.

Keys

Programming takes place by means of selection from the list *Programs* and a click on the desired key in the display. A click on a programmed click (Line) opens an existing program.
Programming of a key (Line) can also take place via the *program overview* by direct input of the address, port and line (key) in the desired program!
Programmed keys (Lines) are displayed in color in accordance with the legend!

Required housings	Depending on the selection of the *No. of keys* when setting up a call station, (*Creating a call station*) the respective additional housings is listed here in addition to the basic housing. One can toggle between the devices by clicking on the list.

Special functions
(**only *Desktop/Flush mount***)

Loud/quiet keys	Two keys can take over the individual volume setting. (Plus/Minus) The selection of this key expands the *Receive level* and *Booster amplifier* fields. Entering the min. and max. determines the range of the keys.
Headph. key No.	**only *Desktop*** If the call station is a special version with a headphone connection, a key can assume the function of toggling between the headphone and internal speaker.
Handset switch-over	**only *Flush mount*** If the call station is a special version with a handset, a key can assume the function of toggling between the handset and the internal call station microphone.

Programs	List of available programs! Selection takes place by highlighting the desired program and clicking on a key. The program dialog box opens for further configuration of the target or function. On leaving the program by means of the *OK* key, the key is programmed.

8.3 Third party-Call stations (Analog)

Connecting analog stations with line technology requires at least two modules. The wires of the lines (keys) are connected to the *24LI* module, and the AF line is connected to a *4NPA* module.

24 lines (keys) can be connected to a *24LI* module.
AF lines of four stations can be connected to a *4NPA* module.

General data

Common adjustments like the identity and behavior of analog call stations.

Station number	Unique number of the call station
Module address, Port	Address and port of the module to which the AF line of the call station is connected (*4NPA*).
Name	Labeling of the call station The button *Get* adopts a noted description from *Address description*.

Keys

Programming takes place by means of selecting and clicking the desired line from the *Programs* list in the line module display. A click on a programmed key (line) opens a program that is already available. Programming of a key (line) can also take place by means of the *program overview* by entering the address, port and line (key) in the desired program.
Programmed keys (lines) are indicated by means of color in accordance with the legend.

24LI	The list contains all available modules *24LI*. To select a module, highlight it with a click. Additional modules can be created by means of the *New* button.

Programs	List of the programs available! Selection takes place by highlighting the desired program and clicking on a Line (LED) in the module graphic. The dialog box of the program then opens for further configuration of the target or the function.

8.4 PCS (PC call station)

The connection of one or more PCS is at the Ethernet connector of the module *LCPU*. The setting of a PCS as a call station is for the documentation at this time.

Station number	Unique number of the device The number belongs to the pool of the call station numbers in the system and it must be unique.
Module address, Port	Address and port of the module at which the PCS is connected. (*LCPU*)
Name	Labeling for the call station The button *Get* adopts a noted description from *Address description*.

8.5 Measuring mic

It is necessary to register a *Measuring mic* as a call station so that the monitoring of the fuses of the module *MI4M* is activated by the CPU.

Station number	Unique number of the device The number belongs to the pool of the call station numbers in the system and it must be unique.
Module address, Port	Address and set of the module at which the *Measuring mic* is connected. (*MI4M*)
Name	Labeling for the *Measuring mic* The button *Get* adopts a noted description from *Address description*.

8.6 Separate amplifier

Spatially separated analog amplifiers can be controlled by using the Separate amplifier function. Control takes place by means of the *4DSS* (RS485) module and UZ-ELA modules connected to it.
The UZ-ELA-Module enables remote PA.
A 2W-Amplifier is integrated.
External PA-Amplifiers can be connected. By feeding the loudspeaker line back to the 100V-input, it is possible to monitor the loudspeaker line.

UZ-ELA = Control sub-center for loudspeaker system (German derivation "UnterZentrale für Elektronische LautsprecherAnlage")

Configuration of the Separate amplifier device takes place in the *Call stations and devices* dialog.
Programming takes place by means of the *PA Public address* program.

Settings

Amplifier No.	Unique number of the amplifier in the system
Address, Port	Address and port of the module to which the RS485 data line of the UZ-ELA module is connected. (*4DSS*)
Subscriber No.	ID for addressing the module (see *Activated amplifier* in Program *PA Public address*)
Volume	Volume/Level of the amplifier
System call	Integration in a system AllCall. (see *AllCall*)
Online level	*Level* is transferred to the amplifier

Measurement

Start measuring starts a reference measurement
Control measuring starts a comparative measurement

The reference value of the measurement is only stored in the configuration file when saved. The configuration file must be transferred to the system, in order for the impedance test to operate with this value.

9 Programs for AF-transfer

9.1 Overview

Explanation of the parent configuration boxes of many AF-programs!

Priority, Audio channel, Audiokompression

Priority
There are 255 levels available, with 1 being the highest. Priorities are dealt with on destination. If a program finds an occupied destination, the priorities of both programs are compared. If the priority of the new connection is higher, the existing connection will be displaced.

Fixed audio channel
In programs with this channel box is the possibility to use a fixed audio channel instead of a dynamic one. It is useful in conjunction with a DSS1 because this module works with eight predefined channels.

Codec
Audio compression method of the codec for the actual connection.
The options are: µLaw (default), ADPCM (7kHz) and aLaw

Please note: Depending on the firmware of the module and the equipped codec type, different combinations of audio compression methods are available.

Codec IC (with pins)	µLaw and aLaw
Codec IC (SMD)	µLaw, aLaw and ADPCM (7kHz)

9.2 Alarm lead 2

Program to control the Module *DSS1* in Operation mode *Speech storage*.

- Playback of recorded sounds.
- Upstream connection of a pre-announcement chime before public address or group calls.

Priority	Handling of priorities (see Section 9.1) **!!!** Linked programs must have the same priority.
Alarm flag	[IO] *Flag* for linking to the *PA Public address*, *AllCall* programs or *ZZ connection* via its ***Lead flag***. To preselect multiple records, multiple programs with an identical *Alarm flag* can be created. The *Alarm flag* operates bi-directionally and contains information regarding the audio channel.

Call station function

- Preselection of chime or alarm tone before announcements
  (see Examples 2-5)
- Alarm function with manual voice input
  This function is only possible on ProCom stations.
  Playback of alarm tones can be triggered. Voice input can be made in the running playback.
  Playback can be stopped.
  (see Example 1)

Address, Port	Address and port of the station
Line	*Line* (key) for preselection or to start playback
Preselection duration	An announcement with chime must be started within the specified time. Otherwise the preselection that has been set is reset when the time expires.
PTT line	*Line* (key) to input voice in the playback while it is running.
Clear line	*Line* (key) to cancel the playback while it is running
Lighting when alarm is active	Display of the active playback by illumination of the key

External contact
Triggering of playback by a *Line*.

Address, Port, Line	Address, port and line of a module, via which the playback is triggered.
Flag (OUT)	[OUT] The *Flag* is switched on, if the *Line* (*External contact*) is switched on.

Tone/Speech message

DSS1 Address, Port	Address and port of the module *DSS1*, that is used as the speech memory
Message number	Entry marker in the memory, from which the playback takes place. The playback starts at the specified mark and ends at the end of the memory area, by switching off or after a set time. Depending on the extent and subdivision of the memory area, recordings of approx. 1x 60sec to 8x 8sec are possible.

Message duration	Specification of the precise duration of the recording (Unit = value x 50, 100, 150 or 200ms) In the event of a permanently pending start criterion, a renewed playback takes place after this time. If the start criterion falls away, the current playback is ended only if the *Message duration* and *Repetition rate* conditions are fulfilled.
Repetition rate	Number of automatic repeats (Non-functional in the case of a permanently pending start criterion!)
Interval time	Pause between automatic repeats (unit = value x 50ms)

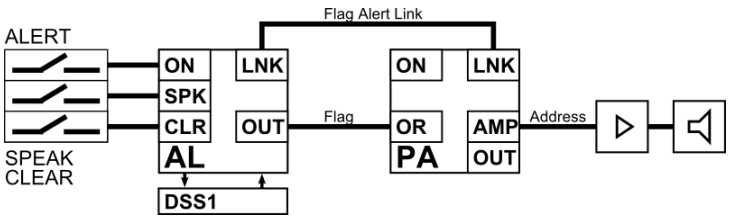
Special functions

Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Flag (OR)	[IN] The program can be switched on by this flag.
Flag (OUT) 1/2	[OUT] The flag is switched on if the program is activated. Further programs can be activated thereby for adaptation to own requirements.
Input Busy flag	[IN] The program is set to the *Busy* status. There are situations in which not all programs recognize the status automatically. In these cases, the status must be transferred explicitly.
Output flag with alarm preselect keying	[OUT] *Flag* starts linked programs via its ***OR Flag***

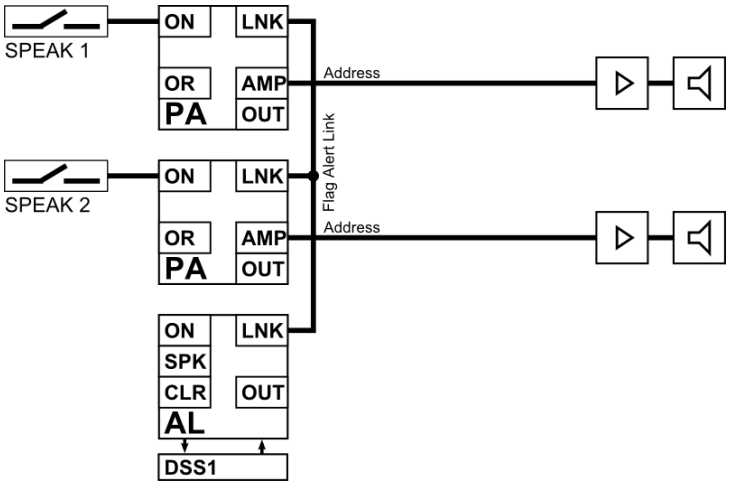
Programming examples (see Menu Help - Examples)

Legend

AL - Alarm lead 2
PA - *PA Public address*
SW - *Contact switch*
AF-SW - *AF switching*
Flag Alert Link - Alarm flag/Lead flag

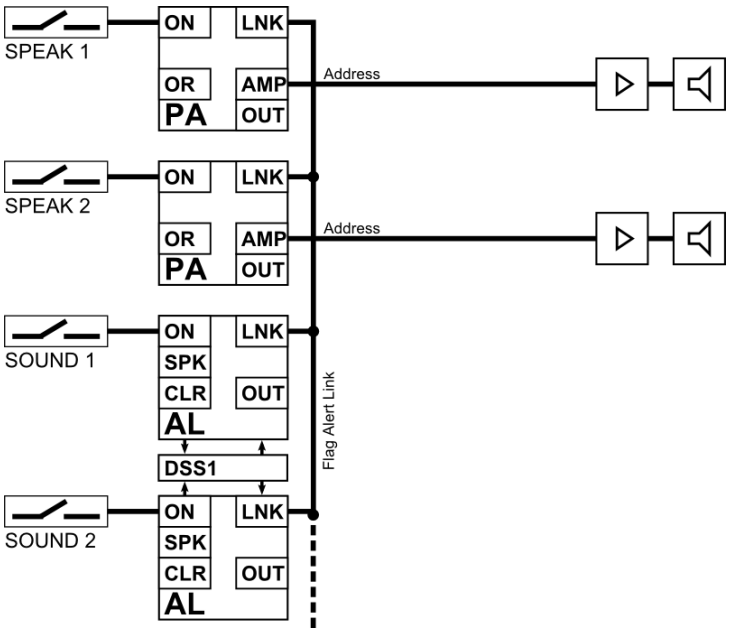


Example 1: Alarm function with manual voice input
Programming example: DSS1_PA_Alarm_1



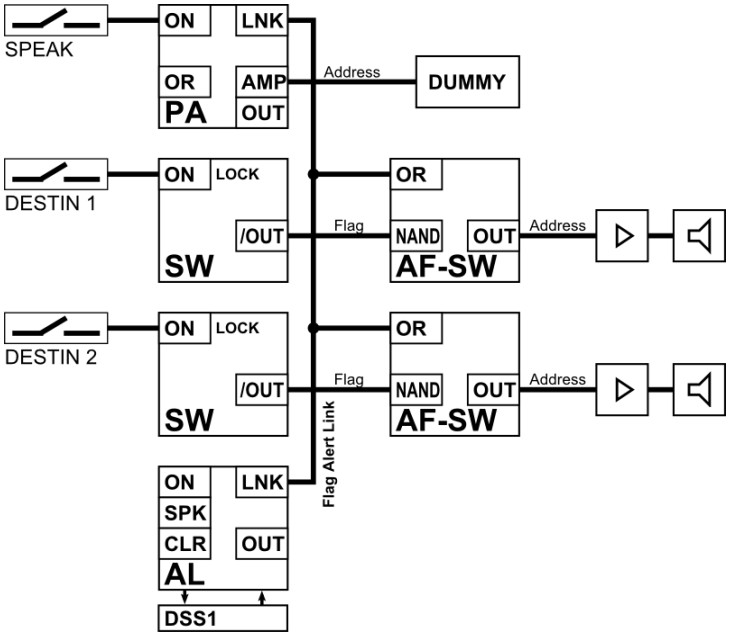
Announcement with chime
Programming example: DSS1_PA_Gong_1

- Targets with fixed assignment
- Chime permanently programmed



Example 2: Announcement with connectible chime
Programming example: DSS1_PA_Gong_2

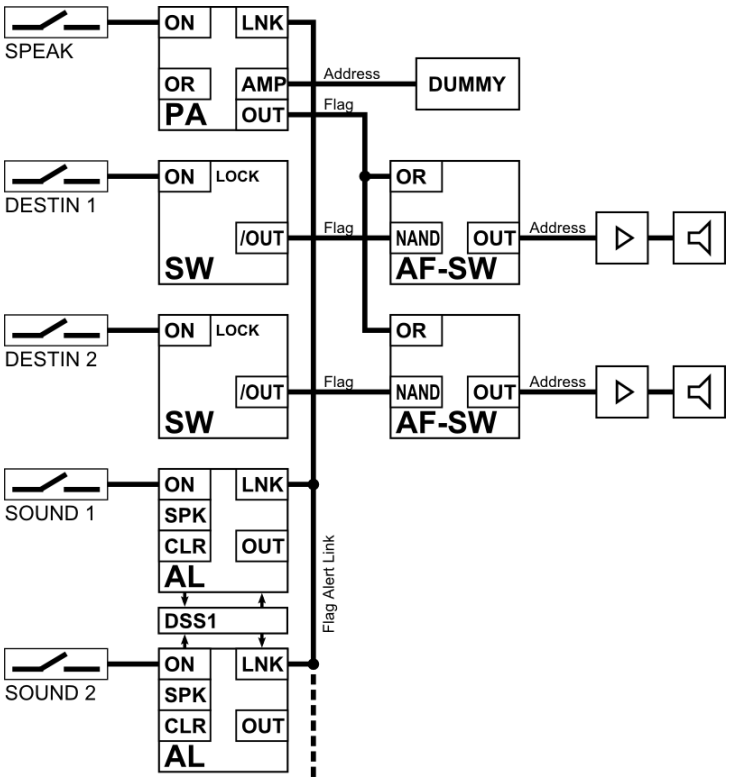
- Targets permanently assigned
- Chime selectable (without, Chime 1, Chime 2)



Example 3 & 4: Announcement with variable target selection and chime
Programming example:
DSS1_PA_Gong_3, DSS1_PA_Gong_4

- Targets individually selectable
- Chime programmed permanently

*Dummy - see next example



Example 5: Announcement with variable target selection and connectible Chime
Programming example: DSS1_PA_Gong_5

- Targets individually selectable
- Chime selectable (without, Chime 1, Chime 2)

*Dummy
The PA Public address program required for the functioning of a **Valid address** at the amplifier output. Without this dummy, the program cannot be activated.
The following modules can assume the dummy function:
- any port of a 4IOS. (also for other uses)
- an **unused** port of a 4NSA/4NPA
- the port of the particular call station

9.3 Fault report sequence 1

Display and acknowledgment of a fault report on ProCom stations. Playback of recorded tones or speech from the *DSS1* module (Operation mode *Speech storage*).

Priority	Handling of priorities (see Section 9.1)
Input	
Address, Port, Line	Address, port and line of the module, which reports the fault. (e.g. the die combined fault of the *SV01* module or an optocoupler of the module *4IOS*)
Call station	
Address, Port, Line	Address, port and line (key) of a call station for display acknowledgment. Statuses: Fault new - LED flashes, playback of the recording Fault acknowledged - LED on No fault - LED off
Tone/Speech message	
DSS1 Address, Port	Address and port of the *DSS1* module, which is used as the speech memory
Message number	Entry mark in the memory area from which playback takes place. The playback starts at the specified mark and ends at the end of the memory area, by switching off or after a preset time. Depending on the duration and subdivision of the memory area, recordings of approx. 1x 60sec up to 8x 8sec are possible.

Message duration	Specification of the precise duration of the recording(Unit = value x 50, 100, 150 or 200ms)
Interval time	Pause between automatic repeats (Unit = value x 50ms)
Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Flag (OR)	[IN] The program can be switched on by this flag.

9.4 IC Intercom

Program to establish **local** IC connections

For **one** connection between two call stations, **two programs** are used. Each program is programmed on a key of the call stations involved.

The program is compatible with the *IC Intercom gate* program! Unilaterally-controlled connections can be set up in this way.

In each case the association arises from the *Station number* of *Destination call station*. Specification of the *Destination call station* is required in both programs. All further specifications are optional.

Priority	Handling of priorities (see Section 9.1)
Codec	Audio compression method by which the codec handles the actual connection. The options are: µLaw (default), ADPCM (7kHz) and aLaw (see Section 9.1)
Latching key	The connection is established and remains one-sided until the key is pressed again. The remote station can reverse the direction and reply. The priorities can be the same.
Own/Analog	Selects the type of call station (ProCom- or Analog- call stations).
Input/call station (Setting *Own*)	
Address, Port, Line	Address and port of the module to which the call station is connected and the line (key) that is used. (*4NSA*)
Input/call station (Setting *Analog*)	
Address AF, Port	Address and port of the module to which the AF line of the call station is connected. (*4NPA*)
Address 24LI, Port, Line	Address, port and line of the module to which the control line of the call station is connected. (*24LI*)
Call storage	Time for the key is illuminated (flashing) after missed calls
Destination call station	
To enter address	The address of the destination is specified directly and not determined via the *Station number*.
Station number	Unique number of the *Destination call station*

In AllCall number .. of destination call station	This side of the IC connection becomes an AllCall function in addition to the target. The association is determined by selecting one or more AllCall numbers. The AllCall function is programmed on the *Destination call station* by means of the *AllCall* program. The AllCall number is also assigned there.
Handset	If the station is equipped with a handset, then the *Accept call* option, the *Latching key* option and *Line* 100 must be assigned as the call line.
Special line	The line is switched on if the program is activated. For example, relays can be switched or keys can be illuminated.
Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Flag (OR)	[IN] The program can be switched on by this flag. The acquisition of AF channels is possible.
Flag (OUT) 1/2	[OUT] The flag is switched on if the the program is activated. Further programs can be activated thereby if adaptation to individual requirements is required.

9.5 IC Intercom Door (unilaterally-controlled Intercom)

The program, in conjunction with the *IC Intercom* program, sets up a local unilaterally-controlled connection. It is programmed on a permanently-occupied station (e.g. control station). It assumes control of calls and ends them. A connection can be set up from both sides.
The program requires a higher priority than the associated IC Intercom.

An optimized version is to be found in the Examples menu. This enables improved signaling and toggling between multiple satellite stations.

Priority	Handling of priorities (see Section 9.1)
Own/Analog	Selects the type of call station (ProCom or analog call stations).
Input/call station (Setting *Own*)	
Address, Port, Line	Address and port of the module to which the call station is connected and the line (key) that is used. (*4NSA*)
Input/call station (Setting *Analog*)	
Address AF, Port	Address and port of the module to which AF line of the call station is connected. (*4NPA*)
Address 24LI, Port, Line	Address, port and line of the module, to which the control line of the call station is connected. (*24LI*)
V-Point-Line	In the case of analog stations, the microphone amplifier is normally switched on internally by activating a PTT key. As the control system takes control in this case, the microphone amplifier must be switched on by a switching voltage. The *V-Point-Line* specifies the output of the associated 24LI that must provide this switching voltage.
Clear line	The connection can be broken via this *Line* (key).
Call storage	Time for which the key is illuminated (flashing) after missed calls
Shutdown time	Time since last key-stroke after which the connection is broken

Destination call station	
To enter address	The address of the destination is specified directly and not determined via the *Call station number*.
Call station number	Unique number of the *Destination call station*

Special line	The line is switched on if the program is activated. For example, relays can be switched or keys can be illuminated.
Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Flag (OR)	[IN] The program can be switched on by this flag. It is possible to acquire AF channels.
Flag (OUT) 1/2	[OUT] The flag is switched on if the program is activated. Further programs can be activated thereby if adaptation to individual requirements is required.
Busy flag	[OUT] for processing the busy state
Clear flag	[IN] The connection can be broken by means of this flag.

9.6 IC Group

The *IC Group* program established a connection with multiple call stations simultaneously. Calls take place without further configuration as a "conference" (each to each)

Priority	Handling of priorities (see Section 9.1)
Codec	Audio compression method by which the codec handles the actual connection. The options are: µLaw (default), ADPCM (7kHz) and aLaw (see Section 9.1)
Interval time	By specifying a time <> 0, a group call switches, once a subscriber has answered, to a selective IC call between the two subscribers. The call remains selective, as long as someone speaks within the time.
No receiving in idle state	The call station does not receive any calls of the group. It can, however, establish a connection to the group. Having said this, by using the **programmed *Interval time*** a selective call can be made by a subscriber replying.
Own/Analog	Selects the type of call station (ProCom or analog call stations).

Input/call station (Setting *Own*)	
Address, Port, Line	Address and port of the module to which the station is connected and the line (key) that is used. (*4NSA*)
Input/call station (Setting *Analog*)	
Address AF, Port	Address and port of the module to which the AF line of the call station is connected. (*4NPA*)
Address 24LI, Port, Line	Address and port of the module to which the control line of the call station is connected. (*24LI*)
Call storage	Time for which the key is illuminated (flashing) after missed calls

	4NSA - Standard, for local operation
4NSA USE1 2Mbit	***USE1*** - for USE1 control station connection Attention! Only up to Hardware version 2 (not for new systems)! Program *USE1 intercom* only up to DVS Firmware 7.21
	2Mbit - A group allocated to multiple systems uses a multi-channel digital connection for transmission via the following modules: *4FTR*, *LCPU*
AllCall number of own station	A group can be integrated in a *AllCall* as a destination. The association is determined by selecting one or more AllCall numbers. The option is activated in the program of the group, in which the *AllCall* program is also programmed on the call station.
Group flag	[IO] All programs with the identical *Group flag* belong to one group.
Input Busy flag	[IN] The program is transferred to the *Busy* status. The associated key is illuminated. There are situations in which not all the programs detect the status automatically. In these cases the status must be conveyed explicitly.
Output Busy flag	[OUT] The flag is switched on if the program switches to a *Busy* status.
Set group busy indication	The program activates a *Busy* status if the specific station is engaged.
Consider and show group busy indication	The program switches to a *Busy* status. Only if no subscriber has a *Busy* status is the connection established.
Address partial group despite of being busy	The connection is established even if the individual subscribers have a *Busy* status.
Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Flag (OR)	[IN] The program can be switched on by this flag. The acquisition of AF channels is possible.
Flag (OUT)	[OUT] The flag is switched on if the program is activated. Further programs can be activated thereby if adaptation to individual requirements is required.
Special line	The line is switched on if the program is activated. For example, relays can be switched or keys can be illuminated.
Blocking - acoustic feedback	To avoid feedback, stations in a group that are in one room, can be incorporated in a sub-group. Announcements are suppressed within the specific sub-group. Only stations (of the group) that are not members of the sub-group are controlled.

9.7 Intercom radio 2

Program to switch on radio stations with differentiation of frequency bands when using the *DSS1* module in the *DB-Radio* (*Tone call*) mode

Priority	Handling of priorities (see Section 9.1)
Own/Analog	Selects the type of call station (ProCom or analog call stations).
Input/call station (Setting *Own*)	
Address, Port, Line	Address and port of the module to which the call station is connected and the line (key) in use. (*4NSA*)
Input/call station (Setting *Analog*)	
Address AF, Port	Address and port of the module to which the AF line of the call station is connected. (*4NPA*)
Address 24LI, Port, Line	Address, port and line of the module to which the control line of the call station is connected. (*24LI*)
Keying line	Keying in frequency band. (Key is illuminated continuously, PTT key flashes)
PTT line	*Line* (key) for the PTT key Switches the AF to the module specified under *Radio AF*. (AF line of the radio station) The fixed AF channel specified under *Audio channel - Radio AF* is used. (26/27/28/29) (see Table Fixed audio channels of the *DSS1*) module When pressing the PTT key, the *Line* and the *Flag (OUT)* specified under *Transmit switch* are activated.
Clear line	The connection can be broken via this *Line* (key).

Tone call
To differentiate radio coverage, the Railway radio stations recognize three call tones (1520, 1750 and 2135 Hz). The *DSS1* module can detect and evaluate these sine frequencies. The *Radio AF* is therefore switched permanently in idle mode to the fixed AF channel specified under *Audio channel - Radio AF*.

No DSS1 (e.g. 24LI)	The module specified by *Address, Port, Section line* is not a *DSS1*. The *Tone call* evaluation takes place externally.
Section line	When a call frequency is detected, the *DSS1* module activates the respective *Line*. The lines are permanently assigned to the frequencies. (5=1520Hz, 6=1750Hz, 7=2135Hz) (see Lines of the Module *DSS1*)
Audio channel - Radio AF	Fixed audio channels of the *DSS1* module for reception (Audio channel 26 - 29) (depending on port)
DSS1 busy line No.	The *DSS1* module is already active and no evaluation can take place. (*Line* 1) (see Lines of the module *DSS1*) Freely programmable if switched on externally.

Audio channel - send tone	The *DSS1* module generate free and busy tones for audible presentation of the states. Fixed audio channels of the *DSS1* module to transmit (Audio channel 22 - 25) tones (depending on the port)
Line Free tone	*Line* to trigger a free tone (see Lines of the module *DSS1*) Freely programmable if switched on externally.
Line Busy tone	*Line* to trigger the engaged tone (see Lines of the module *DSS1*) Freely programmable if switched on externally.
Radio AF	Address and port of the module (as a rule *4NPA*), to which the AF line of the radio station is connected.

Transmit switch
As a rule, when the PTT key is pressed the radio station must be switched from receive to transmit. The *Transmit switch* of the radio station can be controlled by means of a relay.

Address Port Line	Address, port and line (Line 3) for control of the *Transmit switch* by means of a relay of the module *4IOS*
Flag (OUT)	*Transmit switch* alternatively programmed by means of *Flag*.

Timer

Section timer	Maximum time for which the program remains keyed in radio coverage, if the PTT key is not pressed. The PTT key deactivates this timer.
Speech timer	After the last activation of the PTT key or change to the *Carrier flag*, the program is ended automatically once the set time has elapsed.

Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Radio flag	[IO] If a frequency band is served by multiple stations, all programs of the same frequency band each receive the same *Radio flag* for an exchange of status.
Carrier flag	[IN] If required, the *Carrier flag* triggers the *Speech timer*. Appropriate programming is required for this (z.B. *24LI*, *Contact switch*)
Tone identifier flag off	[IN] *Flag* deactivates detection and inhibits automatic switch-off
Radio frequency flag off (1x)	[OUT] Each switch-off of the program briefly activates this *Flag* (a system run)

Monitor loudspeaker	Prevents monitoring the frequency band on the station. The AF is made audible by means of other programs or external devices.

9.8 Intercom radio monitoring

Program for switching on monitoring option for radio on stations or PA loudspeakers. Only suitable when used in connection with ProCom stations and their **monitoring connection(Ma/b)**!

Start function	Address, port and line (key) to activate the program. (*4IOS*, *24LI*)
Radio AF	Address and port of the module (usually *4NPA*), to which the AF line of the radio station is connected.
Monitor address	Address and port of the AF module to which the monitoring connection *Ma/b* is connected.
Tone call	To suppress the *Tone call* frequencies Address, port and line of the module for *Tone call* evaluation (*DSS1*) or another module that provides the information (remote control)
Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Flag (OR)	[IN] The program can be switched on by this flag. It is possible to take over AF channels.
Flag (OUT) 1/2	[OUT] The flag is switched on if the program is activated. This enables further programs to be activated for adaptation to specific requirements.

9.9 AllCall

The *AllCall* program functions locally. Only destinations to which a voice connection can be established from the specific station by means of one of the following programs can be integrated: (*IC Intercom*, *IC Group*, *PA Public address*, *ZZ connection*).

Stations in remote systems can be addressed locally by means of the *Remote - AllCall* program and in the destination system by means of the *Remote - Intercom* program. In this instance, however, there is no option of using the pre-announcement chime or the alarm tone.

Priority	Handling of priorities (see Section 9.1)
Codec	Audio compression method with which the codec handles the actual connection. The options are: µLaw (default), ADPCM (7kHz) and aLaw (see Section 9.1)
AllCall No.	ID of the connection
Own/Analog	Selects the type of call station (ProCom or analog call stations).

Input/call station (Setting *Own*)

Address, Port, Line	Address and port of the module to which the call station is connected and the line (key) that is used. (*4NSA*)

Input/call station (Setting *Analog*)

Address AF, Port	Address and port of the module to which the AF line of the call station is connected. (*4NPA*)
Address 24LI, Port, Line	Address, port and line of the module, to which the control line of the call station is connected. (*24LI*)

USE1 connection	The Address for a USE1 switchboard connection. *System AllCall* for USE1 switchboard connection Attention! Only up to Hardware version 2 (not for new systems)! Program *USE1 intercom* only up to DVS Firmware 7.21
Special line	The line is connected if the program is activated. For example, relays can be switched or keys illuminated.
Illumination on lead flag	Address, port and line (key) for illumination during the announcement of a pre-announcement chime or alarm tone. Function subject to use of the *Lead flag*!
Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Flag (OR)	[IN] The program can be switched on by this flag. It is not possible to take over AF channels.
Flag (OUT) 1/2	[OUT] The flag is switched on the if the program is activated. This enables further programs to be activated for adaptation to specific requirements.
Lead flag	[OUT] The flag enables a pre-announcement chime or alarm tone to be connected upstream if the *DSS1* module and the *Alarm flag* is used in the *Alarm lead 2* program.
Illumination flag	[IN] to illuminate the specific key

9.10 LB connection

Program for *LB* connections and *LB* repeater via Module *USE2*
LB = Local Battery, operation by means of a local battery without central supply (crank and field phones)

Audio channel - incoming	fixed channel for AF transmission (see Section 9.1)
Audio channel - outgoing	fixed channel for AF transmission (see Section 9.1)
Transmission via 2Mbps	AF transmission takes place by means of a multi-channel digital connection (Address and port for control and AF are identical)
USE2 Address	Address of the *USE2* module to which the multi-party line is connected.
USE2 identifier	ID of the *LB* connection
Master/Slave	A *LB* connection always consists of a master module and a slave module. The master controls the connection and disconnection behavior of the *LB* connection. If a third-party switchboard is connected, then this side should be the master.
Transmission line controlling	Address and port of the control system
Transmission line transmitter AF	Address and port of the module to which the AF line for the transmission direction is connected.
Transmission line receiving AF	Address and port of the module to which the AF line for the reception direction is connected.
Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Flag (OUT) 1/2	[OUT] The flag is connected if the the program is activated. This enables further programs to be activated for adaptation to specific requirements.

9.11 LB forwarder

Program for transmission of *LB* telegrams in temporary systems, (*Long distance line - Long distance line*)
LB = Local Battery, operation by means of a local battery without central supply (crank and field phones)

Transmission via 2Mbps	AF transmission takes place by means of a multi-channel digital connection (Address and port for control and AF are identical)
USE2 identifier	ID of the *LB* connection
Transmission line controlling	Address and port of the control system
Transmission line transmitter AF	Address and port of the module to which the AF line for the transmission direction is connected.
Transmission line receiving AF	Address and port of the module to which the AF line for the reception direction is connected.
Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.

9.12 PA Public address

Program for local control of an amplifier

Priority	Handling of priorities (see Section 9.1)
Codec	Audio compression method with which the codec handles the actual connection. The options are: µLaw (default), ADPCM (7kHz) and aLaw (see Section 9.1)
Own/Analog	Selects the type of call station (ProCom or analog call stations).
Input/call station (Setting *Own*)	
Address, Port, Line	Address and port of the module to which the call station is connected and the line (key) that is used. (*4NSA*)
Input/call station (Setting *Analog*)	
Address AF, Port	Address and port of the module to which the AF line of the call station is connected. (*4NPA*)
Address 24LI, Port, Line	Address, port and line of the module to which the control line of the call station is connected. (*24LI*)
Activated amplifier	Address and port of the amplifier (*V100* or external via *4NPA*) Device ID (only with *4DSS* and *UZ-ELA*)
Relay 1/2	These lines are ON when the program is active. e.g. relay can be switched or keys are illuminated.
AllCall number of own station	This program can be integrated as a destination in a *AllCall*. The association is determined by one or multiple AllCall numbers. The *AllCall* program must be running of the specific station.
Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Flag (OR)	[IN] The program can be switched on by this flag. It is possible to take over AF channels.

Flag (OUT) 1/2	[OUT] The flag is switched on if the program is activated. This enables further programs to be activated for adaptation to specific requirements.
AF Flag (OUT)	[OUT] *Flag* as before. Audio channel transfer possible.
Lead flag	[OUT] The flag enables the pre-announcement chime or alarm tone to be connected upstream if the *DSS1* module a the *Alarm lead 2* program are used.
Illumination on lead flag	Address, port and line (key) of a call station to indicate the activity of the alarm lead. The indication is switched on for the playing time of pre-announcement chime or alarm sound.
Suppress busy status message	Suppressing the busy indication on the call station.

9.13 Public address 2 "PA remote/local"

Program for local control of amplifiers or in remote systems for forwarding to transmission systems

Call station - Amplifier	Source and destination are part of a local system
Call station - Long distance line	Source (from station to outgoing long-distance line)
Long distance line - Long distance line	Intermediate system (connection of incoming/outgoing long-distance line)
Long distance line - Amplifier	Destination (from incoming long-distance line on amplifier)

Priority	Handling of priorities (see Section 9.1)
Codec	Audio compression method with which the codec handles the actual connection. The options are: µLaw (default), ADPCM (7kHz) and aLaw (see Section 9.1)
PA ID	ID of the Source-Destination program
Transmission via 2Mbps	AF transmission takes place via a multi-channel digital connection (Address and port for the control system and AF are identical)
Busy message	Specifications for transmission of busy message

Call station selection - xxx	
Own/Analog	Selects the type of call station (ProCom or analog call stations).
Acknowledgment	Type of display of a acknowledgment at the station

Input/call station (Setting *Own*)	
Address, Port, Line	Address and port of the module to which the call station is connected and the line (key) that is used. (*4NSA*)
Input/call station (Setting *Analog*)	
Address AF, Port	Address and port of the module to which the AF line of the call station is connected. (*4NPA*)
Address 24LI, Port, Line	Address, port and line of the module to which the control line of the call station is connected. (*24LI*)

Selection of long-distance line

In-/Output of the control system	Address and port of the module with the control lines
In-/Output AF	Address and port of the module with the AF long-distance lines

Note! In the case of long-distance lines that are connected by means of *4FTR* or *LCPU*, the specification for the control system and the AF are identical.
In the case of long-distance lines that are connected by means of the analog module *4NSA*, addresses and ports may differ!

Selection xxx - Amplifier

Activated amplifier	Address and port of the amplifier (*V100* or External via 4NPA) (1 to 4 amplifiers simultaneously)
Acknowledgment+Relay	Address of the relay module (4IOS, 4LSL) with generation of acknowledgment The ports of the relay module are permanently linked to the amplifier fields. (Example: 1. Amplifier = 1st port of the relay module, etc.)
Acknowledgment processing	AND = PA acknowledgment of all lines must be detected OR = PA acknowledgment of one line must be detected External = no connection with relay module, PA acknowledgment takes place by means of *Flag*
Acknowledgment flag	[IN] to trigger a PA acknowledgment by an external criterion

Note! The *Acknowledgment flag* is only in the setting *Acknowledgment processing Extern* ready. *Busy flag* and *Acknowledgment flag* are not available simultaneously.

Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Flag (OR)	[IN] The program can be switched on by this flag. It is possible to take over AF channels.
Flag (OUT) 1/2	[OUT] The flag is switched on if the program is activated. This enables further programs to be activated for adaptation to specific requirements. It is possible to hand over the AF channel in use.
Busy flag	[IO] *Flag* for processing of Busy status

9.14 AF Switching

Universal program for switching AF and lines.

Priority	Handling of priorities (see Section 9.1)
Fixed audio channel	Channel to be used internally for AF transmission (see Section 9.1)
Codec	Audio compression method with which the codec handles the actual connection. The options are: µLaw (default), ADPCM (7kHz) and aLaw (see Section 9.1)
Input	Line control input for activation of the program
AF Input	Address and port of the AF source
AF Output	Address and port of the AF destination
Call station / 4FTR	AF transmission from/to call stations or via long-distance lines requires a connection to a control line. (see Section *Line*)
Fixed E1 channel	AF transmission via 2Mbit line in permanently-assigned channel (see Channel)
Line	Control line for connection to AF transmission (1-120) The *Line* corresponds to the key number at call stations. Call stations functioning as a destination require linking to switch on the PA amplifier and to illuminate the keys. Control lines over and above the available number of keys will result in no illumination taking place.
Channel	Permanently-assigned E1 channel for AF transmission by means of 2Mbit lines. (31-1) The channels are treated as *Line* with an offset of 300.
Repeat	Repetition rate to refresh the current lines/channel switching state
Relay 1/2	The line is switched on if the program is activated. For example, relays can be switched on or keys can be illuminated.
Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Flag (OR)	[IN] The program can be switched on by this flag. AF channels can be taken over.
Flag (OUT) 1/2	[OUT] The flag is switched on if the program is activated. This enables further programs to be activated for adaptation to specific requirements. It is possible to transfer the AF channel in use.

9.15 USE1 Intercom

Program for switchboard connections via RS485
WARNING! Only modules up to Hardware version 2 (not for new systems)!
Program supported only up to DVS Firmware 7.21!

Currently systems are connected via 2Mbit connections (E1)!
(see Section *4FTR*)

The *Remote - Intercom*, *Remote - Intercom forwarder* and *Remote - Intercom Group* programs are provided for system-wide intercom.

9.16 Remote - Intercom

Program for intercom in split systems.

The control of the connection takes place via a *Call line* and *Busy line* at least! These lines are identical in the source and destination systems! All further options are optional.

Priority	Handling of priorities (see Section 9.1)
Codec	Audio compression method with which the codec handles the actual connection. The options are: µLaw (default), ADPCM (7kHz) and aLaw (see Section 9.1)
Latching key	The connection is established and kept single-sided until the key is pressed once more. The remote station must have higher priority and can reverse the direction and reply.
Time out	Connection is broken after the preset time
Transmission via 2Mbps	AF transmission takes place via a multi-channel digital connection (Address and port for control and AF are identical)
Own/Analog	Selection of the type of call station (ProCom- or Analog- call stations).
Input/call station (Setting *Own*)	
Address, Port, Line	Address and port of the module to which the call station is connected and the line (key) that is used. (*4NSA*)
Input/call station (Setting *Analog*)	
Address AF, Port	Address and port of the module to which the AF line of the call station is connected. (*4NPA*)
Address 24LI, Port, Line	Address, port and line of the module to which the control line of the call station is connected. (*24LI*)
Call flash	The 24LI module converts a call telegram into active flashing. This is standard for the signaling of a call. This flashing may however be undesirable if the source is not a station but an active third-party system. Flashing is suppressed by deactivating the option.
V-Point-Line	In the case of analog stations, the microphone amplifier is usually switched on internally by the activation of a PTT key. As control takes place by means of the control station in this operating mode, the microphone amplifier must be switched on by a switching voltage. The *V-Point-Line* specifies which output of the associated 24LI supplies this switching voltage.
Call storage	Time for the key illuminates (flashing) after missed calls

Transmission line AF	
Address, Port	Address and port of the mode to which the long-distance line for the transmission of AF is connected.
Transmission line controlling	
Address, Port	Address and port of the mode to which the long-distance line for the transmission of control is connected.
Call line	This *Line* is switched on by the source when the PTT key is pressed. The program on the destination reacts to the *Line* and switches to receive.
Busy line	*Line* to transmit the *Busy* status. Depending on the application, the *Busy line* is bi- or unidirectional according to the selection of the input field.
AllCall line	*AllCall-Line* One or more programs can react to this *Line*. The source is the *Remote - AllCall* program in a remote system.
Special line	The line is switched on if the program is activated. The behavior of the direction may depend on the setting of the following option. For example, relays can be switched on or keys can be illuminated.
Active when receiving	Directional behavior of the *Special line*
Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Flag (OR)	[IN] The program can be switched on by this flag. It is possible to take over AF channels.
Flag (OUT) 1/2	[OUT] The flag is switched on if the program is activated. This enables further programs to be activated for adaptation to specific requirements..

9.17 Remote - Intercom Group

Linking local groups that are running the *IC Group* program in split systems.

The program converts the *Group flag* of a group to *Call line* and *Busy line* for transmission over long-distance lines.

Transmission via 2Mbps	AF transmission takes place by means of a multi-channel digital connection (Address and port for control and AF are identical)
USE1	The Address for a USE1-control center connection. Attention! Only up to Hardware version 2 (not for new systems)!
Codec	Audio compression method with which the codec handles the actual connection. The options are: µLaw (default), ADPCM (7kHz) and aLaw (see Section 9.1)
Group flag	[IO] All programs with identical *Group flag* belong to a group.
Reaction, if set by	For specific cases such as ring long-distance lines, it can be specified here that a connection to a long-distance line may only be set up by means of local *IC Group* programs. By using the *Any* option, it is also permitted for additional *Remote - Intercom Group* programs that are activated by a long-distance line.

Long distance line
Specifications regarding the module to which the *Long distance line* is connected.
In the case of *Transmission via 2Mbps*, the *Transmission line controlling* and the *Transmission line AF* are identical.

Address, Port	Address and port of the respective long-distance line
Line	This *Line* is switched on by the source when the PTT key is pressed. The program in the destination reacts to the *Line* and switches to receive. It corresponds to the *Call line* in the *Remote - Intercom* program. Here the program supports an expanded *Lines* range. (240 Lines and 192 lines in the case of *Transmission via 2Mbps*)
Busy line	*Line* for transmission of the status *Busy*.

Group busy indication	The program switches to the *Busy* status. Only if none of the subscribers has a *Busy* status, is the connection set up.
Address partial group despite being busy	The connection is set up, even if individual subscriptions have a *Busy* status.
Input Busy flag	[IN] The program is set to a *Busy* status. The associated key is illuminated. There are situations in which not all programs detect the status automatically. In these cases the status must be conveyed explicitly.
Output Busy flag	[OUT] The flag is switched on if the program switches to the *Busy* status.
Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.

9.18 Remote - AllCall

AllCall is a simultaneous, single-sided speech connection to multiple stations and loudspeaker lines.

The *Remote - AllCall* program can replace the *AllCall* program without, however, the option of using the pre-announcement chime/alarm tone.
All destinations to which a voice connection with the specific station exists via one of the following programs, can be integrated. (*IC Intercom*, *IC Group*, *PA Public address*, *ZZ connection*).
In addition, an outgoing connection can be programmed via a long-distance line. In the destination system, the *Remote - Intercom* program can react by means of its *AllCall-Line*.

Priority	Handling of priorities (see Section 9.1)
Codec	Audio compression method with which the codec handles the actual connection. The options are: µLaw (default), ADPCM (7kHz) and aLaw (see Section 9.1)
AllCall No.	ID of the connection
Own/Analog	Selects the type of call station (ProCom or analog call stations).
Input/call station (Setting *Own*)	
Address, Port, Line	Address and port of the module to which the call station is connected and the line (key) that is used. (*4NSA*)
Input/call station (Setting *Analog*)	
Address AF, Port	Address and port of the module to which the AF line of the call station is connected. (*4NPA*)
Address 24LI, Port, Line	Address and port of the module to which the control line of the call station is connected. (*24LI*)
Transmission line AF	
Address, Port	Address and port of the module to which the long-distance line for the transmission of AF is connected.
Transmission line controlling	
Address, Port	Address and port of the module to which the long-distance line for control transmission is connected.
Busy line	*Line* for transferral of the *Busy* status.
AllCall line	*AllCall-Line* Destination of one or more programs *Remote - Intercom* in a remote system.
Special line	The line is switched on if the program is activated. For example, relays can be switched or keys can be illuminated.
Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Flag (OR)	[IN] The program can be switched on by this flag. AF channels can be taken over.
Flag (OUT) 1/2	[OUT] The flag is switched on if the program is activated. This enables further programs to be activated for adaptation to specific requirements.

9.19 Remote - Intercom forwarder

Transmission of *Remote - Intercom* connections in temporary systems

Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Codec	audio compression process to be used (see Section 9.1)

Long distance line
Specifications of where incoming and outgoing *Long distance line* lines are connected.
In the case of *Transmission via 2Mbps*, *Transmission line controlling* and *Transmission line AF* are identical.

Address, Port	Address of the transmission line
Control lines	The lines correspond with the *Remote - Intercom* program.

9.20 ZZ connection

ZZ connection refers to a intercom connection between a DVS-21 and a analog third party system. The connection is made by means of a *4ZZA* module.

Priority	Handling of priorities (see Section 9.1)
Own/Analog	Selection of the type of call station (ProCom or analog call stations).

Input/call station (Setting *Own*)

Address, Port, Line	Address and port of the module to which the call station is connected and the line (key) that is used. (*4NSA*)

Input/call station (Setting *Analog*)

Address AF, Port	Address and port of the module to which the AF line of the call station is connected. (*4NPA*)
Address 24LI, Port, Line	Address, port and line of the module to which the control line of the call station is connected. (*24LI*)
Call storage	Time for which the key is illuminated (flashing) after missed calls

AllCall number of own station	A *ZZ connection* can react to an *AllCall* of the specified number. (also many) The triggering *AllCall* program must must be programmed on the same station.
Illumination on lead flag	Address, port and line (key) to be illuminated during the playback of a pre-announcement chime or alarm tone. Function subject to use of the *Lead flag*!
Special line	The line is switched on if the program is activated. For example, relays can be switched on or keys can be illuminated.
Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.)
Flag (OR)	[IN] [IN] The program can be switched on by this flag. It is possible to take over AF channels.
Flag (OUT) 1/2	[OUT] The flag is switched on if the program is activated. Other programs can be triggered.
Lead flag	[OUT] The flag allows the upstream switching of a pre-announcement chime or alarm tone subject to the use of the *DSS1* module and the *Alarm flag* in the *Alarm lead 2* program.

10 Programs for logic and control

10.1 Flag Input/Output

Programming logical connections with combinable time responses
Interrogation of specific conditions such as a module fault and AF activity

Note! Enhanced information regarding AF channels (*Audio channel*) in a *Flag* can be transferred from each (*Flag (OR)*) input to the (*Flag (OUT)*) outputs! Combined with the capability of most AF programs to exchange AF channel information by means of *Flag (OR)* and *Flag (OUT)*, it is possible to program complex AF channel switch-overs. **The AF channel of the first flag to become active in the output is always taken over!**

Procedure:
The output of the program becomes active, if the input and timer conditions permit this!
Only inputs in which a *Flag* or a *Line* is entered, are taken into account. Inputs with a 0-entry are ignored.
At **least one *Flag (OR)*** must be programmed and **active** in order for **Output active** to be possible. For continuous activation, the *Flag* 255 (*Always ON*) is available.

The *Flag (OR), Line* inputs and the configurable special input are OR linked.

Input conditions:

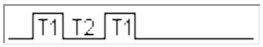
- The field of an OR-link fulfills the condition for itself alone.
- A *Flag (AND)* must be used in conjunction with at least a *Flag (OR)*. AND and OR must be active in order to fulfill a the condition.
- An active *Flag (NAND)* switches off independently of other inputs immediately. Only the use of Timer 2 or Timer 4 delays switch-off after Follow-up time T1.

Flag (OR)	[IN] The program can be switched on by this flag. It is possible to take over AF channels.
Flag (AND)	[IN] AND link with *Flag (OR)*
Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Selection box	Special input (see next table)
Input	Address, port and line from a module
Flag (OUT) 1/2	[OUT] The flag is switched on if the program is activated. Other programs can be triggered. It is possible to transfer the AF channel in use.
Flag (OUT) (invers)	[OUT] *Flag* ON in idle position
Output	Address, port and line to a module
Output (invers)	Address, port and line to a module (ON in idle position)

Special input (Selection box)

Line output polling	Polling of the state of an outgoing line on a module
Module fault report polling	Polling of a module regarding a fault report Helpful for modules with active self-monitoring such as *V100* and modules with front-mounted fuses, as well as *4NSA* with stations or *4FTR* with long-distance lines. In the case of modules without self-monitoring such as *24LI* only the lack of the module is noted.
Imp. amplifier No.	Polling whether a specific amplifier is currently performing the *Impedance measurement* of its loudspeaker line. Only functions if the *Impedance measurement* program has been used. **Not to be confused** with *Impedance measurement* by the *4LSL* module! At least the *Impedance flag* and the amplifier number must be specified.
AF on/off	Polling whether the port of a module has switched to active AF
AF (incoming)	Polling whether the port of a module has switched to incoming AF
AF (outgoing)	Polling whether the port of a module has switched to outgoing AF

Timer
For the programming of temporal behavior,Timer 1 - Timer 4 can be stopped at an immediate point. . The intervals of the timer are determined by Times T1 and T2. The maximum time 32000 seconds (>8 hours).

	Symbol	Explanation
		Input signal
Timer 0		No timer, output follows the input
Timer 1		Time runs from start
Timer 2		Follow-up time, time runs from end
Timer 3		Trigger
Timer 4		Combination of delay and follow-up

10.2 Flag Input/Output 2

Programming logical connections with combinable time responses

Note! Expanded information via AF channels (*Audio channel*) in a *Flag* **are not transferred**!

The inputs are configurable in relation to the *Flag Input/Output* program. Each input has a switch to select the logic. The inputs of the 3rd gate can can be decoupled as desired, in order to use the 1st and 2nd gate separately or in combination.

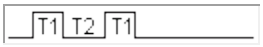
Procedure:
An output of the program becomes active if this is permitted by its input and timer conditions!
Only inputs in which a *Flag* or a *Line* is entered, are taken into consideration. Inputs with a 0 entry are ignored.
At **least** one *Flag (OR)* or at least two *Flag (AND)* must be **active** in order for the **output to be active** as well. The *Flag* 255 (*Always ON*)is available for continuous activation.

Input conditions:

- Each *Flag (OR)* fulfills the condition for itself alone.
- If a *Flag (AND)* are specified in combination, then at least one *Flag (OR)* or a second *Flag (AND)* must be active.
- An active *Flag (NAND)* switches off immediately, independently of other inputs. Only by using Timer 2 or Timer 4 is a switch-off delayed by the follow-up time T1.
  When latching Lines (LOCK) are used, Flag 1 and Flag 5 as NAND in addition cancel latching again!

Input 1/2	Address, port and line from a module configurable (OR, AND, NAND, LOCK (Latching))
Flag 1-6	[IN] configurable (OR, AND, NAND, OFF)
Output 1/2	Address, port and line to a module
Flag (OUT) 1-4	[OUT] *Flag* is ON if conditions are fulfilled

Timer
For the programming of temporal behavior,Timer 1 - Timer 4 can be stopped at an immediate point. The intervals of the timer are determined by Times T1 and T2. The maximum time is 10,5 hours (63 x 10 minutes).

	Symbol	**Explanation**
		Input signal
Timer 0		No timer, output follows the input
Timer 1		Time runs from start
Timer 2		Follow-up time, time runs from end
Timer 3		Trigger
Timer 4		Combination of delay and follow-up

10.3 Flag timing

Program for triggering of actions at fixed time intervals.

e.g. *Impedance measurement*, Level reduction at night (*V100*)

Send time stamp to interface	The current system time is sent to the module specified under *Output*. (*4LSL* in conjunction with the *Temperature profile*)
Date Time	Output date, Output time The output time is to be specified according to the interval. The date is not required for the *hourly* and *daily* option!
Interval	Triggering Interval
Duration	Outputs are active for this time
Output 1/2	Address, port and line for a module
Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Flag (OUT) 1/2	[OUT] The flag is switched on if the program is activated. Other programs can be triggered.
Clear output flag 1/2	[IN] *Flag* switches the respective *Flag (OUT)* off

Special function: System Reset
The ALT-R key combination superimposes a text field. By entering the word "reset", the program goes into Reset Mode. In this mode, the program triggers a system reset at the set time.
This mode can be ended by canceling the program!

10.4 Impedance measurement

Process control for internal impedance measurement of the *V100* amplifier
Not to be confused with *Impedance measurement* by the *4LSL* module!

The program controls one or more *V100* by means of their *Impedance flag* and evaluates the measured values.
Automatic measurements at specific times are performed by the *Flag timing* program by means of the *Flag (OR)*.

Connection to amplifier

Impedance flag	[IO] *Flag* for control of the measurement in the amplifier *V100*
Tolerance	Deviation of the instantaneous measured value from the stored reference value of the respective *V100*. The tolerance is specified in percent or digits. **For *V100* versions as from Firmware x129 only *Tolerance in steps* (Digit) is to be used!**

Start function

Address, Port, Line	Starting of measurement by a line

Illumination line

Address, Port, Line	Address, port and line (key) to display the status The LED flashes when measurement is active. The LED glows continuously in the event of a measurement fault.

Other fault report outputs	
Address, Port, Line	Output of a measurement fault via any module.
Impedance output flag	[OUT] *Flag* is active in the case of measurement faults.
Fault indication SV01	Measurement faults trigger a *Summary fault* on the *SV01* module
Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Flag (OR)	[IN] The program can be switched on by this flag.

10.5 Level control (loud/quiet)

Placing loud/quiet soft function (keys) on a station, to change level (Codec setting) of any module.

Note! Not to be confused with the loud/quiet soft function of ProCom stations!

Input	
Address, Port	Address and port of the module to which the call station is connected, from which the level is to be changed.
Line Loud function	*Line* (key) for the "Louder" function
Line Quiet function	*Line* (key) for the "Softer" function
Module to level change	
Address, Port	Address and port of the module, the limit (Codec setting) of which is to be changed.
Direction	the module direction that is to be limited

10.6 Level control (attenuation) (manual/automatic)

Program for the selective attenuation of any modules with Codec, and automatic volume control in conjunction with Module *MI4M*

Operation mode Control (Control by means of *Flag* or *Line*)

The program transfers the specified level to the Codec of a module on activation. When the program is ended, the previous value is reactivated.

Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Input	
Address, Port, Line	Address, port and line (key) for activation of the program.
Latching key	Latching function for the input. The brief switching on of the input line toggles the state.
Flag (OR)	[IN] The program can be switched on by this flag.

Leveling of Module

Address, Port Address and port of the module, the level (Codec setting) of which is to be changed.

Level values and direction (according to type of device)

Device types	
4NSA/4NPA	To change attenuation of a module that is separated according to direction.
V100	To change the volume level of an amplifier (V100).
4W Normal/Call	To change the volume of the internal amplifier.
25W Normal/Call	To change the volume of the auxiliary amplifier of a station.
Microphone	To change the sensitivity of the microphone amplifier in stations.
Intercom interval time	To change the switching time of *Level Normal/Call* in stations. (Call stations)

Operation mode Control *(MI4M)* (Automatic gain control)

In this operating mode, a control loop is set up in conjunction with external measuring microphones, modules *MI4M* and amplifiers.

The program is always active in this operating mode and reacts to measurement value telegrams of the assigned *MI4M* (30h telegrams).

Switching thresholds for the permanently-assigned level values are calculated from the reference and correction values. By comparing the measurement values with the calculated switching thresholds, the program determines a level value and allocates this value to the amplifier.

The measurement values must be requested at each announcement by the *MI4M* via *Line* 1.

Flag (NAND) [IN] The program can be turned off by this flag or switching on can be prevented.

MI4M

Address, Port Address and port of the module with the assigned microphone (*MI4M*)

Flag Night operation [IN] Activates the *Night max* value
(Time control can be set up with the *Flag timing* program.)

Module to level change

Address, Port Address and port of the module, the level(Codec setting) of which is to be set.

4NSA/4NPA or *V100* Internal amplifier *V100* or external amplifier on *4NPA*

Location adjustment for measured value	Difference between the idle level of the measuring microphone and the simultaneously measured sound level value at the location where the announcement is to take place
MI4M Calibration offset	Check display of the offsets in the module configuration (Default 42, current value in the case of online measurement)
Level above environment	The regulating system sets a level that is spaced by this value over the ambient volume that has been determined
Day max	Maximum level that may not be exceeded by the regulating system in daytime! (*Flag Night operation*)
Night max	Maximum level that may not be exceeded by the regulating system at night! (*Flag Night operation*)
Reference values Amplifier Level and *Measurement (Location)*	*Measurement* (*Location*) is the manually measured sound level value during a announcement at the specified location using the specified *Amplifier Level*

Measurements/Simulation

This part of the program is to be regarded as active support in the case of measurement. The measurement values of the module can be displayed in the right-hand part of the (*Monitor*). To do so, the online status of the program must first be activated by means of the *Activate* switch. (any active online modules are deactivated, except if a data transfer is active)
The left-hand part (*Characteristic*) emulates the algorithm of an active program and marks the level values that would be used in actual operation.

Switch*MI4M Measurement*	Activates/deactivates the measuring mode of the measuring module by transmitting the *Line* 9 The module transmits measurement values permanently with other identification (34h - 37h)! The measurement values (30h) are suppressed in order to deactivate the control.
Switch*MI4M Reset*	Resets the Min/Max memory of the measuring module by transmitting the *Line* 10
Switch*Measurement Online*	The program logs on to the CPU as *Monitor*, displays the measurement values and emulates the reaction on the right.
Switch*Measurement Simulation*	The measurement value telegram (34h) is ignored. Input takes place manually by means of the arrow keys.
Switch*Online level*	Sends the set level value to the amplifier.

Reference: detailed description of the measuring process in the document "MI4M Start-up"

10.7 LB splitter

Program for the transmission of *LB* telegrams by means of cascaded systems with local connection of a *USE2* module (upgraded Repeater mode)
Should multiple segments be switched sequentially in *LB* Repeater mode, then the system determines that the total reaction time is the sum of each individual segment. If the systems are, however, connected by means of 2Mbit lines, this program enables programs of all stations to be controlled within a very narrow time frame.

USE2 Local	Address and port of the local USE2 mode
USE2 Recognition	ID of the *LB* connection
Long-distance line control	Address and port of the control system

10.8 Call number converter

Program for the transfer of a telephone number to the *USE2* module. The transfer takes place by *Lines* or as a telegram to Port 3.
Lines 1 - 10 correspond to the digits 1 - 9, 10 = 0, 11-14 = A-D, 15 = # and 16 = *

Output (*USE2*)

Address, Port	Address of the *USE2* module. Reception always takes place at Port 3 of the module.
Transfer with line	The transferral of the telephone number takes place by means of lines.
Transfer as telegram	The transferral of the telephone number takes place by means of special telegrams.

Number of digits	Number of digits that make up the telephone number. (max. 16)
Pause between digits	Pause until transmission of the next digit as *Line*.
Duration of activation	The lines are active for this time.
Start delay	Pause before the program transfers the first digit as *Line*.
Digits	16 fields for the digits of the telephone number. The following are valid: 0 - 9, A - D, #, * and P for Pause!
Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Flag (OR)	[IN] The program can be switched on by this flag.
Flag (OUT) 1/2	[OUT] The flag is switched on if the program is activated. Other programs can be triggered.

10.9 Contact switch

Switching of lines and basic logic operators between *Line* and *Flag*

Latching key	Latch function for the input. The state of the outputs is toggled if the input line is switched on briefly.
Keylock	To secure the function of a station, if a mechanical key switch is installed. The selection cancels the blocking of a station if a key is pressed continuously.
Input	Address, port and line
Output	Address, port and line
Long distance line line pool	Expansion of the range from 120 to 255 lines by using special lines. (only on own long-distance lines between ProCom systems)
Flashing (call station / 24Li)	Use of the *Flashing* (only stations/24LI)line type
Repeat	To transmit special lines cyclically (only for existing systems) (replaced by Trigger Special Lines)
Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.
Flag (AND)	[IN] AND-linking with *Flag (OR)*
Flag (OR)	[IN] The program can be switched on by this flag.
Flag (OR) (Latching)	[IN] The program can be switched on by this flag. It remains active even if the flag is switched off again. Only when the flag is next switched on is the program deactivated.
Flag (OUT) 1/2	[OUT] The flag is switched on if the program is activated. Other programs can be triggered.
Flag (OUT) (Pulse with start)	[OUT] *Flag* is ON for a CPU cycle if the program is active
Flag (OUT) (Idle)	[OUT] *Flag* with a negative state of the *Flag (OUT)*

10.10 System time

The internal clock can be synchronized to an external 24 hour time cycle.

Input

Address, Port, Line	Address, port and line of the incoming time pulse The time pulse can come as a line via a long-distance line from a neighboring system or be received directly at IO modules (24LI, 4IOS) from third-party systems.

Time	The new time that is set in the system when the pulse becomes active
Flag (NAND)	[IN] The program can be turned off by this flag or switching on can be prevented.

10.11 Line block trigger

The transmission of Lines by means of long-distance lines takes place in fixed blocks of 8 lines each.

[1 - 8] [9 - 16] [17 - 24] [25 - 32] [33 - 40]
[41-48] [49 - 56] [57 - 64] [65 - 72] [73 - 80]
[81-88] [89 - 96] [97 -104] [105 -112] [113 -120]

A Block line is not transmitted if the state of a *Line* changes within a block. This static behavior can lead to problems if, for example, the connection between networked systems is disrupted and the state of a *Line* changes in the source system. When the connection is restored, the states of the lines remain inconsistent with each other until a fresh change takes place to any *Line* within the block.

The *Line block trigger* program can counteract the problem and transmit selected blocks cyclically.

Address	Address to which the outgoing line blocks are to be triggered
Port 1-4 (Block)	Selection of blocks per port
Block-Interval time	Pause until the block is transmitted (Unit: Main loop passes)
Port-Interval time	Pause until the next port is processed (Unit: Seconds)
Program-Interval time	Pause until the program begins afresh (Unit: Seconds)
----	Reset selection completely
+++	Select all

10.12 Special trigger lines

The use of special lines can be activated in the *Contact switch* program by using the *Long distance line line pool* option. (Range 1 to 255 lines)
This is only possible in the case of long-distance line transmission. Transmission takes place entirely as a Single line by a single special telegram type.

As is the case with a Block line, the state of a Special line is only transmitted in the event of a change of state. This static behavior can lead to problems if, for example, the connection between networked systems is disrupted and the state of a Special line changes in the source system. When the connection is restored, the state of the lines remains inconsistent in relation to each other until a fresh change of state takes place.

The *Special trigger lines* program can counteract the problem and can once again begin transmitting the states of the lines cyclically in selected areas.

Address	Address of the module, the outgoing special line of which is to be triggered.
Port 1-4 (Line)	Selection of line ares per port
Line-Interval time	Pause between the transmission of a *Special line* (Unit: Main loop passes)
Port-Interval time	Pause until the next port is processed (Unit: Seconds)
Program-Interval time	Pause until the program is resumed (Unit: Seconds)

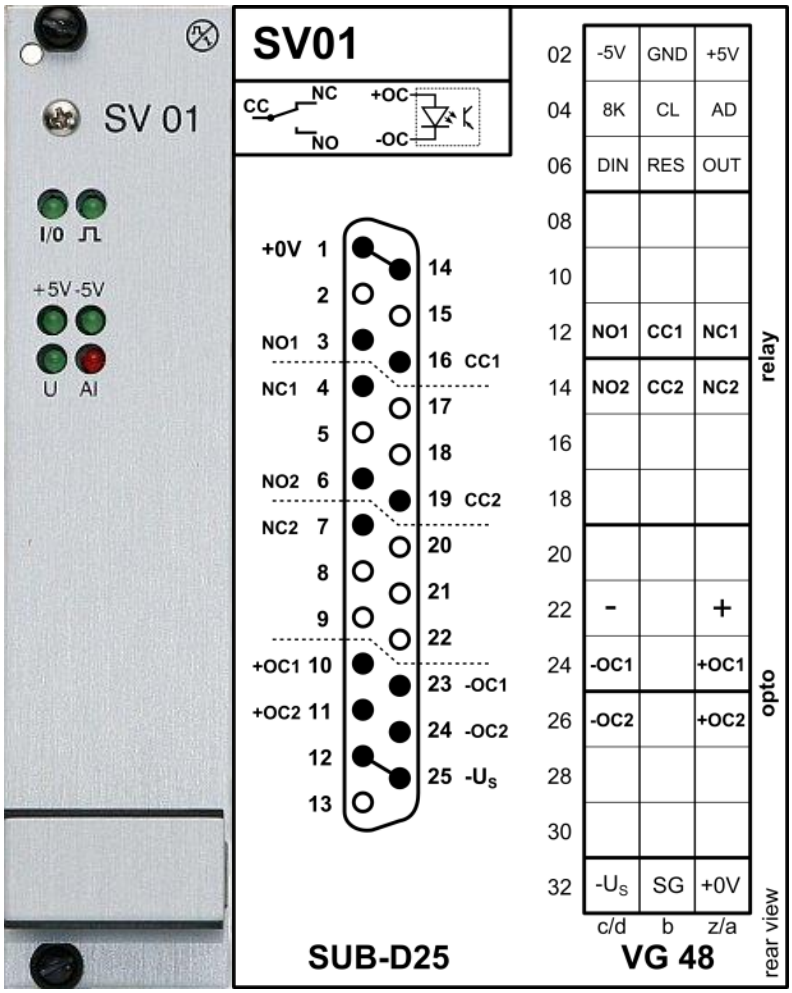
10.13 Byte Edit (Universal32)

This does not involve a program as such but rather a universal input mask for a 32 byte dataset. New programs or options can be configured by means of this dialog, for which there a mask does not exist.

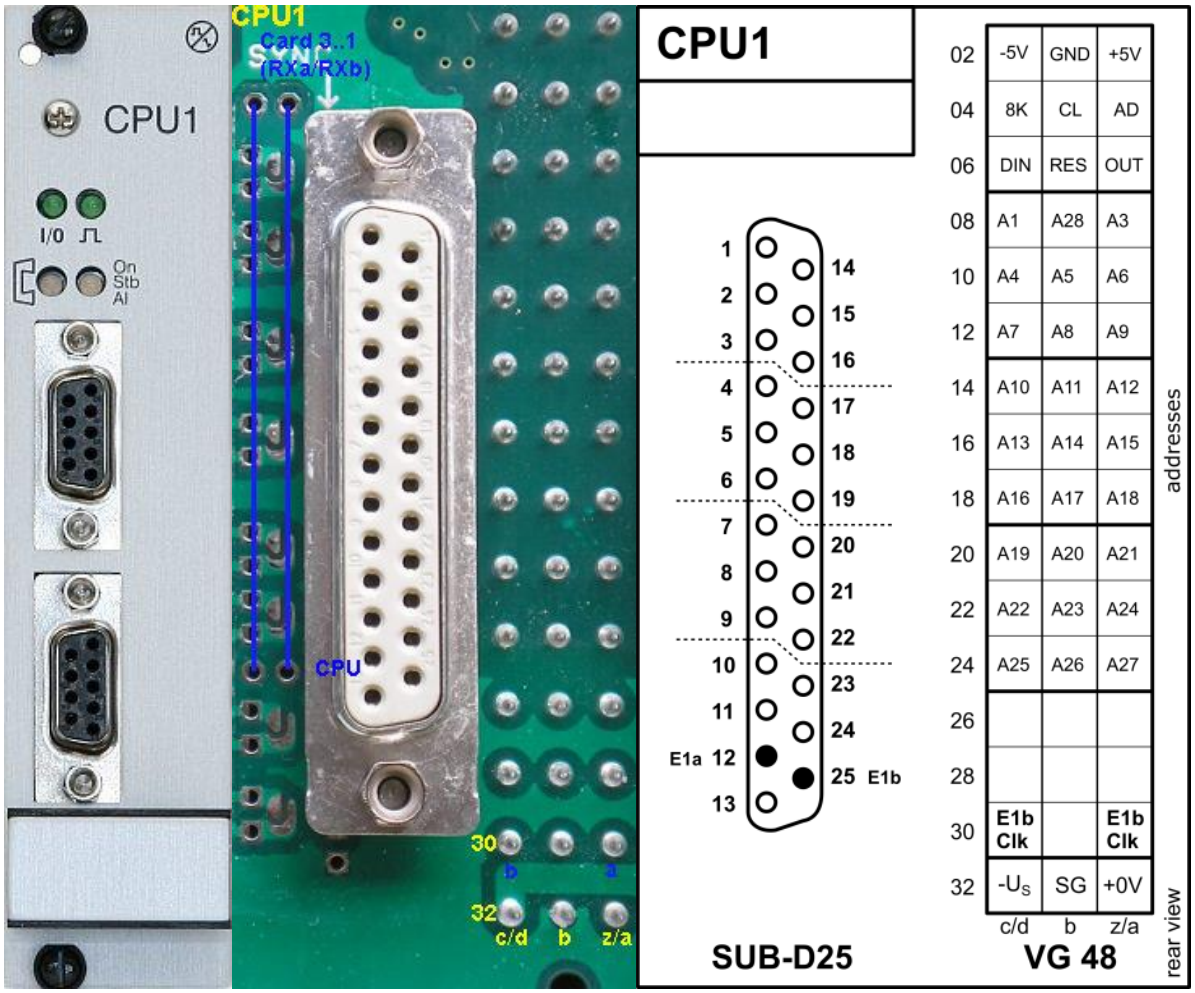
Available programs can be opened with his dialog via the right-hand mouse menu (*Dataset*). An empty dialog is opened for a new dataset via the selection of the programs in the module *Programs*.

11 Attachment

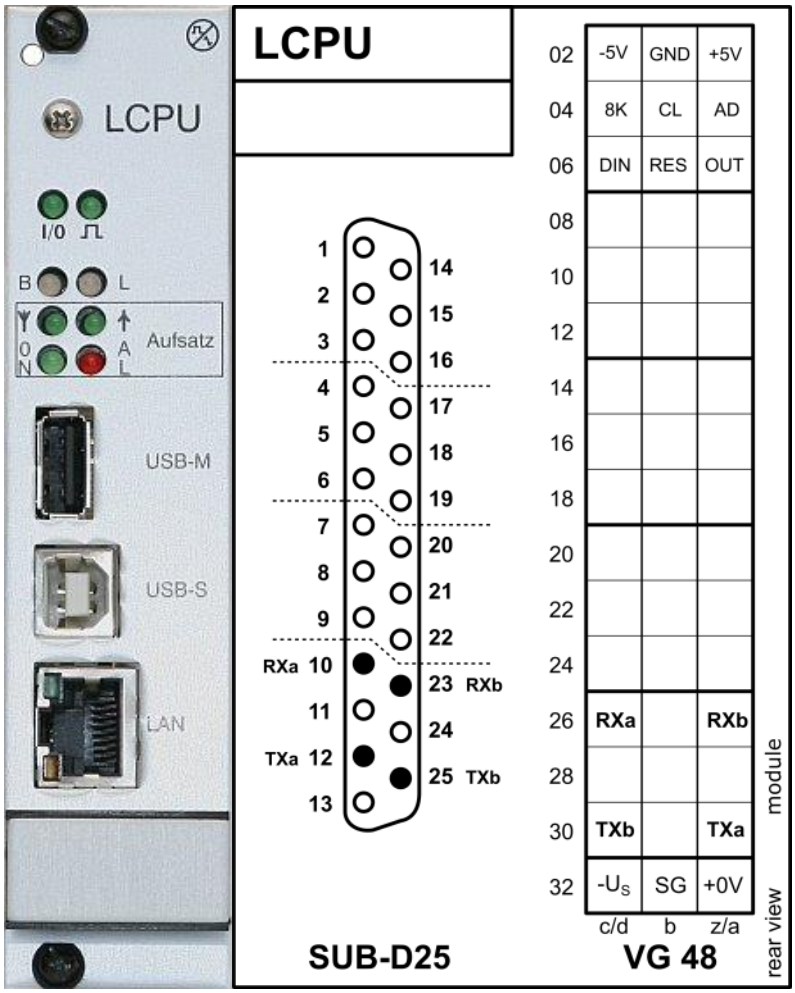
11.1 SV01



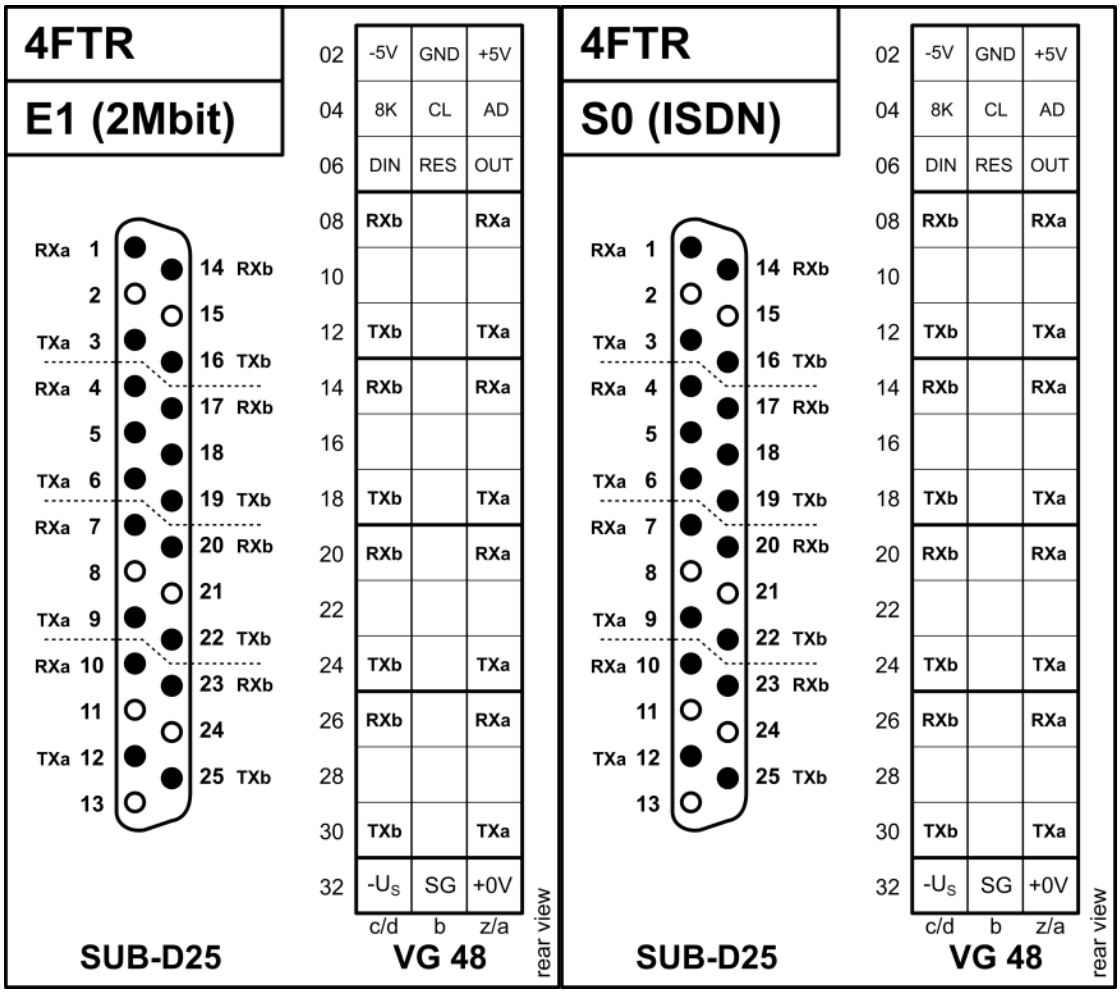
11.2 CPU

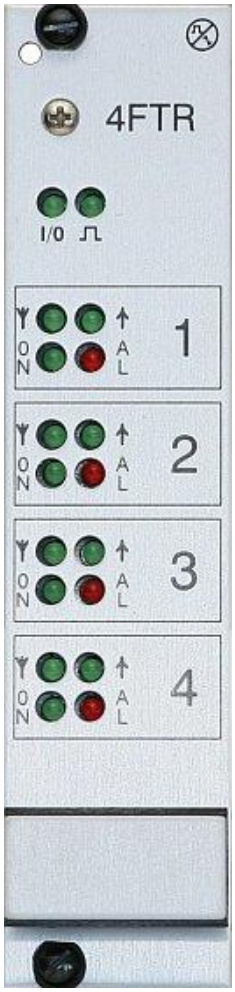


11.3 LCPU

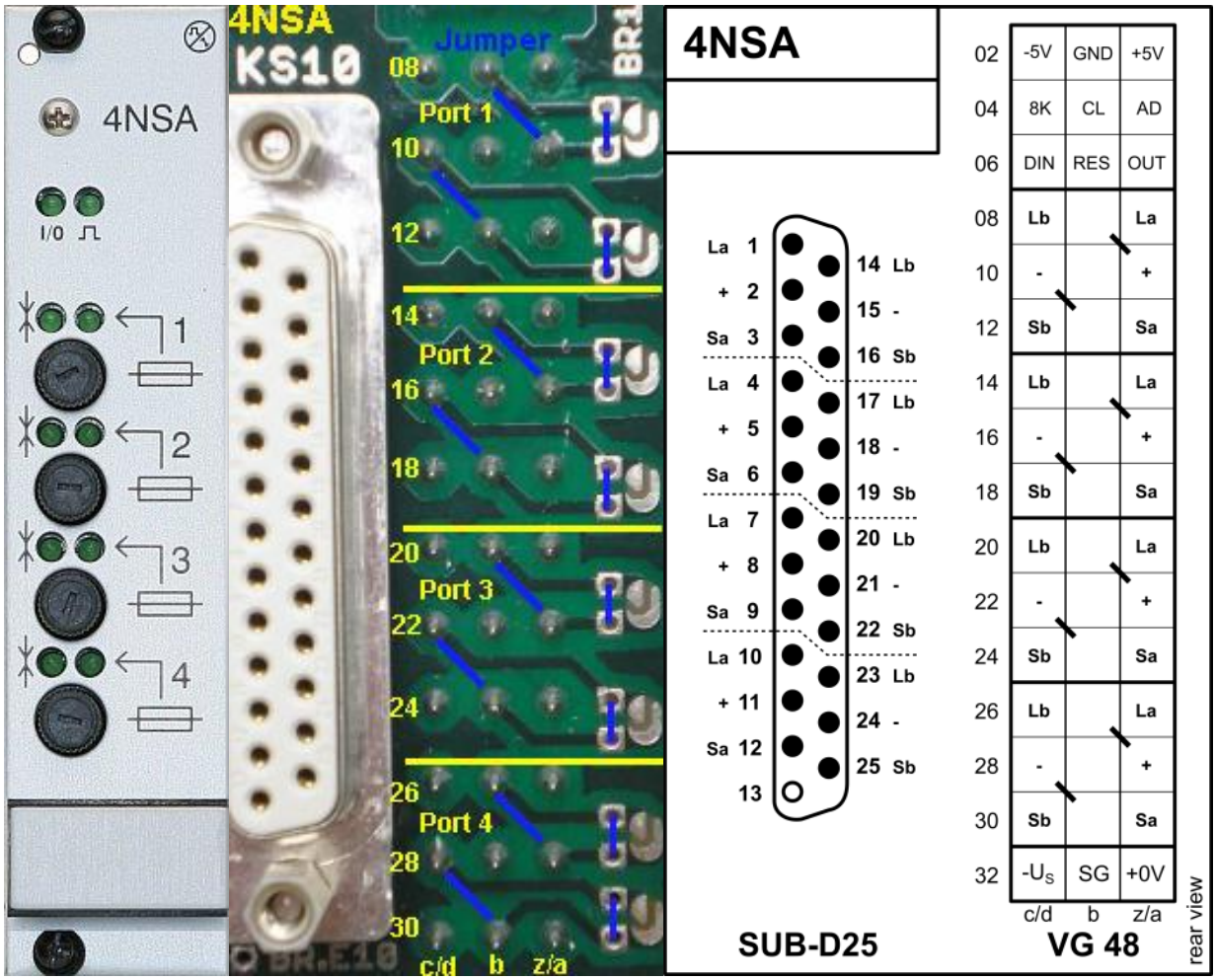


11.4 4FTR

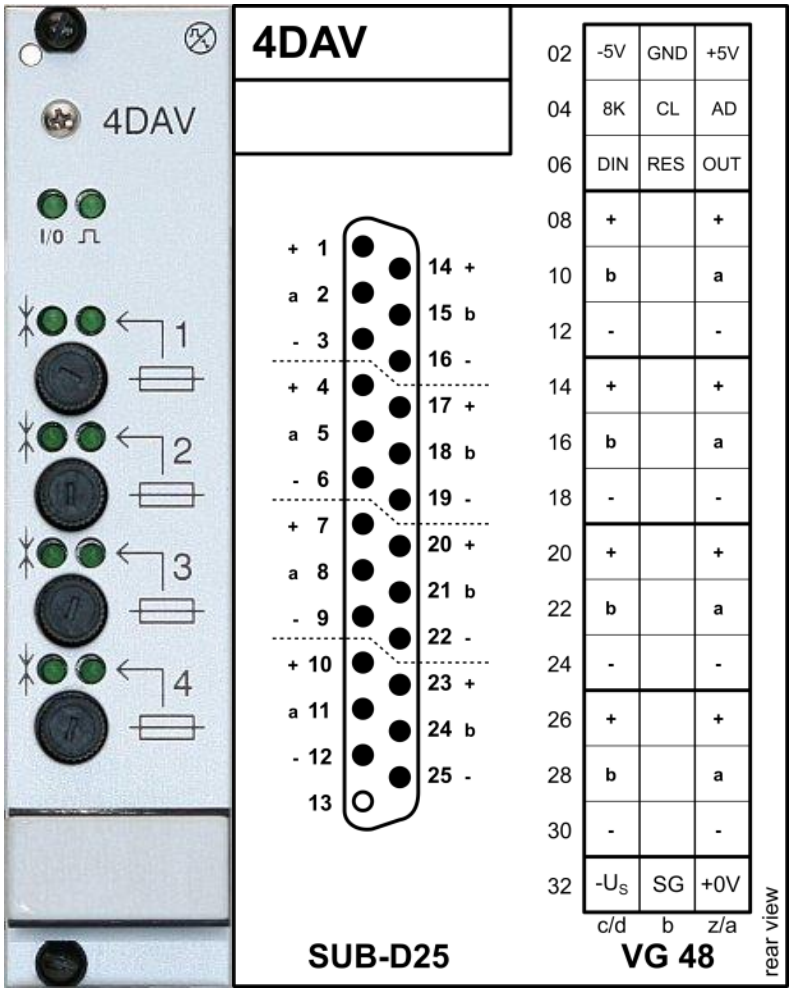




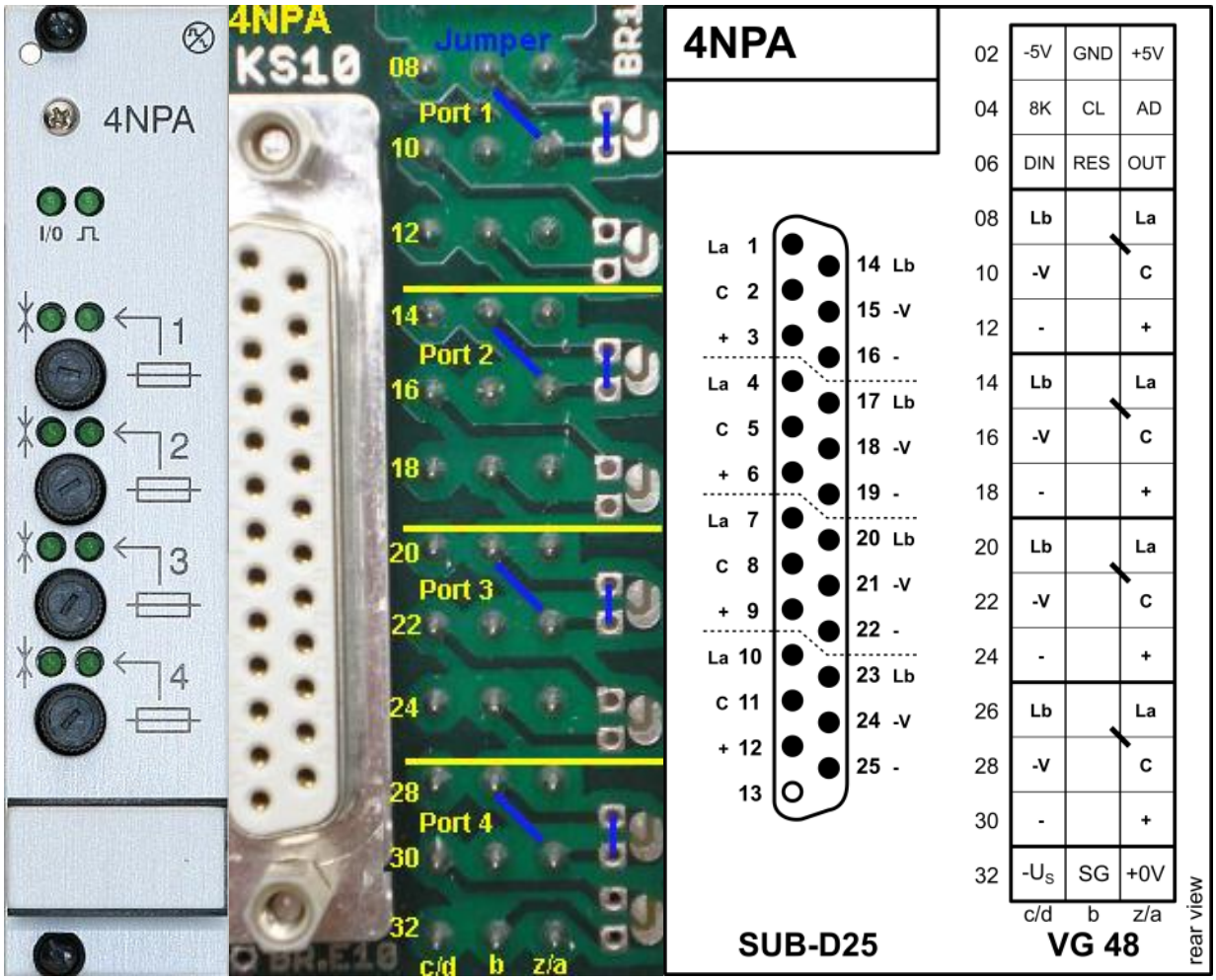
11.5 4NSA



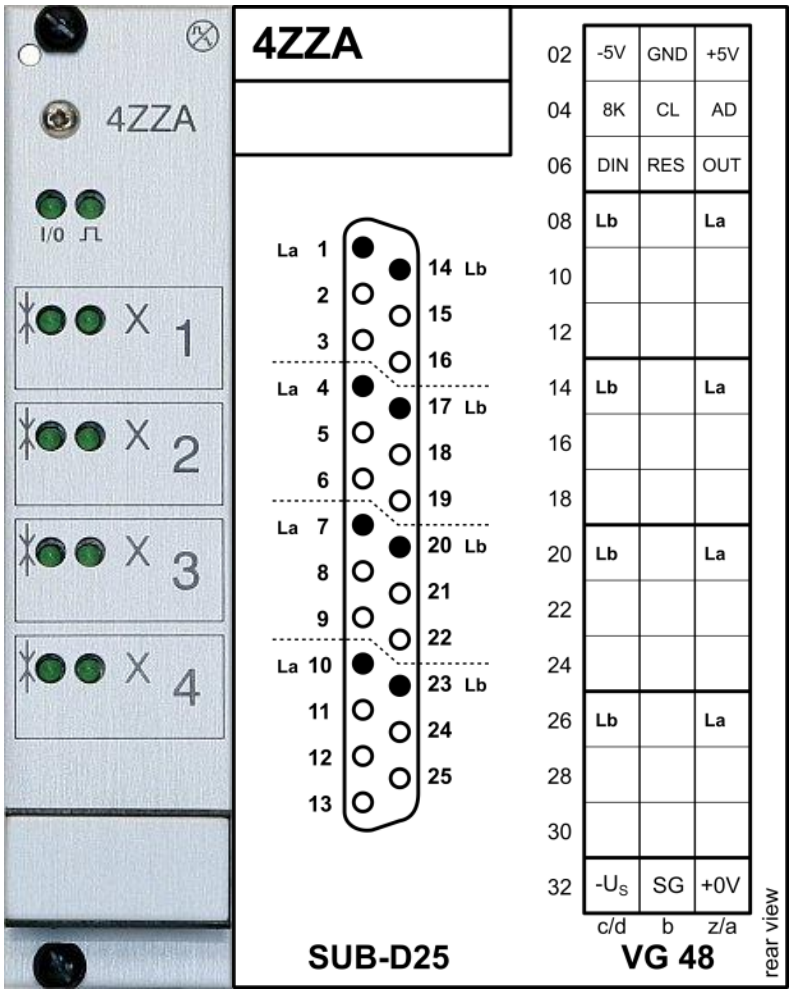
11.6 4DAV



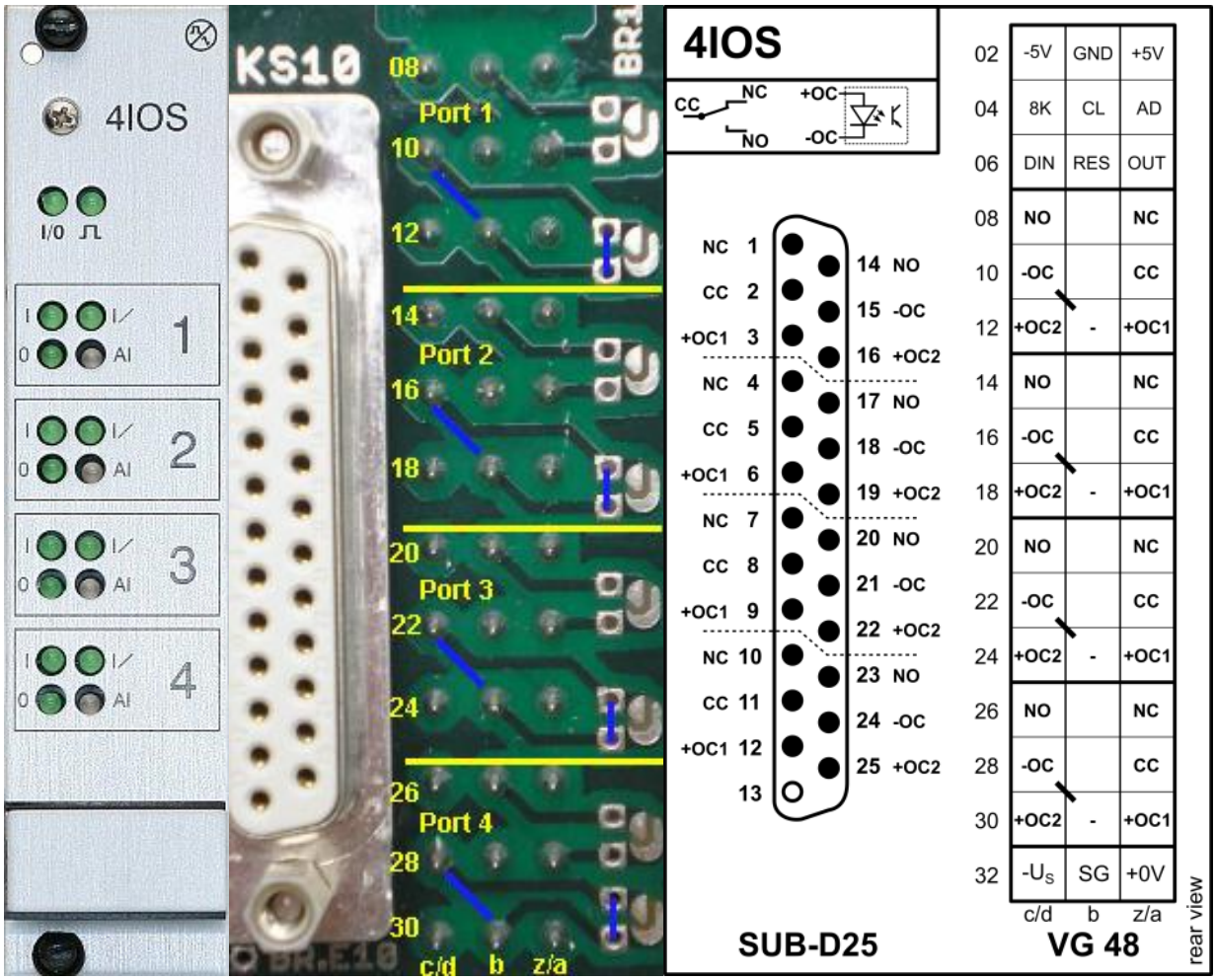
11.7 4NPA



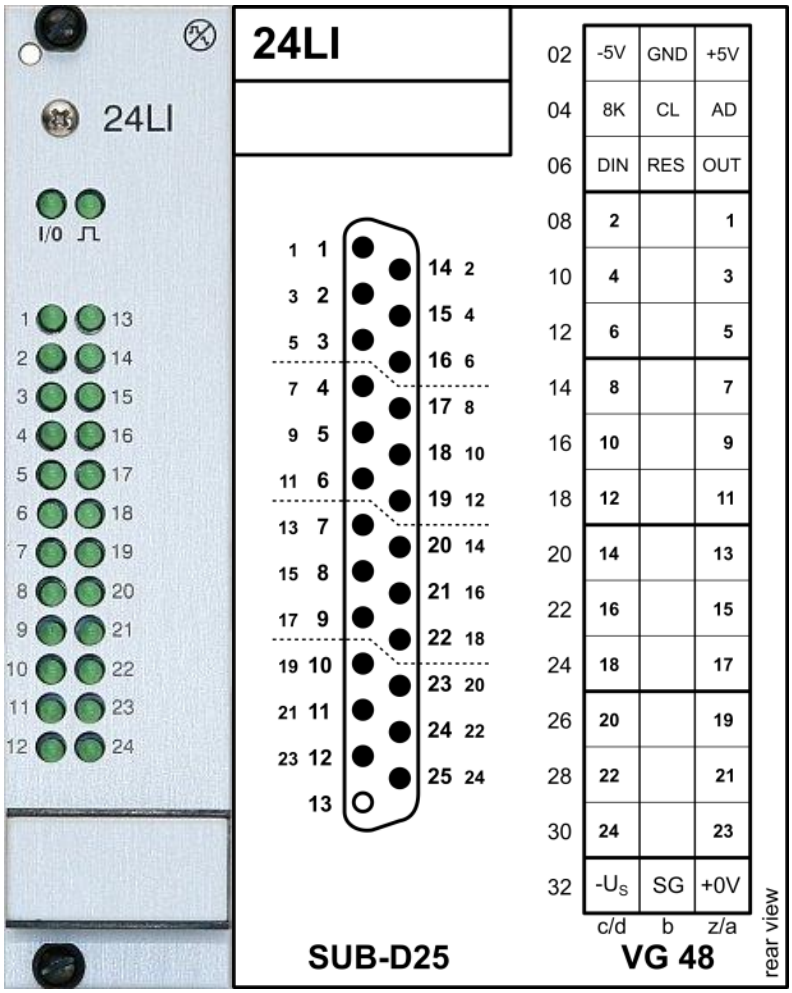
11.8 4ZZA



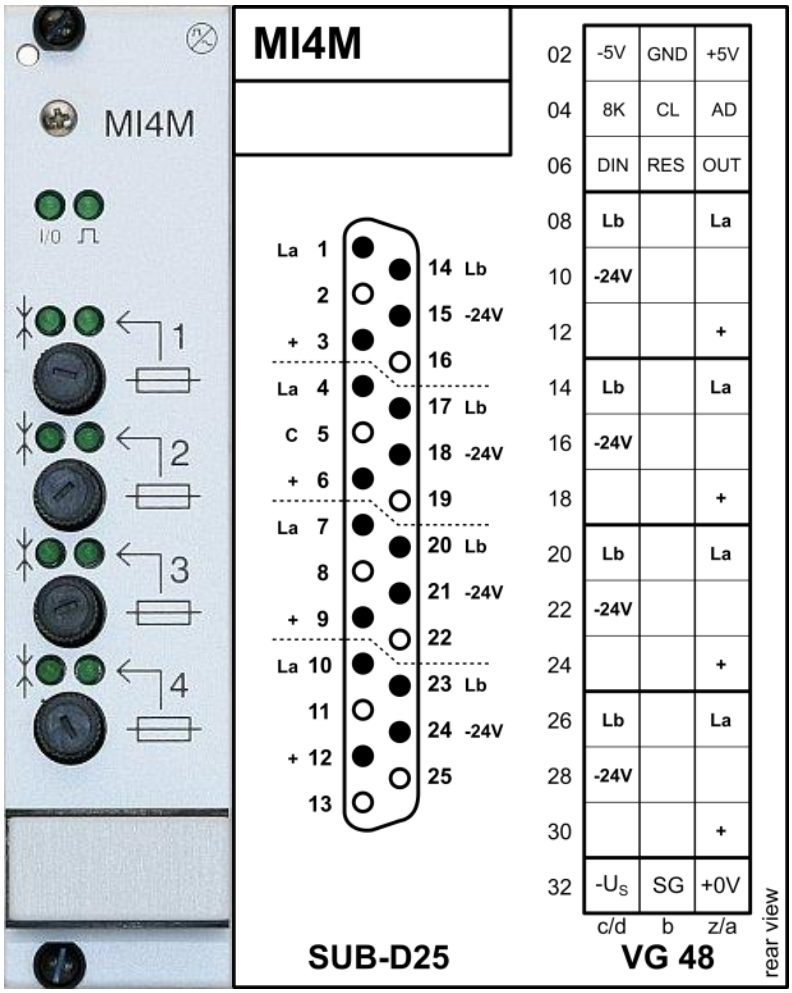
11.9 4IOS



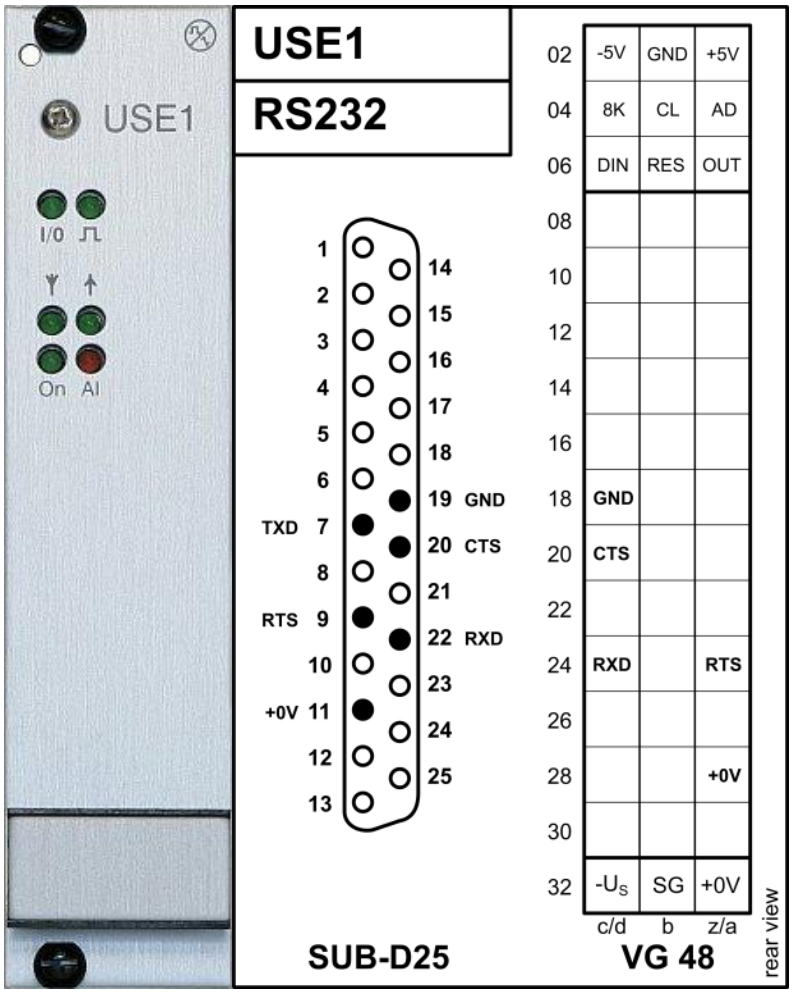
11.10 24LI



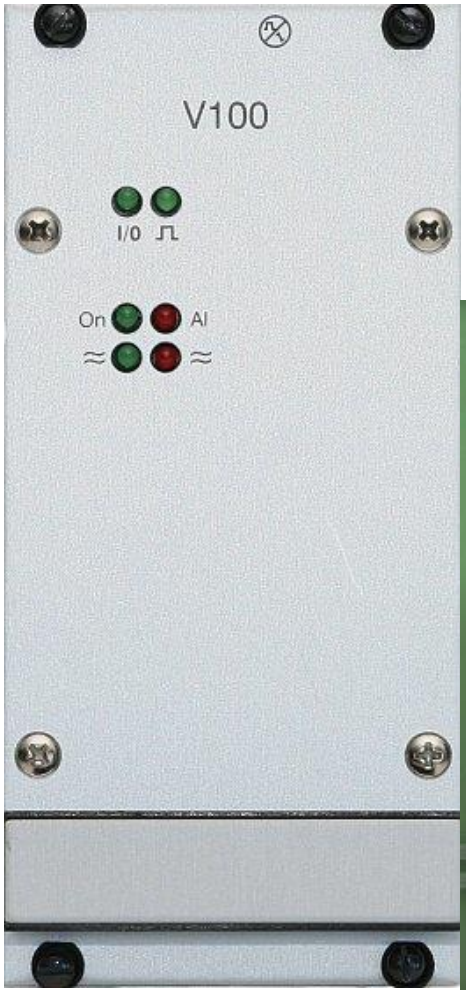
11.11 MI4M

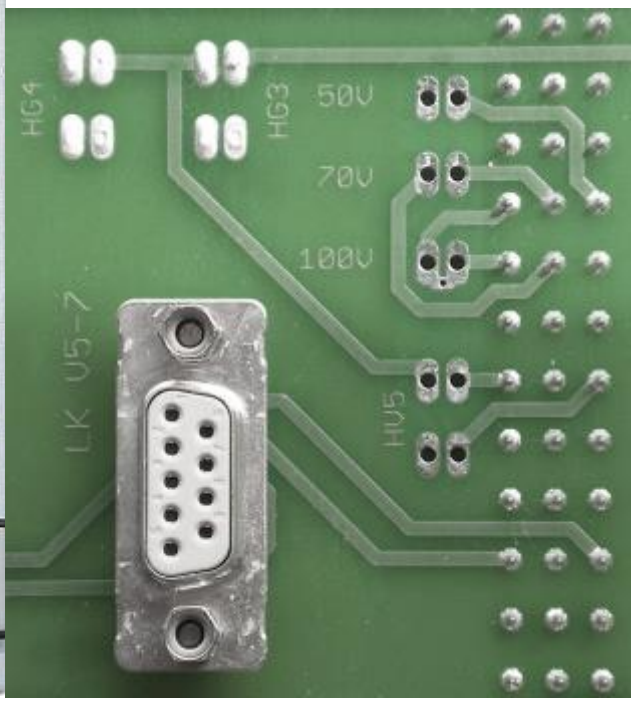


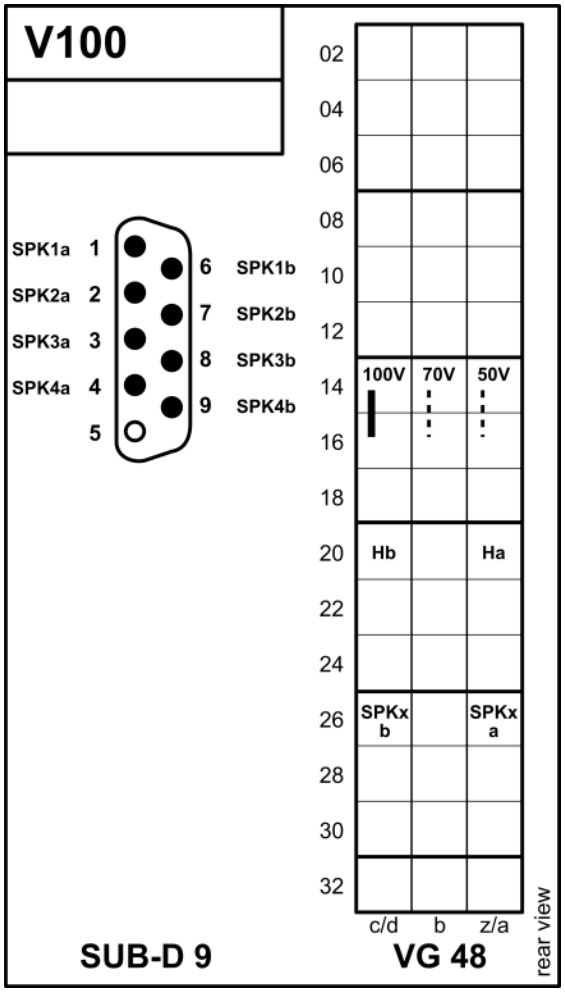
11.12 USE1 (RS232)



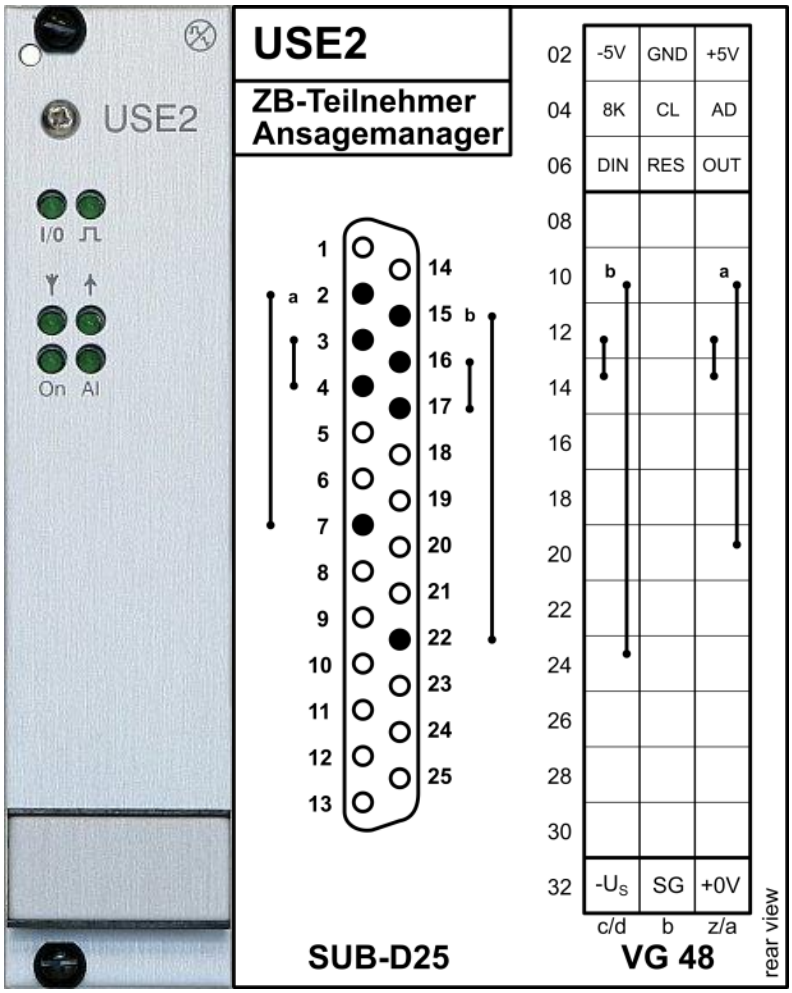
11.13 V100

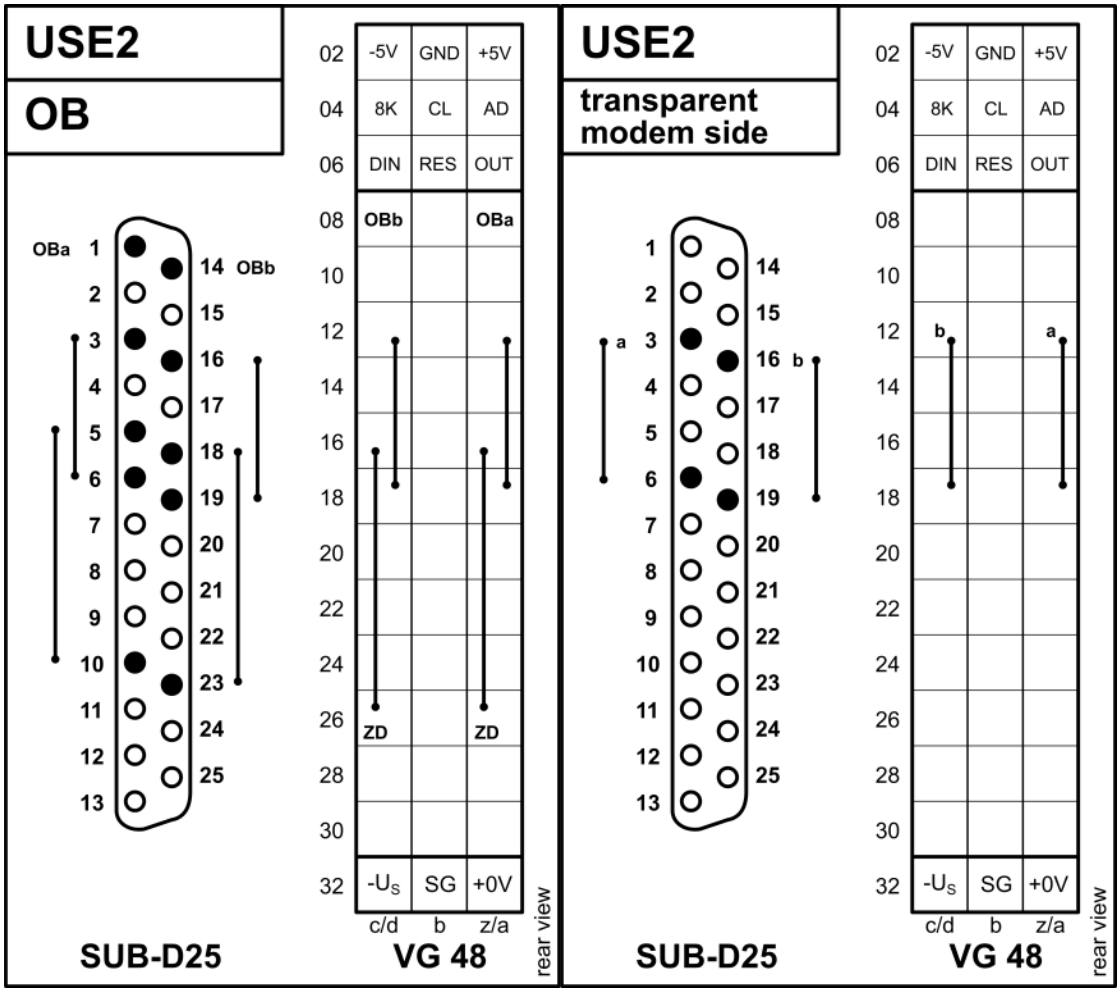


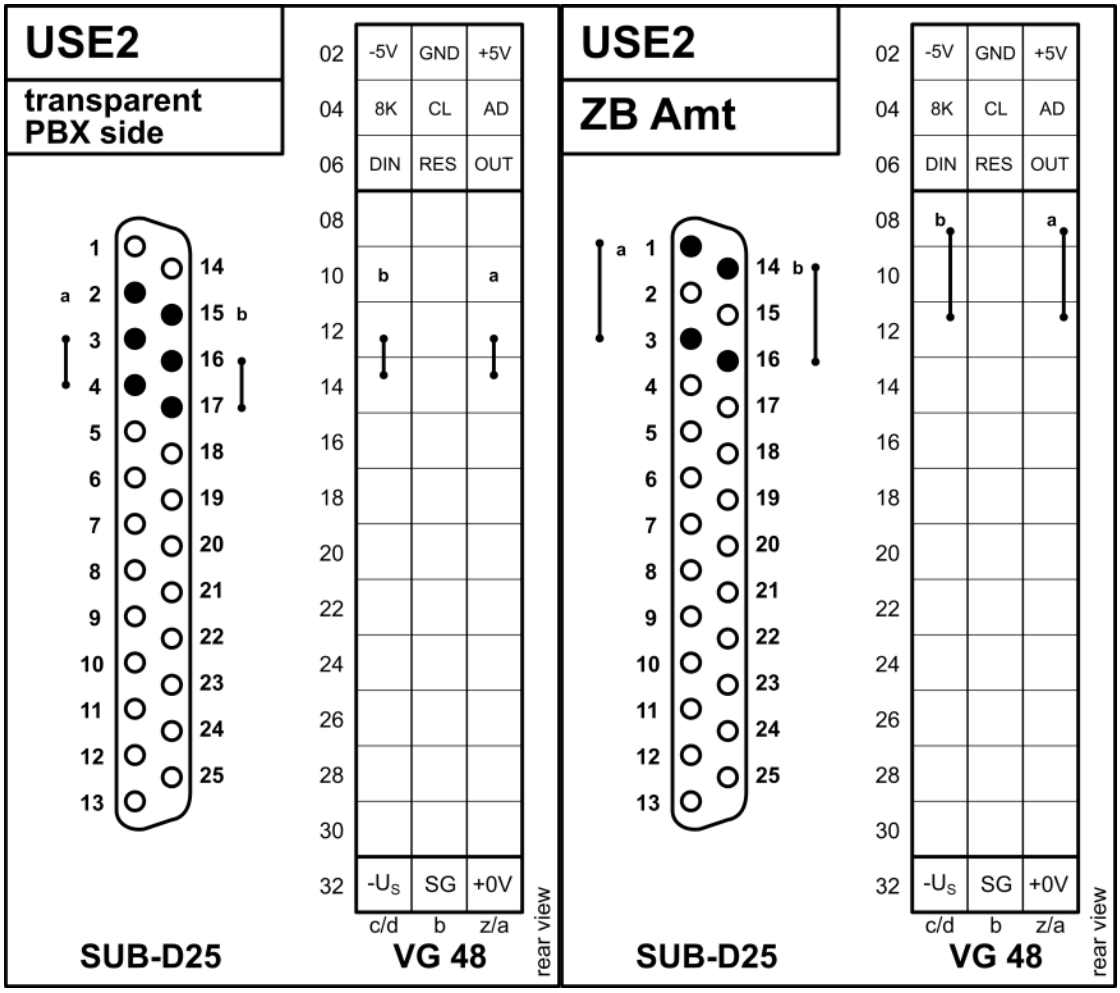




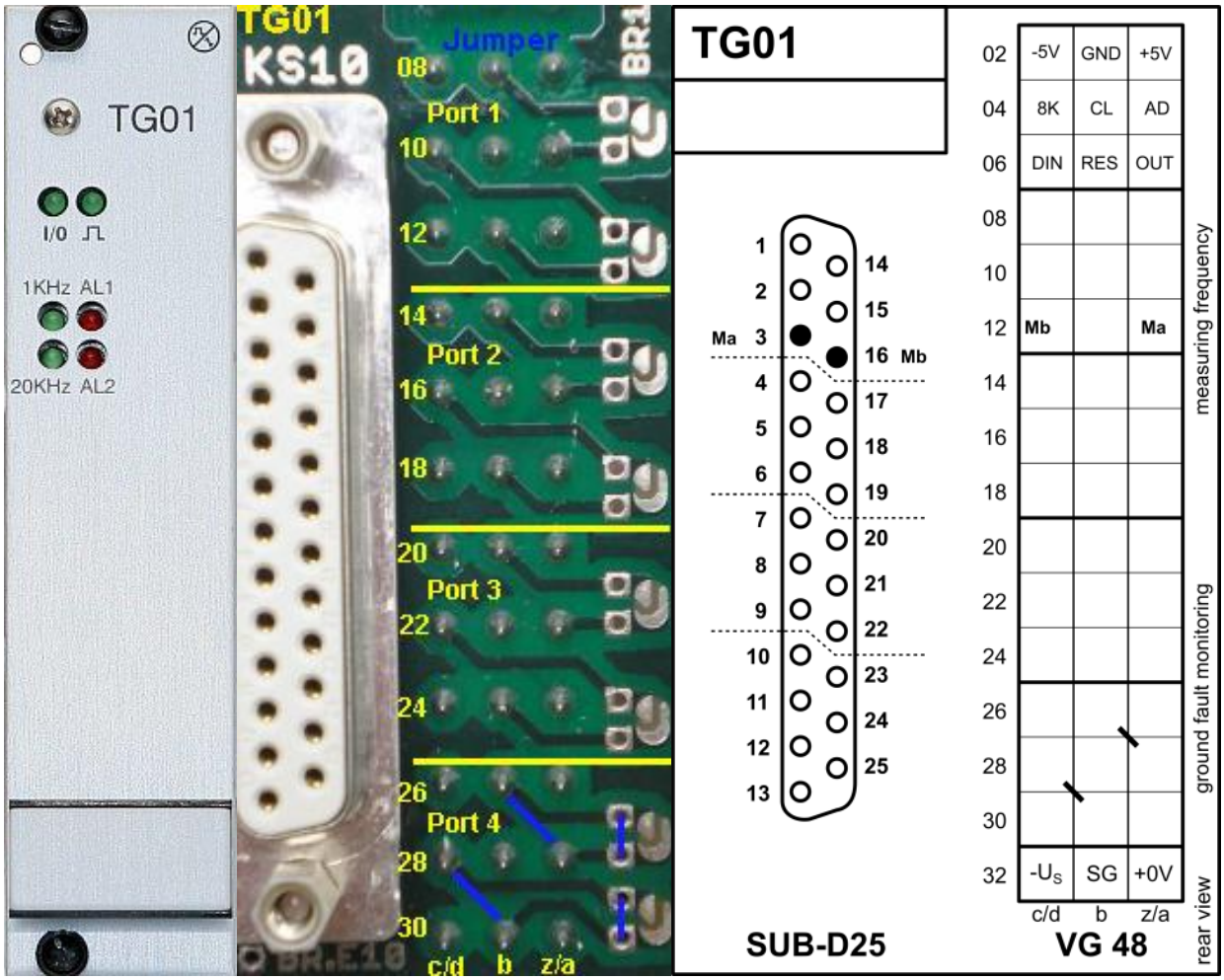
11.14 USE2



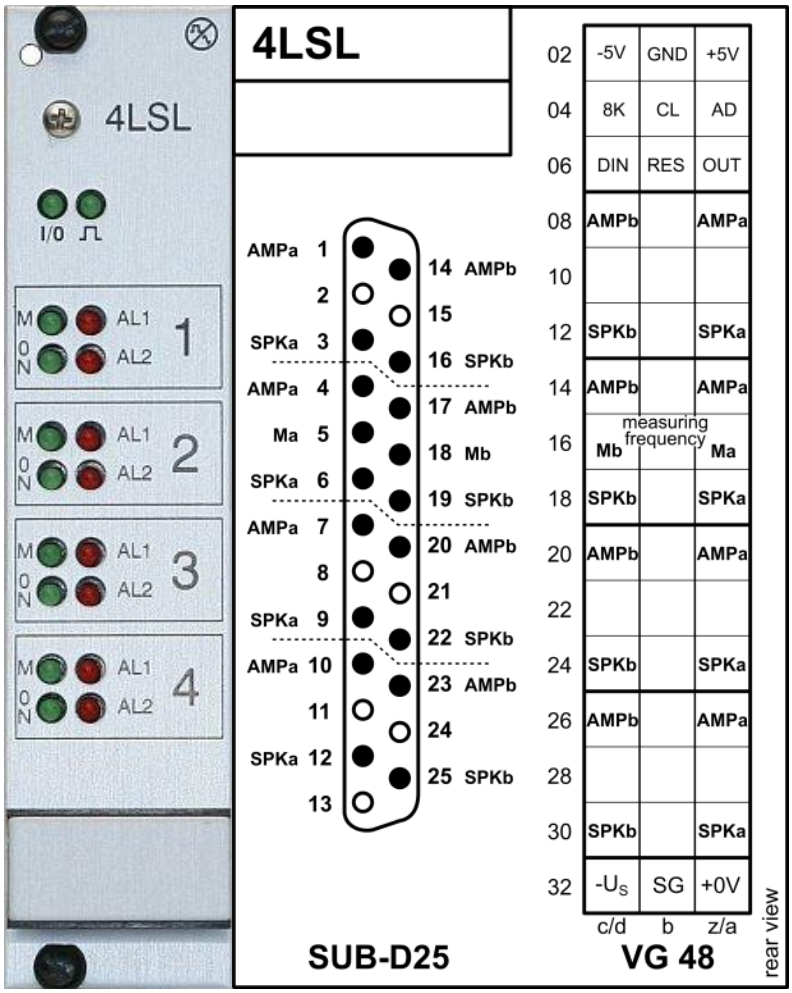




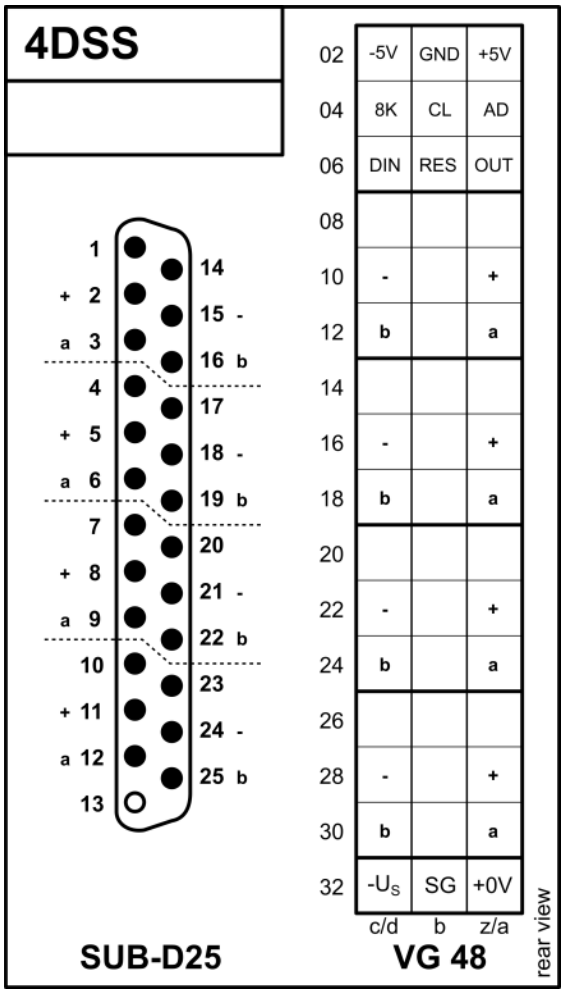
11.15 TG01



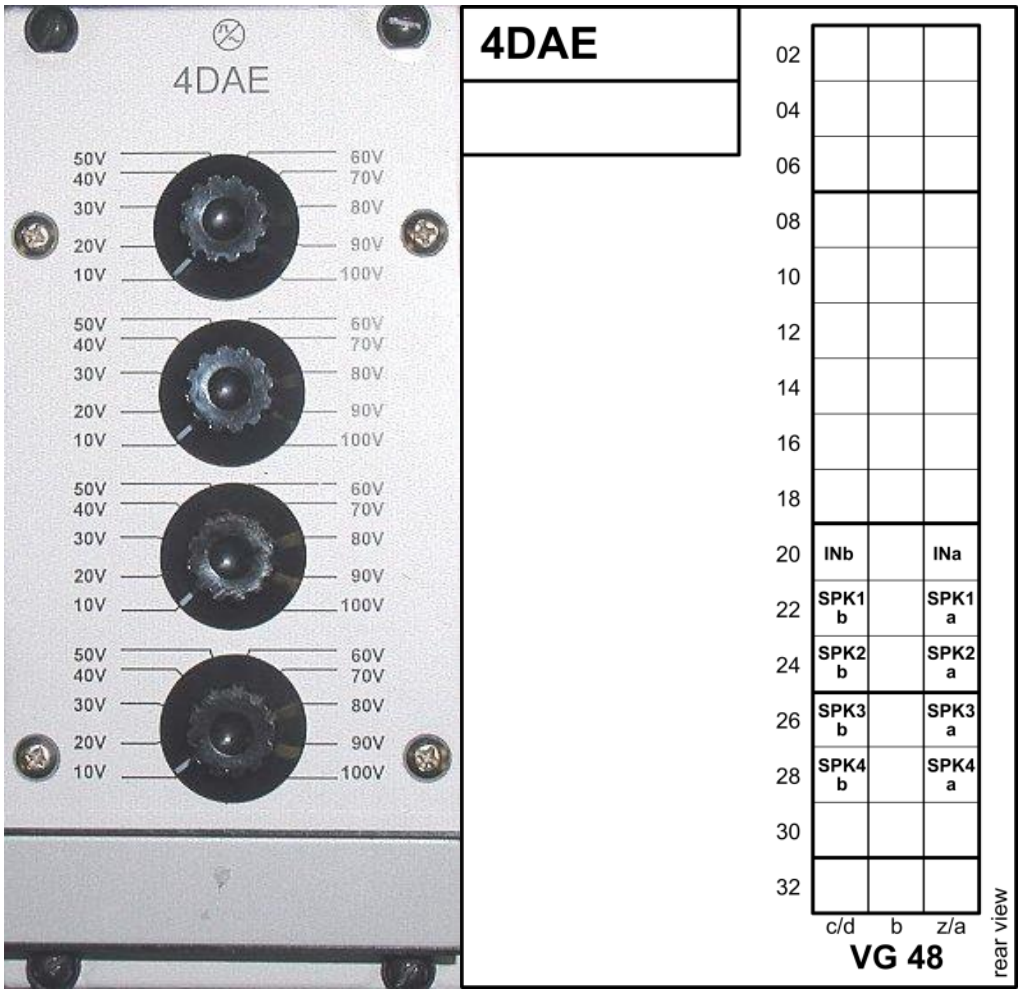
11.16 4LSL



11.17 4DSS

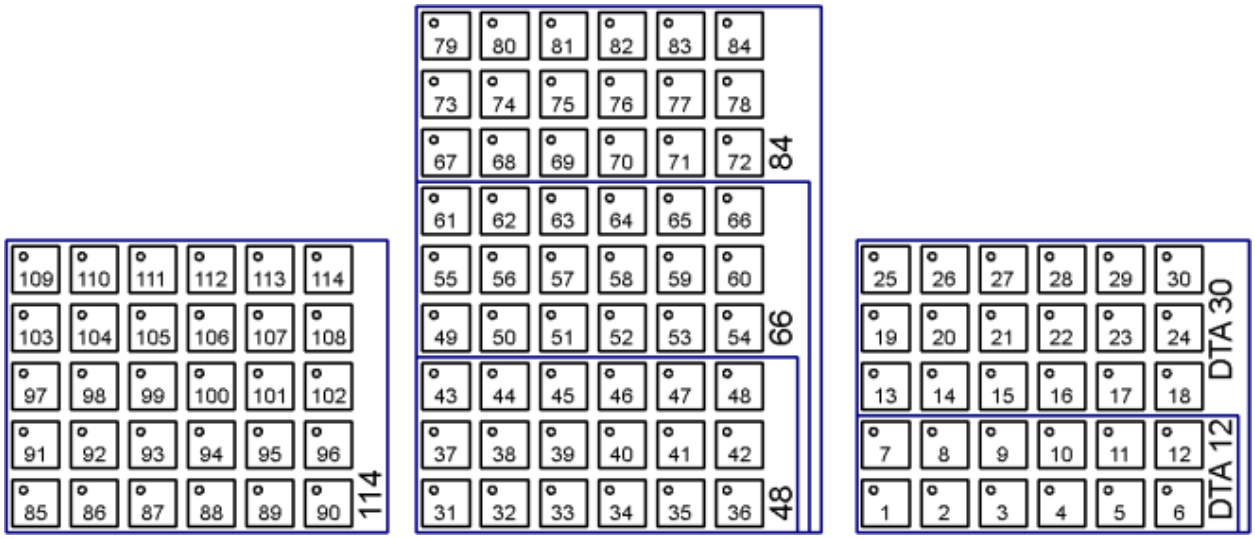


11.18 4DAE

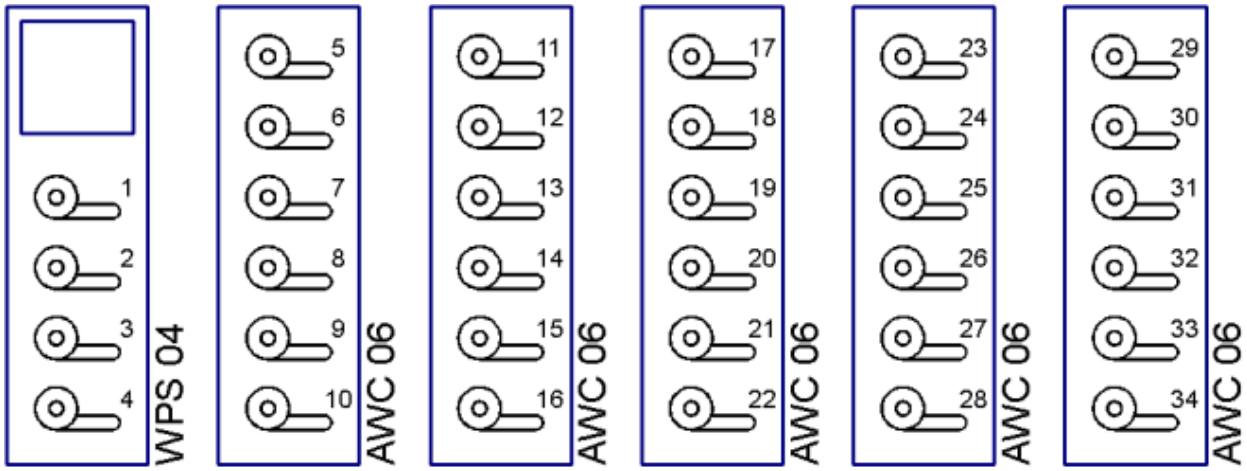


11.19 Station Keypads

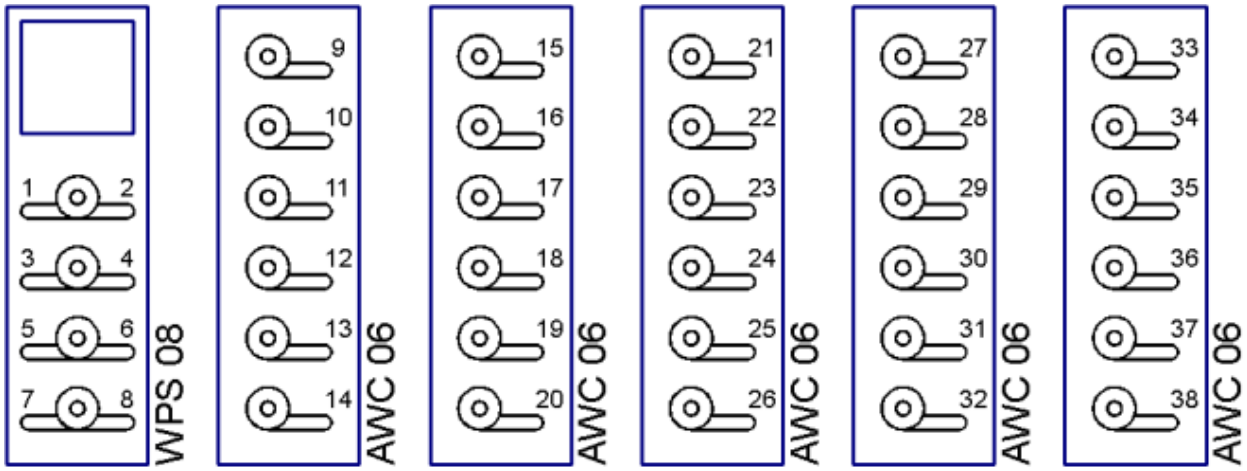
DTA (12, 48, 66, 84, 114)



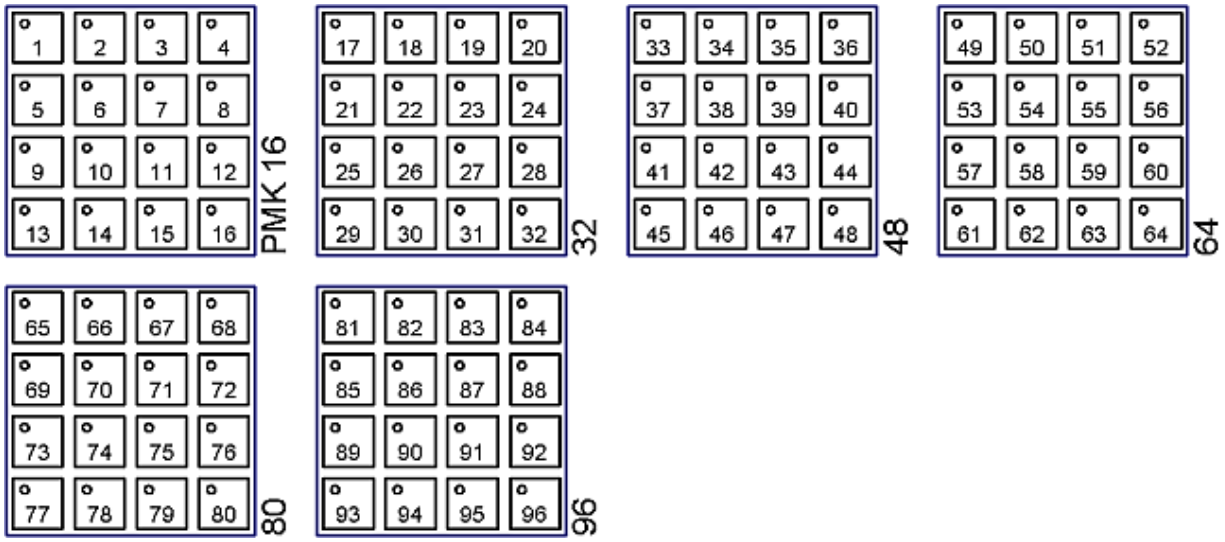
WPS 04 + AWC 06 (4, 10, 16, 22, 28, 34)



WPS 08 + AWC 06 (8, 14, 20, 26, 32, 38)



PMS/PMK 16 (16, 32, 48, 64, 80, 96)



DTA-LAN (24, 78, 132, 186, 240)