PRODUCT CATALOG 2019/20

TERRA

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SAT IF distribution system

Terrestrial TV products

Channel processing equipment

Specifications are subject to change without notice. The parameters are measured at room temperature +25 °C.

Fiber optics equipment

Broadband equipment

Contents

Specifications are subject to change without notice. The parameters are measured at room temperature + 25 °C.

1. SAT IF distribution system

Contents

SAT IF-IF conversion system
SAT IF channel converters

- frequency conversion of SAT IF channels from different polarizations/sub-bands
- making a new frequency plan
- up to 32 converted channels could be transmitted via single cable
- Web control and SNMP agent
- loading settings from saved file
- DIN rail or wall mounting
- robust die-cast housing
- connectors:
  6xRF - type F
  Ethernet control - RJ-45
  screw terminal block for DC entry
  power distribution bus

obsolete

Technical specifications

TYPE			cs432	cs464
Ordering number			01794	01795
RF input	frequency range	pr.	250-2350 MHz	
	inputs number		4	
	level	pr.	55...88 dBµV	60...93 dBµV
	symbol rate		3 ÷ 45 Ms/s	
	return loss/impedance		> 10 dB/75 Ω	
	LNB powering/control	pr.	0/13/18 V 300 mA max. DiSEqC 1.0	
RF output	outputs number		1	2
	frequency range	pr.	950-2150 MHz by 1 MHz step	
	channel bandwidth	pr.	20 ÷ 60 MHz	
	channels number	pr.	32 max.	64 max.
	level per carrier at 2150 MHz		90 ± 2 dBµV	
	fixed slope precorrection		5 dB	
	carrier output level adjustment	pr.	0 ÷ -8 dB by 0.5 dB step	
	common output level adjustment	pr.	0 ÷ -15 dB by 1 dB step	
	return loss/impedance		> 10 dB/75 Ω	
	spurious in band		< - 35 dB	
	frequency range of RF combining		5-2150 MHz	-
	combining through loss Terr/SAT		< 1 dB	-
Supply voltage			12 ± 1 V	
Current consumption without external DC feeding			0.43 A	0.81 A
Operating temperature range			0° ÷ +50° C	
Dimensions/Weight (packed)			36x198x112 mm/0.9 kg	48.5x198x112 mm/1 kg

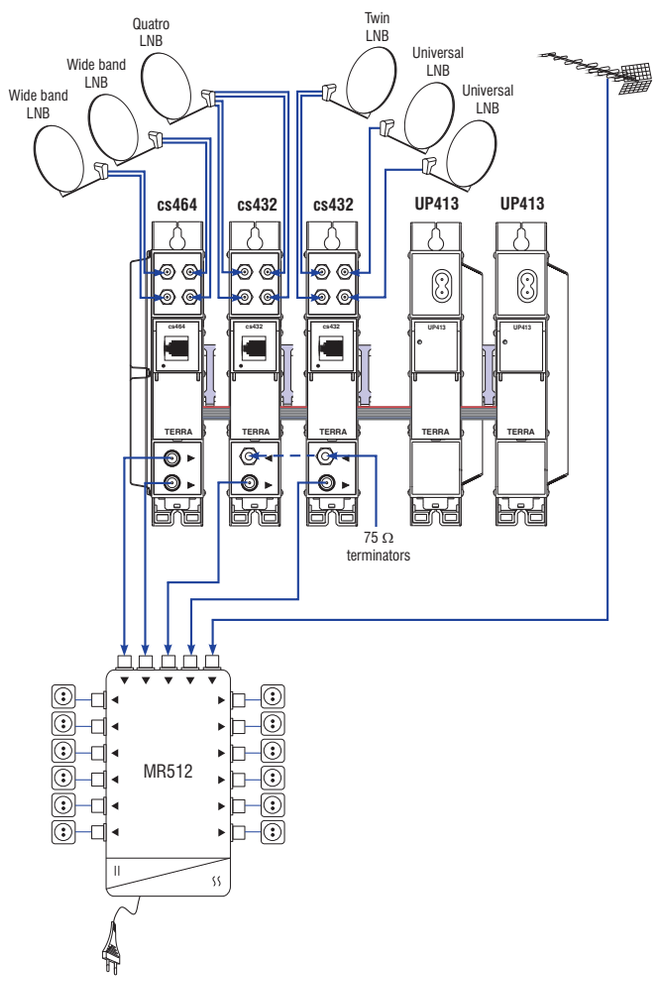
pr. software control

SAT IF-IF conversion system
Power supplies

- suitable for operation in parallel connection for back-up function implementation (UP413)
- modular power supply with integrated RF combiner (UP410S)
- switch-mode technology
- short circuit and overload protected
- DIN rail or wall mounting
- robust die-cast housing
- connectors:
  3xRF - type F (UP410S)
  screw terminal block for DC output power distribution bus

Technical specifications

TYPE		UP413	UP410S
Ordering number		03821	02874S
Power supply	input voltage	187-250 V~ 50/60 Hz	
	output voltage, current	12 V 4.5 A max.	
	power consumption	65 W max.	
RF combiner	frequency range	-	47-2400 MHz
	insertion loss	-	4 dB at 862 MHz; 6 dB at 2400 MHz
	isolation	-	≥ 20 dB
	return loss	-	≥ 20 dB at 862 MHz ; ≥ 12 dB at 2400 MHz
Operating temperature range		0° ÷ +50° C	
Dimensions/Weight (packed)		48x198x107.5 mm/1 kg	48x198x107.5 mm/0.97 kg



Application example of SAT IF distribution system from 6 different satellites.

cs464 - SAT IF channel converter, two RF outputs, **page 1.02**
cs432 - SAT IF channel converter, one RF output, **page 1.02**
MR512 - 5x12 multiswitch, **page 1.20**

See accessories, page 1.04.

SAT IF-IF conversion system
Power supplies & accessories

Power supplies

- switch-mode technology
- short circuit and overload protected
- DIN rail mounting (HDR-60-12)

Technical specifications

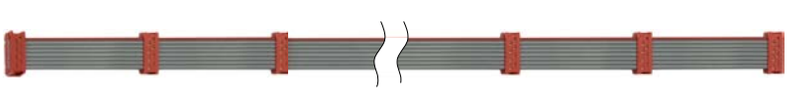
TYPE	HDR-60-12	SGA25E12-W
Ordering number	00631	00633
DC output	+12 V 4.5 A max.	+12 V 2 A max.
Mains voltage	100 V÷ 240 V~ 50/60 Hz	
Operating temperature range	-20° ÷ +50° C	-20° ÷ +40° C
Dimensions/Weight (packed)	52.5x90x54.5 mm/0.3 kg	75.5x32x47.5 mm/0.16 kg

Accessories

- Fmale - Fmale quick coaxial bridge 699.026:
  for modules with width 36 mm
  Ordering number 21876
- Fmale - Fmale quick coaxial bridge 780.026:
  for modules with width 48.5 mm
  Ordering number 21881

- DC distribution cable 699.20 for 4 modules
  with width 36 mm
  Ordering number 21875
- DC distribution cable 780.20 for 4 modules
  with width 48.5 mm
  Ordering number 21882

- DC distribution cable 908.20 for 12 modules
  Ordering number 21883



- 19" system mountable rack
  Ordering number 01957

- Rail for wall mounting, 1 meter, 699.027
  Ordering number 21877

5 cable dSCR system

Cascadable single cable multiswitch

Cascadable single cable multiswitch for the distribution of SAT IF and DTT signals over one cable to up to 32 receivers.

- wideband/quattro LNB IF range, switchable
- control according legacy/EN 50494/EN 50607
- dSCR/Legacy mode automatic selection
- configurable with programmer PC102W
- DC input for external power supply
- current pass from DC input or tap output to H trunk lines
- passive terrestrial TV path
- robust die-cast housing
- connectors:
  RF inputs/outputs - type F
  DC input - type F

Technical specifications

TYPE		SRM522
Ordering number		02788
Frequency range	SAT IF	290-2350 MHz
	SAT IF output	950-2150 MHz
	Terr. TV	5-862 MHz
Number of inputs	SAT IF	4
& trunk outputs	Terr. TV	1
Number of tap outputs		2
Return loss / impedance		> 10 dB / 75 Ω
Input level per channel	SAT IF	60-95 dBμV
	Terr. TV	passive
Tap output with	user bands	32 max. per pair outputs, configurable
combined DTT	user band bandwidth	20-60 MHz configurable
	dSCR mode output level, AGC controlled	84 dBμV configurable
	legacy mode output level AGC controlled, typical	78 dBμV
	Terr.TV loss, typical	11 dB
Trunk output loss	SAT IF	< 3 dB
	Terr. TV	< 4 dB
Decoupling	SAT IF inputs/SAT IF inputs	> 30 dB
	SAT IF inputs/Tap outputs	> 30 dB
	SAT IF / Terr. TV	> 25 dB
DC pass through	SAT IF	2 A max., 1 A max. through one line
trunk lines	Terr. TV	250 mA max.
Current pass	from DC input	20 V 1.78 A max.
to H trunk lines	from tap outputs	20 V 550 mA max.
Current consumption*	from DC input, H trunk lines	20 V 220 mA max.
	from STB	13 V 350 mA max
Operating temperature range		-20° ÷ + 50° C
Dimensions/Weight (packed)		116.6x91x25.5 mm/0.28 kg

* without external DC feeding

5 cable dSCR system

Cascadable single cable multiswitches

Cascadable single cable multiswitches for the distribution of SAT IF and DTT signals over one cable to up to 32 receivers per pair outputs.

- quatro LNB IF range
- control according legacy/EN50494/EN50607
- dSCR/Legacy mode automatic selection
- configurable with programmer PC102W
- DC input for external power supply
- current pass to H trunk lines, switchable
- active terrestrial TV path
- powering status LED indication
- robust die-cast housing
- connectors:
  RF inputs/outputs - type F
  DC input - type F

SRM523
active DTT path, two dSCR outputs

SRM543
active DTT path, four dSCR outputs

Technical specifications

TYPE		SRM523	SRM543
Ordering number		02792	02793
Frequency range	SAT IF	950-2150 MHz	
	Terr. TV	47-862 MHz	
Number of trunk inputs	SAT IF	4	
& outputs	Terr. TV	1	
Number of tap outputs		2 (1 pair)	4 (2 pairs)
Trunk output loss	SAT IF	< 3.0 dB	
	Terr. TV	< 1.0 dB	
Return loss / impedance		> 10 dB / 75 Ω	
Input level per channel	SAT IF	60-95 dBµV	
	Terr. TV	IMD3=60 dB 96 dBµV max.	
Terr. TV noise figure		6 dB	
Tap output with combined DTT	user bands (dSCR mode)	32 max. per pair outputs, configurable	
	user band bandwidth (dSCR mode)	20-60 MHz configurable	
	dSCR mode output level, AGC controlled	84 dBµV configurable	
	legacy mode output level, typical	78 dBµV	
	Terr.TV gain	8 dB	4 dB
	Terr. TV output level	IMD3=60 dB 104 dBµV max.	IMD3=60 dB 100 dBµV max.
Decoupling	SAT IF inputs/SAT IF inputs	> 30 dB	
	SAT IF inputs/Tap outputs	> 30 dB	
	SAT IF / Terr. TV	> 25 dB	
DC pass through	SAT IF	2 A max., 1 A max. through one line	
trunk lines	Terr. TV	250 mA max.	
Current consumption	from DC input*, H trunk lines	20 V 270 mA max.	20 V 510 mA max.
	from STB	13 V 410 mA max.	
Current pass from DC input to H trunk lines, switch.		20 V 1.73 A max.	20 V 1.49 A max.
Operating temperature range		-20° ÷ + 50° C	
Dimensions/Weight (packed)		134x135x30 mm/0.42 kg	134x135x30 mm/0.44 kg

* without external DC feeding

5 cable dSCR system

Cascadable single cable multiswitches

Cascadable single cable multiswitches for the distribution of SAT IF and DTT signals over one cable to up to 32 receivers per pair outputs.

- wide band / quatro LNB IF range, switchable
- control according legacy/EN50494/EN50607
- dSCR/Legacy mode automatic selection
- configurable with programmer PC102W
- dedicated control/configuration port
- DC input for external power supply
- current pass to H trunk lines, switchable
- powering from H/V lines
- powering status LED indication
- robust die-cast housing
- connectors:
  RF inputs/outputs - type F
  2xDC inputs - type F

SRM524
active DTT path with AGC, two dSCR outputs

SRM544
active DTT path with AGC, four dSCR outputs

SRM524T
passive DTT path, two dSCR outputs

SRM544T
passive DTT path, four dSCR outputs

SRM524
SRM524T

SRM544
SRM544T

Technical specifications

TYPE		SRM524	SRM544	SRM524T	SRM544T
Ordering number		03705	03706	03707	03708
Frequency range	SAT IF	290-2350 MHz			
	DTT	47-862 MHz		5-862 MHz	
Number of trunk inputs	SAT IF	4			
& outputs	DTT	1			
Number of tap outputs		2 (1 pair)	4 (2 pairs)	2 (1 pair)	4 (2 pairs)
Trunk output loss	SAT IF	< 4.0 dB			
	DTT	< 4.0 dB			
Return loss / impedance		> 10 dB / 75 Ω			
Input level per channel	SAT IF	65-105 dBµV			
	DTT, per channel	55-85 dBµV (8 DTT channels)		-	
Terr. TV noise figure		< 8 dB		-	
Tap output with combined DTT	user bands (dSCR mode)	32 max. per pair outputs, configurable			
	user band bandwidth (dSCR mode)	20-60 MHz, adjustable			
	dSCR mode output level, AGC controlled	84 dBµV, adjustable			
	legacy mode output level, typical	78 dBµV			
	DTT output level, AGC controlled	82 dBµV max. (8 DTT channels), adjustable		-	
	DTT loss	-		18 dB	
Decoupling	SAT IF inputs/SAT IF inputs	> 30 dB			
	SAT IF inputs/Tap outputs	> 30 dB			
	SAT IF / DTT	> 25 dB			
DC pass through	SAT IF	3.2 A max., 1.6 A max. through one line			
trunk lines	DTT	200 mA max.			
Current consumption	from DC inputs*, H/V trunk lines	20 V 290 mA max.	20 V 500 mA max.	20 V 250 mA max.	20 V 470 mA max.
	from STB	18 V 20 mA max.			
Current pass from DC input to each H trunk line, switchable		20 V 1.6 A max.	20 V 1.5 A max.	20 V 1.6 A max.	20 V 1.53 A max.
Operating temperature range		-20° ÷ + 50° C			
Dimensions/Weight (packed)		134x135x30 mm/0.42 kg		134x135x30 mm/0.44 kg	

* without external DC feeding

5 cable dSCR system

Cascadable single cable multiswitches

Cascadable single cable multiswitch for the distribution of SAT IF and DTT signals over one cable to up to 32 receivers per pair outputs.

- wideband / quatro LNB IF range, switchable
- control according legacy/EN50494/EN50607
- dSCR/Legacy mode automatic selection
- configurable with programmer PC102W
- dedicated control/configuration port
- DC input for external power supply
- current pass to H and V trunk lines, independent switching
- powering from H/V trunk lines
- powering status LED indication
- robust die-cast housing
- connectors:
  RF inputs/outputs - type F
  2xDC inputs - type F

SRM564
active DTT path with AGC, six dSCR outputs

SRM584
active DTT path with AGC, eight dSCR outputs

SRM564T
passive DTT path, six dSCR outputs

SRM584T
passive DTT path, eight dSCR outputs

SRM564
SRM564T

SRM584
SRM584T

Technical specifications

TYPE		SRM564	SRM584	SRM564T	SRM584T
Ordering number		03709	03710	03711	03712
Frequency range	SAT IF	290-2350 MHz			
	DTT	47-862 MHz		5-862 MHz	
Number of trunk inputs	SAT IF	4			
& outputs	DTT	1			
Number of tap outputs		6 (3 pair)	8 (4 pairs)	6 (3 pair)	8 (4 pairs)
Trunk output loss	SAT IF	< 4.0 dB			
	DTT	< 4.0 dB			
Return loss / impedance		> 10 dB / 75 Ω			
Input level per channel	SAT IF	65-105 dBµV			
	DTT	55-85 dBµV (8 DTT channels)		-	
Terr. TV noise figure		< 8 dB		-	
Tap output with combined DTT	user bands (dSCR mode)	32 max. per pair outputs, configurable			
	user band bandwidth (dSCR mode)	20-60 MHz, adjustable			
	output level, AGC controlled (dSCR mode)	84 dBµV, adjustable			
	output level, typical (legacy mode)	78 dBµV			
	DTT output level, AGC controlled	82 dBµV max. (8 DTT channels), adjustable		-	
	DTT loss	-		18 dB	
Decoupling	SAT IF inputs/SAT IF inputs	> 30 dB			
	SAT IF inputs/Tap outputs	> 30 dB			
	SAT IF / DTT	> 25 dB			
DC pass through	SAT IF	3.2 A max., 1.6 A max. through one line			
trunk lines	DTT	200 mA max.			
Current consumption	from DC inputs*, H/V trunk lines	20 V 740 mA max.	20 V 970 mA max.	20 V 700 mA max.	20 V 930 mA max.
	from STB	18 V 20 mA max.			
Current pass from DC inputs to each H/V trunk line, switchable		20 V 1.26 A max.	20 V 1.03 A max.	20 V 1.3 A max.	20 V 1.07 A max.
Operating temperature range		-20° ÷ + 50° C			
Dimensions/Weight (packed)		226x135x30 mm/0.8 kg			

* without external DC feeding

5 cable dSCR system

Cascadable single cable multiswitches

Cascadable single cable multiswitch for the distribution of SAT IF and DTT signals over one cable to up to 32 receivers per pair outputs.

- control according legacy/EN50494/EN50607
- dSCR/Legacy mode automatic selection
- configurable with programmer PC102W
- DC input for external power supply
- current pass to H trunk lines, switchable
- active terrestrial TV path
- powering status LED indication
- robust die-cast housing
- connectors:
  RF inputs/outputs- type F
  DC input - type F
  DC input - type F

SRM580
quatro LNB IF range;
active/bypass DTT path (switchable), eight dSCR outputs

SRM581
wideband LNB IF range;
active DTT path, eight dSCR outputs

Technical specifications

TYPE		SRM580	SRM581
Ordering number		02789	02798
Frequency range	SAT IF	950-2150 MHz	290-2350 MHz
	Terr. TV	47-862 MHz	
Number of inputs	SAT IF	4	
& trunk outputs	Terr. TV	1	
Number of tap outputs		8 (4 pairs)	
Trunk gain	SAT IF	> - 4 dB	> - 8.0 dB
	Terr. TV (active mode)	10 dB	> - 1.0 dB
	Terr. TV (bypass mode)	-6 dB	-
Return loss / impedance		> 10 dB / 75 Ω	
Input level	SAT IF	60-95 dBμV	65-95 dBμV
per channel	Terr. TV (active mode)	IMD3= 60 dB 92 dBμV max.	IMD3= 60 dB 88 dBμV max.
Terr. TV noise figure (active mode)		6 dB	
Tap output	user bands (dSCR mode)	32 max. per pair outputs, configurable	
with combined DTT	user band bandwidth (dSCR mode)	20-60 MHz, configurable	
	dSCR mode output level, AGC controlled	84 dBμV configurable	
	legacy mode output level, typical	78 dBμV	
	Terr. TV loss (active mode)	6 dB	-
	Terr. TV loss (bypass mode)	22 dB	-
	Terr. TV output level (active mode)	IMD3= 60 dB 86 dBμV max.	IMD3= 60 dB 96 dBμV max.
	Terr.TV gain	-	8 dB
Decoupling	SAT IF inputs/SAT IF inputs	> 30 dB	
	SAT IF inputs/tap outputs	> 30 dB	
	SAT IF/ Terr. TV	> 25 dB	
DC pass through	SAT IF	2 A max., 1 A max. through one line	
trunk lines	Terr. TV	250 mA max.	
Current consumption	from DC input*, H trunk lines	20 V 1.2 A max.	20 V 1 A max.
	from STB	13 V 400 mA max.,	13 V 460 mA max.
Current pass from DC input to H trunk lines, switch.		20 V 800 mA max.	20 V 1 A max.
Operating temperature range		-20° ÷ + 50° C	
Dimensions/Weight (packed)		226x135x30 mm/0.8 kg	

* without external DC feeding

5 cable dSCR system

Single cable adaptor/multiswitch

Single cable adaptor/multiswitch for the distribution of SAT IF and DTT signals over one cable to up to 32 receivers.

- compatible with 5 cable legacy multiswitches
- control according legacy/EN50494/EN50607
- dSCR/Legacy mode automatic selection
- configurable with programmer PC102W
- DC input for external power supply
- active terrestrial TV path
- powering status LED indication
- robust die-cast housing
- connectors:
  RF inputs/outputs- type F
  DC input - type F

Technical specifications

TYPE			SRQ540
Ordering number			02794
Input frequency range			V, Lo 950-1950 MHz; H, Lo 950-1950 MHz; V, Hi 1100-2150 MHz; H, Hi 47-2150 MHz
Output frequency range		SAT IF	950-2150 MHz
		Terr. TV	47-862 MHz
Supply voltage through RF inputs			V, Lo - 12 V; H, Lo - 18 V; V, Hi - 12 V & 22 kHz; H, Hi - 17.5 V & 22 kHz
DC supply		per port	H, Lo 200 mA max., V, Lo; V, Hi; H, Hi 100 mA max.
through RF inputs		total	500 mA max.
Number of inputs		SAT IF+ Terr. TV	4
Number of dSCR/legacy + Terr. TV outputs			4
Return loss / impedance			> 10 dB / 75 Ω
Input level		SAT IF	60-95 dBμV
		Terr. TV	IMD3=60 dB 96 dBμV max.
Terr. TV noise figure			6 dB
Output		user bands	32 max. per pair outputs, configurable
with combined DTT		user band bandwidth	20-60 MHz, configurable
		dSCR mode output level, AGC controlled	84 dBμV
		legacy mode output level	78 dBμV
		Terr. TV gain	4 dB
		Terr. TV output level	IMD3=60 dB 100 dBμV max.
Decoupling		inputs	> 30 dB
		inputs/outputs	> 30 dB
		SAT IF/ Terr. TV	> 25 dB
Current	from DC input*		20 V 1.1 A max.
consumption	from STB**	legacy mode	18 V 20 mA max.
		dSCR mode	13 V 10 mA max.
		legacy+ dSCR mode	18 V 20 mA max.
Operating temperature range			-20° ÷ + 50° C
Dimensions/Weight (packed)			114x135x30 mm/0.4 kg

* with maximal external DC load, total 500 mA

** power supply 20V connected at DC IN

5 cable dSCR system
Multiswitch programmer

The PC102W - single cable multiswich programmer is usefull instrument while configuring and troubleshooting SAT IF distribution system built on dSCR multiswitches based on new digital channel stacking components. The application software “dSCRmaster” for Windows operating system PCs allows simply change parameters of the multiswitch: operating mode (static or dynamic), frequency plan for static mode, frequency and bandwidth of user bands for dynamic mode, output power level of each user band carrier and etc. Service mode of the multiswitch could be switched on for quick finding the problem during installation work. In an internal memory four different configuration files can be stored (prepared on the PC) and send to the multiswitch by pressing dedicated buttons on the PC102W. The programmer can feed DC power for the multiswitch using the external AC/DC power supply and allows parallel connection to a PC over USB cable.The remote Wi-Fi access allows to modify parameters of dSCR multiswitch from any device (tablet, smartphone, laptop, PC) using web browser. The PC102W, wirelessly connected to the Wi-Fi access point, can be used for remote control and monitoring of the multiswitch. The programmer is supplied with an external AC/DC power supply and a USB cable. An application software “dSCRmaster” is available from the Web.

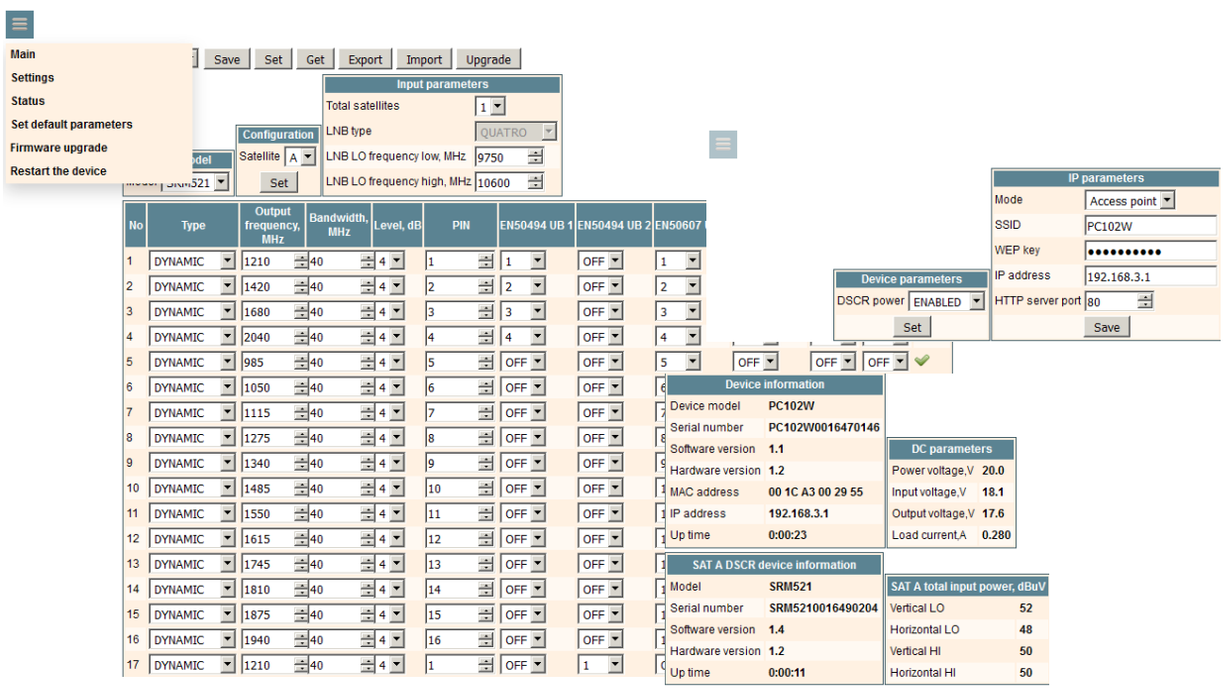
- store and upload up to 4 users selectable configurations
- no PC required for configuration uploading
- free PC application software for creating new configurations
- Web & remote control through Wi-Fi access
- LED status indicator
- die-cast housing inside plastic case
- connectors:
  RF ports & DC input - type F
  PC connection - micro USB

CABRIOLINE

Technical specifications

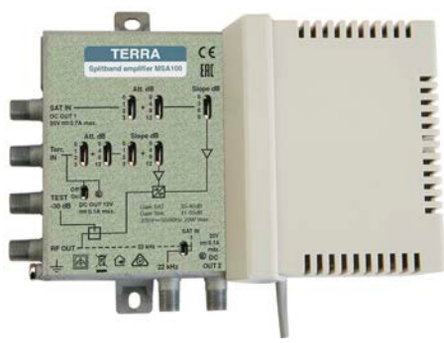
T Y P E	PC102W
Ordering number	02785
Frequency range	DC+22 kHz, 47-2400 MHz
RF through loss	< 1.5 dB
Multiswitch powering/control	14/18 V & 600 mA max. EN50494/EN50607/DiSEqC 2.0
Supply voltage	18 - 20 V
Current consumption	5 V 200 mA (from USB port)
	20 V 50 mA* (from power supply)
Operating temperature range	0º ÷ + 50º C
Dimensions/Weight (packed)	133x73x39 mm/0.36 kg

* without external DC feeding; power supply included in scope of delivery



5 cable dSCR system
Launch splitband amplifier

- for combining and amplification signals of SAT IF and terrestrial TV
- built-in power supply for remote DC feeding of dSCR LNB, terrestrial TV preamplifier and other network components
- 16 positions discrete gain and slope regulators for terrestrial TV
- 16 positions gain and 4 positions slope regulators for SAT IF
- switchable DiSEqC signal pass
- possibility to connect PC102W programmer for remote control
- robust die-cast housing
- connectors:
  RF inputs/outputs - type F
  DC output - type F



Technical specifications

T Y P E	MSA100	
Ordering number	02795	
	Terr. TV	**SAT IF**
Frequency range	47-862 MHz	950-2400 MHz
Gain (fixed slope pre-correction)	31-35 dB	35-40 dB
Gain adjustment	15 dB by 1 dB step	
Slope adjustment	15 dB by 1 dB step	9 dB by 3 dB step
Input and output return loss	≥ 10 dB	
Output level	115 dBμV, IMD3=60 dB, 2 equal carriers	120 dBμV, IMD3=35 dB, 2 equal carriers
Noise figure	7 dB	8 dB
Output test point	-30 dB	
Rejection	≥ 25 dB of SAT IF	≥ 35 dB of Terr. TV
DC feeding for external	12 V 100 mA, switchable 20 V 700 mA + 100 mA	
Power consumption*	230 V~ 50/60 Hz 3.7 W	
Operating temperature range	$-20^0 \div +50^0$ C	
Dimensions/Weight (packed)	180x135x52 mm/0.62 kg	

* without external DC load; with maximal external DC load 29 W

5 cable dSCR system
System accessories

Power inserter

- for powering dSCR multiswitches
- 22 kHz, DiSEqC pass
- robust die-cast housing

Technical specifications

TYPE	PI012
Ordering number	02786
Frequency range	47-2400 MHz
Insertion loss	< 1.5 dB
DC IN	20 V 800 mA max.
DC IN connector	F socket
Operating temperature range	-20° ÷ + 50° C
Dimensions/Weight (packed)	80x40x19 mm/0.071 kg

Line amplifiers

- for recovering of signal loss in SAT IF distribution networks
- DC and tone pass through (tone pass for SA004 only)
- robust die-cast housing

Technical specifications

TYPE	AB007	SA004
Ordering number	02787	03719
Frequency range	47-862 MHz	300-2350 MHz
Gain (fixed slope pre-correction)	10-17 dB	14-24 dB
Noise figure	5 dB	8 dB
Maximal output level	IMD3=60 dB 107 dBµV	IMD3=35 dB (EN50083-3) 115 dBµV
DC pass	20 V 1 A max.	20 V 1.5 A max.
Current consumption	10-20 V 60 mA	10-20 V 90 mA max.
Operating temperature range	-20° ÷ + 50° C	
Dimensions/Weight (packed)	80x27x19 mm/0.085 kg	

Power supply

- high efficiency 20 V & 2 A switch-mode power supply

Technical specifications

TYPE	PS202F
Ordering number	00636
DC output	+20 V 2 A
Output DC connector	F male
Mains voltage	180 V÷ 240 V~ 50 Hz
Operating temperature range	-20° ÷ + 40° C
Dimensions	78x130x33 mm

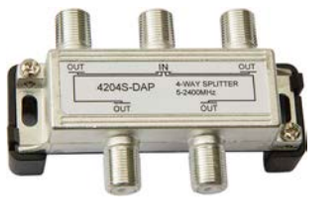
5 cable dSCR system
System accessories

Splitters

- bi-directional power pass between ports: max. 1 A, 30 V
- die-cast housing
- connectors F type
  (center conductor diameter 0.5 ÷ 1.1 mm)

4202S-DAP
2 way 2.4 GHz splitter

4204S-DAP
4 way 2.4 GHz splitter



Technical specifications

TYPE		4202S-DAP	4204S-DAP
Ordering number		00772	00760
Insertion loss (IN-OUT)	5-40 MHz	4 dB	8 dB
	40-1000 MHz	5 dB	9 dB
	1000-2050 MHz	5.5 dB	11 dB
	2050-2400 MHz	6.0 dB	11.5 dB
Isolation (OUT-OUT)	5-40 MHz	20 dB	25 dB
	40-1000 MHz	21 dB	21 dB
	1000-2050 MHz	21 dB	21 dB
	2050-2400 MHz	20 dB	21 dB
Return loss	5-40 MHz	12 dB	10 dB
	40-1000 MHz	10 dB	11 dB
	1000-2050 MHz	10 dB	11 dB
	2050-2400 MHz	10 dB	10 dB

DC pass attenuators

- frequency range 5-2400 MHz
- DC pass: max. 1 A, 30 V
- metal housing
- F plug - F socket, 75 Ω

Technical specifications

TYPE		4621-10	4621-20
Ordering number		00977	00978
Insertion loss	5-1750 MHz	10 dB ± 1.5 dB	20 dB ± 1.5 dB
	1750-2150 MHz		
	2150-2400 MHz		
Return loss	5-1750 MHz	≥ 14 dB	
	1750-2150 MHz	≥ 14 dB	
	2150-2400 MHz	≥ 10 dB	

Voltage block

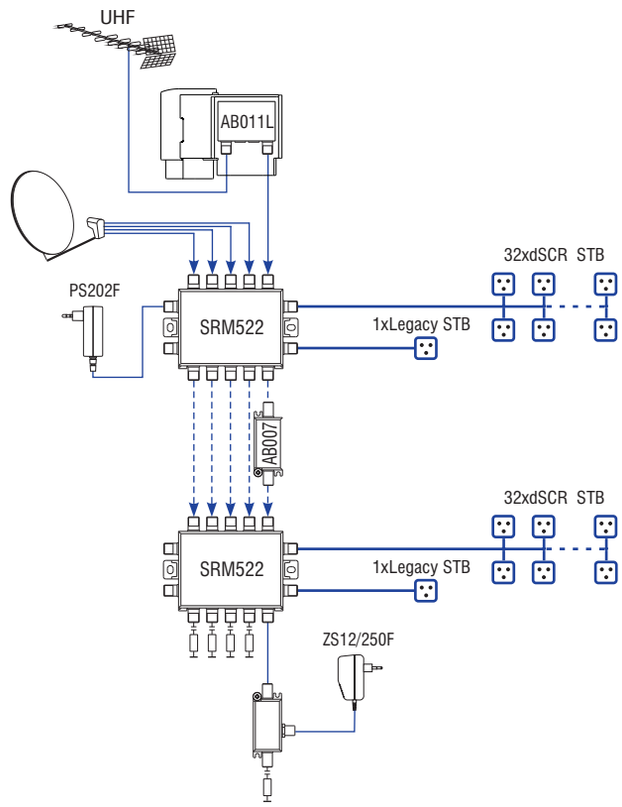
- AC 60 V, DC 48 V
- metal housing
- F plug - F socket

Technical specifications

TYPE	FC37
Ordering number	00962
Frequency range	5-2400 MHz
Insertion loss	< 0.2 dB
Return loss	> 18 dB

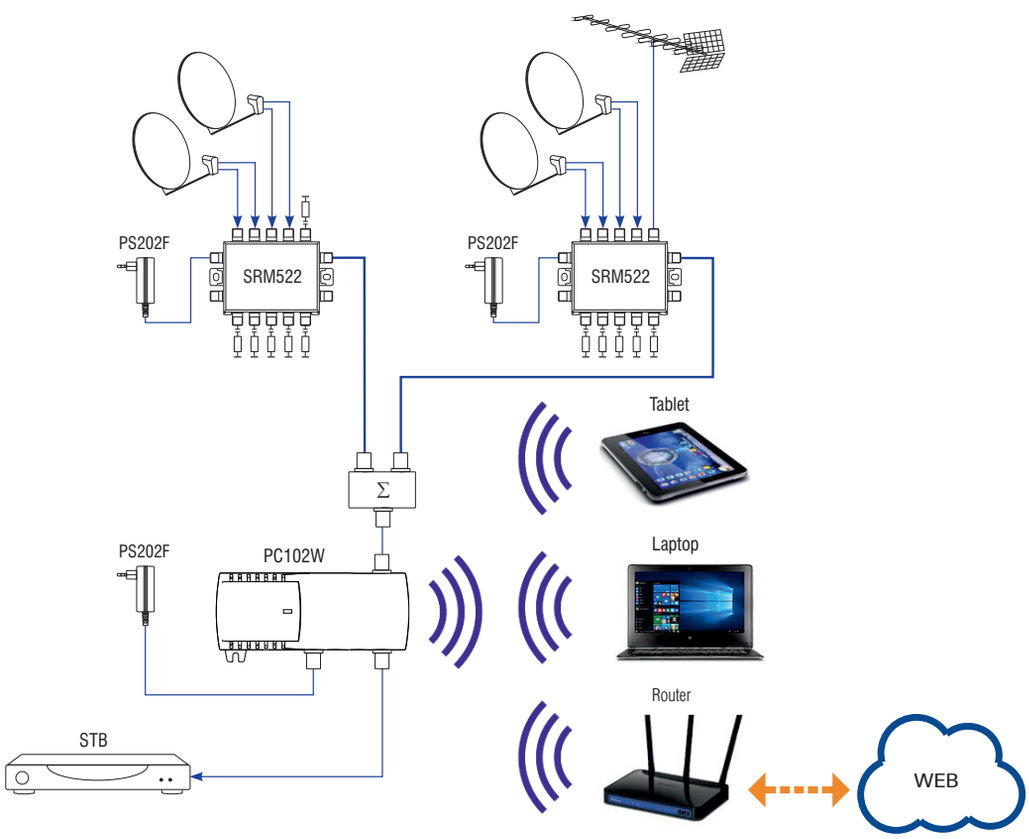
5 cable dSCR system
Application diagrams

Floor by floor installation.



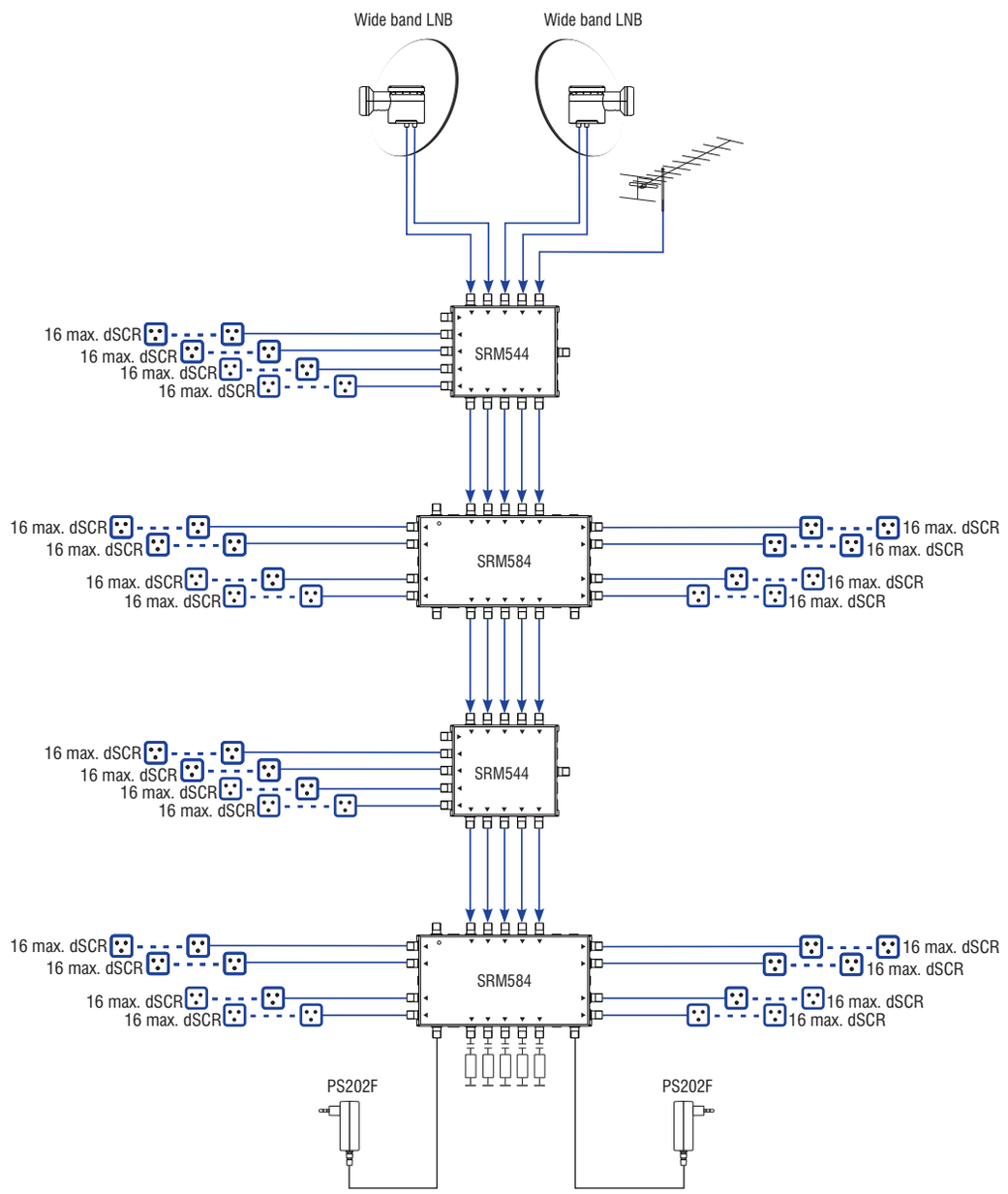
AB011L - UHF masthead amplifier, see www.terraelectronics.com
SRM522 - cascadable single cable multiswitch, page 1.05
AB007 - line amplifier, page 1.13
PC102W - multiswitch programmer, page 1.11
PS202F - power supply, page 1.13
ZS12/250F - power supply, see www.terraelectronics.com

Programming and configuration mode.



5 cable dSCR system
Application diagram

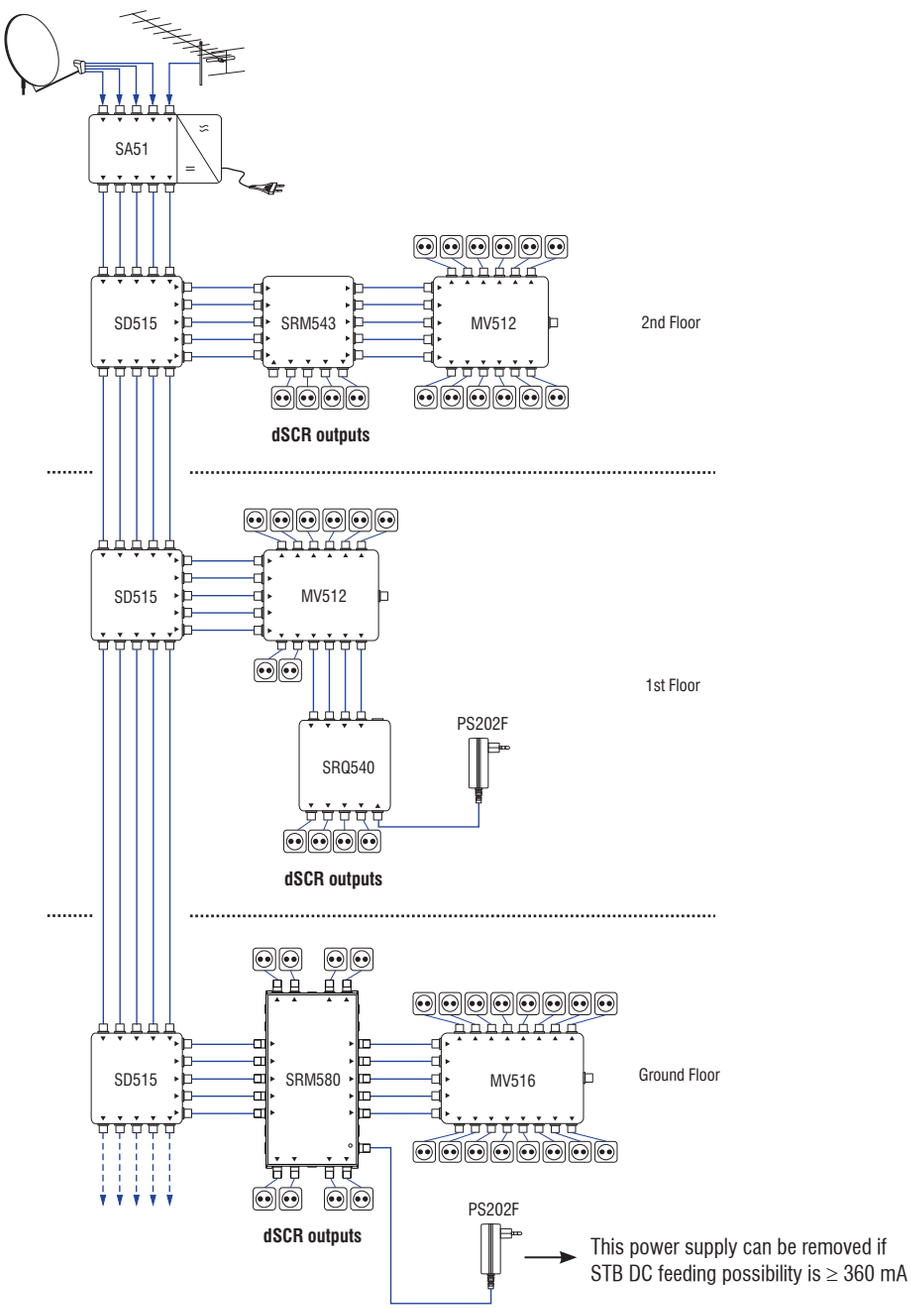
Application diagram of wide band SAT IF distribution system. Powered from the bottom.



SRM544 - cascadable single cable multiswitches, **page 1.07**
SRM584 - cascadable single cable multiswitches, **page 1.08**
PS202F - power supply, **page 1.13**

5 cable dSCR system
Application diagram

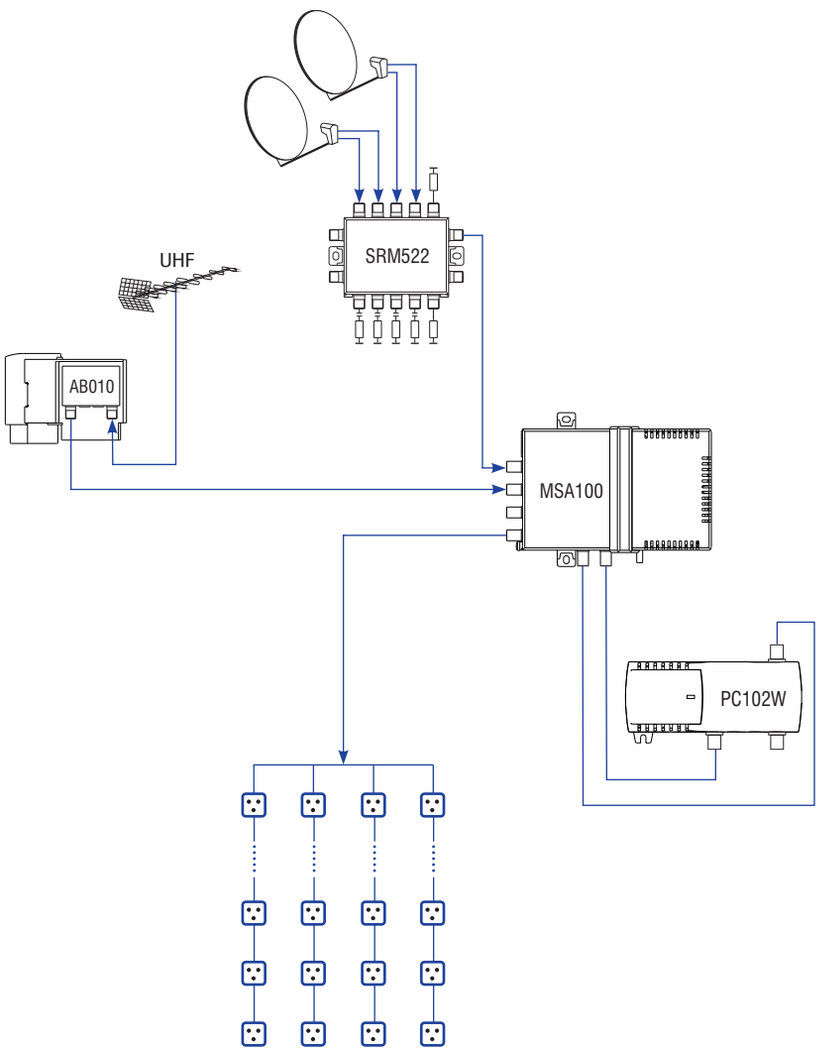
Installation example of upgrade legacy 5 cable distribution network by dSCR multiswitches.



SA51 - launch amplifier, **page 1.25**
SD515 - 1 way 15 dB tap, **page 1.24**
SRM543 - cascadable single cable multiswitch, **page 1.06**
SRQ540 - single cable adaptor/multiswitch, **page 1.10**
SRM580 - cascadable single cable multiswitch, **page 1.09**
MV512 - 5x12 multiswitch, **page 1.22**
MV516 - 5x16 multiswitch, **page 1.22**
PS202F - power supply, **page 1.13**

5 cable dSCR system
Application diagram

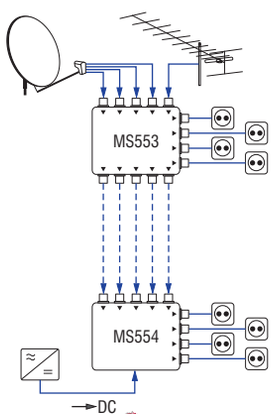
Installation example of SAT IF and DTT signal distribution.
SRM522 multiswitch is operating at static mode.



SRM522 - cascadable single cable multiswitch, **page 1.05**
MSA100 - splitband amplifier, **page 1.12**
PC102W - multiswitch programmer, **page 1.11**
AB010 - UHF band amplifier, see **www.terraelectronics.com**

5 cable system
Cascadable multiswitches

- cascadable distribution system of 4 SAT polarities and terrestrial TV for floor by floor installation and/or star distribution
- possibility to supply DC for LNBs through end line multiswitches MS554, MS554P; MS554P makes 14 V from external 18 V source
- economical power using consept - no DC power consumption from line
- passive terrestrial TV path allows to receive terrestrial TV programs without switching on SAT TV receiver
- depending on interconnection cable up to 5 multiswitches can be connected into cascade without compensating amplifier
- ready for return path operation

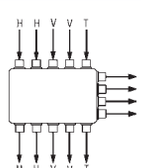
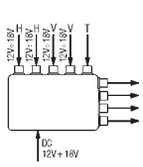
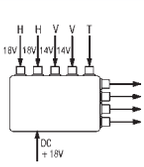


MS553
through line 5x4 multiswitch

MS554
end line 5x4 multiswitch feeds DC to all SAT IF incoming lines

MS554P
end line 5x4 multiswitch;
creates 14 V DC for powering via vertical lines;
18 V DC feeds via horizontal lines

Technical specifications

T Y P E		MS553 (obsolete)	MS554 (obsolete)	MS554P (obsolete)
Ordering number		01727	01728	01729
Frequency range	SAT IF	950-2400 MHz		
	Terr. TV	5-862 MHz		
Tap gain	SAT IF	2 dB		
	Terr. TV	- 19 dB		
Maximal output level for SAT IF circuit, IMD3=35 dB (EN60728-3)		93 dBµV		
SAT inputs decoupling		> 30 dB		
Outputs decoupling	SAT IF	> 30 dB		
	Terr. TV	> 30 dB		
Through gain	SAT IF	- 3 dB	-	
	Terr. TV	- 3.5 dB	-	
DC pass through SAT input-output		2 A max.	-	
DC pass from external	through V lines	-	+12 V ÷ +18 V	14 V & 0.5 A max.
18 V power supply	through H lines	-	& 1 A max.	18 V &1 A max.
Current consumption from receiver		< 60 mA		
Control signals	V/Lo, H/Lo	11.5-14.5 V/0 kHz, 16.5-19 V/0 kHz		
	V/Hi, H/Hi	11.5-14.5 V/22 kHz, 16.5-19 V/22 kHz		
Operating temperature range		-20° ÷ + 50° C		
Dimensions/Weight (packed)		117x106x34mm/0.25 kg		117x97x34mm/0.23 kg
				

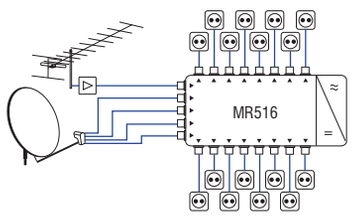
5 cable system
Radial multiswitches

- for star distribution system of 4 SAT IF polarities and terrestrial TV signal up to 16 users
- 16 positions discrete gain regulator for terrestrial TV
- built-in power supply for remote DC feeding
- possibility to feed preamplifier through terrestrial TV input
- die-cast housing

MR508
5x8 multiswitch

MR512
5x12 multiswitch

MR516
5x16 multiswitch



Technical specifications

TYPE			MR508	MR512	MR516
Ordering number			02725	02726	02727
Number of outputs			8	12	16
Frequency range	SAT IF		950-2400 MHz		
	Terr. TV		47-862 MHz		
Gain	SAT IF	outputs 1-4	0 ÷ 8 dB		
(fixed slope		outputs 5-8	-1 ÷ 6 dB		
pre-correction)		outputs 9-12	-	-2 ÷ 3 dB	
		outputs 13-16	-		-3 ÷ 1 dB
	Terr. TV	outputs 1-4	-1 ÷ 5 dB		
		outputs 5-8	-2 ÷ 3 dB		
		outputs 9-12	-	-3 ÷ 1 dB	
		outputs 13-16	-		-4 ÷ -1 dB
Gain adjustment Terr. TV			15 dB by 1 dB step		
Output level for SAT IF (IMD3=35 dB)*			96 dBμV		
Output level for Terr. TV		outputs 1-4	88 dBμV	88 dBμV	88 dBμV
(IMD3=60 dB)*		outputs 5-8	86 dBμV	86 dBμV	86 dBμV
		outputs 9-12	-	84 dBμV	84 dBμV
		outputs 13-16	-	-	82 dBμV
SAT inputs decoupling			≥ 30 dB		
Outputs decoupling	SAT IF		≥ 30 dB		
	Terr. TV		≥ 35 dB		
Rejection	Terr. TV/SAT		≥ 30 dB		
	SAT/Terr. TV		≥ 40 dB		
Supply voltage through RF inputs			H,Lo and H,Hi - 18 V; V,Lo and V,Hi - 14 V; Terr. TV - 12 V		
DC supply current	+18V &+14V &+12V		< 0.7 A		
through RF inputs	+14V &+12V		< 0.5 A		
	+12V		≤ 100 mA		
Current consumption from receiver			< 65 mA		
Control signals			14/18 V, 0/22 kHz		
Power consumption**			230 V~ 50/60 Hz 2 W		
Operating temperature range			-20° ÷ + 50° C		
Dimensions/Weight (packed)			253x135x52 mm/0.8 kg	293x135x52 mm/0.9 kg	333x135x52 mm/1.1 kg

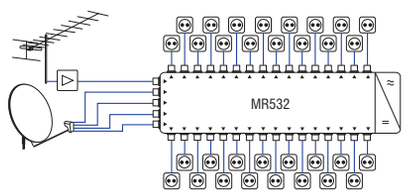
* 2 equal carriers
** without external DC load; with maximal load 17 W

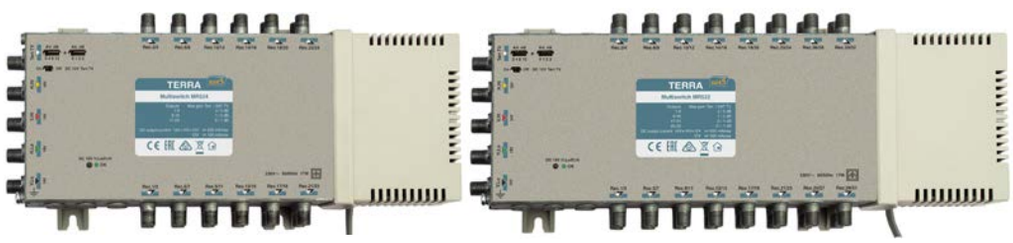
5 cable system
Radial multiswitches

- for star distribution system of 4 SAT IF polarities and terrestrial TV signal up to 32 users
- 16 positions discrete gain regulator for terrestrial TV
- built-in power supply for remote DC feeding
- possibility to feed preamplifier through terrestrial TV input
- die-cast housing

MR524
5x24 multiswitch

MR532
5x32 multiswitch





Technical specifications

TYPE			MR524	MR532
Ordering number			02728	02729
Number of outputs			24	32
Frequency range	SAT IF		950-2400 MHz	
	Terr. TV		47-862 MHz	
Gain (fixed slope pre-correction)	SAT IF	outputs 1-8	-3 ÷ 5 dB	
		outputs 9-16	-4 ÷ 3 dB	
		outputs 17-24	-5 ÷ 1 dB	
		outputs 25-32	-	-6 ÷ -1 dB
	Terr. TV	outputs 1-8	-2 ÷ 3 dB	
		outputs 9-16	-4 ÷ 1 dB	
		outputs 17-24	-5 ÷ 0 dB	
		outputs 25-32	-	-6 ÷ -2 dB
Gain adjustment Terr. TV			15 dB by 1 dB step	
Output level for SAT IF (IMD3=35 dB)*			96 dBμV	
Output level for Terr. TV (IMD3=60 dB)*		outputs 1-8	86 dBμV	
		outputs 9-16	84 dBμV	
		outputs 17-24	82 dBμV	
		outputs 25-32	-	80 dBμV
SAT inputs decoupling			≥ 30 dB	
Outputs decoupling	SAT IF		≥ 30 dB	
	Terr. TV		≥ 35 dB	
Rejection	Terr. TV/SAT		≥ 30 dB	
	SAT/Terr. TV		≥ 40 dB	
Supply voltage through RF inputs			H,Lo and H,Hi - 18 V; V,Lo and V,Hi - 14 V; Terr. TV - 12 V	
DC supply current through RF inputs	+18V &+14V &+12V		< 0.65 A	
	+14V &+12V		< 0.5 A	
	+12V		≤ 100 mA	
Current consumption from receiver			< 65 mA	
Control signals			14/18 V, 0/22 kHz	
Power consumption**			230 V~ 50/60 Hz 3 W	
Operating temperature range			-20° ÷ + 50° C	
Dimensions/Weight (packed)			293x135x52 mm/1.7 kg	333x135x52 mm/2.1 kg

* 2 equal carriers
** without external DC load; with maximal load 17 W

5 cable system
Remotely powered multiswitches

- for large installations of SAT IF distribution systems
- in line powering through H lines
- all components of 5 cable distribution system are compatible to each other
- length of the subscriber line up to 80 meters
- four positions discrete gain regulator for each SAT IF line and separate 16 positions discrete gain regulator for terrestrial TV
- optimized for operation with terrestrial digital/analog signals
- active terrestrial TV path powering from central power supply allows to receive terrestrial TV programs without switching on SAT TV receiver
- LED indication of 18 V line powering
- possibility to feed LNBs and network equipment from external +18 V power supply unit: recommended power supply - PS182F (**page 1.41**)
- die-cast housing

MV508
5x8 multiswitch
MV512
5x12 multiswitch
MV516
5x16 multiswitch

Technical specifications

TYPE			MV508	MV512	MV516
Ordering number			02720V1	02721V1	02722V1
Number of outputs			8	12	16
Frequency range	SAT IF		950-2400 MHz		
	Terr. TV		47-862 MHz		
Gain	SAT IF	outputs 1-4	5 ÷ 14 dB		
(fixed slope		outputs 5-8	4 ÷ 12 dB		
pre-correction)		outputs 9-12	-	3 ÷ 10 dB	
		outputs 13-16	-		2 ÷ 8 dB
	Terr. TV	outputs 1-4	-1 ÷ 5 dB		
		outputs 5-8	-2 ÷ 3 dB		
		outputs 9-12	-	-3 ÷ 1 dB	
		outputs 13-16	-		-4 ÷ -1 dB
Gain adjustment	SAT IF		12 dB by 4 dB step		
	Terr. TV		15 dB by 1 dB step		
Output level for SAT IF (IMD3=35 dB)*			105 dBμV		
Output level for Terr. TV		outputs 1-4	88 dBμV	88 dBμV	88 dBμV
(IMD3=60 dB)*		outputs 5-8	86 dBμV	86 dBμV	86 dBμV
		outputs 9-12	-	84 dBμV	84 dBμV
		outputs 13-16	-	-	82 dBμV
SAT inputs decoupling			≥ 30 dB		
Outputs decoupling	SAT IF		≥ 30 dB		
	Terr. TV		≥ 35 dB		
Rejection	Terr. TV/SAT		≥ 30 dB		
	SAT/Terr. TV		≥ 40 dB		
Current consumption from receiver			< 65 mA		
Current consumption from inputs H lines or from external power supply			+18 V 60 mA		
Control signals			14/18 V, 0/22 kHz		
Operating temperature range			-20° ÷ + 50° C		
Dimensions/Weight (packed)			187x135x30 mm/0.6 kg	227x135x30 mm/0.7 kg	267x135x30 mm/0.9 kg

* 2 equal carriers

5 cable system
Remotely powered multiswitches

- for large installations of SAT IF distribution systems
- in line powering through H lines
- all components of 5 cable distribution system are compatible to each other
- length of the subscriber line up to 80 meters
- four positions discrete gain regulator for each SAT IF line and separate 16 positions discrete gain regulator for terrestrial TV
- optimized for operation with terrestrial digital/analog signals
- active terrestrial TV path powering from central power supply allows to receive terrestrial TV programs without switching on SAT TV receiver
- LED indication of 18 V line powering
- possibility to feed LNBs and network equipment from external +18 V power supply unit: recommended power supply - PS182F (**page 1.41**)
- die-cast housing

MV524
5x24 multiswitch
MV532
5x32 multiswitch

Technical specifications

TYPE			MV524	MV532
Ordering number			02723V1	02724V1
Number of outputs			24	32
Frequency range	SAT IF		950-2400 MHz	
	Terr. TV		47-862 MHz	
Gain (fixed slope pre-correction)	SAT IF	outputs 1-8	5 ÷ 14 dB	
		outputs 9-16	4 ÷ 12 dB	
		outputs 17-24	3 ÷ 10 dB	
		outputs 25-32	-	2 ÷ 8 dB
	Terr. TV	outputs 1-8	-1 ÷ 5 dB	
		outputs 9-16	-2 ÷ 3 dB	
		outputs 17-24	-3 ÷ 1 dB	
		outputs 25-32	-	-4 ÷ -1 dB
Gain adjustment	SAT IF		12 dB by 4 dB step	
	Terr. TV		15 dB by 1 dB step	
Output level for SAT IF (IMD3=35 dB)*			105 dBμV	
Output level for Terr. TV (IMD3=60 dB)*		outputs 1-8	86 dBμV	
		outputs 9-16	84 dBμV	
		outputs 17-24	82 dBμV	
		outputs 25-32	-	80 dBμV
SAT inputs decoupling			≥ 30 dB	
Outputs decoupling	SAT IF		≥ 27 dB	
	Terr. TV		≥ 35 dB	
Rejection	Terr. TV/SAT		≥ 30 dB	
	SAT/Terr. TV		≥ 40 dB	
Current consumption from receiver			< 65 mA	
Current consumption from inputs H lines or from external power supply			+18 V 100 mA	
Control signals			14/18 V, 0/22 kHz	
Operating temperature range			-20° ÷ + 50° C	
Dimensions/Weight (packed)			227x135x50 mm/1.5 kg	267x135x50 mm/1.9 kg

* 2 equal carriers

5 cable system

Taps and splitter

- 2 way splitter and one way taps of 4 SAT+1 terrestrial signals
- low losses
- DC pass through SAT and terrestrial TV trunk lines; switchable DC pass to tap H outputs
- accepts central pin ∅ 1.2 mm max.
- die-cast housing

SD504
2 way splitter

SD515
1 way 15 dB tap

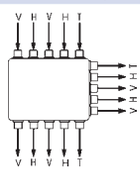
SD510
1 way 10 dB tap

SD520
1 way 20 dB tap

net5

Technical specifications

TYPE		SD504	SD510	SD515	SD520
Ordering number		02715	02716	02717	02718
Frequency range	SAT IF	950-2400 MHz			
	Terr. TV	5-862 MHz			
Through loss	SAT IF	4 dB	1.5 dB	1.1 dB	0.8 dB
	Terr. TV	4 dB	1.8 dB	1.3 dB	1.1 dB
Tap loss	SAT IF	4 dB	12 ÷ 8 dB	17 ÷ 13 dB	22 ÷ 18 dB
	Terr. TV	4 dB	10 dB	15 ÷ 16 dB	20 dB
SAT inputs decoupling	SAT IF	30 dB			
	Terr. TV	30 dB			
DC pass through	H lines	2 A max. (1 A max. through one line)			
	Terr.TV lines	0.1 A max.			
Return loss		> 10 dB			
Operating temperature range		-20° ÷ + 50° C			
Dimensions/Weight (packed)		126x135x30 mm/0.44 kg			



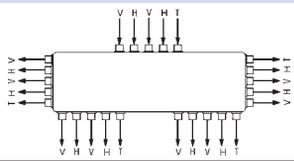
4 way splitter

- 4 way splitter of 4 SAT+1 terrestrial TV signals
- DC pass through H trunk lines; switchable DC pass to tap H outputs
- accepts central pin ∅ 1.2 mm max.
- die-cast housing

net5

Technical specifications

TYPE		SDQ508
Ordering number		02719
Frequency range	SAT IF	950-2400 MHz
	Terr. TV	5-862 MHz
Through loss	SAT IF	8 dB
	Terr. TV	8 dB
SAT inputs decoupling	SAT IF	30 dB
	Terr. TV	30 dB
DC pass through	H lines	2 A max. (1 A max. through one line)
	Terr.TV lines	0.1 A max.
Return loss		> 10 dB
Operating temperature range		-20° ÷ + 50° C
Dimensions/Weight (packed)		267x135x30 mm/0.7 kg



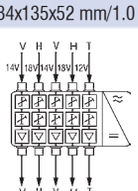
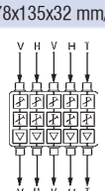
5 cable system
Launch and line amplifiers

- for compensation of through losses of multiswitches and interconnection cables in 5 cable distribution systems
- cascadable with 5 cable system components: taps, splitters and multiswitches
- signal level control and adjustable equalizer at all inputs
- push-pull amplifier on terrestrial TV line
- die-cast housing

SA51
launch amplifier for amplifying of 4 SAT IF and terrestrial TV signals; built-in switch-mode power supply allows to feed: 18 V DC via H inputs and 14 V DC via V inputs to up lines; switchable 18 V DC via H outputs and switchable 14 V DC via V outputs to down lines;
switchable 12 V DC via Terr. TV input

SA51D
line amplifier for amplifying of 4 SAT IF and terrestrial TV signals; in line powering through H lines;
switchable DC pass through H and V lines;
switchable 12 V feeding via Terr. TV input;
remote powering voltage indication

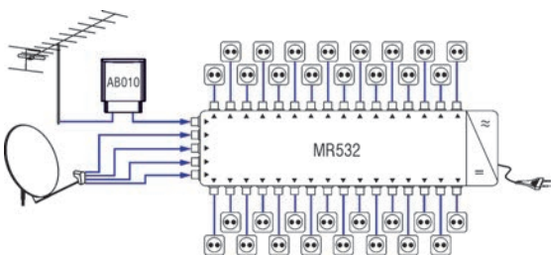
Technical specifications

TYPE		SA51	SA51D
Ordering number		02730	02731
Frequency range	SAT IF	950-2400 MHz	
	Terr. TV	47-862 MHz	
Gain	SAT IF, adjustable	22 dB (0 ÷ -15 dB) by 1 dB step	
	Terr. TV, adjustable	22 dB (0 ÷ -15 dB) by 1 dB step	
Slope	SAT IF, switchable	0/3/5/7 dB	
	Terr. TV, switchable	0/6/12/18 dB	
Isolation	SAT/SAT	30 dB	
	SAT/Terr. TV	30 dB	
Noise figure, typical		≤ 9 dB	
Output level IMD3=60 dB Terr. TV**		109 dBμV	
Output level IMD3=35 dB SAT IF**		114 dBμV	
External equipment	through V lines	14 V 0.5 A max. (switchable)	-
powering	through H lines	18 V 2 A* max. (switchable)	-
	through Terr line	12 V 0.1 A max. (switchable)	-
DC pass through, switchable through H lines		2 A* max.	
Power consumption		230 V~ 50/60 Hz 5 W**	DC 9-18 V 4 W***
Operating temperature range		-20° ÷ + 50° C	
Dimensions/Weight (packed)		284x135x52 mm/1.0 kg	178x135x32 mm/0.6 kg
			

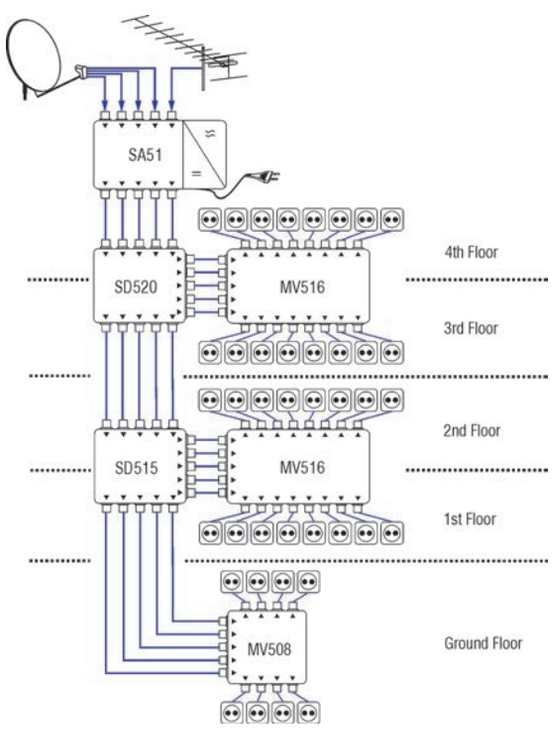
* 1 A max. through one line
** without external DC loading; with maximal external DC load - 55 W
*** in line powering of SA51D through H lines
**** measured using 2 equal signals

5 cable system
Application diagrams

Radial installation for 32 subscribers.



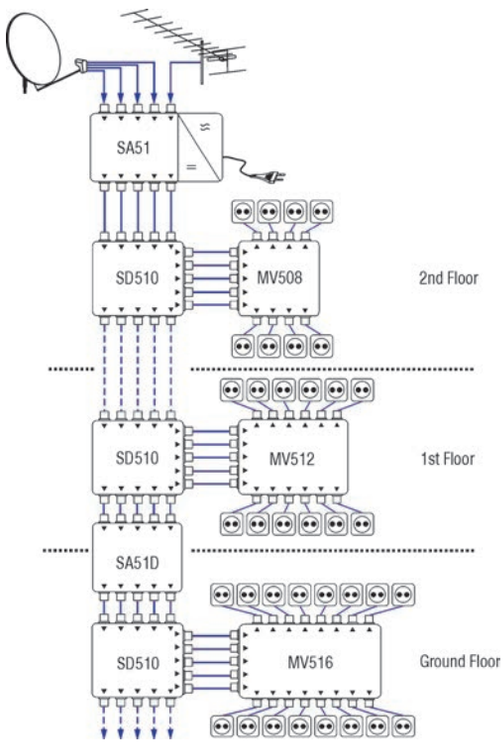
Installation of single multiswitch for two floors. 8 subscribers on every floor.



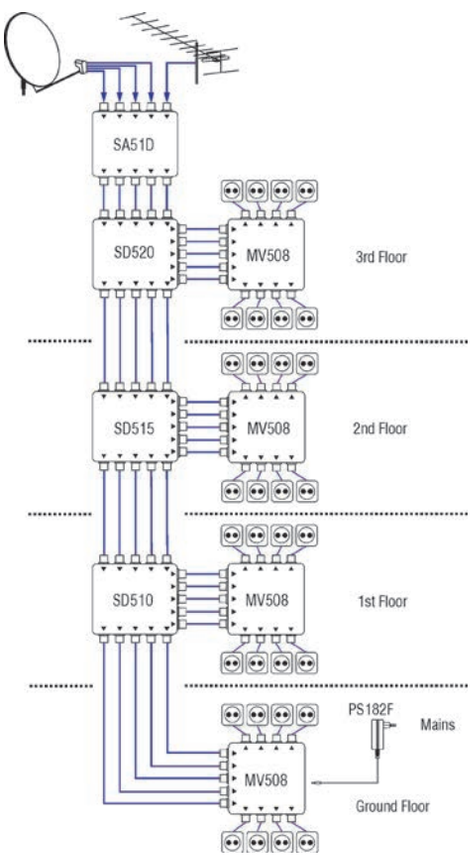
AB010 - fixed gain UHF masthead amplifier, see www.terraelectronics.com
MR532 - 5x32 multiswitch, page 1.21
MV508 - 5x8 multiswitch, page 1.22
MV516 - 5x16 multiswitch, page 1.22
SA51 - launch amplifier, page 1.25
SD515 - 1 way 15 dB tap, page 1.24
SD520 - 1 way 20 dB tap, page 1.24

5 cable system
Application diagrams

Floor by floor installation powered from SA51.



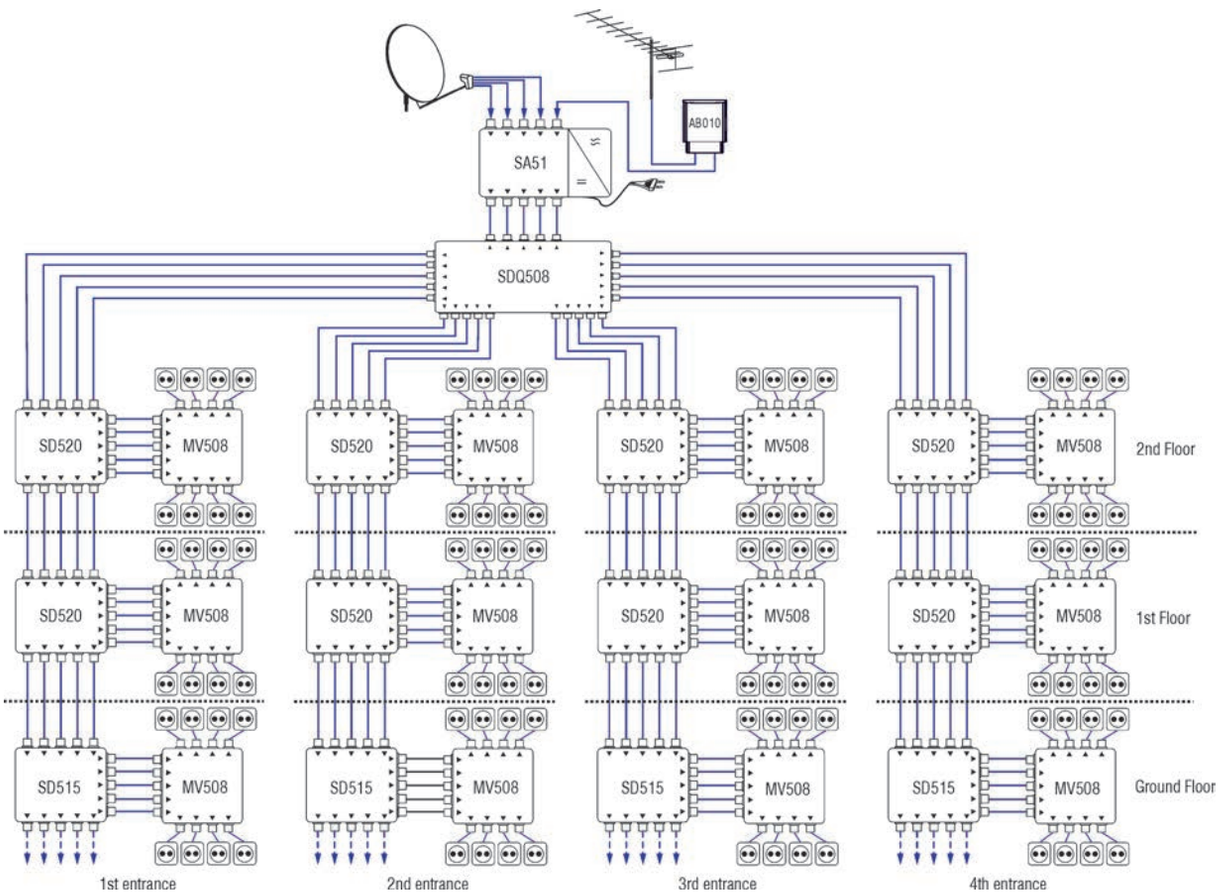
Floor by floor installation powered from external power supply on ground level.



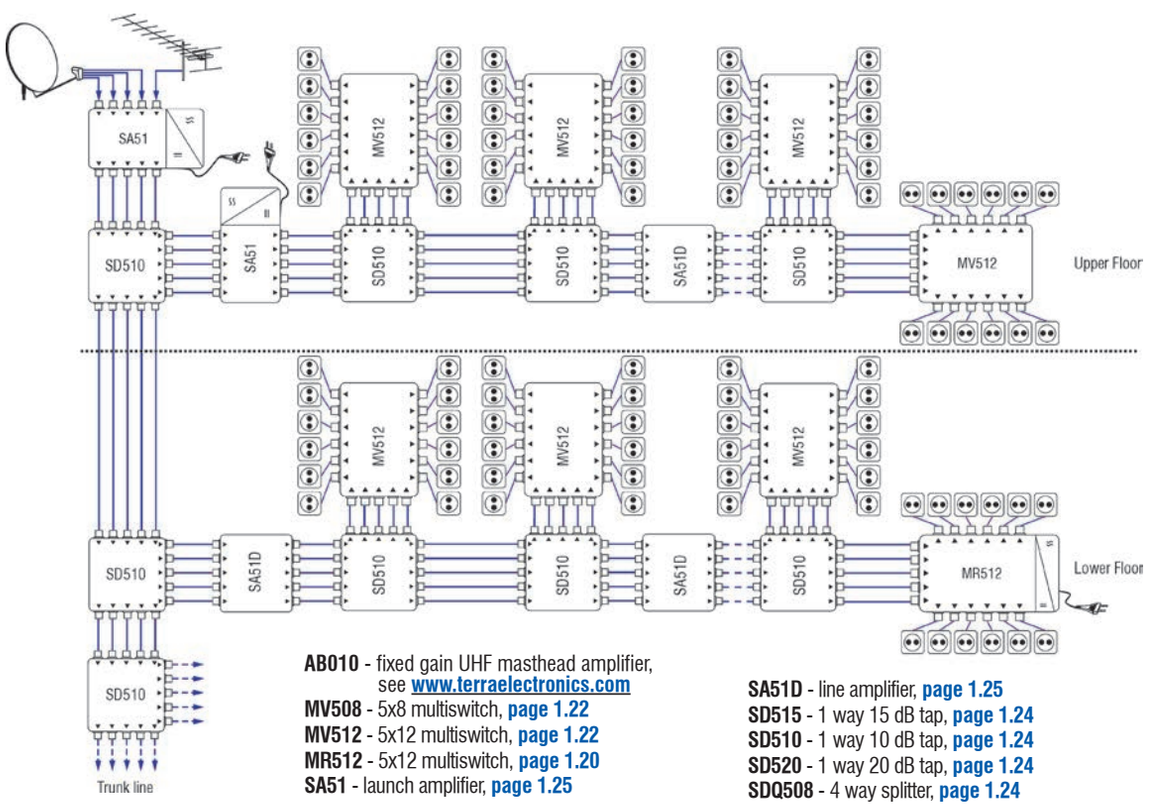
MV508 - 5x8 multiswitch, **page 1.22**
MV512 - 5x12 multiswitch, **page 1.22**
MV516 - 5x16 multiswitch, **page 1.22**
PS182F - power supply, **page 1.41**
SA51 - launch amplifier, **page 1.25**
SA51D - line amplifier, **page 1.25**
SD510 - 1 way 10 dB tap, **page 1.24**
SD515 - 1 way 15 dB tap, **page 1.24**
SD520 - 1 way 20 dB tap, **page 1.24**

5 cable system
Application diagrams

Four entrances house, 2 floors house installation. Whole system powered from SA51.



Long coridor house installation. Trunk line powered from SA51.
Upper coridor line powered from SA51. Lower coridor line powered from MR512.



AB010 - fixed gain UHF masthead amplifier, see www.terraelectronics.com
MV508 - 5x8 multiswitch, **page 1.22**
MV512 - 5x12 multiswitch, **page 1.22**
MR512 - 5x12 multiswitch, **page 1.20**
SA51 - launch amplifier, **page 1.25**

SA51D - line amplifier, **page 1.25**
SD515 - 1 way 15 dB tap, **page 1.24**
SD510 - 1 way 10 dB tap, **page 1.24**
SD520 - 1 way 20 dB tap, **page 1.24**
SDQ508 - 4 way splitter, **page 1.24**

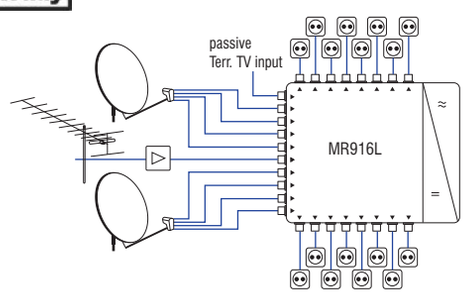
9 cable system
Radial multiswitches

- star distribution system of 8 SAT IF polarities and terrestrial TV signal up to 16 users
- integrated LTE signal suppression filter
- built-in power supply with possibility of remote DC feeding for LNBs and preamplifier through terrestrial TV input
- gain regulators for every SAT IF input and separate 1 dB step regulator for terrestrial TV
- passive and active Terr.TV path
- die-cast housing

MR908L
9x8 multiswitch

MR912L
9x12 multiswitch

MR916L
9x16 multiswitch



Technical specifications

T Y P E			MR908L	MR912L	MR916L
Ordering number			02771	02772	02773
Number of outputs			8	12	16
Frequency range	SAT IF		950-2400 MHz		
	Terr. TV		active 47-790 MHz; passive 5-862 MHz		
Gain (fixed slope pre-correction)	SAT IF	outputs 1-4	9 ÷ 14 dB		
		outputs 5-8	8 ÷ 12 dB		
		outputs 9-10	-	7 ÷ 10 dB	
		outputs 11-12	-	6 ÷ 8 dB	7 ÷ 10 dB
		outputs 13-16	-		6 ÷ 8 dB
	Terr. TV active	outputs 1-4	1 ÷ 5 dB		
		outputs 5-8	0.5 ÷ 4 dB		
		outputs 9-10	-	0 ÷ 3 dB	
		outputs 11-12	-	-1 ÷ 2 dB	0 ÷ 3 dB
		outputs 13-16	-		-1 ÷ 2 dB
Loss	Terr.TV passive	outputs 1-8	28 dB		
		outputs 9-16	-	30 dB	
Gain adjustment	SAT IF		12 dB by 4 dB step		
	Terr. TV active		15 dB by 1 dB step		
Output level for SAT IF (IMD3=35 dB)*			93 dBµV		
Output level for Terr. TV (IMD3=60 dB)*		outputs 1-8	85 dBµV		
		outputs 9-12	-	83 dBµV	
		outputs 13-16	-		82 dBµV
SAT inputs decoupling			> 30 dB		
Outputs decoupling			> 30 dB		
Supply voltage through RF inputs			H,Lo and H,Hi - 18 V; V,Lo and V,Hi - 14 V; Terr. TV - 12 V		
DC supply current through RF inputs	+18V &+14V &+12V		< 1 A		
	+14V & +12V		< 0.5 A		
	+12V		< 0.1 A		
Current consumption from receiver			< 60 mA		
Control signals			14/18 V, 0/22 kHz, tone burst or DiSEqC 2.0		
Power consumption**			230 V~ 50/60 Hz 4 W		
Operating temperature range			-20° ÷ + 50° C		
Dimensions/Weight (packed)			253x135x52 mm/1.44 kg		

* 2 equal carriers; output level by DIN45004B - add 3 dB to mentioned above value

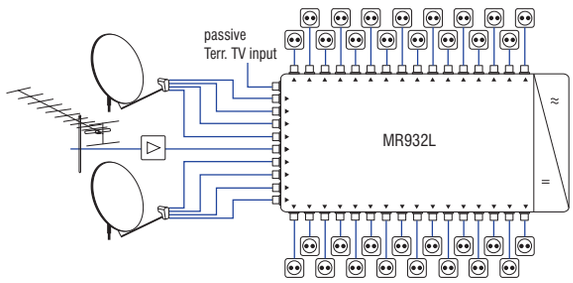
** without external DC load; with maximal load 25 W

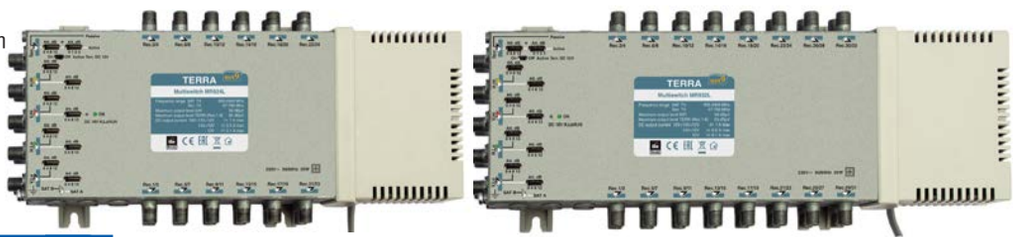
9 cable system
Radial multiswitches

- star distribution system of 8 SAT IF polarities and terrestrial TV signal up to 32 users
- integrated LTE signal suppression filter
- built-in power supply with possibility of remote DC feeding for LNBs and preamplifier through terrestrial TV input
- gain regulators for every SAT IF input and separate 1 dB step regulator for terrestrial TV
- passive and active Terr.TV path
- die-cast housing

MR924L
9x24 multiswitch

MR932L
9x32 multiswitch





Technical specifications

T Y P E			MR924L	MR932L
Ordering number			02774	02775
Number of outputs			24	32
Frequency range	SAT IF		950-2400 MHz	
	Terr. TV		active 47-790 MHz; passive 5-862 MHz	
Gain (fixed slope pre-correction)	SAT IF	outputs 1-8	7 ÷ 12 dB	
		outputs 9-16	6 ÷ 10 dB	
		outputs 17-24	5 ÷ 8 dB	
		outputs 25-32	-	4 ÷ 6 dB
	Terr. TV active	outputs 1-8	1 ÷ 4 dB	
		outputs 9-16	0 ÷ 2 dB	
		outputs 17-24	-1 ÷ 0 dB	
		outputs 25-32	-	-2 ÷ -2 dB
Loss	Terr. TV passive	outputs 1-8	29 dB	
		outputs 9-16	31 dB	
		outputs 17-24	33 dB	
		outputs 25-32	-	35 dB
Gain adjustment	SAT IF		12 dB by 4 dB step	
	Terr. TV active		15 dB by 1 dB step	
Output level for SAT IF (IMD3=35 dB)*			93 dBµV	
Output level for Terr. TV (IMD3=60 dB)*		outputs 1-8	85 dBµV	
		outputs 9-16	83 dBµV	
		outputs 17-24	81 dBµV	
		outputs 25-32	-	79 dBµV
SAT inputs decoupling			> 30 dB	
Outputs decoupling			> 30 dB	
Supply voltage through RF inputs			H,Lo and H,Hi - 18 V; V,Lo and V,Hi - 14 V; Terr. TV - 12 V	
DC supply current through RF inputs	+18V &+14V &+12V		< 1 A	
	+14V & +12V		< 0.5 A	
	+12V		< 0.1 A	
Current consumption from receiver			< 60 mA	
Control signals			14/18 V, 0/22 kHz, tone burst or DiSEqC 1.0, DiSEqC 2.0 or compatible versions	
Power consumption**			230 V~ 50/60 Hz 4 W	
Operating temperature range			-20° ÷ + 50° C	
Dimensions/Weight (packed)			293x135x52 mm/1.75 kg	333x135x52 mm/2.15 kg

* 2 equal carriers; output level by DIN45004B - add 3 dB to mentioned above value

** without external DC load; with maximal load 25 W

9 cable system
Remotely powered multiswitches

- for large installations of SAT IF distribution systems
- integrated LTE signal suppression filter
- in line powering through H lines
- length of the subscriber line up to 80 meters
- gain regulators for every SAT IF input and separate 1 dB step regulator for terrestrial TV
- active terrestrial TV path and SAT IF input amplifiers are powered from central power supply
- LED indication of 18 V line powering
- possibility of supply powering for LNBs equipment from external +18 V power supply unit: recommended power supply - PS182F, page 1.41
- die-cast housing

MV908L
9x8 multiswitch

MV912L
9x12 multiswitch

MV916L
9x16 multiswitch

Technical specifications

TYPE			MV908L	MV912L	MV916L
Ordering number			02766	02767	02768
Number of outputs			8	12	16
Frequency range	SAT IF		950-2400 MHz		
	Terr. TV		47-790 MHz		
Gain (fixed slope pre-correction)	SAT IF	outputs 1-4	9 ÷ 14 dB		
		outputs 5-8	8 ÷ 12 dB		
		outputs 9-10	-	7 ÷ 10 dB	
		outputs 11-12	-	6 ÷ 8 dB	7 ÷ 10 dB
		outputs 13-16	-		6 ÷ 8 dB
	Terr. TV	outputs 1-4	4 ÷ 9 dB		
		outputs 5-8	3.5 ÷ 8 dB		
		outputs 9-10	-	3 ÷ 7 dB	
		outputs 11-12	-	2.5 ÷ 6 dB	3 ÷ 7 dB
		outputs 13-16	-		2.5 ÷ 6 dB
Gain adjustment	SAT IF		12 dB by 4 dB step		
	Terr. TV		15 dB by 1 dB step		
Output level for SAT IF (IMD3=35 dB)*			93 dBµV		
Output level for Terr. TV (IMD3=60 dB)*		outputs 1-8	88 dBµV		
		outputs 9-12	-	86 dBµV	
		outputs 13-16	-		86 dBµV
SAT inputs decoupling			> 30 dB		
Outputs decoupling			> 30 dB		
Current consumption from receiver			< 60 mA		
Current consumption from inputs H lines or from external power supply			12 V ÷ 18 V < 160 mA at 18 V		
DC pass through connector "AUX 18 V"			18 V 1 A max.		
Control signals			14/18 V, 0/22 kHz, tone burst or DiSEqC 1.0, DiSEqC 2.0 or compatible versions		
Operating temperature range			-20° ÷ + 50° C		
Dimensions			187x135x52 mm		
Weight (packed)			1.26 kg		

* 2 equal carriers; output level by DIN45004B - add 3 dB to mentioned above value

9 cable system
Remotely powered multiswitches

- for large installations of SAT IF distribution systems
- integrated LTE signal suppression filter
- in line powering through H lines
- length of the subscriber line up to 80 meters
- gain regulators for every SAT IF input and separate 1 dB step regulator for terrestrial TV
- active terrestrial TV path and SAT IF input amplifiers are powered from central power supply
- LED indication of 18 V line powering
- possibility of supply powering for LNBs equipment from external +18 V power supply unit: recommended power supply - PS182F, page 1.41
- die-cast housing

MV924L
9x24 multiswitch

MV932L
9x32 multiswitch

Technical specifications

TYPE			MV924L	MV932L
Ordering number			02769	02770
Number of outputs			24	32
Frequency range	SAT IF		950-2400 MHz	
	Terr. TV		47-790 MHz	
Gain (fixed slope pre-correction)	SAT IF	outputs 1-8	7 ÷ 12 dB	
		outputs 9-16	6 ÷ 10 dB	
		outputs 17-24	5 ÷ 8 dB	
		outputs 25-32	-	4 ÷ 6 dB
	Terr. TV	outputs 1-8	4 ÷ 9 dB	
		outputs 9-16	3 ÷ 7 dB	
		outputs 17-24	2 ÷ 5 dB	
		outputs 25-32	-	1 ÷ 3 dB
Gain adjustment	SAT IF		12 dB by 4 dB step	
	Terr. TV		15 dB by 1 dB step	
Output level for SAT IF (IMD3=35 dB)*			93 dBµV	
Output level for Terr. TV (IMD3=60 dB)*		outputs 1-8	88 dBµV	
		outputs 9-16	86 dBµV	
		outputs 17-24	84 dBµV	
		outputs 25-32	-	82 dBµV
SAT inputs decoupling			> 30 dB	
Outputs decoupling			> 30 dB	
Current consumption from receiver			< 60 mA	
Current consumption from inputs H lines or from external power supply			12 V ÷ 18 V < 160 mA at 18 V	
DC pass through connector "AUX 18 V"			18 V 1 A max.	
Control signals			14/18 V, 0/22 kHz, tone burst or DiSEqC 1.0, DiSEqC 2.0 or compatible versions	
Operating temperature range			-20° ÷ + 50° C	
Dimensions/Weight (packed)			227x135x52 mm/1.42 kg	267x135x52 mm/1.86 kg

* 2 equal carriers; output level by DIN45004B - add 3 dB to mentioned above value

9 cable system

Taps and splitter

- 2 way splitter and one way taps of 8 SAT+1 terrestrial signals
- low losses
- switchable DC pass to tap H outputs
- accepts central pin ∅ 1.2 mm max.
- die-cast housing

SD904
2 way splitter

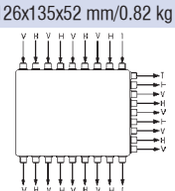
SD915
1 way 15 dB tap

SD910
1 way 10 dB tap

SD920
1 way 20 dB tap

Technical specifications

TYPE		SD904	SD910	SD915	SD920
Ordering number		02776	02777	02778	02779
Frequency range	SAT IF	950-2400 MHz			
	Terr. TV	5-862 MHz			
Through loss	SAT IF	4 dB	1.5 dB	1.1 dB	0.8 dB
	Terr. TV	4 dB	1.8 dB	1.3 dB	1.1 dB
Tap loss	SAT IF	4 dB	12 ÷ 8 dB	17 ÷ 13 dB	22 ÷ 18 dB
	Terr. TV	4 dB	10 dB	15 dB ÷ 16 dB	20 dB
SAT inputs decoupling	SAT IF	30 dB			
	Terr. TV	30 dB			
DC pass through	V lines	0.5 A max.			
	H lines	4 A max. (1 A max. through one line)			
	Terr.TV lines	0.1 A max.			
Return loss		> 10 dB			
Operating temperature range		-20° ÷ + 50° C			
Dimensions/Weight (packed)		126x135x52 mm/0.82 kg			

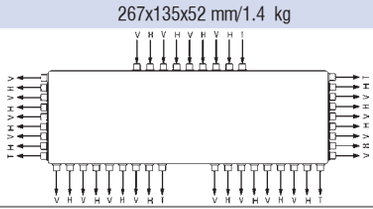


4 way splitter

- 4 way splitter of 8 SAT+1 terrestrial TV signals
- switchable DC pass to tap H outputs
- accepts central pin ∅ 1.2 mm max.
- die-cast housing

Technical specifications

TYPE		SDQ908
Ordering number		02780
Frequency range	SAT IF	950-2400 MHz
	Terr. TV	5-862 MHz
Through loss	SAT IF	8 dB
	Terr. TV	8 dB
SAT inputs decoupling	SAT IF	30 dB
	Terr. TV	30 dB
DC pass through	V lines	0.5 A max.
	H lines	4 A max. (1 A max. through one line)
	Terr.TV lines	0.1 A max.
Operating temperature range		-20° ÷ + 50° C
Dimensions/Weight (packed)		267x135x52 mm/1.4 kg

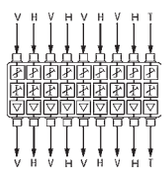


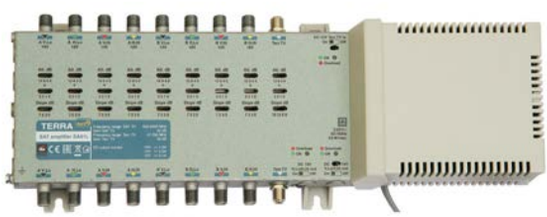
9 cable system
Launch and line amplifiers

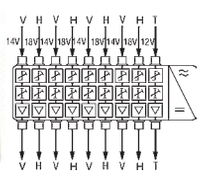
- for compensation of through losses of multiswitches and interconnection cables in 9 cable distribution systems
- integrated LTE signal suppression filter
- signal level control and adjustable equalizer at all inputs
- push-pull amplifier on terrestrial TV line
- die-cast housing

SA91L
launch amplifier for amplifying of 8 SAT IF and terrestrial TV signals; built-in switch-mode power supply allows to feed: 18 V DC via H inputs and 14 V DC via V inputs to up lines; switchable 18 V DC via H outputs and switchable 14 V DC via V outputs to down lines; switchable 12 V DC via Terr. TV input

SA91DL
line amplifier for amplifying of 8 SAT IF and terrestrial TV signals; in line powering through H lines; switchable DC pass through H and V lines; switchable 12 V feeding via Terr. TV input; remote powering voltage indication







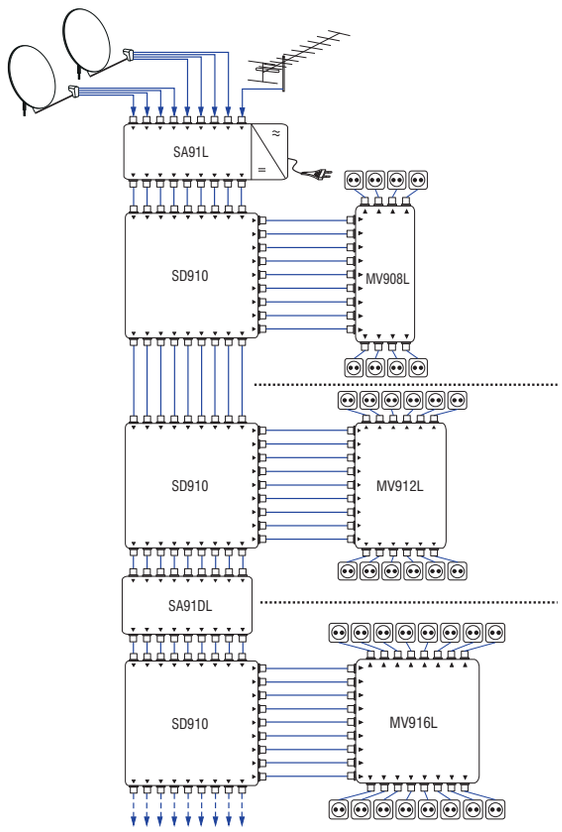
Technical specifications

TYPE		SA91L	SA91DL
Ordering number		02781	02782
Frequency range	SAT IF	950-2400 MHz	
	Terr. TV	47-790 MHz	
Gain	SAT IF, adjustable	22 dB (0 ÷ -15 dB) by 1 dB step	
	Terr. TV, adjustable	22 dB (0 ÷ -15 dB) by 1 dB step	
Slope	SAT IF, switchable	0/3/5/7 dB	
	Terr. TV, switchable	0/6/12/18 dB	
Isolation	SAT/SAT	30 dB	
	SAT/Terr. TV	30 dB	
Noise figure, typical		≤ 9 dB	
Output level IMD3=60 dB Terr. TV**		109 dBμV	
Output level IMD3=35 dB SAT IF**		114 dBμV	
External equipment powering	through V lines	14 V 0.5 A max. (switchable)	-
	through H lines	18 V 1.8 A* max. (switchable)	-
	through Terr line	12 V 0.1 A max. (switchable)	-
DC pass through, switchable through H lines		2 A* max.	
Power consumption		230 V~ 50/60 Hz 7 W**	DC 9-18 V 5 W***
Operating temperature range		-20° ÷ + 50° C	
Dimensions/Weight (packed)		335x135x52 mm/1.18 kg	255x135x32 mm/0.9 kg

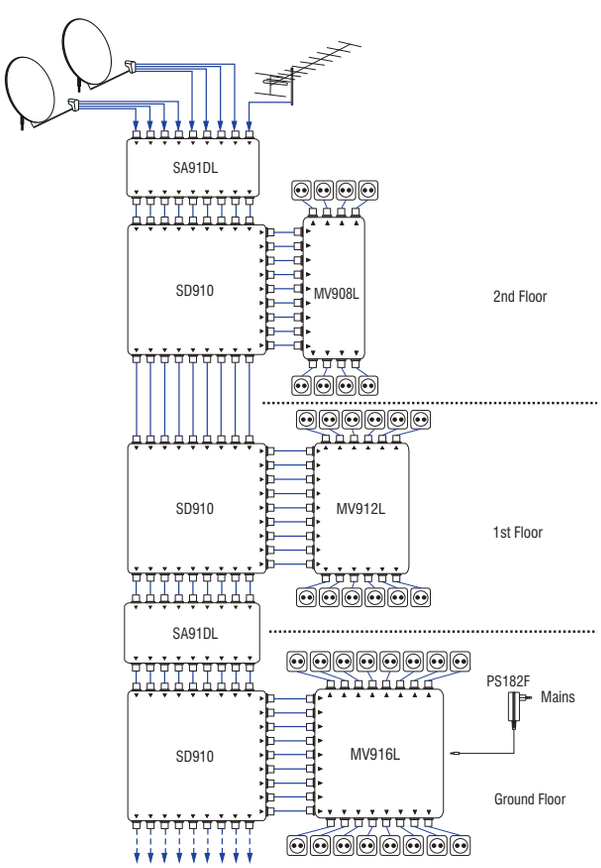
* 1 A max. through one line
** without external DC loading; with maximal external DC load - 55 W
*** in line powering of SA91D through H lines
**** measured using 2 equal signals; output level by DIN45004B - add 3 dB to mentioned above value

9 cable system
Application diagrams

Floor by floor installation powered from SA91L.



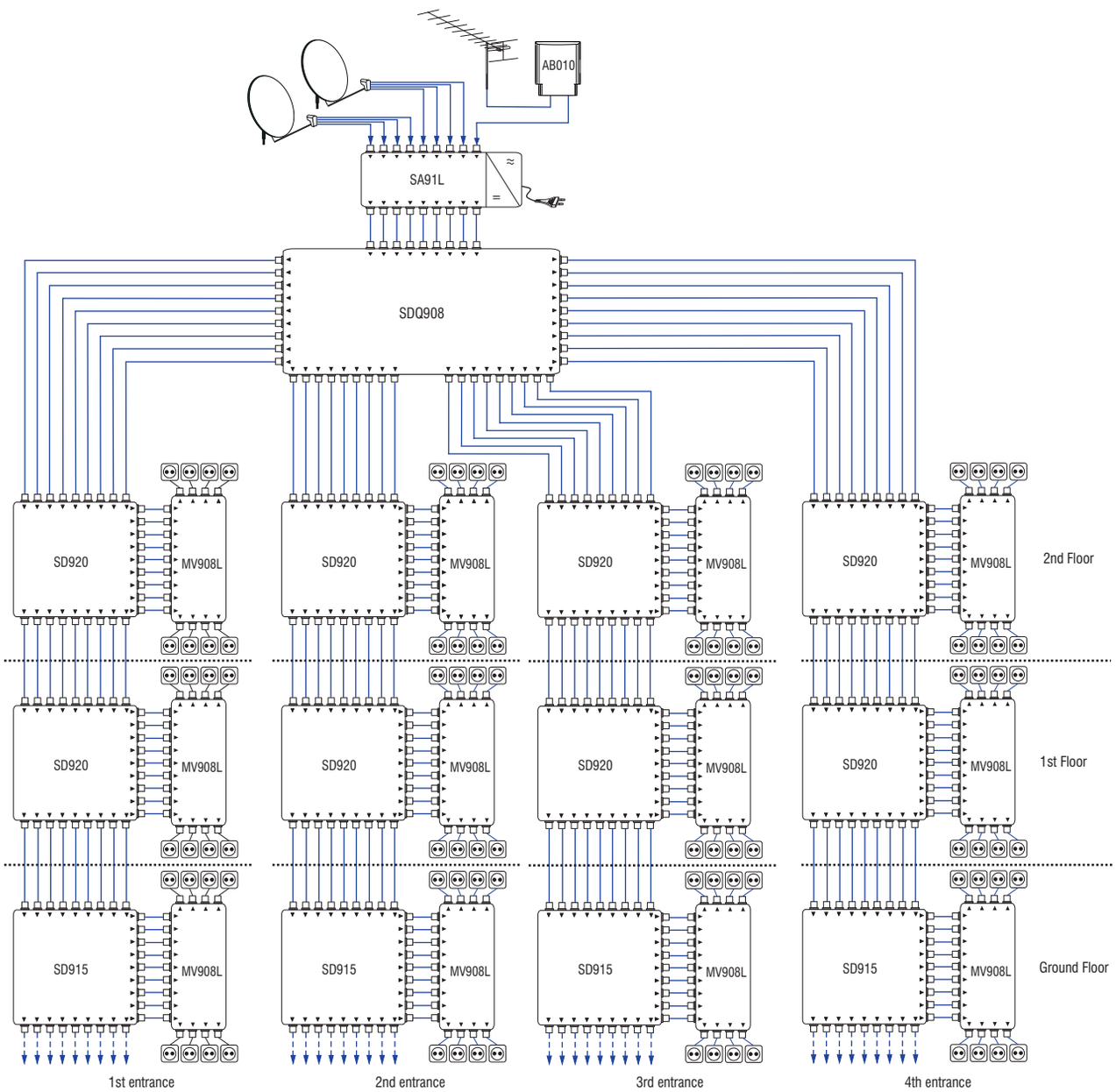
Floor by floor installation powered from external power supply on ground level.



MV908L - 9x8 multiswitch, **page 1.31**
MV912L - 9x12 multiswitch, **page 1.31**
MV916L - 9x16 multiswitch, **page 1.31**
PS182F - power supply, **page 1.41**
SA91L - launch amplifier, **page 1.34**
SA91DL - line amplifier, **page 1.34**
SD910 - 1 way 10 dB tap, **page 1.33**

9 cable system
Application diagrams

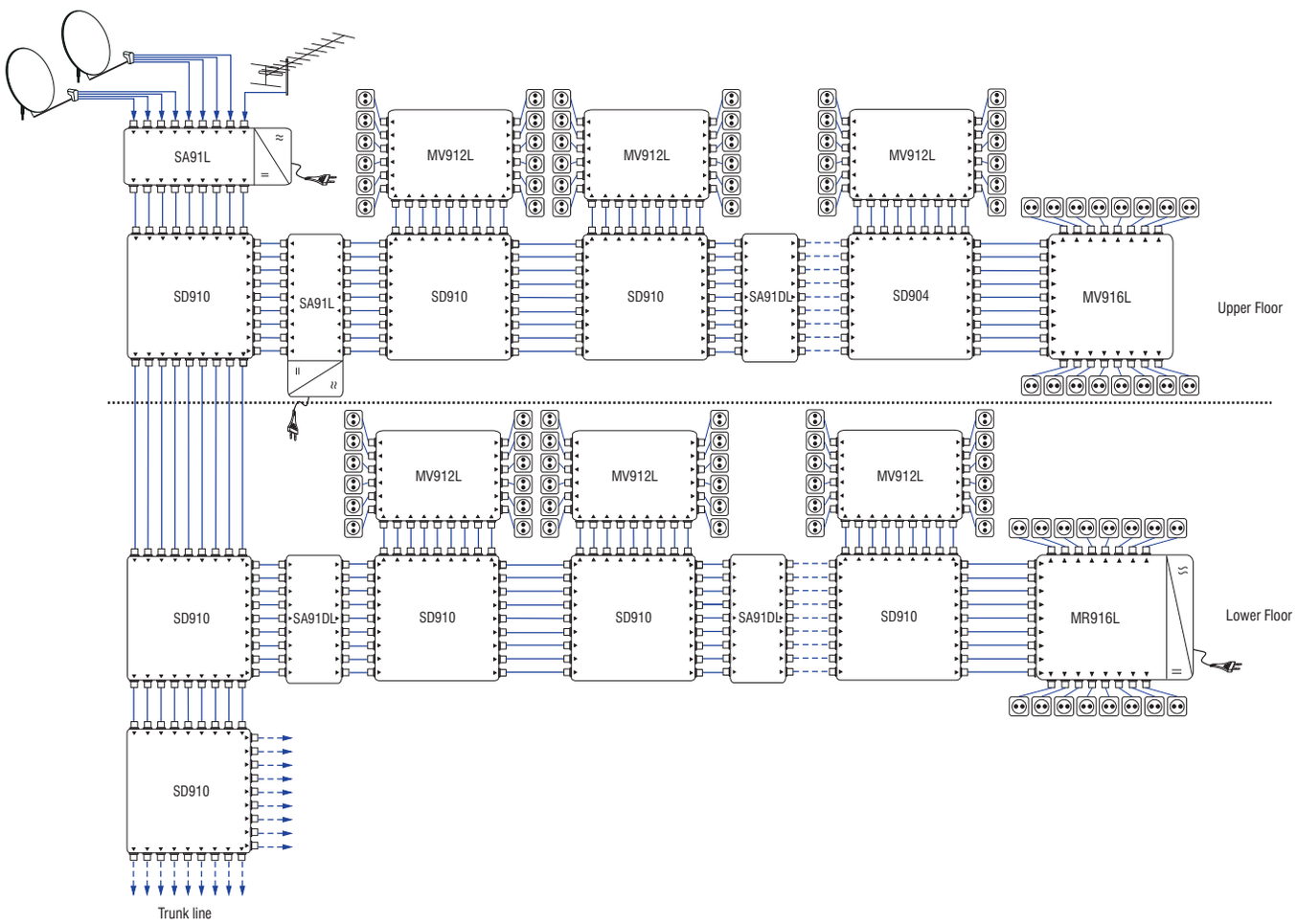
Four entrances house, 2 floors house installation. Whole system powered from SA91L.



AB010 - fixed gain UHF masthead amplifier, see www.terraelectronics.com
MV908L - 9x8 multiswitch, page 1.31
SA91L - launch amplifier, page 1.34
SD915 - 1 way 15 dB tap, page 1.33
SD920 - 1 way 20 dB tap, page 1.33
SDQ908 - 4 way splitter, page 1.33

9 cable system
Application diagrams

Long coridor house installation. Trunk line powered from SA91L.
Upper coridor line powered from SA91L. Lower coridor line powered from MR916L.



MV912L - 9x12 multiswitch, **page 1.31**
MV916L - 9x16 multiswitch, **page 1.31**
MR916L - 9x16 multiswitch, **page 1.29**
SA91L - launch amplifier, **page 1.34**
SD904 - 2 way splitter, **page 1.33**
SD910 - 1 way 10 dB tap, **page 1.33**

System accessories
Splitband amplifiers

- for amplification signals of SAT IF and terrestrial TV bands
- suitable for signals combining of SAT IF and terrestrial TV bands
- possibility to feed LNBs from external power supply
- possibility of DC and DiSEqC signals pass
- built-in separate gain & slope regulators for every band
- die-cast housing

HSA100
SAT IF amplifier with switchable active/passive terrestrial TV path

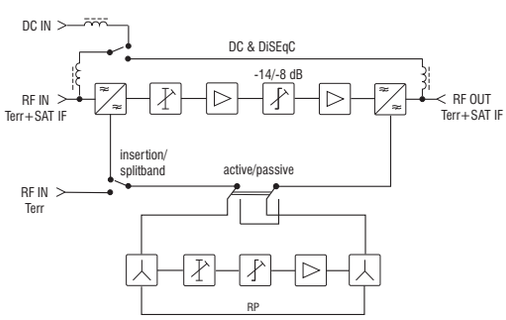
HSA100R30
SAT IF amplifier with switchable active/passive terrestrial TV path and 30 MHz passive return path

HSA100R65
SAT IF amplifier with switchable active/passive terrestrial TV path and 65 MHz passive return path

Technical specifications

TYPE		HSA100	HSA100R30	HSA100R65
Ordering number		01778	01779	01780
Forward path				
Frequency range	SAT IF	950- 2400 MHz		
	Terr. TV	47-862 MHz		87-862 MHz
Gain	SAT IF	23-31 dB (pre-correction)		
	Terr. TV	21-24 dB (pre-correction)/-4 dB, switchable		
Gain adjustment	SAT IF	10 dB		
	Terr. TV*	18 dB		
Slope adjustment	SAT IF	14/8 dB switchable		
	Terr. TV*	18 dB		
Input and output return loss	SAT IF	≥ 10 up to 1750 MHz, 1750-2400 MHz linear decrease from 10 dB up to 7 dB		
	Terr. TV	≥ 10 dB		
Maximal output level IMD3=35 dB (EN60728-3)	SAT IF	120 dBμV (2 egual carriers)		
Maximal output level IMD3=60 dB (DIN45004B)	Terr. TV	115 dBμV		
Noise figure	SAT IF	8 dB		
	Terr. TV	8 dB		
Return path				
Frequency range		-	5 - 30 MHz	5-65 MHz
Loss		-	3 dB	
Return loss		-	>14 dB	
General				
Mains power consumption		230 V~ 50/60 Hz 7.5 W		
Temperature range		-20° ÷ +50° C		
Dimensions		185x91x47 mm/0.7 kg		

* terrestrial TV signal gain, slope adjustment and return path are not available in passive terrestrial TV mode



System accessories
Splitband amplifiers

- for amplification signals of SAT IF and terrestrial TV bands
- possibility of DC and DiSEqC signals pass
- built-in separate gain regulators for every band
- die-cast housing inside plastic case

HSA001
SAT IF amplifier with active terrestrial TV path, without return path

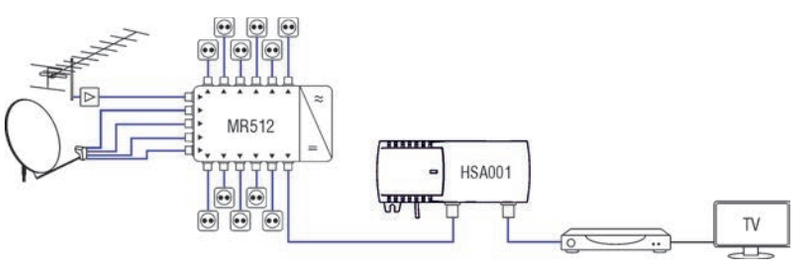
HSA001R3
SAT IF amplifier with active terrestrial TV path, with 30 MHz passive return path

HSA001R6
SAT IF amplifier with active terrestrial TV path, with 65 MHz passive return path

CABRIOLINE

Technical specifications

TYPE		HSA001	HSA001R3	HSA001R6
Ordering number		01786	01787	01788
Forward path				
Frequency range	SAT IF	950- 2400 MHz		
	Terr. TV	47-862 MHz		87-862 MHz
Gain	SAT IF	18-25 dB (pre-correction)		
	Terr. TV	14-18 dB (pre-correction)		
Gain adjustment	SAT IF	10 dB		
	Terr. TV	15 dB		
Input and output return loss	SAT IF	≥ 10 up to 1750 MHz, 1750-2400 MHz linear decrease from 10 dB up to 7 dB		
	Terr. TV	≥ 10 dB		
Maximal output level IMD3=35 dB (EN60728-3)	SAT IF	115 dBμV (2 egual carriers)		
Maximal output level IMD3=60 dB (DIN45004B)	Terr. TV	110 dBμV		
DC pass		400 mA max.		
Return path				
Frequency range		-	5 - 30 MHz	5-65 MHz
Loss		-	4 dB	
Return loss		-	>14 dB	
General				
Mains power consumption		230 V~ 50/60 Hz 4 W		
Temperature range		-20° ÷ +50° C		
Dimensions		133x73x39 mm/0.36 kg		



System accessories

Masthead products

Diplexer

- for combining of SAT IF and terrestrial TV signals
- DC and 22 kHz tone pass through to SAT TV input
- for outdoor mounting

Technical specifications

TYPE	DC010
Ordering number	02556
Frequency range	47-862 MHz/950-2400 MHz
Attenuation in the stop-band	25 dB
Gain Terr/SAT	- 2 / -2.5 dB
DC pass Terr/SAT	- / 0.5 A max.
Dimensions/Weight (packed)	89x107x43mm/0.18 kg

obsolete

DiSEqC controlled switches

- metal housing inside and weather-cap

Technical specifications

TYPE	TRU4508	TRU4518
Ordering number	11796	11797
Number of inputs	2	4
Frequency range	950-2300 MHz	
Through loss	2 dB	
Current consumption / Through pass	10 mA / 0.5 A max.	
Operating temperature range	-20° ÷ + 50° C	
Dimensions/Weight (packed)	97x101x23 mm/0.11 kg	97x101x23 mm/0.15 kg

System accessories

Line amplifier SA003

- for compensation of signal losses in SAT IF distribution networks
- feeding via RF output
- DC, tone and terrestrial TV passive bypass
- die-cast housing

Diplexer DC009

- for combining of SAT IF and terrestrial TV signals
- DC and tone pass through to SAT TV input

Polarity/band switch PI010

- for insertion 14 V/18 V / 0/22 kHz control signal
- powered from line or external 18 V power supply

Technical specifications

T Y P E	SA003		DC009	PI010
Ordering number	02783		01543	01789
Frequency range	47-790 MHz	950-2400 MHz	47-862 MHz/950-2400 MHz	950-2400 MHz
Attenuation in the stop-band	-		20 dB	-
Gain	- 3 dB	17-22 dB	- 1.5 dB	- 1 dB
Noise figure, typical	-	≤ 8 dB	-	-
Maximal output level IMD3=35 dB (EN60728-3)	-	118 dBμV	-	-
DC bypass	18 V 500 mA max.		0.4 A max.	0.3 A max.
Current consumption	+12 ÷ +18 V 55 mA		-	14 V/18 V 30 mA
Dimensions/Weight (packed)	80x27x19mm/0.085 kg		53x64x24mm/0.07 kg	53x64x24mm/0.08 kg

Power supply

- high efficiency 18 V & 2 A switch-mode power supply

Technical specifications

T Y P E	PS182F
Ordering number	00626
DC output	+18 V 2 A
Output DC connector	F male
Mains voltage	180 V÷ 240 V~ 50 Hz
Dimensions	78x130x33 mm

Power inserter

- F female, 5-2400 MHz
- I max. 1 A

Ordering number 00797

Link

- F male-quick - F male-quick for interconnection of the equipment

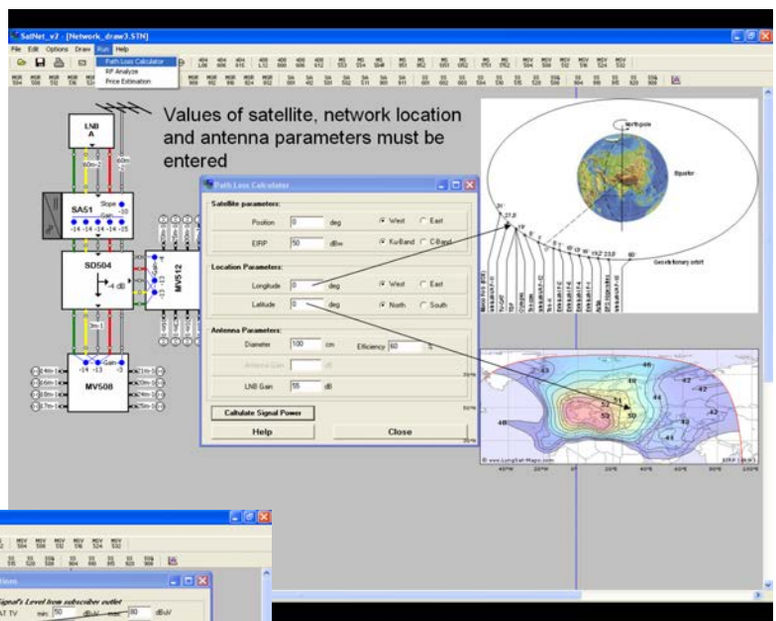
Ordering number 00933

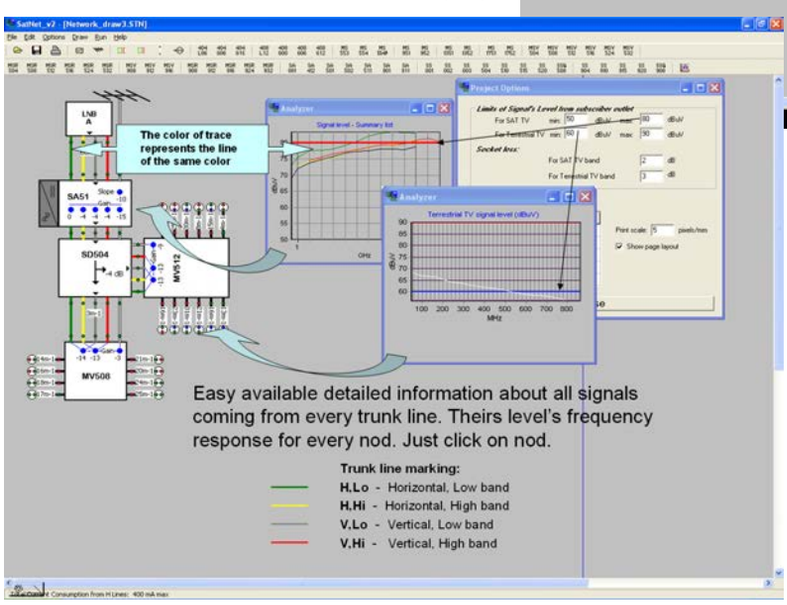
System accessories

Simulation Software SatNet

Freeware software for simulation of SAT IF distribution networks the latest version could be downloaded from **www.terraelectronics.com**, section **downloads**

- significantly facilitates designing of complex satellite IF distribution networks with TERRA components
- component library includes all TERRA satellite IF products and is constantly updated when new products are available
- accurateness of calculating allows to avoid preparing of invalid bill of materials, unreasonable estimated network prices and consumed time for troubleshooting the network during installation
- user-friendly graphical interface
- include “Path Loss Calculator” in the case if measured input levels are not available
- realistically simulates action of controls if they are
- have a useful tools for automatic positioning of controls and navigating inside big network
- easy to learn - short animated tutorial available
- can rearrange cascadable networks by applying interchangeable components with optimal tap loss (gain)





1. Allowed complexity of network:	
- SAT IF trunk lines	up to 16 (4 quatro LNB)
- terrestrial path	1
- subscribers points	unlimited
2. Results	- comprihensive information about signal's level on every nod - indication of overloaded components - indication of nods with lacking signal strength - total consumed current - report for network's price estimation
3. Memory occupied by software	12 MB (zipped)
4. Minimum hardware requirements	- 1 GHz CPU - VGA 768 by 1024 pixels - Windows 98/Windows XP or later version

2. Terrestrial TV products

Contents

LTE signals rejection filters
LTE 800 filters

- filters for suppression of LTE 800 signals
- DC through pass
- shielded metal case inside plastic housing

Technical specifications

T Y P E		LF001	LF003	LF007
Ordering number		02562	02563	02580
Pass band		5-790 MHz	5-782 MHz	5-320, 470-790 MHz
Stop band		821-1000 MHz	813-1000 MHz	791-1000 MHz
Attenuation, typical	5 MHz	< 0.3 dB		
	230 MHz		< 0.8 dB	< 1 dB
	470 MHz		< 1.2 dB	< 2 dB
	782 MHz		< 3 dB	< 4 dB
	790 MHz	< 3 dB		
	791 MHz			> 13 dB
	793 MHz			> 15 dB
	813 MHz		> 60 dB	
	821 MHz	> 60 dB	> 60 dB	> 25 dB
	1000 MHz	> 65 dB	> 65 dB	> 25 dB
Return loss in pass band		> 10 dB		
DC pass		24 V 100 mA, max.		
Operating temperature range		$-20^0 \div +50\ ^0C$		
Dimensions / Weight (packed)		89x107x43 mm / 0.18 kg		

- filters for suppression of LTE 800 signals
- DC through pass
- shielded metal case

Technical specifications

T Y P E		LF005	LF006
Ordering number		02573	02574
Pass band		5-790 MHz	5-320, 470-790 MHz
Stop band		821-1000 MHz	791-1000 MHz
Attenuation, typical	5 MHz	< 0.3 dB	
	230 MHz		< 1 dB
	470 MHz		< 2 dB
	782 MHz		< 4 dB
	790 MHz	< 3 dB	
	791 MHz		> 13 dB
	793 MHz		> 15 dB
	821 MHz	> 30 dB	> 25 dB
	1000 MHz	> 30 dB	> 25 dB
Return loss in pass band		> 10 dB	
DC pass		24 V 100 mA, max.	
Operating temperature range		$-20^0 \div +50\ ^0C$	
Dimensions / Weight (packed)		80x27x19 mm / 0.085 kg	

LTE signals rejection filters

LTE 700 filters

- complies with ETSI EN 303354 clasification 1 (TF007A)
- filters for suppression of LTE 700 signals
- DC through pass
- shielded metal case inside plastic housing

Technical specifications

TYPE		TF001	TF007A
Ordering number		02576	02584
Pass band		5-694 MHz	5-240, 470-694 MHz
Stop band		733-1000 MHz	703-3000 MHz
Attenuation, typical	5 MHz	< 0.3 dB	
	240 MHz	-	< 2 dB
	470 MHz	-	< 3 dB
	694 MHz	< 3.5 dB	< 4 dB
	703 MHz	-	≥ 25 dB
	733 MHz	> 60 dB	≥ 25 dB
	1000 MHz	> 60 dB	> 35 dB
	3000 MHz	-	> 35 dB
Return loss in pass band		> 10 dB	
DC pass		24 V 100 mA, max.	
Operating temperature range		-20⁰ ÷ +50 ⁰C	
Dimensions / Weight (packed)		89x107x43 mm / 0.18 kg	

- complies with ETSI EN 303354 clasification 1 (TF006A)
- filters for suppression of LTE 700 signals
- DC through pass
- shielded metal case

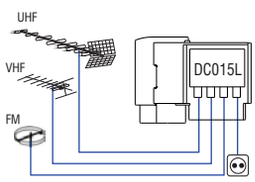
Technical specifications

TYPE		TF005	TF006A
Ordering number		02577	02583
Pass band		5-694 MHz	5-240, 470-694 MHz
Stop band		733-1000 MHz	703-3000 MHz
Attenuation, typical	5 MHz	< 0.3 dB	
	240 MHz	-	< 2 dB
	470 MHz	-	< 3 dB
	694 MHz	< 3 dB	< 4 dB
	703 MHz	-	≥ 25 dB
	733 MHz	> 50 dB	≥ 25 dB
	1000 MHz	> 50 dB	> 35 dB
	3000 MHz	-	> 35 dB
Return loss in pass band		> 10 dB	
DC pass		24 V 100 mA, max.	
Operating temperature range		-20⁰ ÷ +50 ⁰C	
Dimensions / Weight (packed)		80x27x19 mm / 0.085 kg	

Masthead products

Diplexers

- diplexers for combining signals from various antennas
- integrated LTE signal suppression filter
- DC feeding for preamplifier through UHF input
- for outdoor mounting
- shielded metal case inside plastic housing

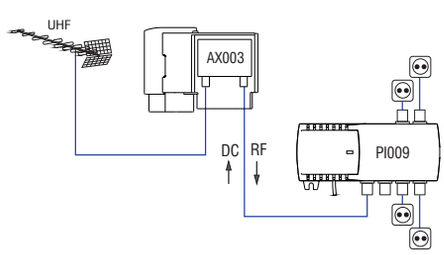


Technical specifications

TYPE		DC015L	DC015T
Ordering number		02568	02568T
Number of inputs		3	3
Insertion loss	VHFI+FM (47-108 MHz)	< 1 dB (88-108 MHz)	
	VHFIII (174-260 MHz)	< 1 dB (174-230 MHz	
	UHF (470-862 MHz)	< 2 dB (470-790 MHz)	< 2 dB (470-694 MHz)
Inputs isolation		VHF, UHF > 20 dB	
DC pass		24 V 0.2 A max.	
Operating temperature range		-20⁰ ÷ +50 ⁰C	
Dimensions/Weight (packed)		89x107x43 mm/0.20 kg	

TV band amplifiers

- single input low noise preamplifiers
- DC feeding via output connector
- for outdoor mounting
- shielded metal case inside plastic housing



Technical specifications

TYPE		AX003	AX005
Ordering number		03530	03531
Gain	VHFIII (88-260 MHz)	-	20 dB
	UHF (470-790 MHz)	20 dB	
Noise figure		≤ 3 dB	4 dB
Maximal output level IMD3=60 dB (DIN45004B)		108 dBμV	
IMD3=60 dB		105 dBμV	
Interstage gain control		0 ÷ 10 dB	-
Return loss		> 10 dB	
Current consumption		12 V 60 mA	
Operating temperature range		-20⁰ ÷ +50 ⁰C	
Dimensions/Weight (packed)		89x107x43 mm/0.18 kg	

Masthead products
UHF and VHF band amplifiers

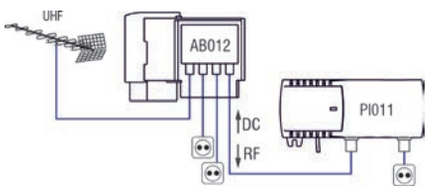
- single input preamplifiers with extremely low noise figure
- for outdoor mounting
- DC feeding through output connector (AB012 powered through any output)
- shielded metal case inside plastic housing

AB010
15 dB fixed gain UHF masthead amplifier

AB011
27 dB switchable gain UHF masthead amplifier

AB012
22 dB switchable gain UHF masthead amplifier and three RF isolated outputs

AB013
17 dB fixed gain VHF masthead amplifier



Technical specifications

TYPE	AB010	AB011	AB012	AB013
Ordering number	02544	02545	02546	02555
Frequency range	470-862 MHz			174-230 MHz
Gain	15 dB	27 dB	22 dB	17 dB
Number of inputs	1	1	1	1
Number of outputs	1		3	1
Noise figure	0.8 dB	≤ 1 dB		1.2 dB
Maximal output level	IMD3=60 dB(DIN45004B) = 98 dBμV, IMD3=60 dB 95 dBμV	IMD3=60 dB(DIN45004B) =108 dBμV, IMD3=60 dB 105 dBμV	IMD3=60 dB(DIN45004B) =103 dBμV, IMD3=60 dB 100 dBμV	IMD3=60 dB(DIN45004B) =96 dBμV, IMD3=60 dB 93 dBμV
Interstage gain control	-	13 dB, switchable	15 dB, switchable	-
Return loss	> 10 dB			
Current consumption	4.5 V ÷ 12 V 30 mA	4.5 V ÷ 12 V 60 mA		4.5 V ÷ 12 V 30 mA
Operating temperature range	-20⁰ ÷ +50 ⁰C			
Dimensions/Weight (packed)	89x107x43 mm/0.18 kg			

- single input preamplifiers with extremely low noise figure
- integrated LTE signal suppression filter
- for outdoor mounting
- DC feeding via output connector
- shielded metal case inside plastic housing

AB010L
14 dB fixed gain UHF masthead amplifier

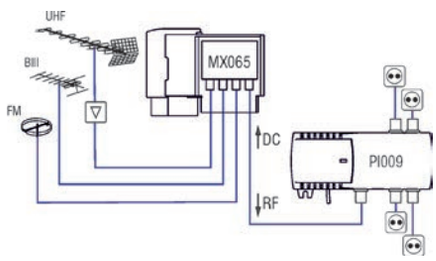
AB011L, AB011T
26 dB switchable gain UHF masthead amplifiers
AB011L - 470-790 MHz
AB011T - 470-694 MHz

Technical specifications

TYPE	AB010L	AB011L	AB011T
Ordering number	02544L	02545L	02545T
Frequency range	470-790 MHz		470-694 MHz
Gain	14 dB	26 dB	
Noise figure	≤ 1 dB (700 MHz)	≤ 1.3 dB (700 MHz)	≤ 1.3 dB (600 MHz)
Maximal output level	IMD3=60 dB (DIN45004B) 98 dBμV, IMD3=60 dB 95 dBμV	IMD3=60 dB (DIN45004B) 108 dBμV, IMD3=60 dB 105 dBμV	
Interstage gain control	-	13 dB, switchable	
Return loss	> 10 dB		
Current consumption	4.5 V ÷ 12 V 30 mA	4.5 V ÷ 12 V 60 mA	
Operating temperature range	-20⁰ ÷ +50 ⁰C		
Dimensions/Weight (packed)	89x107x43 mm/0.18 kg		

Masthead products
Multiband amplifiers

- for combining and balancing of the signals up to 3 TV antennas
- switchable DC feeding for preamplifier UHF
- built-in attenuators for every band
- DC feeding via output connector
- for outdoor mounting
- shielded metal case inside plastic housing



Technical specifications

TYPE		MX061	MX062	MX064	MX065
Ordering number		03525	03526	03527	03528
Gain	FM (88-108 MHz)	16 dB	30 dB	30 dB	28 dB
	VHFIII (174-260 MHz)				28 dB
	UHFIV (470-566 MHz)	-	-	-	-
	UHFV (590-790 MHz)	-	-	-	-
	UHF (470-790 MHz)	2x20 dB	2x34 dB	38 dB	38 dB
Number of inputs		3	3	2	3
Noise figure		VHF 6 dB; UHF 3 dB			
Maximal output level IMD3=60 dB (DIN45004B)		108 dBµV			
IMD3=60 dB		105 dBµV			
Gain control		VHF 0 ÷ -10 dB UHF 0 ÷ -10 dB	VHF 0 ÷ -20 dB; UHF 0 ÷ -16 dB		
Return loss		> 10 dB			
DC for preamplifiers (switchable)*		through UHF input			
Current consumption**		12 V 65 mA	12 V 80 mA		
Operating temperature range		-20⁰ ÷ +50 ⁰C			
Dimensions/Weight (packed)		89x107x43 mm/0.18 kg			

* 12 V 60 mA max. ** without external DC loading

- for combining and balancing of the signals up to 3 TV antennas
- integrated LTE signal suppression filter ⎍:
  MA08XL - LTE 800 band
  MA08XT - LTE 700 band
- built-in attenuators for every band
- DC feeding via output connector
- for outdoor mounting
- shielded metal case inside plastic housing

Technical specifications

TYPE		MA080L	MA080T	MA081L	MA081T	MA082L	MA082T
Ordering number		03512	03534	03513	03535	03514	03536
Gain, typical	FM (88-108 MHz)	20 dB		20 dB		20 dB	
	VHFIII (174-230 MHz)	20 dB					
	UHF (470-790 MHz)	30 dB ⎍	-	2 x 30 dB* ⎍	-	30 dB ⎍	-
	UHF (470-694 MHz)	-	30 dB ⎍	-	2 x 30 dB* ⎍	-	30 dB ⎍
Number of inputs		3				2	
Noise figure at 600 MHz		VHF 5 dB; UHF 3 dB					
Maximal output level		IMD3=60 dB (DIN45004B) 108 dBµV, IMD3=60 dB 105 dBµV					
Gain control		VHF 0 ÷ -12 dB; UHF 0 ÷ -15 dB					
Return loss		> 10 dB					
Current consumption		12 V 60 mA					
Operating temperature range		-20⁰ ÷ +50 ⁰C					
Dimensions/Weight (packed)		89x107x43 mm/0.18 kg					

* both inputs are filtered

Supplements for masthead products

Power supplies

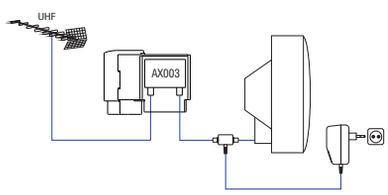
CABRIOLINE

- power supplies for remote DC feeding through RF input with various quantities of outputs
- DC and tone pass (PI011 only)
- protection and indication of DC feeding overload
- die-cast housing inside plastic case

Technical specifications

TYPE	PI008	PI009	PI011
Ordering number	02548	02549	02559
Frequency range	47-862 MHz		47-2150 MHz
Loss	4 dB (2 RF isolated outputs)	8 dB (4 RF isolated outputs)	2 dB (1 RF output)
DC feeding for external	12 V 0.1 A max.		11.5 V 0.1 A max.
DC pass	-		12 V ÷ 18 V 0.5 A max.
Power consumption	230 V~ 50/60 Hz 4 W		
Dimensions/Weight (packed)	133x63x39 mm/0.36 kg	133x73x39 mm/0.36 kg	133x63x39 mm/0.36 kg

- stabilized power supply with power inserter, F socket - F socket



Technical specifications

TYPE	ZS12/250F
Ordering number	00624
DC output	+12 V 0.25 A
Frequency range	45-862 MHz
Attenuation	1 dB
Output connector	F
Mains voltage	220 V~ 50 Hz
Dimensions	57x81x49 mm

House amplifiers
Apartment broadband amplifiers

- built-in adjustable gain regulators
- built-in power supply
- integrated LTE signal suppression filter
- die-cast housing inside plastic case

Technical specifications

TYPE	AS039L	AS039T
Ordering number	02514L	02514T
Forward path		
Frequency range	47-790 MHz	47-694 MHz
Outputs number	2	
Gain*	16 dB/47 MHz; 20 dB/790 MHz	16 dB/47 MHz; 20 dB/694 MHz
Gain adjustment	0 ÷ -12 dB	
Maximal output level*	IMD3=60 dB (DIN45004B) 100 dBμV, IMD3=60 dB 97 dBμV	
Noise figure at 600 MHz	< 6 dB	
Power consumption	230 V~ 50/60 Hz 3 W	
Operating temperature range	-20° ÷ +50° C	
Dimensions/Weight (packed)	133x63x39 mm/0.36 kg	

* when loaded other symmetrical output

Apartment splitband amplifiers

- splitband amplifier with separate gain adjustment in VHF and UHF ranges
- integrated LTE signal suppression filter (HS018L, HS018T)
- built-in power supply
- die-cast housing inside plastic case

HS016
amplifier with two outputs

HS018L, HS018T
amplifier with two outputs,
integrated LTE signal suppression filter
HS018L - 88-230, 470-790 MHz
HS018T - 88-230, 470-694 MHz

HS017
amplifier with four outputs

Technical specifications

TYPE	HS016	HS017	HS018L	HS018T
Ordering number	02523	02524	02569	02569T
Frequency range	47-300, 470-862 MHz	47-300, 470-862 MHz	88-230, 470-790 MHz	88-230, 470-694 MHz
Outputs number	2	4	2	
Gain (fixed slope pre-correction)	20-22 dB, 20-22 dB	18-20 dB, 18-20 dB	26 dB	
Gain adjustment	VHF 0 ÷ –15 dB, UHF 0 ÷ –12 dB			
Maximal output level IMD3=60 dB (DIN45004B)	104 dBμV	100 dBμV	IMD3=60 dB (DIN45004B) 107 dBμV, IMD3=60 dB 104 dBμV	
Input and output return loss	> 10 dB			
Noise figure	VHF < 4.5 dB, UHF <3 dB	VHF < 4.5 dB, UHF <3 dB	VHF < 3 dB UHF <3.5 dB (700 MHz)	VHF < 3 dB UHF <3.5 dB (600 MHz)
Test point	-20 dB			
Outputs decoupling	> 16 dB	> 16 dB	> 18 dB	
Power consumption	230 V~ 50/60 Hz 3.5 W			
Operating temperature range	-20° ÷ +50° C			
Dimensions/Weight (packed)	133x63x39 mm/0.36 kg	133x73x39 mm/0.36 kg	133x63x39 mm/0.36 kg	

House amplifiers

Apartment splitband amplifier

- double band amplifier (2 inputs, 2 outputs) with switchable remote DC feeding through UHF input
- separate gain adjustments in VHF and UHF bands
- protection and indication of DC feeding overload

Technical specifications

T Y P E	HS013
Ordering number	01588
Frequency range	47-400/470-862 MHz
Gain	22 dB*
Gain adjustment	VHF 0 ÷ -15 dB, UHF 0 ÷ -12 dB
Maximal output level IMD3=60 dB (DIN45004B)	105 dBμV*
Maximal output level IMD2=60 dB (EN60728-3)	95 dBμV
Noise figure	VHF < 4.5 dB, UHF < 3 dB
DC feeding for external	12 V 0.1 A max.
Power consumption**	230 V~ 50/60 Hz 4 W
Dimensions/Weight (packed)	78x118x47 mm/0.36 kg

* 1 output loaded; when 2 outputs loaded: gain - 20 dB, output level - 103 dBμV

** without external DC loading

Medium power splitband amplifiers

- splitband amplifier with separate gain & slope adjustment in VHF & UHF ranges
- integrated LTE signal suppression filter
- switchable DC feeding for preamplifier through RF input connector
- protection and indication of DC feeding overload
- input and output test points
- built-in power supply
- die-cast housing

Technical specifications

T Y P E	HS004	HS004L	HS004T	HS005L	HS005T
Ordering number	02570	02570L	02570T	02571L	02571T
Frequency range	**VHF** 47-414 MHz	**VHF** 88-230 MHz		**VHF** 88-230 MHz	
	UHF 470-862 MHz	**UHF** 470-790 MHz	**UHF** 470-694 MHz	**UHF** 470-790 MHz	**UHF** 470-694 MHz
Gain	**VHF** 34-39 dB **UHF** 39-44 dB	**VHF** 36-39 dB, **UHF** 39-44 dB		**VHF** 30 dB, **UHF** 34 dB	
Flatness	± 1 dB			**VHF** ± 1 dB, **UHF** ± 0.5 dB	
Gain adjustment	**VHF** 20 dB, **UHF** 14 dB	**VHF** 20 dB, **UHF** 14 dB		20 dB	
Slope adjustment	**VHF** 20 dB, **UHF** 10 dB	**VHF** 14 dB, **UHF** 10 dB		-	
Maximal output level IMD3=60 dB (DIN45004B)	121 dBμV	121 dBμV		115 dBμV	
IMD3=60 dB	-	118 dBμV		112 dBμV	
Input and output return loss	>10 dB				
Noise figure	**VHF, UHF** < 6 dB	**VHF** < 6 dB **UHF** < 6 dB (700 MHz)	**VHF** < 6 dB **UHF** < 6 dB (600 MHz)	**VHF** < 5 dB **UHF** < 4 dB (700 MHz)	**VHF** < 5 dB **UHF** < 4 dB (600 MHz)
Test points	input -20 dB, output -30 dB			output -30 dB	
DC feeding for external	12 V 100 mA max.			12 V 60 mA max.	
Power consumption*	230 V~ 50/60 Hz 5 W				
Operating temperature range	-20⁰ ÷ +50⁰C				
Dimensions/Weight (packed)	135x180x52 mm/0.7 kg				

* without external DC load; with maximal external DC load 7 W

House amplifiers

Medium power broadband amplifiers

- integrated LTE signal suppression filter
- built-in adjustable gain & slope regulators
- input and output bi-directional test points
- die-cast housing

Technical specifications

T Y P E	HA131L	HA131T
Ordering number	02575	02585
Frequency range	88 - 790 MHz	88 - 694 MHz
Gain	36 dB	
Flatness	± 0.7 dB	
Gain adjustment	20 dB	
Slope adjustment	20 dB	
Maximal output level IMD3=60 dB (DIN45004B)	122 dBμV	
Output level CTB (EN60728-3)	106 dBμV	
Output level CSO (EN60728-3)	101 dBμV	
Input and output return loss	≥ 14 dB at 40 MHz; -1.5 dB/oct., but not less 10 dB	
Noise figure	7 dB	
Test points	input - 20 dB, output - 30 dB	
Power consumption	230 V~ 50/60 Hz 6.5 W	
Operating temperature range	-20° ÷ +50° C	
Dimensions/Weight (packed)	135x164x52 mm/0.7 kg	

Multiband amplifiers
Medium power amplifiers

- amplifier for combining and balancing of the signals up to 4 TV antennas
- protection and indication of DC overload
- integrated LTE signal suppression filter (MA056L, MA056T)
- built-in attenuators for every band
- DC feeding for preamplifier through UHF input
- die-cast housing inside plastic case
- die-cast housing (MA044M, MA045M)

Technical specifications

TYPE		MA056	MA056L	MA056T	MA044M	MA045M
Ordering number		03506	03506L	03506T	01598M	01599M
Gain	VHFI+FM (47-108 MHz)	30 dB				
	VHFIII (174-230 MHz)	30 dB				
	UHF (470-862 MHz)	2 x 35 dB	-	-	2 x 34 dB	34 dB
	UHF (470-790 MHz)	-	2 x 35 dB	-	-	-
	UHF (470-694 MHz)	-	-	2 x 35 dB	-	-
Number of inputs		4			4	3
Noise figure, typical	VHF	<6 dB				
	UHF	<6 dB				<4 dB
Maximal output level		IMD3=60 dB (DIN45004B) 112 dBμV, IMD3=60 dB 109 dBμV			IMD3=60 dB (DIN45004B)= 115 dBμV, IMD3=60 dB 112 dBμV	
Gain control		0 ÷ -16 dB			0 ÷ -20 dB	
Return loss		> 10 dB				
Test point		-20 dB			-30 dB	
DC feeding for external		5 V 80 mA max.			12 V 60 mA max.	
Power consumption		230 V~ 50/60 Hz 2.3 W*			230 V~ 50/60 Hz 7 W	
Operating temperature range		-20° ÷ +50° C				
Dimensions/Weight (packed)		133x73x39 mm/0.36 kg			135x180x52 mm/0.72 kg	

* without external DC load; with external DC load 3 W

- for combining and balancing of the signals up to 4 TV antennas
- integrated LTE signal suppression filter
- protection and indication of DC overload
- built-in attenuators for every band
- switchable DC feeding for preamplifier through one UHF input
- die-cast housing

Technical specifications

TYPE		MA048LC	MA049L	MA049T	MA050L
Ordering number		03500	03501	03501T	03502
Gain	FM (88-108 MHz)	30 dB			30 dB
	VHFIII (174-230 MHz)	30 dB			
	UHF (470-790 MHz)	-	34 dB	-	34 dB
	UHF (470-694 MHz)	-	-	34 dB	-
	UHF1 (470-766 MHz)	34 dB	-		
	UHF2 (470-790 MHz)	34 dB	-		
Number of inputs		4	3	3	2
Noise figure, typical	VHF	< 6 dB			
	UHF (700 MHz)	< 7 dB	< 5 dB		
Maximal output level		IMD3=60 dB (DIN45004B) 115 dBμV, IMD3=60 dB 112 dBμV			
Gain control		0 ÷ - 20 dB			
Return loss		> 10 dB			
Test point		- 30 dB			
DC feeding for external		12 V 60 mA max.			
Power consumption*		230 V~ 50/60 Hz 7 W			
Operating temperature range		-20° ÷ +50° C			
Dimensions/Weight (packed)		135x180x52 mm/0.72 kg			

* without external DC loading

Multiband amplifiers
Medium power amplifiers

- for combining and balancing of the signals up to 4 TV antennas
- protection and indication of DC overload
- built-in attenuators for every band
- switchable DC feeding for preamplifiers through all inputs and separate DC output via 2.1/5.5 mm socket
- built-in test point
- metal-plastic housing

Technical specifications

TYPE		MA024	MA025
Ordering number		10558	10559
Gain	VHFI+FM (47-108 MHz)	30 dB	30 dB
	VHFIII (174-230 MHz)	30 dB	30 dB
	UHF (470-862 MHz)	2x34 dB	30 dB
Number of inputs		4	3
Noise figure		VHF < 5 dB; UHF < 7 dB	
Maximal output level IMD3=60 dB (DIN45004B)		115 dBμV	
Gain control		0 ÷ -20 dB	
Return loss		> 10 dB	
Test point		- 30 dB	
DC feeding for external, switchable		12 V 100 mA max.	
Power consumption*		230 V~ 50/60 Hz 9 W	
Operating temperature range		-20° ÷ +50° C	
Dimensions/Weight (packed)		201x128x53 mm/0.77 kg	

* without external DC loading

High power amplifiers

- for combining and balancing of the signals up to 5 TV antennas
- protection and indication of DC overload
- built-in attenuators for every band
- switchable DC feeding for preamplifier through one UHF input
- die-cast housing

Technical specifications

TYPE		MA074 (obsolete)	MA075 (obsolete)	MA076 (obsolete)	MA077
Ordering number		03515	03516	03517	03518
Gain	FM (88-108 MHz)	35 dB	35 dB	35 dB	35 dB
	VHFIII (174-230 MHz)	35 dB	35 dB	35 dB	35 dB
	UHF (470-790 MHz)	44 dB	47 dB	2x47 dB	3x44 dB
	UHF1 (470-590 MHz)	44 dB	-	-	-
	UHF2 (590-790 MHz)	44 dB	-	-	-
Number of inputs		5	3	4	5
Noise figure, typical	VHF	< 6 dB	< 5 dB		
	UHF	< 4 dB	< 3 dB	< 3.5 dB	< 4 dB
Maximal output level		IMD3=60 dB (DIN45004B) 121 dBμV, IMD3=60 dB 118 dBμV			
Gain control		0 ÷ - 20 dB			
Return loss		> 10 dB			
Test point		- 30 dB			
DC feeding for external		12 V 100 mA max.			
Power consumption*		230 V~ 50/60 Hz 5 W			
Operating temperature range		-20° ÷ +50° C			
Dimensions/Weight (packed)		135x180x52 mm/0.72 kg			

* without external DC load; with maximal external DC load 7 W

Multiband amplifiers
High power amplifiers

- for combining and balancing of the signals up to 5 TV antennas
- integrated LTE signal suppression filter
- protection and indication of DC overload
- built-in attenuators for every band
- switchable DC feeding for preamplifier through one UHF input
- die-cast housing

Technical specifications

TYPE		MA074L	MA074T	MA075L	MA075T	MA076L	MA076T	MA077LC	MA077TB
Ordering number		03519	03538	03520	03539	03521	03540	03522	03541
Gain	FM (88-108 MHz)	35 dB							
	VHFIII (174-230 MHz)	35 dB							
	UHF (470-694 MHz)**	-	44 dB	-	47 dB	-	2x47 dB*	-	44 dB
	UHF (470-790 MHz)**	44 dB	-	47 dB	-	2x47 dB*	-	44 dB	-
	UHF1 (470-590 MHz)	44 dB	44 dB	-	-	-	-	-	-
	UHF1 (470-862 MHz)	-	-	-	-	-	-	44 dB	44 dB
	UHF2 (590-694 MHz)**	-	44 dB	-	-	-	-	-	-
	UHF2 (590-790 MHz)**	44 dB	-	-	-	-	-	-	-
	UHF2 (470-678 MHz)**	-	-	-	-	-	-	-	44 dB
	UHF2 (470-766 MHz)**	-	-	-	-	-	-	44 dB	-
Number of inputs		5		3		4		5	
Noise figure, typical	VHF	<6 dB	<5 dB						
	UHF	<4 dB		<3 dB		<3.5 dB		<4 dB	
Maximal output level		IMD3=60 dB (DIN45004B) 121 dBµV, IMD3=60 dB 118 dBµV							
Gain control		0 ÷ -20 dB							
Return loss		> 10 dB							
Test point		-30 dB							
DC feeding for external		12 V 100 mA max.							
Power consumption* **		230 V~ 50/60 Hz 5 W							
Operating temperature range		-20° ÷ +50° C							
Dimensions/Weight (packed)		135x180x52 mm/0.72 kg							

* both inputs are filtered

** LTE signal suppression filter on the input

*** without external DC load; with maximal external DC load - 7 W

TERRA

Multichannel headend
UHF TV channel amplifiers

lte Ready

- UHF TV channel amplifiers tunable in UHF range
- SAW filters provide a high selectivity processing of digital and analog channels
- integrated LTE signal suppression filter (for at440 only)
- each section has a built-in AGC system and an independent regulator of output level
- built-in indicators and push buttons allow operatively to set required parameters
- DC feeding for preamplifiers through RF input
- DIN rail or wall mounting
- robust die-cast housing
- connectors:
  4xRF - type F
  screw terminal block for DC entry
  power distribution bus

at420
two 8 MHz bandwidth sections
at421
two 7 MHz bandwidth sections
at440
four 8 MHz bandwidth sections

at420
at421

at440

Technical specifications

TYPE			at420		at421		at440
Ordering number			02558		02565		02561
Sections			2				4
Tuning range of channels			470-862 MHz				470-790 MHz
RF input	TV standard	pr.	analog (G, K, I, NZ)	DVB-T*	analog (Au/G, K, I, NZ)	DVB-T*	DVB-T*
	channel bandwidth		8 MHz	8 MHz	7/8 MHz	7 MHz	8 MHz
	level/impedance		60-85 dBµV/75 Ω	50-80 dBµV/75 Ω	60-85 dBµV/75 Ω	50-80 dBµV/75 Ω	50-75 dBµV/75 Ω
	frequency range of RF distribution		47-862 MHz				47-790 MHz
	loop through gain		0 ± 1.5 dB				
	return loss		>12 dB				>10 dB
RF output	level/ impedance, typical		90 dBµV/75 Ω	85 dBµV/75 Ω	90 dBµV/75 Ω	85 dBµV/75 Ω	82 dBµV/75 Ω
	MER of DVB-T signal		-	≥ 36 dB (input signal MER 38 dB)	-	≥ 36 dB (input signal MER 38 dB)	≥ 36 dB (input signal MER 38 dB)
	frequency range of RF combining		47-2150 MHz				
	DC pass through		0.3 A				
	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			7 dB				
Selectivity, typical			40 dB, ±1.25 MHz from 8 MHz bandwidth border	pr. 40 dB, ±2 MHz from 8 MHz bandwidth border	40 dB, ±1.25 MHz from 7 MHz bandwidth border	pr. 40 dB, ±2 MHz from 7 MHz bandwidth border	40 dB, ±2 MHz from 8 MHz bandwidth border
Offset**			±1 MHz by 0.25 MHz step				±1 MHz by 0.125 MHz step
Spurious signals level			≤ -60 dBc				≤ -55 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.				
Current consumption***			12 V 0.45 A				12 V 0.75 A
Operating temperature range			0°÷ +50°C				
Dimensions/Weight (packed)			36x198x107.5 mm/0.9 kg				48.5x198x107.5 mm/1 kg

pr. software control

* 21-69 channels for at420 by G standard, 20-75 channels for at421 by Au standard, 21-60 channels for at440 by G standard
** the offset is used for fine tuning of the channel frequency response
*** without external DC loading

TERRA

Multichannel headend
VHF TV channel amplifier

- VHF TV channel amplifiers tunable in VHFIII range
- SAW filters provide a high selectivity processing of digital and analog channels
- each section has a built-in AGC system and an independent regulator of output level
- built-in indicators and push buttons allow operatively to set required parameters
- DC feeding for preamplifiers through RF input
- DIN rail or wall mounting
- robust die-cast housing
- connectors:
  4xRF - type F
  screw terminal block for DC entry
  power distribution bus

Technical specifications

T Y P E			at422	
Ordering number			02564	
Sections			2	
Tuning range of channels			174-230 MHz	
RF input	TV standard	pr.	analog (Au, B)	digital (DVB-T*)
	channel bandwidth		7 MHz	
	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		>10 dB	
RF output	level/impedance, typical		90 dBμV/75 Ω	85 dBμV/75 Ω
	MER of DVB-T signal		-	≥ 36 dB (input signal MER 38 dB)
	frequency range of RF combining		47-2150 MHz	
	DC pass through		0.3 A	
	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, typical		pr.	40 dB, ±1.25 MHz from 7 MHz bandwidth border	40 dB, ±2 MHz from 7 MHz bandwidth border
Offset**			±1 MHz by 0.125 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.	
Current consumption***			12 V 0.45 A	
Operating temperature range			0° ÷ +50° C	
Dimensions/Weight (packed)			36x198x107.5 mm/0.9 kg	

pr. software control

* 6-12 channels by Au standard, E5-E12 channels by B standard
** the offset is used for fine tuning of the channel frequency response
*** without external DC loading

Multichannel headend

Multiband system amplifier

- FM, BIII & DAB and UHF inputs
- high output level
- built-in gain controls
- DC feeding for preamplifiers through RF inputs
- DIN rail or wall mounting
- robust die-cast housing
- connectors:
  4xRF - type F
  screw terminal block for DC entry
  power distribution bus

Technical specifications

TYPE		ma400
Ordering number		10503
Gain	FM (88-108 MHz)	30 dB
	VHFIII (174-260 MHz)	30 dB
	UHF (470-862 MHz)	30 dB
Number of inputs		3
Noise figure		VHF < 7 dB; UHF < 5 dB
Maximal output level IMD3=60 dB (DIN45004B)		VHF 116 dBµV; UHF 118 dBµV
Gain control	attenuator	0 ÷ -15 dB
	switch	0/-10 dB
Return loss		> 10 dB
DC feeding for external (total)		12 V 0.1 A max.
Current consumption*		12 V 0.48 A
Operating temperature range		0° ÷ +50° C
Dimensions/Weight (packed)		36x198x107.5 mm/ 0.9 kg

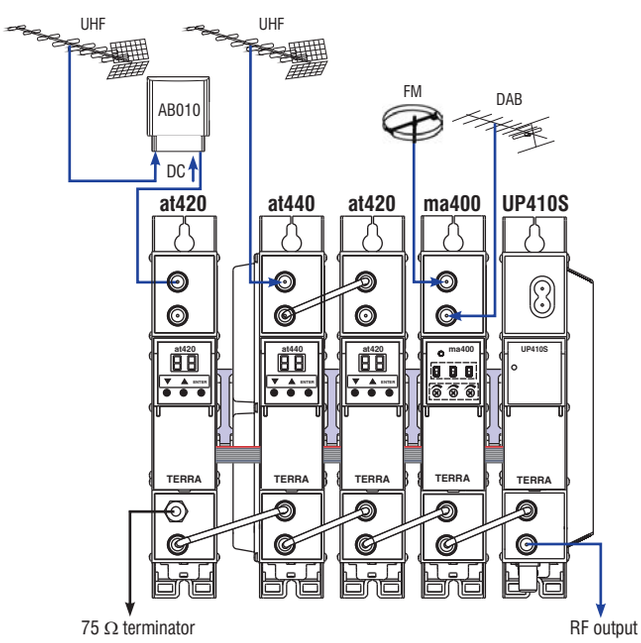
* without external DC loading

Power supply

- modular power supply with integrated RF combiner
- switch-mode technology
- short circuit and overload protected
- DIN rail or wall mounting
- robust die-cast housing
- connectors:
  3xRF - type F
  screw terminal block for DC output
  power distribution bus

Technical specifications

TYPE		UP410S
Ordering number		02874S
Power supply	input voltage	187-250 V~ 50/60 Hz
	output voltage, current	12 V 4.5 A max.
	power consumption	65 W max.
RF combiner	frequency range	47-2400 MHz
	insertion loss	4 dB at 862 MHz 6 dB at 2400 MHz
	isolation	≥ 20 dB
	return loss	≥ 20 dB at 862 MHz ≥ 12 dB at 2400 MHz
Operating temperature range		0° ÷ +50° C
Dimensions/Weight (packed)		48x198x107.5 mm/0.97 kg



Application diagram of filtering 8 TV channels from 2 directions & combining with FM and DAB signals.
DC power is distributed from single power supply by power distribution bus.

AB010 - fixed gain UHF masthead amplifier, **page 2.05**
at420 - two sections TV channel amplifier, **page 2.14**
at440 - four sections TV channel amplifier, **page 2.14**

See accessories, page 2.17.

Multichannel headend
Power supplies & accessories

Power supplies

- switch-mode technology
- short circuit and overload protected
- DIN rail mounting (HDR-60-12)

Technical specifications

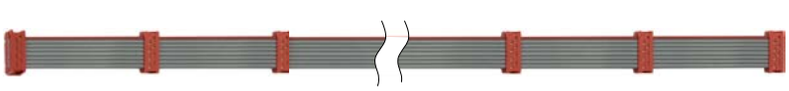
TYPE	HDR-60-12	SGA25E12-W
Ordering number	00631	00633
DC output	+12 V 4.5 A max.	+12 V 2 A max.
Mains voltage	100 V÷ 240 V~ 50/60 Hz	
Operating temperature range	-20°÷ +50°C	-20°÷ +40°C
Dimensions/Weight (packed)	52.5x90x54.5 mm/0.3 kg	75.5x32x47.5 mm/0.16 kg

Accessories

- Fmale - Fmale quick coaxial bridge 699.026: for modules with width 36 mm
  Ordering number 21876
- Fmale - Fmale quick coaxial bridge 780.026: for modules with width 48.5 mm
  Ordering number 21881

- DC distribution cable 699.20 for 4 modules with width 36 mm
  Ordering number 21875
- DC distribution cable 780.20 for 4 modules with width 48.5 mm
  Ordering number 21882

- DC distribution cable 908.20 for 12 modules
  Ordering number 21883



- 19” system mountable rack
  Ordering number 01957

- Rail for wall mounting, 1 meter, 699.027
  Ordering number 21877

3.Channel processing equipment

Contents

TERRA

Stand alone modulators
DSB TV modulators

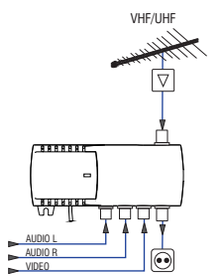
- frequency agile double sideband multistandard TV modulators
- LED display and push buttons control of internal microprocessor
- non-volatile channel memory
- PLL crystal stabilization of carriers frequency
- built-in power supply
- adjustable audio input level & RF output level
- protection from unauthorized access
- loop through RF combining
- die-cast housing inside plastic case
- connectors:
  video/audio - RCA sockets
  RF - type F

MT41
standards: G/H/I/L/K/M/N/Au (UHF range)

MT47
standards: B/G/D/K/H/I/L/M/N/Au
(UHF & VHF ranges)

MT57
standards: B/G/Au/stereo A2,
D/K/H/I/L/M/N/mono (UHF & VHF ranges)

CABRIOLINE



Technical specifications

TYPE		MT41	MT47	MT57
Ordering number		12860V1	12862V1	12863V1
Video input	frequency range	20 Hz - 6 MHz		
	level/impedance	1 V ± 0.1 V/75 Ω		
Audio input	frequency range	20 Hz - 15 kHz		
	level adjustment	0 ÷ 7 dB		±6 dB by 2 dB step pr.
	level/impedance/deviation	775 mV RMS/10 kΩ/50 kHz	2x775 mV RMS/10 kΩ/50 kHz	2x775 mV RMS/10 kΩ/50 kHz
RF output	level (typical)/impedance	90 dBμV/75 Ω	85 dBμV/75 Ω	
	level adjustment	0 ÷ -20 dB		
	output channels according channels charts pr.	G/H/I/L/K/M/N/Au	B/G/D/K/H/I/L/M/N/Au	
	frequency range pr.	470-862 MHz	45-84 MHz, 170-300 MHz, 470-862 MHz	
Sound subcarrier frequency pr.		4.5 MHz, 5.5 MHz, 6.0 MHz, 6.5 MHz		
Second sound subcarrier frequency pr.		-		5.742 MHz*
Fine tuning range of video carrier frequency pr.		±2.25 MHz max. by 0.25 MHz step		
Combining through loss		1.5 dB	2.5 dB	
Frequency range of RF combining		5-862 MHz		
A/V ratio pr.		12/16 dB		
Amplitude modulation depth, typical		81 %		
Signal/noise ratio, weighted		≥ 55 dB		
Power consumption		230 V~ 50/60 Hz 3.5 W	230 V~ 50/60 Hz 3 W	230 V~ 50/60 Hz 4 W
Operating temperature range		-10° ÷ + 50° C		+0° ÷ + 50° C
Dimensions/Weight (packed)		133x63x39 mm/0.36 kg	133x73x39 mm/0.36 kg	

* B/G/Au stereo A2

pr. software control

TERRA

Stand alone modulators
VSB TV modulators

- frequency agile vestigial sideband TV modulators
- LED display and push buttons control of internal microprocessor
- non-volatile channel memory
- PLL crystal stabilization of carriers frequency
- adjustable RF output level and audio input level
- loop through RF combining
- low level harmonics and intermodulation products
- built-in test pattern generator
- die-cast housing
- connectors:
  video/audio - type RCA socket
  RF - type F

MT32
standards: B/G/D/K/Au/I/L

MT32C
standards: B/G/D/K/Au stereo A2, I/L mono

Technical specifications

TYPE		MT32	MT32C
Ordering number		14803	14804
Video input	frequency range	20 Hz - 6 MHz	
	level/impedance	1 V ± 0.1 V/75 Ω	
Audio input	frequency range	20 Hz - 15 kHz	
	level adjustment	0 ÷ 7 dB	± 6 dB by 2 dB step (pr.)
	level/impedance	775 mV/10 kΩ	
RF output	level (typical)/impedance	95 dBμV/75 Ω	
	level adjustment	0 ÷ -15 dB	
	output channels according channels charts (pr.)	B/G/D/K/Au/I/L	B/G/D/K/Au stereo A2, I/L mono
	frequency range (pr.)	45-862 MHz	
Sound subcarrier frequency (pr.)		5.5 MHz, 6.0 MHz, 6.5 MHz	
Second sound subcarrier frequency (pr.)		-	5.742 MHz*/6.258 MHz**
Fine tuning range of video carrier frequency (pr.)		± 2.25 MHz max. by 0.25 MHz step	
Combining through loss		2.5 dB	
Frequency range of RF combining		45-862 MHz	
A/V ratio (pr.)		12/16 dB	
Amplitude modulation depth, typical		81 %	
Signal/noise ratio, weighted		≥ 55 dB	
II, III order intermodulation distortion		< -60 dB	
Power consumption		230 V~ 50/60 Hz 5.5 W	230 V~ 50/60 Hz 6 W
Operating temperature range		-10° ÷ +50° C	
Dimensions/Weight (packed)		135x180x52 mm/0.74 kg	

* B/G/Au stereo A2

** D/K stereo A2

(pr.) software control

Stand alone modulators
HDMI to DVB-T modulators

Modulating from HDMI signal source into COFDM modulated DVB-T RF channel.

- frequency agile digital TV modulator
- LED display and push buttons control of internal microprocessor
- RF loop through input
- die-cast housing inside plastic case
- connectors:
  RF input/output - type F
  digital input - HDMI
  DC IN - 3.5/1.3 mm DC jack
  (reducer 5.5/2.1 mm in scope)

CABRIOLINE

Technical specifications

TYPE		MHD001	MHD001P*
Ordering number		14807	14808
Video input	input signal type	HDMI	
	video coding	MPEG-4 AVC/H.264, Baseline profile 4.0	
Audio input	input signal type	HDMI	
	audio coding	MPEG-1 Layer II, AAC	
H.264 Encoder	standard	MPEG-4 AVC/H.264	
Output resolution		up to 1920x1080x30p	
Transport stream processing	automatic generation	PAT, SDT, PMTs tables	
RF output	DVB standard	DVB-T	
	frequency range (pr.)	174 - 230 MHz, 470-862 MHz	
	MER, typical	32 dB	
	modulation	QAM64	
	channel bandwidth (pr.)	7 MHz/ 8 MHz	
	shoulder attenuation	> 36 dB	
	level/impedance	90 dBμV/75 Ω	
	output level adjustment (pr.)	0 ÷ -30 dB by 1 dB step	
	loop through frequency range/loss	45-862 MHz / ≤ 2.5 dB	
Current consumption		12 ± 1 V 300 mA	-
Power consumption		-	100-240 V~ 50/60 Hz 4 W
Operating temperature		0°C ÷ +40°C	
Dimensions/Weight (packed)		133x63x39 mm/0.18 kg	133x63x39 mm/0.34 kg

(pr.) software control

* MHD001P is packed with external power supply SYS1381-1212-W2E

Stand alone modulators
HDMI to DVB-T modulators with HDMI loop through

Modulating from HDMI signal source into COFDM modulated DVB-T RF channel.

- frequency agile digital TV modulator
- LED display and push buttons control of internal microprocessor
- HDMI & RF loop through circuits
- die-cast housing inside plastic case
- connectors:
  RF input/output - type F
  digital input/output - HDMI
  DC IN - 3.5/1.3 mm DC jack
  (reducer 5.5/2.1 mm in scope)

CABRIOLINE

Technical specifications

T Y P E			MHD002	MHD002P*
Ordering number			14811	14812
HDMI video input/output resolution			up to 1920x1080x60p	
H.264 Encoder	video encoding standard		MPEG-4 AVC/H.264, Baseline profile 4.0	
	video output resolution		up to 1920x1080x30p	
	audio encoding standard		MPEG-1 Layer II, AAC	
Transport stream processing	automatic generation		PAT, SDT, PMTs tables	
RF output	DVB standard		DVB-T	
	frequency range	pr.	174 - 230 MHz, 470-862 MHz	
	MER, typical		32 dB	
	modulation		QAM64	
	channel bandwidth	pr.	7 MHz/ 8 MHz	
	shoulder attenuation		> 36 dB	
	level/impedance		90 dBμV/75 Ω	
	output level adjustment	pr.	0 ÷ -30 dB by 1 dB step	
	loop through frequency range/loss		45-862 MHz / ≤ 2.5 dB	
Current consumption			12 ± 1 V 330 mA	-
Power consumption			-	100-240 V~ 50/60 Hz 4.4 W
Operating temperature			0°C ÷ +40°C	
Dimensions/Weight (packed)			133x63x39 mm/0.18 kg	133x63x39 mm/0.34 kg

pr. software control

* MHD002P is packed with external power supply SYS1381-1212-W2E

TERRA

Stand alone modulators
Digital TV modulator

Converting of TSoIP input signal into 2 QAM/COFDM modulated channels.

- software switchable standards DVB-C/DVB-T/J.83B/ISDB-T
- SPTS or MPTS input stream
- any service to any output
- PCR restamping
- RTSP protocol of video H.264/H.265, audio AAC conversion to transport stream
- IP camera discovery and control
- Web control panel via Ethernet port
- RF loop through input
- die-cast housing inside plastic case
- connectors:
  RF input/output - type F
  Ethernet control, Ethernet stream input - RJ-45
  DC IN - 3.5/1.3 mm DC jack

CABRIOLINE

Technical specifications

TYPE			MI520*			
Ordering number			see ordering information*			
IP input	standard		IEE802.3 10/100 BaseT			
	bit rate		≤ 80 Mbit/s			
	protocols		UDP / RTP / RTSP			
	MPTS, SPTS		Yes			
RF output	number of channels		2			
	standard	pr.	**DVB-T**	**ISDB-T**	**DVB-C**	**J.83B**
	modulation	pr.	QPSK/QAM16/QAM64	QPSK/QAM16/ QAM64/DQPSK	QAM16/QAM32/ QAM64/QAM128/QAM256	QAM64/QAM256
	frequency range	pr.	174-230 MHz, 470-862 MHz		96-862 MHz	
	channel allocation		adjacent			
	level/impedance		90 dBμV/75 Ω			
	MER		≥ 35 dB		≥ 40 dB	
	channel bandwidth		7/8 MHz pr.	6 MHz	1.15...8.3 MHz	6 MHz
	guard interval	pr.	1/4, 1/8, 1/16, 1/32		-	
	code rate	pr.	1/2, 2/3, 3/4, 5/6, 7/8		-	
	symbol rate		-		1...7.2 Msps pr.	5.057/6.36 Msps
	transmission mode		2K		-	
	total output level adjustment	pr.	0 ÷ 30 dB by 1 dB step			
	loop through frequency range/loss		45-862 MHz / ≤ 2.5 dB			
Management port			standard IEE802.3 10/100 BaseT (the same as stream input)			
UI language			multilingual			
Current consumption			12 ± 1 V 375 mA (MI520)			
Power consumption			100-240 V~ 50/60 Hz 5.5 W (MI520P)			
Operating temperature range			0° ÷ +40° C			
Dimensions/Weight (packed)			133x63x39 mm/0.18 kg (MI520); 133x63x39 mm/0.26 kg (MI520P)			

pr. software control

* ordering information:

Type	**Ordering number**
MI520	14809
MI520P	14813

MI520P is packed with external power supply SYS1381-1212-W2E.

Stand alone modulators
Power supply

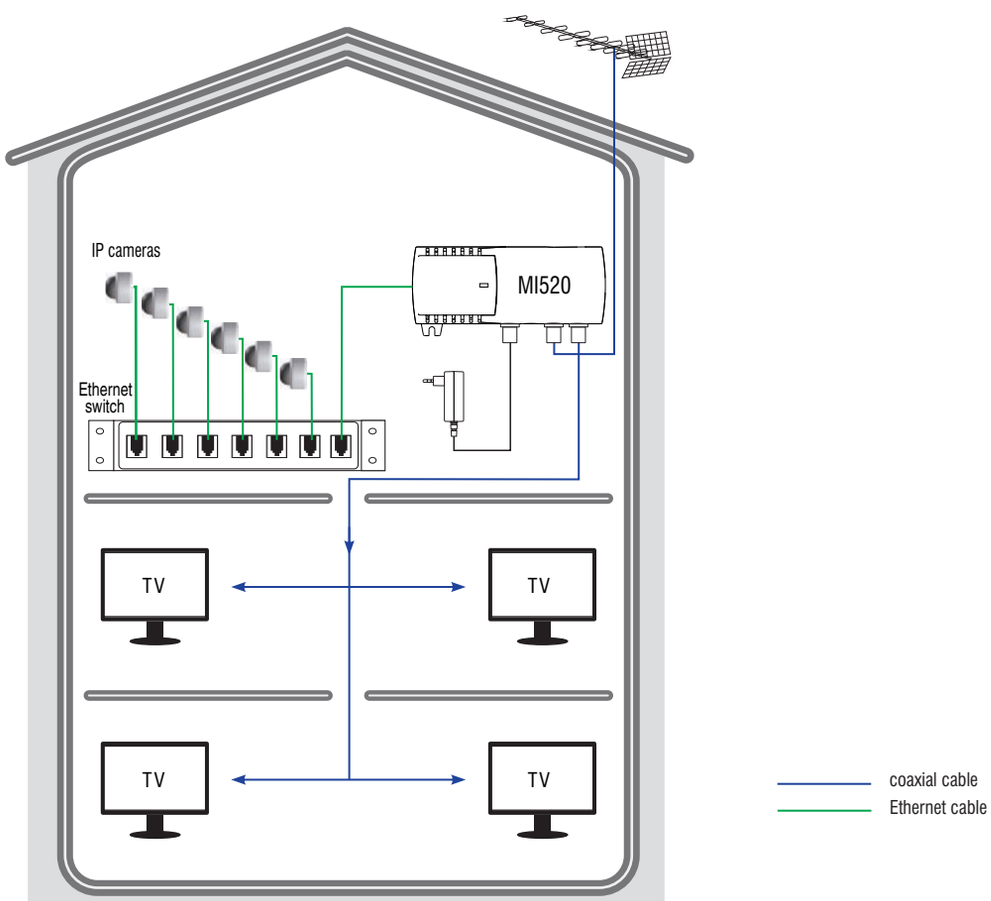
- switch-mode technology
- short circuit and overload protected

Technical specifications

TYPE	SYS1381-1212-W2E
Ordering number	00635
DC output	+12 V 1 A max.
Mains voltage	100-240 V~ 50/60 Hz
Operating temperature range	0°÷ +40°C
Dimensions/Weight (packed)	63.6x29.5x45.6 mm/0.091 kg

Application diagram

The injection of the video streams from IP CCTV cameras into SMATV distribution network.



Modular TV modulators
Twin TV modulators

Modulating analogue video/audio signals into VSB RF channel with mono or stereo A2 sound.

- frequency agile vestigial sideband TV modulators
- LED display and push buttons control of internal microprocessor
- non-volatile channel memory
- PLL crystal stabilization of carriers frequency
- adjustable RF output level and audio input level
- loop through RF combining
- low level harmonics and intermodulation products
- built-in test pattern generator
- robust die-cast housing
- connectors:
  video/audio input - RCA socket
  RF - type F
  screw terminal block for DC entry
  power distribution bus

mt420
twin TV modulator,
standard B/G/D/K/I/L/Au

mt420C
twin TV modulator,
standard B/G/D/K/Au stereo A2

Technical specifications

TYPE			mt420	mt420C
Ordering number			02872	02873
Sections			2	
TV standard		pr.	B/G/D/K/I/L/Au	B/G/D/K/Au stereo A2
Frequency range			110-862 MHz	
Video input	frequency range		20 Hz - 6 MHz	
	level/impedance		1 V ± 0.1 V/75 Ω	
Audio input	frequency range		20 Hz - 15 kHz	
	level/impedance		775 mV/10 kΩ	
	level adjustment	pr.	+ 6 ÷ -6 dB by 2 dB step	
RF output	level/impedance		90 dBμV/75 Ω	
	level adjustment range		0 ÷ –10 dB by 1 dB step	
	frequency range of RF combining		47-2150 MHz	
	DC pass through		0.3 A	
	combining through loss Terr/SAT		≤ 2.5 dB	
	return loss		≥ 10 dB	
Fine tuning range of video carrier frequency		pr.	± 2.25 MHz max. by 0.25 MHz step	
IF bandwidth		pr.	7/8 MHz	
S/N ratio, weighted			> 55 dB	
A/V ratio		pr.	12/16 dB	
IMD2/IMD3 spurious level			< -60 dB	
Current consumption			12 V 0.45 A	12 V 0.47 A
Operating temperature range			0° ÷ +50° C	
Dimensions/Weight (packed)			36x198x107.5 mm/0.9 kg	

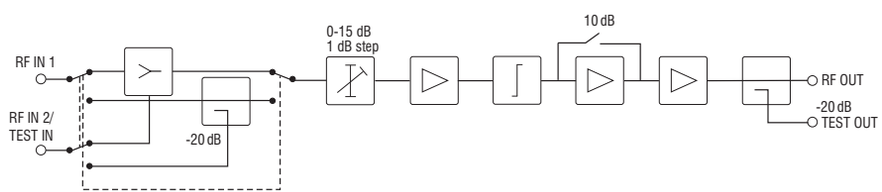
pr. software control

Modular TV modulators
Output amplifier

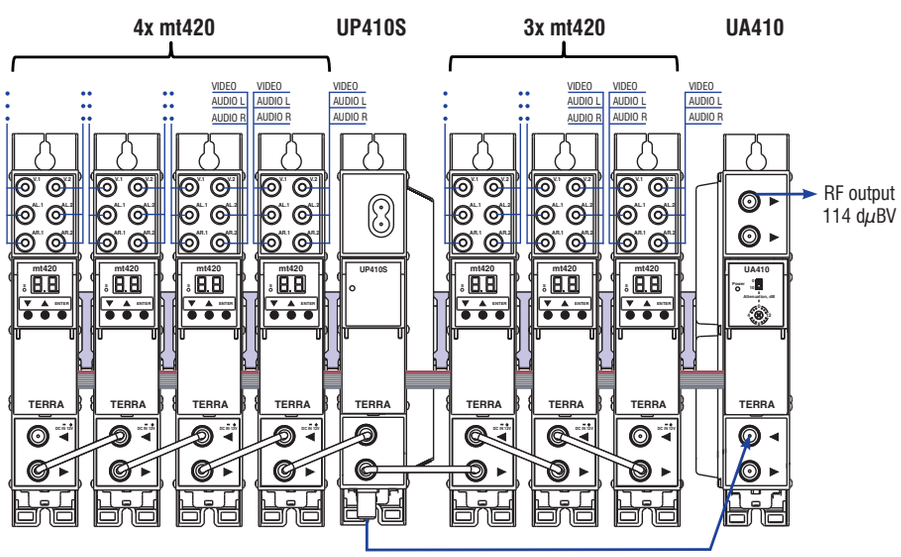
- high output level system amplifier
- switchable input mode: 2 inputs or 1 input and directional input test point
- gain adjustment by 1 dB step
- output test point
- DIN rail or wall mounting
- robust die-cast housing
- connectors:
  4xRF - type F
  screw terminal block for DC entry
  power distribution bus

Technical specifications

T Y P E	UA410
Ordering number	02566
Frequency range	47-862 MHz
Gain, switchable	30/40 dB
Output level CTB (-60 dB, EN60728-3)	110 dBμV
Output level CSO (-60 dB, EN60728-3)	111 dBμV
Noise figure (2 inputs / input and test point)	11 / 8 dB
Gain adjustment	15 dB by 1 dB step
Test points	-20 dB ± 0.75 dB
Current consumption	12 V 0.8 A
Operating temperature range	0° ÷ + 50° C
Dimensions/Weight (packed)	48.5x198x107.5 mm/1.2 kg



Application diagram of transmitting of 14 analog TV channels.



mt420 - VSB modulator, **page 3.08**
UP410S - power supply, **page 3.24**

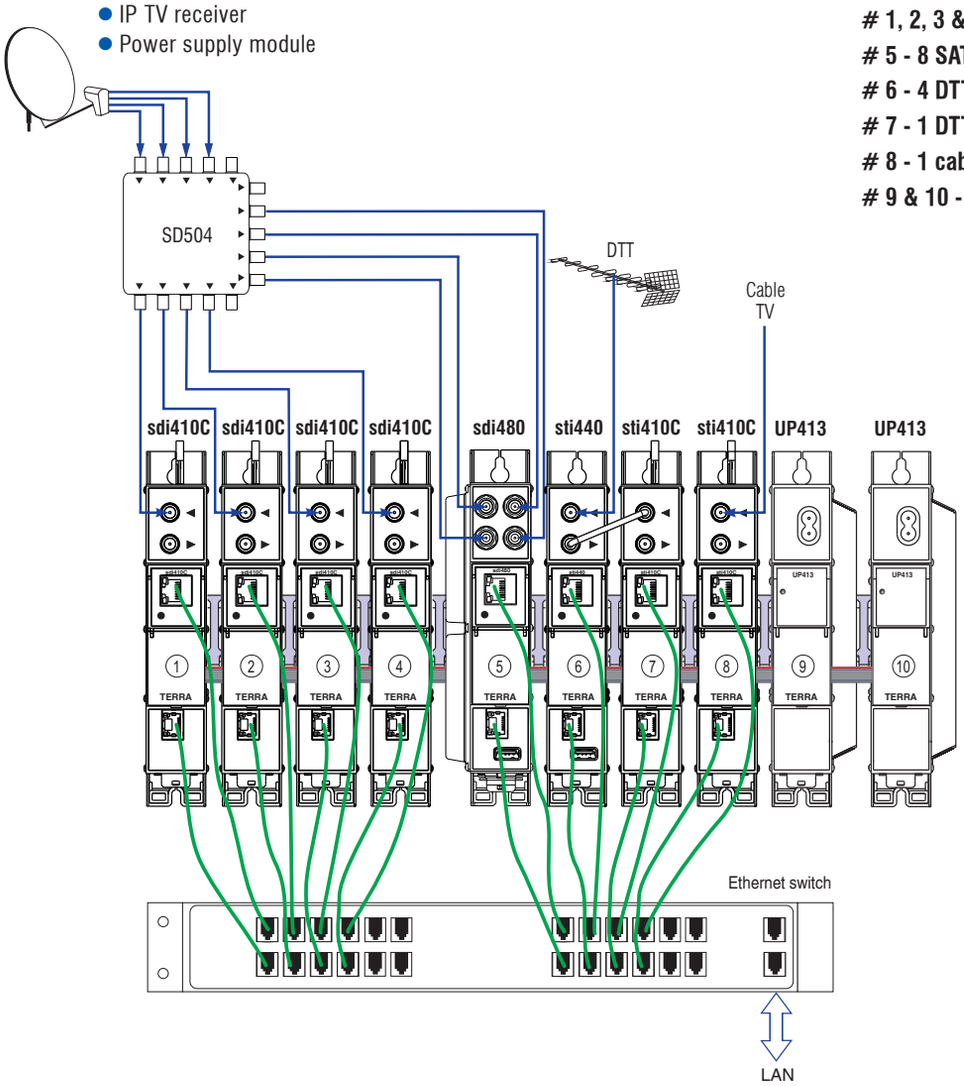
See accessories, page 3.25.

Modular reception system
DVB to IP and IP to DVB equipment

Dynamic penetration to every day live of tablets, laptops, SMART TVs creates the growing demand for distribution of visual content over in house Local Area Network.
Flexibility and interactivity additional positive feature brings Internet protocol based television to TV distribution.
TERRA offers IPTV streaming solution for various applications like hotels and hospitals, offices and stadiums and etc. The headend enables streaming of broadcasting programs from DBS satellites, terrestrial towers and CATV networks as well content from external DVB source through ASI interface.
Decryption of scrambled services is available through built in Common interface.The web-based control of the headend makes easy setup and configuration.
The headend is very compact and power saving - high density solution.

- DVB-S/S2, DVB-T/T2/C, DVB-ASI streamer modules
- Multichannel DVB-S/S2, DVB-T/T2/C streamer modules
- IP to DVB modulator modules
- HDMI encoder module
- IP TV receiver
- Power supply module

Application diagram of IP streaming from:
 # 1, 2, 3 & 4 - 4 SAT transponders (descrambled)
 # 5 - 8 SAT transponders (FTA)
 # 6 - 4 DTT channels (FTA)
 # 7 - 1 DTT channel (descrambled)
 # 8 - 1 cable TV channel
 # 9 & 10 - redundant powering



UP413 - power supply, **page 3.24**
SD504 - two way SAT IF splitter, see **www.terraelectronics.com**

TERRA

Modular reception system
DVB to IP streamers

IP streaming and ASI output of free-to-air or descrambled DVB services.

- one channel IP streamers
- common interface
- BISS descrambling
- SPTS or MPTS IP stream
- regeneration of information contained in the MPEG-2 tables
- UDP and RTP transmission protocols
- SDP/SAP protocol support
- Web control and SNMP agent
- loop through RF distributing
- DIN rail or wall mounting
- robust die-cast housing
- connectors:
  RF inputs, ASI input/output - type F
  Ethernet control, Ethernet stream output - RJ-45
  CAM - PCMCIA
  screw terminal block for DC entry
  power distribution bus

sdi410C
DVB-S/S2 to IP

sti410C
DVB-T/T2/C to IP

sda410C
DVB-S/S2 to IP and ASI

sta410C
DVB-T/T2/C to IP and ASI

Technical specifications

T Y P E		sdi410C	sti410C	sda410C	sta410C
Ordering number		03818	03819	03822	03823
RF input		**QPSK / 8PSK**	**COFDM / QAM**	**QPSK / 8PSK**	**COFDM / QAM**
	frequency range	950-2150 MHz	47-862 MHz	950-2150 MHz	47-862 MHz
	AGC range/impedance	45-85 dBμV / 75 Ω	30-80 dBμV / 75 Ω	45-85 dBμV / 75 Ω	30-80 dBμV / 75 Ω
	symbol rate	2-45 Ms/s	-	2-45 Ms/s	-
LNB powering/control		0/14/18 V & 300 mA max. DiSEqC 1.0	-	0/14/18 V & 300 mA max. DiSEqC 1.0	-
DC output for preamplifier		-	12 V 100 mA	-	12 V 100 mA
IP output	standard	IEE802.3 10/100 Base T			
	bit rate	up to 100 Mbps			
	transmission protocols	UDP/RTP			
	multicast	Yes			
	MPTS	Yes			
	SPTS	Yes			
ASI output	bit rate	-		up to 72 Mbps	
	impedance	-		75 Ω	
	packet length	-		188 bytes	
	MPTS	-		only	
Control port		standard IEE802.3 10/100 Base T			
Current consumption*		12 V 0.2 A			
Operating temperature range		0° ÷ +50° C			
Dimensions/Weight (packed)		36x198x112 mm/0.84 kg			

* without external DC feeding and CAM; with CAM ≈ 0.35 A

Modular reception system
Multichannel DVB to IP streamers

IP streaming of free-to-air DVB services.

- SPTS or MPTS IP stream
- regeneration of information contained in the MPEG-2 tables
- BISS descrambling
- UDP and RTP transmission protocols
- SDP/SAP protocol support
- TS file streaming from USB flash
- Web control and SNMP agent
- 4 SAT IF inputs (sdi480)
- loop through RF distributing (sti440)
- DIN rail or wall mounting
- robust die-cast housing
- connectors:
  RF ports - type F
  Ethernet control, Ethernet stream output - RJ-45
  USB - USB-A
  screw terminal block for DC entry
  power distribution bus

sdi480
DVB-S/S2 to IP

sti440
DVB-T/T2/C to IP
supporting multi PLP mode

Technical specifications

TYPE		sdi480*	sti440
Ordering number		03825	03829
Number of channels		8	4
RF input		**4x QPSK / 8PSK**	**COFDM / QAM**
	frequency range	950-2150 MHz	47-862 MHz
	AGC range/impedance	45-85 dBμV / 75 Ω	45-80 dBμV / 75 Ω
	symbol rate	2-45 Ms/s	-
LNB powering/control		0/14/18 V & 350 mA max. DiSEqC 1.0, EN50494	-
DC output for preamplifier		-	12 V 100 mA
IP output	standard	IEE802.3 100/1000 Base T	
	bit rate	up to 400 Mbps	up to 200 Mbps
	transmission protocols	UDP/RTP	
	multicast	Yes	
	MPTS	Yes	
	SPTS	Yes	
Control port		standard IEE802.3 10/100 Base T	
Current consumption**		12 V 0.7 A	12 V 0.5 A
Operating temperature range		0° ÷ +50° C	
Dimensions/Weight (packed)		48.5x198x112 mm/0.97 kg	36x198x112 mm/0.84 kg

* T2-MI deencapsulation is supported only in M.1 version; M.1 version is supplied by special request

** without external DC feeding

Modular reception system
Quatro and twin IP DVB modulators

Converting of TSoIP input signal into 4 QAM/COFDM modulated DVB-C/J.83B/DVB-T/ISDB-T channels and 2 QPSK modulated DVB-S channels.

- SPTS or MPTS input stream
- MPTS service filtering
- PCR restamping
- RTSP protocol of video H.264/H.265, audio AAC conversion to transport stream
- SDP/SAP protocol support
- TS file streaming from USB flash
- Web control and SNMP agent
- RF loop through input
- DIN rail or wall mounting
- robust die-cast housing
- connectors:
  RF input/output - type F
  Ethernet control, Ethernet stream input - RJ-45
  USB - USB-A
  screw terminal block for DC entry
  power distribution bus

miq440
DVB-C/J.83B modulator

mix440
DVB-T/ISDB-T modulator

mid420
DVB-S modulator

miq440
mix440

mid420

Technical specifications

TYPE			miq440		mix440		mid420
Ordering number			03870		03871		03873
IP input	standard		IEE802.3 100/1000 BaseT				
	bitrate		up to 200 Mbps				
	reception protocols		UDP/RTP, RTSP				
	MPTS		Yes				
	SPTS		Yes				
RF output	standard	pr.	**DVB-C**	**J.83B**	**DVB-T**	**ISDB-T**	**DVB-S**
	modulation	pr.	QAM16, QAM32, QAM64, QAM128, QAM256	QAM64, QAM256	QPSK, QAM16, QAM64	QPSK, QAM16, QAM64, DQPSK	QPSK
	frequency range	pr.	96-862 MHz		170-230 MHz / 470-862 MHz		250-2350 MHz
	channel allocation		adjacent				independent
	channel count		4				2
	level/impedance		90 ± 2 dBµV/75 Ω				80 ± 2 dBµV/75 Ω
	TS bit rate		< 53 Mbit/s		< 31 Mbit/s		< 72 Mbit/s
	MER		≥ 40 dB		≥ 35 dB		≥ 30 dB
	channel bandwidth	pr.	4...8.3 MHz		7 MHz / 8 MHz		3...60 MHz
	symbol rate	pr.	3.5...7.2 Ms/s		-		2...45 Ms/s
	transmission mode	pr.	-		2K / 8K		-
	total output level adjustment	pr.	0 ÷ -15.0 dB by 1 dB step				
	loop through frequency range/loss		45-862 MHz / ≤ 2.5 dB				45-2400 MHz / ≤ 5.0 dB
Management port			standard IEE802.3 10/100 BaseT (independent on IP input)				
Current consumption			12 V 700 mA				12 V 1 A
Operating temperature range			0° ÷ +50° C				
Dimensions/Weight (packed)			36x198x112 mm/0.84 kg				48.5x198x112 mm/1.06 kg

pr. software control

TERRA

Modular reception system
Triple HDMI to DVB-IP encoder

IP streaming from HDMI sources.

- SPTS IP stream
- UDP and RTP transmission protocols
- SDP/SAP protocol support
- Web control and SNMP agent
- DIN rail or wall mounting
- robust die-cast housing
- connectors:
  HDMI
  Ethernet control, Ethernet stream output - RJ-45
  screw terminal block for DC entry
  power distribution bus

Technical specifications

T Y P E		mhi430
Ordering number		03872
Video input	input signal type	HDMI
	video coding	MPEG-4 AVC/H.264, Baseline profile 4.0
	input resolution	up to 1920x1080-60p
	output resolution	up to 1920x1080-30p
Audio input	input signal type	HDMI
	standard	MPEG-1 Layer II, AAC
	audio bit rate	64, 96, 128, 192, 256, 320, 384 kbps
H.264 Encoder	standard	MPEG-4 AVC/H.264
	bit rate	0.5 - 25 Mb/s adjustable
	configurable parameters	Service Name, Service ID, Video PID, Audio PID, PMT PID, PCR PID
IP output	standard	IEE802.3 10/100 Base T
	bit rate	up to 100 Mbps
	transmission protocols	UDP/RTP
	multicast	Yes
	MPTS	No
	SPTS	Yes
Current consumption		12 V 700 mA max.
Operating temperature		0^0 C ÷ +50^0 C
Dimensions/Weight (packed)		48.5x198x112 mm/0.9 kg

Modular reception system
Compact IP TV receiver (Set-Top Box)

Receiving video, audio and multimedia information transferred by IP protocol stack.

- high performance CPU
- LINUX operating system
- embedded WLAN
- SDP/SAP protocol support
- multimedia file browser
- multi-language OSD
- software updates via USB stick

Technical specifications

T Y P E		VSA N5 WiFi
Ordering number		01321
CPU		ARM A9, 1 GHz
Memory	DDR SDRAM	512 MB
	flash NAND	128 MB
	flash NOR	2 MB
Video decoding		MPEG-2, MPEG-4, H.264
Audio decoding		MPEG-2, AAC, AAC-HE, AC3, E-AC3, LPCM, MP3
Multimedia	supported formats	player .avi, .mkv, .ts, .m2ts, .mov
		picture JPEG, BMP, PNG, GIF, TIFF
		USB storage NTFS, FAT, EXT3
Rear panel	HDMI	HDMI 1.4a CEC
	USB	USB 2.0
	Ethernet	RJ45 10/100 Mbit
	video-audio	TRRS connector 3.5 mm, CVBS (SD)
	IR external	TRRS connector 2.5 mm
	power	DC jack 2.1/5.5 mm
Wireless		WLAN 802.11 b/n 150 Mbit
Powering		external AC/DC adapter 12 V 1.0 A
Operating temperature range		0^0 C ÷ +45^0 C
Dimensions/Weight (packed)		110x35x110 mm/0.55 kg

Modular reception system
DVB transmodulators

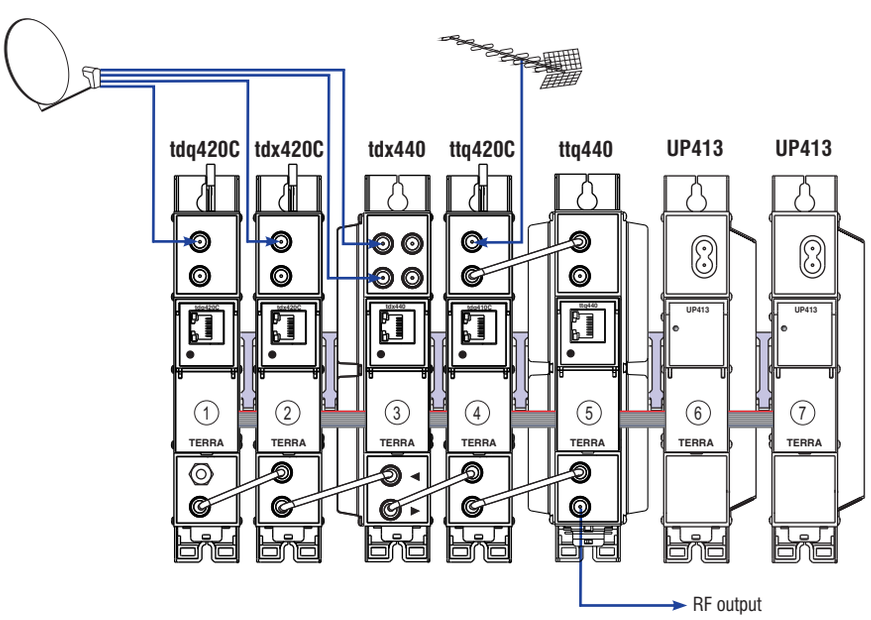
TERRA offers transmodulating solution for various applications like hotels and hospitals, offices and stadiums and etc. The modular system enables distribution of high definition (HDTV) content of broadcasting programs from DBS satellites, terrestrial towers and CATV networks. Decryption of scrambled services is possible through built in Common Interface. The web-based managment of the headend makes easy setup and configuration. Remote control and SW upgrade, SNMP monitoring, save and load configuration file, PW protected control panel for multiple users and more funcions are available. The headend is very compact, power saving and fanless solution implemented in robust die-cast housings.

The range includes the following:

- Twin digital transmodulator modules
- Twin digital transmodulator modules with CAMs
- Quattro T/T2 to DVB-C transmodulator module
- Multichannel digital transmodulator modules
- Power supply modules

Application example of processing from:

 # 1 - 2 SAT transponders to DVB-C
 # 2, 3 - 6 SAT transponders to DVB-T
 # 4 & 5 - 6 DTT channels to DVB-C
 # 6 & 7 - redundant powering



UP413 - power supply, **page 3.24**

TERRA

Modular reception system
Twin digital transmodulators

Converting of 2 DVB-S/S2/T/T2/C modulated input signals into 2 COFDM modulated DVB-T/ISDB-T channels.

- software switchable standards DVB-T/ISDB-T
- common interface
- TS processing:
  service multiplexing - any input to any output
  PCR restamping
  PSI/SI regeneration
  NIT generation
  PMT version monitoring
- Web control and SNMP monitoring
- loop through RF distributing at input and output
- DIN rail or wall mounting
- robust die-cast housing
- connectors:
  RF input/output - type F
  Ethernet control interface - RJ-45
  2xCI ports - PCMCIA (tdx420C, ttx420C)
  screw terminal block for DC entry
  power distribution bus

tdx420C*
DVB-S/S2 - DVB-T/ISDB-T transmodulator with two CAMs

ttx420C
DVB-T/T2/C - DVB-T/ISDB-T transmodulator with two CAMs

tdx420
DVB-S/S2 - DVB-T/ISDB-T transmodulator

ttx420
DVB-T/T2/C - DVB-T/ISDB-T transmodulator

Technical specifications

TYPE			tdx420C* / tdx420		ttx420C / ttx420		
Ordering number			03855 / 03855F		03856 / 03856F		
Number of channels			2				
RF input	frequency range	pr.	950-2150 MHz		47-862 MHz		
	LNB powering/control	pr.	0/13/18 V & 22 kHz, 1 A**** max. DiSEqC 1.0, EN50607, EN50494		12 V 100 mA		
	level/impedance		45-85 dBμV / 75 Ω		40-80 dBμV / 75 Ω		
	loop through gain		-1 ± 1 dB		0 ± 1 dB		
	standard	pr.	**DVB-S**	**DVB-S2****	**DVB-T**	**DVB-T2**	**DVB-C**
	modulation		QPSK	QPSK, 8PSK APSK 8/16/32	QPSK, QAM16, QAM64	QPSK, QAM16, QAM64, QAM256	QAM16, QAM32, QAM64, QAM128, QAM256
	channel bandwidth	pr.	-	-	7 MHz/8 MHz	7 MHz/8 MHz	-
	symbol rate	pr.	2 ÷ 45 Ms/s	2 ÷ 45 Ms/s	-	-	1 ÷ 7.2 Ms/s
	code rate		1/2, 2/3, 3/4, 5/6, 7/8	QPSK 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 8PSK 3/5, 2/3, 3/4, 5/6, 8/9, 9/10	1/2, 2/3, 3/4, 5/6, 7/8	1/2, 3/5, 2/3, 3/4 4/5, 5/6	-
	roll off		35 %	20 %, 25 %, 35 %	-	-	15 %
RF output	standard	pr.	**DVB-T / ISDB-T**				
	modulation	pr.	QPSK/QAM16/QAM64 (DVB-T), QPSK/ DQPSK/QAM16/QAM64 (ISDB-T)				
	frequency range	pr.	100 - 858 MHz, by step 100 kHz				
	channel allocation		adjacent				
	level/impedance		90 ± 2 dBμV/75 Ω				
	spurious level		< -60 dB				
	MER		≥ 38 dB (100-780 MHz); ≥ 35 dB (780-860 MHz)				
	channel bandwidth	pr.	7/8 MHz				
	guard interval	pr.	1/4, 1/8, 1/16, 1/32				
	code rate	pr.	1/2, 2/3, 3/4, 5/6, 7/8				
	transmission mode		2K				
	total output level adjustment	pr.	0 ÷ -15.0 dB by 1 dB step				
	loop through frequency range/loss		47-862 MHz / ≤ 2.5 dB				
Transport stream parameters	max. bit rate		output 31670 kbps				
	max. PID filter count		unlimited				
Management port			standard IEE802.3 10/100 Base T				
Current consumption* **			12 V 550 mA		12 V 650 mA		
Operating temperature range			0° ÷ +50° C				
Dimensions/Weight (packed)			48.5x198x112 mm/0.9 kg				

pr. software control

* T2-MI deencapsulation is supported only in M.1 version; M.1 version is supplied by special request
** supports physical layer scrambling (PLS) and multiple input streams (MIS)
*** without external DC feeding and CAM, with two CAM's ≈0.95 A (for ttx420C), ≈0.85 A (for tdx420C)
**** only in v.1 version

TERRA

Modular reception system
Twin digital transmodulators

Converting of 2 DVB-S/S2/T/T2/C modulated input signals into 2 QAM modulated DVB-C/J.83B channels.

- software switchable standards DVB-C/J.83B
- common interface
- TS processing:
  service multiplexing - any input to any output
  PCR restamping
  PSI/SI regeneration
  NIT generation
  PMT version monitoring
- Web control and SNMP monitoring
- loop through RF distributing at input and output
- DIN rail or wall mounting
- robust die-cast housing
- connectors:
  RF input/output - type F
  Ethernet control interface - RJ-45
  2xCI ports - PCMCIA (tdq420C, ttq420C)
  screw terminal block for DC entry
  power distribution bus

tdq420C*
DVB-S/S2 - DVB-C/J.83B transmodulator with two CAMs

ttq420C
DVB-T/T2/C - DVB-C/J.83B transmodulator with two CAMs

tdq420
DVB-S/S2 - DVB-C/J.83BC transmodulator

ttq420
DVB-T/T2/C - DVB-C/J.83B transmodulator

tdq420C
ttq420C

tdq420
ttq420

Technical specifications

TYPE			tdq420C* / tdq420		ttq420C / ttq420		
Ordering number			03853 / 03853F		03854 / 03854F		
Number of channels			2				
RF input	frequency range	pr.	950-2150 MHz		47-862 MHz		
	LNB powering/control	pr.	0/13/18 V & 22 kHz, 1 A**** max. DiSEqC 1.0, EN50607, EN50494		12 V 100 mA		
	level/impedance		45-85 dBμV / 75 Ω		40-80 dBμV / 75 Ω		
	loop through gain		-1 ± 1 dB		0 ± 1 dB		
	standard	pr.	**DVB-S**	**DVB-S2****	**DVB-T**	**DVB-T2**	**DVB-C**
	modulation		QPSK	QPSK, 8PSK APSK 8/16/32	QPSK, QAM16, QAM64	QPSK, QAM16, QAM64, QAM256	QAM16, QAM32, QAM64, QAM128, QAM256
	bandwidth	pr.	-	-	7 MHz/8 MHz	7 MHz/8 MHz	-
	symbol rate	pr.	2 ÷ 45 Ms/s	2 ÷ 45 Ms/s	-	-	1 ÷ 7.2 Ms/s
	code rate		1/2, 2/3, 3/4, 5/6, 7/8	QPSK 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 8PSK 3/5, 2/3, 3/4, 5/6, 8/9, 9/10	1/2, 2/3, 3/4, 5/6, 7/8	1/2, 3/5, 2/3, 3/4 4/5, 5/6	-
	roll off		35 %	20 %, 25 %, 35 %	-	-	15 %
RF output	standard	pr.	**DVB-C / J.83B**				
	modulation	pr.	QAM16/QAM32/QAM64/QAM128/QAM256 (DVB-C), QAM64/QAM256 (J.83B)				
	frequency range	pr.	100 - 858 MHz, by step 100 kHz				
	channel allocation		adjacent				
	level/impedence		90 ± 2 dBμV/75 Ω				
	return loss		≥ 14 dB at 47 MHz; -1.5 dB/oct., but not less 10 dB				
	spurious level		< -60 dB				
	MER		≥ 40 dB				
	channel bandwidth / symbol rate	pr.	4...8.3 MHz / 3.5 ÷ 7.2 MS/s				
	roll off		15 %				
	signal processing		EN 300 429, J.83 A (Annex A)				
	total output level adjustment	pr.	0 ÷ -15.0 dB by 1 dB step				
	loop through frequency range/loss		47-2150 MHz/ ≤ 2.5 dB				
Transport stream parameters	max. bit rate		output 53 Mbps				
	max. PID filter count		unlimited				
Management port			standard IEE802.3 10/100 Base T				
Current consumption* **			12 V 550 mA		12 V 650 mA		
Operating temperature range			0° ÷ +50° C				
Dimensions/Weight (packed)			48.5x198x112 mm/0.9 kg				

pr. software control

* T2-MI deencapsulation is supported only in M.1 version; M.1 version is supplied by special request
** supports physical layer scrambling (PLS) and multiple input streams (MIS)
*** without external DC feeding and CAM, with two CAM's ≈0.85 A (for tdq420C), ≈0.95 A (for ttq420C)
**** only in v.1 version

Modular reception system
Quatro digital transmodulator

Converting of 4 DVB-T/T2 modulated input signals into 4 QAM modulated DVB-C channels.

- supporting multi PLP mode
- four sections with independent control
- transparent transmodulation
- Web control and SNMP monitoring
- loop through RF distributing at input and output
- DIN rail or wall mounting
- robust die-cast housing
- connectors:
  RF ports - type F
  Ethernet control interface - RJ-45
  screw terminal block for DC entry
  power distribution bus

Technical specifications

TYPE			ttq440	
Ordering number			13897	
Channels			4	
RF input	frequency range	pr.	47-862 MHz	
	preamplifier powering		12 V 100 mA	
	level/impedance		40-80 dBµV / 75 Ω	
	loop through gain		0 ± 1 dB	
	standard	pr.	**DVB-T**	**DVB-T2**
	modulation		QPSK, QAM16, QAM64	QPSK, QAM16, QAM64, QAM256
	bandwidth	pr.	7 MHz/8 MHz	7 MHz/8 MHz
	code rate		1/2, 2/3, 3/4, 5/6, 7/8	1/2, 3/5, 2/3, 3/4, 4/5, 5/6
RF output	frequency range	pr.	230-446 MHz & 470-862 MHz by 100 kHz step	
	channel allocation		4 adjacent	
	level/impedance		90 ± 2 dBµV/75 Ω	
	spurious level		< -60 dB	
	loop through frequency range/loss		47-2150 MHz / < 2.5 dB	
	MER		≥ 40 dB	
	symbol rate	pr.	3.5-7.2 Ms/s	
	modulation	pr.	QAM16, QAM32, QAM64, QAM128, QAM256	
	channel bandwidth		4-8.3 MHz	
	roll of		15 %	
	total output level adjustment	pr.	0 ÷ -15 dB by 1 dB step	
Output data rate			max. 53 Mbps per channel	
Management port			standard IEE802.3 10/100 Base T	
Current consumption*			12 V 700 mA	
Operating temperature range			0° ÷ +50° C	
Dimensions/Weight (packed)			48.5x198x112 mm/0.9 kg	

pr. software control

* without external DC feeding

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Modular reception system
Multichannel digital transmodulators

Converting of 8 DVB-S/S2 modulated input signals into 4/8 COFDM/QAM modulated DVB-T/ISDB-T/DVB-C/J.83B RF channels.

- software switchable standards:
  tdx440, tdx480: DVB-T/ISDB-T
  tdq440, tdq480: DVB-C/J.83B
- integrated 2x8 multiswitch
- TS processing:
  any service to any output
  PCR restamping
  service filtering
  PSI/SI regeneration
  NIT generation
  PMT version monitoring
- BISS descrambling
- Web control and SNMP monitoring
- loop through RF distributing at input and output
- DIN rail or wall mounting
- robust die-cast housing
- connectors:
  RF input/output - type F
  Ethernet control interface - RJ-45
  screw terminal block for DC entry
  power distribution bus

tdx480
8 DVB-S/S2 transmodulator to 8 DVB-T/ISDB-T channels

tdx440
8 DVB-S/S2 transmodulator to 4 DVB-T/ISDB-T channels

tdq480
8 DVB-S/S2 transmodulator to 8 DVB-C/J.83B channels

tdq440
8 DVB-S/S2 transmodulator to 4 DVB-C/J.83B channels

Technical specifications

TYPE			tdx480	tdx440	tdq480	tdq440
Ordering number			03857	03868	03858	03869
Sections input/output			8/8	8/4	8/8	8/4
RF input	frequency range	pr.	950-2150 MHz			
	LNB powering/control	pr.	0/13/18 V & 22 kHz, 500 mA total, DiSEqC 1.0, EN50494, EN50607			
	level/impedance		55-95 dBµV / 75 Ω			
	modulation		QPSK, 8PSK (DVB S/S2)			
	symbol rate	pr.	2 ÷ 45 Ms/s			
	return loss		≥ 10 dB			
	RF input count		2			
	loop through frequency range/loss		950-2150 MHz / ≤ 1.5 dB			
RF output	standard	pr.	**DVB-T / ISDB-T**		**DVB-C / J.83B**	
	modulation	pr.	QPSK, QAM16, QAM64		QAM16, QAM32, QAM64, QAM128, QAM256	
	frequency range	pr.	170-230 MHz / 470-862 MHz		96-862 MHz	
	channel allocation, adjacent		4 + 4	4	4 + 4	4
	level/impedance		90 ± 2 dBµV/75 Ω			
	TS bit rate		< 31 Mbit/s		< 53 Mbit/s	
	MER		≥ 35 dB		≥ 40 dB	
	channel bandwidth	pr.	7 MHz / 8 MHz		4...8.3 MHz	
	guard interval	pr.	1/4, 1/8, 1/16, 1/32		-	
	code rate	pr.	1/2, 2/3, 3/4, 5/6, 7/8		-	
	symbol rate	pr.	-		3.5 ÷ 7.2 Ms/s	
	return loss		≥ 10 dB			
	roll off		-		15%	
	transmission mode		2K	2K / 8K pr.	-	
	total output level adjustment	pr.	0 ÷ -15.0 dB by 1 dB step			
	loop through frequency range/loss		45-862 MHz / ≤ 2.5 dB			
Management port			standard IEE802.3 10/100 Base T			
Current consumption*			12 V 1.1 A	12 V 0.8 A	12 V 1.1 A	12 V 0.8 A
Operating temperature range			0° ÷ +45° C			
Dimensions/Weight (packed)			48.5x198x112 mm/0.9 kg			

pr. software control * without external DC feeding

Modular reception system
Multichannel digital transmodulators

Converting of 16 DVB-S/S2 modulated input signals into 8 COFDM/QAM modulated DVB-T/ISDB-T/DVB-C/J.83B channels.

- software switchable standards:
  tdx4168: DVB-T/ISDB-T
  tdq4168: DVB-C/J.83B
- supporting EN50607
- TS processing:
  any service to any output
  PCR restamping
  PSI/SI regeneration
  NIT generation
  PMT version monitoring
- BISS descrambling
- Web control and SNMP monitoring, E-mail notification
- loop through RF distributing at input and output
- DIN rail or wall mounting
- robust die-cast housing
- connectors:
  RF input/output - type F
  Ethernet control interface - RJ-45
  screw terminal block for DC entry
  power distribution bus

tdx4168
16 DVB-S/S2 transmodulators to 8 DVB-T/ISDB-T channels

tdq4168
16 DVB-S/S2 transmodulators to 8 DVB-C/J.83B channels

Technical specifications

TYPE			tdx4168	tdq4168
Ordering number			03876	03877
Sections input/output			16/8	
RF input	frequency range	pr.	950-2150 MHz	
	LNB powering/control	pr.	0/13/18 V & 22 kHz, 1000 mA total, DiSEqC 1.0, EN50494, EN50607	
	level/impedance		55-95 dBµV / 75 Ω	
	modulation		QPSK, 8PSK (DVB S/S2)	
	symbol rate	pr.	2 ÷ 45 Ms/s	
	return loss		≥ 10 dB	
	RF input count		2	
	loop through frequency range/loss		950-2150 MHz / ≤ 1.5 dB	
RF output	standard	pr.	**DVB-T / ISDB-T**	**DVB-C / J.83B**
	modulation	pr.	QPSK, QAM16, QAM64	QAM16, QAM32, QAM64, QAM128, QAM256
	frequency range	pr.	170-230 MHz / 470-862 MHz	96-862 MHz
	channel allocation, adjacent		4 + 4	
	level/impedance		90 ± 2 dBµV/75 Ω	
	TS bit rate		< 31 Mbit/s	< 53 Mbit/s
	MER		≥ 35 dB	≥ 40 dB
	channel bandwidth	pr.	7 MHz / 8 MHz	4...8.3 MHz
	guard interval	pr.	1/4, 1/8, 1/16, 1/32	-
	code rate	pr.	1/2, 2/3, 3/4, 5/6, 7/8	-
	symbol rate	pr.	-	3.5 ÷ 7.2 Ms/s
	return loss		≥ 10 dB	
	roll off		-	15%
	transmission mode		2K	-
	total output level adjustment	pr.	0 ÷ -15.0 dB by 1 dB step	
	loop through frequency range/loss		45-862 MHz / ≤ 2.5 dB	
Management port			standard IEE802.3 10/100 Base T	
Current consumption*			12 V 1.2 A	
Operating temperature range			0° ÷ +45° C	
Dimensions/Weight (packed)			63x198x112 mm/1.12 kg	

pr. software control * without external DC feeding

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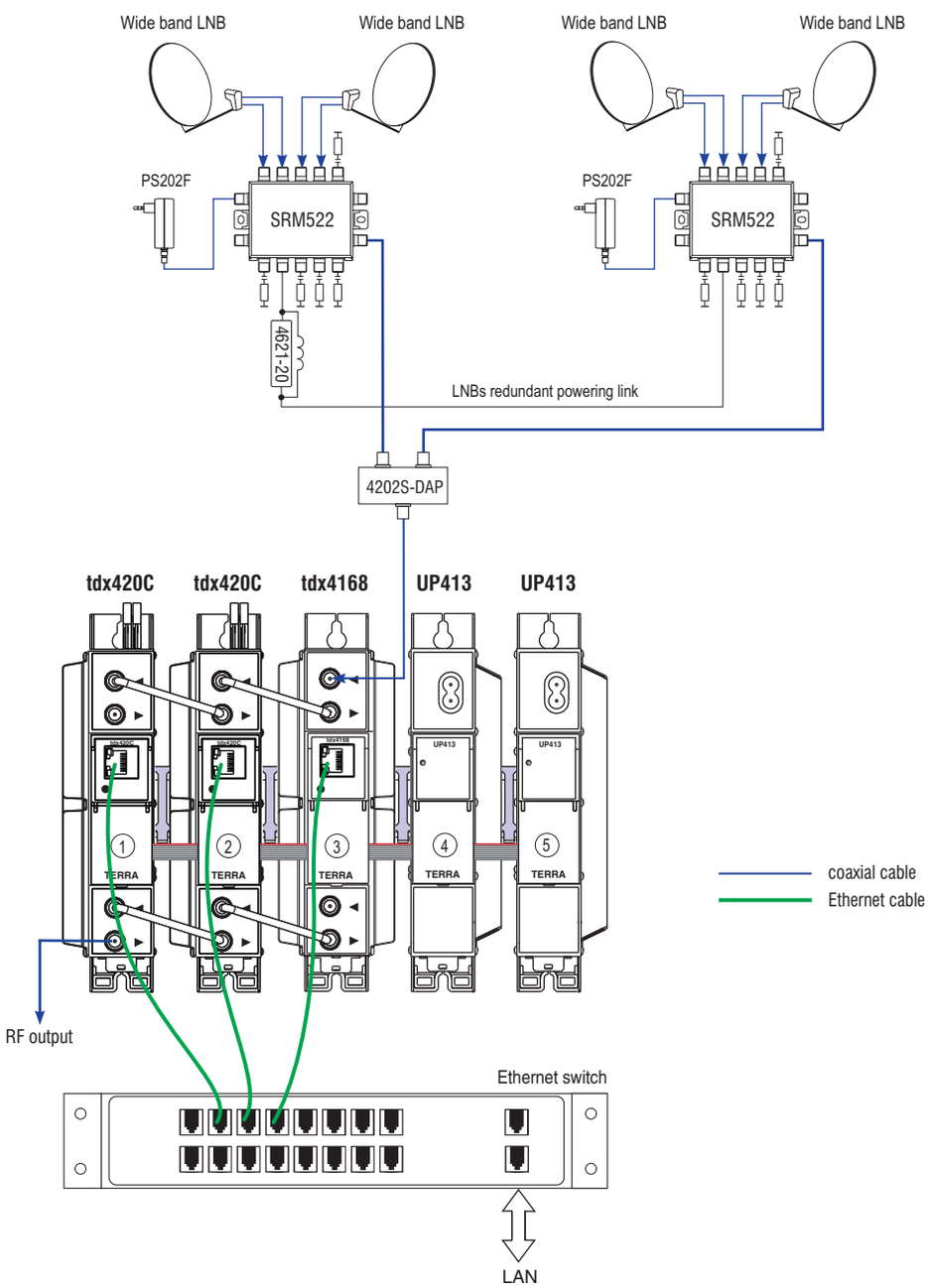
Modular reception system
Application diagram

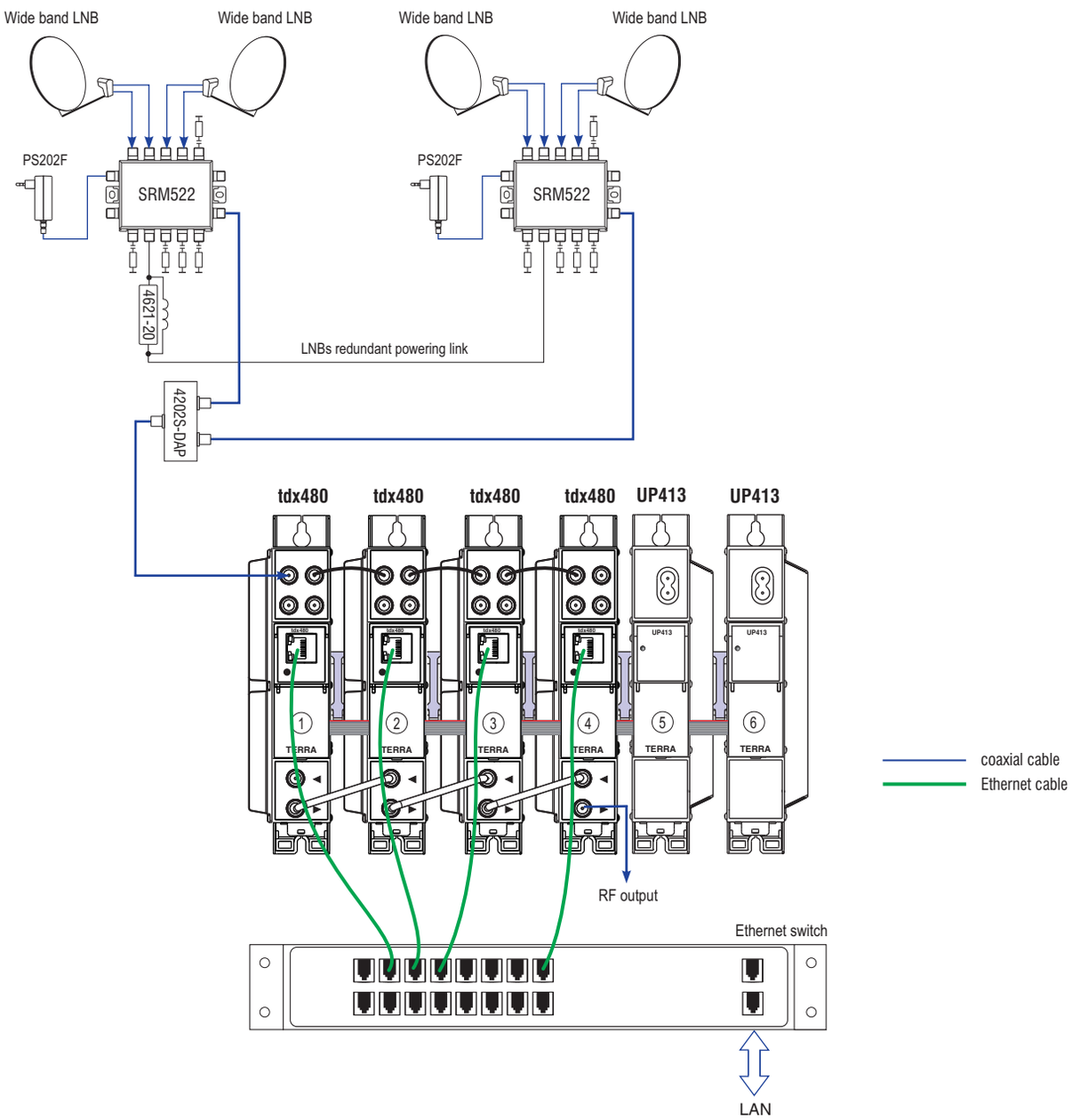
Application example of SAT TV content processing from 4 satellite orbit positions:
 # 1, 2 - 4 SAT transponders to DVB-T (scrambled)
 # 3 - 16 SAT transponders to DVB-T (FTA)
 # 4 & 5 - redundant powering



SRM522 - cascadable single cable multiswitch, see www.terraelectronics.com
PS202F - power supply, see www.terraelectronics.com
tdx420C - twin transmodulator with CAMs, page 3.17
tdx4168 - multichannel transmodulator, page 3.21
UP413 - power supply, page 3.24
4202S-DAP - 2 way splitter, see www.terraelectronics.com
4621-20 - DC pass attenuator, see www.terraelectronics.com

Modular reception system
Application diagram

Application example of SAT TV content processing from 4 satellite orbit positions using wide band LNBs:
 # 1, 2, 3, 4 - 32 SAT transponders to DVB-T (FTA)
 # 5 & 6 - redundant powering



SRM522 - cascadable single cable multiswitch, see www.terraelectronics.com
PS202F - power supply, see www.terraelectronics.com
tdx480 - octo transmodulator, page 3.20
UP413 - power supply, page 3.24
4202S-DAP - 2 way splitter, see www.terraelectronics.com
4621-20 - DC pass attenuator, see www.terraelectronics.com

Modular reception system
Power supplies

- suitable for operation in parallel connection for back-up function implementation (UP413)
- modular power supply with integrated RF combiner (UP410S)
- switch-mode technology
- short circuit and overload protected
- DIN rail or wall mounting
- robust die-cast housing
- connectors:
  3xRF - type F (UP410S)
  screw terminal block for DC output
  power distribution bus

Technical specifications

TYPE		UP413	UP410S
Ordering number		03821	02874S
Power supply	input voltage	187-250 V~ 50/60 Hz	
	output voltage, current	12 V 4.5 A max.	
	power consumption	65 W max.	
RF combiner	frequency range	-	47-2400 MHz
	insertion loss	-	4 dB at 862 MHz; 6 dB at 2400 MHz
	isolation	-	≥ 20 dB
	return loss	-	≥ 20 dB at 862 MHz ; ≥ 12 dB at 2400 MHz
Operating temperature range		0° ÷ +50° C	
Dimensions/Weight (packed)		48x198x107.5 mm/1 kg	48x198x107.5 mm/0.97 kg

Modular reception system
Power supplies & accessories

Power supplies

- switch-mode technology
- short circuit and overload protected
- DIN rail mounting (HDR-60-12)

Technical specifications

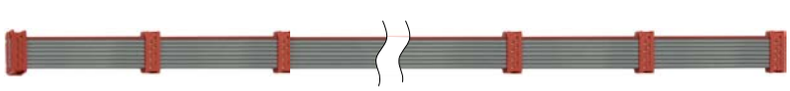
TYPE	HDR-60-12	SGA25E12-W
Ordering number	00631	00633
DC output	+12 V 4.5 A max.	+12 V 2 A max.
Mains voltage	100 V÷ 240 V~ 50/60 Hz	
Operating temperature range	-20°÷ +50°C	-20°÷ +40°C
Dimensions/Weight (packed)	52.5x90x54.5 mm/0.3 kg	75.5x32x47.5 mm/0.16 kg

Accessories

- Fmale - Fmale quick coaxial bridge 699.026: for modules with width 36 mm
  Ordering number 21876
- Fmale - Fmale quick coaxial bridge 780.026: for modules with width 48.5 mm
  Ordering number 21881

- DC distribution cable 699.20 for 4 modules with width 36 mm
  Ordering number 21875
- DC distribution cable 780.20 for 4 modules with width 48.5 mm
  Ordering number 21882

- DC distribution cable 908.20 for 12 modules
  Ordering number 21883



- 19” system mountable rack
  Ordering number 01957

- Rail for wall mounting, 1 meter, 699.027
  Ordering number 21877

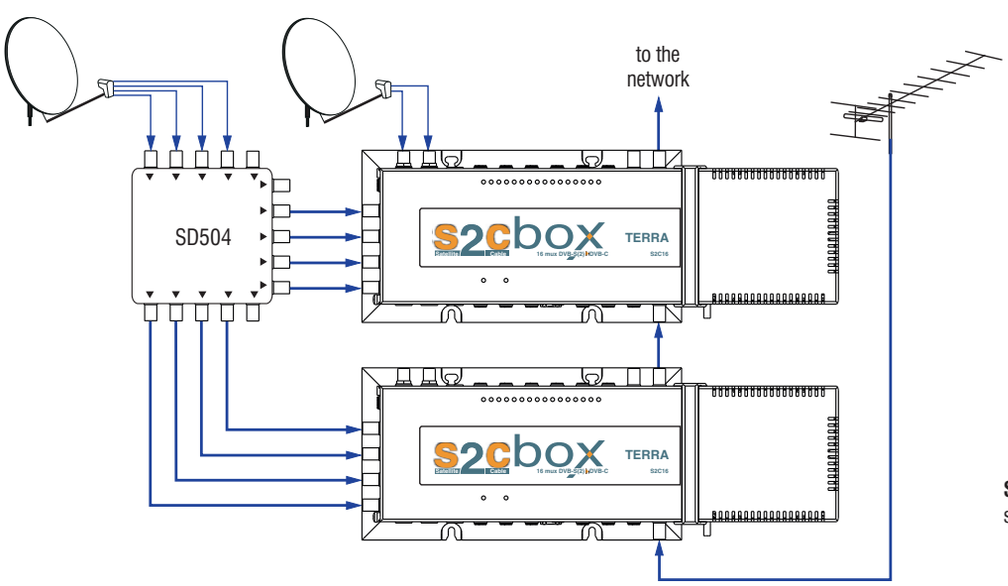
Stand alone headend
16 channels 8PSK/QPSK to 16 QAM transmodulators

S2Cbox - micro processing unit of 37x14x7 cm only, which allows distribution ofsatellite TV programs using the existingin house coaxial network structure. Any output channel from 48 MHz to 858 MHz can be selected and adjusted independently. Fanless solution with extremely low power consumption - 30 W only for 16 SAT transponders processing is implemented in robust die-cast housing. Web-based control of the headend makes easy setup and configuration.

Remote control and SW upgrade, SNMP monitoring, save and load configuration file, PW protected control panel for multiple users and more functions are available.

- **S2C16** -16 channel transmodulator
- **S2C16P** - 16 channel transmodulator with powering redundancy

Application example of processing from 32 SAT transponders to 32 DVB-C channels and combining of terrestrial TV.



SD504 - 2 way splitter, see www.terraelectronics.com

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Stand alone headend
16 channels 8PSK/QPSK to 16 QAM transmodulators

Converting of 16 DVB-S/S2 8PSK/QPSK modulated SAT IF multiplexes into 16 QAM modulated DVB-C RF channels.

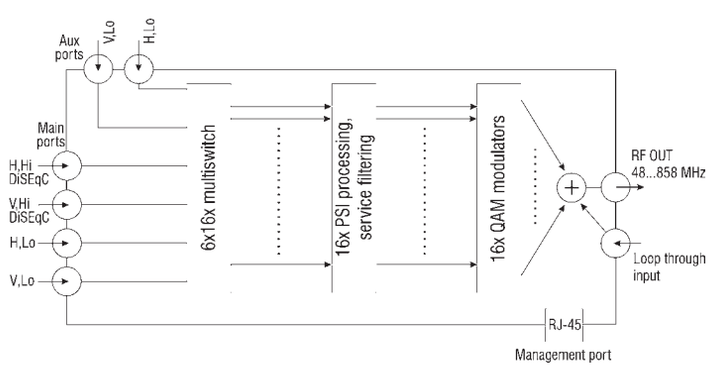
- built-in redundancy power supply with 2 separated mains leads (**S2C16P**)
- 6 SAT IF inputs
- TS processing:
  PCR restamping
  service filtering
  PSI/SI regeneration
  NIT generation
  PMT version monitoring
- SNMP traps
- die-cast housing
- connectors:
  RF input & output, output test point - type F
  Web based control - RJ-45

Technical specifications

T Y P E			S2C16 / S2C16P	
Ordering number			03817 / 03824	
Number of channels			16	
RF input	frequency range	pr.	6x (950 - 2150 MHz)	
	level AGC range/impedance		45-85 dBµV/75 Ω	
	LNB powering/control	pr.	DiSEqC max. 500 mA +250 mA / 13 V/18 V, 22 kHz	
	modulation		**DVB-S demodulator (QPSK)**	**DVB-S2 demodulator (QPSK, 8PSK)**
	symbol rate	pr.	2 ÷ 45 MS/s	2 ÷ 45 MS/s (QPSK), 2 ÷ 31.5 MS/s (8PSK)
	code rate		1/2, 2/3, 3/4, 5/6, 7/8	QPSK 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 8PSK 3/5, 2/3, 3/4, 5/6, 8/9, 9/10
	roll off		35 %	20 %, 25 %, 35 %
	signal processing		ETSI 300 421	ETSI 302 307
RF output	frequency range	pr.	48 - 858 MHz, by step 100 kHz	
	channel allocation		independent	
	output level per carrier/impedence	pr.	90 dBµV/75 Ω	
	total output level adjustment	pr.	15 dB by 0.5 dB step	
	carrier output level adjustment	pr.	+3 dB...-3 dB by 0.5 dB step	
	loop through frequency range/loss		45-862 MHz/3 dB	
	MER		≥ 43 dB	
	modulation DVB-C	pr.	QAM16, QAM32, QAM64, QAM128, QAM256	
	channel bandwidth / symbol rate	pr.	4...8.3 MHz / 3.5 ÷ 7.2 MS/s	
	return loss		≥ 14 dB	
	roll off		15 %	
	signal processing		EN 300 429, ITU-T J.83 A (Annex A)	
	test point		-20 dB	
Input data rate			max. 90 Mbps per channel	
Management port			10/100 Base-T Ethernet	
Power consumption*			230 V~ 50/60 Hz up to 29 W	
Operating temperature range			-10° ÷ +55° C	
Dimensions/Weight (packed)			373x135x69 mm / 3.1 kg (S2C16); 492x135x69 mm / 3.54 kg (S2C16P)	

pr. software control

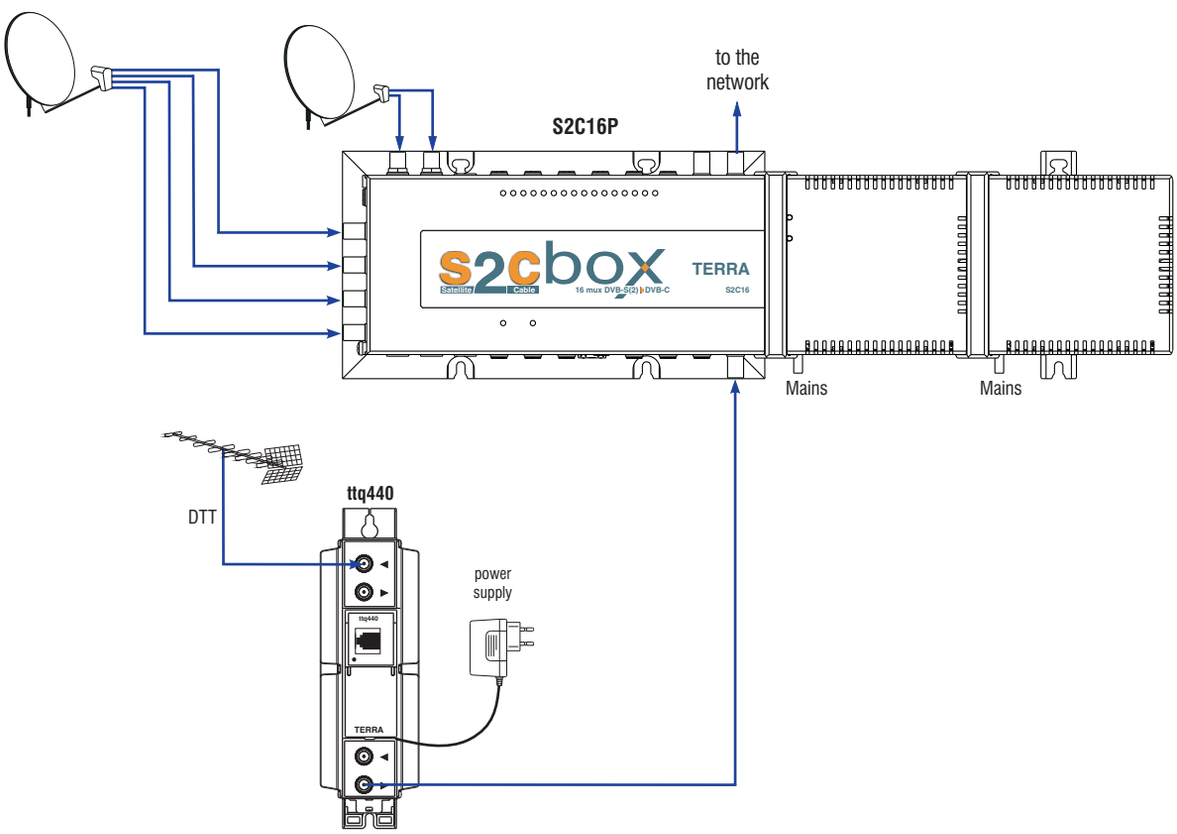
* without external DC load;
with maximal external DC load 44 W



Stand alone headend

Application diagram

Application example of processing from:
- 16 SAT transponders of 2 satellites to DVB-C channels
- 4 DTT channels to DVB-C channels



ttq440 - quatro transmodulator, **page 3.19**

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Stand alone headend

32 channels 8PSK/QPSK to 16/32 QAM transmodulators

Converting of 32 DVB-S/S2 modulated input signals into 16/32 QAM modulated DVB-C RF channels.

- 2 SAT IF inputs supporting EN50607
- TS file playback from USB flash
- compact fanless solution
- built-in redundancy power supply with 2 separated mains leads
- TS processing:
  TS mux - any service to any output
  PCR restamping
  service filtering
  PSI/SI regeneration
  NIT generation
  PMT version monitoring
  BISS descrambling
- SNMP traps
- wall no 19" rack mounting
- die-cast housing
- connectors:
  Web based control - RJ-45
  TS playback: USB-A
  RF ports - type F

S3C32VB
32 DVB-S/S2 transmodulator to 16 DVB-C

S3C32WB
32 DVB-S/S2 transmodulator to 32 DVB-C

Technical specifications

TYPE			S3C32VB	S3C32WB
Ordering number			03885	03875
Number of input / output channels			32/16	32/32
Number of input ports			2	
RF input	frequency range	pr.	950 - 2150 MHz	
	level AGC range/impedance		50-94 dBμV/75 Ω	
	LNB powering/control	pr.	0/13 V/18 V, 22 kHz & 1 A per input channel, total 2 A max.	
	modulation		**DVB-S/S2 demodulator (QPSK, 8PSK)**	
	symbol rate	pr.	2 ÷ 45 MS/s (QPSK), 2 ÷ 31.5 MS/s (8PSK)	
	code rate		QPSK 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 7/8, 8/9, 9/10 8PSK 3/5, 2/3, 3/4, 5/6, 8/9, 9/10	
	roll off		20 %, 25 %, 35 %	
	signal processing		ETSI 300 421, ETSI 302 307	
RF output	frequency range	pr.	48 - 858 MHz, by step 100 kHz	
	channel allocation		independent	
	output level per carrier/impedence	pr.	max. 90 dBμV/75 Ω	
	total output level adjustment	pr.	15 dB by step 1 dB	
	carrier output level adjustment	pr.	2.5 dB by step 0.5 dB	
	MER		≥ 43 dB	
	modulation DVB-C	pr.	QAM16, QAM32, QAM64, QAM128, QAM256	
	channel bandwidth / symbol rate	pr.	1.15...8.3 MHz / 1 ÷ 7.2 MS/s	
	roll off		15 %	
	signal processing		EN 300 429, ITU-T J.83 A (Annex A)	
	test point		-20 dB	
TS playback	file format		MPEG2 TS	
	count of files		1	
Input data rate			max. 90 Mbps per channel	
Management port			10/100 Base-T Ethernet	
Power consumption*			230 V~ 50/60 Hz 25 W	
Operating temperature range			-10° ÷ +55° C	
Dimensions/Weight (packed)			485x176x107 mm / 7.8 kg	

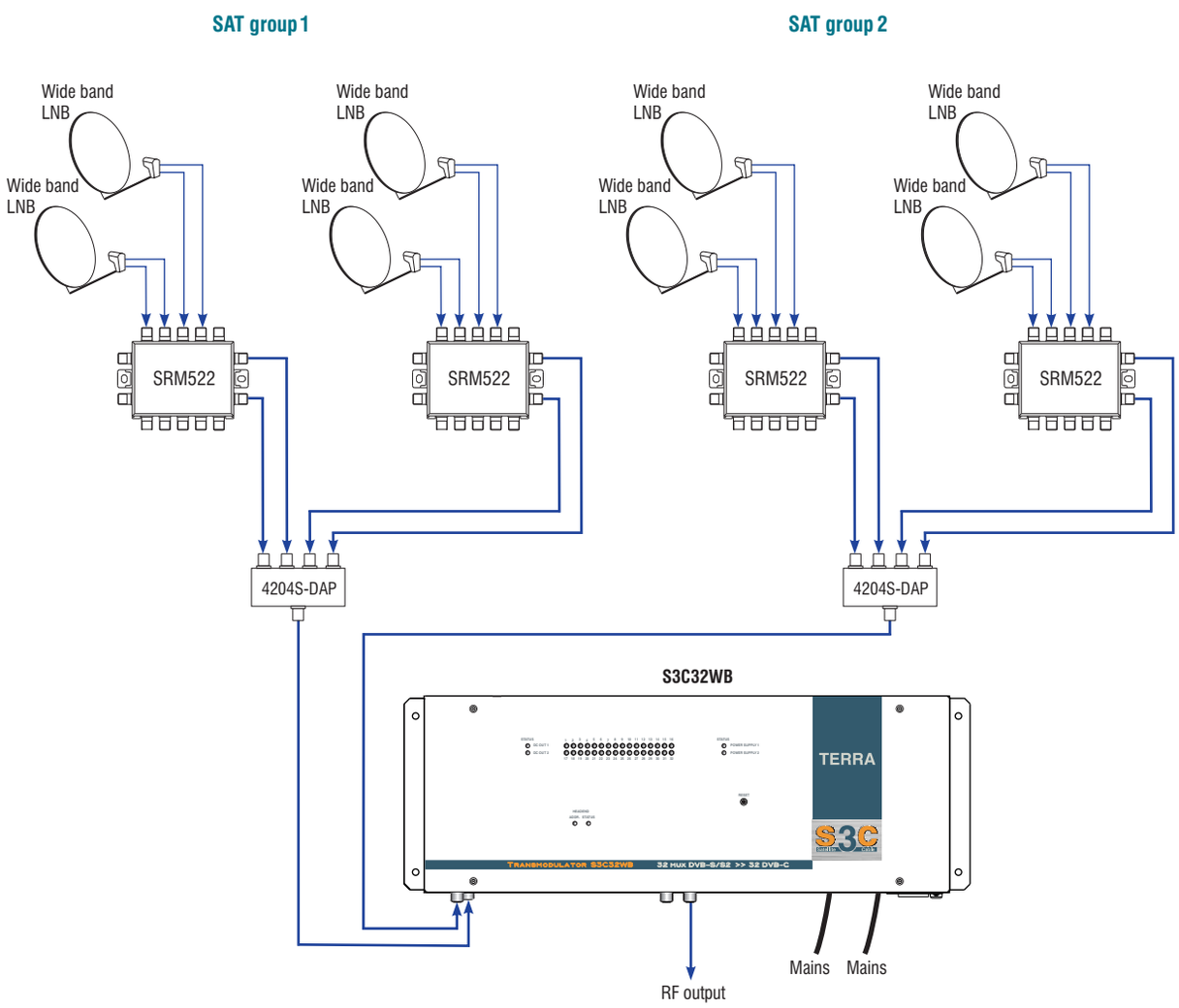
pr. software control

* without external DC load; with maximal external DC load 75 W

TERRA

Stand alone headend
Application diagram

Application example of SAT TV content processing from 8 satellite orbit positions to 32 DVB-C channels.



SRM522 - cascadable single cable multiswitch, see **www.terraelectronics.com**
4204S-DAP - 4 way splitter, see **www.terraelectronics.com**

Contents

CATV range equipment
Micro optical receivers

- designed for fiber to the home FTTH
- ultra compact optical receivers offering optimal price-performance ratio
- AGC based on optical input level
- extremely low power consumption could be powered from USB port
- built-in WDM filter 1550 nm (for OD006-55 only)
- 3xLED indication of optical input level
- robust die-cast housing
- connectors:
  DC IN for optical receiver feeding - micro USB connector
  RF output - type F
  optical - SC/APC

Technical specifications

TYPE		OD006	OD006-55
Ordering number		03803	03804
Optical input	optical wave lenght	1100-1600 nm	1550 nm
	optical input level (AGC range)	-6 ...0 dBm	
	optical return loss	> 40 dB	
	noise current density	≤ 6.5 pA/√Hz	
RF output	frequency range	47-1006 MHz	
	impedance	75 Ω	
	return loss	≥ 14 dB at 40 MHz-1.5 dB/oct., but not less 10 dB	
	frequency response	± 0.75 dB	
	output level (AGC controlled, 4.9% OMI)	80 dBμV	
	output level CTB (EN60728-3)	80 dBμV (42 ch.)	
	output level CSO (EN60728-3)	80 dBμV (42 ch.)	
Power consumption		DC 5 V 0.1 A	
Operating temperature range		-20° ÷ + 50° C	
Dimensions/Weight (packed)		72x53x19 mm/0.08 kg	

Power supply for OD006xx

- switch-mode technology
- short circuit and overload protected

Technical specifications

TYPE	RPI-PSU-EU-MK1
Ordering number	00634
DC output	+5 V 1 A
Mains voltage	100 V÷ 240 V~ 50/60 Hz
DC plug	micro USB
Operating temperature	0° ÷ + 40° C
Dimensions/Weight (packed)	54x24x38 mm / 0. 07 kg

TERRA

CATV range equipment
Optical receiver

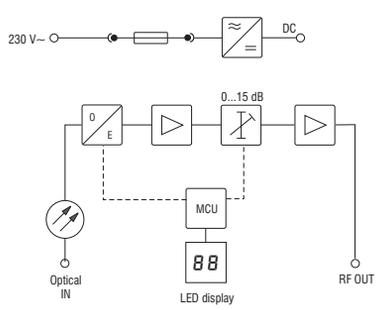
- very compact optical receivers for cost sensitive installations with extended frequency range 1002 MHz
- electronic setting of all parameters
- AGC based on optical input level
- digital indication of optical input level and other parameters
- connectors:
  RF output - type F
  optical - SC/APC

CABRIOLINE

Technical specifications

TYPE		OD003
Ordering number		02843
Optical input	optical wave lenght	1100-1600 nm
	optical input level (AGC range)	-10 ...-3 dBm
	optical return loss	> 40 dB
	noise current density	≤ 8.0 pA/√Hz
RF output	frequency range	47-1002 MHz
	impedance	75 Ω
	return loss	≥ 16 dB at 40 MHz-1.5 dB/oct
	frequency response	± 0.75 dB
	output level (AGC controlled, 4.9% OMI)	80 dBμV
	output level CTB (EN60728-3)	85 dBμV (42 ch.)
	output level CSO (EN60728-3)	82 dBμV (42 ch.)
	interstage attenuator pr.	0-15 dB by 1 dB step
Power consumption		230 V~ 50/60 Hz 4 W
Operating temperature range		-20° ÷ + 50° C
Dimensions/Weight (packed)		133x73x39 mm/0.36 kg

pr. software control



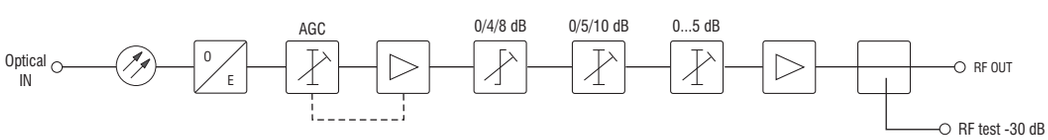
CATV range equipment
Optical receiver

- compact optical receiver offering optimal price-performance ratio
- AGC based on optical input level
- 3xLED indication of optical input level
- die-cast housing
- connectors:
  RF output and test - type F
  optical - SC/APC

Technical specifications

T Y P E		OD005P
Ordering number		03801
Optical input	optical wave lenght	1100-1600 nm
	optical input level (AGC range)	-6 ...0 dBm
	optical return loss	> 40 dB
	noise current density	≤ 6.5 pA/√Hz
RF output	frequency range	47-862 MHz
	impedance	75 Ω
	return loss	≥ 14 dB at 40 MHz-1.5 dB/oct., but not less 10 dB
	frequency response	± 0.75 dB
	output level (AGC controlled, 4.9% OMI)	106 dBμV
	output level CTB (EN60728-3)*	107 dBμV (42 ch.)
	output level CSO (EN60728-3)*	107 dBμV (42 ch.)
	interstage attenuator	0-15 dB
	interstage equalizer	0/4/8 dB
	loss in test point	-30 ± 0.7 dB
Power consumption		230 V~ 50/60 Hz 7 W
Operating temperature range		-20° ÷ + 50° C
Dimensions/Weight (packed)		135x180x52mm/0.7 kg

* output level (CTB, CSO) is measured with 8 dB interstage equalizer



CATV range equipment
Optical receivers

- electronic setting of all parameters
- AGC based on optical input level
- thermal compensation of RF output level drift
- digital indication of optical input level and other parameters
- die-cast housing
- connectors:
  RF output and test - type F
  optical - SC/APC

OD001A
output level 94 dBμV

OD002
output level 106 dBμV

OD100
output level 113 dBμV

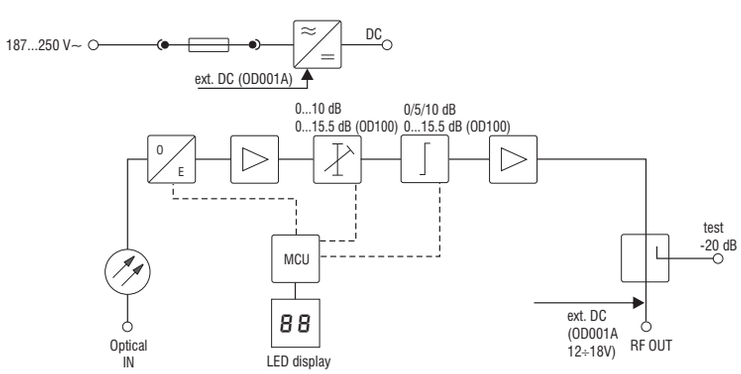
obsolete

Technical specifications

TYPE	OD001A	OD002	OD100
Ordering number	02823	02824	02825
Optical wave lenght	1100-1600 nm		
Optical input level (AGC range)	-7 ...2 dBm		
Optical return loss	> 40 dB		
Noise current density	≤ 7.0 pA/√Hz		
Frequency range	47-862 MHz		
Impedance	75 Ω		
Return loss	≥ 18 dB at 40 MHz-1.5 dB/oct		
Frequency response	± 0.75 dB		
Output level (AGC controlled, 4.9% OMI)	94 dBμV	106 dBμV	115 dBμV
Output level CTB (EN60728-3)*	99 dBμV (42 ch.)	107 dBμV (42 ch.)	113 dBμV (42 ch.)
Output level CSO (EN60728-3)*	101 dBμV (42 ch.)	110 dBμV (42 ch.)	113 dBμV (42 ch.)
Interstage attenuator pr.	0-10 dB by 0.5 dB step		0-15.5 dB by 0.5 dB step
Interstage equalizer pr.	0/5/10 dB		0-15.5 dB by 0.5 dB step
Loss in test point	-20 dB ± 0.7 dB		
Power consumption	230V~50/60 Hz 5 W or DC 12-18 V 4 W	230 V~ 50/60 Hz 6 W	230 V~ 50/60 Hz 12 W
Operating temperature range	-20° ÷ + 50° C		
Dimensions/Weight (packed)	185.5x95x47 mm/0.9 kg		213x138x76 mm (with fixing ears)/1.35 kg

* output level (CTB, CSO) is measured with 5 dB (6 dB - OD100) interstage equalizer

pr. software control



TERRA

CATV range equipment

Optical receiver with RP transmitter

- electronic setting of all parameters
- AGC based on optical input level
- digital indication of optical input level and other parameters on built-in LED display
- switchable ingress blocking filter
- uncooled FP laser diode for CATV return path application
- 5 MHz pilot generator inside
- die-cast housing
- connectors:
  optical - SC/APC
  RF output and test - type F

Technical specifications

T Y P E		OD110*	OD110R*
Forward path			
Optical wave lenght		1100-1600 nm	
Optical input level (AGC range)		-7 ...2 dBm	
Optical return loss		> 40 dB	
Noise current density		≤ 7.0 pA/√Hz	
Frequency range** (depending on diplexer)		47/75/87/108-1002 MHz	
Impedance		75 Ω	
Return loss		≥ 18 dB at 40 MHz-1.5 dB/oct	
Frequency response		± 0.75 dB	
Output level (AGC controlled, 4.9% OMI)		113 dBμV	
Output level CTB (EN60728-3)		111 dBμV (42 ch.)	
Output level CSO (EN60728-3)		112 dBμV (42 ch.)	
Interstage attenuator	pr.	0-15 dB by 1 dB step	
Interstage equalizer	pr.	0-15 dB by 1 dB step	
Test point		-20 dB ± 0.7 dB	
Return path			
Laser diode type		FP	
Optical output power*		1/2 mW	
Wave length***		1310 ± 10 nm	
Frequency range** (depending on diplexer)		5-30/55/65/85 MHz	
Ingress blocking filter attenuation	pr.	>20 dB up to 15 MHz; <0.5 dB from 20 MHz	
RF input level		75-95 dBμV	
Return path attenuator	pr.	0-25 dB by 1 dB step	
Input return loss		18 dB	
Pilot tone	pr.	5 MHz	
Test point		-20 ± 0.5 dB	
General			
Mains voltage, 50/60 Hz		187-250 V~	24÷65 V~
Power consumption, max.		15 W	15 W
Current consumption	24 V AC	-	1 A
	42 V AC	-	0.67 A
	65 V AC	-	0.5 A
Operating temperature range		-20° ÷ + 45° C	
Dimensions/Weight (packed)		213x138x76 mm/1.4 kg	

* ordering information:

	Type	Laser	Ordering number
	OD110R1	1mW 1310 nm	02851
obsolete	OD110DR1	1mW 1310 nm, remote powering	02853

** Frequency range / Diplexer

30/47 MHz	pd 06-30
55/75 MHz	pd 06-55
65/87 MHz	pd 06-65
85/108 MHz	pd 06-85

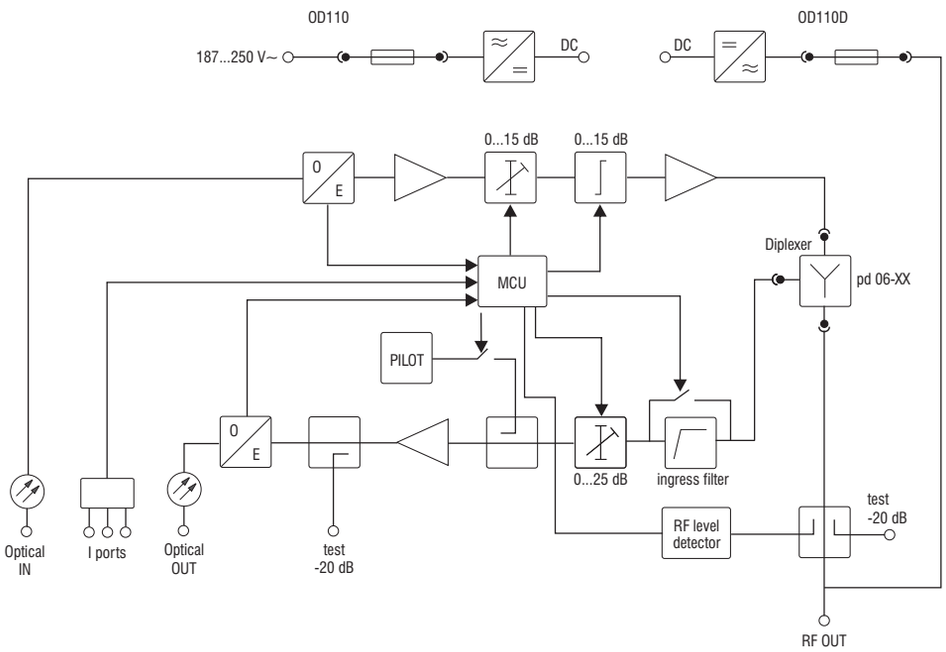
*** DFB laser diodes for CWDM (1470...1610 nm) band are supplied by special request

pr. software control

CATV range equipment

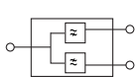
Optical receiver with RP transmitter

Structure diagram



Plug-in modules

Plug-in diplexers



Technical specifications

TYPE		pd 06-30	pd 06-55	pd 06-65	pd 06-85
Ordering number		12870	12871	12872	12873
Frequency range	return path	5-30 MHz	5-55 MHz	5-65 MHz	5-85 MHz
	forward path	47-1002 MHz	75-1002 MHz	87-1002 MHz	108-1002 MHz
Attenuation	5 MHz	≤ 0.2 dB			
		≤ 1.3 dB at 30 MHz	≤ 1.3 dB at 55 MHz	≤ 1.4 dB at 65 MHz	≤ 1.5 dB at 85 MHz
		≤ 1.3 dB at 47 MHz	≤ 1.3 dB at 75 MHz	≤ 1.3 dB at 87 MHz	≤ 1.4 dB at 108 MHz
	1002 MHz	≤ 0.5 dB			
Return loss		≥ 20 dB at 40 MHz reduction - 1.5 dB/octave			

1 SAT IF distribution equipment

Modular optical transmitters

- suitable for SAT IF and CATV application
- option with Web control and SNMP agent functionality marked by letter L, e.g. mo418L, page 4.13
- low signal loss over long distances
- simple installation in the headend with easy module parameter set-up
- loop through RF distribution
- AGC mode for constant laser loading
- manual gain control allows to maintain optimum operation over wide range of input signals
- LED display for easy setup and maintenance
- DIN rail or wall mounting
- robust die-cast housing
- recommended power supplies, page 4.10
- connectors:
  3xRF input/output and test - type F
  optical - SC/APC
  power distribution bus

mo418
mo428

mo418L
mo428L

Technical specifications

T Y P E		mo418*	mo428*
Number of optical outputs		1	2
Optical power		1x6 dBm	2x6 dBm
Optical wave lenght		1310 ± 20 nm / 1550 ± 20 nm	1310 ± 20 nm / 1550 ± 20 nm
Laser type		DFB	
RF frequency range		47-2400 MHz	
RF input level		70-85 dBμV	
RF input impedance		75 Ω	
Gain adjustment		0...-15 dB by 1 dB step	
AGC range		± 5 dB	
RF input loop through	frequency range	47-2400 MHz	
	loss	< 1 dB	
	flatness	± 1.0 dB	
Return loss		≥ 18 dB at 40 MHz -1.5 dB/oct (47-950 MHz); ≥ 10 dB up to 1750 MHz; ≥ 7 dB up to 2400 MHz	
Relative intensity noise RIN		< -150 dB/Hz	
Terr.TV	intermodulation distortion CSO**	> 55 dB	
	intermodulation distortion CTB**	> 60 dB	
	carrier/noise ratio C/N**	> 50 dB	
SAT IF intermodulation distortions*		> 35 dB	
Supply voltage		12 V ± 1 V	
DC feeding for external		12 V 0.4 A	
Current consumption		0.35 A max.	0.4 A max.
Operating temperature range		0° ÷ + 50° C	
Dimensions/Weight (packed)		198x107.5x36 mm/ 0.9 kg	

* ordering information:

Type	Laser	Ordering number
mo418 4D31	6 dBm 1310 nm	02883
mo418 4D55	6 dBm 1550 nm	02884
mo428 4D31	2x6 dBm 1310 nm	02885
mo428 4D55	2x6 dBm 1550 nm	02886

** OMI=4.0 %, 42 channel CENELEC, optical receiver input power - 2 dBm
*** OMI=20 %, two tone test metod according EN50083-3

Transmitter features for option with WEB control:

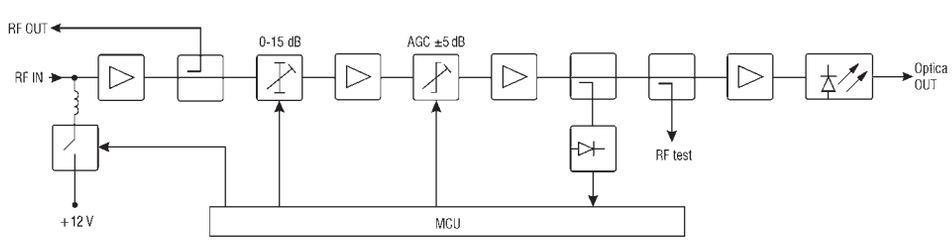
Remotely monitored parameters:

- RF average power
- laser current
- external voltage on RF IN
- supply voltages
- temperature inside
- diagnostic information

Remotely controlled parameters:

- attenuator level
- AGC mode
- switch external voltage on RF

Type	Laser	Ordering number
mo418L 4D31	6 dBm 1310 nm	02883L
mo418L 4D55	6 dBm 1550 nm	02884L
mo428L 4D31	2x6 dBm 1310 nm	02885L
mo428L 4D55	2x6 dBm 1550 nm	02886L



See page 4.13

1 SAT IF distribution equipment
Modular optical PLC splitters

- optical splitters for single mode fiber application
- good spectral uniformity
- wide wave length bandwidth
- high reliability
- small size
- connectors:
  optical - SC/APC



Technical specifications

TYPE		so414	so418	so424
Ordering number		02876	02877	02878
Splitter		1x4	1x8	1x4+1x4
Operating wavelength		1260-1650 nm		
Insertion loss	typical	7.0 dB	10.2 dB	7.0 dB
	maximum value	7.5 dB	10.7 dB	7.5 dB
Loss uniformity		≤ 0.6 dB	≤ 0.8 dB	≤ 0.6 dB
Return loss		≥ 50 dB	≥ 50 dB	≥ 50 dB
Wave length dependent loss		≤ 0.3 dB	≤ 0.3 dB	≤ 0.3 dB
Directivity		≥ 55 dB		
Temperature stability -20 to +70° C		≤ 0.4 dB		
Optical input power, max.		300 mW		
Operating temperature range		-20° ÷ + 50° C		
Dimensions/Weight (packed)		36x198x116 mm/0.65 kg	36x198x116 mm/0.7 kg	

Optical Patch Cords

Technical specifications

TYPE	PCO-2SC/APC-0.5	PCO-2SC/APC-1
Ordering number	02879	02880
Connector type	SC/APC	
Insertion loss	≤ 0.3 dB	
Return loss	≥ 60 dB	
Fiber type	SMF 2.0 mm	
Fiber length	0.5 m	1 m

1 SAT IF distribution equipment

Power supplies

- suitable for operation in parallel connection for back-up function implementation (UP413)
- modular power supply with integrated RF combiner (UP410S)
- switch-mode technology
- short circuit and overload protected
- DIN rail or wall mounting
- robust die-cast housing
- connectors:
  3xRF - type F (UP410S)
  screw terminal block for DC output
  power distribution bus

Technical specifications

T Y P E		UP413	UP410S
Ordering number		03821	02874S
Power supply	input voltage	187-250 V~ 50/60 Hz	
	output voltage, current	12 V 4.5 A max.	
	power consumption	65 W max.	
RF combiner	frequency range	-	47-2400 MHz
	insertion loss	-	4 dB at 862 MHz; 6 dB at 2400 MHz
	isolation	-	≥ 20 dB
	return loss	-	≥ 20 dB at 862 MHz ; ≥ 12 dB at 2400 MHz
Operating temperature range		0°÷ +50°C	
Dimensions/Weight (packed)		48x198x107.5 mm/1 kg	48x198x107.5 mm/0.97 kg

1 SAT IF distribution equipment
Power supplies & accessories

Power supplies

- switch-mode technology
- short circuit and overload protected
- DIN rail mounting (HDR-60-12)

Technical specifications

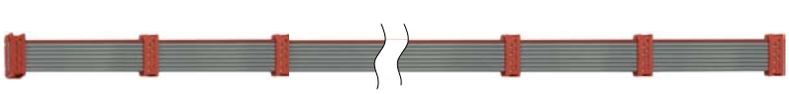
TYPE	HDR-60-12	SGA25E12-W
Ordering number	00631	00633
DC output	+12 V 4.5 A max.	+12 V 2 A max.
Mains voltage	100 V÷ 240 V~ 50/60 Hz	
Operating temperature range	-20°÷ +50°C	-20°÷ +40°C
Dimensions/Weight (packed)	52.5x90x54.5 mm/0.3 kg	75.5x32x47.5 mm/0.16 kg

Accessories

- Fmale - Fmale quick coaxial bridge 699.026:
  for modules with width 36 mm
  Ordering number 21876
- Fmale - Fmale quick coaxial bridge 780.026:
  for modules with width 48.5 mm
  Ordering number 21881

- DC distribution cable 699.20 for 4 modules
  with width 36 mm
  Ordering number 21875
- DC distribution cable 780.20 for 4 modules
  with width 48.5 mm
  Ordering number 21882

- DC distribution cable 908.20 for 12 modules
  Ordering number 21883

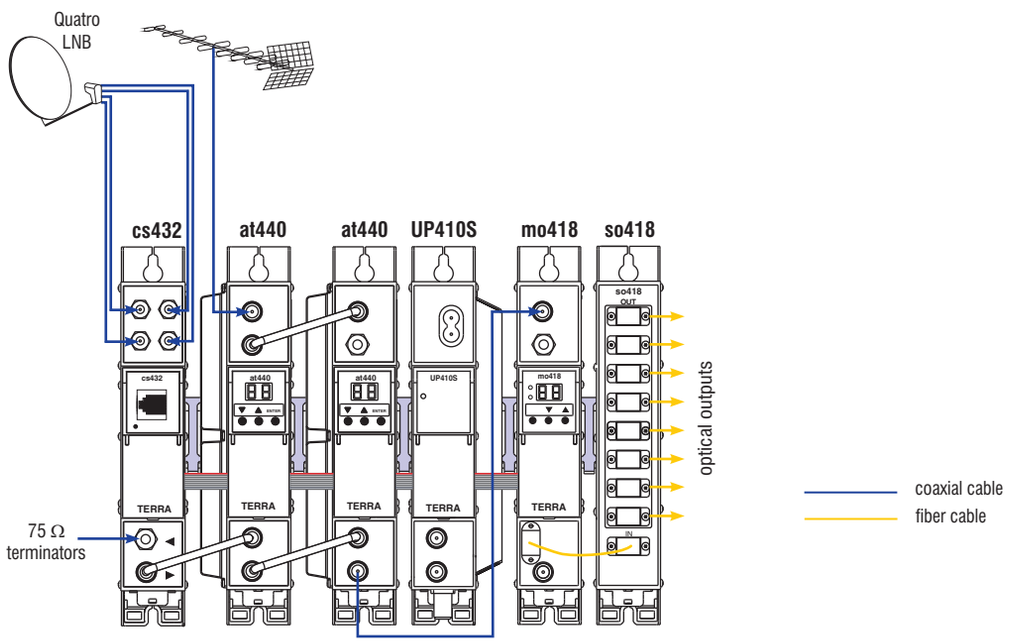


- 19" system mountable rack
  Ordering number 01957

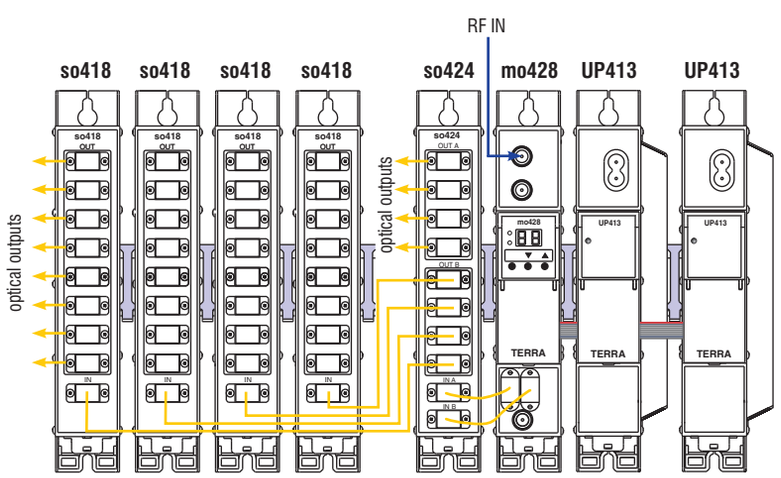
- Rail for wall mounting, 1 meter, 699.027
  Ordering number 21877

1 SAT IF distribution equipment
Application diagrams

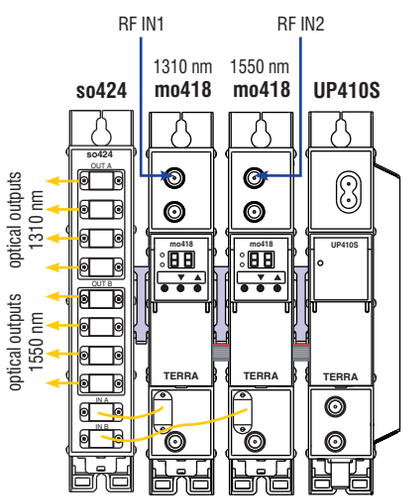
Distribution from 32 SAT transponders and 8 DTT channels through fiber optical network.



Redundant power supply in optical transmitting system and optical signal distribution through passive optical network with 64 optical outputs.



Transmitting of two different wavelength optical signals.



cs432 - SAT IF channel converter, see www.terraelectronics.com
at440 - UHF TV channel amplifier, see www.terraelectronics.com
mo418 - optical transmitter, **page 4.08**
mo428 - optical transmitter, **page 4.08**
so418 - optical PLC splitter, **page 4.09**
so424 - optical PLC splitter, **page 4.09**

UP413 - redundant power supply, **page 4.10**
UP410S - power supply, **page 4.10**

See accessories, page 4.11

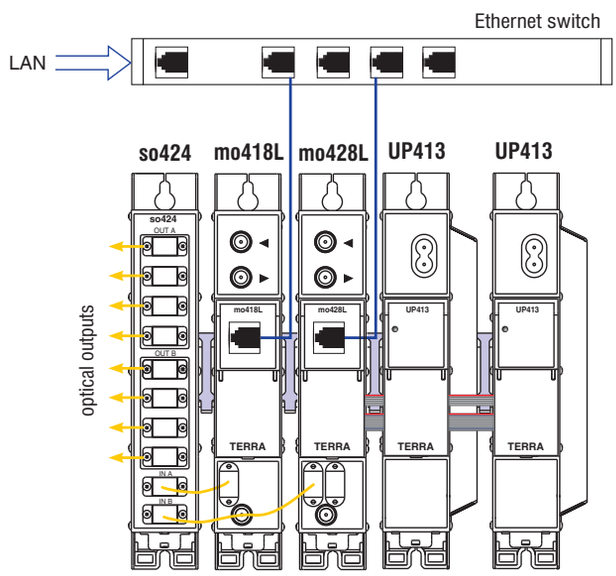
1 SAT IF distribution equipment
WEB/SNMP remote control & monitoring

Remote monitoring system is intended to manage and control devices via LAN.
The system is used for optical transmitters series mo418, mo428, that have option L: „WEB control and SNMP agent".

Features:
- device control via WEB browser
- SNMP monitoring
- SNMP traps
- supported protocol: SNMPv2c
- connector: LAN port - RJ-45 Ethernet 10/100 Base-T

Control window screenshots of optical transmitter.

Application diagram of mo418L, mo428L installation with redundant power supply and WEB/SNMP control possibility.



so424 - optical PLC splitter, **page 4.09**
mo418L - optical transmitter, **page 4.08**
mo428L - optical transmitter, **page 4.08**
UP413 - power supply, **page 4.10**

See accessories, page 4.11

coaxial cable
fiber cable

TERRA

1 SAT IF distribution equipment

Multi-input stand alone optical transmitter

- compact optical transmitter offering optimal price-performance ratio
- control and configuration according EN 50494/EN 50607 with programmer PC102W
- 4 SAT and DTT inputs with DC by pass for remote feeding
- RF and optical outputs
- LED indication of laser diode aging
- robust die-cast housing
- connectors:
  RF & DC input - type F
  optical - FC/APC

obsolete

Technical specifications

T Y P E		TRO001*
SAT IF inputs	count	4
	frequency range	290-2350 MHz
	level (AGC range)	59-89 dBuV (per transponder)
	DC feeding for external, switchable	10-20 V 500 mA max. total
DTT input	count	1
	frequency range	47-790 MHz
	level, 8 transponders	89-93 dBuV (per transponder)
	DC feeding for external, switchable	10-20 V 100 mA max.
Output frequency range	SAT IF	950-2150 MHz
	Terr.TV	47-790 MHz
User band bandwidth		20-60 MHz**, configurable
Number of user bands		32 max.**, configurable
RF output level	SAT IF	75 dBμV
	Terr.TV	80 dBμV
Optical output	parameters of laser	see ordering information*
	return loss	> 45 dB
Supply voltage		10 V...20 V
Current consumption without external load		20 V 0.26 A
Power consumption without external load		5.2 W
Operating temperature range		-20° ÷ + 50° C
Dimensions/Weight (packed)		116x84x25.5 mm/0.28 kg

* ordering information:

Type	Laser	Ordering number
TRO001 6F31	6 dBm FP 1310 nm	03807
TRO001 6D55	6 dBm DFB 1550 nm	03813

Lasers with other optical wavelength are supplied by MOQ request.

** control and configuration with programmer PC102W

1 SAT IF distribution equipment

Optical transmitter

- compact wideband optical transmitter offering optimal price-performance ratio
- SAT and DTT inputs with DC by pass for remote feeding
- gain adjustment (only for RF input)
- LED indication of input signal level and laser diode aging
- RF test output / DTT input port
- robust die-cast housing
- connectors:
  RF inputs - type F
  DC output - type F
  DC AUX - 5.5/2.1 mm DC jack
  optical - FC/APC

Technical specifications

TYPE		MO001*
Wideband	frequency range	45-2400 MHz
RF input	return loss/impedance	> 12 dB / 75 Ω
	flatness	± 1.5 dB
	RF input level (AGC range)	65-90 dBμV (per transponder); 80-105 dBμV (total level)
	gain adjustment	0 - 8 dB by 1 dB step
	OMI (SAT IF 30 transp., AGC range)	4.9 %
	DC feeding for external, switchable	10 V-20 V 350 mA max.
Terr.TV	frequency range	45-790 MHz
RF input	return loss/impedance	> 12 dB / 75 Ω
	flatness	± 1.5 dB
	RF input level	88 dBμV ± 2 dBμV (per transponder)
	DC feeding for external, switchable	10 V - 20 V 100 mA max.
	OMI (Terr.TV 8 channels)	7 %
RF test output	RF IN (wideband)**, output level	62 dBμV ± 2 dB dBμV
	Terr.TV IN loss	-23 dB ± 2 dB
	return loss/impedance	> 12 dB / 75 Ω
	flatness	± 1.5 dB
Optical output	parameters of laser	see ordering information*
	return loss	> 45 dB
Supply voltage		10 V...20 V
Power consumption without external load		2 W
Operating temperature range		-20° ÷ + 50° C
Dimensions/Weight (packed)		116x84x25.5 mm/0.28 kg

* ordering information:

Type	Laser	Ordering number
MO001 6F31	6 dBm FP 1310 nm	03806
MO001 6D55	6 dBm DFB 1550 nm	03809

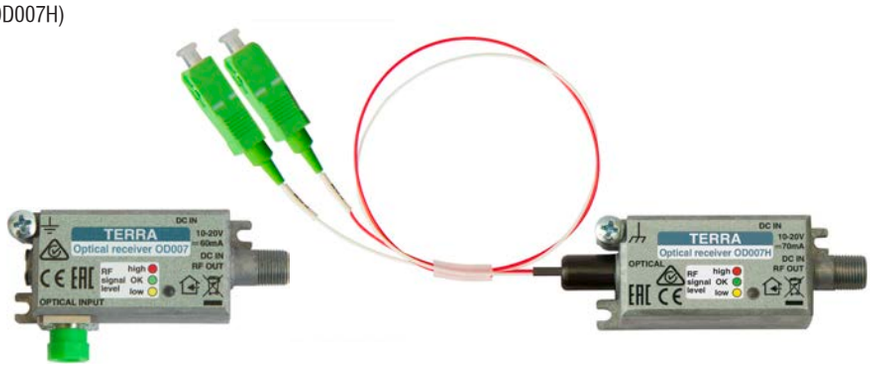
Lasers with other optical wavelength are supplied by MOQ request.

** RF input, 30 SAT IF transponders, AGC range

1 SAT IF distribution equipment

Optical receivers

- compact optical receiver of SAT IF and DTT signals
- optical receiver with integrated WDM filter (OD007H)
- optimal price-performance ratio
- AGC based on RF signal output level
- LED indication of RF signal level
- robust die-cast housing
- recommended power supply
  SYS1381-1212-W2E, page 4.26
- connectors:
  DC IN & RF output - type F
  DC IN - 3.5/1.3 mm DC jack
  (reducer 5.5/2.1 mm in scope)



Technical specifications

TYPE		OD007	OD007H*
Ordering number		see ordering information*	
Optical input	wavelenght for receiver	1100-1600 nm	1540-1560 nm
	wavelenght pass	-	1260-1360 nm & 1480-1500 nm
	optical connector	see ordering information*	
	insertion loss	-	< 0.4 dB
	isolation	-	> 30 dB
	return loss input	> 40 dB	> 50 dB
	return loss output	-	> 40 dB
	input level** (AGC range)	-15 ÷ 0 dBm	
	noise current density	≤ 7.0 pA/√Hz	
RF output	frequency range	47-2400 MHz	
	impedance	75 Ω	
	return loss	≥ 14 dB at 40 MHz -1.5 dB/oct., but not less 10 dB	
	frequency response	± 1.5 dB	3 dB (precorrection) ± 1.5 dB
	output level (AGC range) for 30 SAT IF transponders	70 dBμV (per transponder); 85 dBμV (total)	70 dBμV*** (per transponder); 85 dBμV (total)
Supply voltage		10 V...20 V	
Current consumption		60 mA max.	70 mA max.
Operating temperature range		-20° ÷ + 50° C	
Dimensions/Weight (packed)		71x39x19 mm/0.08 kg	90x27x19 mm/0.08 kg

* ordering information:

Type	Connector COM-BOSA	Ordering number
OD007H HH	SC/APC - SC/APC	03881
OD007	FC/APC	03805

Receivers with other connectors are supplied by MOQ request.

** optical input signal 4.9% OMI, 30 SAT IF transponders: OD007 - 1310 nm, OD007H - 1550 nm

*** at frequency 1300 MHz

1 SAT IF distribution equipment
Optical receivers with 2 RF outputs

- compact optical receiver of SAT IF and DTT signals
- optical receiver with integrated WDM filter (OD009H)
- AGC based on optical input level
- LED indication of -16 ÷ +1 dBm optical signal level and DC powering voltage
- robust die-cast housing
- recommended power supply SYS1381-1212-W2E, page 4.26
- connectors:
  RF output - type F
  DC IN - 3.5/1.3 mm DC jack
  (reducer 5.5/2.1 mm in scope)

Technical specifications

TYPE		OD009	OD009H*
Ordering number		see ordering information*	
Optical input	wavelenght for receiver	1260-1620 nm	1540-1560 nm
	wavelenght pass	-	1260-1360 nm & 1480-1500 nm
	optical connector	see ordering information*	
	insertion loss	-	< 0.4 dB
	isolation	-	> 30 dB
	return loss input	> 45 dB	> 50 dB
	return loss output	-	> 40 dB
	input level (AGC range)	-15 ÷ 0 dBm	
	noise current density	≤ 6 pA/√Hz	
RF outputs	number	2	
	frequency range	47-2400 MHz	
	isolation	22 dB	
	impedance	75 Ω	
	return loss	≥ 12 dB up to 2400 MHz	
	frequency response	± 1.5 dB	
	output level (AGC range)	85 dBμV per carrier**	
	spurious	< -40 dBc**	
	output level adjustment	0 ÷ 12 dB	
Supply voltage* **		10 V ÷ 20 V	
Current consumption		12 V 250 mA max.	
Operating temperature range		-20° ÷ + 50° C	
Dimensions/Weight (packed)		116x88x25.5 mm/0.28 kg	

* ordering information:

Type	Connector IN-OUT	Ordering number
OD009H HH	SC/APC - SC/APC	03883
OD009	SC/APC	03884

Receivers with other connectors are supplied by MOQ request.

** optical input signal OMI 4.9%, 30 SAT IF transponders and 8 DTT channels

*** powering via RF outputs or dedicated 3.5/1.35 mm DC jack

TERRA

1 SAT IF distribution equipment

Optical receiver

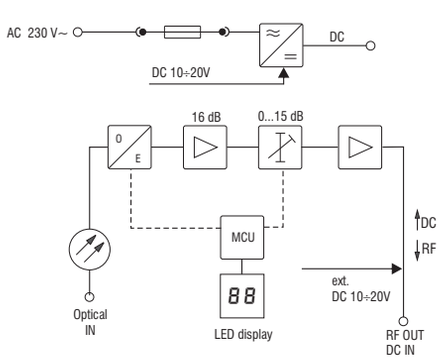
CABRIOLINE

- very compact optical receiver for cost sensitive installations with extended frequency range 2400 MHz
- electronic setting of all parameters
- AGC based on optical input level
- digital indication of optical input level and other parameters
- connectors:
  RF output - type F
  optical - SC/APC

Technical specifications

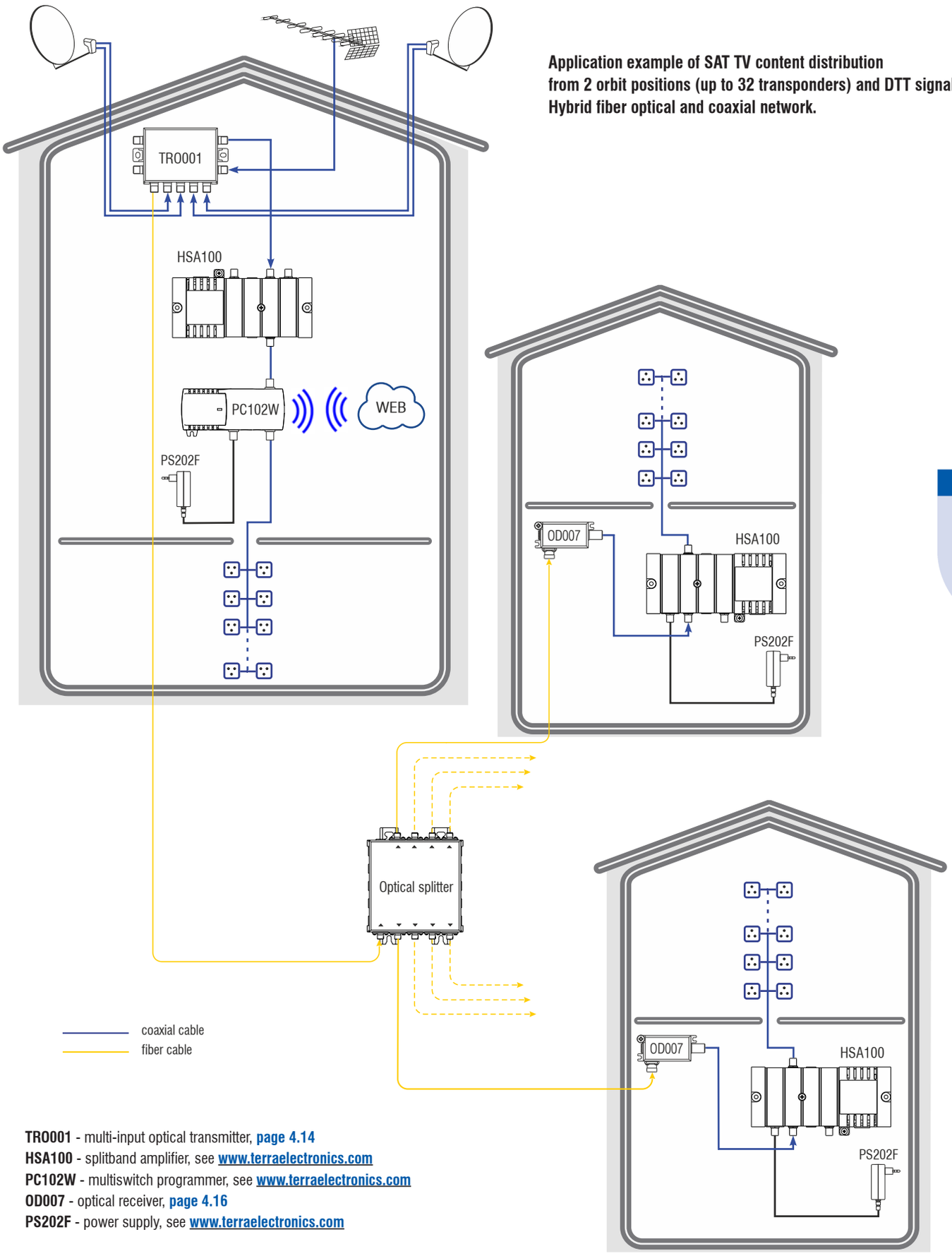
T Y P E			OD004A
Ordering number			02847
Optical	wavelenght		1100-1600 nm
input	input level (AGC range), switchable		-15 ÷ -6 / -8 ÷ 0 dBm
	return loss		> 40 dB
	noise current density		≤ 7.0 pA/√Hz
RF output	frequency range		47-2400 MHz
	impedance		75 Ω
	return loss		≥ 14 dB at 40 MHz -1.5 dB/oct (47-950 MHz); ≥ 10 dB up to 1750 MHz; ≥ 7 dB up to 2400 MHz
	frequency response		± 1.5 dB (47-2150 MHz)
	gain adjustment (manual control mode)		31 dB by 1 dB step
Output level* (AGC range),		-8 ÷ 0 dBm	78 dBμV
optical input level		-15 ÷ -6 dBm	80 dBμV
Output level* CTB (EN60728-3)			90 dBμV
Output level* CSO (EN60728-3)			83 dBμV
Max. output level IMD3=60 dB, 2 carries, 2150 MHz, +f=10 MHz			104 dBμV
Power consumption			230 V~ 50/60 Hz 4 W or DC 10-20 V 2 W
Operating temperature range			-20° ÷ + 50° C
Dimensions/Weight (packed)			133x73x39 mm/0.36 kg

* optical input signal 4.9% OMI, 1310 nm



1 SAT IF distribution equipment

Application diagram



Application example of SAT TV content distribution from 2 orbit positions (up to 32 transponders) and DTT signal. Hybrid fiber optical and coaxial network.

TRO001 - multi-input optical transmitter, **page 4.14**
HSA100 - splitband amplifier, see **www.terraelectronics.com**
PC102W - multiswitch programmer, see **www.terraelectronics.com**
OD007 - optical receiver, **page 4.16**
PS202F - power supply, see **www.terraelectronics.com**

TERRA

2 SAT IF distribution equipment
Optical transmitter

- compact optical transmitter of 2 SAT IF and DTT signals
- built-in AGC system on every input
- LNB and DTT preamplifier feeding possibility
- wall mounting
- robust die-cast housing
- recommended power supply SGA25E12-W, page 4.26
- connectors:
  RF inputs - type F
  optical - FC/APC
  screw terminal block for DC entry

Technical specifications

T Y P E	OT301*
Satellite inputs	
Bandwidth	2 x (950-2150) MHz
Input return loss / impedance	> 10 dB / 75 Ω
RF input level (AGC range) for 30 transponders	60-80 dBμV (per transponder); 75-95 dBμV (total power)
LNB remote feeding	13 /18 V; 350 mA max. total
Terrestrial input	
Bandwidth	47-862 MHz
Input return loss / impedance	> 10 dB / 75 Ω
RF input level (AGC range) for 8 transponders	60-80 dBμV (per transponder); 69-89 dBμV (total power)
Number of transponders	1...16
Preamplifier remote feeding	12 V 100 mA max.
Optical output	
Wavelength SAT & Terr	1310 nm**
Optical output power	6 dBm
Optical return loss	> 45 dB
Main characteristics	
Supply voltage	12 V ± 1 V
Current consumption without external load	0.7 A max.
Current consumption with max. external load	1.25 A max.
Operating temperature range	-20 ÷ + 40 °C
Dimensions/Weight (packed)	108x190x54 mm/1.4 kg

* ordering information:

Type	Ordering number
OT301 6F31	03850

** lasers with other optical wavelength are supplied by request

2 SAT IF distribution equipment
Optical receivers

- compact optical receivers of 2 SAT IF and DTT signals
- built-in AGC system based on optical signal level
- powered by STB or external PS
- robust die-cast housing
- recommended power supply SYS1381-1212-W2E, page 4.26
- connectors:
  RF outputs - type F
  optical - FC/APC
  DC AUX - 3.5/1.3 mm DC jack

OR301M
built-in 2x4 multiswitch

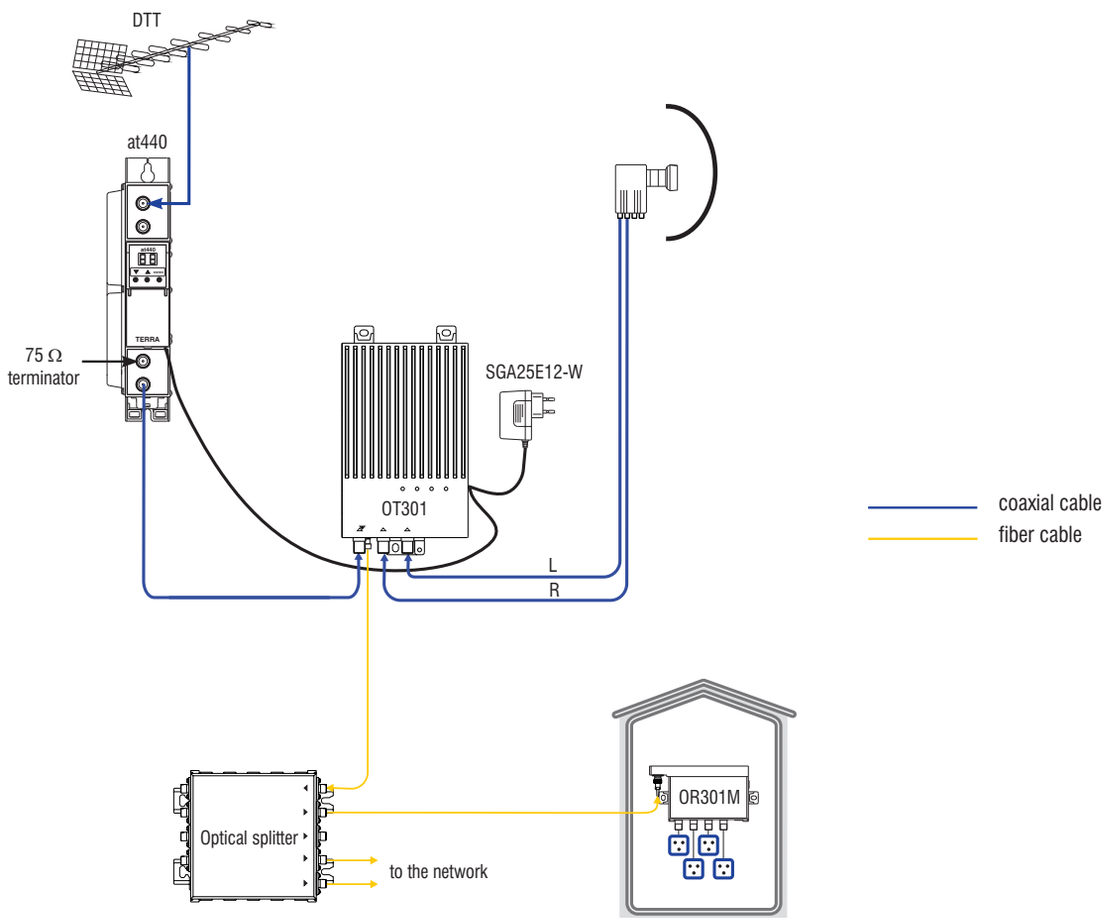
OR301
virtual dual

Technical specifications

TYPE		OR301M (obsolete)	OR301
Ordering number		03851	03852
Optical input			
Wavelength		1100 - 1650 nm	
Optical input level (OLC range)		-15 ÷ -5 dBm	
Optical return loss		> 40 dB	
RF outputs			
Bandwidth	**SAT IF**	4 x (950-2150) MHz	2 x (950-2150) MHz
	Terr.TV	47-790 MHz	47-862 MHz
Return loss / impedance		> 10 dB / 75 Ω	
DTT RF output signal level for 8 transponders (optical -15 ÷ -5 dBm)		75 dBμV (per transponder)	80 dBμV (per transponder)
SAT IF output level for 30 transponders (optical -15 ÷ -5 dBm)		75 dBμV (per transponder)	80 dBμV (per transponder)
SAT IF output control		14/18 V	-
Powering			
Supply voltage range	**DC AUX**	10 V ÷ 20 V	
	SAT IF output	13/18 V	10 V ÷ 20 V
Power consumption		2.7 W	2.4 W
Main characteristics			
Operating temperature range		-20° ÷ + 50 °C	
Dimensions/Weight (packed)		145x86x37 mm/0.42 kg	

2 SAT IF distribution equipment
Application diagram

Application example of transmitting SAT IF signals from 2 sub-bands and up to 4 DTT multiplexes through fiber.



OT301 - optical transmitter, **page 4.20**
at440 - UHF TV channel amplifier, see **www.terraelectronics.com**
OR301M - optical receiver with 2x4 multiswitch, **page 4.21**
SGA25E12-W - power supply, **page 4.26**

4 SAT IF distribution equipment
Stand alone optical transmitters

- compact optical transmitter of 4 SAT IF and DTT signals
- built-in AGC system on every input
- wall mounting
- robust die-cast housing
- recommended power supply SGA25E12-W, page 4.26
- connectors:
  RF inputs - type F
  optical - FC/APC
  screw terminal block for DC entry

OT401
for 4 SAT IF sub-bands;
LNB feeding possibility

OT501W
for 4 SAT IF sub-bands and DTT signals with WDM diplexer;
LNB and DTT preamplifier feeding possibility

Technical specifications

T Y P E	OT401*	OT501W*
Satellite inputs		
Bandwidth	2x(950-1950) & 2x(1100-2150) MHz	
Input return loss / impedance	> 10 dB / 75 Ω	
RF input level (AGC range) for 30 transponders	60-80 dBμV (per transponder); 75-95 dBμV (total power)	
LNB remote feeding	V,Lo and V,Hi - 13.5 V; H,Lo and H,Hi - 18 V; 350 mA total	
Terrestrial input		
Bandwidth	-	47-862 MHz
Input return loss / impedance	-	> 10 dB / 75 Ω
RF input level (AGC range) for 8 transponders	-	60-80 dBμV (per transponder); 69-89 dBμV (total power)
Number of transponders	-	1...16
Preamplifier remote feeding	-	9 V 100 mA max.
Optical output		
Wavelength SAT & Terr	1310 nm**	1310 nm SAT** & 1550 nm DTT**
Optical output power	6 dBm	2 x 6 dBm
Optical return loss	> 45 dB	
Main characteristics		
Supply voltage	12 V - 24 V	
Power consumption without external load	9 W max.	11 W max.
Power consumption with max. external load	15 W max.	18 W max.
Operating temperature range	-10 °C ÷ + 40 °C	
Dimensions/Weight (packed)	108x190x54 mm/1.44 kg	

* ordering information:

Type	Ordering number
OT401 6F31	03830
OT501W 6F31 & 6F55	03831

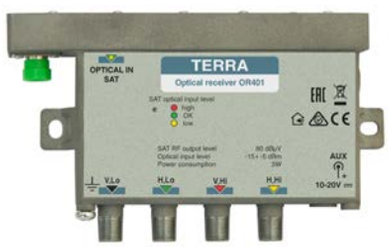
** lasers with other optical wavelength are supplied by request

4 SAT IF distribution equipment
Optical receivers

- compact optical receivers of 4 SAT IF signals
- built-in AGC system based on optical signal level
- powered by STB or external PS
- robust die-cast housing
- recommended power supply SYS1381-1212-W2E, page 4.26
- connectors:
  RF outputs - type F
  optical - FC/APC
  DC AUX - 3.5/1.3 mm DC jack

OR401M
built-in 4x4 multiswitch

OR401
virtual quatro



Technical specifications

T Y P E		OR401M	OR401
Ordering number		03832	03833
Optical input			
Detection wavelength range		1100 - 1650 nm	
Optical input level (OLC range)		-15 ÷ -5 dBm	
Optical return loss		> 40 dB	
RF outputs			
Bandwidth		2 x (950-1950) & 2 x (1100-2150) MHz	
Return loss / impedance		> 10 dB / 75 Ω	
SAT IF output level for 30 transponders (optical -15 ÷ -5 dBm)		75 dBμV (per transponder)	80 dBμV (per transponder)
SAT IF output control		14/18 V, 0/22 kHz	-
Powering			
Supply voltage range	**DC AUX**	10 V ÷ 20 V	
	SAT IF output	13/18 V	10 V ÷ 20 V
Power consumption		3 W	
Main characteristics			
Operating temperature range		-20 °C ÷ + 50 °C	
Dimensions/Weight (packed)		145x86x37 mm/0.42 kg	

obsolete

4 SAT IF distribution equipment
Optical receivers

- compact optical receivers of 4 SAT IF and DTT signals
- built-in AGC system based on optical signal level
- built-in WDM diplexer
- powered by STB or external PS
- robust die-cast housing
- recommended power supply SYS1381-1212-W2E, page 4.26
- connectors:
  RF outputs - F female
  optical - FC/APC
  DC AUX - 3.5/1.3 mm DC jack

OR501MW
built-in 4x4 multiswitch

OR501W
virtual quatro

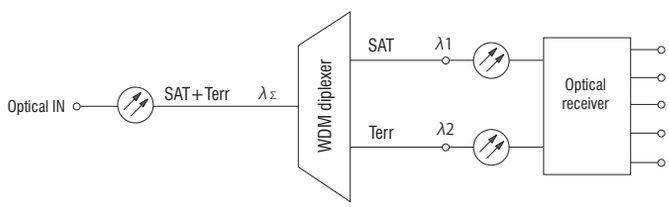
Technical specifications

T Y P E		OR501MW*	OR501W*
Optical input			
Detection wavelength range		1100 - 1650 nm	
Optical input level (OLC range)		-15 ÷ -5 dBm SAT & Terr.	
Optical return loss		> 40 dB	
RF outputs			
Bandwidth	**SAT IF**	2 x (950-1950) & 2 x (1100-2150) MHz	
	Terr.TV	47-790 MHz	47-862 MHz
Return loss / impedance		>10 dB / 75 Ω	
DTT RF output signal level for 8 transponders (optical -15 ÷ -5 dBm)		75 dBμV (per transponder)	80 dBμV (per transponder)
SAT IF output level for 30 transponders (optical -15 ÷ -5 dBm)		75 dBμV (per transponder)	80 dBμV (per transponder)
SAT IF output control		14/18 V, 0/22 kHz	-
Powering			
Supply voltage range	**DC AUX**	12 V ÷ 20 V	
	SAT IF output	13/18 V	10 V ÷ 20 V
Power consumption		4.2 W	
Main characteristics			
Operating temperature range		-20 °C ÷ + 50 °C	
Dimensions/Weight (packed)		158x86x37 mm/0.50 kg	

* ordering information:

Type	Ordering number
OR501MW 31W55	03837
OR501W 31W55	03840

Structure diagram OR501W



4 SAT IF distribution equipment
Power supplies

- switch-mode technology
- short circuit and overload protected

SYS1381-1212-W2E
power supply for optical receivers
series OR4xx, OR5xx, OD007, OD009

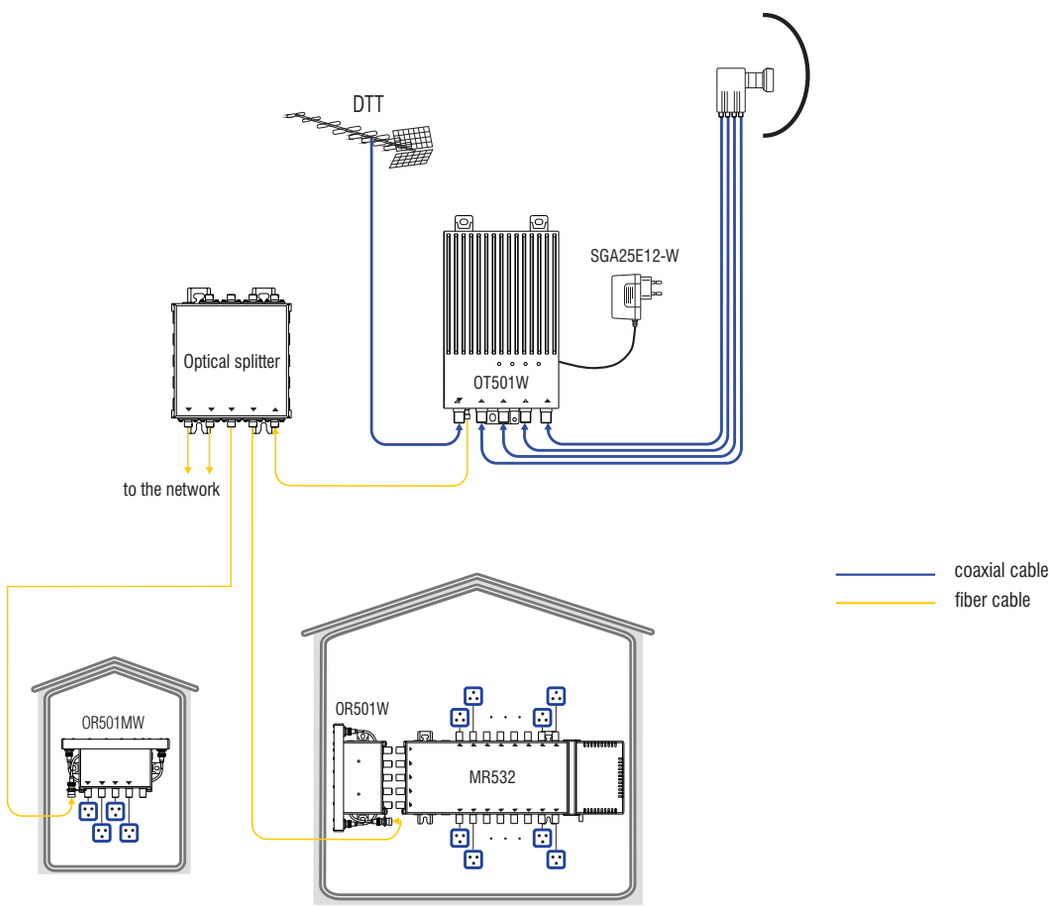
SGA25E12-W
power supply for optical transmitters
series OT4xx, OT5xx

Technical specifications

T Y P E	SYS1381-1212-W2E	SGA25E12-W
Ordering number	00635	00633
DC output	+12 V 1 A max.	+12 V 2 A max.
Mains voltage	100 V÷ 240 V~ 50/60 Hz	
Operating temperature range	0° ÷ +40° C	-20° ÷ +40° C
Dimensions/Weight (packed)	63.6x29.5x45.6 mm/0.091 kg	75.5x32x47.5 mm/0.16 kg

4 SAT IF distribution equipment
Application diagram

Application example of 1 SAT TV distribution and DTT distribution up to 32 receivers.



OT501W - optical transmitter, **page 4.23**
OR501MW - optical receiver with 4x4 multiswitch and WDM diplexer, **page 4.25**
OR501W - optical receiver, virtual quatro, with WDM diplexer, **page 4.25**
MR532 - 5x32 multiswitch, see **www.terraelectronics.com**
SGA25E12-W - power supply, **page 4.26**

Optical amplification equipment
Modular optical amplifiers

- C-band booster amplification
- low noise, high output, high reliability
- Web interface and SNMP monitoring
- automatic shutdown on low input
- easy changeable integrated fan
- DIN rail or wall mounting
- robust die-cast housing
- connectors:
  optical - FC/APC
  LAN connector - RJ-45
  screw terminal block for DC entry

Technical specifications

T Y P E	OAD514	OAD518
Ordering number	03866	03865
Operating wavelength	1528-1564 nm	
Input power	-3...+10 dBm	
Number of outputs	4	8
Power per output	13 dBm	10 dBm
Noise figure	5 dB max.	
Optical return loss	min. 50 dB	
Status indication	LAN & LED	
Supply voltage	12 V ± 1 V	
Current consumption	1.2 A max.	
Operating temperature range	10 ÷ + 35 °C	
Dimensions/Weight (packed)	65x198x124.5 mm/1.64 kg	65x198x124.5 mm/1.7 kg

Remotely monitored parameters:

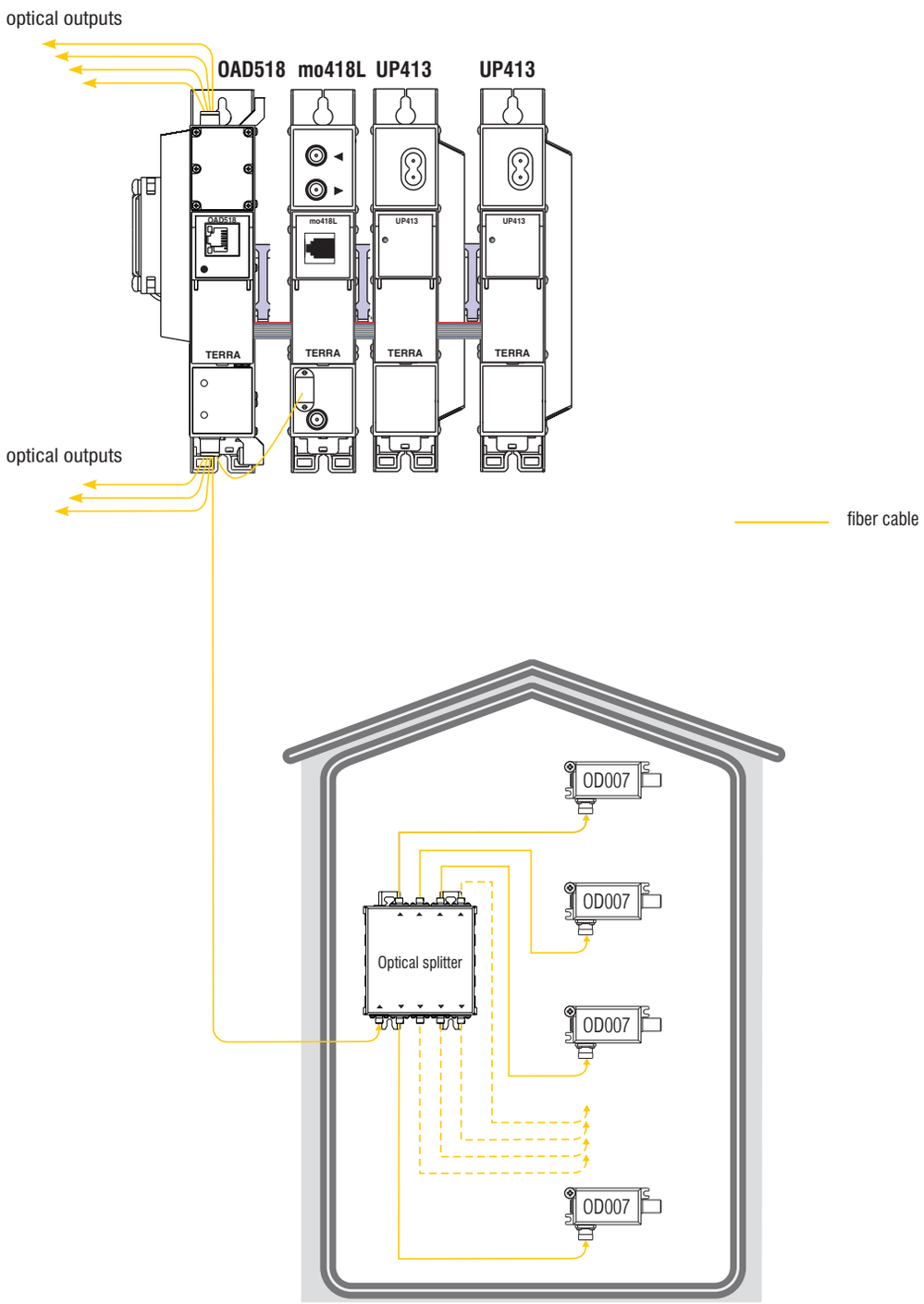
- optical input power
- optical output power
- supply voltage
- pump laser current
- internal temperature
- fan speed
- alarms information
- diagnostic information

Remotely controlled parameters:

- switching pump laser On/Off
- all alarms limits

Optical amplification equipment
Application diagram

Application example of large SAT IF & DTT distribution network.



OAD518 - optical amplifier, **page 4.28**
mo418L - optical transmitter, **page 4.08**
UP413 - power supply, **page 4.10**
OD007 - optical receiver, **page 4.16**

5.Broadband equipment

Contents

TERRA

House amplifiers

Apartment amplifiers

- built-in adjustable gain regulators
- die-cast housing inside plastic case
- built-in power supply

AS036
amplifier with two outputs

AS038
amplifier with four outputs

AS036R65
amplifier with two outputs;
with passive return path from output #1

AS038R65
amplifier with four outputs;
with passive return path from output #1

AS039
amplifier with two outputs

AS039R65
amplifier with two outputs;
with passive return path

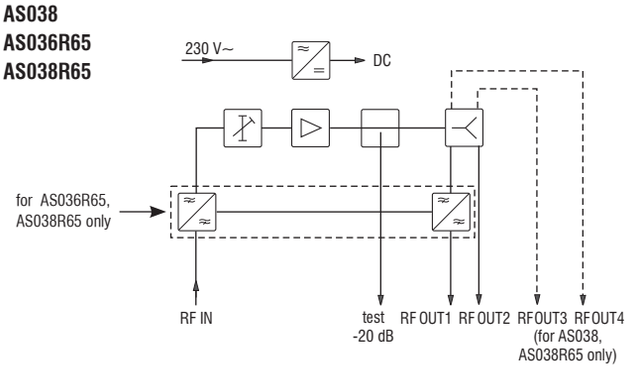
CABRIOLINE

Technical specifications

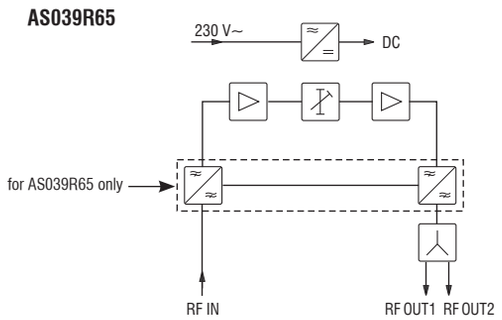
TYPE	AS036	AS036R65	AS038	AS038R65	AS039	AS039R65
Ordering number	02510	02511	02512	02513	02514	02515
Forward path						
Frequency range	47-862 MHz	87-862 MHz	47-862 MHz	87-862 MHz	47-862 MHz	87-862 MHz
Outputs number	2		4		2	
Gain	19 dB/47 MHz; 23 dB/862 MHz		16 dB/47 MHz; 20 dB/862 MHz		16 dB/47 MHz*; 20 dB/862 MHz*	
Gain adjustment	0 ÷ -16 dB				0 ÷ -12 dB	
Maximal output level IMD3=60 dB (DIN45004B)	103 dBμV		100 dBμV		100 dBμV*	
Input and output return loss	>10 dB				-	
Noise figure	< 5 dB				< 6 dB	
Test point	-20 dB				-	
Outputs decoupling	> 16 dB				-	
Return path						
Frequency range	-	5 - 65 MHz	-	5-65 MHz	-	5-65 MHz
Gain	-	-2 dB	-	-2 dB	-	-5 dB*
Return loss	-	> 14 dB	-	> 14 dB	-	> 12 dB*
General						
Power consumption	230 V~ 50/60 Hz 3 W					
Operating temperature range	-20° ÷ +50° C					
Dimensions/Weight (packed)	133x63x39 mm/0.36 kg		133x73x39 mm/0.36 kg		133x63x39 mm/0.36 kg	

* when loaded other symmetrical output

AS036
AS038
AS036R65
AS038R65



AS039
AS039R65



TERRA

House amplifiers
Medium power amplifiers

- built-in adjustable gain & slope regulators
- die-cast housing inside plastic case
- interstage switchable forward path gain allowing to reduce gain without affect noise figure of the amplifier

HA024
without return path

HA024R30
passive return path 30 MHz

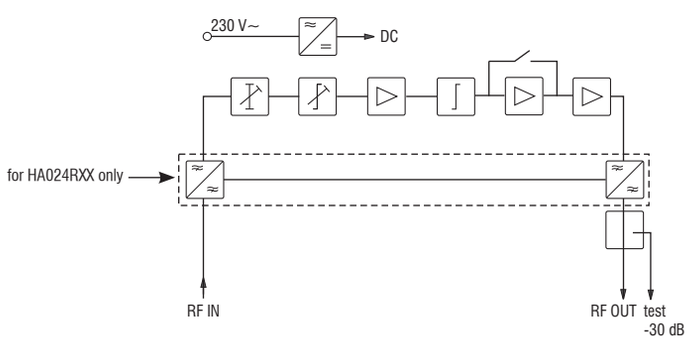
HA024R65
passive return path 65 MHz

CABRIOLINE

Technical specifications

T Y P E	HA024	HA024R30	HA024R65
Ordering number	02520	02521	02522
Forward path			
Frequency range	47- 862 MHz		87- 862 MHz
Gain, switchable*	18-20/27-30 dB (fixed slope pre-correction)		
Gain adjustment	17 dB		
Slope adjustment	17 dB		
Flatness*	±0.5 dB	±0.75 dB	
Input and output return loss	≥ 14 dB at 40 MHz; -1.5 dB/oct., but not less 10 dB		
Output level CTB, CSO (EN60728-3)	97 dBμV		
Test point	- 30 dB bi-directional		
Noise figure	8.5 dB		
Return path			
Frequency range	-	5 - 30 MHz	5-65 MHz
Gain	-	-1.5 dB	-2.5 dB
Return loss	-	> 14 dB	
General			
Power consumption	230 V~ 50/60 Hz 3.5 W		
Operating temperature range	-20° ÷ +50° C		
Dimensions/Weight (packed)	133x63x39 mm/0.36 kg		

* for amplifier with return path measured 10 MHz after the starting frequency of forward path



House amplifiers
Medium power amplifiers

- built-in adjustable gain & slope regulators
- interstage switchable forward path gain allowing to reduce gain without affect noise figure of the amplifier
- die-cast housing inside plastic case

HA129
without return path

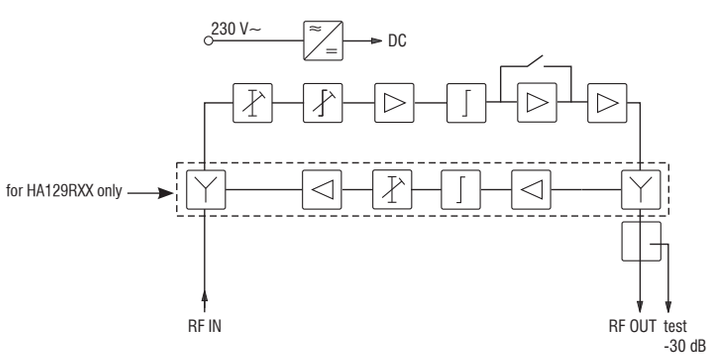
HA129R30, HA129R65
active return path 30 MHz and 65 MHz

CABRIOLINE

Technical specifications

T Y P E	HA129	HA129R30	HA129R65
Ordering number	10589	10590	10591
Forward path			
Frequency range	47- 862 MHz		87- 862 MHz
Gain, switchable*	24-27/32-36 dB (fixed slope pre-correction)		
Gain adjustment	17 dB		
Slope adjustment	17 dB		
Flatness*	±0.5 dB	±0.75 dB	
Input and output return loss	≥ 14 dB at 40 MHz; -1.5 dB/oct., but not less 10 dB		
Output level CTB, CSO (EN60728-3)	100 dBμV		
Test point	- 30 dB bi-directional		
Noise figure	8.5 dB		
Return path			
Frequency range	-	5 - 30 MHz	5-65 MHz
Gain	-	18-21 dB (fixed slope pre-correction)	
Gain adjustment	-	15 dB	
Flatness	-	±0.75 dB	
Return loss	-	> 14 dB	
Noise figure	-	6 dB	
Maximal output level IMD3=60 dB (DIN45004B)	-	114 dBμV	
General			
Power consumption	230 V~ 50/60 Hz 2.5 W	230 V~ 50/60 Hz 4 W	
Operating temperature range	-20° ÷ +50° C		
Dimensions/Weight (packed)	133x63x39 mm/0.36 kg		

* for amplifier with return path measured 10 MHz after the starting frequency of forward path



House amplifiers
Medium power amplifiers

- built-in adjustable gain & slope regulators
- output test point and screw terminal for equipotential bonding
- metal-plastic housing for indoor mounting

HA123
medium gain - 28 dB

HA123R30, HA123R65
passive return path 30 MHz and 65 MHz

HA126
high gain - 34 dB

HA126R30, HA126R65
passive return path 30 MHz and 65 MHz

Technical specifications

T Y P E		HA123	HA123R30	HA123R65	HA126	HA126R30	HA126R65
Ordering number		01559	01566	01597	10539	10540	10541
Frequency range	forward path	47- 862 MHz		87- 862 MHz	47- 862 MHz		87- 862 MHz
	return path	-	5-30 MHz	5-65 MHz	-	5-30 MHz	5-65 MHz
Gain		28 dB			34 dB		
Flatness*		± 0.5 dB	± 0.7 dB		± 0.5 dB	± 0.7 dB	
Gain adjustment		20 dB					
Slope adjustment, typical		18 dB					
Maximal output level IMD3=60 dB (DIN45004B)		117 dBμV					
Output level CTB, CSO (EN60728-3)		101 dBμV					
Input and output return loss		≥ 14 dB at 40 MHz; -1.5 dB/oct., but not less 10 dB					
Noise figure		6 dB			7 dB		
Test point		- 30 dB					
Power consumption		230 V~ 50/60 Hz 5 W					
Operating temperature range		-20° ÷ +50° C					
Dimensions/Weight (packed)		107x148x53 mm/0.6 kg					

* for amplifiers with return path measured 10 MHz after the starting frequency of forward path

- built-in adjustable gain & slope regulators
- input and output bi-directional test points
- die-cast housing

Technical specifications

T Y P E	HA131
Ordering number	02572
Frequency range	47- 862 MHz
Gain	36 dB
Flatness	± 0.7 dB
Gain adjustment	20 dB
Slope adjustment	20 dB
Maximal output level IMD3=60 dB (DIN45004B)	122 dBμV
Output level CTB (EN60728-3)	106 dBμV
Output level CSO (EN60728-3)	101 dBμV
Input and output return loss	≥ 14 dB at 40 MHz; -1.5 dB/oct., but not less 10 dB
Noise figure	7 dB
Test points	input - 20 dB, output - 30 dB
Power consumption	230 V~ 50/60 Hz 6.5 W
Operating temperature range	-20° ÷ +50° C
Dimensions/Weight (packed)	135x164x52 mm/0.7 kg

House amplifiers
Medium power amplifiers

- built-in adjustable gain & slope regulators
- switchable forward path gain
- switchable passive or active return path
- input attenuator for active return path
- die-cast housing

HA127
without return path

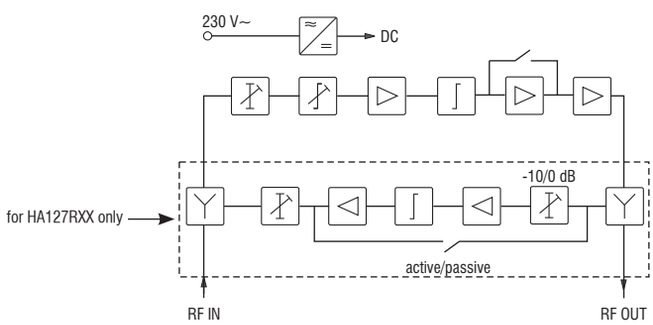
HA127R30
active return path 30 MHz

HA127R65
active return path 65 MHz

Technical specifications

T Y P E	HA127	HA127R30	HA127R65
Ordering number	10525	10526	10527
Forward path			
Frequency range	47- 862 MHz		87- 862 MHz
Gain, switchable*	24-27/32-36 dB (fixed slope pre-correction)		
Gain adjustment	18 dB		
Slope adjustment	18 dB		
Flatness*	±0.5 dB	±0.75 dB	
Input and output return loss	≥ 14 dB at 40 MHz; -1.5 dB/oct., but not less 10 dB		
Output level CTB, CSO (EN60728-3)	101 dBμV		
Noise figure	7 dB		
Return path			
Frequency range	-	5 - 30 MHz	5-65 MHz
Gain, switchable	-	21-24 dB (fixed slope pre-correction)/-3 dB (passive)	
Gain adjustment	-	18 dB	
Input attenuator	-	-10/0 dB	
Flatness	-	±0.75 dB	
Return loss	-	> 14 dB	
Noise figure	-	6 dB (active)	
Maximal output level IMD3=60 dB (DIN45004B)	-	114 dBμV (active)	
General			
Power consumption	230 V~ 50/60 Hz 5 W	230 V~ 50/60 Hz 7.5 W	
Operating temperature range	-20° ÷ +50° C		
Dimensions/Weight (packed)	185x91x47 mm/ 0.8 kg		

* for amplifiers with return path measured 10 MHz after the starting frequency of forward path



House amplifiers
High power amplifiers

- built-in adjustable gain & slope regulators
- switchable forward path gain
- switchable passive or active return path
- input attenuator for active return path
- test points: input - bi-directional, output - directional
- die-cast housing

HA205
local powered; without return path

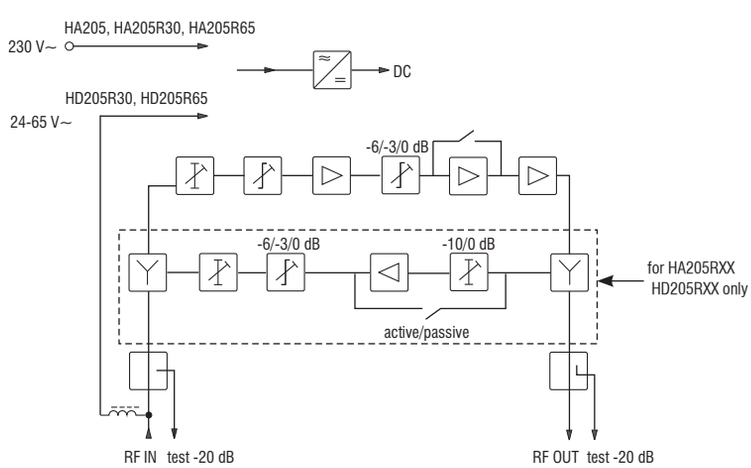
HA205R30, HA205R65
local powered; with return path 30 MHz and 65 MHz

HD205R30, HD205R65
remote powered; with return path 30 MHz and 65 MHz

Technical specifications

T Y P E	HA205	HA205R30	HA205R65	HD205R30	HD205R65
Ordering number	10529	10530	10531	10532	10533
Forward path					
Frequency range	47- 862 MHz		87- 862 MHz	47- 862 MHz	87- 862 MHz
Gain, switchable *	27/36 dB				
Gain adjustment	18 dB				
Slope adjustment	18 dB				
Interstage equalizer	-6/-3/0 dB				
Flatness*	±0.5 dB	±0.75 dB			
Input and output return loss	≥ 14 dB at 40 MHz; -1.5 dB/oct., but not less 10 dB				
Output level CTB, CSO (EN60728-3)**	109 dBμV				
Noise figure	7.5 dB				
Test points	-20 dB				
Return path					
Frequency range	-	5 - 30 MHz	5-65 MHz	5 - 30 MHz	5-65 MHz
Gain, switchable	-	27/-4 dB			
Gain adjustment	-	18 dB			
Input attenuator	-	-10/0 dB			
Output equalizer	-	-6/-3/0 dB			
Flatness	-	±0.75 dB			
Return loss	-	> 14 dB			
Noise figure	-	7 dB (active, 0 dB input attenuator)			
Maximal output level IMD3=60 dB (DIN45004B)	-	115 dBμV (active)			
General					
Power consumption	230 V~ 50/60 Hz 5 W	230 V~ 50/60 Hz 6 W		24-65 V~ 50/60 Hz 6 W	
Operating temperature range	-20° ÷ +50° C				
Dimensions/Weight (packed)	185x91x47 mm/0.7 kg				

* for amplifiers with return path measured 10 MHz after the starting frequency of forward path
** with 6 dB interstage equalizer



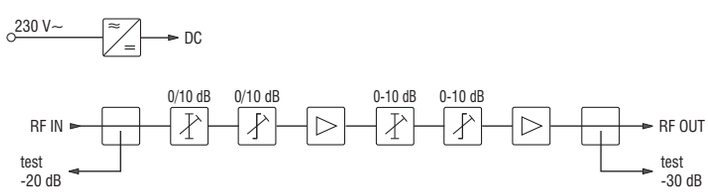
House amplifiers
High power amplifier

- push-pull output stage
- built-in adjustable gain & slope regulators
- input and output test points
- die-cast housing

Technical specifications

T Y P E	HA210
Ordering number	10584
Frequency range	47- 862 MHz
Gain	36 dB
Flatness	± 0.7 dB
Gain adjustment	20 dB
Slope adjustment	20 dB
Output level CTB, CSO (EN60728-3)*	107 dBµV
Input and output return loss	≥ 14 dB at 40 MHz; -1.5 dB/oct., but not less 10 dB
Noise figure	7 dB
Test points	input - 20 dB, output - 30 dB
Power consumption	230 V~ 50/60 Hz 6 W
Operating temperature range	-20° ÷ +50° C
Dimensions/Weight (packed)	135x180x52 mm/0.7 kg

* measured with 10 dB equalizer



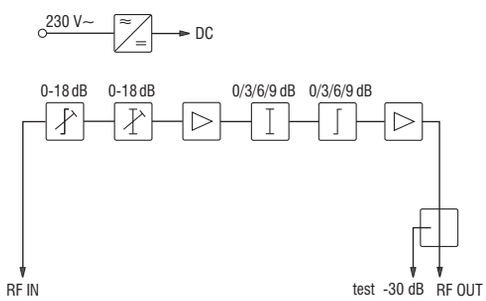
House amplifiers
High power amplifier

- GaAs push-pull output stage
- high output level
- interstage attenuator, slope precorrection and adjustable gain & slope regulators
- output test point
- weatherproof and RF-screened die-cast housing

Technical specifications

TYPE	BA214
Ordering number	02504
Frequency range	47 - 862 MHz
Gain	41 dB
Flatness	± 0.5 dB
Gain adjustment	18 dB
Slope adjustment	18 dB
Interstage attenuator	0/3/6/9 dB
Interstage equalizer	0/3/6/9 dB
Output level CTB, CSO (EN60728-3)*	115 dBμV (42 ch.)
Input and output return loss	≥ 18 dB at 40 MHz - 1.5 dB/octave
Noise figure	< 5 dB
Test point	- 30 dB
Power consumption	230 V~ 50/60 Hz 13 W
Operating temperature range	-20° ÷ +50° C
Dimensions	180x132x76 mm (main body); 213x132x76 mm (with fixing ears)
Weight (packed)	1.4 kg

* measured with 6 dB interstage equalizer



House amplifiers

High power amplifiers

- switchable by 1 dB step, noninterruptable gain & slope regulators ensure high stability of operation
- switchable forward path gain, passive or active return path, ingress blocking filter
- input attenuator for active return path
- test points: input - bi-directional, output - directional
- die-cast housing

HA209
local powered; without return path

HA209R30, HA209R65
local powered; with return path 30 MHz and 65 MHz

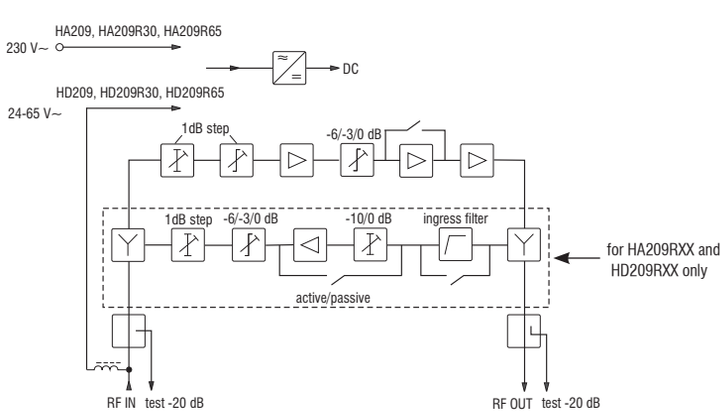
HD209
remote powered; without return path

HD209R30, HD209R65
remote powered; with return path 30 MHz and 65 MHz

Technical specifications

T Y P E	HA209	HA209R30	HA209R65	HD209	HD209R30	HD209R65
Ordering number	10578	10579	10580	10581	10582	10583
Forward path						
Frequency range	47-1002 MHz		87-1002 MHz	47-1002 MHz		87-1002 MHz
Gain, switchable *	27/36 dB					
Gain adjustment	15 dB by 1 dB step					
Slope adjustment	15 dB by 1 dB step					
Interstage equalizer	-6/-3/0 dB					
Flatness*	±0.5 dB	±0.75 dB		±0.5 dB	±0.75 dB	
Input and output return loss	≥ 14 dB at 40 MHz; -1.5 dB/oct., but not less 10 dB					
Output level CTB, CSO (EN60728-3)**	109 dBμV					
Noise figure	≤ 6.5 dB					
Test points	-20 dB					
Return path						
Frequency range	-	5 - 30 MHz	5-65 MHz	-	5 - 30 MHz	5-65 MHz
Gain, switchable	-	27/-3 dB		-	27/-3 dB	
Gain adjustment	-	15 dB by 1 dB step		-	15 dB by 1 dB step	
Ingress blocking filter attenuation	-	>20 dB up to 13.5 MHz; <1.5 dB from 18 MHz		-	>20 dB up to 13.5 MHz; <1.5 dB from 18 MHz	
Input attenuator	-	-10/0 dB		-	-10/0 dB	
Output equalizer	-	-6/-3/0 dB		-	-6/-3/0 dB	
Flatness	-	±0.75 dB		-	±0.75 dB	
Return loss	-	> 14 dB		-	> 14 dB	
Noise figure	-	5 dB (active, 0 dB input attenuator)		-	5 dB (active, 0 dB input attenuator)	
Maximal output level IMD3=60 dB (DIN45004B)	-	115 dBμV (active)		-	115 dBμV (active)	
General						
Power consumption	230 V~ 50/60 Hz 6 W	230 V~ 50/60 Hz 7 W		24-65 V~50/60 Hz 6 W	24-65 V~ 50/60 Hz 7 W	
Operating temperature range	-20° ÷ +50° C					
Dimensions/Weight (packed)	185x91x47 mm/0.7 kg					

* for amplifiers with return path measured 10 MHz after the starting frequency of forward path
** with 6 dB interstage equalizer



Overview of house amplifiers

Type	Return path			Forward path					Powering voltage/ Power consumption max.	IN/OUT connectors	Page
	Frequency range	Fixed/ Plug-in	Active/ Passive	Frequency range	Gain	Output level					
						IMD3=60 dB (DIN45004B)	CTB (EN50083-3)	CSO (EN50083-3)			
AS036	-	-	-	47-862 MHz	23 dB	103 dBµV	-	-	230 V~ 3 W	F	5.02
AS036R65	5-65 MHz	F	P	87-862 MHz	23 dB	103 dBµV	-	-	230 V~ 3 W	F	5.02
AS038	-	-	-	47-862 MHz	20 dB	100 dBµV	-	-	230 V~ 3 W	F	5.02
AS038R65	5-65 MHz	F	P	87-862 MHz	20 dB	100 dBµV	-	-	230 V~ 3 W	F	5.02
AS039	-	-	-	47-862 MHz	20 dB	100 dBµV	-	-	230 V~ 3 W	F	5.02
AS039R65	5-65 MHz	F	P	87-862 MHz	20 dB	100 dBµV	-	-	230 V~ 3 W	F	5.02
HA024	-	-	-	47-862 MHz	18-20/27-30 dB	-	97 dBµV	97 dBµV	230 V~ 3.5 W	F	5.03
HA024R30	5-30 MHz	F	P	47-862 MHz	18-20/27-30 dB	-	97 dBµV	97 dBµV	230 V~ 3.5 W	F	5.03
HA024R65	5-65 MHz	F	P	87-862 MHz	18-20/27-30 dB	-	97 dBµV	97 dBµV	230 V~ 3.5 W	F	5.03
HA129	-	-	-	47-862 MHz	24-27/32-36 dB	-	100 dBµV	100 dBµV	230 V~ 2.5 W	F	5.04
HA129R30	5-30 MHz	F	A	47-862 MHz	24-27/32-36 dB	-	100 dBµV	100 dBµV	230 V~ 4 W	F	5.04
HA129R65	5-65 MHz	F	A	87-862 MHz	24-27/32-36 dB	-	100 dBµV	100 dBµV	230 V~ 4 W	F	5.04
HA123	-	-	-	47-862 MHz	28 dB	117 dBµV	101 dBµV	101 dBµV	230 V~ 5 W	F	5.05
HA123R30	5-30 MHz	F	P	47-862 MHz	28 dB	117 dBµV	101 dBµV	101 dBµV	230 V~ 5 W	F	5.05
HA123R65	5-65 MHz	F	P	87-862 MHz	28 dB	117 dBµV	101 dBµV	101 dBµV	230 V~ 5 W	F	5.05
HA126	-	-	-	47-862 MHz	34 dB	117 dBµV	101 dBµV	101 dBµV	230 V~ 5 W	F	5.05
HA126R30	5-30 MHz	F	P	47-862 MHz	34 dB	117 dBµV	101 dBµV	101 dBµV	230 V~ 5 W	F	5.05
HA126R65	5-65 MHz	F	P	87-862 MHz	34 dB	117 dBµV	101 dBµV	101 dBµV	230 V~ 5 W	F	5.05
HA131	-	-	-	47-862 MHz	36 dB	122 dBµV	106 dBµV	101 dBµV	230 V~ 6.5 W	F	5.05
HA127	-	-	-	47-862 MHz	24-27/32-36 dB	-	101 dBµV	101 dBµV	230V~ 5 W	F	5.06
HA127R30	5-30 MHz	F	A/P	47-862 MHz	24-27/32-36 dB	-	101 dBµV	101 dBµV	230V~ 7.5 W	F	5.06
HA127R65	5-65 MHz	F	A/P	87-862 MHz	24-27/32-36 dB	-	101 dBµV	101 dBµV	230V~ 7.5 W	F	5.06
HA205	-	-	-	47-862 MHz	27/36 dB	-	109 dBµV	109 dBµV	230V~ 4 W	F	5.07
HA205R30	5-30 MHz	F	A/P	47-862 MHz	27/36 dB	-	109 dBµV	109 dBµV	230V~ 5 W	F	5.07
HA205R65	5-65 MHz	F	A/P	87-862 MHz	27/36 dB	-	109 dBµV	109 dBµV	230V~ 5 W	F	5.07
HD205R30	5-30 MHz	F	A/P	47-862 MHz	27/36 dB	-	109 dBµV	109 dBµV	24-65 V~ 7 W	F	5.07
HD205R65	5-65 MHz	F	A/P	87-862 MHz	27/36 dB	-	109 dBµV	109 dBµV	24-65 V~ 7 W	F	5.07
HA210	-	-	-	47-862 MHz	36 dB	-	107 dBµV	107 dBµV	230V~ 6 W	F	5.08
BA214	-	-	-	47-862 MHz	41 dB	-	115 dBµV	115 dBµV	230 V~ 13 W	F	5.09
HA209	-	-	-	47-1002 MHz	27/36 dB	-	109 dBµV	109 dBµV	230V~ 6 W	F	5.10
HA209R30	5-30 MHz	F	A/P	47-1002 MHz	27/36 dB	-	109 dBµV	109 dBµV	230V~ 7 W	F	5.10
HA209R65	5-65 MHz	F	A/P	87-1002 MHz	27/36 dB	-	109 dBµV	109 dBµV	230V~ 7 W	F	5.10
HD209	-	-	-	47-1002 MHz	27/36 dB	-	109 dBµV	109 dBµV	230V~ 6 W	F	5.10
HD209R30	5-30 MHz	F	A/P	47-1002 MHz	27/36 dB	-	109 dBµV	109 dBµV	230V~ 7 W	F	5.10
HD209R65	5-65 MHz	F	A/P	87-1002 MHz	27/36 dB	-	109 dBµV	109 dBµV	230V~ 7 W	F	5.10

[1] frequency range depends on inserted plug-in diplexer
[2] depends on inserted active or passive plug-in module

2019/20

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