



ARC100 DVB Aspect Ratio Controller



ARC100

- Automatic adaptation of control signals based on active visual content •
 - Creative programme properties remain untouched •
- ASI connections (with automatic built-in loop-through switch) •
 - No loss of picture quality •
 - SNMP • ASI or GbE •



ITNM Systems ARC100 DVB Aspect Ratio Controller

Operational excellence of digital television

Digital television distribution systems make use of signals coming from program suppliers all over the world. A network operator combines these signals to one complete and varied bouquet. For user-friendliness it is important that the properties of the channels - like sound, picture, programme information, teletext and subtitling - differ as little as possible. In practice, these properties appear to be quite different that degrades the quality of service. With maximum customer satisfaction, ITNM Systems develops applications that help to minimise the differences in a way the services can be used with the best possible performance after all.

ARC100 DVB Aspect Ratio Controller

Television images are broadcasted in aspect ratios 4:3, 14:9 and 16:9. The best way to transfer the pictures appears in case the source material, the properties of the television set and the broadcast mode are all the same. If this is not the case, some kind of conversion has to be done. Dependent on the way this is

performed, unpleasant artefacts can arise like distorted proportions between height en width, black bars, reduced resolution and loss of parts of the picture.

Artefacts

Without any doubt, the most annoying form is the effect of unnecessary double conversion that results in black bars all around the picture. Television sets based on the traditional format still are in the majority at the customer's side (source: memorandum European Commission) which means that this group keeps to deserve serious attention. Wide screen viewers on the other hand are disadvantaged as well because in this specific example, generally none of the options to manipulate the size of the picture can be used anymore. This means wide screen viewers are burdened with unchangeable black bars on both sides of the screen.

ARC100

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Product description

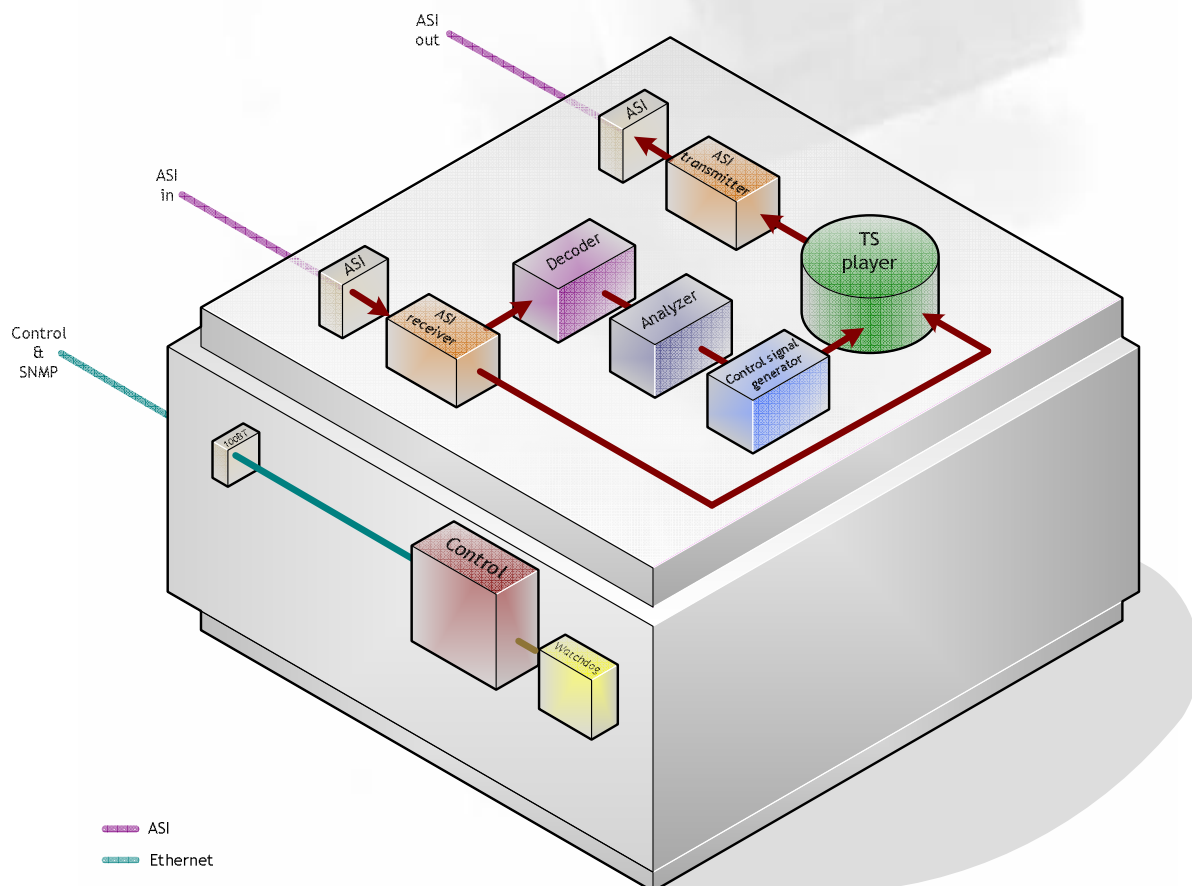
The solution

The task of the ARC100 is correction of the double conversion artefact so that - in case of 4:3 source material - instead of black bar surrounded pictures, a full screen in the right proportions can be displayed again.

Analogue and digital

The ARC100 can be applied for both analogue and digital distribution. In case of the former, the ARC100 can feed a professional decoder directly. For the latter, the digital set-top box will be supplied with supplementary control signals. Providing that the set-top box is compliant with the appropriate DVB standards, both 16:9 and 4:3 television sets will be supported as good as possible.

The drawing below shows an overview of the internal construction.



Schematic overview ARC100

ARC100

ARC100

Product description

Connections

Input for the system is the multiplexed transport stream - stripped of any scrambling - coming from the DVB multiplexer, or the output signal of one or more DVB decoders. The output supplies the complete elementary stream of the channel and can be connected to the DVB multiplexer as well as to an external decoder.

Implementation

Integration of the ARC100 is easy thanks to automatic configuration. The system analyses the properties of the picture and checks the status of the video header and perhaps available AFD (Active Format Descriptor) and WSS (Wide Screen Signalling). In case double conversion is observed, the ARC100 generates the appropriate control signals for optimum display by both professional as well as consumer decoders, providing that these are compliant with the standards.

Transparent data transport

For maximum stability, nothing is changed to the original data structure and by doing that, the system acts as most transparent as possible. Other components will remain completely untouched.

Functionality

Starting point in the design of the ARC100 is the proposition that rebroadcast operators - irrespective of the kind of infrastructure - must not have the intention to change the creative properties of programme material. The basic functionality supports the view that the system corrects only the erroneous display properties.

Basics

Video is not decoded and re-encoded again what would lead to a degraded picture quality. Instead of that - according to visual information and after careful assessment - the right control signals are generated. Programmes transmitted in 16:9 will maintain to be visible in wide screen format, so full screen for wide screen and as a letterbox for traditional viewers. In case of 4:3 programmes, the result will be full screen 4:3 on both types of television sets. Normal sets will display a full screen picture while wide screen sets are able to manipulate the size of the picture as usual again, based on user preferences.

Automatic switch-over

The ARC100 will do its job automatically. An SNMP-generator - suitable to display the status of the system - is standard.

No loss of picture quality

The ARC100 performs all changes directly and without any loss of video quality. All other data will remain unchanged in order to pursue maximum stability and to maintain integrity of the composition of the signal stream.

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Product description

Practical examples

Below some examples are shown of double conversion of 4:3 source material in a 16:9 frame. The ARC100 corrects this mistake for both analogue and digital distribution as well as for both 4:3 and 16:9 television sets.

Conversion error on a 4:3 television set

4:3 material inside a 16:9 frame displayed on a 4:3 television set. Black bars all around the picture appear.



4:3-video in a 16:9-frame

The result after ARC100 processing. The complete picture fills the screen again.



After ARC100 processing

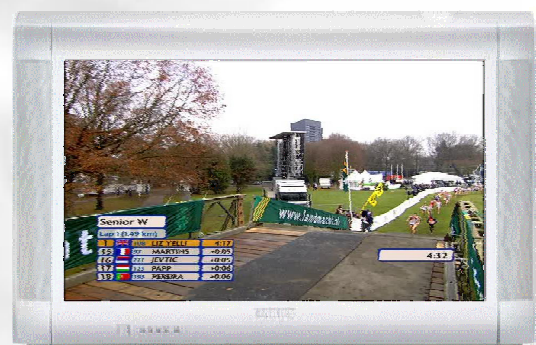
Conversion error on a 16:9 television set

4:3 material inside a 16:9 frame displayed on a 16:9 television set. Black bars on both sides of the picture appear. In most cases, picture size control is not available anymore.



4:3-video in a 16:9-frame

The result after ARC100 processing. All full or partial modes to zoom in to the picture are available again.



After ARC100 processing

ARC100

ARC100 Networks

Integration in networks

The ARC100 is applicable in several kinds of network architecture.

Implementation

Normally the system is placed at the location where centralised processing of digital radio and television services is performed; the head-end or digital play-out centre. There are many ways to connect, depending on the construction of the existing multiplexer and receiver equipment.

Connections

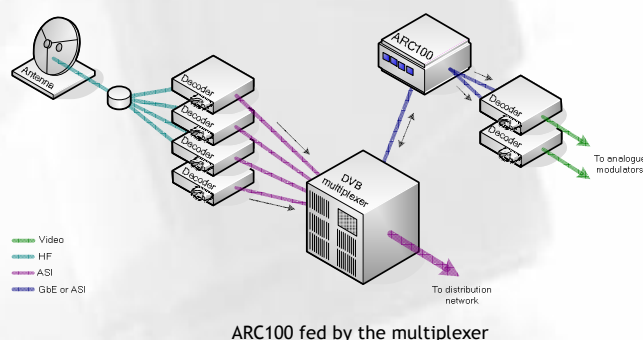
In the standard set-up, all DVB transmission is done by ASI interfaces. It is also possible to choose for Ethernet instead of ASI (Asynchronous Serial Interface). In case of the former, an automatic built-in switch will connect the input with the output in case of a failure or power interruption. The output of the ARC100 supplies as much as the same signal that is offered to the input and can supply the DVB multiplexer and/or external professional decoders. In case of an emergency, the signal can easily be re-routed outside of the unit. Communications with the ARC100 for maintenance and SNMP is done by common Ethernet.

Examples

The following drawings show examples of implementation of the ARC100 in several kinds of network design. However, the possibilities are not limited to these examples.

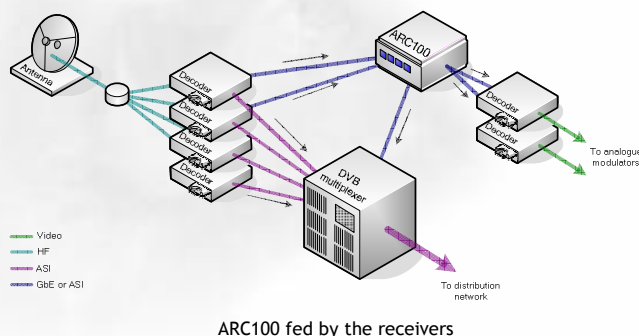
Fed by the multiplexer

The signal flow to and from the ARC100 normally is done through the multiplexer. The composed output signal runs over one connection to the multiplexer where the channels can be added. According to customer preferences, the ARC100 can supply external decoders for analogue distribution directly or by means of the digital distribution.



Fed by the receivers

In case it is not possible or not desired to connect through the multiplexer, then the ARC100 also accepts ASI input signals directly coming from the satellite receivers. For this, one or more ASI connections can be used.



ARC100

ARC100 Specifications

Capacity

- 2 television channels simultaneously

Functionality

- Automatic adaptation of control signals based on active visual content
- Creative programme properties remain untouched
- No loss of picture quality
- SNMP
- ASI connections (with automatic built-in loop-through switch)

Options

- Gigabit Ethernet connections
- Redundant design
- User specific demands

ITNM Systems reserves the right to change the specifications.

ARC100

ARC100 Foundation

Construction

The foundation of the ARC100 is a Supermicro industrial server controlled by Linux operation system. The power supply and hard disk can be swapped from the outside. A watchdog circuit is monitoring the availability continuously. Communications for maintenance and SNMP can be done by means of common Ethernet. The foundation can optionally be equipped with redundant power supplies and ditto hard disks. Delivery based on a HP Proliant server is also an option.



Front and rear panel of the industrial server

Standard configuration

Industrial server
Watchdog circuit
Swappable power supply and hard disk
No keyboard or mouse needed to start up
Mains 230 V 50 Hz (other available on request)
Used power 150-250 W*
Colours beige and black

Dimensions (width x depth x height):

1 RU = 438 x 681 x 43 mm

Environmental conditions:

Temperature range storage 0 - 50 °C
Temperature range operating 10 - 35 °C
Humidity 8%-90% non-condensing

Safety and EMC:

CE compliant (EN 60950/IEC 60950)

Connections:

1 x MPTS input (ASI)
1 x MPTS output (ASI)
1 x Control/SNMP (10/100/1000Base-T)

Connection options:

2 x MPTS/SPTS input/output (GbE 1000Base-SX,
LC duplex connector)

* Dependent on the configuration.

ITNM Systems reserves the right to change the specifications
of the configuration.

ARC100

ARC100 Management

Purpose

Besides powerful and advanced functionality and cost-effective design durability of a part in a digital television broadcast system is of course of vital importance. A service level agreement is the appropriated means for a user defined improved or continuous availability.

Service level agreement

A service level agreement covers preventive as well as corrective maintenance of the whole system as well as possible bugs in the applications. The standard rate is 7 % of the installed base per year. The standard coverage in the Netherlands implies a maximum response time of one hour during seven days a week between 9 o'clock in the morning and 11 o'clock in the evening. The response time at the location is four hours maximum. Spare material can be included on customer's demand as part of the delivery.

Contact

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