



# SMATV Headend systems

Quality and variety to both present  
and future network subscribers

Simply **more**  
- more simply





# Headend solutions for all kinds of SMATV applications - Worldwide

A headend system can be an extremely rational and inexpensive way of offering variety and quality to the subscribers in a multi dwelling network. But the value to subscribers is totally dependent on the flexibility of the headend system. Both the supply of TV-channels and consumer demands are bound to change in the lifetime of a new headend system. A solution that is difficult or expensive to change will restrict subscribers in their freedom of choice, and possibly be an economic burden.

## Rational alternatives

Triax offers many different kinds of systems that can be combined and expanded to both present and future needs. The common denominators are simplicity and logic that save time in installation and in future adaptations. Our choice of materials and processing is based on extensive knowledge of year-after-year performance of headends in every possible environment. Each product and process is tested individually to ensure quality according to specifications.

## Remote access is no longer a remote possibility...

Being open for advanced programming and data exchange, the top model of Triax Digital Headend system (TDH 700) is fully prepared for all the opportunities of digitalization and remote control via modem. One of the immediate benefits of TDH 700 is that it opens up for a whole new and more efficient way of supervising and controlling community networks.

## TDH 700 digital

The top model of Triax Digital Headend system (TDH 700) is a modular and programmable solution prepared for all the opportunities of digitalization and satellite TV, including remote supervision and control of networks. One TDH 700 basic unit holds up to six modules each carrying a satellite, cable or terrestrial channel.

## TDH 700 digital - now also as "stand alone" modules

All the different kinds of modules for the Triax Digital Headend system (TDH 700) can be delivered as single channel, so now it is possible to add a single channel to you existing headend or expand the new one if you want 7, 8 or 9 channels. If you use the "stand alone" modules together with a TDH basic unit, you can control it from here.



1 Basic unit and 4 Sub units can be coupled in cascade for a maximum of 30 channels, and with the advantage that they all share the same system control.

## A complete range of modules to fit the world..

At this very moment we have a complete range of modules for:

- DVB – S (QPSK-PAL, QPSK - FM)
- DVB – T (COFDM – PAL)
- DVB – C (QPSK - QAM)
- Modulator AV in PAL/Secam

- more modules will be added to this range, so remember to ask you supplier.





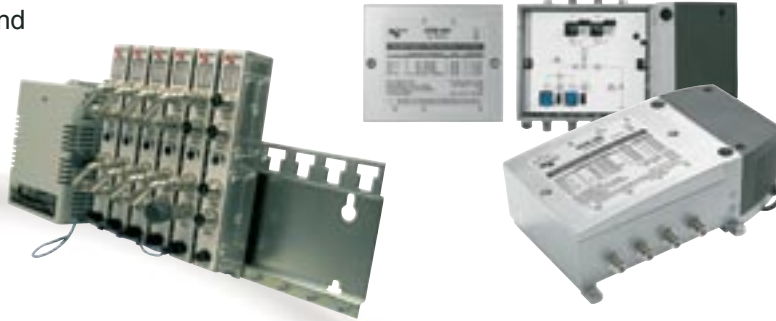
## TCH 600 analogue

Triax compact headend system (TCH 600) is the equally flexible solution for the analogue transmission.

Different types of modules are available for this system e.g. TV and FM channel converters for organizing frequency and channels systematically and multi-standard modulator modules i.e. can be set to existing world TV-standards.

## AS-series

The AS terrestrial headend replaces many individual antennas with one system and a better and more stable reception of local channels.



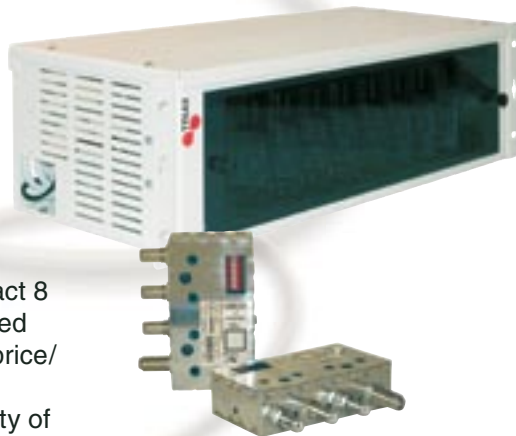
## ARM multiband amplifiers are practical, low-cost solutions

ARM and ATB are a series of multiband amplifiers with up to 5 separate inputs, one for each band.



## TCM-08 analogue single modulator

The TCM-08 is a compact 8 channel modulator unit designed for simple operation and high price/performance ratio. Combine this with the possibility of choosing between a unit with middle or high output level, then hotels, motels, apartment building blocks are typical applications for this semiprofessional unit. The system will be delivered as an empty frame where you can choose to put in from 1 to 8 channel modulators.



All Triax SMATV headend systems are described in more detail on the following pages and the pages with technical specifications.

## Let us help with answers or a complete system proposal

Giving precise and understandable answers is probably the most important way of keeping it simple. Triax support is only a phone call away, and we will assist you with useful answers.

Furthermore we offer you complete planning and documentation of community networks.

Based on computer software, we can provide you with specifications of the right solution, including drawings,

## Market focus



performance calculations and a part list of all the equipment needed. All you have to do is to specify network requirements, using the checklist on [www.computer.com](http://www.computer.com) and specify demands by e-mail from the website.





# The digital TDH 700 headend system adds flexibility and reduces costs

The fact that you can monitor and change the headend system from the distance is only one example of flexibility and potential cost savings in operation of the Triax TDH 700 headend system. It also offers other practical and valuable benefits to both installers and operators.

## 30 channels and only one system control board

One TDH 700 basic unit holds up to six modules each carrying a satellite, cable or terrestrial channel. Up to five units can be coupled in cascade for a maximum of 30 channels, and with the advantage, that they all share the same system control.

System control is included only in the first basic unit, the main unit, and all configuring is done through this. Additional sub units are added using the same system control, which not only reduces costs but also simplifies installation and later changes in system set-up.

Initial investments in network components and installation time are further minimized with high output levels ensuring efficient distribution and quality signals with a minimum of components.

## A complete range of modules to fit the world...

Today we have a complete range of modules for:

- DVB – S (QPSK-PAL, QPSK - FM)
- DVB – T (COFDM – PAL)
- DVB – C (QPSK - QAM)
- Modulator AV in PAL/Secam

- more modules will be added to this range, so remember to ask your supplier.

## A new way of operating

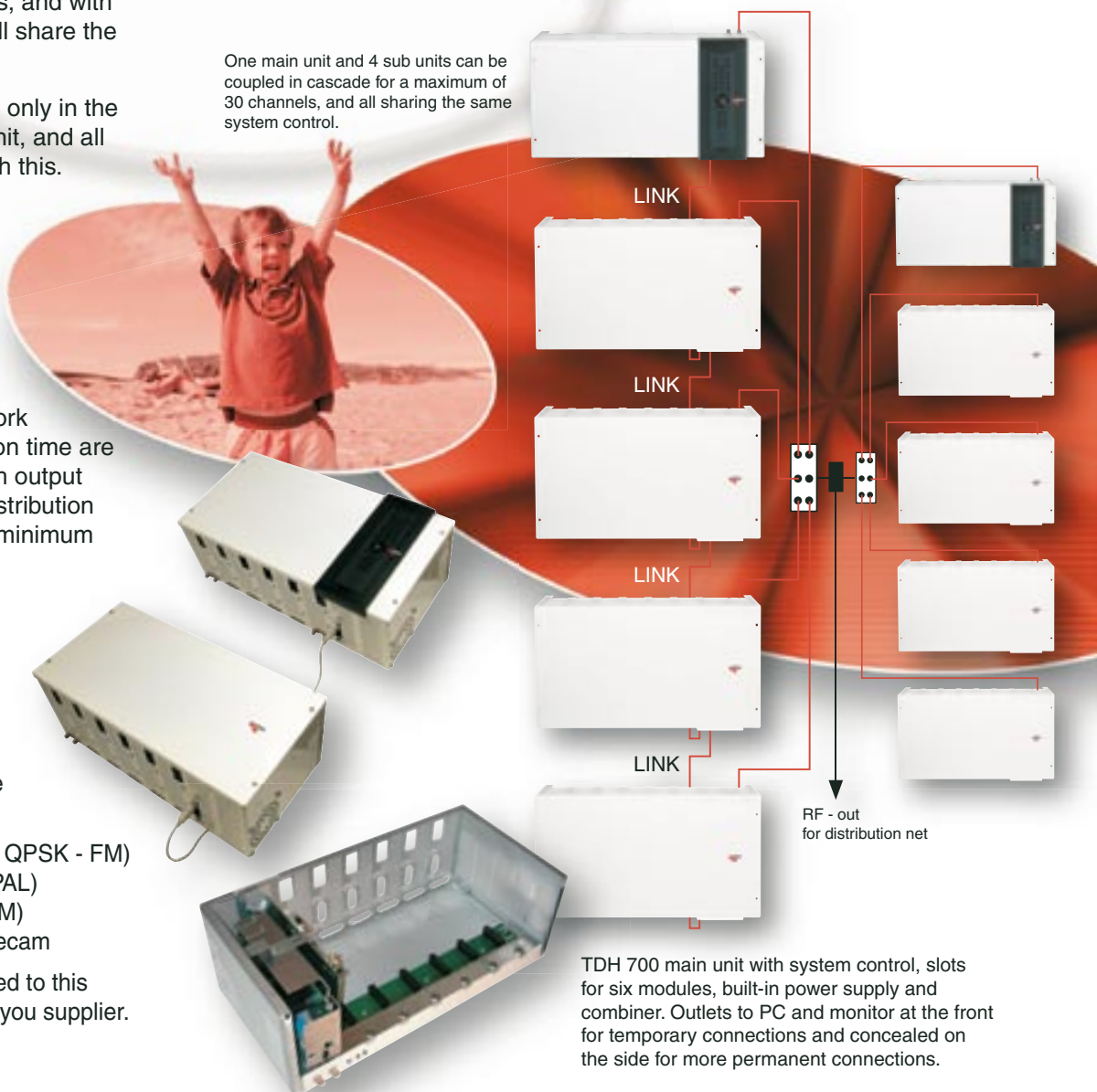
With Triax new TDH 700 headend system, the operator can monitor and change the system through remote access, from anywhere, where a PC and a standard or GSM modem is at hand.

The operator - whether a housing society, a hospital or a hotel - can control the system from the most convenient location, and can control several systems from one location or even choose to outsource surveillance.

## 6 programmes from 1 multiplex

One of the unique and cost-saving features of TDH 700 headend system is that it allows you to receive one "free-to-air" multiplex and distribute it as different programs with one module configured as master and the other modules as slaves. Up to six programs can be distributed from one multiplex, and the master/slaves set-up simplifies the whole installation. It saves time in initial installation, but also in later changes of configuration.

One main unit and 4 sub units can be coupled in cascade for a maximum of 30 channels, and all sharing the same system control.



TDH 700 main unit with system control, slots for six modules, built-in power supply and combiner. Outlets to PC and monitor at the front for temporary connections and concealed on the side for more permanent connections.

## A new way of thinking

The technology behind TDH 700 headend system represents a new way of thinking with headends designed more and more like computer networks and on an open platform allowing communication and integration with a vast number of different systems and devices.

Characteristics of the technological concept are

- The network principle with programming through one system control board and all modules being internally connected by a high-speed bus
- The use of a recognized and open standard (XML) for data exchange.

The combination of an open data exchange standard and high-speed communication between modules creates an efficient bridge between the headend system and a wide range of digital devices. Additionally it makes upgrading fast and simple. Software for updating the system will always be available online.

## From the distance or on location

Both from the distance and on location, you can access the headend system through a PC.

However, the system can also be accessed from a TDH 700 remote control unit integrated in the TDH 700 main unit like on a set top box.

A user-friendly menu system - similar to the user interface known from set-top boxes - reduces the time needed for configuring or changing the system.

The remote control unit is used in combination with a video monitor, and the on-screen interface is practically the same on the PC and on the video monitor.

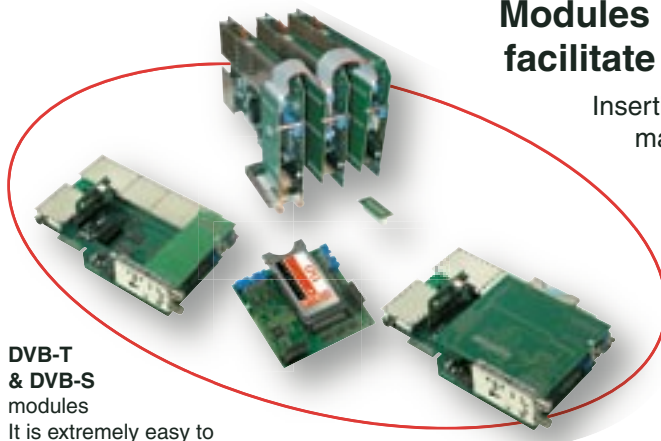
Access to the system - remote or on location, via PC or via remote control - is efficiently password protected and the remote control unit can also be secured with an optional physical lock.

PC software for supervision and control comes with the main unit, and updated software versions are always available at [www.triax.com](http://www.triax.com).

## Modules designed to facilitate installation

Inserting modules in TDH 700 main and sub units is extremely easy. Slots are easily accessible and the plug-in operation involves no risk of damaging components. A stable and safe EMC connection is ensured automatically.

The prime module is the multistandard QPSK-PAL/SECAM module with common interface board.



### DVB-T & DVB-S modules

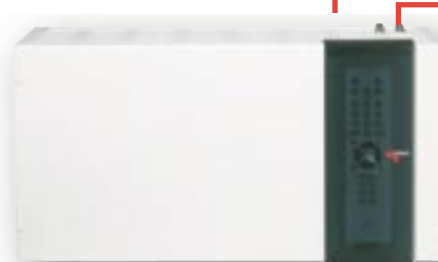
It is extremely easy to upgrade an FTA with an add-on common interface board, and plug-in a card reader with a card for your favorite channels.



MODEM



MODEM



A remote control unit is integrated in the main unit. In addition to on-screen password protection, the remote control unit can also be protected with a physical lock.

Innovation





# What you want, when you want it

## TCH 600 headend system

### Analogue reception & distribution

With a TCH 600 headend system the initial system investment can be limited to present and recognized needs only. There is no reason to invest in excess functionality or capacity for possible future use. Needs will change, but when they do, it is easy to change the TCH 600 system at the exact point needing change.

### Flexible building blocks and expandable foundation

The building blocks are programmable TCH 600 modules that each holds one channel in the VHF, UHF or FM band and can be used in combination with

- Channel converters for avoiding interference (dual signals) from nearby TV transmitters and for organizing channels systematically
- Modulator modules for integrating video or DVD signals, surveillance cameras or other closed circuit applications in the distribution system

The foundation and physical frame is the compact TCH 600 basic unit with a programming and control unit for all modules. Each basic unit has 8 module positions holding 8 analogue modulators or TV-channels and to carry the number of channels required, several units can be cascaded together.

With a high adjustable output of 90 – 100 dB $\mu$ V for the combined channels, the TCH 600 headend system can provide many subscribers with signals, and if the level is not sufficient to provide all subscribers, an amplifier is either already available or can easily be inserted.

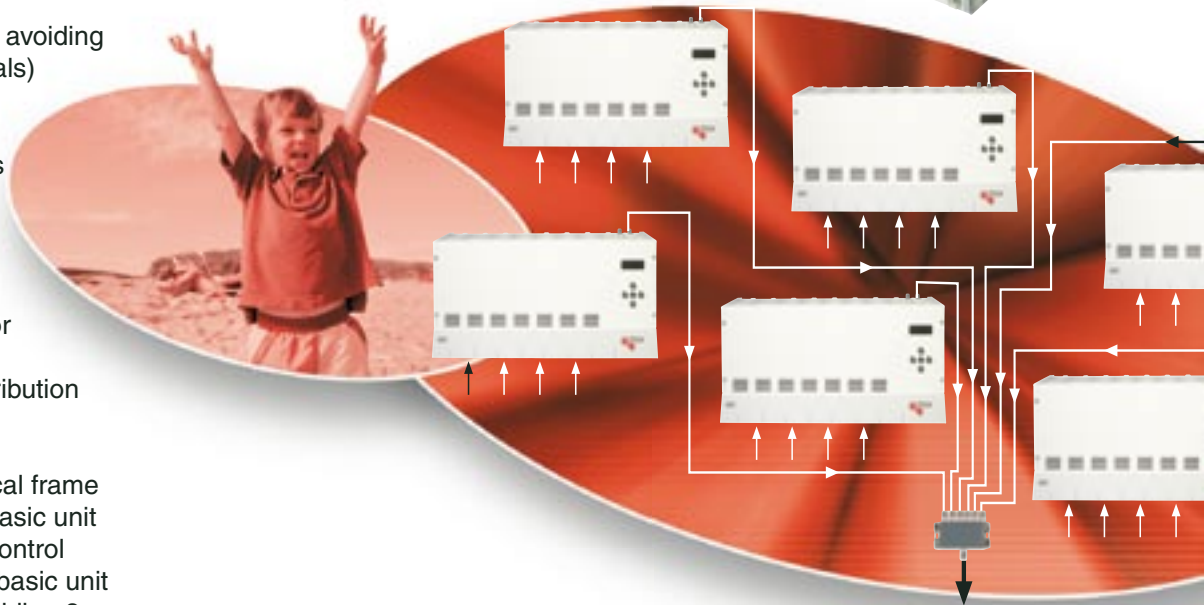
### A fast way of programming anything

All TCH 600 modules are programmed in a quick step-by-step operation:

- TV-standard (PAL B/G, PAL I, PAL D/K and SECAM L) is chosen by one single click on the module's easily accessible DIP-switch
- Modulator settings are programmed with the small keyboard in the TCH 600 basic unit, where the installer on a display is guided through a logical sequence of choices



The compact dimensions of the TCH 600 basic unit (44 x 20 x 13 cm) make it possible to install the unit under a staircase or in the hotel reception.



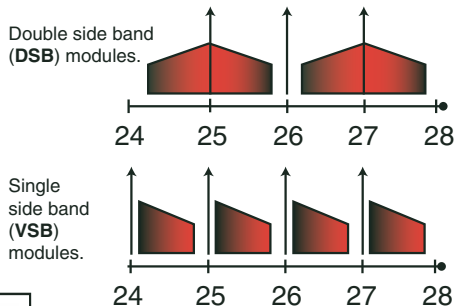
Surveillance of buildings, entrance doors, garages etc. can easily be integrated in a TCH 600 system. Triax's line powered camera is for in- and outdoor use (waterproof) and available as both colour and black/white camera.



You can expand an TCH 600 system with e.g. an HFA amplifier and get a reliable and cost efficient solution to distribute signals in networks - or in existing networks and thereby reuse the existing cable system.

## Makes use of all accessible channels

TCH 600 modules are available in both vestigial side band (VSB) and double side band (DSB) versions. When VSB modules are chosen, you can place programs on every single channel in the frequency range. There is no interference between channels, i.e. 30, 31, 32 etc., and all channels accessible in the antenna system can be applied for TV-signals. DSB modules cost less but require twice as much channel space.



## Reliable operation day and night, year in and year out

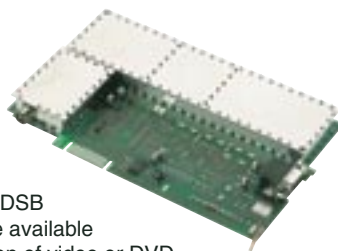
Features of the TCH 600 headend system also include

- Constant microprocessor control of tuner settings
- Individual adjustment of output levels to ensure uniform output level on all channels and on both TV and audio signals
- Watchdog function in all digital modules automatically detects errors and restarts the module in case of for example power failure or errors in the bit-stream.



## 19" swing rack cabinet provides easy access and excellent overview

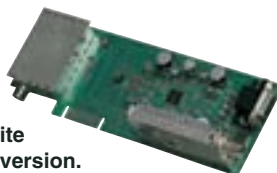
If more basic units are built together, they can conveniently be inserted in Triax's 19" swing rack providing an excellent overview and easy access to all connections and the programming units.



**Modulator modules** in VSB and DSB versions are available for integration of video or DVD signals and surveillance cameras in the distribution system.



**TV and FM channel converters** with automatic gain control are available for converting TV and FM programs from one frequency to another.



**Analogue satellite module in DSB version.** Complies with almost all TV-standards. Available in mono or A2 stereo version.



**Analogue satellite module in VSB version.** Complies with almost all TV-standards. Available in mono and A2 stereo version.



## Accessories for TCH 600

Naturally we can supply you with all kinds of accessories for the TCH 600 headend e.g. decoder-cable, video/audio cable.





# T CM-08

## 8 compact modulators - in one unit

### Ideal solution for private cable systems, hotels, institutions, and SMATV applications

The TCM-08 is a compact 8 channel modulator unit designed for simple operation and high price/performance ratio.

Hotels, motels, apartment building blocks are typical applications for this semiprofessional unit.

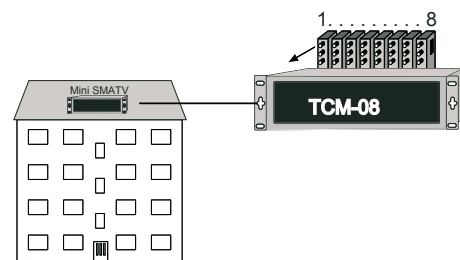
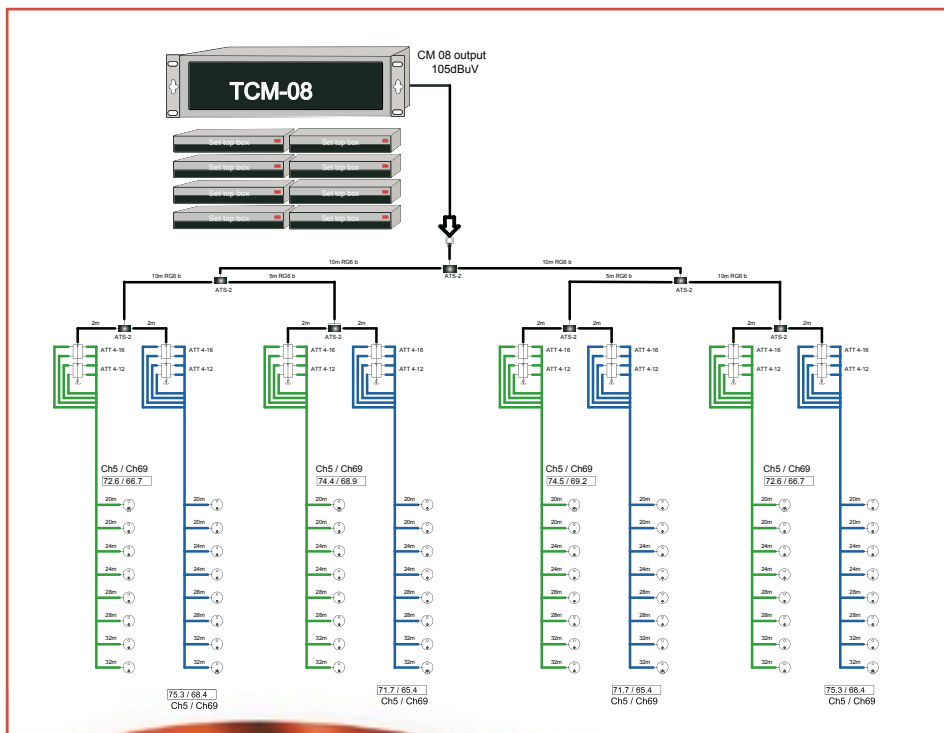
Having A/V sources coming from standard set-top boxes, the modulator modules deliver a number of high quality RF channels into a distribution network.

All RF cables for connecting and combining the signals are included together with the tooling for fastening the modulator modules.

#### TCM-08 includes:

- Slots for up to 8 DSB CM02 modulator modules
- Switch mode power supply
- RF combiner
- Mid or high output level.  
**TCM-08 = 80 dB $\mu$ V**  
**TCM-08A = 105 dB $\mu$ V**
- Can be mounted on wall or 19 inch rack

The TCM-08 has 8 modulator positions for holding 8 CM-02 modulators.



#### The CM-02

Modulator modules are designed for high performance signal quality. Programming of the output channel and setting of output level is done at each module individually by means of a DIP switch.

The CM02 modules are easily mounted in the TCM-08 basic unit and VHF and UHF modules can be mixed within the unit.

#### CM-02 modulator modules features:

- Double side band multistandard modulator
- Modules available in VHF or UHF
- High performance picture quality S/N >55
- Adjustable output level
- $\mu$ P controlled PLL synthesis for high stability



# Single channel AS headend and ARM and ATB multiband amplifiers

Increased globalization of news and entertainment is accompanied by increased consumer interest and loyalty to local events, including local TV-stations. Most of these use, and will continue to use terrestrial broadcasting, so the need for quality solutions applies not only to satellite TV but also to terrestrial TV.

Triax's AS system, ARM and ATB multiband amplifiers are compact and efficient solutions for increasing stability and quality of the TV-pictures subscribers get from local terrestrial channels. Both systems handle digital as well as analogue channels. Used in small and medium-sized community networks, they can replace many individual antennas.

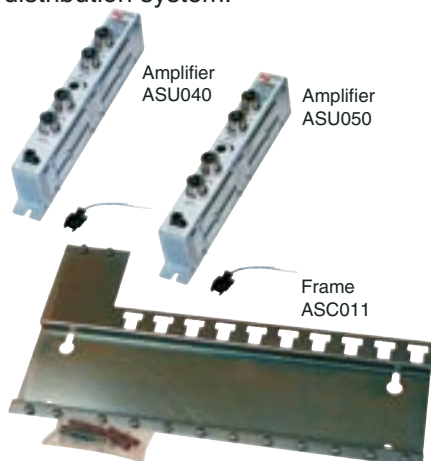
## AS single channel headend system (MATV) ensures perfect quality

The Triax AS system is based on single channel amplifiers with a gain of 37-50 dB and a high output level of 105-113 dB $\mu$ V.

The quality of the signals is ensured by an extremely high selectivity (36 dB at +/-16 MHz) which furthermore means that you can use adjacent channels (8, 9, 10 ...) and utilize all channels accessible in the antenna system for TV-signals.

## Integrated power unit

The system has low power consumption and the integrated power supply can also remote feed, for example, pre-amplifiers or other electronic components in the distribution system.



## Plug-and-play - and expandable

A Triax AS unit can include up to 10 amplifier modules for supplying subscribers with TV-channels. The modules are delivered pre-programmed from Triax, so they just need to be mounted with the power supply and connected in the compact mounting frame.

When subscribers need a new or an extra channel, you just need to order a new module with the specific channel. Mounting it in the mounting frame is a 10 minute operation.



Power Supply  
ASA015

Terminator  
ASR075



Clamp  
ASL030

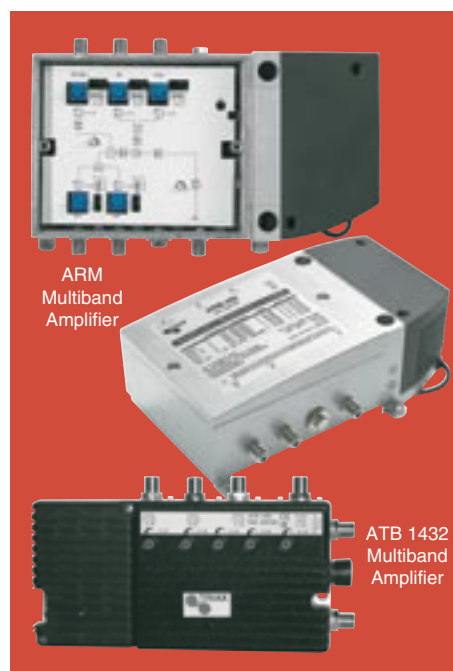


Logic



## ARM and ATB multiband amplifiers

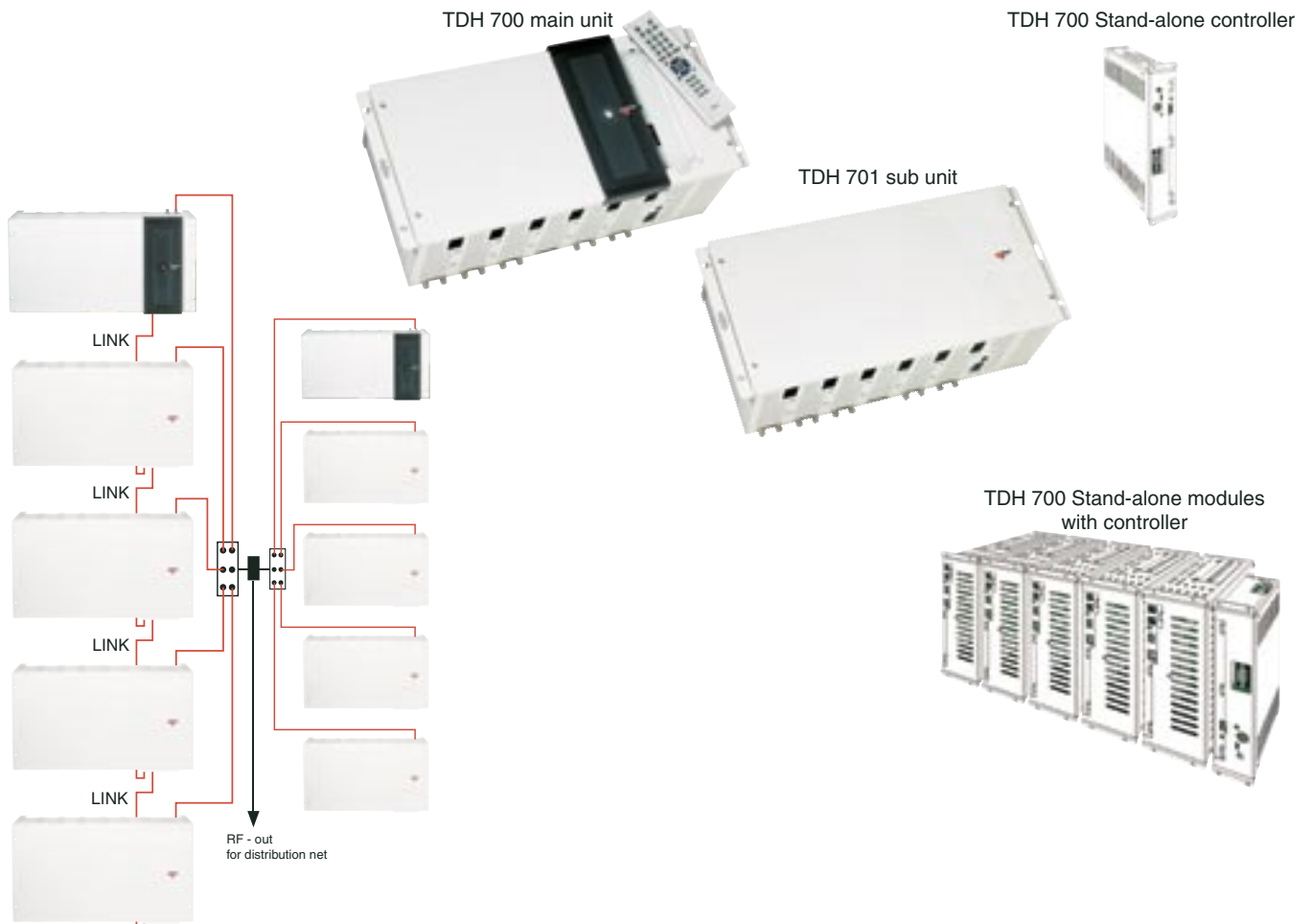
ARM and ATB are a series of multiband amplifiers with up to 5 separate inputs, one for each band. The amplifiers have separate and easy-to-adjust 0-20 dB attenuation on each input. Used as headends in small and medium-sized terrestrial distribution systems, an ARM or ATB amplifier is a practical solution for minimizing the costs of components and installation. Both multiband amplifiers have built-in power supply. All models are for cable mounting with F-connectors.



# TDH 700 Main and sub unit for digital headend

## Technical data

TYPE		TDH 700 Main Unit	TDH 701 Sub unit	TDH 700 Stand-alone controller
Part No.		490790	490791	301700
Number of channels	Pcs	6	6	
Output frequency range	MHz	47 - 862	47 - 862	
Max. output level - 6 combined channels max. @ 60 dB IMD	dB $\mu$ V	105	105	
Adjustment	dB	10	10	
Test point	dB	-30	-30	
Return loss output Tv in - tv out - module RF in	dB	$\geq 10$	$\geq 10$	
Impedance	Ohm	75	75	
Remote control		Yes		
PC-interface functions		Yes		
Software download	9 pin	RS 232 female		RS 232 female
Modem connector	9 pin	RS 232 male		RS 232 male
Main/sub unit connector		USB A/B cable	USB A/B cable	USB A/B cable
Wall/rack bracket		Yes	Yes	Yes
Operation voltage	V/AC	190 - 260	190 - 260	
Power consumption	W	120 max.	110 max.	8
Connector in - out		F female	F female	F female
Operation temperature range		-10...+50	-10...+50	-10...+50
Weight	kg	5.8	5.8	2.2
Dimensions (H x D x W)	mm	223 x 160 x 440	223 x 160 x 440	198 x 141 x 44





# TDH digital satellite modules QPSK-PAL

## Technical data TDH - DVB-S master modules (VSB) VHF/UHF

TYPE		TDH master DVB-S mono with CI	TDH master DVB-S stereo with CI	TDH master DVB-S mono Free to air	TDH master DVB-S stereo Free to air
Part No. 8 MHz band-width		490702	490703	490722	490723
7 MHz band-width		490742	490743	490746	490747
8 MHz stand-alone module	SA	301702	301703	301722	301723
7 MHz stand-alone module	SA	301742	301743	301746	301747
Modulator type		VSB	VSB	VSB	VSB
Band		VHF/UHF	VHF/UHF	VHF/UHF	VHF/UHF
TV standard system		B/G, I, L, D/K	B/G, I, L, D/K	B/G, I, L, D/K	B/G, I, L, D/K
Input frequency range	MHz	920 - 2150	920 - 2150	920 - 2150	920 - 2150
Input level	dBm	-65....-25	-65....-25	-65....-25	-65....-25
IF bandwidth	MHz	36	36	36	36
Output frequency range	Ch. MHz	2....69 47 - 862	2....69 47 - 862	2....69 47 - 862	2....69 47 - 862
Output level SA modules	dBμV	103	103	103	103
Output level attenuator	dB	10	10	10	10
Video S/N ratio	dB	54	54	54	54
Differential phase	deg.	< 8	< 8	< 8	< 8
Picture carrier stability	kHz	< +/- 70	< +/- 70	< +/- 70	< +/- 70
Spurious signals ref picture carrier	dB	> - 60	> - 60	> - 60	> - 60
Sound mode		<b>Mono</b>	<b>A2 stereo</b>	<b>Mono</b>	<b>A2 stereo</b>
Audio distortion @ 1 kHz	%	< 1	< 1	< 1	< 1
Audio S/N ratio	dB	> 50	> 50	> 50	> 50
Sound sub carrier stability	kHz	< +/- 5	< +/- 5	< +/- 5	< +/- 5
LNB control 13/18 volt - 0/22 kHz	mA	200	200	200	200
Conditional access	EN	<b>50221</b>	<b>50221</b>	<b>FTA</b>	<b>FTA</b>
Teletext type		Reinserted in VBI	Reinserted in VBI	Reinserted in VBI	Reinserted in VBI
Demultiplexer data rate	Mbps	< 65	< 65	< 65	< 65
Video data rate	Mbps	< 15	< 15	< 15	< 15
Viterbi rates	Mpps	1-30 (SCPC/MCPC)	1-30 (SCPC/MCPC)	1-30 (SCPC/MCPC)	1-30 (SCPC/MCPC)
Impedance	Ohm	75	75	75	75
Operation temperature range	°C	-10...+50	-10...+50	-10...+50	-10...+50
Power supply - stand alone module	VAC	190 - 260	190 - 260	190 - 260	190 - 260
Weight - standard module	kg	0.45	0.45	0.45	0.45
- stand-alone module	kg	2.25	2.25	2.10	2.10
Dimensions (H x D x W)					
- standard module	mm	150 x 230 x 50	150 x 230 x 50	150 x 230 x 50	150 x 230 x 50
- stand-alone module	mm	198 x 220 x 76	198 x 220 x 76	198 x 220 x 76	198 x 220 x 76

TDH 702/742



TDH 703/743



TDH 722/746



TDH 723/747



TDH 742S - SA



TDH 743S - SA



TDH 722S - SA



TDH 723S - SA



# TDH digital terrestrial modules COFDM-PAL



## Technical data TDH - DVB-T modules (VSB) VHF/UHF

TYPE		TDH master DVB-T mono with CI	TDH master DVB-T Stereo with CI	TDH master DVB-T mono Free to air	TDH master DVB-T Stereo Free to air
Part No.	8 MHz band-width	490712	490713	490714	490715
	7 MHz band-width	490762	490763	490764	490765
	8 MHz stand-alone module SA	301712	301713	301714	301715
	7 MHz stand-alone module SA	301762	301763	301764	301765
Modulator type		COFDM	COFDM	COFDM	COFDM
Band		VHF/S/UHF	VHF/S/UHF	VHF/S/UHF	VHF/S/UHF
TV standard system		B/G, I, L, D/K	B/G, I, L, D/K	B/G, I, L, D/K	B/G, I, L, D/K
Input frequency range	MHz	177.5 - 858.0	177.5 - 858.0	177.5 - 858.0	177.5 - 858.0
Input level	dBm	-65...-25	-65...-25	-65...-25	-65...-25
Output frequency range	Ch. MHz	2...69 47 - 862	2...69 47 - 862	2...69 47 - 862	2...69 47 - 862
Output level SA modules	dBμV	103	103	103	103
Output level attenuator	dB	10	10	10	10
Video S/N ratio	dB	54	54	54	54
Differential phase	deg.	< 8	< 8	< 8	< 8
Picture carrier stability	kHz	< +/- 70	< +/- 70	< +/- 70	< +/- 70
Spurious signals ref picture carrier	dB	> - 60	> - 60	> - 60	> - 60
Sound mode		<b>Mono</b>	<b>A2 stereo</b>	<b>Mono</b>	<b>A2 stereo</b>
Audio distortion @ 1 kHz	%	< 1	< 1	< 1	< 1
Audio S/N ratio	dB	> 50	> 50	> 50	> 50
Sound sub carrier stability	kHz	< +/- 5	< +/- 5	< +/- 5	< +/- 5
LNB control 13/18 volt - 0/22 kHz	mA	200	200	200	200
Conditional access	EN	<b>50221</b>	50221	<b>FTA</b>	<b>FTA</b>
Teletext type		Reinserted in VBI	Reinserted in VBI	Reinserted in VBI	Reinserted in VBI
Demultiplexer data rate	Mbps	< 65	< 65	< 65	< 65
Video data rate	Mbps	< 15	< 15	< 15	< 15
Viterbi rates	Mpps	1-30 (SCPC/MCPC)	1-30 (SCPC/MCPC)	1-30 (SCPC/MCPC)	1-30 (SCPC/MCPC)
FFT Mode	Mpps	2K/8K	2K/8K	2K/8K	2K/8K
Constellations		QPSK, 16QAM, 64QAM		QPSK, 16QAM, 64QAM	
Guard interval		1/4, 1/8, 1/16, 1/32		1/4, 1/8, 1/16, 1/32	
Viterbi decoder		1/2, 2/3, 3/4, 5/6, 7/8		1/2, 2/3, 3/4, 5/6, 7/8	
Reed Solomon decoder		204,188, t=8.		204,188, t=8.	
Impedance	Ohm	75	75	75	75
Operation temperature range	°C	-10...+50	-10...+50	-10...+50	-10...+50
Weight - standard module	kg	0.45	0.45	0.45	0.45
- stand-alone module	kg	2.25	2.25	2.10	2.10
Dimensions (H x D x W)					
- standard module	mm	150 x 230 x 50	150 x 230 x 50	150 x 230 x 50	150 x 230 x 50
- stand-alone module	mm	198 x 220 x 76	198 x 220 x 76	198 x 220 x 76	198 x 220 x 76

TDH 712/762



TDH 713/763



TDH 714/764



TDH 715/765



TDH 712T - SA



TDH 713T - SA



TDH 714T - SA



TDH 715T - SA





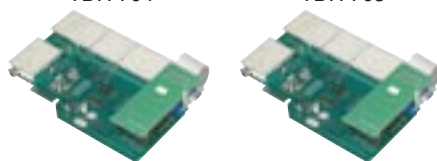
# TDH digital slave modules Sat/Ter

## Technical data TDH - Slave modules (VSB) VHF/UHF

TYPE		TDH slave DVB-S/T mono	TDH slave DVB-S/T stereo		
Part No.	8 MHz band-width	490704	490705		
	7 MHz band-width	490744	490745		
	stand-alone module	SA			
Modulator type		VSB	VSB		
Band		VHF/S/UHF	VHF/S/UHF		
TV standard system		B/G, I, L, D/K	B/G, I, L, D/K		
Output frequency range	Ch. MHz	2...69 47 - 862	2...69 47 - 862		
Output level attenuator	dB	10	10		
Video S/N ratio	dB	> 54	> 54		
Differential phase	deg.	< 8	< 8		
Picture carrier stability	kHz	< +/- 70	< +/- 70		
Spurious signals ref picture carrier	dB	> - 60	> - 60		
Sound mode		<b>Mono</b>	<b>Stereo</b>		
Audio distortion @ 1 kHz	%	< 1	< 1		
Audio S/N ratio	dB	> 50	> 50		
Sound sub carrier stability	kHz	< +/- 5	< +/- 5		
Teletext type		Reinserted in VBI	Reinserted in VBI		
Demultiplexer data rate	Mbps	< 65	< 65		
Video data rate	Mbps	< 15	< 15		
Viterbi rates	Mpps	1-30 (SCPC/MCPC)	1-30 (SCPC/MCPC)		
Impedance	Ohm	75	75		
Operation temperature range		-10...+50	-10...+50		
Weight - standard module		0.30	0.30		
- stand-alone module					
Dimensions (H x D x W)					
- standard module		150 x 230 x 50	150 x 230 x 50		
- stand-alone module					

TDH 704

TDH 705



# TDH digital QAM modules QPSK-QAM

## Technical data - QAM modules

TYPE		TDH C DVB-C TDT	TDH C DVB-C
Part No.	8 MHz band-width	490730	490732
	7 MHz band-width		
	stand-alone module SA	301730	301732
Modulator type		QAM Transparent	QAM
Band		VHF/S/UHF	VHF/S/UHF
TV standard system		QPSK	QPSK
Input frequency range	MHz	920 - 2150	920 - 2150
Input level	dBm	-65....-25	-65....-25
Return loss	dB	>10	>10
Aerial input	SAT	F	F
Aerial loop-through	SAT	Yes/F	Yes/F
<b>Demolator</b>			
Type		QPSK	QPSK
Symbol rate	Mbps	2-40 (SCPC/MCPC)	2-40 (SCPC/MCPC)
Viterbi decoder		1/2, 2/3, 3/4, 5/6, 7/8	1/2, 2/3, 3/4, 5/6, 7/8
Reed Solomon decoder		204, 188, t=8	204, 188, t=8
<b>Modulator</b>			
Output mode		QAM 16, 32, 64, 128, 256	QAM 16, 32, 64, 128, 256
Output control		Normal, Inverted, Random	Normal, Inverted, Random
Output frequency range	MHz	47 - 862	47 - 862
Output level SA modules	dB $\mu$ V	97	97
Output level adjustable	dB $\mu$ V	<b>90-100</b>	<b>90-100</b>
Symbol rate	Mbaud	< 7.0	< 7.0
Roll-off factor	%	15	15
FEC block code		RS (204, 188)	RS (204, 188)
Scrambling		<b>DVB ETS 300429</b>	<b>DVB ETS 300429</b>
Interleaving		<b>DVB ETS 300429</b>	<b>DVB ETS 300429</b>
Carrier suppression	dB	>40	>40
C/N	dB	>38	>38
MER	dB	>35	>35
IQ imbalance	Dgr	<1	<1
Output impedance	Ohm	75	75
Return loss (MOD OUT)	dB	>10	>10
Temperature, operation	$^{\circ}$ C	-10..+50	-10..+50
Weight - standard module	kg	0.45	0.45
- stand-alone module	kg	2.25	2.25
Dimensions (H x D x W)			
- standard module	mm	150 x 230 x 50	150 x 230 x 50
- stand-alone module	mm	198 x 220 x 76	198 x 220 x 76
Remarks			* With stopunit incl. PCR-correction * No processing *PiD-filter

TDH 730



TDH 730C - SA



TDH 732



TDH 732C - SA





# TDH digital QPSK - FM module FM radio from satellite

## Technical data TDH - QPSK - FM module

TYPE		TDH 737 FM DVB-S/FM Free to air	TDH 738 FM DVB-S/FM with CI	TDH 739 FM DVB slave modulator
Part No.	8 MHz band-width	490737	490738	490739
	7 MHz band-width			
	stand-alone module	SA	301730	301732
			301732	301739
				FM Stereo
Modulator type		QPSK - FM Stereo	QPSK - FM Stereo	FM Stereo
Band		FM	FM	FM
Input frequency range	MHz	920 - 2150	920 - 2150	von Master
Input level	dBm	-15.....-25	-15.....-25	-
Modulation		FM	FM	FM
Output level max	dB $\mu$ V	92	92	92
Input	Sat	F-female	F-female	F-female
Loophthrough	Sat	Yes/F-female	Yes/F-female	-
Output frequency range	MHz	87.5 - 108.0	87.5 - 108.0	87.5 - 108.0
Spurious signals ref. carrier	dB	> -60	> -60	> -60
Audio S/N ratio	dB	60	60	60
Audio distortion, 1 kHz	%	<1	<1	<1
Return loss (MOD OUT)	dB	>10	>10	>10
Output impedance	Ohm	75	75	75
Temperature, operation	$^{\circ}$ C	-10...+50	-10...+50	-10...+50
Weight - standard module	kg	0.45	0.45	0.45
- stand-alone module	kg			
Dimensions (H x D x W)				
- standard module	mm	150 x 230 x 50	150 x 230 x 50	150 x 230 x 50
- stand-alone module	mm			

TDH 737



TDH 738



TDH 739 FM



# TDH AV-PAL Audio- and FM modulator

## Technical data TDH AV- and FM modulator

TYPE		TDH 725 AV VSB mono	TDH 726 AV VSB stereo	TDH 736 FM FM modulator	TDH 772 FM FM amplifier
Part No.	8 MHz band-width	490725	490726	490736	490772
	7 MHz band-width	490765	490766		
	stand-alone module	SA 301725	301726	304736	
Modulator type		VSB	VSB	FM Stereo	FM Stereo
Tv Norm		B/G, I, L, D/K	B/G, I, L, D/K		
Input frequency range	MHz	K 2....69	K 2....69	87.5 - 108.0	87.5 - 108.0
Input level	dBm	-15.....-25	-15.....-25	-	
Audio mode		Mono	A2 stereo	FM	FM
Gain	dB				45
Attenuation switchable	dB				6-10
Attenuation adjustable	dB				10
Notches adjustable (X 6)	dB				- 10
Noise figur	dB				< 6
Linarity	dB				+/- 1
Output level max	dBµV	105	105	92	> 100
Output level attenuator	dB	10	10	10	
Return loss	dB				> 10
Spurious signals ref picture carrier	dB	> -60	> -60	F-female	F-female
Video input CVBS niveau	Vpp	0.7 - 1.3	0.7 - 1.3	87.5 - 108.0	
Audio input level	V/RMS	0.5 V/RMS	0.5 V/RMS	0.5 V/RMS	
Video S/N ratio	dB	>54	>54	60	
Audio input/output		15 pol SUB-D	15 pol SUB-D	15 pol SUB-D	
Temperature, operation	°C	-10...+50	-10...+50	-10...+50	-10...+50
Weight - standard module	kg	0.45	0.45	0.45	0.45
- stand-alone module	kg	2.25	2.25	2.25	
Dimensions (H x D x W)					
- standard module	mm	150 x 230 x 50	150 x 230 x 50	150 x 230 x 50	150 x 230 x 50
- stand-alone module	mm	198 x 220 x 76	198 x 220 x 76	198 x 220 x 76	
Video/audio cable	15 cm	Part No. 300748	Part No. 300748	Part No. 300748	
[Phone - Sub-D]	150 cm	Part No. 300745	Part No. 300745	Part No. 300745	

TDH 725 AV



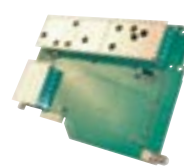
TDH 726 AV



TDH 736 FM



TDH 772 FM



TDH 725AV - SA



TDH 726AV - SA



TDH 736AV - SA



**Video/audio cable**  
15 cm  
Part No. 300748



**Video/audio cable**  
150 cm  
Part No. 300742



**Decoder cable**  
1.5 m cable fitted  
with D-sub and  
Scart-connector  
Part No. 300742



**Distributor cable**  
Multi switches,  
distributor cables  
8 x 33 cm coaxial  
cable, F-F  
Part No. 300740





# TCH 600 basic unit for analogue headend and TV - FM converters

## Technical data

TYPE		TCH 600 basic unit
Part No.		490600
Number of terrestrial inputs		1
Number of combined outputs		1
Number of module space		4 digital or 8 analogue
Frequency range		
TV in - TV out - module RF in	MHz	47 - 862
Output level - 8 combined channels		
max. @ 54 dB IMD	dB $\mu$ V	100
max. @ 60 dB IMD	dB $\mu$ V	90
Return loss		
TV in - TV out - module RF in	dB	$\geq 10$
Through loss		
TV in - TV out	dB	4
Impedance		75
Operation voltage		V/AC 190 - 260
Power consumption		W 65 max.
Connector in - out		F female
Operation temperature range		$^{\circ}$ C 0...+50
Weight		kg 4.1
Dimensions (H x D x W)		mm 200 x 130 x 440

TCH 600



## Technical data TCCC and TCFC converters

TYPE		TCCC 677 TV converter	TCCC 678 TV converter	TCFC 679 FM converter	
Part No.		490677	490678	490679	
Input frequency range	MHz	47 - 862	47 - 862	87.5 - 108	
Input level	dB $\mu$ V	65 - 90	65 - 90	60 - 90	
Output frequency range	MHz	47 - 862	47 - 862	87.5 - 108	
Output channel bandwidth	MHz	8	7		
Output level	dB $\mu$ V	90 - 100	90 - 100	82 - 92	
Output level attenuator	dB	0 - 10	0 - 10	0 - 10	
Impedance	Ohm	75	75	75	
TV standard system		BG	BG		
Temperature range	$^{\circ}$ C	0...+50	0...+50	0...+50	
Weight	kg	0.377	0.377	0.377	
Dimensions (H x D x W)	mm	120 x 190 x 45	120 x 190 x 45	120 x 190 x 45	

TCCC 677



TCFC 678



TCFC 679



# TCSA analogue satellite modules



## Technical data TCSA-analogue satellite modules (DSB) VHF/S



TCSA 611



TCSA 621



TCSA 613

TYPE		TCSA 611 analogue	TCSA 613 analogue	TCSA 621 analogue	
Part No.		490611	490613	490648	
Modulator type		DSB	DSB	DSB	
Band		VHF/S	VHF/S	VHF/S	
TV standard system		B/G, I, L, D/K	B/G, I, L, D/K	B/G, I, L, D/K	
Input frequency range	MHz	920 - 2150	920 - 2150	920 - 2150	
Input level	dBm	-65....-25	-65....-25	-65....-25	
IF bandwidth programmable	MHz	18 / 27	18 / 27	<b>27 / 32</b>	
Output frequency range	Ch.	E5....E12, S11....S25	E5....E12, S11....S25	E5....E12, S11....S25	
Output level	dB $\mu$ V	90 - 100	90 - 100	90 - 100	
Output level attenuator	dB	0 - 10	0 - 10	0 - 10	
Video S/N ratio	dB	> 54	> 54	> 54	
Spurious signals ref picture carrier	dB	> -60	> -60	> -60	
Sound mode		<b>Mono</b>	<b>A2 stereo</b>	<b>Mono</b>	
Audio frequencies	MHz	5.50-9.77	5.50-9.77	5.50-9.77	
LNB control	Volt kHz	14/18 0/22	14/18 0/22	14/18 0/22	
Software download		15 pol SUB-D	15 pol SUB-D	15 pol SUB-D	
Impedance	Ohm	75	75	75	
Operation temperature range	$^{\circ}$ C	0...+50	0...+50	0...+50	
Weight	kg	0.282	0.282	0.282	
Dimensions (H x D x W)	mm	75 x 190 x 45	75 x 190 x 45	75 x 190 x 45	

## Technical data TCSA-analogue satellite modules (DSB) UHF



TCSA 612



TCSA 622



TCSA 614

TYPE		TCSA 612 analogue	TCSA 614 analogue	TCSA 622 analogue	
Part No.		490612	490614	490649	
Modulator type		DSB	DSB	DSB	
Band		UHF	UHF	UHF	
TV standard system		B/G, I, L, D/K	B/G, I, L, D/K	B/G, I, L, D/K	
Input frequency range	MHz	920 - 2150	920 - 2150	920 - 2150	
Input level	dBm	-65....-25	-65....-25	-65....-25	
IF bandwidth programmable	MHz	18 / 27	18 / 27	<b>27 / 32</b>	
Output frequency range	Ch.	21....69	21....69	21....69	
Output level	dB $\mu$ V	90 - 100	90 - 100	90 - 100	
Output level attenuator	dB	0 - 10	0 - 10	0 - 10	
Video S/N ratio	dB	> 48	> 48	> 48	
Spurious signals ref picture carrier	dB	> -60	> -60	> -60	
Sound mode		<b>Mono</b>	<b>A2 stereo</b>	<b>Mono</b>	
Audio frequencies	MHz	5.50-9.77	5.50-9.77	5.50-9.77	
LNB control	Volt kHz	14/18 0/22	14/18 0/22	14/18 0/22	
Software download		15 pol SUB-D	15 pol SUB-D	15 pol SUB-D	
Impedance	Ohm	75	75	75	
Operation temperature range	$^{\circ}$ C	0...+50	0...+50	0...+50	
Weight	kg	0.282	0.282	0.282	
Dimensions (H x D x W)	mm	75 x 190 x 45	75 x 190 x 45	75 x 190 x 45	



# TCSA analogue satellite modules

## Technical data TCSA-analogue satellite modules (VSB)

TYPE		TCSA 671 analogue	TCSA 672 analogue	TCSA 637 analogue	TCSA 638 analogue
Part No.		490671	490672	490637	490638
Modulator type		VSB	VSB	VSB	VSB
Band		VHF/UHF	VHF/UHF	VHF/S	VHF/S
TV standard system		B/G, I, L, D/K	B/G, I, L, D/K	B/G, I, L, D/K	B/G, I, L, D/K
Input frequency range	MHz	920 - 2150	920 - 2150	920 - 2150	920 - 2150
Input level	dBm	-65....-25	-65....-25	-65....-25	-65....-25
IF bandwidth programmable	MHz	18 / 27	18 / 27	18 / 27	18 / 27
Output frequency range	Ch.	2....69	2....69	2....S41	2....S41
Output level	dBµV	90 - 100	90 - 100	90 - 100	90 - 100
Output level attenuator	dB	0 - 10	0 - 10	0 - 10	0 - 10
Video S/N ratio	dB	> 54	> 54	> 48	> 48
Spurious signals ref picture carrier	dB	> -60	> -60	> -60	> -60
Sound mode		<b>Mono</b>	<b>A2 stereo</b>	<b>Mono</b>	<b>A2 stereo</b>
Audio frequencies	MHz	5.50-9.77	5.50-9.77	5.50-9.77	5.50-9.77
LNB control	Volt kHz	14/18 0/22	14/18 0/22	14/18 0/22	14/18 0/22
Software download		15 pol SUB-D	15 pol SUB-D	15 pol SUB-D	15 pol SUB-D
Impedance	Ohm	75	75	75	75
Operation temperature range	°C	0...+50	0...+50	0...+50	0...+50
Weight	kg	0.405	0.405	0.405	0.405
Dimensions (H x D x W)	mm	120 x 190 x 45	120 x 190 x 45	120 x 190 x 45	120 x 190 x 45

TCSA 671



TCSA 672



TCSA 637



TCSA 638



## Technical data TCSA-analogue satellite modules (VSB) VHF/UHF

TYPE		TCSA 627 analogue	TCSA 631 analogue	TCSA 632 analogue	
Part No.		490647	490631	490632	
Modulator type		VSB	VSB	VSB	
Band		VHF/UHF	VHF/UHF	VHF/UHF	
TV standard system		B/G, I, L, D/K	B/G, I, L, D/K	B/G, I, L, D/K	
Input frequency range	MHz	920 - 2150	920 - 2150	920 - 2150	
Input level	dBm	-65....-25	-65....-25	-65....-25	
IF bandwidth programmable	MHz	<b>27 / 32</b>	18 / 27	18 / 27	
Output frequency range	Ch.	E5....E12 / S11....S38 21....60	E5....E12 / S11....S38 21....60	E5....E12 / S11....S38 21....60	
Output level	dBµV	90 - 100	90 - 100	90 - 100	
Output level attenuator	dB	0 - 10	0 - 10	0 - 10	
Video S/N ratio	dB	> 48	> 48	> 48	
Spurious signals ref picture carrier	dB	> -60	> -60	> -60	
Sound mode		<b>Mono</b>	<b>Mono</b>	<b>A2 stereo</b>	
Audio frequencies	MHz	5.50-9.77	5.50-9.77	5.50-9.77	
LNB control	Volt kHz	14/18 0/22	14/18 0/22	14/18 0/22	
Software download		15 pol SUB-D	15 pol SUB-D	15 pol SUB-D	
Impedance	Ohm	75	75	75	
Operation temperature range	°C	0...+50	0...+50	0...+50	
Weight	kg	0.405	0.405	0.405	
Dimensions (H x D x W)	mm	120 x 190 x 45	120 x 190 x 45	120 x 190 x 45	

TCSA 631



TCSA 627



TCSA 632



# TCMA modulator modules

## Technical data TCMA-modulator modules (VSB) VHF/UHF

TYPE		TCMA 635 modulator	TCMA 636 modulator	TCMA 673 modulator	TCMA 674 modulator
Part No.		490635	490636	490673	490674
Modulator type		VSB	VSB	VSB	VSB
Band		UHF	UHF	VHF/UHF	VHF/UHF
TV standard system		B/G, I, L, D/K	B/G, I, L, D/K	B/G, I, L, D/K	B/G, I, L, D/K
Output frequency range	Ch.	21...69	21...69	2...69	2...69
Output level	dB $\mu$ V	90 - 100	90 - 100	90 - 100	90 - 100
Output level attenuator	dB	0 - 10	0 - 10	0 - 10	0 - 10
Video S/N ratio	dB	> 48	> 48	> 54	> 54
Sound mode		<b>Mono</b>	<b>A2 stereo</b>	<b>Mono</b>	<b>A2 stereo</b>
Video input CVBS-level	Vpp	0.7 - 1.3	0.7 - 1.3	0.7 - 1.3	0.7 - 1.3
Audio input level	V RMS	0.5	0.5	0.5	0.5
Input connector		15 pol SUB-D	15 pol SUB-D	15 pol SUB-D	15 pol SUB-D
Impedance	Ohm	75	75	75	75
Operation temperature range	$^{\circ}$ C	0...+50	0...+50	0...+50	0...+50
Weight	kg	0.350	0.350	0.350	0.350
Dimensions (H x D x W)	mm	120 x 190 x 45	120 x 190 x 45	120 x 190 x 45	120 x 190 x 45

TCMA 673



TCMA 674



TCMA 635



## Technical data TCMA-modulator modules (VSB) VHF/UHF

TYPE		TCMA 633 modulator	TCMA 634 modulator		
Part No.		490633	490634		
Modulator type		VSB	VSB		
Band		VHF/UHF	VHF/UHF		
TV standard system		B/G, I, L, D/K	B/G, I, L, D/K		
Output frequency range	Ch.	E5...E12, S11...S38, 21...60	E5...E12, S11...S38, 21...60		
Output level	dB $\mu$ V	90 - 100	90 - 100		
Output level attenuator	dB	0 - 10	0 - 10		
Video S/N ratio	dB	> 48	> 48		
Sound mode		<b>Mono</b>	<b>A2 stereo</b>		
Video input CVBS-level	Vpp	0.7 - 1.3	0.7 - 1.3		
Audio input level	V RMS	0.5	0.5		
Input connector		15 pol SUB-D	15 pol SUB-D		
Impedance	Ohm	75	75		
Operation temperature range	$^{\circ}$ C	0...+50	0...+50		
Weight	kg	0.350	0.350		
Dimensions (H x D x W)	mm	120 x 190 x 45	120 x 190 x 45		

TCMA 636



TCMA 633



TCMA 634



**Video/audio cable**  
15 cm  
Part No. 300748



**Video/audio cable**  
150 cm  
Part No. 300742



**Decoder cable**  
1.5 m cable fitted with D-sub and Scart-connector  
Part No. 300742



**Distributor cable**  
Multi switches, distributor cables  
8 x 33 cm coaxial cable, F-F  
Part No. 300740



# TCMA modulator and multiband amplifiers

## Technical data TCMA-modulator modules (DSB) VHF or UHF

TYPE		TCMA 615 modulator	TCMA 617 modulator	TCMA 616 modulator	TCMA 618 modulator
Part No.		490615	490617	490616	490618
Modulator type		DSB	DSB	DSB	DSB
Band		VHF/S	VHF/S	UHF	UHF
TV standard system		B/G, I, L, D/K	B/G, I, L, D/K	B/G, I, L, D/K	B/G, I, L, D/K
Output frequency range	Ch.	E5...E12 S11...S25	E5...E12 S11...S25	21...69	21...69
Output level	dB $\mu$ V	90 - 100	90 - 100	90 - 100	90 - 100
Output level attenuator	dB	0 - 10	0 - 10	0 - 10	0 - 10
Video S/N ratio	dB	> 54	> 54	> 54	> 54
Sound mode		Mono	A2 stereo	Mono	A2 stereo
Video input CVBS-level	V <sub>pp</sub>	0.7 - 1.3	0.7 - 1.3	0.7 - 1.3	0.7 - 1.3
Audio input level	V RMS	0.5	0.5	0.5	0.5
Input connector		15 pol SUB-D	15 pol SUB-D	15 pol SUB-D	15 pol SUB-D
Impedance	Ohm	75	75	75	75
Operation temperature range	°C	0...+50	0...+50	0...+50	0...+50
Weight	kg	0.232	0.232	0.232	0.232
Dimensions (H x D x W)	mm	75 x 190 x 45	75 x 190 x 45	75 x 190 x 45	75 x 190 x 45



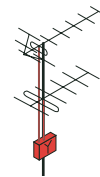
TCMA 617



TCMA 616



TCMA 618



## Technical data - ARM and ATB multiband amplifiers

TYPE		ARM 404	ARM 455	ARM 486	ATB 1432
Part No.		324121	324122	324123	324520
Input 1 - Frequency range	MHz	47 - 68 + 87.5 - 108	47 - 68 + 87.5 - 108	87.5 - 108	47 - 68
Input 1 - Gain	dB	32	34	36	2 - 22
Input 1 - Noise figure	dB	5.0	5.0	8.0	8.0/6.0
Input 2 - Frequency range	MHz	174 - 230	174 - 230	47 - 68 + 470 - 862	87.5 - 108
Input 2 - Gain	dB	32	34	36	2 - 22
Input 2 - Noise figure	dB	5.0	5.0	8.0	8.0/6.0
Input 3 - Frequency range	MHz	470 - 862	470 - 862	174 - 230	174 - 230
Input 3 - Gain	dB	40	47	36	8 - 28
Input 3 - Noise figure	dB	8.0	5.0	7.0	8.0/6.0
Input 4 - Frequency range	MHz	470 - 862	470 - 862	470 - 862	470 - 862
Input 4 - Gain	dB	40	40	47	12 - 32
Input 4 - Noise figure	dB	8.0	9.0	5.0	10.0
Input 5 - Frequency range	MHz		470 - 862	470 - 862	470 - 862
Input 5 - Gain	dB		40	44	12 - 32
Input 5 - Noise figure	dB		9.0	9.0	10.0
Input 6 - Frequency range	MHz			470 - 862	
Input 6 - Gain	dB			44	
Input 6 - Noise figure	dB			9.0	
Output level 3.order @ 60 dB IMD	- VHF - UHF	117.0 117.0	117.0 117.0	121.0 121.0	114.0 114.0
Connectors		F	F	F	F
Impedance	Ohm	75	75	75	75
Power consumption	W	7	7.5	11.3	7
Remote supply	V/mA	12/100	12/100	12/60	
Operation voltage	V/AC	185 - 265	185 - 265	185 - 265	230
Operation temperature range	°C	-20 to +55	-20 to +55	-20 to +55	-20 to +55
Weight	kg	1.250	1.250	1.250	0.915
Dimensions (H x D x W)	mm	122 x 70 x 210	122 x 70 x 210	122 x 70 x 210	98 x 43 x 180

ARM 404



ARM 455



ARM 486



ATB 1432



# AS single channel headend system

## Technical data - AS modules

TYPE		ASV 137	ASV 237	ASV 337	ASU 040	ASU 050
Part No.		324590	324591	324592	324593	324594
Frequency band		BI E2-E4	FM 87,5-108MHz	BIII E5-E12	Channel X* (21...69)	Channel X* (21...69)
Channel band width	MHz	7		7	8	8
Gain	dB	37	37	37	40	50
Selectivity	dB	36 at ±16MHz	36 at ±16MHz	36 at ±16MHz	36 at ±16MHz	36 at ±16MHz
Attenuation	dB	0-18	0-18	0-18	0-18	0-18
Output level ***	dBμV	117	112	117	117	125
Output level **	dBμV	105	105	105	105	113
Power consumption	mA	35	35	35	60	110
Connector	IEC	Female	Female	Female	Female	Female
Temperature range	°C	0 - 50	0 - 50	0 - 50	0 - 50	0 - 50
Dimensions (H x D x W)	mm	160 x 45 x 20	160 x 45 x 20	160 x 45 x 20	160 x 45 x 20	160 x 45 x 20

\* Remember to order the specific channel

\*\* IMA 3 (-52dB)

\*\*\* DIN norm D45004



## Technical data - AS power supply

TYPE		ASA 015
Part No.		324585
Mains input voltage	V/AC	230 ±10%
Output DC	V	+15
Max output current	mA	1500
Temperature range	°C	0 - 50
Dimensions (H x D x W)	mm	128 x 57 x 85



## Accessories

TYPE	ASC 011	ASR 075	ASL 030
Part No.	324587	324598	324599
Description	Mounting frame for 10 modules + Power supply	75 Ohm terminating plug	Rigid coaxial interconnection cable



# TCM-08 single channel modulator

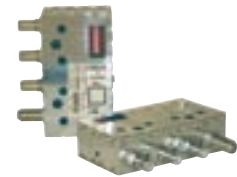
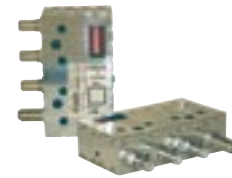
## Technical data - TCM-08 modulator cabinets

TYPE		TCM-08 basic unit	TCM-08A basic unit
Part No.		300110	300111
Output frequency range	MHz	47 - 862	47 - 862
Attenuation	dB		10
Output level max (with 8 channels) IMD - 60 dB	dB $\mu$ V	80	105
Return loss, output	dB	>14 @ 47MHz (Min. 10dB)	>14 @ 47MHz (Min. 10dB)
Output impedance	Ohm	75	75
Input voltage	V-ac	190 - 260	190 - 260
Power consumption (with 8 modulator)	W	17	20
RF output, OUT		1 x F-type	1 x F-type
Temperatur, operation	$^{\circ}$ C	0..+50	0..+50
Weight	kg	4.4	4.6
Dimensions (H x D x W)	mm	180 x 440 x 130	180 x 440 x 130



## Technical data - modulator module

TYPE		CM02V VHF modulator	CM02U UHF modulator
Part No.		490898	490899
TV system		(B-D-I-L)+(AU/NZ)	(G-K-I-L)+(AU/NZ)
Output frequency range	MHz	175-342	470 - 862
Picture carrier stability	kHz	< +/-70	< +/-70
Spurious signals ref. picture carrier	dB	> -55	> -55
Output level max	dB $\mu$ V	95 +/- 2,5	95 +/- 2.5
Output impedance	Ohm	75	75
Return loss	dB	>10	>10
Differentiel gain	%	<8	<8
Differentiel phase	Deg.	<8	<8
Crominance/luminance delay	nS	<80	<80
Luminance non-linearity	%	<8	<8
Video S/N ratio	dB	>55	>52
Sound sub carrier	MHz	5.5/6.0/6.5	5.5/6.0/6.5
Sound sub carrier stability	kHz	< +/-5	< +/-5
Audio distortion, 1 KHz	%	< 1	< 1
Audio S/N ratio	dB	> 55	> 55
<b>Video:</b>			
Input level	V <sub>pp</sub>	0.8-1.3	0.8-1.3
Input impedance	Ohm	75	75
<b>Audio:</b>			
Input level	V <sub>rms</sub>	0.5-1.0	0.5-1.0
Input impedance	kOhm	10	10
<b>Power supply</b>			
Voltage	V-dc/mA	12/117	12/110
Power consumption	W	1.4	1.5
<b>Connectors</b>			
RF output, OUT		1 x F	1 x F
Audio/Video input		3 x RCA	3 x RCA
Power supply		Via RF output	Via RF output
Temperature, operation	$^{\circ}$ C	0..+50	0..+50
Weight	kg	0.1	0.1
Dimensions L x B x H	mm	96 x 25 x 67	96 x 25 x 67



Video/audio cable  
15 cm  
Part No. 300748



Video/audio cable  
150 cm  
Part No. 300742



# Simply more - more simply....

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