



Headend Equipment

Matchmaster has a full range of Headend equipment from entry level to complex systems, including engineering support and system designs.

Matchmaster can offer simple Channel Filters with AGC through to complex DVB modules for any type of broadcast including Encoders, Modulators & Transmodulators for DVB-T, DVB-C, DVB-S/S2, IP, ASI, SDI, FM and many more.

Headend Equipment

Vast Multi-service Cam & Smart Card

13MM-VAST-MULTICAM

Features and Benefits

- » Decode Multiple services - up to 8 TV or Radio
- » VAST to COFDM Headend solutions for remote sites, Mine Camps etc
- » Reception of VAST services in commercial application



10 Input 1 RF Output Combiner For 14MM-GN40/GN50

14MM-DM17-1001

Features and Benefits

- » 10 TAP inputs
- » Test point -20dB
- » 19" rack mounting
- » Great to combine headends with high isolation



14MM-DM17-1001 Specifications

Frequency Range	5-1000MHz	
Impedance	75Ohm	
Number of Inputs	10	
Number of Outputs	1	
Through Loss IN-OUT	65MHz	14dB
	862MHz	16dB
Isolation IN-IN	>27dB	
Test Port	-20dB	
Dimensions	19", 1RU	
Connectors	F	
EAN	4010056708030	

21 Port Combination Splitter

14MM-DC28W-3S1T

Features and Benefits

- » RF input splitter for Matchmaster's headend range, combination unit for satellite and terrestrial
- » Satellite x 21 and terrestrial x 7 outputs
- » DC pass for LNB powering
- » Industry standard 19" rack mountable
- » Can be used as stand alone splitter for other applications



14MM-DC28W-3S1T Specifications

Frequency Range	Terr.	45-862MHz
	SAT	920-2150MHz
Input Impedance	75 Ohm	
Input Return Loss	Terr.	>15dB
	SAT	>11dB
Number of Outputs	28	
Output Impedance	75 Ohm	
Output Return Loss	Terr.	>15dB
	SAT	>11dB
Through Loss In-Out 1-2	Terr.	<13dB (31dB)
	SAT	<14dB (32dB)
Through Loss In-Out 3-7	Terr.	<13dB (31dB)
	SAT	<14dB (32.5dB)
Isolation Out-Out	>25dB/>23dB	
Power Pass	Terr.	No
	SAT	Yes (from all taps)
DC Voltage	<21 VDC	
DC Current (continuous)	<1.5A	
DC Current (pulse)	<17A, 20ms	
Dimensions	19", 1 RU	
Connectors Input	4 x F-Connector	
Connectors Output	28 x F-Connector	
Temperature Range	-20° - +55°C	
EAN	4010056712556	

Headend Equipment

Dual HDMI To COFDM MPEG2/4 Modulator Rack Mount 14MM-DD2HD-R

Features and Benefits

- » 2 HDMI inputs and outputs 1 RF channels and 1 UDP IP port

Quad HDMI To COFDM MPEG2/4 Modulator Rack Mount 14MM-DD4HD-R

Features and Benefits

- » 4 HDMI inputs and outputs 2 RF channels and 1 UDP IP port



Specifications

Product Code	14MM-DD4HD-R	14MM-DD2HD-R
Video Input	HDMI*4	HDMI*2
Video Resolution	1920x1080_60P, 1920x1080_50P, (-for MPEG4/H.264), 1920x1080_60i, 1920x1080_50i, 1280x720_60p, 1280x720_50p	
Audio Encoding	MPEG1 Layer II, (MPEG2-AAC, MPEG4-AAC available)	
Audio Sample Rate	48KHz	
Audio Bit Rate	64bps, 96kbps, 128kbps, 192kbps, 256kbps, 320kbps	
Standard	EN300744	
FFT Model	2k, 8k	
Bandwidth	6M, 7M, 8M	
Constellation	QPSK, 16QAM, 64QAM	
Guard Interval	1/4, 1/8, 1/16, 1/32	
FEC	1/2, 2/3, 3/4, 5/6, 7/8	
MER	42dB	
RF Frequency	30-960MHz, 1KHz step	
RF Out	2*RF COFDM DVB-T out (2 carriers combined output)	1* RF Output
RF Output Level	-30 - -10dBm (81-97dBμV), 0.1dB Step	
Local Interface	LCD + Control Buttons	
Remote Management	Web NMS	
Ouput	2*MPTS out (RJ45, 100M)	1*MPTS out (RJ45, 100M)
Power Supply	AC 100V-240V	
Operating Temperature	0° -45°C	



Headend Equipment

Chameleon 1HU Base Unit With Power Supply Unit And Fan 14MM-GN20B

Features and Benefits

- » Holds up to 2 Chameleon cards
- » High DVB processing power
- » Also available with dual redundant power supply unit (14MM-GN20R)



Specifications

Product Code	14MM-GN20B	14MM-GN20R
Dimensions	483 x 235mm	
Power Supply	Single PSU, approx. 60W	Dual Redundant PSU, approx. 2x60W

3RU Professional Sub-Rack With Gig-E SW 14MM-GN50

Features and Benefits

- » Embedded gigabit switch has GigE capacity with 4 streaming ports and 1 management port
- » Large capacity signal processing
- » Built in power supply and option for redundancy, double independent, load sharing power supply units
- » Wall mountable or 19" rack mountable
- » The fan tray is hot-swappable from the front



Redundant Power Supply For GN50 14MM-GN55W-0230

Features and Benefits

- » Redundant PSU 230V for GN50
- » Hot pluggable
- » Load sharing with redundant PSU
- » Information readable: type, serial number, hardware ID, software ID, max. output power, threshold of max. current, voltage and temperature
- » Measure values: output voltage internal, output voltage external, output current, temperature

Chameleon Chassis 3RU 14MM-GN40

Features and Benefits

- » Access to management and streaming RJ45 Ethernet ports
- » Large capacity signal processing with remote control
- » Built in 1 RU power supply and fan unit
- » Wall mountable or 19" rack mountable



14MM-GN40 Specifications

Module Slots	10
Power Supplies	1 pcs.
Operating Voltage AC	180-265V (47-63Hz)
Power Consumption	<245W
Operating Temperature	-20° - +50°C

14MM-GN50 Specifications

Streaming Ports	4 pcs. (1 Gbit/s)
Control Ports	1 pcs. (100 Mbit/s)
Category	Layer 2+
Multicast	IGMP V2 + V3
Protocols	RTP, UDP, Multicast/Unicast
Redundancy	N+1 Module Redundancy
Module Slots	10 pcs.
RJ45	5 pcs.
Power Supplies	1 pcs.
Optional Redundant Power Supply Unit	1 pcs.
Operating Voltage AC	180-265V (47-63Hz)
Power Consumption	<245W
Operating Temperature	-20° - +50°C

14MM-GN55W-0230 Specifications

Input Voltage	180V 265VAC (47-63Hz)
Operating Temperature	-5° - +45°C



Headend Equipment

Headend Combiner Amplifier For Chameleon/Tangram 14MM-GNAMP

Features and Benefits

- » Allows you to combine and amplify up to 8 RF inputs
- » Headend combine-amplifier
- » Redundant and hot swappable power supply
- » Management via web interface
- » Monitoring via SNMP
- » Adjustable gain and input attenuator via web GUI



14MM-GNAMP Specifications

Frequency Range	47-1006MHz
Analog TV Inputs	Input Nr. 1-4
QAM/FM Inputs	Input Nr. 5-8
Impedance	75Ohm
Gain	8dB (±0.5dB)
Output Level	98dBµV (CENELEC flat)
CSO/CTB	>70dB
CNR	>69dB @ Input Level 90dBµV
Input Attenuator	0-10dB (0.5dB)
Interstage Attenuator	0-5dB (0.5dB)
Interstage Slope	
Input Isolation	≥25dB (-1 dB/Oct.)
FM Filter Input (switchable)	Input Nr. 7, 8
FM Filter Interstage (switchable)	Input Nr. 1-4; 5-8
RF-Test Point	-20dB
Loop Through Input	0dB
Power Supply	Redundancy Hot Pluggable Current/Voltage controlled
EMC	EN50083-2
Power Consumption	≥11W
Operating Temperature Range	-20° - +50°C
Nominal Temperature Range	0° - +40°C
Input	8 x F-connector
Output	1 x F-connector
Test Point	1 x F-connector
LT-Input (0dB)	1 x F-connector
Management	RJ45
Indicators	5 x LED (Amp, Temp/Fan, PS1, PS2, Power)

Chameleon Software Licenses

Features and Benefits

- » Individual software unlocking facilitates the application-specific product activation. You only pay for what you use
- » Firmware version upgrades for 12 months
- » Quick and easy expansion by adding additional units or software options, extended SLA available
- » Absolute flexibility for signal processing



Product Code	License For
14MM-GNC	One DVB-C Tuner
14MM-GNDC	Two DVB-C Tuners
14MM-GNCI	One CI Slot
14MM-GNDCI	Two CI Slots
14MM-GNCMOD	One QAM Output
14MM-GNDCMOD	Two QAM Outputs
14MM-GNDASI	Dual ASI In/Out BNC 1 & 2
14MM-GNDOL	Dolby Audio Decoding
14MM-GNT	One DVB-T Tuner
14MM-GNDT	Two DVB-T Tuners
14MM-GNTMOD	One COFDM Output
14MM-GNDTMOD	Two COFDM Outputs
14MM-GNVMOD	One VSB Output
14MM-GNDVMOD	Two VSB Outputs
14MM-GNHSDI	HD SDI Decoder On BNC1
14MM-GNMUX	Multiplexer
14MM-GNOCTFM	8 FM Radio Outputs
14MM-GNS2	One DVB-S/S2 Tuner
14MM-GNDS2	Two DVB-S/S2 Tuners
14MM-GNSCR	Quad Simulcrypt Scrambler
14MM-GNSSDI	SD SDI Decoder To BNC1
14MM-GNSTR	IP Streaming
14MM-GNSTREC	IP Streaming With Fec
14MM-GNSYMUX	Umbrella Software For Interconnected Multiplexers
14MM-GNSYSMG	System Management



Headend Equipment

Chameleon MPEG4 SD/HD Encoder Module 14MM-GNHWENCW

Features and Benefits

- » Chameleon hardware module dedicated encoder offering both standard definition and high definition with HDMI input
- » All desired Individual solution functions can simply be activated and modified by uploading software
- » Absolute flexibility for signal processing
- » Additional modules are linked via IP interfaces increasing the processing capacity to match the computing performance of bigger multiplexers
- » ASI/SDI/IP output options



14MM-GNHWENCW Specifications

Analog Video Input	
Number of Ports	2 x BNC Ports
Input Format	CBVS (Composite FBAS-signal) PAL (B/G, H, I, M, N), NTSC, SECAM
Input Impedance	75Ohm
Analog Audio Input	
Number of Ports	3 x 3.5mm Jack Ports
Input Format	Left, Right Asymmetrical
Input Impedance	600Ohm/15kOhm (switchable)
SDI Input	
Number of Ports	2 BNC ports
Input Video	SDI, Audio Embedded
Input Audio	Stereo/Mono/Dual Sound
Input Format	1080i50, 1080i60, 720p50, 720p60
Input Impedance	75Ohm

HD-SDI Input	
Number of Ports	1 BNC port, hard wired to BNC port 1
Input Video	HD-SDI, Audio Embedded
Input Audio	Stereo/Mono/Dual Sound
Input Format	1080i50, 1080i60, 720p50, 720p60
Input Impedance	75Ohm
HDMI Input	
Number of Ports	1 x HDMI
Input Format HDMI	1080i50, 720p50, 576i50
Compliance HDMI	HDMI 1.4a (no scaling)
Encoding Parameters Video	
Video System	ISO/IEC 14496-10 (H.264/AVC) High Profile, Level 4.0
Picture Size SD	576i50
Picture Size HD	1080i50, 720p50
Picture Format SD	4:3
Picture Format HD	16:9
Encoding Parameters Audio	
Audio System	ISO 11173-3 (MPEG-1 L2) Dolby Digital AC3 MPEG-2 AAC (LC(HE))
Number of Audio Channels	2 per Video Input
ASI TS Output	
Number of Ports	1 x F Connector Port
Packet Size	188 Byte
ASI Output Capacity	1 TS (MPTS or SPTS)
IP TS Output	
Output Bitrate	Max 50Mbit/s
Connector	GN40: RJ45 GigE GN50: SGMII GigE
Output Protocol	UDP/RTP Multicast/Unicast
IP Output Format	CBR/VBR (MPTS or SPTS)
IP Output Capacity	Max 2 TS
Miscellaneous	
GigE/Control/Power (Backplane)	Compact PCI Type C (SGMII)
GigE/Control for GN40	2 x RJ45 GigE, 1 Streaming, 1 Management
Power Supply	12VDC nom. (9-14VDC)
Power Consumption	Typ. 15W, max. 18W
Dimensions	230 x 105 x 40mm (excl. connectors)
Weight	Approx. 640g
Controller Embedded	Web Server, SNMP
Operating Temperature	5° - +45°C

Headend Equipment

Chameleon Multi-Purpose Hardware Module 14MM-GNHWUW



Features and Benefits

- » Modular headend system with hardware modules that can change their function as needed for all current and future applications
- » Modules can be mounted in the standard GN20, GN40 chassis as well as GN50 chassis with redundant power supply and integrated GigE switch
- » Additional modules are linked via IP interfaces increasing the processing capacity to match the computing performance of bigger multiplexers
- » Remote diagnosis and SNMP traps for alarm activation reduce maintenance

14MM-GNHWUW Specifications

DVB-S/S2 Satellite Receivers	
Input Frequency	925-2175MHz
Input Level	-65 to -25dBm, 44 to 84dBμV
Spectral Inversion	Yes, Selectable
LNB Voltage	Auto, Off or 13/18V, Programmable
22kHz to LNB	Auto, On or Off, Programmable
DVB-T/T2 Receiver	
Input Frequency	43-1002MHz
Input Level	39 to 79dBμV, -60 to -30dBm
Bandwidth (DVB-T)	6/7/8MHz
Bandwidth (DVB-T2)	1.7/5/6/6/8 MHz and ext. Bandwidth
DVB-C Receiver	
Input Frequency	43-1002MHz
Input Level	49 to 79dBμV, -60 to -30dBm
Bandwidth	8MHz
Symbol Rate	1-7.2 Mbaud
ASI Input/Output	
Max Payload Bit Rates in/out	Typical 200Mbit/s
PCR Restamping	Yes
IPTV Input/Output	
Input Bit Rate	Max 110Mbit/s per IPTS, Max 200Mbit/s total
Output Bit Rate	Max 100Mbit/s per IPTS, Max 200Mbit/s total
Input/Output Protocol	UDP/RTP Multicast/Unicast
Input/Output Format/Capacity	CBR/VBR, Max 20 IPTS
Time Stamp & De-jitter	Yes
CI Multidecryption	
Supported Bit Rates	55/62/72 Mbit/s

DVB-CSA Scrambler/Simulcrypt	
Interface	IP
Number of Encrypted PIDS	64 PIDs per Output
Number of SCG	64 SCG per Output
MPEG Decoder - Audio/Video	
Video Formats	MPEG-2 MP@HL, MPEG-4 H.264 AVC, HiP, Level 4
Audio Formats	MPEG-1 Layer II, AAC HE
Downscaling	HD to SD for 1 Service
Aspect Ratio	Letterbox, Pan/Scan, or conversion combined (14:9) programmable, WSS
Teletext	Subtitling Teletext or DVB subtitling
VSB - AM Modulation	
Standards	PAL B/G, D/K, I, SECAM D/K, B/G, L
Sound	Mono, NICAM stereo, A2 or A2 Stereo
Modulation Video	VSB AM, neg. or pos.
Modulation Audio	Audio FM or AM
Output Frequency	45-855MHz
Output Level	>110/107dBμV (1ch/2ch)
Video S/N (Weighted)	>65dB
C/N Broadband	>70dB (65dB typical at adjacent channel)
SDI Output	
Output Video	SDI, audio embedded
Output Audio	Stereo, Mono or Dual Sound
FM Modulation Radio	
Audio Decoder	MPEG-1 Layer I/II
Sound	Mono, stereo, joint stereo
Modulation	FM, ref ITU-R BS.450-3
RDS Insertion (dynamic and static)	Yes. ref EN50067
Output Frequency	87.5-108MHz, 100MHz step size
Output Level per FM Channel	>93dBμV
S/N	>60dB (m), >55dB (s)
C/N Broadband	>60dB
DVB-C Modulation	
QAM Mode	16, 32, 64, 128 and 256
Symbol Rate	2.4-13.6Mbaud/s
MER (at RF out)	>43dB for 256-QAM
QAM Output Frequency	43-1002MHz
Output Level	>105/102/99/96dBμV (1ch/2ch/3ch/4ch)
DVB-T Modulation	
COFDM Mode/Modulation	2k, 8k/QPSK, 16QAM, 64QAM
Guard Interval	1/4, 1/8, 1/16, 1/32
FEC	1/2, 2/3, 3/4, 5/6, 7/8
MER	>38dB, typical 40dB
Output Frequency	43-1002MHz
Output Level	>103/11dBμV (1ch/2ch)



Headend Equipment

Headend Kit VHF/UHF For All Capital Cities

14MM-KIT-420-METRO

Features and Benefits

- » Comprised of 4 x AT series channel amplifiers
- » Twin programmable 420 series offers SAW filtering and AGC control
- » Twin channel amplifiers for each module totalling 6 x VHF and 2 x UHF channels
- » Fully digitally compatible headend solution where regeneration is not required
- » Mains power supply



Headend Kit UHF 8 Channels

14MM-KIT-420-UHF8

Features and Benefits

- » Comprised of 4 x AT series UHF channel amplifiers
- » Twin programmable 420 series offers SAW filtering and AGC control
- » Twin channel amplifiers for each module totalling 8 x UHF channels
- » Very compact and fully digitally compatible headend solution where regeneration is not required



Headend Kit UHF 6 Channels

14MM-KIT-420-UHF6

Features and Benefits

- » Comprised of 3 x AT series UHF channel amplifiers
- » Twin programmable 420 series offers SAW filtering and AGC control
- » Twin channel amplifiers for each module totalling 6 x UHF channels
- » Very compact and fully digitally compatible headend solution where regeneration is not required



Multi-Channel Headend

Multiband Amplifier

14MM-MA400

Features and Benefits

- » Total flexibility with this multiband amplifier offering FM, VHF and UHF amplification
- » High-level output
- » Separate manual gain controls for each band
- » Switchable attenuation for each band
- » Loop input and output with F connection



Headend Kit VHF 6 Channels

14MM-KIT-420-VHF6

Features and Benefits

- » Comprised of 3 x AT series VHF channel amplifiers
- » Twin programmable 420 series offers SAW filtering and AGC control
- » Twin channel amplifiers for each module totalling 6 x VHF channels
- » Very compact and fully digitally compatible headend solution where regeneration is not required



14MM-MA400 Specifications

Number of Inputs	3
Gain - FM (88-108MHz)	30dB
Gain - VHF B3 (174-260MHz)	30dB
Gain - UHF (470-862MHz)	30dB
Noise Figure	VHF <7dB; UHF <5dB
Maximum Output	VHF 116dBμV; UHF 118dBμV
Gain Control Attenuator	0 to -15dB
Gain Control Switch	0/-10dB
Return Loss	>10dB
Power Consumption	12V 480mA
Operating Temperature Range	0° - +50°C

Headend Equipment

Multi-Channel Twin AV To DVB-T Modulator 14MM-MDX420

Features and Benefits

- » AT series family DVBT twin modulators totally agile and independent channels
- » AV composite to DVB-T COFDM modulator
- » Programmable twin modulators
- » Rack mountable system
- » Loop input/output with F connection



14MM-MDX420 Specifications

Video Input	Frequency Range	20Hz - 6MHz
	Level/Impedance	1 V ± 0.1 V/75Ohms
Audio Input	Frequency Range	20Hz - 15kHz
	Level/Impedance	775mV/10kOhms
	Level Adjustment	6 - -6dB (2dB step)
Processing Video	Encoding	ISO/IEC13818-2 MPEG-2 MP@ML
	Resolution	720 x 576 (at 25 fps), 720 x 480 (at 30 fps)
	Frame Rate	25 max. PAL, SECAM, 30 max. NTSC
	Compressed System Bit Rate	2-9 Mbps
Processing Audio	Encoding	ISO /IEC11172-3 (MPEG1 audio) layer 2 compliant
	Sampling Rate	44.1kHz
	Bit Rate	256Kbps
	Audio Mode	Stereo
Modulation	MER	≥35 dB
	Modulation	QPSK, QAM16, QAM64
	Channel Bandwidth	7/8MHz
	Guard Interval	1/4, 1/8, 1/16, 1/32
	Code Rate	1/2, 2/3, 3/4, 5/6, 7/8
	Transmission	2K
RF Output	Frequency Range	110 - 860MHz
	Level/Impedance	85 dBμV/75 Ohm
	Output C/N	≥50dB
	Output Level Adjustment	0 - -15.5dB by 0.5dB step
	Frequency Range of RF Combining	47-2150MHz
	DC Pass Through	0.3 A
	Combining Through Loss Terr/SAT	1.5/2.5dB
	Return Loss	≥10dB
Current Consumption	12 V 0.65 A	
Operating Temperature	0° - +50°C	



Headend Equipment

19" System Rack Mountable 14MM-MR19-420

Features and Benefits

- » AT series 19" rack mount solution offers total flexibility for your headend needs
- » Coated steel to minimise corrosion
- » Recessed for racking system permitting rack door closure



Rail For Wall Mounting 14MM-MR420

Features and Benefits

- » Multi-channel headend mounting rail only, used for modular system as wall attachment



Twin Modulator 7-8MHz Selectable Stereo 14MM-MT420C

Features and Benefits

- » Modulating analogue video/audio signals into VSB RF channel with mono or stereo A2 sound
- » LED display and push buttons control
- » RF output level and audio input level loop through RF combining low level harmonics and intermodulation products
- » Built-in test pattern generator

14MM-MT420C Specifications

Number of Internal Channel Amplifiers	2
Video Input	RCA - Composite
Video Level/Impedance	1V ± 0.1V / 75 Ohm
Audio Input	Dual RCA
Audio Level/Impedance	775mV / 10kOhm
Audio Level Adjustment	-6dB - 6dB (2dB steps)
TV Standard	B/G/D/K/Au stereo A2
Output Frequency	110-862MHz
Output Level	90 dBµV
Attenuation Available	0 - 10dB in 1dB steps
Frequency Range of RF Combining	47 - 2150MHz
Combining Through Loss Terr/Sat	1.5/2.5dB
Return Loss	> 10dB
A/V Ratio	12/16dB
IMD2/IMD3 Spurious Level	< -60dB
Power Consumption	12V 470mA
Operating Temperature	0° - +50°C



Headend Equipment

Programmer 14MM-OH41

Features and Benefits

- » Hand held programmer with memory, backlight and LED torch
- » Cable powered hand controller, no batteries
- » Works with OH family of products
- » Works with some VX amplifiers and optical TX/RX



14MM-OH41 Specifications

Display	LCD Dot Matrix
RJ11 Connectors	1 pcs.
Power Supply	5V DC
Length of Connection Cable	1.2m (max.)
Operating Temperature	0° - +50 °C

WISI OH Series Base Unit With Web Based GUI License Included (OH51)

14MM-OH50A-KIT

Features and Benefits

- » Integrated FM amplifier, high output power
- » Analog and digital channel processing headends
- » Capacity for 14 modules, 19"- rack-mounting or wall mounting (14 analog or 28 digital channels)
- » Programmable via USB stick, OH41 hand controller or WEB interface
- » Full remote access (modem switch not supplied)
- » LAN RJ45 industry standard connector



Twin OH Modulator For Analogue 14MM-OH38

Features and Benefits

- » Modulation of 2 AV signals to 2 analog TV channels multi-standard operation
- » Output frequency range 45-862 MHz
- » Interface for audio/video with BNC/Cinch
- » Independently adjustable in 250 kHz steps
- » Stereo capable vestigial sideband modulator



14MM-OH38 Specifications

Video Input Level	1 V ± 0.4 V
Video Input Bandwidth	20Hz - 5MHz
Audio Input Impedance	600 / 10 k Ohm
Audio Input Level (for nom. deviation)	- 4dBm / 1 kHz
Audio Level Range	- 9dB - +5dB
Audio Input Bandwidth	40-15000 Hz
Output Impedance	75Ohm
Output Frequency Range	45-862MHz
Frequency Steps	250kHz
Stability of Output Frequency	± 30kHz
Output Channel Bandwidth	2 x 7/8 MHz
Output Level	(1 dB steps) ± 1 dB
TV Standards	B/G, D/K, I, L
Audio Format	Mono, Stereo, Dual
S/N Video (CCIR-rec. 567-1)	>58dB
S/N Audio	>50dB
Stability of Output Level	±1dB
Spurious Inside TV Channel	>55dB
Spurious Outside TV Channel	>55dB
Power Consumption	<8W
Operating Temperature	-20° - +55 °C



Headend Equipment

RF Converter 14MM-OH45

Features and Benefits

- » Channel processor convertor used for processing signals, not suitable where channel conversion requires 34>MER
- » Mount into OH50A with full remote control via the LAN web interface
- » Data and power connection at rear of board
- » AGC control over a wide signal input range
- » Low profile blade fully shielded



14MM-OH45 Specifications

Input Frequency Range	45-862MHz
Input Frequency Steps	250kHz
Input Channel Bandwidth	7/8MHz
Input Level Range	50-90dB μ V
AGC Range	\geq 40dB
Output Frequency Range	45-862MHz
Frequency Steps	250kHz
Output Channel Bandwidth	7/8MHz
Output Level	(1dB steps) 95-105dB μ V
Group Delay (-0.5-4.43 MHz)	<80ns
S/N Audio	>50dB
Stability of Output Level	\pm 1dB
Spurious Outside TV Channel	>55dB
Connectors RF	F-connector
Current Consumption	0.5 A/12 V
Power Consumption	< 10 W
Operating Temperature	-20 ° - +55 °C

TDT Headend Base Unit Plus 8x OH84 With Power Supply 14MM-OH50A-TDT

Features and Benefits

- » Power supply for compact headend base unit
- » Base unit offers up to 14 module slots
- » Easy to configure compact headend
- » Includes 8x 4ch DVB S/S2 QAM transmodulator



14MM-OH50A/OH50A-TDT Specifications

Frequency Range TV	47-862MHz	
Frequency Range FM	87.5-108MHz	
Output Impedance	75Ohm	
Output Return Loss	>14dB	
Output Level	110dB μ V	
Output Attenuator	0-15dB (1dB steps)	
Input Level (FM)	70-100dB μ V	
FM Attenuator	0-30dB (1dB steps)	
CTB	>60dB	
CSO	>60dB	
Test Output	-20dB	
Input Voltage	180-265VAC (47-63Hz)	
Max. Power Consumption	Configured to 8x4 @ 32 transponders is 90W)	
Power Consumption	85-90W	
Efficiency	\leq 89%	
Output Voltage	12.5V	
Output Current	12A	
LNB Power	12.5V 1.2A	
PFC	EN61000-3-2	
Connectors	FM-Input	1 x F-connector
	RF-Output	1 x F-connector
	Test-Output	1 x F-connector
	Handset Control	RJ11
	Software Update Remote	USB-A RJ45
Operating Temperature	-20 ° - +50 °C	
Nominal Temperature	+5 ° - +50 °C	

Headend Equipment

Twin AV Encoder QAM/COFDM 14MM-OH66

Features and Benefits

- » Twin digital modulation solution with MPEG2 encoding of analog audio and video signals
- » Output frequency range 45-862 MHz
- » QPSK, COFDM and QAM modulation is available
- » Use ASI input of output signals
- » SDI & CVBS input selectable
- » Input / output connectors are BNC and 3.5mm for audio



14MM-OH66 Specifications

Module	OH 66 Twin A/V-Encoder
Input Video Analogue	
Input Format	Composite FBAS-signal
Input Impedance	75 Ohm
Input Level	1 V _{ss} ± 0.4 V
Frequency Range	20Hz-5MHz
Video Processing	
Encoding Standard	MPEG 2 ISO/IEC 13818-2 MP@ML (4:2:2)
Bit Rate	1.5-9 Mb/s in 1.5 Mb/s-steps; CBR & VBR
Picture size	720 Pixel horizontal, 576 Pixel vertical
Teletext	Extraction from analogue video signal
Picture Format	Support for 4:3 and 16:9 automatic detection by WSS
PID Setting	Automatic; Manual overwriting possible
PSI/SI settings	Automatic creation of PAT
NIT setting with LCN	Optional with CS77
Input Audio	
Input Format	Analogue (left/right) or digital (SDI with embedded audio)
Frequency Range	40-15000Hz
Audio Processing	
Sampling frequency	32/44, 1/48 kHz
Encoding Standard	MPEG 1 L1/L2 ISO/IEC 13818-3
Bit Rate	Up to 192 kbit/s
Format	Stereo, Joint Stereo, Dual, Mono

Output

QAM or COFDM	Can be selected by the modulation
Output Frequency Range	47-862 MHz
Spurious Outside TV Channel	≥50 dB
QAM-Mode	
Modulation Scheme	16-, 32-, 64-, 128-, 256-QAM
Output Frequency Steps	500KHz
Output Channel Bandwidth	8MHz
Output Level	88-103 dB _μ V
MER	≥40dB
Symbol rate	3.45-6.9 MS/s
Bit Stuffing	Yes
PCR Correction	Yes
COFDM-Mode	
Modulation Scheme	COFDM
Output Frequency Steps	250KHz
Output Channel Bandwidth	7/8MHz
Output Level	82-97dB _μ V
MER	≥37dB
Modulation of Single Carriers	QPSK, 16-, 64-QAM
FEC	1/2, 2/3, 3/4, 5/6, 7/8
Guard Interval	1/4, 1/8, 1/16, 1/32
FFT Mode	2k, 8k
General Data	
Connectors	Per channel 1 x BNC
Video/Audio-input	1 x stereo jack socket 3.5 mm
RF-Output	F-connector
Operating Temperature	- 20 ° - +55 °C



Headend Equipment

Transmodulator COFDM To PAL 14MM-OH79D

Features and Benefits

- » Reception of a DVB-T/C HD/SD signal and modulation to an analogue TV channel
- » Reception and decryption of MPEG2 and MPEG4 signals
- » Dolby digital decoding
- » CI interface
- » NICAM encoder
- » Easy to configure compact headend



14MM-OH79D Specifications

Input Frequency Range	110-878MHz
Input Frequency Steps	0.250MHz
Input Level Range	47-90 dBμV
Output Channel Band Width	7/8 MHz
COFDM-Spectrum DVB-T	2 k/8 k/16 k/32 k FFT
COFDM Modulation Type	QPSK, 16QAM, 64QAM, 128QAM, 256QAM
COFDM Guard Interval	1/4, 1/8, 1/16, 1/32
Output Frequency Range	45-862MHz
Output Frequency Steps	250kHz
Frequency Stability	±30MHz
Output Channel Bandwidth (couplet)	7/8 MHz
Output Level	90-105dBμV (1dB steps)
Flatness	±1.5 dB
Spurious Suppression	>58
Video-Format	4:3/16:9/4:3 Zoom
F-socket Connectors	2 pcs.
Common Interface Connectors	1 pcs.
Power Consumption	10W
LNB Supply Voltage	12V
LNB electrical power supply	0.85A
Operating Temperature	-20° - +55 °C

TDT DVBS/S2 Twin Transmodulator 14MM-OH85H

Features and Benefits

- » Transmodulation from 8PSK/QPSK to QAM, with the inclusion of CI interfaces for descrambling the unit can deliver services transparently or through PID filtering selected QAM services
- » Twin DVBS/S2 to QAM 16-256 symbols
- » Integrated Conditional Access interface for both channels
- » Internal NIT generation available
- » PID filtering available
- » Input range 950-2150MHz DVBS/S2



14MM-OH85H Specifications

Module	OH85H (SD/HD) Twin DVB-S/S2 - QAM transmodulator with CI
Input Frequency Range	950-2150MHz
Input Frequency Steps	1MHz
Input Level Range	47-80dBμV
AFC	±10MHz
Modulation Scheme	QPSK, 8PSK
Symbol Rate	1-45 MS/s
FEC inner code	LDPC (1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10)
Spectral Inversion	C-Band/KU-Band
Output Frequency Range	45-862MHz
Output Frequency Steps	500kHz
Output Stability	±30kHz
Output Channel Bandwidth	2 x 8 MHz
Output Level	82-103dBμV
Stability of Output Level	±1dB
Spurious Outside TV Channel	>50dB
SNR	≥45dB
MER	≥40dB
Modulation (COFDM)	16-, 32-, 64-, 128-, 256-QAM
Symbol Rate	3.45-6.9 MS/s
FEC Outer Code	RS (204,188,16)
Spectral Inversion	Normal/Inverted
Interleaving	Conv., I=12
Bit Stuffing	Yes
PCR Correction	Yes
Connectors RF	F-connector
Current Consumption	ca. 0.83 A / 12 V
Power Consumption	< 10W
LNB Power	12 V / 0.5 A max., DiSEqC 2.0
Operating temperature	- 20 °- + 55 °C

Headend Equipment

TDT DVBS/SC To COFDM With CI Slot 14MM-OH88

Features and Benefits

- » Transmodulation from DVBS/S2 to DVBT/C, with the inclusion of CI interfaces for descrambling the unit can deliver services transparently or through PID filtering selected digital services
- » Integrated Conditional Access interface for both channels
- » Internal NIT generation available



14MM-OH88 Specifications

Module	OH88H (SD/HD) Twin DVB-S/S2 - COFDM transmodulator with CI	
Input Frequency Range	950-2150MHz	
Input Frequency Steps	1MHz	
Input Level Range	47-80dB μ V	
AFC	\pm 10MHz	
Modulation Scheme	QPSK, 8PSK	
Symbol Rate	1-45 MS/s	
FEC inner code	LDPC (1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10)	
Spectral Inversion	C-Band/KU-Band	
Output Frequency Range	45-862MHz	
Output Frequency Steps	250kHz	
Output Stability	\pm 30kHz	
Output Channel Bandwidth	2 x 7/8 MHz 88-103 dB μ V	
Output Level	82-97dB μ V	
Stability of Output Level	\pm 1dB	
Spurious Outside TV Channel	>50dB	
SNR	\geq 41dB	
MER	\geq 37dB	
Modulation (COFDM)	QPSK, 16-, 64-QAM	
FEC	1/2, 2/3, 3/4, 5/6, 7/8	
Guard interval	1/4, 1/8, 1/16, 1/32	
FFT Mode	2k, 8k	
Bit Stuffing	Yes	
PCR Correction	Yes	
PID Filtering	Yes	
NIT editing	Yes	
Connectors RF	Yes	
Current Consumption	ca. 0.83 A / 12 V	
Power Consumption	< 10W	
LNB Power	12 V / 0.5 A max., DiSEqC 2.0	
Operating temperature	- 20 °- + 55 °C	



Headend Equipment

Transmodulator Twin DVBT/C To COFDM 14MM-OH89

Features and Benefits

- » Transmodulation from DVBT/C to DVBT/C, with the inclusion of CI interfaces for descrambling
- » Internal NIT generation available
- » Conditional access interface
- » Input range 110-878MHz DVBT/T2
- » Delivers services transparently or through PID filtering selected digital services
- » Regeneration of the DVBT services to a DVBT- COFDM signal, transparent or select services with PID filtering



14MM-OH89 Specifications

Input Frequency Range	110–878MHz
Input Frequency Steps	250kHz
Input Level Range	47–90dB μ V
Channel Bandwidth	7/8MHz
COFDM Spectral	2 k and 8 k FFT
COFDM Modulation Scheme	QPSK, 16-QAM, 64-QAM
COFDM Guard Interval	1/32, 1/16, 1/8, 1/4
COFDM FEC Inner Code	Conv., K=7, G=1/2, 2/3, 3/4, 4/5, 5/6, 7/8
QAM Modulation Scheme	16-, 32-, 64-, 128-, 256-QAM
QAM Symbol Rate	1–7 MBaud
Output Frequency Range	47–862MHz
Output Frequency Steps	250kHz
Output Stability	\pm 30kHz
Output Channel Bandwidth (bonded)	2 x 7/8 MHz
Output Level	82–97dB μ V
Stability of Output Level	\pm 1dB
Spurious Outside TV Channel	>50dB
SNR	\geq 41dB
MER	\geq 37dB
Modulation (COFDM)	QPSK, 16-, 64-QAM
FEC	1/2, 2/3, 3/4, 5/6, 7/8
Guard Interval	1/4, 1/8, 1/16, 1/32
FFT Mode	2k, 8k
Bit Stuffing	Yes
PCR Correction	Yes
PID Filtering	Yes
NIT Editing	Yes
Connectors RF	F-connector
Current Consumption	0.5 A / 12 V
Power Consumption	< 10W
Operating temperature	- 20 °- + 55 °C

Headend Equipment

Profiler Plus 10 Clusters 14MM-PR05

Features and Benefits

- » An ultra-reliable power supply (detachable)
easy programming by PC or dedicated control unit remote configuration possible
- » 10 highly selective filters (LTE proof)



14MM-PR05 Specifications

Inputs	BI-FM	BIII/DAB	AUX	UHF1	UHF2	UHF3	UHF4
Frequency Range	47-68/88-108MHz	174-240MHz	47-862MHz	470-862MHz			
Number of UHF Cluster Filters	-			10 x Cluster Filter			
UHF Cluster Filter Bandwidth	-			1-7Ch. (8-56MHz)			
Gain	35dB	40dB	30dB	60dB			
Gain Adjustment	20dB			30dB			
General UHF Level Adjustment	-			+10 to -10dB			
Noise Figure	7dB	5dB	15dB	6dB			
Maximum Input Level	80dBμV		100dBμV	105dBμV			
Maximum Output Level	118dBμV		122dBμV				
Selectivity	-			30dB/Ch±2			
Return Loss	>10dB						
LNA Remote Voltage: 5/12/24V	-	Yes	-	Yes			
LNA Remote Current: 100 mA Total							
Outputs	2 x TV Output 1 x Test Output: -30dB (12VDC)						
Configuration	PC (UUI Software) or Control Unit (ref. 6565)						
Power Supply	230-240V						
Operating Temperature	-5 ° - +50 °C						

Control Unit 14MM-PRA01

Features and Benefits

- » Designed to control Johansson products through the coax cable
- » Products like profilers and active combiners can be configured with this device
- » OLED display
- » Easy rotary button makes configuration simple



14MM-PRA01 Specifications

Connectors	1 x F female (control port) 1 x 2.1 mm power jack
Operating voltage	5-24V
Power supply	Delivered with 5V power adapter (can be powered through COAX)
Consumption	160mA (@5VDC) 70mA (@24VDC)
Operating temperature	-5 - +50°C

Headend Equipment

Ethernet Bridge 14MM-PRA02

Features and Benefits

- » Allows coaxial devices to be configured through Ethernet
- » Data is transmitted between the Ethernet connection and the coaxial network
- » Can be used for configuration only or permanently installed
- » Configuration with the universal user interface



14MM-PRA02 Specifications

Connectors	2 x F female (RF input/RF output) 1 x RJ-45 control port 1 x 2.1 mm power jack
Operating voltage	5-24V
Power supply	Delivered with 5V power adapter (can be powered through COAX)
Consumption	160mA (@5VDC) 80mA (@24VDC)
Operating temperature	-5° - +50°C

IP Streamer Terra AT Headend with CI DVBT/T2 14MM-STI410C-DVBT/T2

Features and Benefits

- » Unique communication protocol allowing fully automatic configuration of IPTV receivers
- » Ability to watch TV on PCs, laptops
- » Low power consumption, power redundancy



14MM-STI410C-DVB/T2 Specifications

Frequency Range	47-862MHz
AGC Range/Impedance	30-80dB μ V/75Ohm
Loop Through Gain	0 \pm 1dB
Modulation	QPSK, QAM16, QAM64, QAM256
Bandwidth	7MHz, 8MHz
Code Rate	1/2, 3/5, 2/3, 3/4, 4/5, 5/6
Signal Processing	ETS 302 755
LNB Powering/Control	12V 100mA
IP Output Standard	IEE802.3 10/100 Base T
Bit Rate	Up To 80 Mbps
No. of Simultaneous Streams	Up To 24
Transmission Protocols	UDP/RTP
Multicast, MPTS, SPTS	Yes
Management Port	Standard IEE802.3 10/100 Base T
Operating Temperature	0° - +50°C

Headend Equipment

DVB-S/S2-DVB-T Transmodulator 14MM-TDX410C

Features and Benefits

- » Web interface via Ethernet port
- » TS monitoring via Web interface
- » Loop through RF distributing at input and output
- » Robust diecast housing
- » SNMP monitoring
- » Converts satellite signals (Q/8PSK) to DVB-T output

Specifications

Product Code	14MM-TDX410C		14MM-TTX410C		
RF Input					
Frequency Range	950-2150MHz		47-862MHz		
LNB Powering/Control	0/14/18 V & 300 mA max. DiSEqC 1.0		12 V 100 mA		
Level/Impedance	45-85dB μ V/75 Ohm		40-80dB μ V/75 Ohm		
Loop Through Gain	-1 \pm 1dB		0 \pm 1dB		
Standard	DVB-S	DVB-S2	DVB-T	DVB-T2	DVB-C
Modulation	QPSK	QPSK, 8PSK	QPSK, QAM16, QAM64	QPSK, QAM16, QAM64, QAM256	QAM16, QAM32, QAM64, QAM128, QAM256
Bandwidth	-		7MHz/8MHz	7MHz/8MHz	-
Symbol Rate	2 \div 45 Ms/s		-		1 \div 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					
Frequency Range	170-230/470-860MHz				
Level/Impedance	90 \pm 2dB μ V/75 Ohm				
Spurious Level	< -60dB				
Loop Through	47-2150MHz/ \leq 2.5dB				
MER	\geq 35dB				
Modulation DVB-T	QPSK, QAM16, QAM64				
Channel Bandwidth	7/8MHz				
Guard Interval	1/4, 1/8, 1/16, 1/32				
Code Rate	1/2, 2/3, 3/4, 5/6, 7/8				
Transmission Mode	2K/8K				
Output Level	0 \div -15.0dB by 1dB step				
Transport Steam Parameters					
Max. Bit Rate	31670kbps				
Max. PID filter count*	31				
PCR Restamping	up to 5 PID's (services)				
Management Port	Standard IEEE802.3 10/100 Base T				
Current Consumption**	12 V 400 mA		12 V 450 mA		
Operating Temperature	- 20 $^{\circ}$ - + 50 $^{\circ}$ C				

*Number of PID that can be blocked or passed, for example: 1000; 1001...1030 PID's are passed

**Without external DC feeding and CAM; with CAM ~ 0.6A

DVB-T/T2/C-DVB-T Transmodulator 14MM-TTX410C

Features and Benefits

- » Web interface via Ethernet port
- » TS monitoring via Web interface
- » Robust diecast housing
- » SNMP monitoring
- » Loop through RF distributing at input/output
- » Regenerates your DVB-T signal to >35dB MER



Headend Equipment

UHF Twin Amplifier 7MHz Channel AGC 14MM-AT421



VHF Twin Amplifier 7MHz Channel AGC 14MM-AT422

Features and Benefits

- » Dual input AT series of channel amplifier which is push button programmable
- » Loop through F connectors for both output and input allowing cascading to more modules
- » LED display for channel and programming information and 1RU rack mountable
- » Frequency range 170-230MHz, 470-862MHz

Specifications

Product Code	14MM-AT421	14MM-AT422
Number of Internal Channel Amplifiers	2	
Channel Range	20-75	6-12
Bandwidth	7MHz	
Selectivity	-40dB at 32MHz from edge of 7MHz filter	
Loop Through Gain	0 ± 1.5dB	
Return loss	>12dB	
Output Level	85dBµV	
Attenuation Available	0-10dB in 1 dB steps	
Frequency range of RF combining	47-2150MHz	
Combining through loss Terr/Sat	1.5/2.5dB	
Return Loss	>10dB	
Noise Figure	8dB	
Flatness of channel bandwidth	31.5dB	
Masthead Amplifier Supply	12V 100mA max	
Power Consumption	12V 450mA	
Temperature Range	0-50°C	

Female To Female Quick Coaxial Bridge 14MM-CB420



Features and Benefits

- » Coaxial bridge designed specifically for the AT series modules
- » Excellent RF shielding
- » Industry standard F connector
- » Rigid solid material
- » Used to daisy chain modules

DIN Rail Multi-Channel Power Supply 14MM-UP410S



Features and Benefits

- » AT series headend modular power supply with integrated RF combiner
- » Switch mode technology
- » Short circuit and overload protected
- » DIN rail or wall mounting, robust die-cast housing
- » Screw terminal block for DC output power distribution bus

14MM-UP410S Specifications

DC Output Voltage	+12V 4.5 A, Max
Mains Voltage	187-250V ~ 50Hz
Operating Temperature	-20 °C + 50 °C

Power Supply With E61 Self Monitoring 20MM-UP412



Features and Benefits

- » Modular reception system power supply with parallel capability and self monitoring via LAN
- » Can be used in parallel for redundancy
- » Switch mode technology
- » Short circuit protected
- » Screw terminal block for DC output power distribution bus
- » Din rail mounting

DIN Rail Power Supply With Parallel Capability 14MM-UP413



Features and Benefits

- » Modular reception system power supply with parallel capability
- » Switch mode technology
- » Short circuit protected, DIN rail mounting
- » Screw terminal block for DC output power distribution bus

14MM-UP413 Specifications

Input Voltage	187-250V 50/60Hz
Output Voltage	12V 4.5 A max.
Power Consumption	65 W max.
Power Consumption	<245W
Operating Temperature	0° - +50 °C