

## Product description

The at421 twin TV channel amplifier is intended to filter and equalize TV signals of UHF channels before distributing in the network.

There are incorporated two fully independent TV amplifiers in one unit and consist of: AGC (Automatic Gain Control) circuit, SAW (Surface Acoustic Wave) based ultra high selective filter, IF (Intermediate Frequency) offset control circuit, adjustable output attenuator and controllable +12 V DC feeding circuit for preamplifier (Figure 1).

The amplifier can be used as stand-alone unit as well as modular system powered from single power supply (Figure 3).

The amplifier is intended for indoor use only.

## Safety instructions

Installation of the amplifier must be done according IEC60728-11 and national safety standards.

The amplifier is powered from power supply unit (PSU) +12 V. This voltage is not dangerous to life.

PSU +12 V must have a short circuit protection.

Any repairs must be done by skilled personnel.

Do not plug the PSU +12 V into the mains socket until all amplifier's cables have been connected correctly. The mains socket of PSU +12 V must be easily accessible.

Amplifier shall not be exposed to dripping or splashing water.

Avoid placing amplifier next to central heating components and in areas of high humidity.

If the amplifier has been kept in cold conditions for a long time, keep it in a warm room no less than 2 hours before plugging into the mains.

The ventilation should not be impeded by covering the ventilation openings with items, such as newspapers, table-cloths, curtains.

Mount the amplifier in vertical position.

From top, front and bottom of installed amplifier must be as least 10 cm free space.

## External view

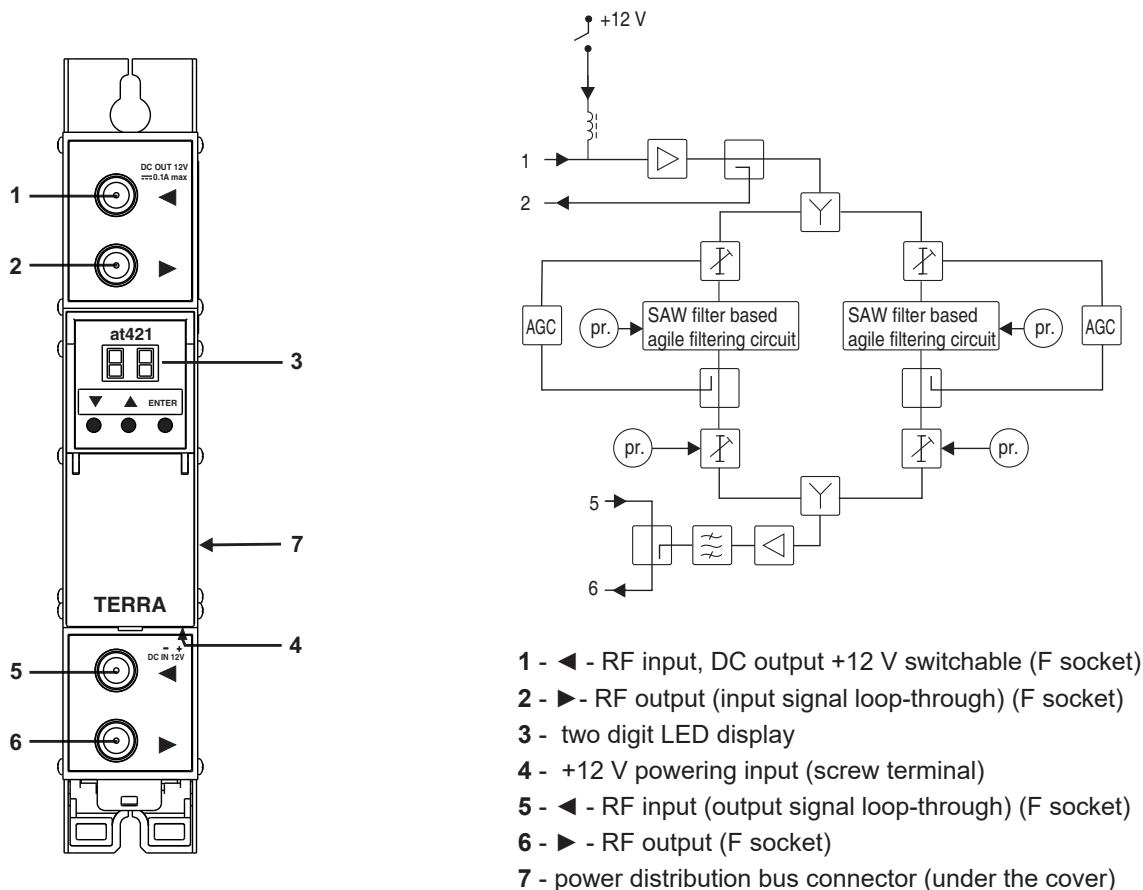


Figure 1. External view and structure diagram

This product complies with the relevant clauses of the European Directive 2002/96/EC. The unit must be recycled or discarded according to applicable local and national regulations.

Equipment intended for indoor usage only.

This product is in accordance to following norms of EU: EMC norm EN50083-2, safety norm EN IEC62368-1 and RoHS norm EN50581.

This product is in accordance with Custom Union Technical Regulations: "Electromagnetic compatibility of technical equipment" CU TR 020/2011, "On safety of low-voltage equipment" CU TR 004/2011.

This product is in accordance with safety standard AS/NZS 60065 and EMC standards of Australia.

## Installation instructions

Read the safety instruction first.

DC power should be connected, after at421 mechanically placed into position (Figure 2, 4 and connected Figure 3).

Menu settings are ready for user updates.

If RF IN connector (pos. 5, Figure 1) is not used, connect the 75 Ω isolated load supplied (Figure 3).

If one of two amplifiers is used only, switch off RF of unused one.

Output attenuator of -30 dB is enabled automatically, when RF input falls below a defined threshold to minimize channel noise. Output attenuator is restored to previous value, when RF input reaches minimum required power level.

If it is possible, set at421 RF channels as far as possible one from another.

### ATTENTION!

1. RF output is switched off as a default.
2. RF output level of the amplifier should be set after half an hour of warm-up.
3. Set the difference of RF output levels less then 2 dB.
4. Do not use 75 Ω terminator without DC isolation.

5. **Recommendation for analog channels:** the difference of RF input level should not exceed 10 dB for every second channel pair (e.g. 21 and 23, 41 and 43, 61 and 63); 20 dB for every fifth channel pair (e.g. 21 and 26, 41 and 46, 61 and 66).

## MOUNTING

The module or mounting bracket must be fixed with steel screws Ø 3.5-4 mm. The screws are not included in a package. Mounting bracket on DIN rail should be connected to main potential equalization bus.

### Mounting on a wall by screws

### Mounting on a bracket (ordering number 01960)

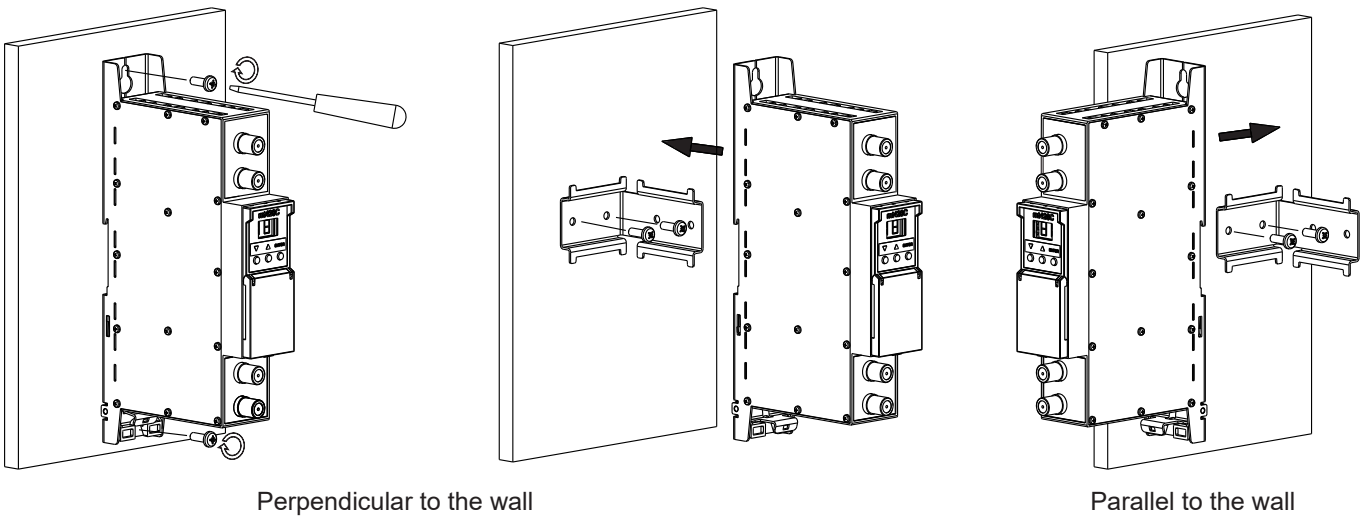


Figure 2. Mounting of amplifier

## Connection of cables

### Requirements for external power supply unit

- Output voltage +12 V ± 0.5 V
- Ripple at single and/or double mains frequency < 10 mV p-p
- Ripple & noise < 100 mV p-p
- Short circuit protection
- Double insulated (marked )
- Meet EN 55022 class B conducted emissions requirements, measuring with grounded load

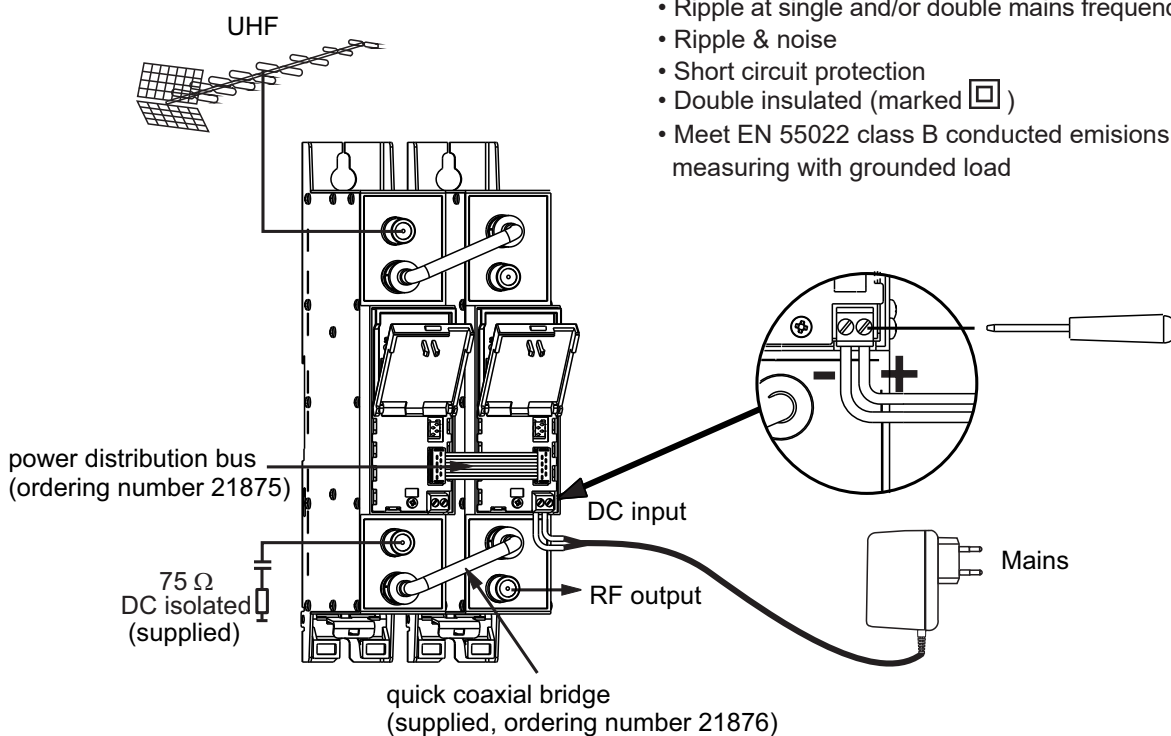


Figure 3. Powering of amplifier

## Mounting on DIN rail

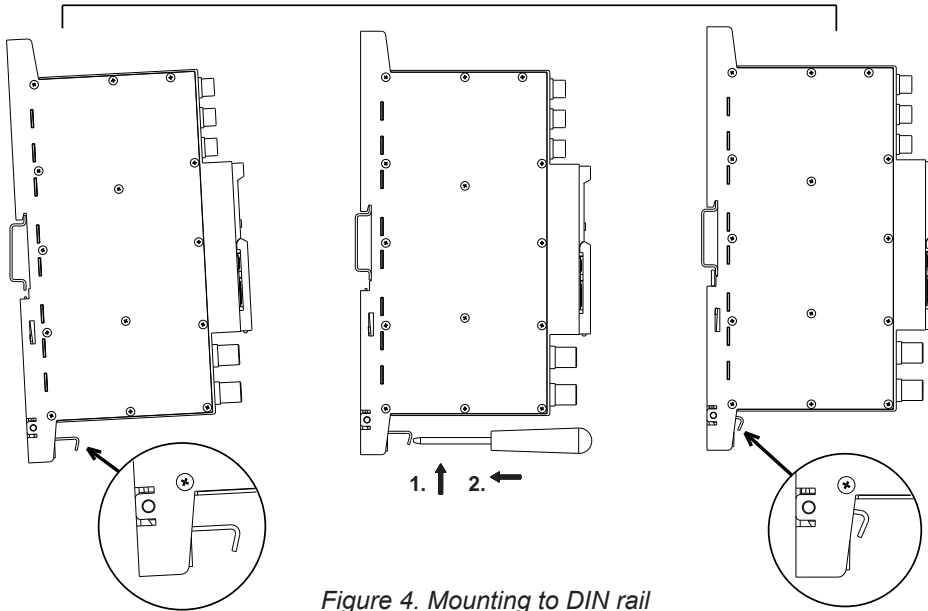


Figure 4. Mounting to DIN rail

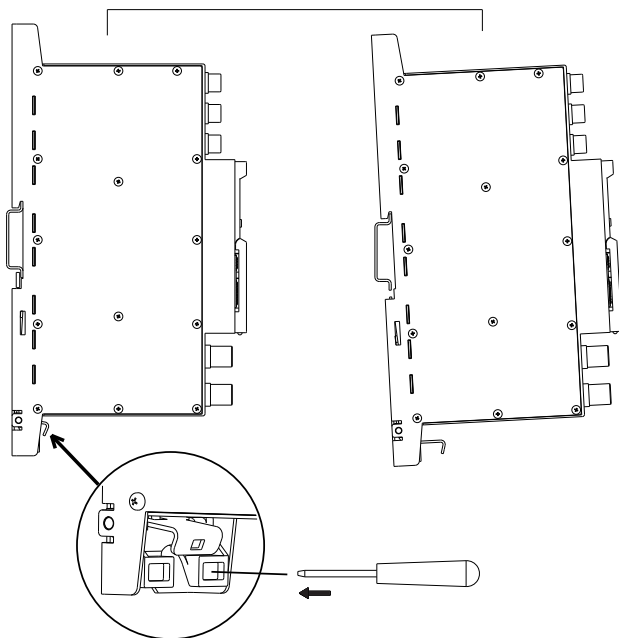


Figure 5. Mounting from DIN rail

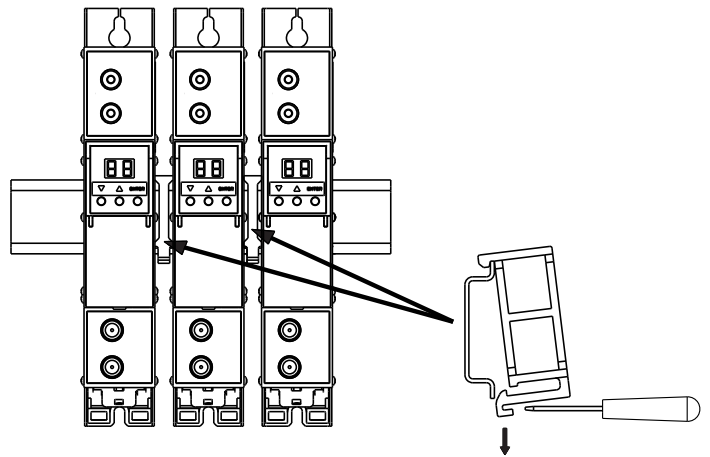


Figure 6. Mounting or removing to/from DIN rail of plastic spacers (supplied).

## Default settings

The amplifiers are supplied with the following default settings:

Section 1, Section 2	Displayed
UHF channel (20-75)	20
Output attenuator (00-10) dB	00
RF output (on/off)	oF (RF off)
Analog/ Digital (On/OFF)	OF (Digital channel)
Offset (-4 4)	0 (see table 1)
DC on RF input (0 /12)	0

## Locking the front panel controls

To lock keyboard  $\text{LO}$  or unlock keyboard  $\text{UL}$ , press buttons  $\blacktriangledown + \blacktriangle$  simultaneously twice for 0.5 sec. " $\text{LO}$ " will briefly be displayed. To revert to normal operation, repeat above procedure. " $\text{UL}$ " will briefly be displayed. The symbol " $\text{LO}$ " appears, if you try to change settings in locked mode.

## OPERATING

### Settings menu

The amplifier has two modes of operating:

1. Normal mode: sets after switch on;

RF channel (20-75) can be set in normal mode by pressing buttons ▼ or ▲.

Menu settings of each section should be set individually. Section 1 or 2 can be selected by pressing button “Enter” (for example: 6.5 - 1 section, output channel 65; 69. - 2 section, output channel 69), see Figure 7:



Figure 7.

Position of glowing dot means which section is activated.

2. Setting mode: to enter the setting mode press and hold ▼ and ▲ buttons simultaneously for 1 second, to exit mode press and hold ▼ and ▲ buttons simultaneously for 1 second again.

Select necessary to change parameter by pressing button ▼.

Enter necessary parameter values by pressing ▲ button:

1. 00 10 - Output attenuator 0 dB to -10 dB by 1 dB step
2. on/off - RF output on/off
3. 0n/0F - Analog/ Digital (0n for analog channel)
4. -4 4 - Offset of a central frequency in respect to filter (see table 1)
5. 0 /1 2 - DC on RF input

If RF channel (20-75) is changed, frequency offset of current section will be reseted.

**NOTE!** DC on RF input (0 /1 2) can be dangerous for some devices.

If no action is taken for 1 minute, sleep mode (-) is activated. To leave sleep mode press any button.

The last selected parameters will remain in memory if the power is interrupted.

### Offset tuning

Table 1

Displayed	Shift MHz
0	0
1	+0.25
2	+0.5
3	+0.75
4	+1.0
-4	-1.0
-3	-0.75
-2	-0.5
-1	-0.25

### Technical specifications

Table 2.

Sections		2	
Tuning range of channels		470-862 MHz (20-75 ch.)	
RF input	TV standard (pr.)	analog	digital
	level/impedance	60-85 dBμV/75 Ω	50-80 dBμV/75 Ω
	frequency range of RF distribution	47-862 MHz	
	loop through gain	0 ± 1.5 dB	
	return loss	> 12 dB	
RF output	level, typical	90 dBμV	85 dBμV
	MER of DTT signal	-	≥ 36 dB (input signal MER 38 dB)
	frequency range of RF combining	47-2150 MHz	
	DC pass through, max.	0.3 A 24 V	
	combining through loss Terr/SAT	1.5/2.5 dB	
	level adjustment range (pr.)	0 ÷ -10 dB by 1 dB step	
	return loss	≥ 10 dB	
Noise figure	8 dB		
Selectivity (referring to Australian standard), typical	40 dB, ± 1.25 MHz from bandwidth border	-	
Selectivity, typical	-	40 dB, ± 2 MHz from bandwidth border	
Offset	± 1 MHz by 0.25 MHz step		
Spurious signals level	≤ -60 dBc		
Mirror channel selectivity	≥ 60 dB		
Flatness of channel bandwidth, typical	± 1.5 dB		
DC feeding for external (pr.)	12 V  0.1 A max.		
Supply voltage	12 ± 1 V		
Current consumption*	0.45 A		
Operating temperature range	0° ÷ +50° C		
Dimensions/Weight (packed)	198x107.5x36 mm/0.9 kg		

\* without external DC loading (pr.) software control