

User Manual

dCSS-/dSCR-Multi Switch

MSU 504-16 K

Item No: 57003342



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1. INTRODUCTION

Product Description

The MSU 504-16 K is specified to support a wide range of installations with new and existing multi switches.

The MSU 504-16 K offers:

- 4 Cascade Inputs and Outputs for Quattro-LNB-Signals: VL HL VH HH
- 1 terrestrial input
- 4 SCR/Legacy outputs
- 1 DC input

Every output can be used for a variety of receivers:

- In "Legacy" Mode the outputs behave like those of a standard multi switch.
- In SCR Mode the related outputs support up to 16 user bands with all Unicable versions. This includes OLT, SCR, CSS, EN50494, EN50607, and later versions

Because all outputs are independent, the installation can include a mixture of Legacy and SCR connections.

The terrestrial Part supports all terrestrial signals up to 1 GHz including terrestrial, CATV and DOCSIS reception.

The passed-through trunk lines allow the cascading of several products to support big installations of more than 100 subscribers in MDU applications like apartment complexes or more than 100 rooms in environments like hotels.

The DC power supply can be inserted on every point. In cascaded systems, several power supplies could be necessary. Please see "Power Status LED" for more information. The recommended power supply is the DCT DELTA NT 20-3.3F (Item No. 57003401).

Packing Content

1x digital SCR Multi Switch MSU 504-16 K (without power supply)

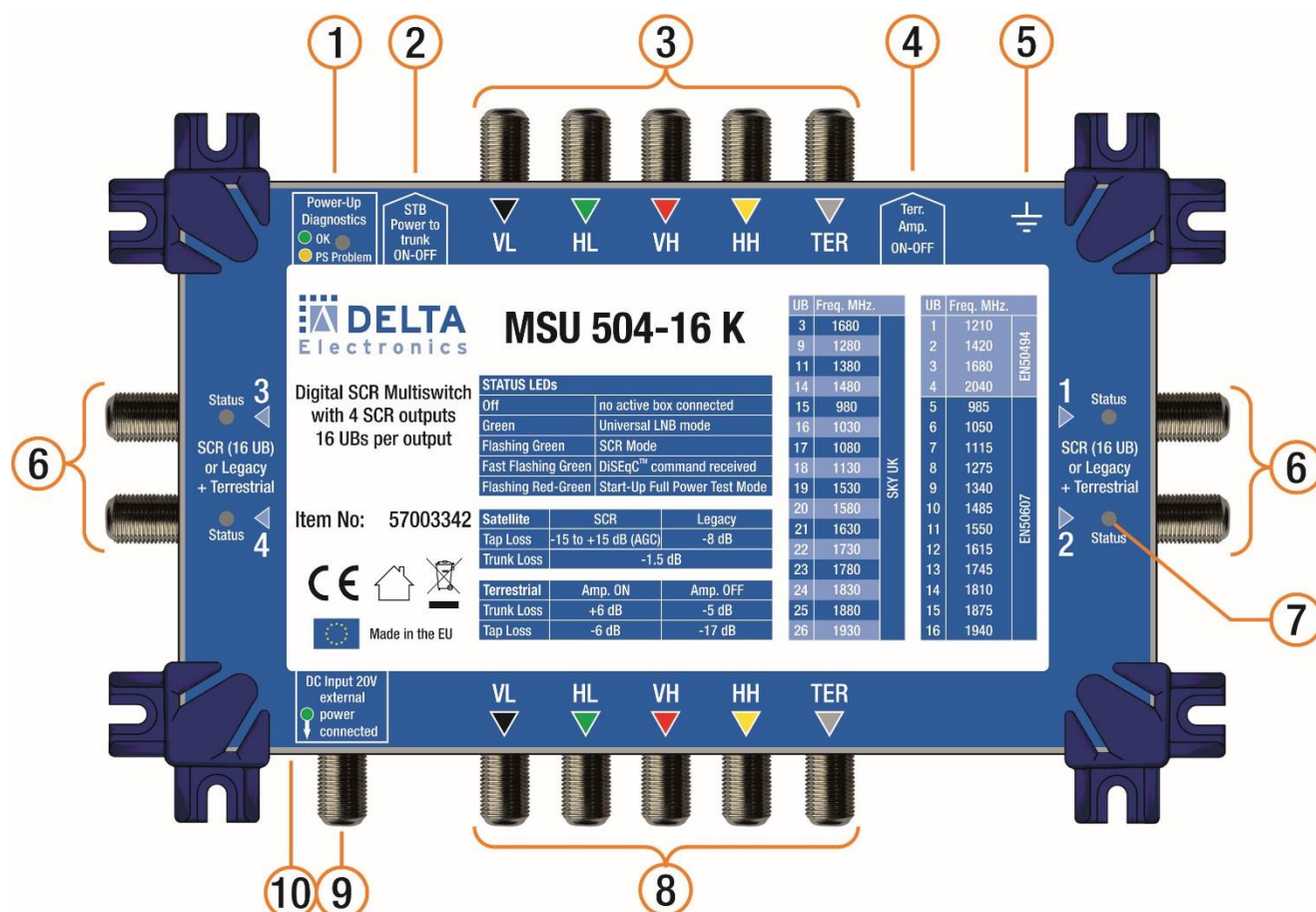
1x User manual

Technical support, help for your installations and general information about Unicable you can find at our website:



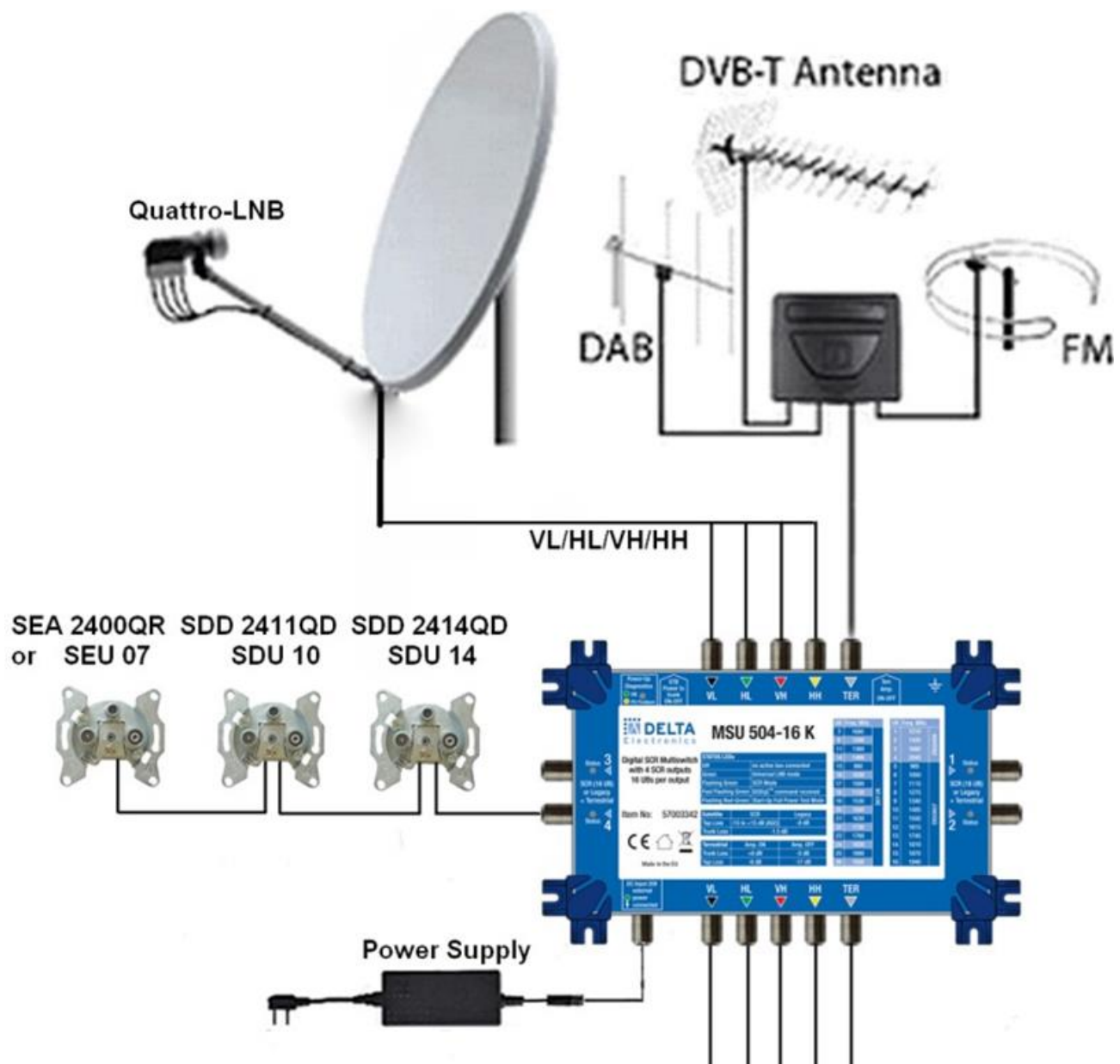
www.unicable-hilfe.de

Operating Elements

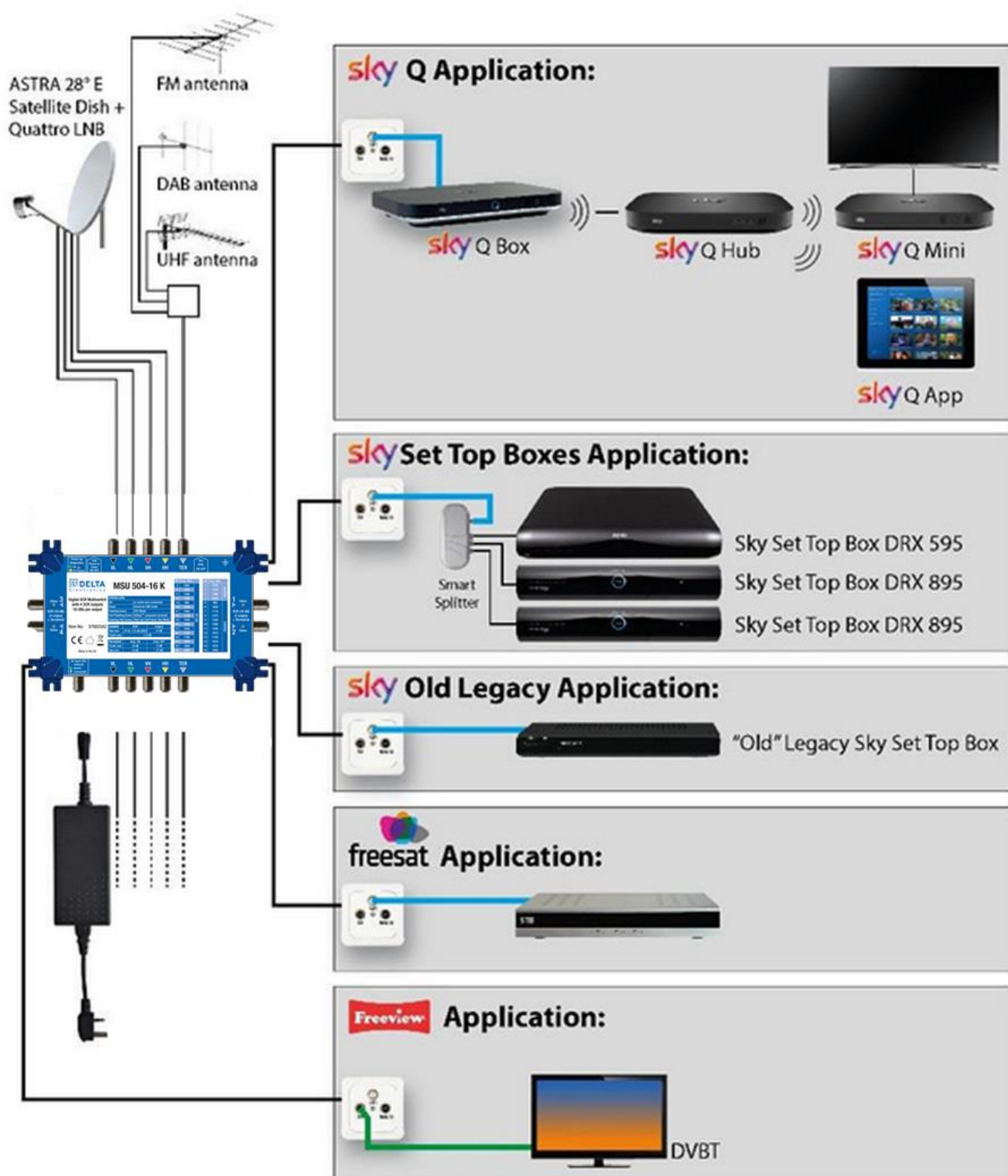


- 1 Power Status LED
- 2 Switch for power supply selection (external power supply – power supply by STB)
- 3 Trunk line inputs
- 4 Switch for terrestrial amplification
- 5 Ground Connection
- 6 Subscriber outputs
- 7 Subscriber Status LED
- 8 Trunk line outputs
- 9 DC connector
- 10 Status LED for external power supply

2. INSTALLATION



Typical Application for UK



3. CONFIGURATION OF THE MSU 504-16 K

Power Status LED ①

The LED is shining **green**, if the supplied voltage is sufficient for the operation of the multi switch.

The LED is shining **orange**, if the supplied voltage is not sufficient of the operation of the multi switch. This can happen if too many multi switches have been installed as a cascade which are supplied only by one power supply or if the voltage is supplied by the STB and this supplied voltage is too low.

Switch for power supply selection ②

With this switch you determine if the power is supplied by the attached STB or through the trunk lines.

OFF: This is the standard setting. Via the VL trunk line all cascaded units and the LNB are supplied with electric power from the DC connector (3). You can cascade one or more units to one power supply.

ON: The STB are powering the unit and the LNB. This is only valid if only one multi switch is used in the system. As soon as you have more multi switches in your system you need to supply the voltage with an external power supply.

The voltage is always provided through the satellite trunk lines.

Trunk Line Inputs ③

The MSU 504-16 has 4 Satellite inputs and one terrestrial input.

Switch for terrestrial amplification ④

The terrestrial trunk line includes an integrated amplifier that can be set to bypass mode (no amplification).

Only in bypass mode the multi switch is ready for DOCSIS return channel. The terrestrial trunk line should always be terminated with a 75 Ohms resistor if it is not cascaded to the next multi switch.

Ground connection ⑤

The ground connection is used for a ground wire. In general all devices in every installation should be connected to ground.

Subscriber outputs ⑥

The MSU 504-16 K has 4 subscriber outputs with 16 user bands each. On the left and on the right side of the multi switch you can find two subscriber outputs each.

Subscriber Status LED 7

Directly after the multi switch has been switched on (plugged in), it will start in a Start-Up-Mode to check the power supply. During this time, the subscriber status LEDs are blinking alternately **green** and **red**.

This special mode is only active at the start if switch 2 is set to "OFF" and the power is provided through the trunk lines, not if the power is supplied by the connected STBs. In this mode the device is using the maximum power. This allows the installation routine to check if there is sufficient power supplied for maximum power consumption in SCR mode. This "High Power" mode allows the installer in a 15 second time frame to check the performance of the power supply. After 15 seconds the multi switch changes to one of the two operation modes (SCR or Legacy).

During the 15 seconds the power status LEDs of all multi switches should be verified.

If the voltage on the trunk lines is too low to supply the device sufficiently, the power status LED will be **orange**. In this case you have to connect an additional power supply with the DC input of the related multi switch. If the voltage on the trunk lines is sufficient, the LED will shine in **green** color.

After the start up mode has been finished, the multi switch changes to working mode. In the operation mode the kind of operation will be showed in the following way:

SCR operation:	Slow green blinking
Legacy operation:	Permanently green light

The MSU 504-16 K can work independently on each output: SCR mode and Legacy mode.

The standard setting is "Legacy" mode. The MSU 504-16 K is switching automatically into SCR mode after the first reception of a DiSEqC command of the connected SCR-Set-Top-Box. If the SCR mode has been activated, it stays active until the power supply is interrupted completely. Then it starts in Legacy mode again.

SCR Mode: Subscriber Status LED is blinking slowly in green color

If a compatible STB is connected and running in SCR mode, 16 user bands can be generated which can be assigned independently to each LNB input and transponder.

The MSU 504-16 K is compatible with SKY, EN50607 and EN50494 CENELEC standard. The Set-Top-Box is sending the required data for the LNB input and selected frequency by using DiSEqC commands.

Legacy Mode: Subscriber Status LED is permanently green

If a SCR compatible Set Top Box is connected to the related output, it is working like a standard multi switch and only allows one tuner to switch polarity and frequency band by 13/18 V and 0/22kHz tone.

Trunk Line Outputs **8**

The MSU 504-16 has 4 satellite outputs and one terrestrial Output to allow the connection of further MSU 504-16 K multi switches in a cascade.

DC Input **9**

The DC input of the MSU 504-16 allows the connection of an external power supply. The input has a F connector to ensure a safe connection and to avoid accidentally pull out.

We are suggesting to use the DCT DELTA power supply NT 20-3.3 F to operate the multi switch.

Status LED for external power supply **10**

The status LED for external power supplies provides you an information if the connected power supply is working correct and delivers the needed voltage. If the LED is shining in **green** color, the supplied voltage is sufficient. If the supplied voltage is too low or the power supply does not provide enough power, the LED stays off.

CSS Mode

ONLY EN50494/SCR Standard

For installations with Legacy STB and PVR/MySKYHD SCR compatible:

- Max. 4 user bands (UB1 bis UB4) per output
- DiSEqC 1.0 commands

ONLY EN50607/dCSS Standard

For NEW HMG Installation:

- 12 user bands per output for HMG ranging from UB5 to UB16
- DiSEqC 1.0 or 2.0 commands

SIMULTANEOUS EN50494-/EN50607 Standards

For existing MULTIVISION installations (Legacy STB/PVR SCR compatible), where the main STB is equipped according to Next Gen PVR/HMG.

- Max. 4 user bands per output (UB1 to UB4) available for actual STB/PVR
- 12 user band per output for HMG ranging from UB5 to UB16
- DiSEqC 1.0 commands + DiSEqC 2.0 commands in the same cable from the LNB to the apartment.

SKY UK Standard

For installations with SKY Q-Box:

- 16 user bands per output in SCR mode
- DiSEqC 1.0 or 2.0 commands

4. TECHNICAL SPECIFICATION

MSU 504-16 K	
SAT.	
Operation frequency range	950 - 2150 MHz
Inputs	4
Outputs * (Trunk)	4
Max- and Min-Input Txp power	-35 to -5 dBm
Through loss trunk lines	-2,5 dB (-1,5 dB typical)
Subscriber output gain SCR	-15 dB to +15 dB, AGC controlled
Subscriber output gain Legacy	-13 dB max. (-8 dB typical)
Return loss	> 8 dB
Terrestrial	
Operation frequency range	88 - 790 MHz
Inputs	1
Outputs * (Trunk)	1
Max Input MUX power	Gained: 96 dBμV min.
Through Loss trunk lines	Bypass: -7 dB to -5 dB max (-6 dB typical) Gained: +4 dB min (+6 db typical)
Subscriber output gain	Bypass: -23 dB max (-17 dB typical) Gained: -12 dB max (-6 dB typical)
dSCR Output Ports	
dSCR Output ports	4
Supported output modes	SCR + Legacy + DVB-T/DAB/FM
SCR Mode indication	Green blinking subscriber status LED
SCR output power per port	Min. 85dBμV typical 87dBμV, AGC controlled
SCR Channel bandwidth	46 MHz
SCR User bands	16
SCR Standard (automatic recognition)	BSkyB SCR CENELEC EN50494, CENELEC EN50607, Universal LNB Tone & voltage
Legacy output power per Txp	Up to -15 dBm, no AGC
DiSEqC commands	DiSEqC conform

*: unused outputs must be terminated with 75 Ohm termination resistors (DC blocked).

DC Supply		
DC Supply	The MSU 504-16 K can be powered through the DC input, via the trunk lines or via the subscriber outputs (all F type)	
Operation indication	Green LED (front side of the unit)	
Power supply voltage	10 to 20 VDC	10 to 20 VDC (from STB) 11 to 20 VDC (from external power supply)
Max. power consumption	SCR mode: 6W (per pair of outputs) LNB emulation mode < 2,1 W (per port - TER Amp OFF)	
DC through on trunk lines	Yes (not for terrestrial trunk line)	
Power supply for LNB (switchable)	500 mA @ 20 V	
Shortage & Power On Diagnostics	Yes	
Earthing clamp	1	
Operation temperature range	-20°C bis +50°C (Inhouse use only)	

Sky UK		EN50607		EN50494	
UB	FREQ.	UB	FREQ.	UB	FREQ.
3	1680	5.	985	1.	1210
9.	1280	6.	1050	2	1420
11.	1380	7.	1115	3	1680
14.	1480	8.	1275	4	2040
15.	980	9.	1340		
16.	1030	10	1485		
17.	1080	11.	1550		
18.	1130	12.	1615		
19.	1530	13.	1745		
20.	1580	14.	1810		
21.	1630	15.	1875		
22.	1730	16.	1940		
23.	1780				
24.	1830				
25.	1880				
26.	1930				

5. SAFETY NOTES



Please read the instruction carefully before you connect the device



To avoid fire, shortage and electric shocks:

- Never expose the device to rain or humidity.
- Install the device in a dry place without the danger of humidity or condensation.
- Protect the device against dripping and splashing water.
- Don't place any with liquids filled containers onto the device.
- If liquids run into the device, please pull the power plug immediately.



To avoid overheating:

- Install the device in a well ventilated location. To ensure a good ventilation make sure to keep a minimum distance of at least 10 cm to other devices or walls.
- Don't put any things onto the device, that could block the ventilation holes (newspaper, table cloth, curtains, ...).
- Never place open flames like burning candles onto the device.
- Install the device in a dust free environment.
- Use the device only in environments with moderate humidity.
- Die minimum and maximum operating temperatures need to be maintained in every season.



To avoid electric shock:

- Connect the device only properly grounded.
- The power plug needs to be easily accessible at all time.
- Pull out the power plug before you make any changes on the installation.
- Under no circumstances open the device as long as it is powered.



Maintenance and care



Only use dry and soft cloth to clean the device



Don't use any solvents



For repair and maintenance please contact qualified installers.



Disposal according to local regulations

6. TERMS OF GUARANTEE

DCT DELTA AG guarantees for a period of 24 months after the purchase, that the device is free of material and production defects.

Should the product show any material or production defects during normal application within the guarantee period, DCT DELTA AG will replace or repair the product at its own discretion. Please bring or send the defect device back to your dealer.

The guarantee is only valid for material and production defects and does not cover defects caused by:

- Abuse or usage of the product outside its specification.
- Installation or usage which is not compliant to the local safety regulations
- Usage of unsuitable accessories (Power supplies, adaptors, ...).
- Installation in a not proper environment.
- External sources outside the influence of DCT DELTA AG, like e.g. drop, accident, stroke of lightning, water, fire, insufficient ventilation ...

The guarantee commitment ends even ahead of time if:

- The production date or serial number is not readable anymore or has been changed, deleted, removed or in any other way manipulated.
- The device has been opened or repaired by unauthorized people.

Hereby DCT DELTA AG declares that the radio equipment type multiswitch MSU 504-16 K is in compliance with directive 2014/53/EU. The complete text of the EU declaration of conformity is available at the following internet address:

www.dct-delta.de/service/



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