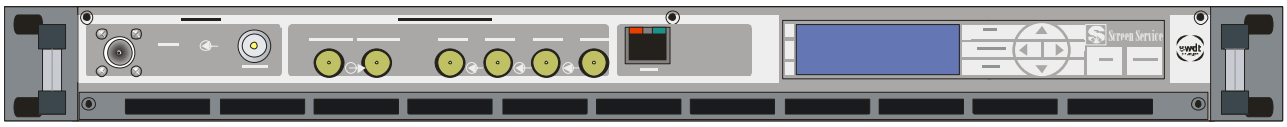
Screen Service

SDT 200UB – SDT 500UB ARK-1 ATSC

Software Defined Transmitter



OPERATION MANUAL

July 2009 - Version 1.0

Screen Service Broadcasting Technologies S.p.A.
Via Giuseppe Di Vittorio, 17
25125 Brescia, Italy

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OPERATION MANUAL

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CHAPTER 1: **GENERAL INFORMATION**
Gives information on safety procedures and good practices to follow using the equipment.

CHAPTER 2: **PURPOSE AND PLANNING**
Introduction to the manual, technical specifications, brief functional description with block diagram.

CHAPTER 3: **OPERATIONS**
Installation and unpacking instructions, mounting specifications, controls and connections, first time operating procedures and channel changing procedures.

CHAPTER 4: **TECHNICAL INFORMATION**
Provides technical information on all modules including schematic diagrams and components layouts.

CHAPTER 5: **MANUAL CHANGE INFORMATION**

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OPERATION MANUAL

1 GENERAL INFORMATION

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1.1 SAFETY SUGGESTIONS

Regardless of how well electrical equipment is designed, personnel can be exposed to **dangerous electrical shock** when protective covers are removed for maintenance or other activities. Therefore, it is incumbent on the user to see that all safety regulations are consistently observed and that each individual assigned to the equipment has a clear understanding of the first aid related to electrical shocks. (see next pages)

In addition these safety practices must be followed:

- Do not attempt to adjust unprotected circuit controls or to dress leads with power on.
- Always avoid placing parts of the body in series between ground and circuit points.
- To avoid burns, do not touch heavily loaded or overheated components without precautions.
- Remember that some semiconductor cases and solid-state circuits carry high voltages.
- Do not assume that all danger of electrical shock is removed when the power is off. Charged capacitors can retain dangerous voltages for a long time after power is turned off. These capacitors should be discharged trough a suitable resistor before any circuit points are touched.
- Don't take chances. Be fully trained. Screen Service Italia equipment should be operated and maintained by fully qualified personnel.
- Do not service alone and do not perform internal adjustments of this unit unless another person capable of rendering first aid and resuscitation is present.
- Some components used in the construction of this equipment contain Beryllium Oxide (BeO). This substance is harmless as it is, but becomes highly dangerous if it is ground to powder. Special procedures of disposal must be observed in case of failure of these devices.

NOTE: This section is not intended to contain a complete statement of all safety precautions which should be observed by personnel in using this electronic equipment or others.
Screen Service shall not be responsible for injury or damage resulted from improper procedures or from using it by improperly trained or inexperienced personnel.

1.2 GENERAL SAFETY RECOMMENDATIONS

When connecting the equipment to the power, please follow these important recommendations:

- This product is intended to operate from a power source that will not apply more than 10% of the voltage specified on the rear panel between the supply conductors or between either supply conductor and ground. A protective-ground connection by way of the grounding conductor in the power cord is essential for safe operation.
- This equipment is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired socket before connecting to the product input or output terminals.
- Upon loss of the protective-ground connection, all accessible conductive parts (including parts that may appear to be insulating) can render an electric shock.
- To avoid fire hazard, use only the fuse of correct type, voltage rating, and current rating. Refer fuse replacement to qualified service personnel.
- To avoid explosion, do not operate this equipment in an explosive atmosphere.
- To avoid personal injury, do not remove the product covers or panels. Do not operate the product without the covers and panels properly installed.

1.3 GOOD PRACTICES

In maintaining the equipment covered in this manual, please keep in mind the following, standard good practices:

- At regular intervals, the condition of the equipment and the correct functioning of protective and safety devices shall be checked by a skilled person approved by the appropriate authority for this duty. Functional checks shall be carried out on interlocking systems of doors, mechanical interlocks, isolating switches, earthing switches, parallel resistances and protective devices against over-voltages and over-currents. The above checks shall not be carried out after the protective and safety devices have operated under fault conditions. The safety devices shall not be altered or disconnected except for replacement, nor shall the safety circuit be modified without specific approval of the appropriate authority in each case.
- When connecting any instrument (wattmeter, spectrum analyzer, etc.) to a high frequency output, use the appropriate attenuator or dummy load to protect the final amplifiers and the instrument input.
- When inserting or removing printed circuit boards (PCBs), cable connectors, or fuses, always turn off power to the affected portion of the equipment. After power is removed, allow sufficient time for the power supplies to bleed down before reinserting PCBs.
- When troubleshooting, remember that FETs and other metal-oxide semiconductor (MOS) devices may appear defective because of leakage between traces or component leads on the printed circuit board. Clean the printed circuit board and recheck the MOS device before assuming it is defective.
- When replacing MOS devices, follow standard practices to avoid damage caused by static charges and soldering.
- When removing components from PCBs (particularly ICs), use care to avoid damaging PCB traces.

1.4 PROCEDURE FOR ESTABLISH THE ABSENCE OF VOLTAGE

Follow these simple steps for establish the absence of voltage:

- Before starting work on the equipment, it shall be isolated from the mains supply. This disconnection shall always be checked by visual inspection. Further precautions shall be taken to ensure that the mains supp!y cannot be restored whilst work is being carried out. After the mains supply has been disconnected, all other lines such as control, interlocking and modulation lines shall be disconnected if they carry dangerous voltages. Moreover, the antenna or the antenna transmission line shall be disconnected from the antenna terminal device to prevent the introduction of dangerous voltages due to antenna pick-up. When disconnection of the antenna or antenna transmission line is not possible, other suitable precautions shall be taken, for example, earthing, when necessary at several places, to esablish absence of voltage. These earthing connections shall be very short compared with the wave-lenght.

- Capacitors which are connected to a circuir isolated frcm its supply shall be discharged and have their terminals permanently short-circuited and the casing earthed during the whole period of the work.

- The electrical charge retained by electrical machinery when stopped may, in certain cases, be sufficient to cause a severe shock. This shall be taken into account when making connections to an apparently "dead" machine. Therefore all machinery shall be discharged and earthed using an adequately insulated lead for this purpose. The discharge operation shall be repeated several times.

- Before any maintenance work is carried out on automatic or remote controlled equipment, the remote swithching circuits shall be made inoperative.

1.4.1 PROCEDURE FOR DETERMINATION OF THE ABSENCE OF VOLTAGE

After the equipment has been isolated according to the standard EN60215, the absence of voltage shall be determined at the work place. This may be done by the use of voltage indicators, measuring instruments, glow discharge lamps for indicating radio-frequency voltage or other suitable means.

1.5 FIRST AID IN CASE OF ELECTRICAL SHOCK

If someone seems unable to free himself while receiving an electric shock, **turn power off** before rendering aid. A muscular spasm or unconsciousness can make a victim unable to free himself from the electrical power.

DO NOT TOUCH VICTIM OR HIS CLOTHING BEFORE POWER IS DISCONNECTED OR YOU CAN ALSO BECOME A SHOCK VICTIM

If power cannot be turned off immediately, **very carefully** loop a length of dry non-conducting material (such as a rope, insulating material, or clothing) around the victim and pull him free of the power. Carefully avoid touching him or his clothing until free of power.

1.5.1 EMERGENCY RESUSCITATION TECHNIQUE

Step 1

Check the victim for unresponsiveness. If there is no response, **immediately call for medical assistance**, and then return to the person.

Step 2

Position the person flat on their back. Kneel by their side and place one hand on the forehead and the other under the chin. Tilt the head back and lift the chin until teeth almost touch. Look and listen for breathing.

Step 3

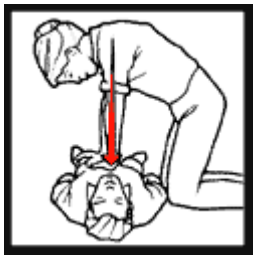
If not breathing normally, pinch the nose and cover the mouth with yours. Give two full breaths. The person's chest will rise if you are giving enough air.

Step 4

Put the fingertips of your hand on the Adam's apple, slide them into the groove next to the windpipe. Feel for a pulse. If you can not feel a pulse or are unsure, move on to the next step.

Step 5

Position your hands in the center of the chest between the nipples. Place one hand on top of the other.



Step 6

Push down firmly two inches. Push on chest 15 times.

CONTINUE WITH TWO BREATHS AND 15 PUMPS UNTIL HELP ARRIVES.

1.5.2 TREATMENT FOR BURNS

- Continue treat victim for electrical shock.
- Check for points of entry and exit of current.
- Cover burned surface with a clean dressing.
- Remove all clothing from the injured area, but cut around any clothing that adheres to the skin and leave it in place. Keep the patient covered, except the injured part, since there is a tendency to chill.
- Splint all fractures. (Violent muscle contractions caused by the electricity may result in fractures.)
- Never permit burned surfaces to be in contact with each other, such as: areas between the fingers or toes, the ears and the side of the head, the undersurface of the arm and the chest wall, the folds of the groin, and similar places..
- Transport to a medical facility

1.5.3 ELECTRIC SAFETY PRECAUTIONS

All the parts making up the equipment have got danger identification tags (with a yellow background) to highlight the parts dangerous for the operator that has access to the system.

Presence of hazardous energy levels

A hazardous energy level is defined as a stored energy level of 20 J or more, or an available continuous power level of 240 VA or more, at a potential of 2 V or more.

1.5.4 COMPONENTS CONTAINING TOXIC MATERIAL HANDLING PRECAUTION

Beryllium (BERILLIUM OXIDE) is used in the construction of the some of the components in this equipment.

This material, when in the form of fine dust or vapor and inhaled into the lungs, can cause a respiratory disease. In its solid form, as used here, it can be handled quite safely although it is prudent to avoid handling conditions which promote dust formation by surface abrasion.

Because of this hazard, you are advise to be very careful in removing and disposing of these components. Do not put them in the general industrial or domestic waste or dispatch them by post. They should be separately and securely packed and clearly identified to show the nature of the hazard and then disposed of in a safe manner by an authorized toxic waste contractor.

Before removing or replacing any RF COMPONENTS, make sure that all precautions comply with SAFETY recommendations.

This WARNING tag is used for the RF COMPONENTS.

1.5.5 ELECTROSTATIC PRECAUTIONS

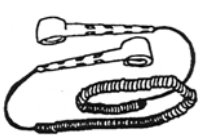
Before removing or replacing any PCB assembly within the equipment, make sure that all precautions comply with ESD protections (ESD = Electro Static Discharge). Make sure that electrostatic discharge protections are reset after maintenance and/or measurement operations.

This ATTENTION tag is used for the majority of electronic devices that are sensitive to electrostatic discharges.

If electronic parts have to be touched during installation or repair, please observe the following precautions.

Operators must be equipped with anti-static protection devices such as:

Elastic wrist band. To be fixed on the operator's wrist.



Flexible cord. To be connected to the elastic wrist band and the special plug on the shelf highlighted with the ESD warning label.

1.6 R&TTE DIRECTIVE 1999/5/EC

Declaration of Conformity with regards to the R&TTE Directive 1999/5/EC

English:	This equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC
Deutsch:	Dieses Gerät entspricht den grundlegenden Anforderungen und den weiteren entsprechenden Vorgaben der Richtlinie 1999/5/EU.
Dansk:	Dette udstyr er i overensstemmelse med de væsentlige krav og andre relevante bestemmelser i Directiv 1999/5/EF.
Español:	Este equipo cumple con los requisitos esenciales asi como con otras disposiciones de la Directiva 1999/5/EC.
'Ελληνας	Αυτός ο εξοπλισμός συμμορφώνεται με τις ουσιώδεις απαιτήσεις και τις λοιπές διατάξεις της Οδηγίας 1999/5/ΕΚ
Français:	Cet appareil est conforme aux exigences essentielles et aux autres dispositions pertinentes de la Directive 1999/5/EC.
Íslenska:	Þessi búnaður samrýmist lögboðnum kröfum og öðrum ákvæðum tilskipunar 1999/5/ESB.
Italiano:	Questo apparato é conforme ai requisiti essenziali ed agli altri principi sanciti dalla Direttiva 1999/5/EC.
Nederlands:	Deze apparatuur voldoet aan de belangrijkste eisen en andere voorzieningen van richtlijn 1999/5/EC.
Norsk:	Dette utstyret er i samsvar med de grunnleggende krav og andre relevante bestemmelser i EU-directiv 1999/5/EC.
Português:	Este equipamento satisfaz os requisitos essenciais e outras provisões da Directiva 1999/5/EC.
Suomalainen:	Tämä laite täyttää direktiivin 1999/5/EY oleelliset vaatimukset ja on siinä asetettujen muidenkin ehtojen mukainen.
Svenska:	Denna utrustning är i överensstämmelse med de väsentliga kraven och andra relevanta bestämmelser i Direktiv 1999/5/EC.

The Declaration of Conformity related to this product can be found at the following URL: www.screen.it/rtte

The following CE mark is affixed to the equipment:

RADIO LINKS:

CE 0470 !

TV BROADCASTING EQUIPMENTS:

CE 0648 !

The identification number of the Notified Body who certified the product might change.

This equipment is intended to be used in all EU and EFTA countries.

The use of this equipment may be restricted to certain frequencies and requires a license for operation. For more details, contact your customer service representative.

1.7 WASTE ELECTRICAL AND ELECTONIC EQUIPMENT (WEEE)

The purpose of the DIRECTIVE 2002/96/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on waste electrical and electronic equipment (WEEE) is, as first priority, the prevention of waste electrical and electronic equipment and, in addition, the reuse, recycling and other forms of recovery of such wastes so as to reduce the disposal of waste.

To do this, remember to collect separately all the electronic material.

1.8 RADIO LINK SYSTEM SPECIAL ADVISE: EN 50385 STANDARD

The responsible of the installation and (or) the use of the RADIOLINK SYSTEM composed of:

- EQUIPMENT(s)
- CONNECTION(s)
- ANTENNA(s)

Shall certify under its own responsibility the conformity as per EN 50385 standard:
EN 50385:2002 - Product standard to demonstrate the compliance of radio base stations and fixed terminal stations for wireless telecommunication systems with the basic restrictions or the reference levels related to human exposure to radio frequency electromagnetic fields (110 MHz - 40 GHz) - General public.

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2 PURPOSE AND PLANNING

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2.1 INTRODUCTION

ARK1 ATSC is a Multi-standard Television Transposer based on Software defined technology; ARK1 ATSC allows the definition of different operative modes on the same hardware platform.
At the state of the art ARK1 ATSC has two working modes:

- ITU 470 modulator (based on ITU-R BT.470-7);
- ATSC modulator (based on ATSC A/53).

ITU 470 modulator receives NTSC signals on SDI interfaces and modulates them.
ATSC modulator receives ATSC signals and modulates them. Inputs and outputs allow to import and export TS contents on ASI and GBE interfaces.
The single software controller allows the switching between working modes and different settings for each operative mode using the same platform.
A brief description of the main features and potentialities of each operative mode follows.

2.2 ITU 470 modulator

ITU 470 modulator for NTSC (ITU-R BT.470-7) television system.
Capable of:

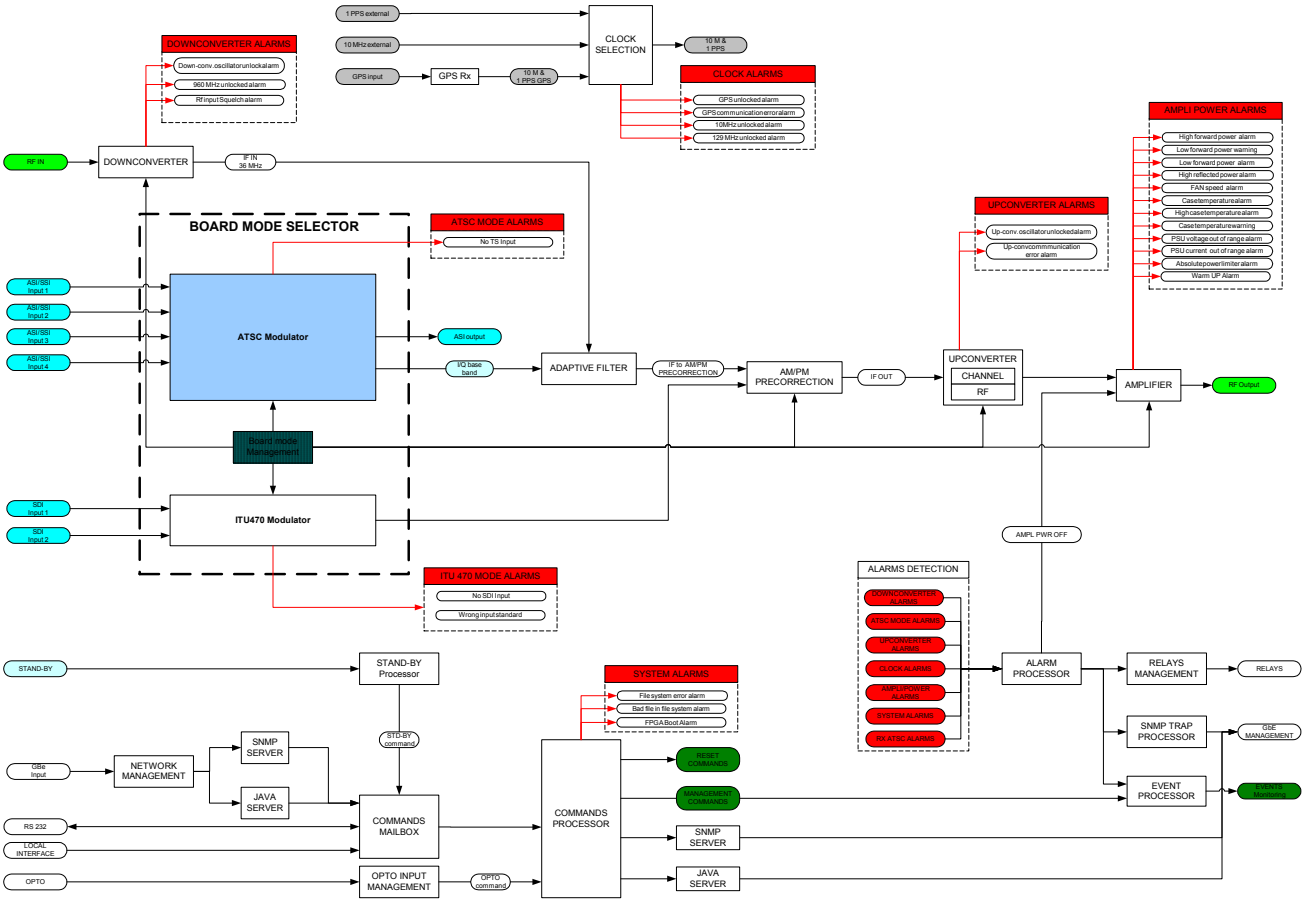
- Agile UHF output Up-converter (from 473 MHz up to 851 MHz).
- Video and Audio modulation parameters setting.
- AM/PM Software Pre-correction.

2.3 ATSC modulator

ATSC modulator for digital (ATSC A/53) television standard.
Capable of:

- Agile UHF input Down-converter (from 473 MHz up to 851 MHz)
- Agile UHF output Up-converter (from 473 MHz up to 851 MHz).
- Input RF signal level monitoring.
- Auxiliary Transport Stream inputs on ASI (EN-50083/9).
- Auxiliary Transport Stream inputs on Gigabit Ethernet (Pro-MPEG cop 3) - **not implemented.**
- Adaptive filter.
- AM/PM Software pre-correction.

2.3.1 FUNCTIONAL BLOCK DIAGRAMS



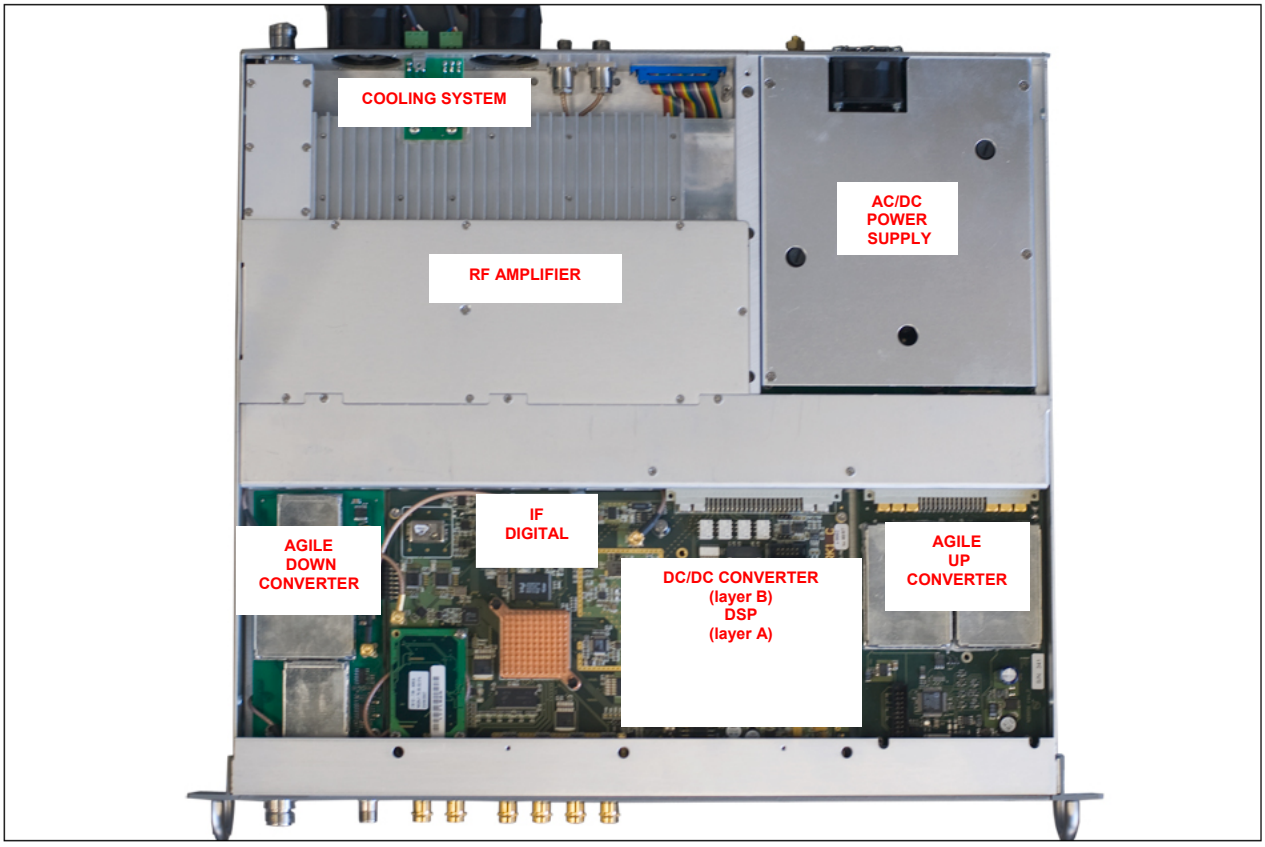
2.4 PURPOSE

This manual contains information and reference documentation on installation, operation and maintenance of the SDT 200UB - 500UB ARK-1 ATSC equipment.

2.5 COMPOSITION

The equipment is composed of the following functional blocks:

1st AC/DC POWER SUPPLY
2nd IF DIGITAL
3rd RF AMPLIFIER
4th COOLING SYSTEM
5TH AGILE DOWN CONVERTER
6TH AGILE UP CONVERTER
7TH DC/DC CONVERTER



2.5.1 FRONT AND RARE PANEL FUNCTIONS LIST

On the **front panel** are located the following functions/connectors (from left to right)

1. RF INPUT
2. GPS INPUT
3. DIGITAL OUTPUT HP
4. DIGITAL OUTPUT LP
5. DIGITAL INPUT 1
6. DIGITAL INPUT 2
7. DIGITAL INPUT 3
8. DIGITAL INPUT 4
9. GBE
10. DISPLAY & NAVIGATION

1 2 3 4 5 6 7 8 9 10

On the **rear panel** are located the following functions/connectors (from left to right)

1. AC MAIN INPUT & ON/OFF SWITCH
2. AC/DC FAN
3. GROUND REFERENCE
4. AUX REMOTE
5. 10 MHz INPUT
6. 1 PPS INPUT
7. FANs EQUIPMENT COOLING (a & b)
8. RF OUTPUT
9. RF MONITOR

1 2 3 4 5 6 7a 7b 8

9

2.6 TECHNICAL SPECIFICATIONS

2.6.1 GENERAL

Available standards	ATSC
Operating frequency range	UHF Band (470 - 862 MHz)
Cooling	Forced Air (3 FANS: 1 P.S + 2 equipment)
Main supply	230 V AC
MAX Power consumption	500 VA (ARK 1 – 201 U) 200 VA (ARK 1 – 100 U)

2.6.2 MECHANICAL AND ENVIRONMENTAL

Dimensions	483 mm (W) x 400 mm (D) x 90 mm (H)
Weight	11 kg approx.
Operating temperature	from 0° C to + 45° C
Storage temperature	from -10° C to +60° C
Maximum relative humidity	90%, non condensing

2.6.3 INPUT PARAMETERS

2.6.3.1 DIGITAL 1, 2, 3, 4

Input Signal	Transport Stream, ASI, SSI format
Input Level	800 mV (±10%)
Data rate	270 MB/s
Data rate error	±3ppm
Input connector	BNC
Input impedance	75 Ω

2.6.3.2 GBE

MPEG over IP Transport Stream input using GBE port (not yet implemented).
Full control and management via SNMP protocol using GBE port

2.6.3.3 GPS

Input connector	TNC female
Antenna power supply	from transmitter, 5V DC

2.6.4 OUTPUT PARAMETERS

2.6.4.1 RF GENERAL

RF OUTPUT Connector	N Female
Impedance	50 Ω
Load mismatches	2:1 Max. (With output isolator)
RF monitor connector	SMA
Impedance	50 Ω

2.6.5 *ATSC* MODULATION

Modulation Modes	8VSB
Inputs	2 ASI + 2 SSI
Input Data Rate	up to 19.39 Mbps
Channel Bandwidth	6 MHz
Symbol Rate	10.762 MSymbol/sec
Bandwidth Efficiency	3 Bits/symbol
PCR Restamping and Del. Null Packet	Included
Frequency Step	1 Hz
Test Signal	PRBS, CW
GPS Receiver	Integrated
Adaptive Digital Precorrector	Integrated

2.6.6 OUTPUT PARAMETERS

2.6.6.1 ATSC MODE

Nominal output power	8W rms (SDT 200UB ARK-1) 20W rms (SDT 500UB ARK-1)
In Band Flatness	± 0.5dB
Shoulders at $F_0 \pm 4.3$ MHz	better than 40 dB With pre-correction inserted
Spurious emission (with output filter)*	< -60 dBc

* An external filter is required for compliance with the emission masks, Screen Service recommends the COMTECH CL6X30C or any FCC approved filter with similar specifications. See CL6X30C specs sheet attached at the end of this section.

2.6.7 RF AMPLIFICATION

The signal coming from the agile up converter goes to the RF amplifier section. The RF amplification is done by class A stages (ARK_1 200 U) and by class AB (ARK_1 201).

They are made by PALLET and, as reported in FIGG.2-3 and 2.4, there are NO SINGLE POINT FAILURE

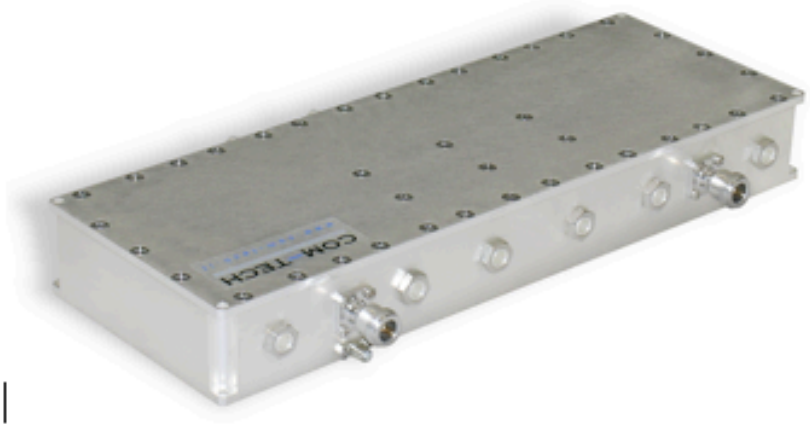
Out of the final stage, the RF signal passes through a directional coupler. The directional coupler detects samples of direct and reflected power and passes this information to the check function

Product Data Sheet

UHF DTV BANDPASS FILTER

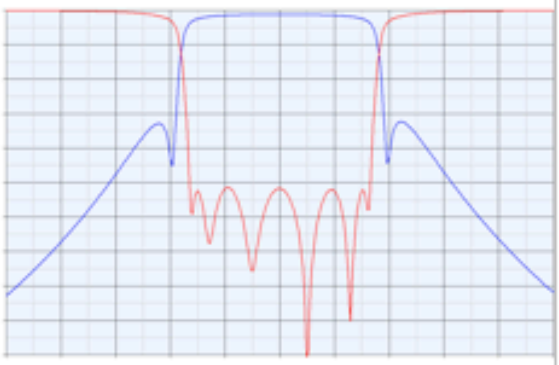
100 W, 6 Poles Elliptical Response, *XLine*

CL6X30C



FEATURES

- UHF 100 W Digital TV bandpass filter
- DVB-T and DVB-H Non-Critical Mask applications
- ATSC FCC LPTV Mask applications
- 6 Poles elliptical response (Extracted Poles)
- *XLine* technique (two transmission zeros)
- Foreshorten in-line combline design
- Low loss (Typ. 0.88 dB@858 MHz)
- Temperature stabilized
- Compact and lightweight



SPECIFICATIONS

Frequency Range	470 – 862 MHz
Bandwidth	6 to 8 MHz
Max Input Power	100 W DTV (150 W ATV)
Over-Temperature	29 K @ 100 W DTV
Temperature Stability	< 6 kHz / K
Environmental Conditions	-5 to +45 °C
Weight (Approx)	2.5 kg
Connectors	2 x N Female

OPTIONS

E	7-16 Female Conn.
0	Painted Black
1	SMA Output Monitor Probe

TUNING DATA	DVB 8 MHz Non Critical Mask	ATSC FCC LPTV Mask
Insertion Loss	< 1.00 dB@C.F. (858 MHz)	< 1.20 dB@C.F. (803 MHz)
	< 2.20 dB@C.F.±3.8 MHz	< 2.20 dB@C.F.±2.7 MHz
Selectivity	> 3 dB@V.C.±4.2 MHz	> 6 dB@C.F.±3.5 MHz
	> 16 dB@C.F.±6 MHz	> 24 dB@C.F.±6 MHz
	> 36 dB@C.F.±12 MHz	> 36 dB@C.F.±9 MHz
Return Loss	> 24 dB	> 24 dB
Group Delay Variation	< 200 ns	< 150 ns

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3.1 INSTALLATION

3.1.1 INSTALLATION PROCEDURE CHECK OFF

Some procedures in this section contain steps preceded by a check box. Fill out or initial each step as it is completed.

3.1.2 SITE SELECTION

Use the following specifications to establish criteria for site selection and equipment installation.

3.1.2.1 MOUNTING SPECIFICATIONS

- **Mount.**
  - A floor-standing, open rack or permanent structure with vertical mounting members conforming to EIA Standard 310 is recommended.

- **Environment.**
  - Ambient temperature: 0°C to +45°C (room temperature or below is ideal)
  - Relative humidity: 10% to 90%, non condensing

- **Clearance.**
  - No clearance is required for sides.
  - At least 1 U free space above and below the equipment is recommended to obtain adequate cooling.
  - Access to the front requires approximately 20 centimeters clearance for making connections.
  - Access to the rear requires approximately 20 centimeters clearance for making connections.

3.1.3 UNPACKING

The containers used to ship a MAGNUM transmitter will vary with the number of options ordered. If there is any external damage to the containers, inform the shipping company and request that an agent be present during unpacking. Carefully unpack the boxes (no special instructions are required) and note any damage making pictures if possible.
After all items are unpacked, check the equipment received. If there are any damages or shortages, notify the carrier and Screen Service BT immediately.

3.1.4 EQUIPMENT MOUNTING

Install the transmitter in an EIA (Standard 310) 19 inch rack as follows:

- Place the equipment into the rack (2 units), align the mounting holes, and secure in place with four rack screws.
- If configured to operate, make sure the "LINE" switch on the front panel of the POWER SUPPLY & METERING module is OFF.
- Connect the power cord to an operating power source.

Note: We warmly suggest the installation of spike suppressors, line conditioners, isolation transformers or other devices useful to protect the equipment.

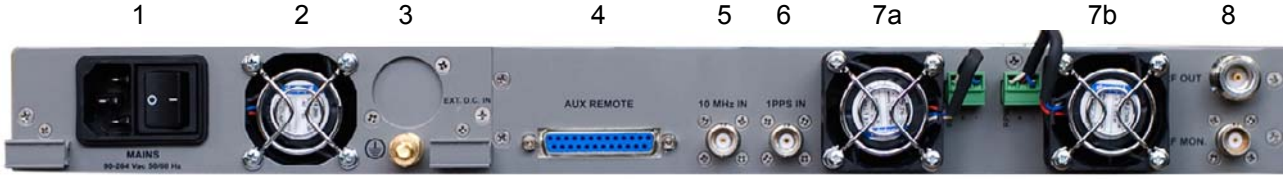
- Connect the transmitting antenna cable to the "RF OUTPUT" connector in the rear panel.
- Connect the Transport Stream source/s, SAT RECEIVER , GPS, SNMP PORT, AUX REMOTE and CVBS/R,G,B to the relevant connectors on the front and rear panel.
- REMEMBER TO CONNECT the equipment to the GROUND using the relevant screw located on the rear panel.

3.1.5 FRONT PANEL

ARK 1 Front Panel

n.	Label	Description
1	RF INPUT	
2	GPS IN	
3	ASI OUTPUT HP	
4	ASI OUTPUT LP	
5	DIGITAL in 1	
6	DIGITAL in 2	
7	DIGITAL in 3	
8	DIGITAL in 4	
9	GBE 1	
10	LCD Display	

3.1.5.1 REAR PANEL

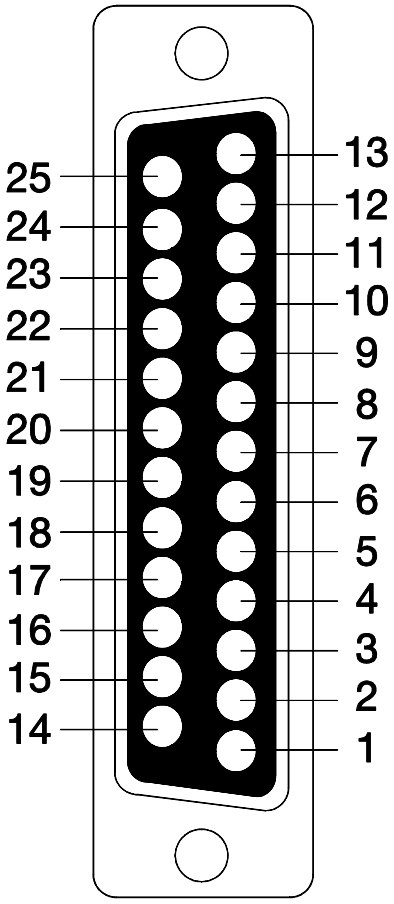


ARK 1 Rear Panel

n.	Label	Description
1	AC INPUT	
2	AC/ DC FAN	
3	GND	
4	AUX REMOTE	
5	10 MHz INPUT	
6	1 PPS INPUT	
7,a,b	FANs EQUIPMENT	
8	RF OUTPUT	N Type (50W) female connector, 50 Ω
9	RF MONITOR	BNC Type female connector, 50 Ω

3.1.5.2 REAR PANEL CONNECTORS

AUX REMOTE CONNECTOR
Sub-D 25 Male.



PIN	ASSIGNMENT	REMARKS
1		
2	Not used	
3	Alarm reset	in opto active to gnd
4	Remote STBY	in opto active to gnd
5	GND OPTO	
6		
7		
8		
9	SERIAL 485/232	
10	SERIAL 485/232	
11		
12	RF OFF	in opto active to gnd
13		
14		
15		
16		
17	COM RL 0	NOR. CLOSED
18	RL 0	
19	COM RL 1	NOR. CLOSED
20	RL 1	
21	COM RL2	NOR. CLOSED
22	RL 2	
23	COM RL 3	NOR. CLOSED
24	RL 3	
25		

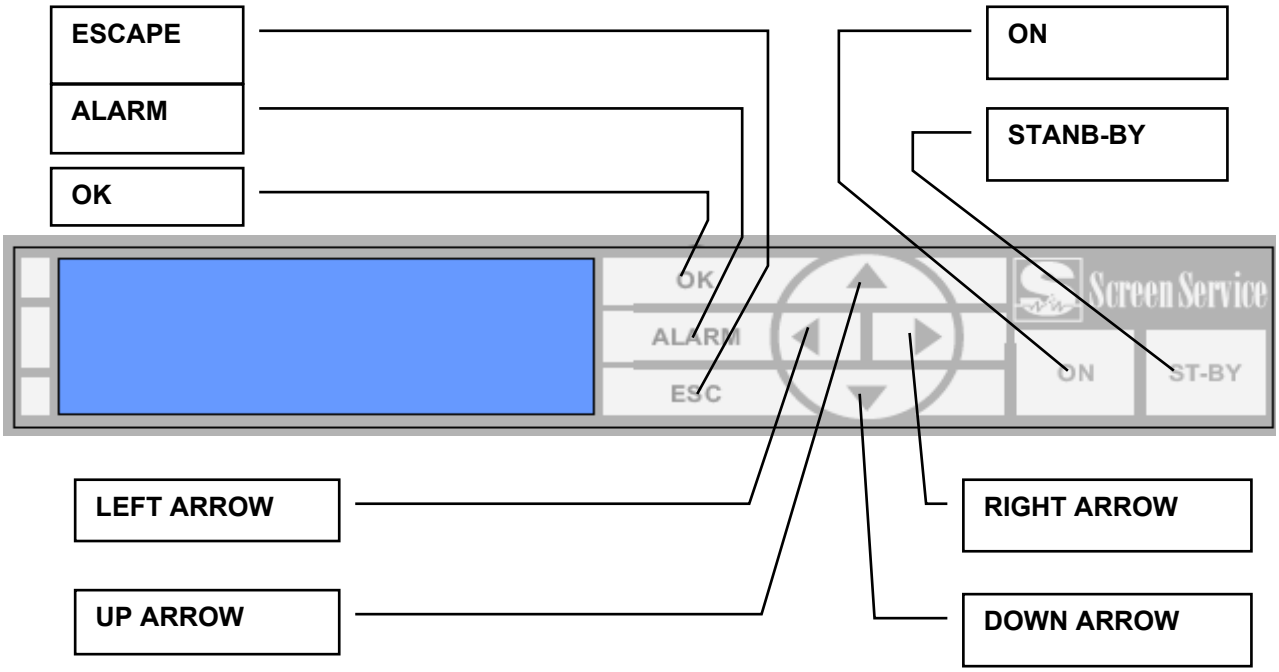
Fig. 1: AUX REMOTE CONNECTOR

3.2 MULTIMETER

The following paragraphs describe the local user interface for **ARK1**.

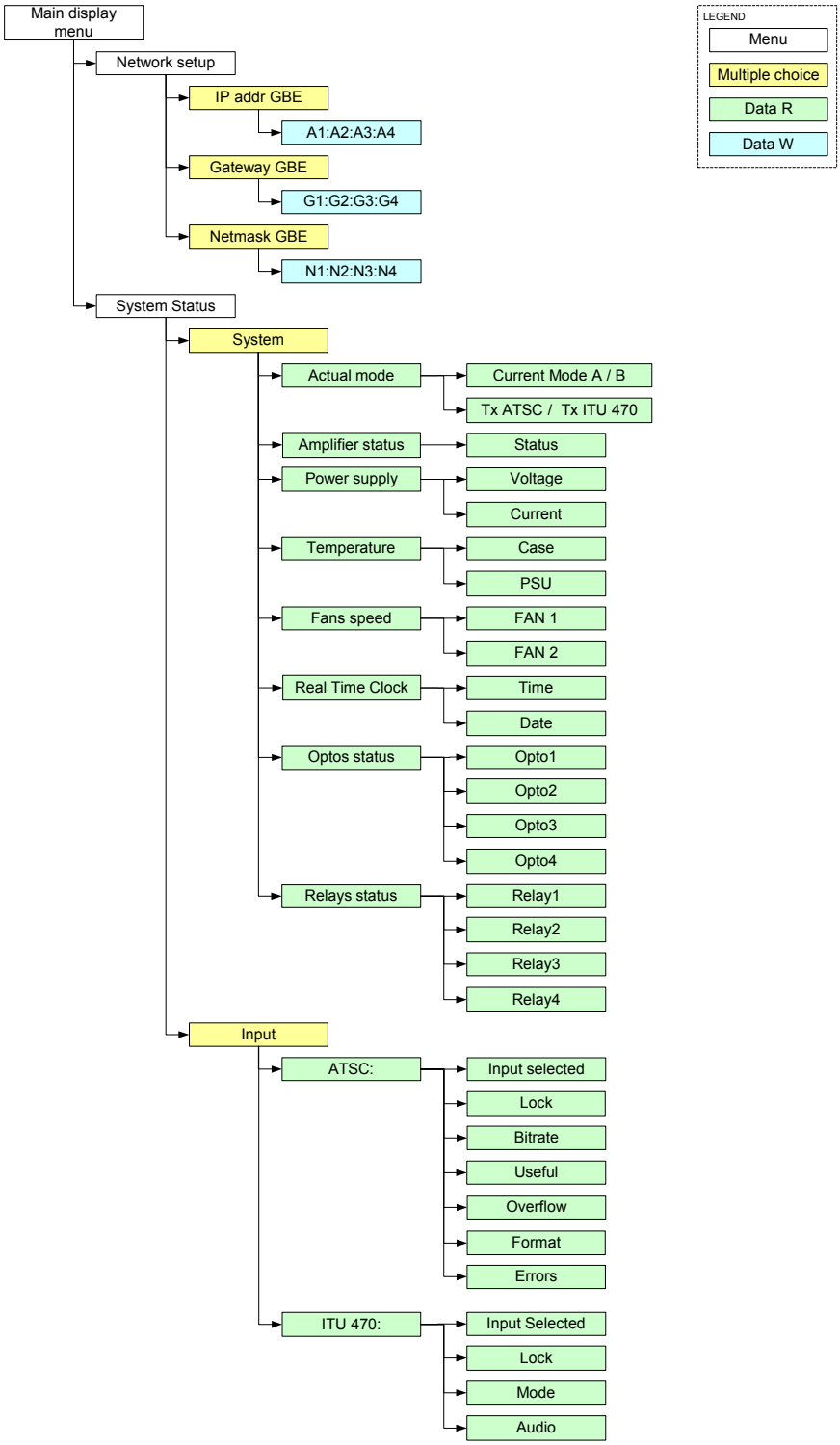
This user interface is composed of LCD Display, seven buttons and two status leds.

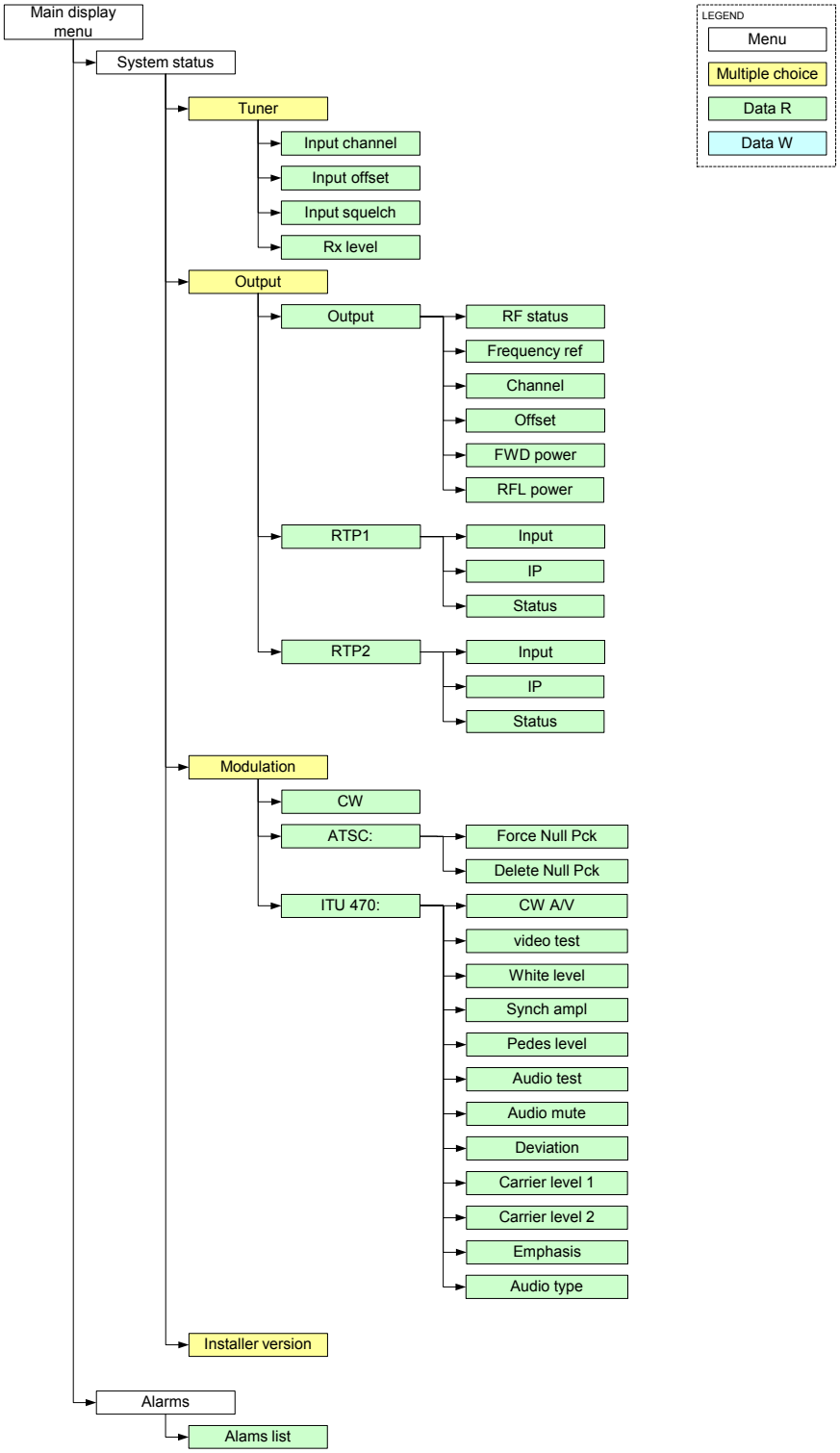
Here below is depicted the ARK1 Front Panel.



- **STAND-BY**: push this button (lie in wait for two seconds) to put the equipment on STAND-BY mode. The orange led lights up and the written **STAND-BY MODE** appears on the display. The remote Stand-by mode is enforceable only if on JAVA interface this feature is enabled.
- **ON**: push this button (lie in wait for two seconds) to turn on the equipment. The green led lights up and the **MAIN MENU** is displayed.
- **OK**: push this button to select or to confirm the subwindow or the value respectively. Touching the screen with a finger the green led lights up.
- **ESC**: push this button to quit a submenu and to return to the previous one. Touching the screen with a finger the green led lights up.
- **ALARM**: when an alarm occurs the RED LED lights up.
- **UP ARROW**: push this botton to scroll up menus or to increase a value. Touching the screen with a finger the green led lights up.
- **DOWN ARROW**: push this botton to scroll down menus or to decrease a value. Touching the screen with a finger the green led lights up.
- **LEFT ARROW**: push this botton to move within a string. Touching the screen with a finger the green led lights up.
- **RIGHT ARROW**: push this botton to move within a string. Touching the screen with a finger the green led lights up.

3.2.1 LOCAL INTERRFACE MENU TREE




Main display menu
System status
Tuner
Input channel
Input offset
Input squelch
Rx level
Output
Output
RF status
Frequency ref
Channel
Offset
FWD power
RFL power
RTP1
Input
IP
Status
RTP2
Input
IP
Status
Modulation
CW
ATSC:
Force Null Pck
Delete Null Pck
ITU 470:
CW A/V
video test
White level
Synch ampl
Pedes level
Audio test
Audio mute
Deviation
Carrier level 1
Carrier level 2
Emphasis
Audio type
Installer version
Alarms
Alams list
LEGEND
Menu
Multiple choice
Data R
Data W

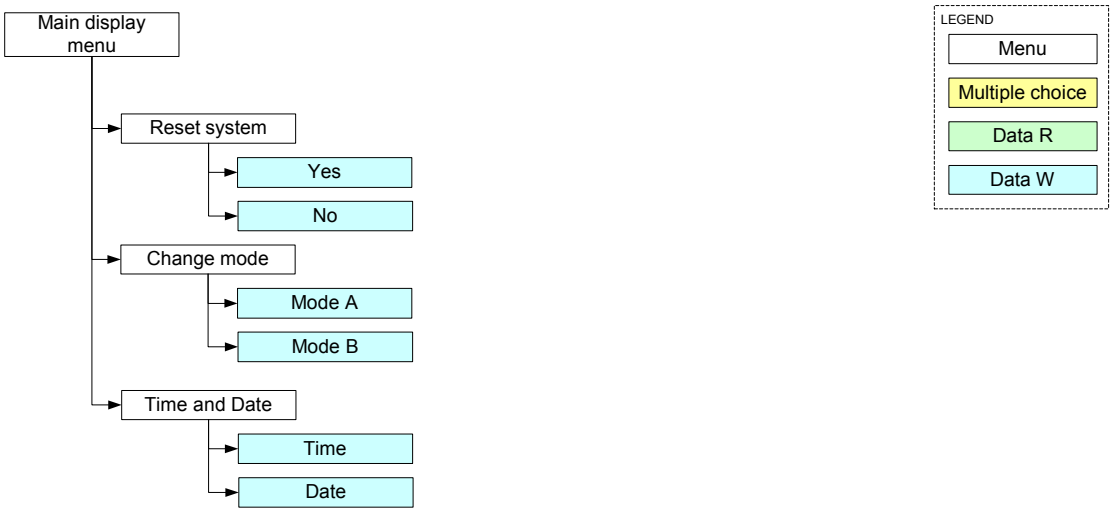
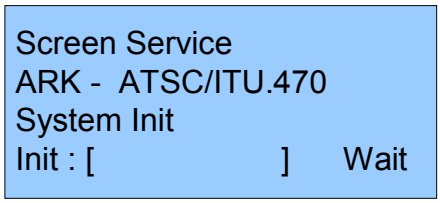
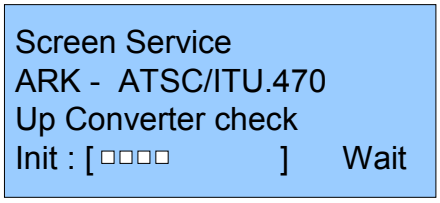


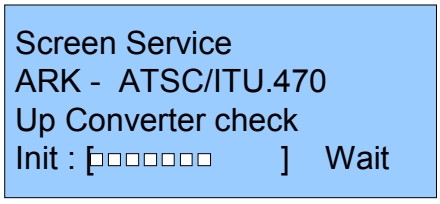
Fig. 2: Local Interface Menu Tree

3.2.2 BOOT AND WELCOME MESSAGE

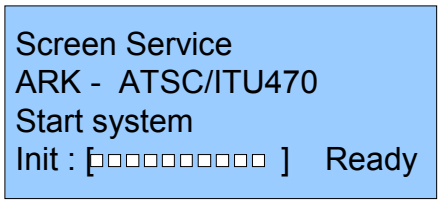
Turning on the equipment, the display shows the progress bar as follow:

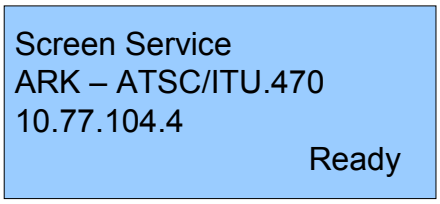






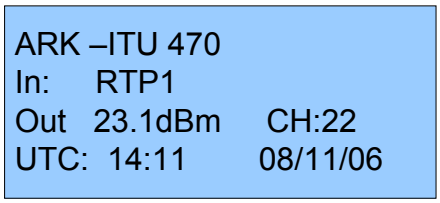
When the boot is over, the board is ready.

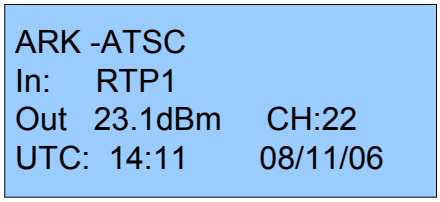




Press ESC to enter the main menu, otherwise after one minute waiting the idle status message appears.

3.2.3 Idle Menu





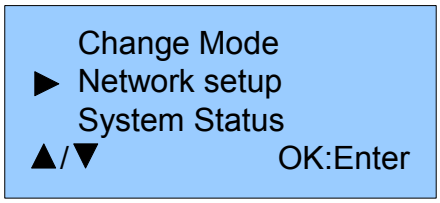
This menu appears after one minute waiting from the last touch. Information contained in the Idle Menu are described in next table.

Table 1. Local User Interface: Idle Menu

Information	Description
Operating mode	• ARK - ATSC: ATSC modulator • ARK - ITU 470: NTSC modulator
Input	• In: input selected
Output Power and Channel	• Out: output power and channel
UTC	• Time and date coming from GPS receiver

Press ESC to enter the MAIN MENU.

3.2.4 Main Menu



This menu shows five SUBMENUS. It is possible to view them sliding the menu up and down, with the UP or DOWN ARROWS, and to select one of them by pushing on the OK button.
Submenus contained in the Main Menu are described in next table.

Submenu	Description
Network setup	Enter this submenu to change: • Board IP address • Gateway address • Netmask
System Status	Enter this submenu to monitor: • Selected mode / System HW status • Selected input statistics • Tuner status • Output status and settings • Actual modulation • Installer version All information are refreshed every 5 seconds.
Alarms	Enter this submenu to view the alarm list

Reset system	Enter this submenu to reset the device.
Change mode	Enter this submenu to change operating mode (A or B).
Time and Date	Enter this submenu to change Time and Date

3.2.5 LCD alarms

Through the LCD Alarms mask it is possible to select which alarm has to be notified on LCD display. The alarm button is lighted and when an alarm condition occurs, alarms status is displayed in the Alarms submenu.
The following table lists the alarms messages displayed on LCD, associated to the corresponding alarm (refer to Alarms paragraph for further information about alarms and their masks).

Alarms descriptions list

Table 2

Alarm	**Alarm Message**
Up converter Osc. Unlock	UPCV not locked
PS Voltage out of range	PS V out of range
PS Current out of range	PS I out of range
Absolute Power Limiter	Abs. pwr high
Communication error	UPCV dialog error
Temperature High Alarm	Temperature high
Temperature Level-3dB	Temp alarm (-3dB)
Temperature High Warning	Temp warning
Forward Power High	FWD power high
Forward Power Low Warning	FWD low warning
Forward Power Low Alarm	FWD low alarm
Reflex Power High	RFL power high
Fan Speed	Fans warning
S/N level	RF in S/N low
GPS Lock	GPS not locked
GPS Communication Error	GPS dialog error
Signal 10 MHz Lock	10MHz not detected
Signal 129 MHz Lock	129MHz not detected
Signal 960 MHz Lock	960MHz not detected
Down Converter Osc. Unlock	DWCV not locked
No RF Input	In. not detected
RF Input Squelch	RF in Squelch
RF Digital Ber Alarm	RF BER high
File System Error	FS wrong

Alarm	**Alarm Message**
Bad File in File system	File error
No TS Input	In. not detected
FPGA Boot alarm	FPGA boot err
Warm up alarm	Sys. warm up

3.3 SNMP – SIMPLE NETWORK MANAGEMENT PROTOCOL

The SNMP model assumes the existence of managers and agents. A manager is a software module in a management system responsible for managing the device. An agent is a software module in a managed device responsible for maintaining local management information and delivering that information to a manager via SNMP. A management information exchange can be initiated by the manager (via polling) or by the agent (via trap).
Interaction between a user of board management and the board management software takes place across a user interface. Such an interface is needed to provide users with a monitoring and controlling tool in order to allow some parameters to be viewed or set locally.
The operations that are supported in SNMP network management are the alteration and inspection of variables. Specifically, three general-purpose operations may be performed on scalar objects:

- Get: a management station retrieves a scalar object value from a managed station.
- Set: a management station updates a scalar object value in a managed station.
- Trap: a managed station sends an unsolicited scalar object value to a management station.

Management information accessible via SNMP is maintained in a management information base (MIB) at each manager and agent node.
On manager side, ARK1 ATSC management system has been tested with MG-SOFT as MIB Browser; besides compatibility with any other MIB browser is assured.
The following MIB libraries are required for the SNMP management of the equipment:

- SCREENSERVICE-SCB-BROADCASTING-MIB.my;
- ark1atsc_0_6.MY.

Compatibility tested and assured with SNMP version 1 and 2.

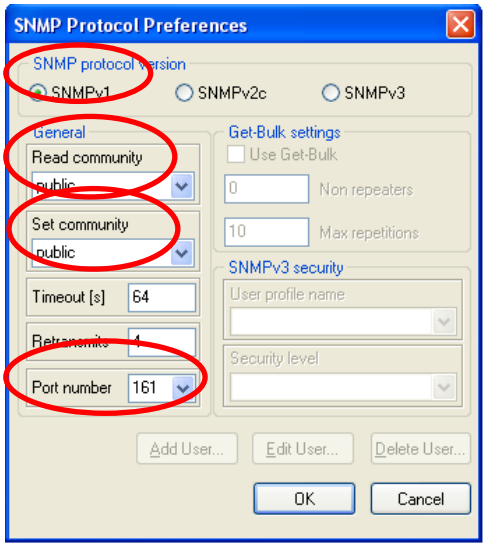
3.3.1 SNMP Protocol Preferences

Go to SNMP Protocol Preferences. The following parameters should be set in order to correctly configure the SNMP Manager:

- SNMP protocol version: **SNMPv1**;
- Read Community: the same of the one set in the **Get** field of Java interface, community section;
- Set Community: the same of the one set in the **Set** field of Java interface, community section;
- Timeout [s]: user defined;
- Retransmits: user defined;
- Port number: **161**.

Next figure illustrates how to configure SNMP Protocol Preferences using MG_SOFT MIB Browser as an example.

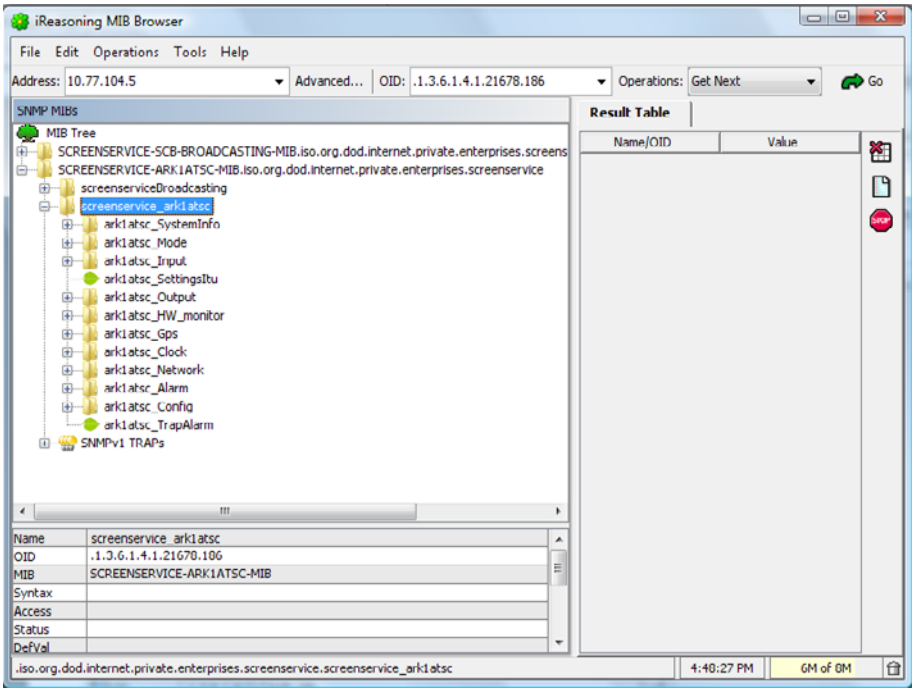
Fig. 3: SNMP Protocol Preferences



3.3.2 Monitoring

All status and setup information can be queried via SNMP. To get the setup and status information you need a management system (or a special MIB browser).
Next figure, referring to iReasoning MIB Browser as an example, is a broad view of the ARK1 ATSC tree structure.

Fig. 4: ARK1 ATSC MIB Browser



3.3.3 OID

Any status and setup information has an OID (Object Identifier). The OID of the ARK1 ATSC system is:

- *screenservice_ark1atsc: 1.3.6.1.4.1.21678.186*

  iso(1).org(3).odd(6).internet(1).private(4).enterprises(1).screenservice(21678).screenservice_ark1atsc(186)

3.3.4 SNMP tree structure

The screenservice_ark1atsc tree has 12 nodes and 1 leave.
The nodes are:

- **ark1atsc_SystemInfo:** global description of the system.
- **ark1atsc_Mode:** shows and manages board modes.
- **ark1atsc_Input:** shows and manages inputs.
- **ark1atsc_Modulation:** shows and sets local modulation.
- **ark1atsc_Output:** shows and manages the output.
- **ark1atsc_HW_monitor:** shows the amplifier status.
- **ark1atsc_Gps:** shows the collection of live data from GPS receiver.
- **ark1atsc_Clock:** shows and sets 10MHz and 1PPS source.
- **ark1atsc_Network:** shows and sets network parameters.
- **ark1atsc_Alarm:** shows and manages system alarms.
- **ark1atsc_Config:** allows the management of the machine configuration.
- **ark1atsc_TrapAlarm:** is the OID used in the trap message:

Table 3. ARK ATSC SNMP Tree Structure

OID	Name	R\W	Description
1	iso		
1.03	org		
1.03.06	dod		
1.3.6.1	internet		
1.3.6.1.2	mgmt		
1.3.6.1.2.1	mib-2		
1.3.6.1.2.1.1	system		
1.3.6.1.2.1.1.1	sysDescr	R	
1.3.6.1.2.1.1.2	sysObjectID	R	
1.3.6.1.2.1.1.3	sysUpTimeInstance	R	

OID	Name	R\W	Description
1.3.6.1.2.1.1.4	sysContact	R	
1.3.6.1.2.1.1.5	sysName	R	
1.3.6.1.2.1.1.6	sysLocation	R	
1.3.6.1.2.1.1.7	sysServices	R	
1.3.6.1.4	private		
1.3.6.1.4.1	enterprise		
1.3.6.1.4.1.21678	screenservice		
1.3.6.1.4.1.21678.186	screenservice_ark1atsc		
1.3.6.1.4.1.21678.186.1	ark1atsc_SystemInfo		
1.3.6.1.4.1.21678.186.1.1	ark1atsc_SystemInfoIdentifier	R	Identification name of the equipment managed
1.3.6.1.4.1.21678.186.1.2	ark1atsc_SystemInfoName	R	Manufacturer name
1.3.6.1.4.1.21678.186.1.3	ark1atsc_SystemInfoDescription	R	Description of the equipment managed
1.3.6.1.4.1.21678.186.1.4	ark1atsc_SystemInfoLocation	R	Geographical implantation
1.3.6.1.4.1.21678.186.1.5	ark1atsc_SystemInfoContact	R	The person to contact in case of problems with the managed element
1.3.6.1.4.1.21678.186.1.6	ark1atsc_SystemInfoFamilyNumber	R	Device family number
1.3.6.1.4.1.21678.186.1.7	ark1atsc_SystemInfoId	R	System info ID
1.3.6.1.4.1.21678.186.1.8	ark1atsc_SystemInfoSerialNumber	R	Device serial number
1.3.6.1.4.1.21678.186.1.9	ark1atsc_SystemInfoVersion		
1.3.6.1.4.1.21678.186.1.9.1	ark1atsc_VersionUc	R	UC file version
1.3.6.1.4.1.21678.186.1.9.2	ark1atsc_VersionFpga	R	Fpga file version
1.3.6.1.4.1.21678.186.1.9.3	ark1atsc_VersionSnmp	R	Snmp file version
1.3.6.1.4.1.21678.186.1.9.4	ark1atsc_VersionPsu		
1.3.6.1.4.1.21678.186.1.9.4.1	ark1atsc_PsuFamily	R	PSU family number
1.3.6.1.4.1.21678.186.1.9.4.2	ark1atsc_PsuSerial	R	PSU serial number
1.3.6.1.4.1.21678.186.1.9.5	ark1atsc_VersionUpconverter		
1.3.6.1.4.1.21678.186.1.9.5.1	ark1atsc_UpconverterFamily	R	Upconverter family number
1.3.6.1.4.1.21678.186.1.9.5.2	ark1atsc_UpconverterSerial	R	Upconverter serial number
1.3.6.1.4.1.21678.186.1.9.5.3	ark1atsc_UpconverterLib	R	Upconverter software library number
1.3.6.1.4.1.21678.186.1.9.5.4	ark1atsc_UpconverterVer	R	Upconverter version
1.3.6.1.4.1.21678.186.2	ark1atsc_Mode		
1.3.6.1.4.1.21678.186.2.1	ark1atsc_ModeSwitch	RW	Switch mode selector 0:manual 1:auto 2:opto 3:time
1.3.6.1.4.1.21678.186.2.2	ark1atsc_ModeManualSelector	RW	Manual mode 0: modeA 1: modeB
1.3.6.1.4.1.21678.186.2.3	ark1atsc_ModeActual	R	Actual mode 0: modeA 1: modeB
1.3.6.1.4.1.21678.186.2.4	ark1atsc_ModeSelectorA	RW	Mode A selector 0: ITU 470 1: ATSC
1.3.6.1.4.1.21678.186.2.5	ark1atsc_ModeSelectorB	RW	Mode B selector 0: ITU 470 1: ATSC
1.3.6.1.4.1.21678.186.2.6	ark1atsc_ModeAutoSwitchTmo	RW	Auto-switch timeout (s)

OID	Name	R\W	Description
1.3.6.1.4.1.21678.186.2.7	ark1atsc_ModeActualTmo	R	Actual auto-switch timeout (s)
1.3.6.1.4.1.21678.186.2.8	ark1atsc_ModeAutoSwitchRuleA	RW	Auto-switch rules mode A (bit to alarm association) 0: no rules 4: no TS input rule
1.3.6.1.4.1.21678.186.2.9	ark1atsc_ModeAutoSwitchRuleB	RW	Auto-switch rules mode B (bit to alarm association) 0: no rules 4: no TS input rule
1.3.6.1.4.1.21678.186.2.10	ark1atsc_ModeSwitchingTime		
1.3.6.1.4.1.21678.186.2.10.1	ark1atsc_SwitchingTimeYear	RW	Switching time: year setting (starting from 2000)
1.3.6.1.4.1.21678.186.2.10.2	ark1atsc_SwitchingTimeMonth	RW	Switching time: month setting
1.3.6.1.4.1.21678.186.2.10.3	ark1atsc_SwitchingTimeDay	RW	Switching time: day setting
1.3.6.1.4.1.21678.186.2.10.4	ark1atsc_SwitchingTimeHour	RW	Switching time: hour setting
1.3.6.1.4.1.21678.186.2.10.5	ark1atsc_SwitchingTimeMinutes	RW	Switching time: minutes setting
1.3.6.1.4.1.21678.186.2.10.6	ark1atsc_SwitchingTimeSeconds	RW	Switching time: seconds setting
1.3.6.1.4.1.21678.186.3	ark1atsc_Input		
1.3.6.1.4.1.21678.186.3.1	ark1atsc_InputSettings		
1.3.6.1.4.1.21678.186.3.1.1	ark1atsc_InputSettingsA		
1.3.6.1.4.1.21678.186.3.1.1.1	ark1atsc_InputSettingsA_Rf		
1.3.6.1.4.1.21678.186.3.1.1.1.1	ark1atsc_SettingsA_Rf_Channel	RW	Mode A: input channel
1.3.6.1.4.1.21678.186.3.1.1.1.2	ark1atsc_SettingsA_Rf_FrequencyOffset	RW	Mode A: input frequency offset expressed in Hz (from -4,000,000 up to 4,000,000)
1.3.6.1.4.1.21678.186.3.1.1.2	ark1atsc_InputSettingsA_Atsc		
1.3.6.1.4.1.21678.186.3.1.1.2.1	ark1atsc_SettingsA_Atsc_Input	RW	Mode A: Atsc input selector 0: asi 1 1: asi 2 2: asi 3 3: asi 4 4: ssi 1 5: ssi 2 6: ssi 3 7: ssi 4 8: Gbe Ch1 9: Gbe Ch2
1.3.6.1.4.1.21678.186.3.1.1.3	ark1atsc_InputSettingsA_Itu		
1.3.6.1.4.1.21678.186.3.1.1.3.1	ark1atsc_SettingsA_Itu_Input	RW	Mode A: Itu 470 input selector 0: sdi 1 1: sdi 2
1.3.6.1.4.1.21678.186.3.1.1.3.2	ark1atsc_SettingsA_Itu_Audio_Ch	RW	Mode A: Itu 470 audio channel selector 0: CH 1,2 1: CH 3,4
1.3.6.1.4.1.21678.186.3.1.2	ark1atsc_InputSettingsB		
1.3.6.1.4.1.21678.186.3.1.2.1	ark1atsc_InputSettingsB_Rf		
1.3.6.1.4.1.21678.186.3.1.2.1.1	ark1atsc_SettingsB_Rf_Channel	RW	Mode B: input channel
1.3.6.1.4.1.21678.186.3.1.2.1.2	ark1atsc_SettingsB_Rf_FrequencyOffset	RW	Mode B: input frequency offset expressed in Hz (from -4,000,000 up to 4,000,000)
1.3.6.1.4.1.21678.186.3.1.2.2	ark1atsc_InputSettingsB_Atsc		
1.3.6.1.4.1.21678.186.3.1.2.2.1	ark1atsc_SettingsB_Remod_Input	RW	Mode B: input selector 0: asi 1 1: asi 2 2: asi 3 3: asi 4 4: ssi 1 5: ssi 2 6: ssi 3 7: ssi 4 8: Gbe Ch1 9: Gbe Ch2
1.3.6.1.4.1.21678.186.3.1.2.3	ark1atsc_InputSettingsB_Itu		
1.3.6.1.4.1.21678.186.3.1.2.3.1	ark1atsc_SettingsB_Itu_Input	RW	Mode B: Itu 470 input selector 0: sdi 1 1: sdi 2

OID	Name	R\W	Description
1.3.6.1.4.1.21678.186.3.1.2.3.2	ark1atsc_SettingsB_Itu_Audio_Ch	RW	Mode B: Itu 470 audio channel selector 0: CH 1,2 1: CH 3,4
1.3.6.1.4.1.21678.186.3.2	ark1atsc_InputStatistics		
1.3.6.1.4.1.21678.186.3.2.1	ark1atsc_StatisticsRf		
1.3.6.1.4.1.21678.186.3.2.1.1	ark1atsc_RfRxLevel	R	Input RX level 0: over input 255: low power 1...254: power (absolute value expressed in dBm)
1.3.6.1.4.1.21678.186.3.2.1.2	ark1atsc_Not_implemented		
1.3.6.1.4.1.21678.186.3.2.1.3	ark1atsc_Not_implemented		
1.3.6.1.4.1.21678.186.3.2.2	ark1atsc_StatisticsAtsc		
1.3.6.1.4.1.21678.186.3.2.2.1	ark1atsc_AtscAsiSsi		
1.3.6.1.4.1.21678.186.3.2.2.1.1	ark1atsc_AsiSsi1		
1.3.6.1.4.1.21678.186.3.2.2.1.1.1	ark1atsc_AsiSsi1WordRate	R	Asi 1 input word rate
1.3.6.1.4.1.21678.186.3.2.2.1.1.2	ark1atsc_AsiSsi1ByteRate	R	Asi 1 input byte rate
1.3.6.1.4.1.21678.186.3.2.2.1.1.3	ark1atsc_AsiSsi1Filtered	R	Asi 1 filtered byte rate
1.3.6.1.4.1.21678.186.3.2.2.1.1.4	ark1atsc_AsiSsi1OverFlowAlarm	R	Asi 1 overflow alarm 0: off 1: on
1.3.6.1.4.1.21678.186.3.2.2.1.1.5	ark1atsc_AsiSsi1Lock	R	Asi 1 lock status 0: unlock 1: lock
1.3.6.1.4.1.21678.186.3.2.2.1.1.6	ark1atsc_AsiSsi1PacketFormat	R	Asi 1 packet format 0: 204 1: 188
1.3.6.1.4.1.21678.186.3.2.2.1.1.7	ark1atsc_AsiSsi1Cd	R	Asi 1 carrier detect alarm 0: unlock 1: lock
1.3.6.1.4.1.21678.186.3.2.2.1.1.8	ark1atsc_AsiSsi1Errors	R	Asi 1 wrong bytes received (pay attention: when the input is not connected it is different from zero)
1.3.6.1.4.1.21678.186.3.2.2.1.1.9	ark1atsc_AsiSsi1Type	R	Asi 1 type 0: ASI 1: SSI
1.3.6.1.4.1.21678.186.3.2.2.1.2	ark1atsc_AsiSsi2		
1.3.6.1.4.1.21678.186.3.2.2.1.2.1	ark1atsc_AsiSsi2WordRate	R	Asi 2 input word rate
1.3.6.1.4.1.21678.186.3.2.2.1.2.2	ark1atsc_AsiSsi2ByteRate	R	Asi 2 input byte rate
1.3.6.1.4.1.21678.186.3.2.2.1.2.3	ark1atsc_AsiSsi2Filtered	R	Asi 2 filtered byte rate
1.3.6.1.4.1.21678.186.3.2.2.1.2.4	ark1atsc_AsiSsi2OverFlowAlarm	R	Asi 2 overflow alarm 0: off 1: on

OID	Name	R\W	Description
1.3.6.1.4.1.21678.186.3.2.2.1.2.5	ark1atsc_AsiSsi2Lock	R	Asi 2 lock status 0: unlock 1: lock
1.3.6.1.4.1.21678.186.3.2.2.1.2.6	ark1atsc_AsiSsi2PacketFormat	R	Asi 2 packet format 0: 204 1: 188
1.3.6.1.4.1.21678.186.3.2.2.1.2.7	ark1atsc_AsiSsi2Cd	R	Asi 2 carrier detect alarm 0: unlock 1: lock
1.3.6.1.4.1.21678.186.3.2.2.1.2.8	ark1atsc_AsiSsi2Errors	R	Asi 2 wrong bytes received (pay attention: when the input is not connected it is different from zero)
1.3.6.1.4.1.21678.186.3.2.2.1.2.9	ark1atsc_AsiSsi2Type	R	Asi 2 type 0: ASI 1: SSI
1.3.6.1.4.1.21678.186.3.2.2.1.3	ark1atsc_AsiSsi3		
1.3.6.1.4.1.21678.186.3.2.2.1.3.1	ark1atsc_AsiSsi3WordRate	R	Asi 3 input word rate
1.3.6.1.4.1.21678.186.3.2.2.1.3.2	ark1atsc_AsiSsi3ByteRate	R	Asi 3 input byte rate
1.3.6.1.4.1.21678.186.3.2.2.1.3.3	ark1atsc_AsiSsi3Filtered	R	Asi 3 filtered byte rate
1.3.6.1.4.1.21678.186.3.2.2.1.3.4	ark1atsc_AsiSsi3OverFlowAlarm	R	Asi 3 overflow alarm 0: off 1: on
1.3.6.1.4.1.21678.186.3.2.2.1.3.5	ark1atsc_AsiSsi3Lock	R	Asi 3 lock status 0: unlock 1: lock
1.3.6.1.4.1.21678.186.3.2.2.1.3.6	ark1atsc_AsiSsi3PacketFormat	R	Asi 3 packet format 0: 204 1: 188
1.3.6.1.4.1.21678.186.3.2.2.1.3.7	ark1atsc_AsiSsi3Cd	R	Asi 3 carrier detect alarm 0: unlock 1: lock
1.3.6.1.4.1.21678.186.3.2.2.1.3.8	ark1atsc_AsiSsi3Errors	R	Asi 3 wrong bytes received (pay attention: when the input is not connected it is different from zero)
1.3.6.1.4.1.21678.186.3.2.2.1.3.9	ark1atsc_AsiSsi3Type	R	Asi 3 type 0: ASI 1: SSI
1.3.6.1.4.1.21678.186.3.2.2.1.4	ark1atsc_AsiSsi4		
1.3.6.1.4.1.21678.186.3.2.2.1.4.1	ark1atsc_AsiSsi4WordRate	R	Asi 4 input word rate
1.3.6.1.4.1.21678.186.3.2.2.1.4.2	ark1atsc_AsiSsi4ByteRate	R	Asi 4 input byte rate
1.3.6.1.4.1.21678.186.3.2.2.1.4.3	ark1atsc_AsiSsi4Filtered	R	Asi 4 filtered byte rate
1.3.6.1.4.1.21678.186.3.2.2.1.4.4	ark1atsc_AsiSsi4OverFlowAlarm	R	Asi 4 overflow alarm 0: off 1: on
1.3.6.1.4.1.21678.186.3.2.2.1.4	ark1atsc_AsiSsi4Lock	R	Asi 4 lock status 0: unlock 1: lock

OID	Name	R\W	Description
.5			
1.3.6.1.4.1.21678.186.3.2.2.1.4 .6	ark1atsc_AsiSsi4PacketFormat	R	Asi 4 packet format 0: 204 1: 188
1.3.6.1.4.1.21678.186.3.2.2.1.4 .7	ark1atsc_AsiSsi4Cd	R	Asi 4 carrier detect alarm 0: unlock 1: lock
1.3.6.1.4.1.21678.186.3.2.2.1.4 .8	ark1atsc_AsiSsi4Errors	R	Asi 4 wrong bytes received (pay attention: when the input is not connected it is different from zero)
1.3.6.1.4.1.21678.186.3.2.2.1.4 .9	ark1atsc_AsiSsi4Type	R	Asi 4 type 0: ASI 1: SSI
1.3.6.1.4.1.21678.186.3.2.2.2	ark1atsc_AtscGbe		
1.3.6.1.4.1.21678.186.3.2.2.2.1	ark1atsc_GbePckCounter	R	Good frame count
1.3.6.1.4.1.21678.186.3.2.2.2.2	ark1atsc_GbeErrors	R	Bad frame count
1.3.6.1.4.1.21678.186.3.2.2.2.3	ark1atsc_GbeRxCh1		
1.3.6.1.4.1.21678.186.3.2.2.2.3 .1	ark1atsc_GbeRxCh1PckRate	R	Not implemented - GbE Rx channel 1 input packet rate
1.3.6.1.4.1.21678.186.3.2.2.2.3 .2	ark1atsc_GbeRxCh1Filtered	R	Not implemented - GbE Rx channel 1 filtered packet rate
1.3.6.1.4.1.21678.186.3.2.2.2.3 .3	ark1atsc_GbeRxCh1PacketFormat	R	Not implemented - GbE Rx channel 1 packet format 0: 204 01: 188 3: not valid
1.3.6.1.4.1.21678.186.3.2.2.2.3 .4	ark1atsc_GbeRxCh1Lock	R	Not implemented - GbE Rx channel 1 lock lock status 0: unlock 1: lock
1.3.6.1.4.1.21678.186.3.2.2.2.3 .5	ark1atsc_GbeRxCh1OverFlowAlarm	R	Not implemented - GbE Rx channel 1 overflow alarm 0: off 1: on
1.3.6.1.4.1.21678.186.3.2.2.2.3 .6	ark1atsc_GbeRxCh1SequenceError	R	Not implemented - GbE Rx channel 1 sequence error 0: off 1: on
1.3.6.1.4.1.21678.186.3.2.2.2.3 .7	ark1atsc_GbeRxCh1Protocol	R	Not implemented - GbE Rx channel 1 transmission protocol 0: udp 1: rtp
1.3.6.1.4.1.21678.186.3.2.2.2.4	ark1atsc_GbeRxCh2		
1.3.6.1.4.1.21678.186.3.2.2.2.4 .1	ark1atsc_GbeRxCh2PcktRate	R	Not implemented - GbE Rx channel 2 input packet rate
1.3.6.1.4.1.21678.186.3.2.2.2.4 .2	ark1atsc_GbeRxCh2Filtered	R	Not implemented - GbE Rx channel 2 filtered packet rate
1.3.6.1.4.1.21678.186.3.2.2.2.4 .3	ark1atsc_GbeRxCh2PacketFormat	R	Not implemented - GbE Rx channel 2 packet format 0: 204 01: 188 3: not valid
1.3.6.1.4.1.21678.186.3.2.2.2.4 .4	ark1atsc_GbeRxCh2Lock	R	Not implemented - GbE Rx channel 2 lock lock status 0: unlock 1: lock
1.3.6.1.4.1.21678.186.3.2.2.2.4 .5	ark1atsc_GbeRxCh2OverFlowAlarm	R	Not implemented - GbE Rx channel 2 overflow alarm 0: off 1: on
1.3.6.1.4.1.21678.186.3.2.2.2.4	ark1atsc_GbeRxCh2SequenceError	R	Not implemented - GbE Rx channel 2 sequence

OID	Name	R\W	Description
.6			error 0: off 1: on
1.3.6.1.4.1.21678.186.3.2.2.2.4.7	ark1atsc_GbeRxCh2Protocol	R	Not implemented - GbE Rx channel 2 transmission protocol 0: udp 1: rtp
1.3.6.1.4.1.21678.186.3.2.3	ark1atsc_StatisticsItu		
1.3.6.1.4.1.21678.186.3.2.3.1	ark1atsc_ItuSdi		
1.3.6.1.4.1.21678.186.3.2.3.1.1	ark1atsc_Sdi1		
1.3.6.1.4.1.21678.186.3.2.3.1.1.1	ark1atsc_Sdi1Lock	R	Sdi 1 lock status 0: unlock 1: lock
1.3.6.1.4.1.21678.186.3.2.3.1.1.2	ark1atsc_Sdi1Cd	R	Sdi 1 carrier detect alarm 0: lock 1: unlock
1.3.6.1.4.1.21678.186.3.2.3.1.1.3	ark1atsc_Sdi1Standard	R	Sdi 1 standard 0: NTSC 4:2:2 component video 1: invalid 2: NTSC 4:2:2 16x9 component video 3: NTSC 4:4:4 13,5 MHz component video 4: PAL 4:2:2 component video 5: invalid 6: PAL 4:2:2 16x9 component video 7: PAL 4:4:4 13,5 MHz component video
1.3.6.1.4.1.21678.186.3.2.3.1.2	ark1atsc_Sdi2		
1.3.6.1.4.1.21678.186.3.2.3.1.2.1	ark1atsc_Sdi2Lock	R	Sdi 2 lock status 0: unlock 1: lock
1.3.6.1.4.1.21678.186.3.2.3.1.2.2	ark1atsc_Sdi2Cd	R	Sdi 2 carrier detect alarm 0: lock 1: unlock
1.3.6.1.4.1.21678.186.3.2.3.1.2.3	ark1atsc_Sdi2Standard	R	Sdi 2 standard 0: NTSC 4:2:2 component video 1: invalid 2: NTSC 4:2:2 16x9 component video 3: NTSC 4:4:4 13,5 MHz component video 4: PAL 4:2:2 component video 5: invalid 6: PAL 4:2:2 16x9 component video 7: PAL 4:4:4 13,5 MHz component video
1.3.6.1.4.1.21678.186.4	ark1atsc_Modulation		
1.3.6.1.4.1.21678.186.4.1	ark1atsc_Modulation_Settings		
1.3.6.1.4.1.21678.186.4.1.1	ark1atsc_Modulation_Atsc		
1.3.6.1.4.1.21678.186.4.1.1.1	ark1atsc_Modulation_Atsc_DelNullPck	RW	Delete null packets enable 0: disabled 1: enable
1.3.6.1.4.1.21678.186.4.1.2	ark1atsc_Modulation_Itu		
1.3.6.1.4.1.21678.186.4.1.2.1	ark1atsc_Modulation_Itu_Video		
1.3.6.1.4.1.21678.186.4.1.2.1.1	ark1atsc_Modulation_Itu_Video_Whitelevel	RW	White level [%] (range 10 to 22) = [(x*0.05) + 10] (x: range 0 to 240)
1.3.6.1.4.1.21678.186.4.1.2.1.2	ark1atsc_Modulation_Itu_Video_SynchAmplitude	RW	Synch Amplitude [%] (range: 22 to 27,5) = [(x*0.05) + 20] (x: range 40 to 150)
1.3.6.1.4.1.21678.186.4.1.2.1.3	ark1atsc_Modulation_Itu_Video_PedesL	RW	Pedes leve [%] (range: 0 to 7) = (x*0.05) (x:

OID	Name	R\W	Description
	evel		range 0 to 140)
1.3.6.1.4.1.21678.186.4.1.2.2	ark1atsc_Modulation_Itu_Audio		
1.3.6.1.4.1.21678.186.4.1.2.2.1	ark1atsc_Modulation_Itu_Audio_Deviation	RW	Audio deviation
1.3.6.1.4.1.21678.186.4.1.2.2.2	ark1atsc_Modulation_Itu_Audio_CarrierLevel1	RW	Carrier Level 1 [dB] (range: -7 to -22) = [-1*(x/10)] (range 70 to 220)
1.3.6.1.4.1.21678.186.4.1.2.2.3	ark1atsc_Modulation_Itu_Audio_CarrierLevel2	RW	Carrier Level 2 [dB] (range: -7 to -22) = [-1*(x/10)] (range 70 to 220)
1.3.6.1.4.1.21678.186.4.1.2.2.4	ark1atsc_Modulation_Itu_Audio_Emphasis	R	Monitor emphasis 0: 50 us 1: 75 us 2: no emphasis 3: no emphasis
1.3.6.1.4.1.21678.186.4.1.2.2.5	ark1atsc_Modulation_Itu_Audio_Type	RW	Select Audio type 0: mono dual carrier 1: dual sound 2: stereo 3: mono single carrier
1.3.6.1.4.1.21678.186.4.2	ark1atsc_Modulation_Test		
1.3.6.1.4.1.21678.186.4.2.1	ark1atsc_Test_Common		
1.3.6.1.4.1.21678.186.4.2.1.1	ark1atsc_Test_Cw	RW	Test CW enable 0: disabled 1: enabled
1.3.6.1.4.1.21678.186.4.2.2	ark1atsc_Test_Atsc		
1.3.6.1.4.1.21678.186.4.2.2.1	ark1atsc_Test_ForceNullPck	RW	Force null packets enable 0: disabled 1: enabled
1.3.6.1.4.1.21678.186.4.2.3	ark1atsc_Test_Itu		
1.3.6.1.4.1.21678.186.4.2.3.1	ark1atsc_Test_Cw_Av	RW	Test CW A/V enable 0: disabled 1: enabled
1.3.6.1.4.1.21678.186.4.2.3.2	ark1atsc_Test_Video	RW	Test video selector 0: bars 1: no video test
1.3.6.1.4.1.21678.186.4.2.3.3	ark1atsc_Test_Audio	RW	Test audio selector 0: no audio test 1: test tone
1.3.6.1.4.1.21678.186.4.2.3.4	ark1atsc_Test_Tone_Right	RW	Right tone frequency (range:0 to127) [unit x 100Hz]
1.3.6.1.4.1.21678.186.4.2.3.5	ark1atsc_Test_Tone_Left	RW	Left tone frequency (range:0 to127) [unit x 100Hz]
1.3.6.1.4.1.21678.186.4.2.3.6	ark1atsc_Test_Mute_Audio_Enable	RW	Mute audio enable 0: disabled 1: enabled
1.3.6.1.4.1.21678.186.5	ark1atsc_Output		
1.3.6.1.4.1.21678.186.5.1	ark1atsc_OutputSettings		
1.3.6.1.4.1.21678.186.5.1.1	ark1atsc_OutputSettingsA		
1.3.6.1.4.1.21678.186.5.1.1.1	ark1atsc_SettingsAChannel	RW	Mode A: output channel
1.3.6.1.4.1.21678.186.5.1.1.2	ark1atsc_SettingsAFrequencyOffset	RW	Mode A: output frequency offset expressed in Hz (from -4,000,000 up to 4,000,000)
1.3.6.1.4.1.21678.186.5.1.1.3	ark1atsc_SettingsAPower	RW	Mode A: output power
1.3.6.1.4.1.21678.186.5.1.2	ark1atsc_OutputSettingsB		
1.3.6.1.4.1.21678.186.5.1.2.1	ark1atsc_SettingsBChannel	RW	Mode B: output channel
1.3.6.1.4.1.21678.186.5.1.2.2	ark1atsc_SettingsBFrequencyOffset	RW	Mode B: output frequency offset expressed in Hz (from -4,000,000 up to 4,000,000)

OID	Name	R\W	Description
1.3.6.1.4.1.21678.186.5.1.2.3	ark1atsc_SettingsBPower	RW	Mode B: output power
1.3.6.1.4.1.21678.186.5.1.3	ark1atsc_OutputSettingsGbe		
1.3.6.1.4.1.21678.186.5.1.3.1	ark1atsc_SettingsGbeTxCh1		
1.3.6.1.4.1.21678.186.5.1.3.1.1	ark1atsc_GbeTxCh1Selector	RW	Not implemented - Input to GbE Tx Ch 1 selector 0: asi 1 1: asi 2 2: asi 3 3: asi 4 4: ssi 1 5: ssi 2 6: ssi 3 7: ssi 4 8: Gbe Ch1 9: Gbe Ch2
1.3.6.1.4.1.21678.186.5.1.3.1.2	ark1atsc_GbeTxCh1Status	R	Not implemented - GbE Tx Ch 1: transmission status 0: off 1: Resolving IP 2: No entry error 3: TX data 4: IP address not found 5: TX multicast data
1.3.6.1.4.1.21678.186.5.1.3.1.3	ark1atsc_GbeTxCh1Enable	RW	Not implemented - GbE Tx Ch 1: transmission enable 0: disabled 1: enabled
1.3.6.1.4.1.21678.186.5.1.3.2	ark1atsc_SettingsGbeTxCh2		
1.3.6.1.4.1.21678.186.5.1.3.2.1	ark1atsc_GbeTxCh2Selector	RW	Not implemented - Input to GbE Tx Ch 2 selector 0: asi 1 1: asi 2 2: asi 3 3: asi 4 4: ssi 1 5: ssi 2 6: ssi 3 7: ssi 4 8: Gbe Ch1 9: Gbe Ch2
1.3.6.1.4.1.21678.186.5.1.3.2.2	ark1atsc_GbeTxCh2Status	R	Not implemented - GbE Tx Ch 2: transmission status 0: off 1: Resolving IP 2: No entry error 3: TX data 4: IP address not found 5: TX multicast data
1.3.6.1.4.1.21678.186.5.1.3.2.3	ark1atsc_GbeTxCh2Enable	RW	Not implemented - GbE Tx Ch 2: transmission enable 0: disabled 1: enabled
1.3.6.1.4.1.21678.186.5.2	ark1atsc_OutputRf		
1.3.6.1.4.1.21678.186.5.2.1	ark1atsc_RfOn	RW	RF output enable 0: disabled 1: enabled
1.3.6.1.4.1.21678.186.5.2.2	ark1atsc_RfStatus	R	RF output status 0: off 1: on
1.3.6.1.4.1.21678.186.5.2.3	ark1atsc_RfPrecCurveMode	R	Pre-correction curve editing status 0: Standalone 1: Driver
1.3.6.1.4.1.21678.186.5.2.4	ark1atsc_RfPrecPort5kStatus	R	Port 5000 status 0: closed 1: opened
1.3.6.1.4.1.21678.186.5.2.5	ark1atsc_RfPrecCurveActualNumber	R	Current pre-correction curve number
1.3.6.1.4.1.21678.186.5.3	ark1atsc_OutputTest		
1.3.6.1.4.1.21678.186.5.3.1	ark1atsc_TestForceNullPck	RW	Force null packets 0: disabled 1: enabled
1.3.6.1.4.1.21678.186.5.3.2	ark1atsc_TestCw	RW	Test CW 0: disabled 1: enabled
1.3.6.1.4.1.21678.186.5.3.3	ark1atsc_NotUsed		
1.3.6.1.4.1.21678.186.5.4	ark1atsc_OutputTsProcessing		
1.3.6.1.4.1.21678.186.5.4.1	ark1atsc_TsProcessingDeleteNullPck	RW	Delete null packets enable 0: disabled 1: enable

OID	Name	R\W	Description
1.3.6.1.4.1.21678.186.5.4.2	ark1atsc_NotUsed		
1.3.6.1.4.1.21678.186.5.5	ark1atsc_OutputMonitor		
1.3.6.1.4.1.21678.186.5.5.1	ark1atsc_Monitor_FwdPowerDbm	R	Forward power [dBm x 10] indicator
1.3.6.1.4.1.21678.186.5.5.2	ark1atsc_Monitor_AgcMode	R	AGC mode status 0: analog 1: digital
1.3.6.1.4.1.21678.186.5.5.3	ark1atsc_Monitor_AgcOn	R	Auto AGC status 0: off 1: on
1.3.6.1.4.1.21678.186.6	ark1atsc_HW_monitor		
1.3.6.1.4.1.21678.186.6.1	ark1atsc_HW_monitor_RflPowerDbm	R	Reflex power [dBm x 10]
1.3.6.1.4.1.21678.186.6.2	ark1atsc_HW_monitor_Amplifier	R	Amplifier status 0: on 1: off 2: restart 3: stand by off 4: GPS off 5: init 6: alarm off 7: rf off 8: opto off 9: change mode
1.3.6.1.4.1.21678.186.6.3	ark1atsc_HW_monitor_CurrentOut	R	Current indicator (mA)
1.3.6.1.4.1.21678.186.6.4	ark1atsc_HW_monitor_PowerSupply	R	Voltage indicator (mV): 28V for 20W and 50W versions, and 42V for 200W version
1.3.6.1.4.1.21678.186.6.5	ark1atsc_HW_monitor_FanPulse		
1.3.6.1.4.1.21678.186.6.5.1	ark1atsc_FanSpeed1	R	FAN 1 speed (rpm)
1.3.6.1.4.1.21678.186.6.5.2	ark1atsc_FanSpeed2	R	FAN 2 speed (rpm)
1.3.6.1.4.1.21678.186.6.5.3	ark1atsc_FanSpeed3	R	FAN 3 speed (rpm) - only for 200W version
1.3.6.1.4.1.21678.186.6.5.4	ark1atsc_FanSpeed4	R	FAN 4 speed (rpm) - only for 200W version
1.3.6.1.4.1.21678.186.6.6	ark1atsc_HW_monitor_Temperature		
1.3.6.1.4.1.21678.186.6.6.1	ark1atsc_TemperatureCase	R	Case temperature
1.3.6.1.4.1.21678.186.6.6.2	ark1atsc_TemperaturePsu	R	PSU temperature
1.3.6.1.4.1.21678.186.6.6.3	ark1atsc_TemperatureCase2	R	Case temperature 2 (only in SDTX 200 version)
1.3.6.1.4.1.21678.186.6.7	ark1atsc_HW_monitor_Relays		
1.3.6.1.4.1.21678.186.6.7.1	ark1atsc_Relay0Status	R	Relay 0 status 0: on 1: off
1.3.6.1.4.1.21678.186.6.7.2	ark1atsc_Relay1Status	R	Relay 1 status 0: on 1: off
1.3.6.1.4.1.21678.186.6.7.3	ark1atsc_Relay2Status	R	Relay 2 status 0: on 1: off
1.3.6.1.4.1.21678.186.6.7.4	ark1atsc_Relay3Status	R	Relay 3 status 0: on 1: off
1.3.6.1.4.1.21678.186.6.8	ark1atsc_HW_monitor_Opto		
1.3.6.1.4.1.21678.186.6.8.1	ark1atsc_Opto0Status	R	Opto 0 status (RF Off): if closed the output RF is switch off 0: closed 1: opened
1.3.6.1.4.1.21678.186.6.8.2	ark1atsc_Opto1Status	R	Opto 1 status (Mode Switch): if closed Mode B, otherwise Mode A 0: closed 1: opened
1.3.6.1.4.1.21678.186.6.8.3	ark1atsc_Opto2Status	R	Opto 2 status (Retry, only in 200 watt version) 0: closed 1: opened
1.3.6.1.4.1.21678.186.6.8.4	ark1atsc_Opto3Status	R	Opto 3 status (Stand-by): if closed the device is put on stand-by 0: closed 1: opened
1.3.6.1.4.1.21678.186.6.9	ark1atsc_HW_monitor_PowerSupply24V	R	24V voltage indicator (mV), only in 200 watt version

OID	Name	R\W	Description
1.3.6.1.4.1.21678.186.7	ark1atsc_Gps		
1.3.6.1.4.1.21678.186.7.1	ark1atsc_GpsSat		
1.3.6.1.4.1.21678.186.7.1.1	ark1atsc_SatVisible	R	Number of visible satellite
1.3.6.1.4.1.21678.186.7.1.2	ark1atsc_SatTracked	R	Number of satellite locked
1.3.6.1.4.1.21678.186.7.2	ark1atsc_GpsStatus		
1.3.6.1.4.1.21678.186.7.2.1	ark1atsc_StatusDataValid	R	Signal precision status 0: Not valid 1: Valid
1.3.6.1.4.1.21678.186.7.3	ark1atsc_GpsPosition		
1.3.6.1.4.1.21678.186.7.3.1	ark1atsc_PositionLatitude	R	Latitude position [°]
1.3.6.1.4.1.21678.186.7.3.2	ark1atsc_PositionLongitude	R	Longitude position [°]
1.3.6.1.4.1.21678.186.7.4	ark1atsc_GpsTime		
1.3.6.1.4.1.21678.186.7.4.1	ark1atsc_TimeActual	R	UTC time
1.3.6.1.4.1.21678.186.7.4.2	ark1atsc_TimeDate	R	UTC date
1.3.6.1.4.1.21678.186.8	ark1atsc_Clock		
1.3.6.1.4.1.21678.186.8.1	ark1atsc_ClockSel10MhzReference	RW	10 MHz frequency reference 0: ext 1: int 2: gps
1.3.6.1.4.1.21678.186.8.2	ark1atsc_ClockSel1Pps	RW	1PPS frequency reference 0: int 1: ext
1.3.6.1.4.1.21678.186.8.3	ark1atsc_GainFineTuning	RW	Gain fine tuning (from 0 up to 255)
1.3.6.1.4.1.21678.186.9	ark1atsc_Network		
1.3.6.1.4.1.21678.186.9.1	ark1atsc_NetworkManagement		
1.3.6.1.4.1.21678.186.9.1.1	ark1atsc_ManagementMacAddress	R	Board MAC address
1.3.6.1.4.1.21678.186.9.1.2	ark1atsc_ManagementIpAddress	R	Board IP address
1.3.6.1.4.1.21678.186.9.1.3	ark1atsc_ManagementNetmask	R	Subnet mask
1.3.6.1.4.1.21678.186.9.1.4	ark1atsc_ManagementGateway	R	Gateway address
1.3.6.1.4.1.21678.186.9.1.5	ark1atsc_ManagementUdpPort	RW	UDP port
1.3.6.1.4.1.21678.186.9.1.6	ark1atsc_ManagementSpeed	R	GBE Speed 0: 10 Mbit 1: 100 Mbit 2: 1 Gbit
1.3.6.1.4.1.21678.186.9.1.7	ark1atsc_ManagementGoodFrame	R	GbE good frame counter
1.3.6.1.4.1.21678.186.9.1.8	ark1atsc_ManagementBadFrame	R	GbE bad frame counter
1.3.6.1.4.1.21678.186.9.2	ark1atsc_NetworkIgmp		
1.3.6.1.4.1.21678.186.9.2.1	ark1atsc_IgmpEnable	RW	Not implemented - IGMP enable 0: disabled 1: enabled
1.3.6.1.4.1.21678.186.9.3	ark1atsc_NetworkTxChannel1		
1.3.6.1.4.1.21678.186.9.3.1	ark1atsc_TxChannel1Type	RW	Not implemented - Tx channel 1: transmission protocol selector 0: RTP 1: UDP
1.3.6.1.4.1.21678.186.9.3.2	ark1atsc_TxChannel1TsFormat	RW	Not implemented - Tx channel 1: packet format 0: 204 1: 188
1.3.6.1.4.1.21678.186.9.3.3	ark1atsc_TxChannel1TsNum	RW	Not implemented - Tx channel 1: number of TS packet per frame
1.3.6.1.4.1.21678.186.9.3.4	ark1atsc_TxChannel1IpAddr	RW	Not implemented - Tx channel 1: destination IP

OID	Name	R\W	Description
			address
1.3.6.1.4.1.21678.186.9.3.5	ark1atsc_TxChannel1Port	RW	Not implemented - Tx channel 1: destination port
1.3.6.1.4.1.21678.186.9.3.6	ark1atsc_TxChannel1Ssrc	RW	Not implemented - Tx channel 1: SSRC identifier
1.3.6.1.4.1.21678.186.9.3.7	ark1atsc_TxChannel1MacAddr	R	Not implemented - Tx channel 1: destination MAC address
1.3.6.1.4.1.21678.186.9.4	ark1atsc_NetworkTxChannel2		
1.3.6.1.4.1.21678.186.9.4.1	ark1atsc_TxChannel2Type	RW	Not implemented - Tx channel 2: transmission protocol selector 0: RTP 1: UDP
1.3.6.1.4.1.21678.186.9.4.2	ark1atsc_TxChannel2TsFormat	RW	Not implemented - Tx channel 2: packet format 0: 204 1: 188
1.3.6.1.4.1.21678.186.9.4.3	ark1atsc_TxChannel2TsNum	RW	Not implemented - Tx channel 2: number of TS packet per frame
1.3.6.1.4.1.21678.186.9.4.4	ark1atsc_TxChannel2IpAddr	RW	Not implemented - Tx channel 2: destination IP address
1.3.6.1.4.1.21678.186.9.4.5	ark1atsc_TxChannel2Port	RW	Not implemented - Tx channel 2: destination port
1.3.6.1.4.1.21678.186.9.4.6	ark1atsc_TxChannel2Ssrc	RW	Not implemented - Tx channel 2: SSRC identifier
1.3.6.1.4.1.21678.186.9.4.7	ark1atsc_TxChannel2MacAddr	R	Not implemented - Tx channel 2: destination MAC address
1.3.6.1.4.1.21678.186.9.5	ark1atsc_NetworkRxChannel1		
1.3.6.1.4.1.21678.186.9.5.1	ark1atsc_RxChannel1IpAddr	RW	Not implemented - Rx channel 1: IP address
1.3.6.1.4.1.21678.186.9.5.2	ark1atsc_RxChannel1Port	RW	Not implemented - Rx channel 1: port
1.3.6.1.4.1.21678.186.9.5.3	ark1atsc_RxChannel1ClkRecoveryEnable	RW	Not implemented - Rx channel 1: clock recovery enable 0: enabled 1: disabled
1.3.6.1.4.1.21678.186.9.5.4	ark1atsc_RxChannel1SourceClkReference	RW	Not implemented - Rx channel 1: source clock reference selector 0: 90 kHz 1: 27 MHz
1.3.6.1.4.1.21678.186.9.6	ark1atsc_NetworkRxChannel2		
1.3.6.1.4.1.21678.186.9.6.1	ark1atsc_RxChannel2IpAddr	RW	Not implemented - Rx channel 2: IP address
1.3.6.1.4.1.21678.186.9.6.2	ark1atsc_RxChannel2Port	RW	Not implemented - Rx channel 2: port
1.3.6.1.4.1.21678.186.9.6.3	ark1atsc_RxChannel2ClkRecoveryEnable	RW	Not implemented - Rx channel 2: clock recovery enable 0: enabled 1: disabled
1.3.6.1.4.1.21678.186.9.6.4	ark1atsc_RxChannel2SourceClkReference	RW	Not implemented - Rx channel 2: source clock reference selector 0: 90 kHz 1: 27 MHz
1.3.6.1.4.1.21678.186.9.7	ark1atsc_SnmpTrap		
1.3.6.1.4.1.21678.186.9.7.1	ark1atsc_Trap0IpAddress	RW	Trap 0: destination IP address
1.3.6.1.4.1.21678.186.9.7.2	ark1atsc_Trap1IpAddress	RW	Trap 1: destination IP address
1.3.6.1.4.1.21678.186.9.7.3	ark1atsc_Trap2IpAddress	RW	Trap 2: destination IP address
1.3.6.1.4.1.21678.186.9.7.4	ark1atsc_Trap3IpAddress	RW	Trap 3: destination IP address
1.3.6.1.4.1.21678.186.9.7.5	ark1atsc_Trap4IpAddress	RW	Trap 4: destination IP address

OID	Name	R\W	Description
1.3.6.1.4.1.21678.186.9.7.6	ark1atsc_Trap5IpAddress	RW	Trap 5: destination IP address
1.3.6.1.4.1.21678.186.9.7.7	ark1atsc_Trap6IpAddress	RW	Trap 6: destination IP address
1.3.6.1.4.1.21678.186.9.7.8	ark1atsc_Trap7IpAddress	RW	Trap 7: destination IP address
1.3.6.1.4.1.21678.186.10	ark1atsc_Alarm		
1.3.6.1.4.1.21678.186.10.1	ark1atsc_AlarmThr		
1.3.6.1.4.1.21678.186.10.1.1	ark1atsc_Not_implemented		
1.3.6.1.4.1.21678.186.10.1.2	ark1atsc_ThrRfSquelchA	RW	Mode A: Squelch threshold (absolute value)
1.3.6.1.4.1.21678.186.10.1.3	ark1atsc_ThrRfSquelchB	RW	Mode B: Squelch threshold (absolute value)
1.3.6.1.4.1.21678.186.10.1.4	ark1atsc_ThrFwdPowerWarning	RW	Forward power warning threshold (absolute value [dBm x 10])
1.3.6.1.4.1.21678.186.10.1.5	ark1atsc_ThrFwdPowerAlarm	RW	Forward power alarm threshold (absolute value [dBm x 10])
1.3.6.1.4.1.21678.186.10.1.6	ark1atsc_ThrTemperatureWarning	RW	Case temperature warning threshold
1.3.6.1.4.1.21678.186.10.1.7	ark1atsc_ThrTemperatureAlarm	RW	Case temperature alarm threshold
1.3.6.1.4.1.21678.186.10.1.8	ark1atsc_Not_implemented		
1.3.6.1.4.1.21678.186.10.1.9	ark1atsc_Not_implemented		
1.3.6.1.4.1.21678.186.10.1.10	ark1atsc_InputAlarmDelay	RW	TS input missing alarm delay [val * 100 ms]
1.3.6.1.4.1.21678.186.10.2	ark1atsc_AlarmStatus	R	32 bits word indicating alarms status (each bit is associated to an alarm)
1.3.6.1.4.1.21678.186.10.3	ark1atsc_AlarmTrap		
1.3.6.1.4.1.21678.186.10.3.1	ark1atsc_Trap0Enable	RW	Trap 0: alarm mask
1.3.6.1.4.1.21678.186.10.3.2	ark1atsc_Trap1Enable	RW	Trap 1: alarm mask
1.3.6.1.4.1.21678.186.10.3.3	ark1atsc_Trap2Enable	RW	Trap 2: alarm mask
1.3.6.1.4.1.21678.186.10.3.4	ark1atsc_Trap3Enable	RW	Trap 3: alarm mask
1.3.6.1.4.1.21678.186.10.3.5	ark1atsc_Trap4Enable	RW	Trap 4: alarm mask
1.3.6.1.4.1.21678.186.10.3.6	ark1atsc_Trap5Enable	RW	Trap 5: alarm mask
1.3.6.1.4.1.21678.186.10.3.7	ark1atsc_Trap6Enable	RW	Trap 6: alarm mask
1.3.6.1.4.1.21678.186.10.3.8	ark1atsc_Trap7Enable	RW	Trap 7: alarm mask
1.3.6.1.4.1.21678.186.10.4	ark1atsc_AlarmRelay		
1.3.6.1.4.1.21678.186.10.4.1	ark1atsc_Relay0Mode	RW	Relay 0: mode selector 0: alarm mask 1: mode indicator 2: RF status
1.3.6.1.4.1.21678.186.10.4.2	ark1atsc_Relay0Enable	RW	Relay 0: alarm mask
1.3.6.1.4.1.21678.186.10.4.3	ark1atsc_Relay1Mode	RW	Relay 1: mode selector 0: alarm mask 1: mode indicator
1.3.6.1.4.1.21678.186.10.4.4	ark1atsc_Relay1Enable	RW	Relay 1: alarm mask
1.3.6.1.4.1.21678.186.10.4.6	ark1atsc_Relay2Enable	RW	Relay 2: alarm mask
1.3.6.1.4.1.21678.186.10.4.8	ark1atsc_Relay3Enable	RW	Relay 3: alarm mask
1.3.6.1.4.1.21678.186.10.5	ark1atsc_AlarmFrontPanelEnable	RW	Front panel: alarm mask

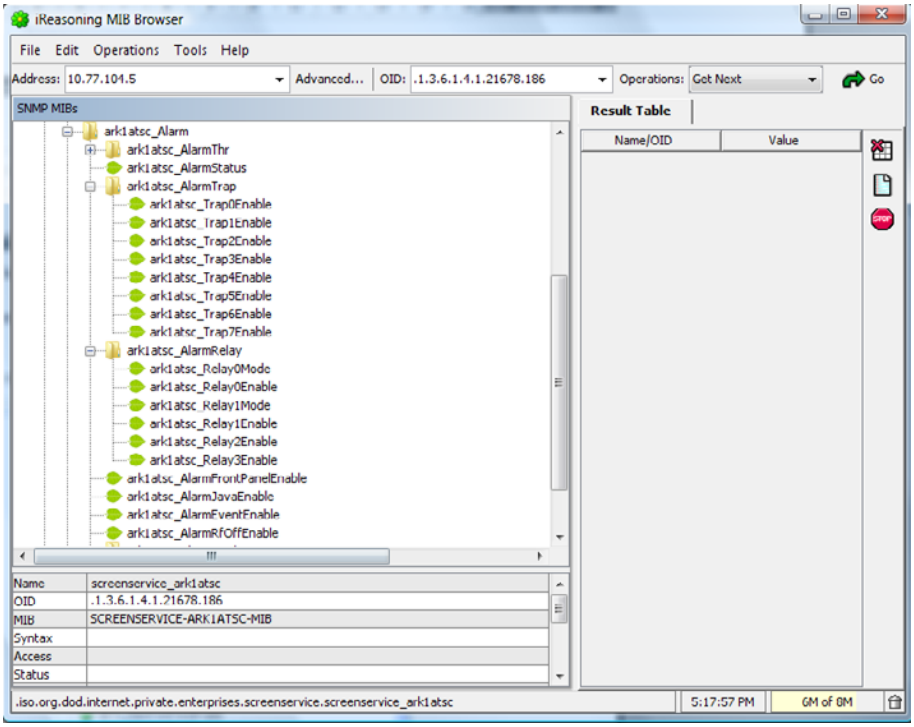
OID	Name	R\W	Description
1.3.6.1.4.1.21678.186.10.6	ark1atsc_AlarmJavaEnable	RW	Java: alarm mask
1.3.6.1.4.1.21678.186.10.7	ark1atsc_AlarmEventEnable	RW	Events: alarm mask
1.3.6.1.4.1.21678.186.10.8	ark1atsc_AlarmRfOffEnable	RW	RF Off: alarm mask
1.3.6.1.4.1.21678.186.10.9	ark1atsc_AlarmSingleStatus		
1.3.6.1.4.1.21678.186.10.9.1	ark1atsc_UpconvUnlockStatus	R	Upconverter Oscillator Unlock alarm status
1.3.6.1.4.1.21678.186.10.9.2	ark1atsc_PsVoltageStatus	R	PS Voltage out of range alarm status
1.3.6.1.4.1.21678.186.10.9.3	ark1atsc_PsCurrentStatus	R	PS Current out of range alarm status
1.3.6.1.4.1.21678.186.10.9.4	ark1atsc_AbsPowerLimiterStatus	R	Absolute Power Limiter alarm status
1.3.6.1.4.1.21678.186.10.9.5	ark1atsc_CommErrorStatus	R	Upconverter Communication error alarm status
1.3.6.1.4.1.21678.186.10.9.6	ark1atsc_TempHighStatus	R	Temperature High Alarm status
1.3.6.1.4.1.21678.186.10.9.7	ark1atsc_TempAlarmStatus	R	Temperature Level -3dB alarm status
1.3.6.1.4.1.21678.186.10.9.8	ark1atsc_TempWarningStatus	R	Temperature High Warning status
1.3.6.1.4.1.21678.186.10.9.9	ark1atsc_FwdPowerHighStatus	R	Forward Power High alarm status
1.3.6.1.4.1.21678.186.10.9.10	ark1atsc_FwdPowerWarningStatus	R	Forward Power Low Warning status
1.3.6.1.4.1.21678.186.10.9.11	ark1atsc_FwdPowerAlarmStatus	R	Forward Power Low Alarm status
1.3.6.1.4.1.21678.186.10.9.12	ark1atsc_ReflexPowerStatus	R	Reflex Power High alarm status
1.3.6.1.4.1.21678.186.10.9.13	ark1atsc_FansSpeedStatus	R	Fans Speed alarm status
1.3.6.1.4.1.21678.186.10.9.14	ark1atsc_ItuNoSdiInputStatus	R	ITU 470: selected SDI input presence alarm status
1.3.6.1.4.1.21678.186.10.9.15	ark1atsc_GpsLockStatus	R	GPS Lock alarm status
1.3.6.1.4.1.21678.186.10.9.16	ark1atsc_GpsCommErrorStatus	R	GPS Communication Error alarm status
1.3.6.1.4.1.21678.186.10.9.17	ark1atsc_10MhzLockStatus	R	Signal 10 MHz Lock alarm status
1.3.6.1.4.1.21678.186.10.9.18	ark1atsc_129MhzLockStatus	R	Signal 120 MHz Lock alarm status
1.3.6.1.4.1.21678.186.10.9.19	ark1atsc_960MhzLockStatus	R	Signal 960 MHz Lock alarm status
1.3.6.1.4.1.21678.186.10.9.20	ark1atsc_DownconvUnlockStatus	R	Downconverter Oscillator Unlock alarm status
1.3.6.1.4.1.21678.186.10.9.21	ark1atsc_ItuWrongInputStdStatus	R	ITU 470: wrong signal standard from selected SDI alarm status
1.3.6.1.4.1.21678.186.10.9.22	ark1atsc_RfInputSquelchStatus	R	RF Input Squelch alarm status
1.3.6.1.4.1.21678.186.10.9.23	ark1atsc_NotUsed	R	Reserved for future use
1.3.6.1.4.1.21678.186.10.9.24	ark1atsc_FileSysErrorStatus	R	File System Error alarm status
1.3.6.1.4.1.21678.186.10.9.25	ark1atsc_BadFileStatus	R	Bad File in File System alarm status
1.3.6.1.4.1.21678.186.10.9.26			
1.3.6.1.4.1.21678.186.10.9.27			
1.3.6.1.4.1.21678.186.10.9.28			
1.3.6.1.4.1.21678.186.10.9.29			
1.3.6.1.4.1.21678.186.10.9.30	ark1atsc_AtscNoTsInputStatus	R	ATSC: selected input TS presence alarm status
1.3.6.1.4.1.21678.186.10.9.31	ark1atsc_FpgaBootStatus	R	FPGA Boot alarm status

OID	Name	R\W	Description
1.3.6.1.4.1.21678.186.10.9.32	ark1atsc_WarmUpStatus	R	Warm up alarm status
1.3.6.1.4.1.21678.186.11	ark1atsc_Config		
1.3.6.1.4.1.21678.186.11.1	ark1atsc_ConfigLoad	W	Load configuration
1.3.6.1.4.1.21678.186.11.2	ark1atsc_ConfigSave	W	Save configuration
1.3.6.1.4.1.21678.186.11.3	ark1atsc_ConfigReset	W	Reset board
1.3.6.1.4.1.21678.186.11.4	ark1atsc_ConfigStandByEnable	RW	LCD stand-by button enable 0: disabled 1: enabled
1.3.6.1.4.1.21678.186.11.5	ark1atsc_ConfigStandByStatus	R	Current device mode 0: normal 1: standby
1.3.6.1.4.1.21678.186.11.6	ark1atsc_ConfigTime		
1.3.6.1.4.1.21678.186.11.6.1	ark1atsc_Year	RW	Year setting (starting from 2000)
1.3.6.1.4.1.21678.186.11.6.2	ark1atsc_Month	RW	Month setting
1.3.6.1.4.1.21678.186.11.6.3	ark1atsc_Day	RW	Day setting
1.3.6.1.4.1.21678.186.11.6.4	ark1atsc_Hour	RW	Hour setting
1.3.6.1.4.1.21678.186.11.6.5	ark1atsc_Minutes	RW	Minutes setting
1.3.6.1.4.1.21678.186.11.6.6	ark1atsc_Seconds	RW	Seconds setting
1.3.6.1.4.1.21678.186.12	ark1atsc_TrapAlarm		Alarm

3.3.5 Configuring alarms masks

The *ark1atsc_Alarm* leaf allows the monitoring of alarms status, the setting of alarm masks and thresholds.
Use alarm masks to select how and which alarm have to be notified.

Fig. 5:Configuring alarms



There are six families of alarm masks:

- ***ark1atsc_AlarmJavaEnable*:** the selected alarms status is notified on the Java alarm page icon.
- ***ark1atsc_AlarmFrontPanelEnable*:** the selected alarms status is notified on LCD display lighting the alarm button and listing the alarms in the Alarms menu (refer to Alarms Menu paragraph).
- ***ark1atsc_AlarmEventsEnable*:** the selected alarms status generate an alarm event that will be logged in the event memory (refer to Events paragraph).
- ***ark1atsc_AlarmRelay*:** the selected alarms switch-on the corresponding relay.
- ***ark1atsc_AlarmTrap*:** the selected alarms generate the corresponding trap message.
- ***ark1atsc_AlarmRfEnable*:** the selected alarms switch off the RF output. The RF mask is almost entirely fixed in order to avoid board damages or malfunctioning.

Each alarm mask is a 32 bits word and each alarm represents one bit (0: Off, 1: On). Set the decimal value corresponding to the mask you want to activate in the relatve leaf. The following table shows the bit-to-alarm association.

Bit-to-alarm association map

Table 4

Alarm	Bit	Alarm	Bit
Up converter Osc. Unlock	0	Signal 10 MHz Lock	16
PS Voltage out range	1	Signal 129 MHz Lock	17
PS Current out of range	2	Signal 960 MHz Lock	18
Absolute Power Limiter	3	Down Converter Osc. Unlock	19
Up converter communication error	4	No RF Input	20
Temperature High Alarm	5	RF Input Squelch	21
Temperature Level-3dB	6	RF Digital Ber. Alarm	22
Temperature High Warning	7	File System Error	23
Forward Power High	8	Bad File in File system	24
Forward Power Low Warning	9	No TS input	25
Forward Power Low Alarm	10	FPGA Boot alarm	26
Reflex Power High	11	Warm Up	27
Fan Speed	12	Not used	28
S/N Level	13	Not used	29
GPS Lock	14	Not used	30
GPS Communication Error	15	Not used	31

E.g. if you want to enable the GPS Lock and No TS Input alarms of a generic alarm mask, set the decimal value of 33,570,816 that corresponds to a binary value of
0000 0010 0000 0000 0100 0000 0000 0000.

3.3.6 Traps

While a management station can poll, at fixed time interval, all the agents it knows for some key information, each agent is responsible for notifying the management station of any alarm condition. These events are communicated in SNMP messages known as *traps*.
The following parameters should be set in order to correctly configure traps:

- SNMP Agent Port: 162.
- SNMP Agent Transport protocol: IP/UDP.
- Variable
    - OID: 1.3.6.1.4.1.21678.186.13.
    - Value(gauge): 32 Bit

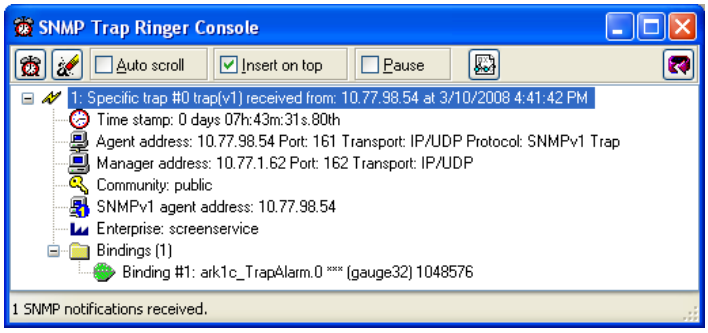
3.3.7 Configuring traps

Use Java (refer to Network and Alarms paragraphs for further information) or SNMP user interfaces to configure traps.

The configuration of traps is performed through the setting of a trap alarm mask, by means of leaves housed in the *ark1atsc_AlarmTrap* node (refer to Configuring alarms paragraph), and through the setting of the destination IP Address of the receiving management stations, by means of leaves housed in the *ark1atsc_Network* node as shown in next figure.

Fig. 6:Configuring traps

Fig. 7:SNMP Trap Message



Each trap carries a 32 bits word in which each alarm represents one bit (0: Off, 1: On). The following table shows the bit-to-alarm association.

Bit-to-trap association map

Table 5

Alarm	Bit	Alarm	Bit
Up converter Osc. Unlock	0	Signal 10 MHz Lock	16
PS Voltage out range	1	Signal 129 MHz Lock	17
PS Current out of range	2	Signal 960 MHz Lock	18
Absolute Power Limiter	3	Down Converter Osc. Unlock	19
Up converter communication error	4	No RF Input	20
Temperature High Alarm	5	RF Input Squelch	21
Temperature Level-3dB	6	RF Digital Ber. Alarm	22
Temperature High Warning	7	File System Error	23
Forward Power High	8	Bad File in File system	24
Forward Power Low Warning	9	No TS Input	25
Forward Power Low Alarm	10	FPGA Boot alarm	26
Reflex Power High	11	Warm Up	27
Fan Speed	12	Not used	28
S/N Level	13	Not used	29
GPS Lock	14	Not used	30
GPS Communication Error	15	Not used	31

E.g. A trap carring the decimal value 33,570,816, corresponding to a binary value of 0000 0010 0000 0000 0100 0000 0000 0000, means GPS Lock (bit 14) and No TS Input (bit 25) alarms raised.
The Community shown in trap messages can be set from Java interface in the *Community* box within the Network window (refer to Network paragraph).

3.4 STANDALONE/DRIVER WORKING MODES

Two different working modes are provided:

- **Stand-alone:** the device works in stand-alone mode. The system configuration can be totally set through user interfaces. Pre-correction curves are automatically selected according to channel and power range.

- **Driver:** the device works in a driven system. The system configuration cannot be totally set through user interfaces. Some settings are disabled on the user interfaces in order to be driven by serial interface commands. Pre-correction curves are not automatically selected according to channel and power range, but the selection is manually performed through serial interface commands.

The following table lists the commands, specific to each system interface, which must be enabled or disabled while working in Driver mode.

Note: Diver mode is a specific working mode available and used only in N+1 configuration systems.

Table 6. Driver mode

Issue	Ethernet Interface – Port 10001	Java	SNMP	Ethernet interface – Port 5000	Char interface	Local Interface (Display)	OPTO
Block output channel setting	Commands: "w" uC registers 0x02 and 0x12 uC ignores the commands.	Java control is disabled	SNMP commands are ignored	Not present	Commands: "W" or "w" uC registers 0x02 and 0x12 The command is enabled.	Control not present	No OPTO associated to the command
Block output frequency offset setting	Commands: "w" FPGA registers 0x07 up to 0x0A and 0x17 up to 0x1A uC ignores the commands.	Java control is disabled	SNMP commands are ignored	Not present	Commands: "W" or "w" FPGA registers 0x07 up to 0x0A and 0x17 up to 0x1A The command is enabled.	Control not present	No OPTO associated to the command
Block power setting	Commands: "w" uC registers 0x0C and 0x0B, and 0x1C and 0x1B uC ignores the commands.	Java control is disabled	SNMP commands are ignored	Not present	Command: "W" or "w" uC registers 0x0C and 0x0B, and 0x1C and 0x1B The command is enabled.	Control not present	No OPTO associated to the command
Block manual RF ON/OFF command	Command: "W" uC register 0x26 uC ignores	Java control is disabled	SNMP commands are ignored	Not present	Command: "W" or "w" uC register 0x26 The command is	Control not present	OPTO 0 control enabled

Issue	Ethernet Interface – Port 10001	Java	SNMP	Ethernet interface – Port 5000	Char interface	Local Interface (Display)	OPTO
	the commands.				enabled.		
Block mode setting	Commands: "w" uC registers 0x00 and 0x10 uC ignores the commands.	Java controls are disabled	SNMP commands are ignored	Not present	Commands: "W" or "w" uC registers 0x00 and 0x10 The command is enabled.	Command mode switch The command is disabled	No OPTO associated to the command
Block mode switch	Commands: "w" uC registers 0x32 and 0x33 uC ignores the commands.	Java controls are disabled	SNMP commands are ignored	Not present	Commands: "W" or "w" uC registers 0x32 and 0x33 The command is enabled.	Control not present	OPTO 1 control enabled

3.5 TRANSPORT-LEVEL PROTOCOLS

ARK 1 ATSC device allows connections over different ports and using different transport protocols over Gigabit Ethernet depending on functions and operations.
In the following table used ports and protocols are listed to help users understand what software functions allow multiple connections and which port must be enabled.
E.g. pre-correction curves editing and files updating operations open and keep busy the connection to port 5000 till the connection releasing. The connection to this port precludes the possibility of multiple connections and of programming the device.

Table 7. Transport-level Protocols

Port	Protocol	Application	Multiple connections
10001	TCP	Management	Yes
5000	TCP	Updating	No
	TCP	Pre-correction curves	No
161	UDP	SNMP	Yes
162	UDP	SNMP Trap management	Yes

Java Virtual Machine

The Java interface requires a host computer connected via Ethernet to the board with the proper Java Machine version installed.

A.1 Ethernet connection

The host computer has to be connected via Ethernet to the board.
Direct or crossed UTP **category 6 cable is recommended**.

A.1.1 Configuration

In order to connect to the board trough a LAN, all the devices have to be on the same network.
The default IP address settings of the X-port are:

- IP address: 10.77.xx.xx , where xx is the host address unique for each board.
- Subnet mask: 255.255.0.0 .

Remember to change these settings if they are not compatible with the LAN where the computer and the board are connected.
IP address and network parameters can be changed only using the local interface. Please refer to chapter 6 for the network setting commands.

3.6 JAVA(TM) PLATFORM

3.6.1 Download

The Java Interface works with any Sun Java Virtual Machine after the 1.4.1 version.
If the computer has no Java Virtual Machine installed, the recommended 1.5.0 version can be downloaded from the Sun Server trough this link:
http://www.java.com/.

3.6.2 Java Control Panel

Java caching must be disabled; to do that follow the following steps:

1. Open the PC general Control Panel and enter in the Java Control Panel

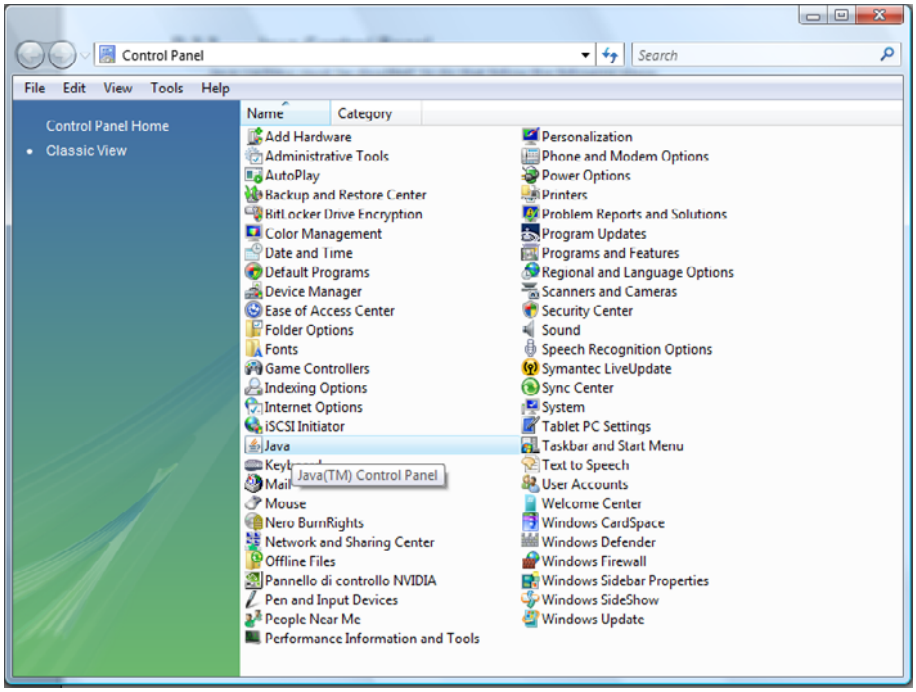


Fig. 8: PC Control Panel

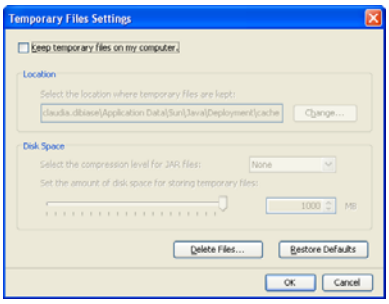
2. The following window will suddenly appear.

Fig. 9: Java Control Panel

3. Select "*Settings…*" in the "*Temporary Internet Files*" section of the "*General*" tab.

4. Deselect the check box of the "Keep temporary files on my computer" (disable cache).

Fig. 10: Temporary Files Settings



5. Push "*OK*" button and close the window.

3.6.3 Supported Web Browsers

The Java GUI is designed to support every Web Browser that uses Sun Java Virtual Machine from 1.4.1 and newer.
Here's a list of Web Browsers where Java GUI has been tested and troubleshot:

- Microsoft Internet Explorer, version 5 and newer.
- Mozilla Firefox, version 1.5 and newer.

3.7 JAVA REMOTE GRAPHIC USER INTERFACE

The Java Graphic User Interface, stored in the board File System, is downloaded to the local PC every time the user connects to the board with a Web Browser. A proper Java Virtual Machine is needed; refer to the Appendix E for a description of supported Java and Internet Browsers.

3.7.1 Java interface overview

The following figure shows the main control switch of the Java User Interface. It allows the switching between control pages for settings and monitoring the device.

Fig. 11: Java main control switch

The following controls are provided:

- **System commands bar** allows the enabling of the following commands:
  - **Connect:** connects/disconnects the local machine to ARK1 ATSC system
  - **Save:** allows saving the device configuration.
  - **Load:** allows loading the last saved device configuration.

Fig. 12: System commands bar

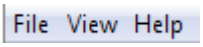
- **Operation pages bar** allows switching between the following operative sections:
  - **General:** allows to enable the Stand-by mode through the LCD Button, to reset the device and to locally download the *.jar file.
  - **Input:** shows ASI/SSI, GbE input statistics for ATSC modulator and SDI input statistics for ITU 470 modulator.
  - **Tuner:** allows to select the input specific for each operative mode, to monitor the RF input and to configure operative modes (ITU 470 modulator and ATSC modulator).
  - **Modulation:** allows management and monitoring of ATSC and ITU-470 modulation parameters
  - **Filter:** allows management and monitoring of adaptive filter in ATSC mode.

- **AM/PM pre-correction:** allows management of AM/PM pre-correction curves tool.
- **Output:** allows to set output parameters, specific for each operative mode, and to monitor the hardware status (ITU 470 modulator and ATSC modulator).
- **Network:** allows the Network management and the GbE in/out parameters setting.
- **GPS:** shows received GPS statistics.
- **Alarms:** provides a grid where to set alarms masks for LCD, Graphic User Interface, Events, Relays, Traps and RF Off.
- **Events:** shows the board events log and allows the manual setting of date and time.

Fig. 13: Operation pages bar

- **System menu** allows the access to the same commands and pages as System commands and Operation pages bars plus management options, help and version windows (refer to System menu paragraph).

Fig. 14: System menu

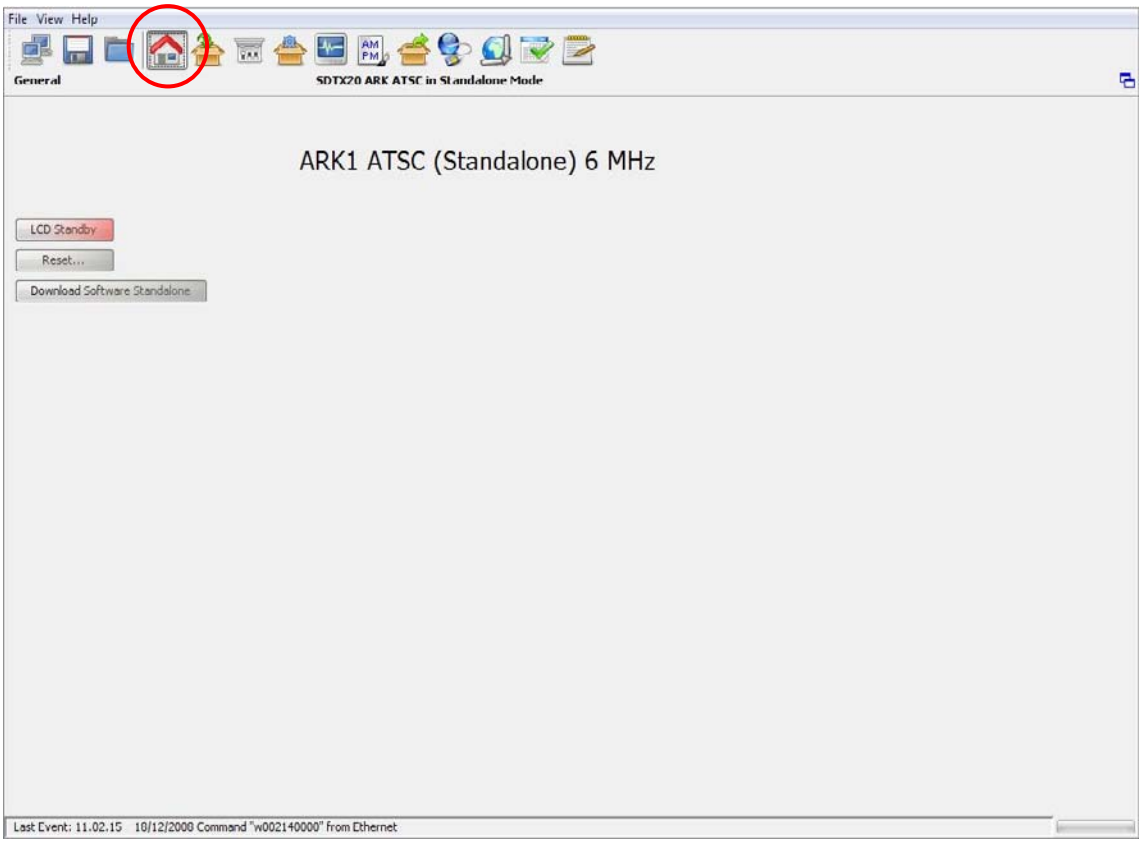


A brief description of all the provided indicators and controls follows in the next paragraphs. The column named I/A specifies if the indicator/command belongs to the ITU 470 modulator mode rather than belonging to the ATSC modulator mode.

3.7.2 General

Click on General button icon, highlighted in the nex figure, to access the general window.

Fig. 15: General window



The General window provides a general description of the device and allows accessing a subset of commands through the following buttons:

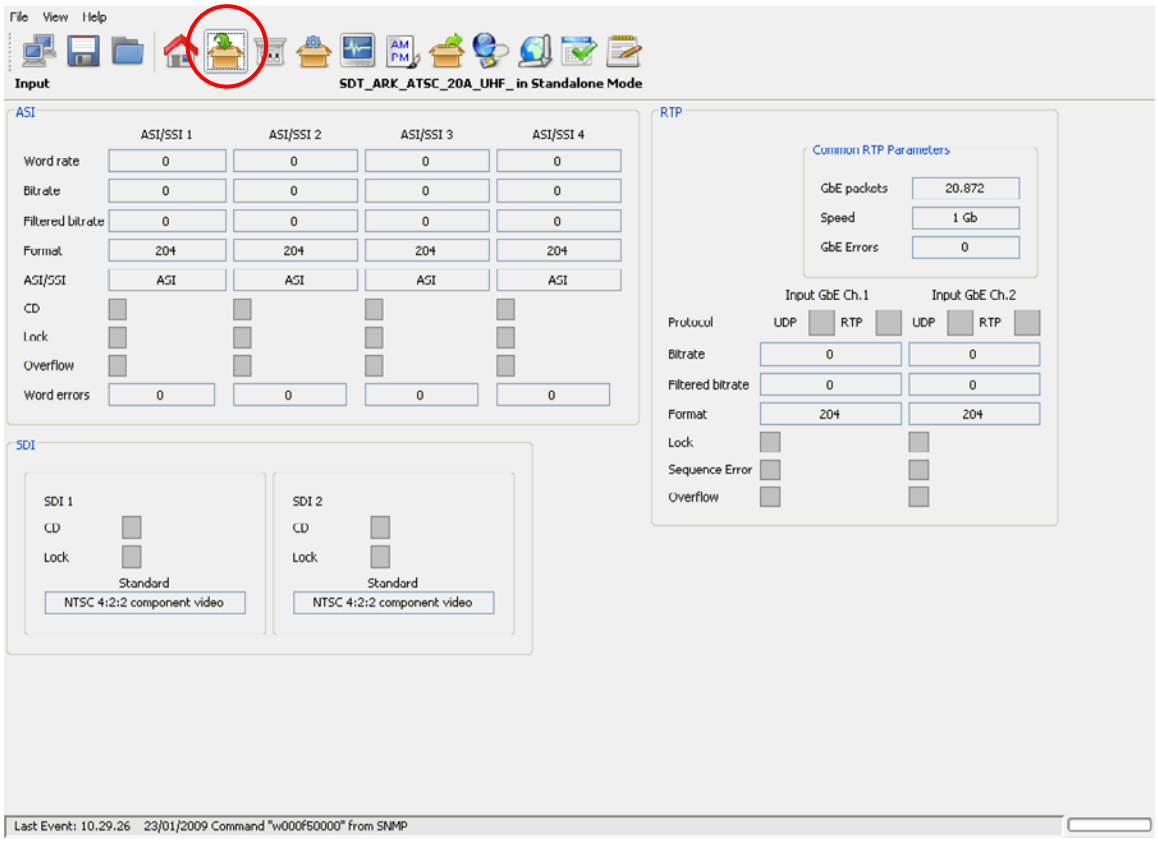
- **Reset:** resets the device.
- **LCD Standby:** enables the LCD Stand-by button.
- **Download Software Standalone:** performs a local download of the *.jar file (refer to Download Software Standalone paragraph).

In General window is also specified the bandwidth and the current working mode (refer to Appendix B).

3.7.3 Input

Click on Input button icon, highlighted in the nex figure, to access the input window.

Fig. 16: Input window



The Input window allows the monitoring of:

- ASI/SSI and GbE input statistics for ATSC modulator;
- SDI input statistics for ITU 470 modulator.

Table 8. Input window

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
ASI/SSI	Word rate	ASI input word rate. 10 bits word rate of ASI input (Ref. to CEI EN 50083-9).	Approximately 27 Mword/s	A
ASI/SSI	Bitrate [bit/s]	ASI input bitrate.		A
ASI/SSI	Filtered bitrate [bit/s]	Bit-rate actually used by the modulator.	• Zero when the input has not been selected • Equal to the total bitrate, when Delete Null Packets disabled • Less than total bitrate, when Delete Null Packets enabled	A
ASI/SSI	Format	Format of received TS Packets (Ref. to CEI EN 50083-9).	• 188 Bytes • 204 Bytes	A
ASI/SSI	CD	ASI Carrier detection flag.	• Green: Detected • Grey: Not detected	A
ASI/SSI	Lock	ASI lock status. The input Transport Stream is unlocked when more than two consecutive Sync Byte are missed then five consecutive Sync Bytes must occur to regain the lock (Ref. to ETSI ETR-291)	• Green: Locked • Grey: Not locked	A
ASI/SSI	Overflow	ASI input overflow indicator. This alarm condition occurs when the input bit-rate exceeds the capability of the modulation (Ref. to ATSC A/53).	• Red: Alarm • Grey: No alarms	A

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
ASI/SSI	Word Errors	Total amount of ASI wrong words received.		A
RTP	Protocol	**Not implemented -** Ethernet input packets protocol.	• UDP • RTP	A
RTP	Bitrate [bit/s]	**Not implemented -** Bitrate of TS from Ethernet input.		A
RTP	Filtered bitrate [bit/s]	**Not implemented -** Bitrate actually used by the modulator.	• Zero when the input is not selected • Equal to the total bitrate, when Delete Null Packets disabled • Less than total bitrate, when Delete Null Packets enabled	A
RTP	Format	**Not implemented -** Format of received TS Packets (Ref. to CEI EN 50083-9).	• 188 Bytes • 204 Bytes	A
RTP	Lock	**Not implemented -** TS lock status. The input Transport Stream is unlocked when more than two consecutive Sync Byte are missed then five consecutive Sync Bytes must occur to regain the lock (Ref. to ETSI ETR-291)	• Green: Locked • Grey: Not locked	A
RTP	Sequence error	**Not implemented -** Ethernet input Sequence error alarm status. This alarm condition occurs when an error in the sequence of input packets at IP level occurs.	• Red: Alarm • Grey: No alarms	A
RTP	Overflow	**Not implemented -** Input GbE overflow alarm status. This alarm condition occurs when the input bitrate exceeds the capability of the modulation (Ref. to ATSC A/53).	• Red: Alarm on • Grey: Alarm off	A

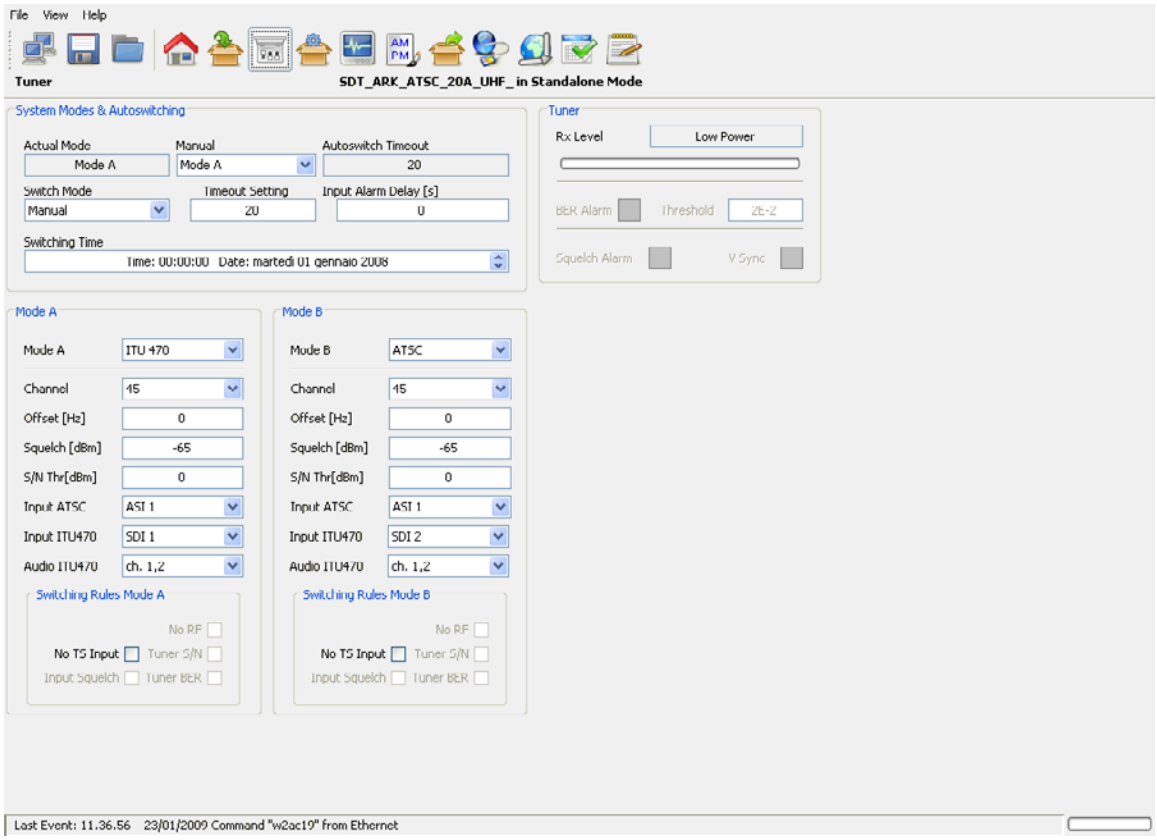
Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
RTP	GBE packets	**Not implemented -** Total amount of good Ethernet frames received.		A
RTP	Speed	**Not implemented -** Ethernet connection speed. No duplex information is provided.	• 10 Mbit//s • 100 Mbit//s • 1 Gbit//s	A
RTP	GBE errors	**Not implemented -** Total amount of bad Ethernet frames received.		A
SDI	CD	SDI Carrier detection flag.	• Green: Detected • Grey: Not detected	I
SDI	Lock	SDI lock status.	• Green: Locked • Grey: Not locked	I

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
SDI	Standard	Standard of received SDI.	• 0: NTSC 4:2:2 component video; • 1: invalid; • 2: NTSC 4:2:2 16x9 component video; • 3: NTSC 4:4:4 13,5 MHz component video; • 4: PAL 4:2:2 component video; • 5: invalid; • 6: PAL 4:2:2 16x9 component video; • 7: PAL 4:4:4 13,5 MHz component video"	I

3.7.4 Tuner

Click on Tuner button icon, highlighted in the nex figure, to access the tuner window.

Fig. 17: Tuner window



This window provides commands that allow the selection of working modes, the management and selection of inputs, and the monitoring of input RF signal level.
The **Tuner** window is divided in the following boxes:

- **System Mode & Autoswitching;**
- **Mode A;**
- **Switching Rules Mode A;**
- **Mode B;**
- **Switching Rules Mode B;**
- **Tuner;**

3.7.4.1 Modes management

These commands allow the setting of working modes and switch selection rules.
The following table shows the commands and indicators available for modes management.

Table 9. Tuner window: modes management

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
System Mode & Autoswitching	Actual mode	Current operating mode.	• Mode A • Mode B	I/A
System Mode & Autoswitching	Manual	Mode selector used when Manual Switch mode is selected.	• Mode A • Mode B	I/A
System Mode & Autoswitching	Switch mode	Selector of the switch mode rules. Switching modes rules Refer to paragraph for a detailed description of the switching rules and conditions.	• Manual • Auto • Opto • Time	A
System Mode & Autoswitching	Autoswitch Timeout	When Auto Switch Mode is enabled shows the time to wait for switching. If the used input regains lock before the countdown reaches 0 the switch is blocked and device keeps the same mode.	• Countdown from 255 to 0 s	A
System Mode & Autoswitching	Timeout setting	Setting of the time to wait for switching. Note: It is highly recommended to set a timeout value different from zero as to allow the input signal locking.	• Min: 0 s • Max: 255 s	A
System Mode & Autoswitching	Input Alarm Delay [s]	Alarms **Not implemented** - Time to wait for No Input alarm rising expressed in seconds (refer to paragraph). Note: It is highly recommended to set an Input Alarm Delay value different from zero as to allow the input signal locking.	• Min: 1 s • Max: 25.5 s	A

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
System Mode & Autoswitching	Switching Time	Time and date setting for modes switching when Time Switch mode is enabled.		I/A
Mode A / Mode B	Mode A / B	Selector of working mode. Two different working modes are provided: • ITU 470 modulator • ATSC modulator	• ITU 470 • ATSC	I/A
Mode A / Mode B	Channel	Selector of the UHF input channel used as RF input.	• Min: 14 • Max: 77	A
Mode A / Mode B	Offset [Hz]	Frequency offset from the channel center frequency of the RF input. 1 Hz step variation.	• Min: -4 MHz • Max: 4 MHz	A
Mode A / Mode B	Squelch [dBm]	Squelch alarm threshold expressed in dBm. Input is squelched when the RF level is under this threshold.	• Min: -70 • Max: -20	A
Mode A / Mode B	S/N Thr [dBm]	**Not implemented** - Signal / Noise alarm threshold	• Min: -10 dBm • Max: –50 dBm	A

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Mode A / Mode B	Input ATSC	Selector of ATSC TS input source.	• ASI 0 • ASI 1 • ASI 2 • ASI 3 • SSI 1 • SSI 2 • SSI 3 • SSI 4 • GbE Ch1 • GbE Ch2	A
Mode A / Mode B	Input ITU470	Selector of ITU470 SDI input.	• SDI 1 • SDI 2	I

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Mode A / Mode B	Audio ITU470	Selector of ITU470 SDI audio channels.	• CH 1,2 • CH 3,4	I
Switching Rules Mode A / B	No RF, No TS Input, Tuner S/N, Input Squelch, Tuner BER, No MIP	Switching modes rules Autoswitch alarms mask. Refer to paragraph for a detailed description of the switching rules and conditions. **Implemented only "No TS Input" rule.**	• Checked: Use rule • Not checked: Do not use rule	A

3.7.5 Modes switching rules

Four switching rules are provided in order to cover different requirements:

- **Manual:** switch between mode A and mode B by selecting one mode using the Manual Selector. The selected mode is always enabled until the user selects the other one.

- **Auto:** switch between mode A and mode B using the rules shown in the following table. One mode is enabled until at least one of the alarms associated to the enabled automatic switch rules is raised, then a countdown starts and, if the parameter doesn't regain a normal status during the timeout, the device switches to the other mode.

Table 10. Auto-switch rules

Mode	Autoswitch rules
ITU 470 modulator	**Not implemented**
ATSC modulator	**No RF:** video carrier not locked by the DVB-T receiver. It is associated to the *No RF Input* alarm. **(Not implemented)** **Input Squelch:** Received signal level under the squelch threshold. It is associated to the *RF Input Squelch* alarm. **(Not implemented)** **Tuner BER:** Bit Error Rate after demodulator over the BER threshold. It is associated to the *RF Digital BER Alarm* alarm. **(Not implemented)** **Tuner S/N:** Signal to Noise ratio under the S/N threshold. It is associated to the *S/N Level* alarm. **(Not implemented)** **No TS Input:** selected TS input not locked. TS input Alarm should be enabled in the RF Off alarms mask. It is associated to the *No Input* alarm.

- **Opto:** switch between mode A and mode B by selecting one mode using the Opto 2 input with the following rules:
  - **1 – Open:** Mode A.
  - **0 – Closed:** Mode B.
- **Time:** switch from mode A to mode B at a specified Date and Time (Switching Time). Switching will happen only one time from A to B. In order to set the Switching Time, select hours, minutes, seconds, days, months and years, and click on up/down arrows to increase/decrease them.

3.7.6 Tuner management

These commands allow the setting of BER alarm threshold and monitoring of RF input status.
The following table shows all the commands and indicators available.

Table 11. Tuner window: Tuner management

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Turner Main	Rx level	RF input rx level monitoring.		A
Turner Main	BER Threshold	**Not implemented -** Demodulator Bit Error Rate alarm threshold.	• Min: 0.000001 • Max: 0.06	A
Turner Main	BER Alarm	**Not implemented -** BER alarm status.	• Red: Alarm • Grey: No alarms	A
Turner Main	Squelch alarm	**Not implemented -** Squelch alarm status.	• Red: Alarm • Grey: No alarms	A
Turner Main	V Sync	**Not implemented -** Analog signal lock status. The PAL detector has been implemented through the detection of the video carrier synchronization at 15,625 Hz..	• Green: Good Analog • Grey: Bad Analog	I

3.7.7 Modulation

Click on Modulation button icon, highlighted in the nex figure, to access the modulation window.

Fig. 18: Modulator window

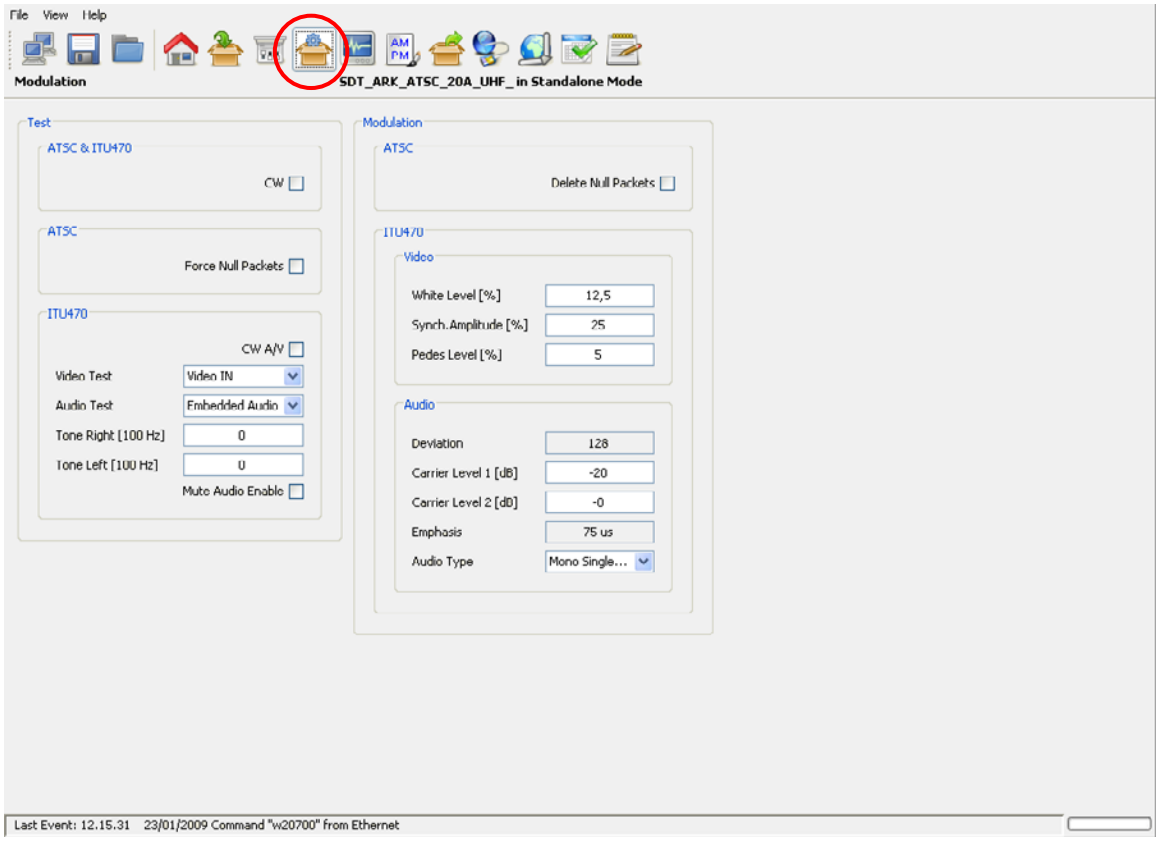


Table 12. Modulator window

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Test: ATSC & ITU	CW	CW check box.	• Not checked: CW disabled • Checked: CW enabled	I/A
Test: ATSC	Force Null Packets	Force Null packets function enable.	• Not checked: Force Null packets disabled • Checked: Force Null packets enabled	A
Test: ITU 470	CW A/V	Enable for CW on video and audio carriers.	• Not checked: CW A/V disabled • Checked: CW A/V enabled	I
Test: ITU 470	Video Test	Video test color bars enable.	• Bars • No video test	I
Test: ITU 470	Audio Test	Audio test tones enable.	• Test Tone • No audio test	I

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Test: ITU 470	Tone Right [100 KHz]	Right tone frequency setting. **Not used for NTSC**	• MIN: 0 • MAX: 127	I
Test: ITU 470	Tone Left [100 KHz]	Left tone frequency setting.	• MIN: 0 • MAX: 127	I
Test: ITU 470	Mute Audio Enable	Audio mute enable	• Not checked: audio mute disabled • Checked: audio mute enabled	I
Modulation ATSC	Delete null packets	Delete null packets function enable.	• Not checked: Delete null packets disabled • Checked: Delete null packets enabled	A

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Modulation ITU470 video	White level [%]	Video white level setting. The level value is in percentage upon the synch level. The synch level is taken as 100% reference.	• MIN: 10 • MAX: 22 • Step: 0,05	I
Modulation ITU470 video	Synch Amplitude [%]	Video synch amplitude setting. The level value is in percentage upon the synch level. The synch level is taken as 100% reference.	• MIN: 22 • MAX: 27,5 • Step: 0,05	I
Modulation ITU470 video	Pedes level [%]	Video pedes level setting. The level value is in percentage upon the synch level. The synch level is taken as 100% reference.	• MIN: 0 • MAX: 7 • Step: 0,05	I
Modulation ITU470 audio	Deviation	Audio deviation monitor.	•	I

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Modulation ITU470 audio	Carrier Level 1 [dB]	Audio 2 carrier level setting.	• MIN: -7 • MAX: -22 • Step: 0,1	I
Modulation ITU470 audio	Carrier Level 2 [dB]	Audio 1 carrier level setting. **Not used for NTSC**	• MIN: -7 • MAX: -22 • Step: 0,1	I
Modulation ITU470 audio	Emphasis	Audio emphasis value monitor.	• 50 us • 75 us • no emphasis	I

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Modulation ITU470 audio	Audio Type	Audio type selector. **Only the mono single carrier audio type is used for NTSC.**	• mono dual carrier • dual sound • stereo • mono single carrier"	I

3.8 Filter

The **Adaptive Filter** provides the ARK1 ATSC with an effective **adaptive linear compensation**.
The adaptive filter works only in ATSC operative mode.
The developed system is responsible for pre-emptively compensating an ATSC signal in order to make unimportant the contribution of the system transmission section. The signal passes through the transmission section and re-enters the system as to determine the distortion and the compensating adaptive filter.
The system is composed of two main blocks: a Power Calculation block and a 128-tap Complex FIR. The modulated signal, with IQ format and sampled at fc frequency, enters both blocks:

- **Power Calculation** block is responsible for estimating the mean power level that will be restored at both transmitting and receiving sides;

- **128-tap Complex FIR** is responsible for linearly pre-correcting the modulated signal. Filter coefficients are obtained by estimating the channel between the signal before the transmission section and the signal reentering the system, after the channel distortion and the A/D conversion.

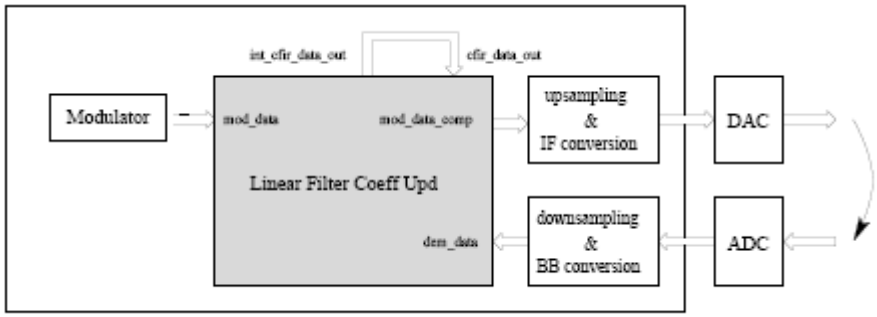
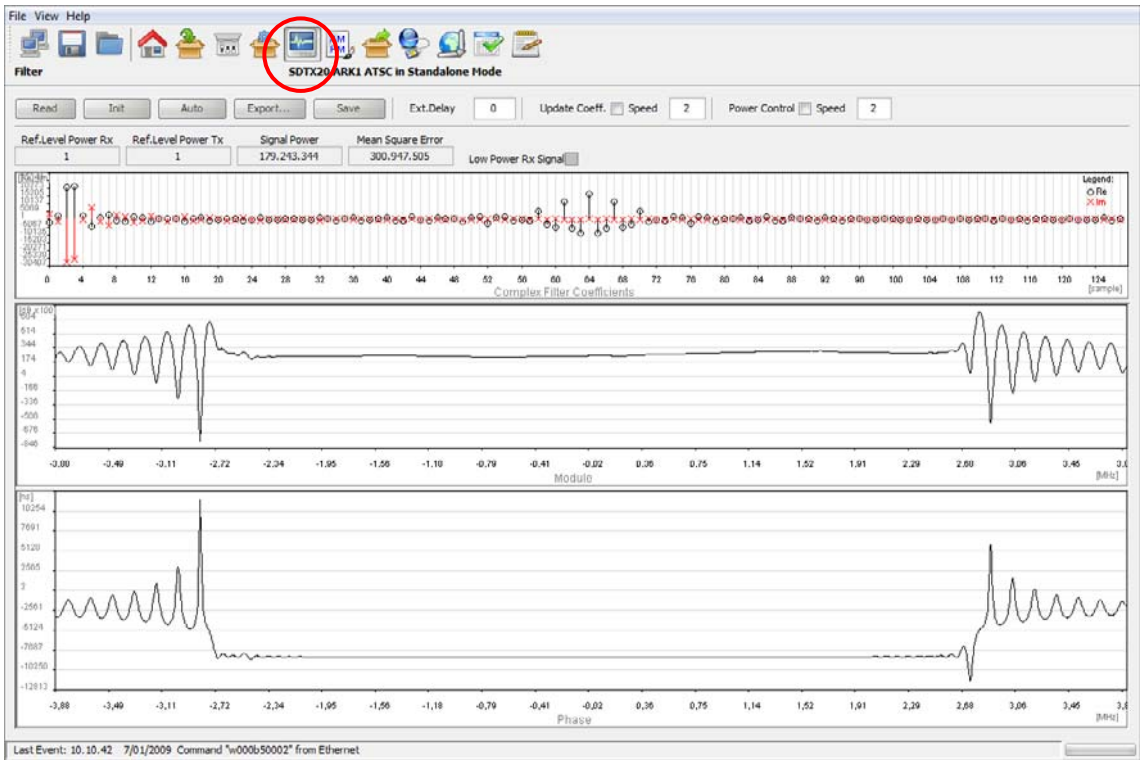


Fig. 19: Adaptive Filter

Click on Filter button icon, highlighted in the nex figure, to access the filter window.

Fig. 20: Filter window



This window provides commands and monitors for adaptive filter management and is organized in four subwindows:

- Management panel
- Complex filter coefficients graph
- Module graph
- Phase graph

3.8.1 Management panel

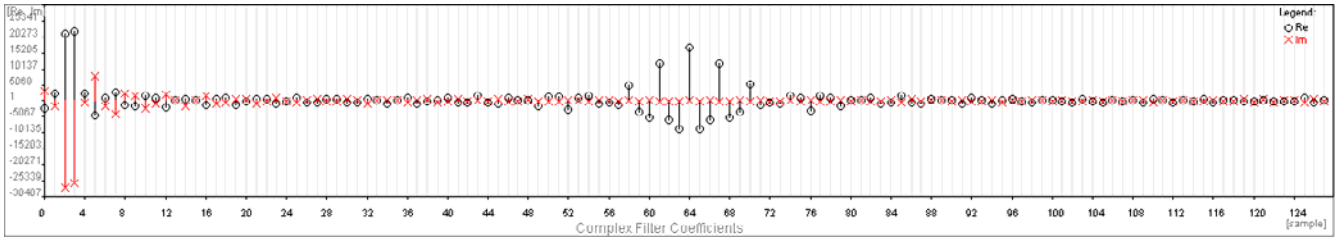
Table 13. Filter window: management panel

Parameter / Control	Description	Admitted Ranges / Values	I/A
Read	To read and loads the filter coefficients from the respective FPGA registers..		I/A
Init	To load flat curves coefficients.		I/A
Auto	To move the filter at the center of the band		I/A
Export	To export the file with the actual adaptive filter coefficients.		I/A
Save	To save the actual adaptive filter coefficients		I/A
Ext Delay	To monitor the external Delay value (indicated in unit x sampling time). The external delay is the delay between the compensated signal at the filter output and the correlated feedback signal at filter input.		I/A
Update Coeff	To enable the filter coefficients real time update.	Checked: enabled Not checked: disabled	I/A
Update Coeff / Speed	To set the speed of the filter coefficients update.	Min: 0 Max: 7	I/A
Power Control	To enable the power control coefficient update. The power control block multiples the input signal for a calculated coefficient to guarantee the same average power level in reception and in transmission of the filter..	Checked: enabled Not checked: disabled	I/A
Power Control / Speed	To set the speed of the power control coefficient update.	Min: 0 Max: 7	I/A
Ref Level Power Rx	To monitor the power control coefficient value applied for the reception.		I/A

Ref Level Power Tx	To monitor the power control coefficient value applied for the transmission.		I/A
Signal Power	To monitor the power value of the modulated signal at the input.		I/A
Mean Square Error	To monitor the Mean Square Error value of the compensate signal. It gives a quality indication of the preventive compensation.		I/A
Low Power Rx Signal	Indicates that the signal that re-enters the system has a low output power. When this flag is on, the automatic update of the filter coefficients is stopped.	Red: bad RF rx signal Grey: good RF rx signal	I/A

3.8.2 Complex filter coefficients graph

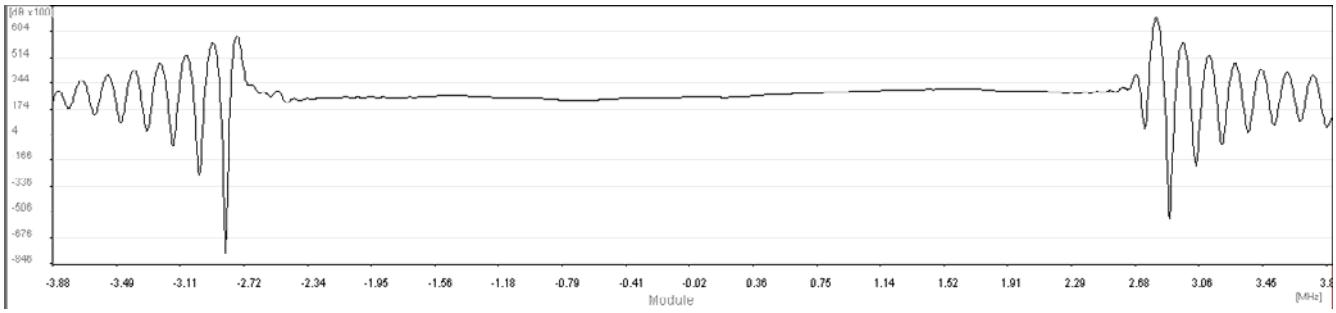
Fig. 21: Filter window: complex filter coefficients graph



This graph shows the actual coefficients values applied. The circles indicate the coefficients real values, the red crosses indicate the imaginary ones.

3.8.3 Module graph

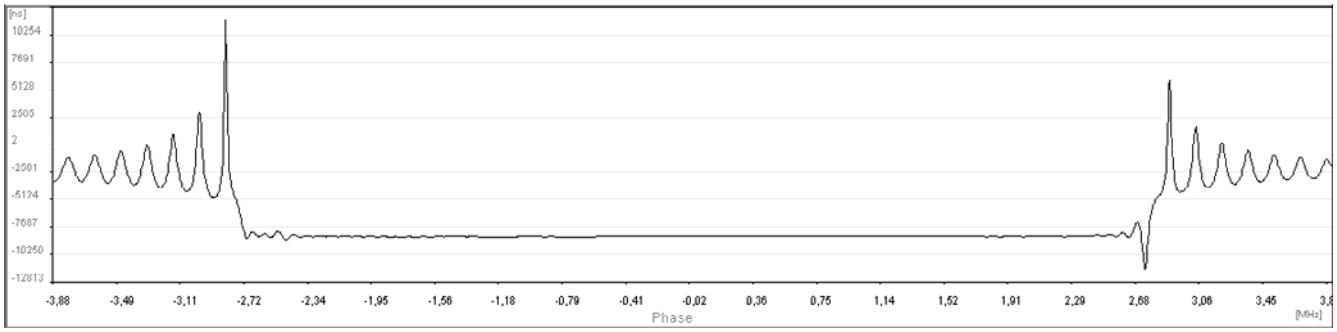
Fig. 22: Filter window: module graph



This graph shows the actual module applied according to the coefficients calculated.

3.8.4 Phase graph

Fig. 23: Filter window: phase graph

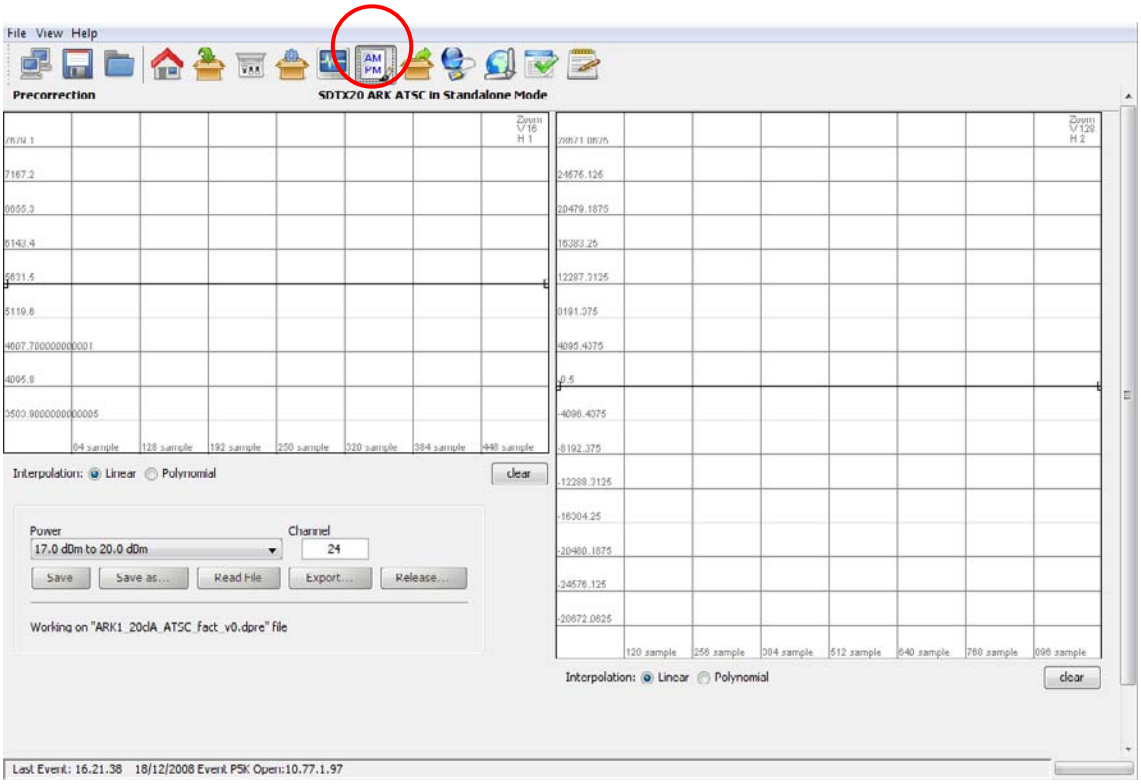


This graph shows the actual phase applied according to the coefficients calculated.

3.8.5 AM/PM pre-correction tool

The ARK1 ATSC system provides a pre-correction tool for AM/PM output signal pre-correction.
Remember to click on the *Save as* button the first time you change the factory default curves in order to do not overwrite them.
Before closing the connection to port 5000, save curves changes otherwise they will be lost.
Note: the operation of uploading and downloading pre-correction curves moves a large amount of data from and to the device. The use of these tools over low badwidth, not stable or high distances netwoks could cause frequently time-out disconnections and it is **not recommended**.
Click on AM/PM button icon, highlighted in the nex figure, to access the pre-correction window.

Table 14. AM/PM pre-correction window



Two main actions are possible in this section:

- AM/AM and AM/PM curve drawing: used to change the AM/PM pre-correction coefficient.

- AM/PM pre-correction files management: used to open or save AM/PM pre-correction setting file.

AM/AM and AM/PM curves are specific for each power range of each output channel.
The two curves are used to calculate the AM/PM pre-correction coefficients. The curves are drawn by the interpolation of 1024 points referring to the points inserted and using a linear or polynomial interpolation algorithm.
Knob points can be added with a left-click of the mouse on the grid and deleted with a right-click, drag and move a point to change the curve.
Each coefficient variation, due to curves change, is saved in the FPGA “runtime” memory registers and dynamically changes the device’s output.

The tool is prevented to send an “overflowing” amount of data to the device: curve changes will be applied only when the mouse button is released.
In the module grid, the red curve is used to monitor the current module curve calculating and saving. The last saved coefficients are locally downloaded from the FPGA runtime memory registers in order to redraw the curve.

During saving actions are created two nonlinear pre-correction files:

- *.dpre files: files containing digital coefficients values.
- *.apre files: files containing analog coefficients values.

The following buttons allow the management of linear pre-correction files and the management of the connection to port 5000:

- **Save:** used to save in the device memory the current curves setting. The previously saved file will be overwritten except in the event that no files have been saved before; in this case a dedicated window appears in order to let the user name the new file.
- **Save as:** used to save in the device memory the current curves setting. The previously saved file will be overwritten with a new name. In the event that no files have been saved before, a new file will be created.
- **Read file:** used to reload the last saved file.
- **Export:** used to download pre-correction files on the user PC. A browser window allows the selection of the saving path.
- **Release:** releases the connection in order to allow others remote machines to connect to port 5000 (refer to Connection to port 5000 paragraph).

Note: only the drawn curves have the coefficients written in the FPGA registers and so savable. A curve not yet drawn takes as default the same shape of the last curve drawn and visualized, to make it drawn click on the graph.
Files are separately managed in analog and in digital AGC mode.

3.8.6 Connection to port 5000

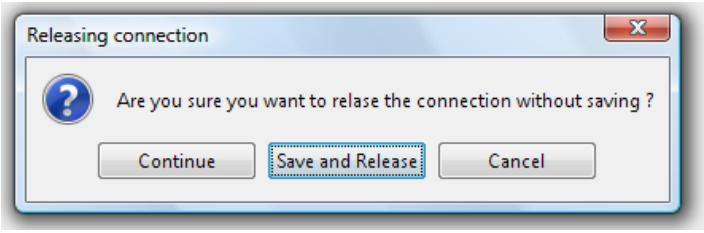
The connection to port 5000 is performed every time the pre-correction tool is opened through AM/PM button, from Java interface. The pre-correction tool opens and keeps busy the connection to port 5000 till the connection releasing
The connection to this port precludes the possibility of:

- programming the device;
- allowing more than one user, the very same one that is keeping busy the connection, to open the pre-correction tools.

The Release button comes through these limits. It closes the connection to port 5000, close the AM/PM window and opens the General window. Once clicked the Release buttons and before quitting the pre-correction tool, three options are provided:

- Continue: continue without saving;
- Save and Release: save, continue and release the connection;
- Cancel: cancel the request of releasing the connection.

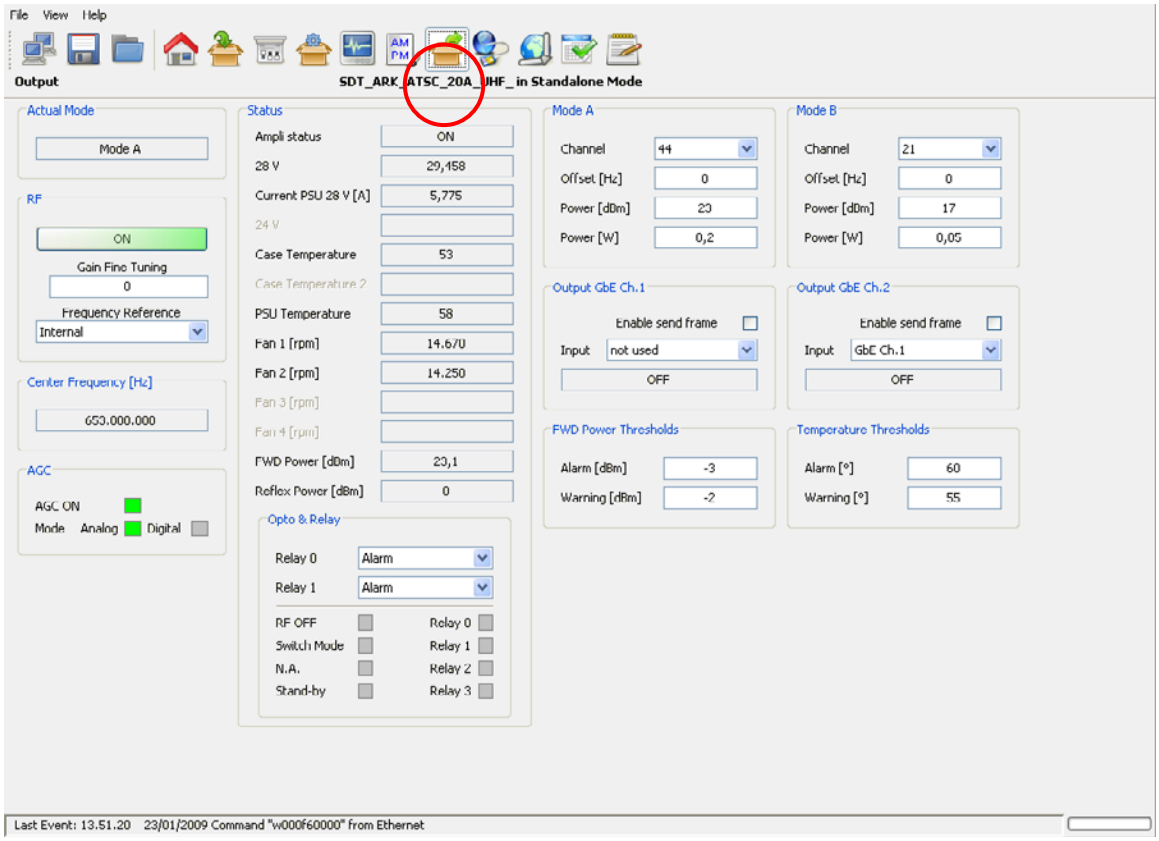
Fig. 24: Releasing connection



3.8.7 Output

Click on Output button icon, highlighted in the nex figure, to access the output window.

Fig. 25: Output window



Use the Output window to change and monitor both Ethernet and RF output settings, and all accessible hardware indicators.

Output window

Table 15.

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
RF	ON / OFF	Output RF signal enabling. The possible output RF signal status are the following: • ON; • RF OFF: automatic switch off of the output signal (refer to Ampli status); • OFF: manual switch off of the output signal.	• Green: ON • Green: RF OFF • Red: OFF	I/A
RF	Frequency reference	Frequency reference source selector.	• External • Internal • GPS	I/A
RF	Internal Freq. Ref. Tune	Internal frequency reference fine tuning setting. Allows the fine tuning of VCO, internal clock oscillator, with 60 Hz steps.	• Min: 0 • Max: 255	I/A

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
AGC	AGC ON	AGC status.	• Green: ON • Grey: OFF	I/A
AGC	Mode	Current AGC mode indicator.	• Analog/Digital: • Green: ON • Grey: OFF	I/A
Frequency Out [Hz]	Frequency Out [Hz]	Output center frequency expressed in Hz.		I/A

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Status	Ampli status	Current amplifier status indicator.	• On • Off • Restart • Stand-by off • GPS Off • Init • Alarm off • Rf off • Opto off • Change mode	I/A

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Status	28V / 42V	PSU voltage indicator (values are expressed in V). It depends on the hardware type of the device: • 28V for SDTx_ARK1 20W and 50W; • 42V for SDTx_ARK1 200W.		I/A
Status	Current PSU 28V / 42V [A]	PSU current indicator (values are expressed in A).		I/A
Status	24V	PSU 24V indicator (values are expressed in V). Only in SDTX 200 version.		I/A
Status	Case Temperature	Case temperature indicator (values are expressed in °C).		I/A
Status	Case Temperature 2	2nd Case temperature indicator (values are expressed in °C). Only in SDTX 200 version.		I/A
Status	PSU Temperature	PSU temperature indicator (values are expressed in °C).		I/A
Status	Fan 1	Fan 1 speed indicator (values are expressed in rpm).		I/A
Status	Fan 2	Fan 2 speed indicator (values are expressed in rpm).		I/A
Status	Fan 3	Fan 3 speed indicator (values are expressed in rpm). Only in SDTX 200 version.		I/A
Status	Fan 4	Fan 4 speed indicator (values are expressed in rpm). Only in SDTX 200 version.		I/A
Status	FWD Power [dBm]	Output forward power indicator (values are expressed in dBm).		I/A

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Status	Reflex Power [dBm]	Output reflex power indicator (values are expressed in dBm).		I/A
Opto & Relay	Relay 0	Selector of Relay 0 using mode.	• Alarm: indicator of an alarm condition • Mode: indicator of operating mode • RF Status: indicator output RF signal status (on/off)	I/A
Opto & Relay	Relay 1	Selector of Relay 1 using mode.	• Alarm: indicator of an alarm condition • Mode: indicator of operating mode	I/A
Opto & Relay	Relay 0…3	Relays status indicators.	• Green: Alarm on/Mode A/RF Off • Grey: Alarm off/Mode B/RF On	I/A

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Opto&Relay	Opto 0…3	Opto status indicators. Optos are normally opened: • Opto 0: RF Off, manual switching off of output RF; • Opto 1: Mode A/B switch; • Opto 2: Retry of amplifier alarms (only in SDTX 200 version); • Opto 3: Stand-by enabling; it puts the device on stand-by.	• Green: Closed (0) • Grey: Opened (1)	I/A
Mode A / Mode B	Channel	Output channel.	• Min: 14 • Max: 77	I/A
Mode A / Mode B	Power [dBm]	Output power (expressed in dBm).	• SDTx 20/50 o Analog min: 23 dBm	I/A

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Mode A / Mode B	Power [W]	Output power (expressed in W).		I/A
Mode A / Mode B	Offset [Hz]	Output frequency offset (expressed in Hz).	• Min: -4 MHz • Max: 4 MHz	I/A
FWD Power Thresholds	Warning [dB]	Forward power warning threshold expressed in dBm.	• Min: -16 dBm	I/A

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
FWD Power Thresholds	Alarm [dB]	Forward power alarm threshold expressed in dBm.		I/A
Temperature Thresholds	Warning	Case temperature warning threshold expressed in °C.	• Min: 0 °C	I/A
Temperature Thresholds	Alarm	Case temperature alarm threshold expressed in °C.	• Max: 100 °C	I/A
Output GbE Ch.1 / Ch. 2	Enable send frame	Enable for transmission on GbE channel 1/2. **Not implemented**	• Checked: Enabled • Not checked: Disabled	A

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Output GbE Ch.1 / Ch. 2	Input	Source selector for transmission on GbE channel 1/2. **Not implemented**	• ASI 0 • ASI 1 • ASI 2 • ASI 3 • SSI 1 • SSI 2 • SSI 3 • SSI 4 • GbE Ch.1 • GbE Ch. 2	A

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Output GbE Ch.1 / Ch. 2	Status	Status indicator of transmission on GbE channel 1/2. **Not implemented**	• Resolving IP Addr. • IP not found • No entry • Transmitting data • Transmitting data multicast • ON • OFF	A

3.8.8 Network

Click on Network button icon, highlighted in the nex figure, to access the Network management window.

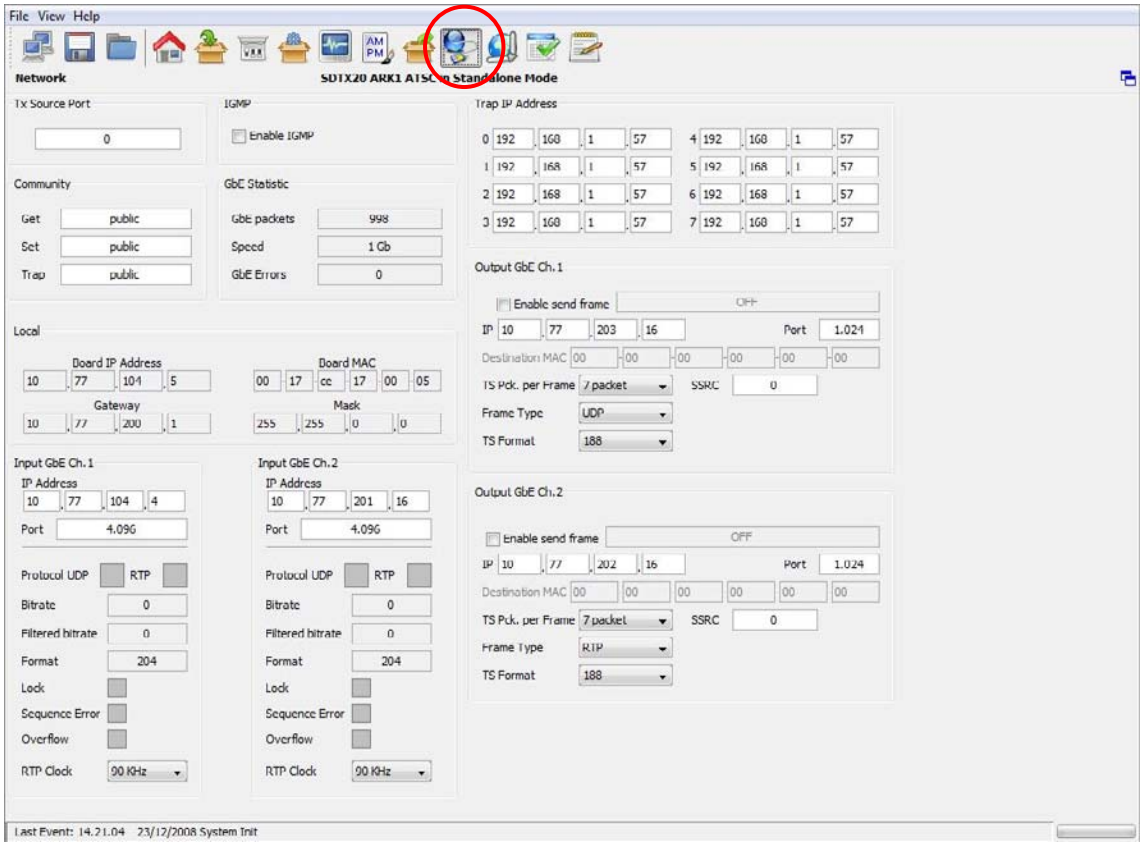


Fig. 26: Network window

This window allows the Network parameters management and monitoring.

Table 16. Network window

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Local	Board IP address	Board IP address.		A
Local	Board MAC address	Board MAC address.		A
Local	Gateway	Gateway address.		A
Local	Mask	Net Mask.		A
Local	Tx Source Port	Board receiving port.	• Min: 0 • Max: 65,535	A
Trap IP address	0…7	Trap 0…7 destination IP address.		A
IGMP	Enable IGMP	IGMP enabling.	• Checked: Enabled • Not checked: Disabled	A
Input GbE Ch.1/ Ch.2	IP Address	Channel 1/2 receiving IP address. **Not implemented.**		A

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Input GbE Ch.1/ Ch.2	Port	Channel 1/2 receiving port. **Not implemented.**	• Min: 0 • Max: 65,535	A

Input GbE Ch.1/ Ch.2	Protocol	Ethernet input packets protocol. **Not implemented.**	• UDP/RTP:
			  ○ Green: Detected
			  ○ Grey: Not detected
				A

Input GbE Ch.1/ Ch.2	Bitrate [bit/s]	Bitrate of TS from Ethernet input. **Not implemented.**		A
Input GbE Ch.1/ Ch.2	Filtered bitrate [bit/s]	Bitrate actually used by the modulator. **Not implemented.**	• Zero when the input is not selected • Equal to the total bitrate, when Delete Null Packets disabled • Less than total bitrate, when Delete Null Packets enabled	A

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Input GbE Ch.1/ Ch.2	Format	Received transmission format. **Not implemented.**	• 188 Bytes • 240 Bytes	A
Input GbE Ch.1/ Ch.2	Lock	Ethernet input lock status indicator. The input Transport Stream is locked when no more than two consecutive Sync Byte are missed. **Not implemented.**	• Green: Lock • Grey: Not locked	A
Input GbE Ch.1/ Ch.2	Sequence error	Ethernet input Sequence error alarm status. This alarm condition occurs when an error in the sequence of input packets at IP level occurs. **Not implemented.**	• Red: Error • Grey: No errors	A
Input GbE Ch.1/ Ch.2	Overflow	Input GbE overflow alarm status. This alarm condition occurs when the input bitrate exceeds the capability of the modulation (Ref. to ATSC A/53). **Not implemented.**	• Red: Alarm on • Grey: Alarm off	A
Input GbE Ch.1/ Ch.2	RTP Clock	RTP packets source clock reference. **Not implemented.**	• 90 kHz • 27 MHz	A
Gbe statistic	GBE Packets	Total amount of good frames received.		A

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Gbe statistic	Speed	Ethernet speed.	• 10 Mbit//s • 100 Mbit//s • 1 Gbit/s	A
Gbe statistic	GBE Errors	Total amount of bad frames received.		A
Community	Get	Read community setting.		A
Community	Set	Set community setting.		A
Community	Trap	Trap community setting.		A
Output GbE Ch.1 / Ch.2	Enable send frame	Channel 1/2 Ethernet transmission enabling. **Not implemented.**	• Checked: Enabled • Not checked: Disabled	A
Output GbE Ch.1 / Ch.2	IP	Channel 1/2 Ethernet transmission IP address. **Not implemented.**		A
Output GbE Ch.1 / Ch.2	Port	Port used for RTP/UDP data transmission. **Not implemented.**	• Min: 0 • Max: 65,535	A

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Output GbE Ch.1 / Ch.2	Status	Ethernet transmission on channel 1/2 status indicator. **Not implemented.**	• Resolving IP Addr. • IP not found • No entry • Transmitting data • Transmitting data multicast • ON • OFF	A
Output GbE Ch.1 / Ch.2	Destination MAC	Destination MAC address. **Not implemented.**		A
Output GbE Ch.1 / Ch.2	SSRC	SSRC identifier of the RTP transmission on channel ½. **Not implemented.**		A
Output GbE Ch.1 / Ch.2	TS Pck per Frame	Number of packets per frame. **Not implemented.**	• Min: 1 • Max: 7	A

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Output GbE Ch.1 / Ch.2	Frame type	Transmission protocol selector. **Not implemented.**	• RTP • UDP	A
Output GbE Ch.1 / Ch.2	TS Format	Transmission format. **Not implemented.**	• 188 Bytes • 240 Bytes	A

3.8.9 GPS

Click on GPS button icon, highlighted in the nex figure, to access the GPS received statistics window.

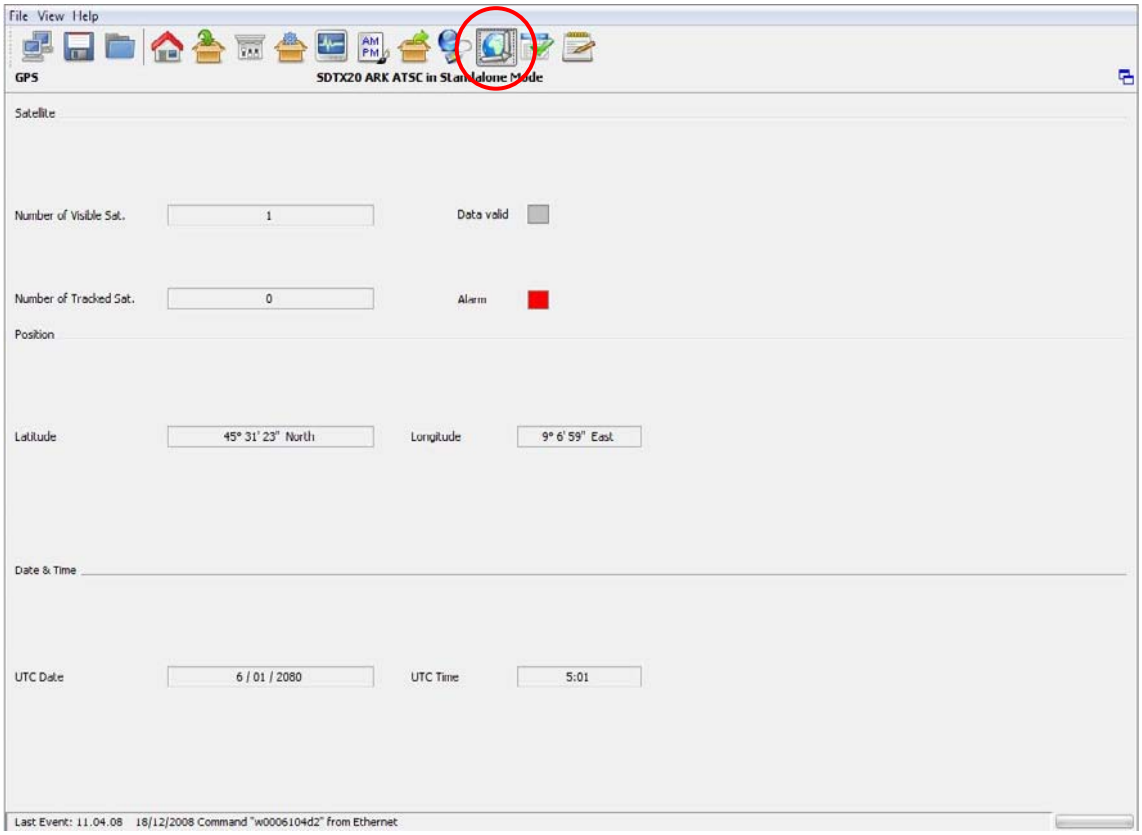


Fig. 27: GPS window

GPS window

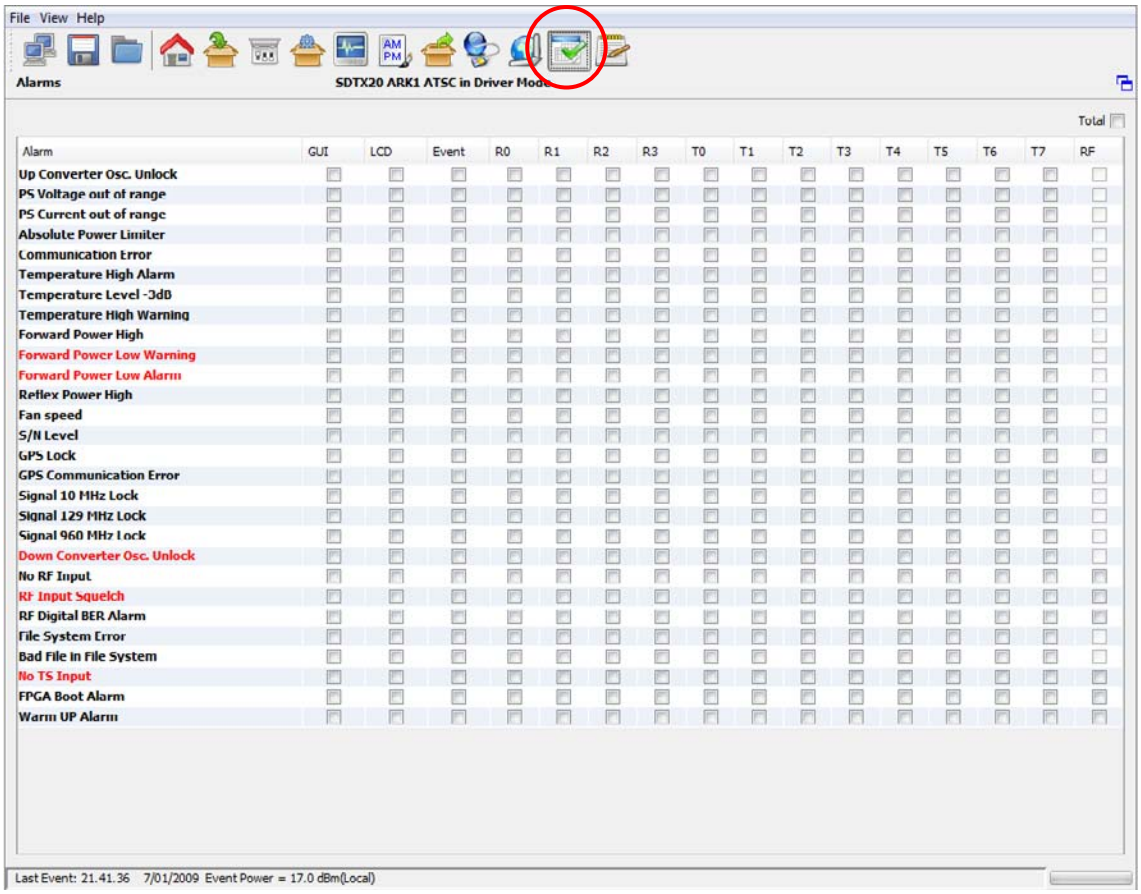
Table 17

Box	Parameter / Control	Description	Admitted Ranges / Values	I/A
Satellite	#Number of Visible sat	Number of visible GPS satellites indicator.		I/A
Satellite	#Number of Tracked sat	Number of tracked GPS satellites indicator.		I/A
Satellite	Alarm	GPS alarm status indicator. This alarm is a logic OR of the GPS alarms (refer to Alarms paragraph).	• Red: Alarm on • Grey: Alarm off	I/A
Satellite	Data valid	Valid satellite signal receiving status indicator.	• Green: Valid • Grey: Not valid	I/A
Position	Latitude (°)	Site latitude expressed in degrees.		I/A
Position	Longitude (°)	Site longitude expressed in degrees.		I/A
Date & Time	UTC Time	Current time indicator. Each GPS satellite has an atomic clock and continually transmits messages containing the current time and date at the start of the message sended by the GPS itself.		I/A
Date & Time	UTC Date	Current date indicator. Each GPS satellite has an atomic clock and continually transmits messages containing the current time and date at the start of the message send by the GPS itself.		I/A

3.8.10 Alarms

Click on Alarms button icon, highlighted in the nex figure, to access the alarms management window.

Fig. 28: Alarms window



The Alarm window allows the setting of alarm masks and the monitoring of alarms status. Use alarm masks to select how and which alarm have to be notified.
Masks are organized in columns. The sixteen columns represent sixteen destinations of each alarm notification:

- **GUI:** the selected alarms status is notified on the Java alarm page icon.
- **LCD:** the selected alarms status is notified on LCD display lighting the alarm button and listing the alarms in the Alarms menu (refer to LCD alarms paragraph).
- **Event:** the selected alarms status generate an alarm event that will be logged in the event memory (refer to Events paragraph).
- **R0…R3:** the selected alarms switch on the corresponding relay.
- **T0…T7:** the selected alarms generate the corresponding trap messages (refer to Network paragraph to set destination IP addresses).
- **RF:** the selected alarms switch off the output RF signal. The RF mask is almost entirely fixed in order to avoid board damages or malfunctioning (refer to RF Off Alarms Mask paragraph).

In the Alarms window, when an alarm condition occurs, the relative alarm is red highlighted.
The Total check box enables all alarms-to-masks associations.

Table 18. Alarms window

Alarm	Description	I/A (1)	Troubleshooting	RF mask
Up converter Osc. Unlock	PLL of the Up-converter board not locked to 129 MHz clock.	I/A	• Hardware fault	1
PS Voltage out range	Voltage out of range. The ranges are: • 20V up to 30V for SDTx_ARK ATSC 20W and 50W; • 38V up to 44V for SDTx_ARK ATSC 200W.	I/A	• Hardware fault	1
PS Current out of range	The current exceeds the 22 Ampere upper limit of SDTx_ARK ATSC 20W and 50W and the 17 Ampere upper limit of SDTx_ARK ATSC 200W.	I/A	• Hardware fault	1
Absolute Power Limiter	The output power exceeds the maximum endurable limit.	I/A	• Hardware fault	1
Communication error	Communication errors between ARK ATSC main board and Up-converter board.	I/A	• Hardware fault	1
Temperature High Alarm	Case temperature over 70°C, the maximum endurable limit.	I/A	• Check alarm and warning thresholds	1
Temperature Level-3dB	Temperature level goes over the alarm threshold. The output power is consequently lowered by 3 dBm (always within the admitted power range).	I/A	• Lower the output power to decrease internal temperature	0

Temperature High Warning	Temperature level goes over the warning threshold.	I/A		0
Forward Power High	FWD power goes over the maximum endurable limit.	I/A	• Verify that the No RF Input alarm is enabled in the RF Off alarms mask • Hardware fault	0
Forward Power Low Alarm	FWD power level goes over the alarm threshold.	I/A	• Check alarm and warning thresholds	0
Forward Power Low Warning	FWD power level goes over the warning threshold.	I/A	• At every amplifier initialization the FWD power alarm and warning are temporary on • Amplifier is not properly working, hardware fault	0
Reflex Power High	RFL power goes over the maximum endurable limit.	I/A	• Check the RF output for disconnection or wrong impendence adaptation	0

Fan Speed	One of the fans speeds is under the minimum speed level (1,000 rpm).	I/A	• Check fans connections • Verify that fans are not damaged; in this case substitute them. The substitution can be performed during device normal operations	0
ITU No SDI Input	• Device in ITU470 mode • Selected SDI input not locked.	I	• Check input statistics	X (1)
GPS Lock	• GPS is selected as frequency reference • GPS communication error alarm is not signaled • GPS signal is not lock.	I/A	• Check cable and GPS antenna connections • Hardware fault	X (0)
GPS Communication Error	• GPS is selected as frequency reference • Communication errors between ARK ATSC main board and GPS board.	I/A	• Hardware fault	X (0)

Signal 10 MHz Lock	• GPS communication error alarm is not signaled
	• GPS lock alarm is not signaled
	• 10 MHz is not locked.
		I/A	• If the Network's Transmitters Synchronization is SFN, check the frequency reference: it should be other than internal
			• If the frequency reference is Internal: internal PLL fault
			• If the frequency reference is External:
			  ○ Internal PLL fault
			  ○ Lack of external 10 MHz
			  ○ Hardware fault
			• If the frequency reference is GPS:
			  ○ Check GPS alarms
			  ○ Internal PLL fault
			  ○ Hardware fault
				X (0)

Signal 129 MHz Lock	• GPS communication error alarm is not signaled • GPS lock alarm is not signaled • 10 MHz lock alarm is not signaled • 129 MHz is not locked.	I/A	• 129 MHz oscillator can loose the lock • Hardware fault	1
Signal 960 MHz Lock	960 MHz is not locked.	I/A	• Hardware fault	1
Down Converter Osc. Unlock	PLL of the Down-converter board not locked to 129 MHz clock.	A	• Hardware fault	X (0)
ITU Wrong Input Standard	• Device in ITU470 mode • Selected SDI signal standard is not NTSC	I	• Check input statistics	X (1)
RF Input Squelch	• Device in ATSC mode • RF input alarm is not signaled. • RF signal level under the squelch threshold	A	• Check Squelch alarm threshold • Check input channel • Check RF input source and signal	X (0)

Not implemented				0
File System Error	File System loading error.	I/A	• File system partition damage	0

Bad File in File system	One more of the following files missing in the File System. • *.def; • *.sav; • *.apwr; • *.dpwr; • *.apre; • *.dpre; • *.chf; • *.cfg. • *.cdef • *.mod • *.gdly	I/A	• Check files list • Reload the file system	0

No TS Input	• Device in ATSC mode • Selected TS input not locked. The No TS Input is an alarm of the Tx ATSC mode. It should be always enabled in the RF Off alarms mask while working in ATSC mode.	A	• Check input statistics	X (1)
FPGA Boot alarm	FPGA boot has not been successfully completed.	I/A	• Restart the machine • Reload the file system	X (0)
Warm up alarm	Temperature level under 5°C or temperature sensor fault.	I/A	• Restart the machine • Temperature sensor fault	0

Notes to the table:

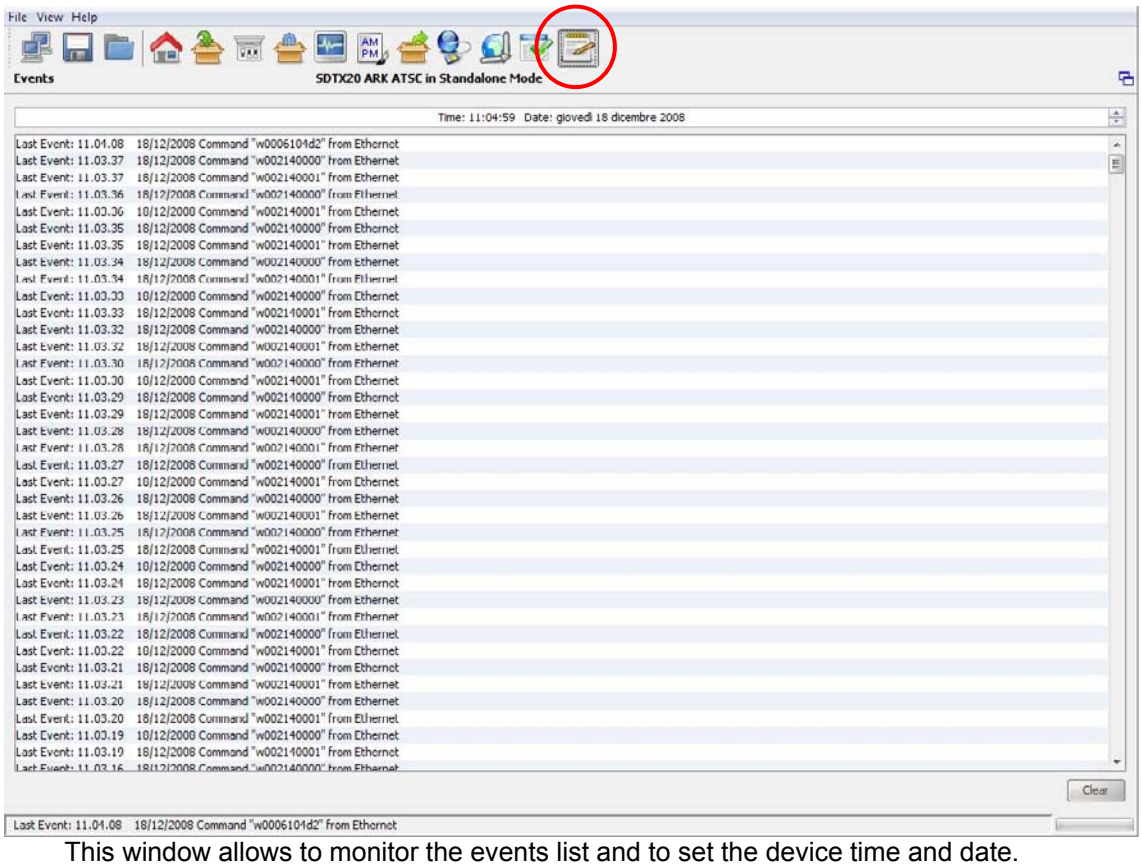
(1) I stands for ITU470 modulator and A stands for ATSC modulator.

(2) 0/1 stands for disabled/enabled and is fixed, X (0/1) stands for not fixed with default value indicated between brackets.

3.8.11 Events

Click on Events button icon, highlighted in the nex figure, to access the events windos.

Fig. 29: Events window

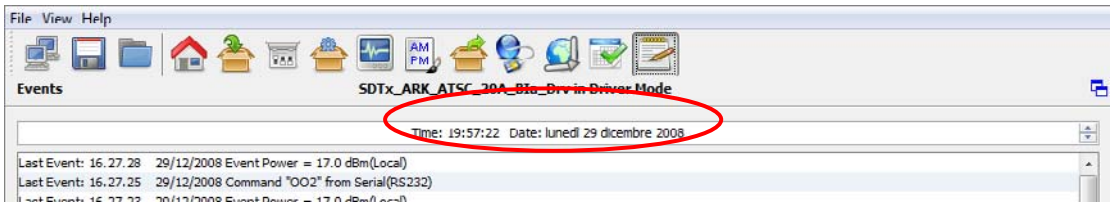


This window allows to monitor the events list and to set the device time and date.

3.8.12 Time/Date setting

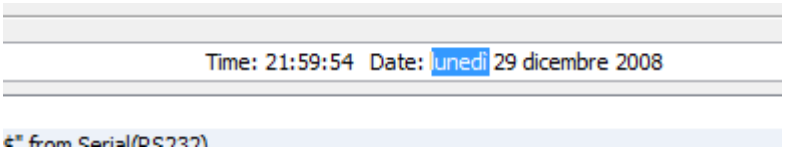
The bar above the events list allows to monitor and to set the device time/date.

Fig. 30: Time/Date bar



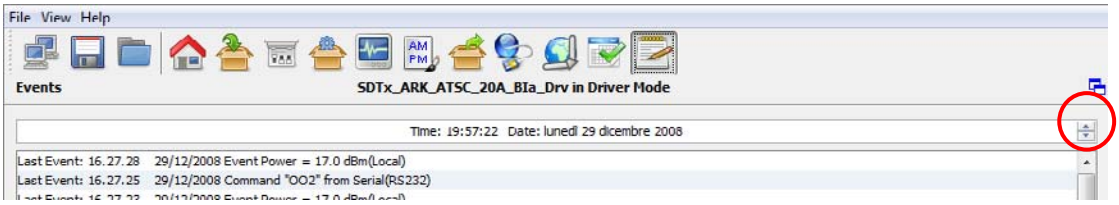
Double click on the Time/Date field to change.

Fig. 31: Time/Date field selected



Click on the lateral up-arrows or on the down-arrows to respectively increase or decrease the value of the field selected.

Fig. 32: Lateral up-down arrows for Time/Date setting



3.8.12.1 Events monitoring

Events are reported with the following information:

- **Time:** event detection time.
- **Date:** event detection date.
- **Type:** event type:
  - **Alarm** (refer to alarms list in Alarms paragraph and to *Alarms list* table);
  - **Command**
  - **Event** (refer to *Events list* table);
  - **System init** (refer to Init System Event paragraph);
  - **TASK_ERR** (refer to Task Error Event paragraph);
  - **SYS_ERR** (refer to System Error Event paragraph).
- **Description:** event description:
  - Alarm: which alarm generated the event;
  - Command: the low level code and command source;
  - Event: event description;
  - System Init: system initialization perhaps followed by the alarm

Use the following buttons, sited on the right side of the window, to manage the Events list:

- **Clear**: resets the events list.
- **Get History**: gets all the stored events from the last board reset (max 512 events).

Events descriptions list

Table 19

Event Description	**Description**
RF OFF enabled from OPTO	RF output switched off through OPTO 0.
RF OFF disabled from OPTO	RF output switched on through OPTO 0.
Stand-by ON from OPTO	Stand-by mode enabled through OPTO 3.
Stand-by OFF from OPTO	Stand-by mode disabled through OPTO 3.
Stand-by ON from LCD	Stand-by mode enabled through LCD button.
Stand-by OFF	Stand-by mode disabled through LCD button.
Power = *xx.x* dBm (*source*)	New output power setting. *xx.x*: output power expressed in dBm. *Source*: Local or MIP
Update file *.*xxxx*	New file loading. *Xxxx*: file extension.
P5K open: *xx.xx.xx.xx*	Connection to port 5000 open. *xx.xx.xx.xx:* host IP address.
P5K closed	Connection to port 5000 closed.
Mode *X*= (*mode*)	Manual change mode. *X*: new mode (A/B) *mode*: Tx ATSC – Tx ITU 470.
Switch mode swhitch *X* => *Y*	Switch mode change. *Switch mode*: Manual / Auto / Opto / Time. *X*=>*Y*: A/B=>B/A.
UPCV not configured	The Upconverter has been found not configured during the Task Error Event UPCV_TASK (refer to paragraph).
UPCV configured	Automatic reconfiguring of the Upconverter. It automatically starts at every UPCV not configured event or UPCV communication error.
File system busy	File system already in use while tring to employ it (e.g. change mode during a file loading).
UTC Time set from GPS	Time and date set by GPS. As soon as the GPS lock is regained, once lost, and if the current time and date are different from the GPS ones, the UTC time is set by GPS.
Warm UP Restart	When Warm up alarm is risen this event is reported and the device is restarted.

Event Description	Description
PS Restart *N*	This event is reported when one of the following alarms is risen: • Up converter Osc. Unlock • PS 28V out range • PS Current out of range • Absolute Power Limiter The fourth time one of the preceding alarms is risen the amplifier is restarted (from 1 up to 4 times). *N:* number of amplifier restarting. Only in SDTX 200 version.
PS OFF	After the fourth time the amplifier has been restarted, if an alarm condition causing a PS Restart event occurs, PS OFF event is reported and the amplifier is turned off When this event is reported amplifier can be turned on only by OPTO 2 (only in SDTX 200 version).
Restart Amp from OPTO	This event is reported when the retry command is given by the Retry Alarm OPTO (OPTO 2). Only in SDTX 200 version.
PS ON	This event is reported at every amplifier restarting Only in SDTX 200 version.
FPGA Re-config	When Signal 129 MHz Lock alarm is risen the FPGA is re-configured and this event is reported.
Events List cleared	This event is reported when the events list is cleared.
Saving config…	Saving configuration task started (after the command “s” given by RS232 or GbE commans).
Save config Finished	Saving configuration task correctly ended.
Save config error: *xx*	An error occurs during saving configuration. *xx:* error code: • 0x80: File system busy; • 0x01: New *.sav file opening error; • 0x02: FPGA data writing error; • 0x03: uC data writing error; • 0x05: Old *.sav file deleting error • 0x06: New file naming error (deleting of “*”).

The following table lists the descriptions of all the alarm type events (refer to Alarms paragraph for further information about alarms).

Alarms descriptions list

Table 20

Alarm	**Alarm Description**
Up converter Osc. Unlock	UPCV Osc. not locked
PS Voltage out of range	PS voltage error
PS Current out of range	PS current error
Absolute Power Limiter	Absolute pwr high
Communication error	UPCV dialog error
Temperature High Alarm	Temperature high
Temperature Level-3dB	Temperature -3dB
Temperature High Warning	Temperature warning
Forward Power High	FWD Power high
Forward Power Low Warning	FWD Pwr low warning
Forward Power Low Alarm	FWD Pwr low alarm
Reflex Power High	Reflected Power high
Fan Speed	Fans warning
S/N level	RF input S/N low
GPS Lock	GPS not locked
GPS Communication Error	GPS dialog err
Signal 10 MHz Lock	10MHz not locked
Signal 129 MHz Lock	129MHz not locked
Signal 960 MHz Lock	960MHz not locked
Down Converter Osc. Unlock	DWCV Osc. not locked
No RF Input	RF In. not detected
RF Input Squelch	RF input squelch
RF Digital Ber Alarm	RF input BER high
File System Error	File system wrong
Bad File in File system	File error (*.ext)
No TS Input	TS In. not detected
FPGA Boot alarm	FPGA boot err
Warm up alarm	System warm up

3.8.13 Task Error Event

The watchdog performs a periodic (every 20 seconds) polling of tasks and triggers a system reset if one or more tasks do not answer, restarting the Codeloader (*See Codeloader_Operations_Note_v1.1.doc for further information*) and generating a TSK ERR event as follows:

TSK ERR 00000028, 0000003c

The blue underlined 32-bits word is the enabling status of the alarms mask. The red underlined 32-bits word indicates the status of tasks (1 if the task has been successfully performed, otherwise 0) as specified in the following table:

Table 21. Task error event specific data

TASK	Description	Bit
WD_FAN_TASK	This task controls fans speed on the base of the board temperature.	0
WD_UPCV_TASK	This task controls the Upconverter status.	1
WD_GPS_TASK	This task controls the GPS status.	2
WD_STATUS_TASK	This task gathers quite all the board information in order to perform the following operations: • It updates all variables of the system; • It manages alarms; • It manages the RF status (e.g. on, off…); • It manages the mode switch; • It manages the ARP resolution in DVB mode.	3
WD_TCP_IP_TASK	This task implements the TCP-IP protocol stack.	4
WD_TIMER_TICK_TASK	This task generates the clock for the TCP-IP task.	5
WD_STV0371_TASK	This task gathers information from the demodulator and configures it.	6

The default tasks mask at the board startup is set to 0x0000007D (nb the UPCV task is excepted). Once the presence of the upconverter is assured, the upconverter task bit is automatically enabled and the mask is set to 0x0000007F. Tasks execution is stopped during de-fragmentation operations and FPGA boots.

3.8.14 System Error Event

For critical and fatal errors, the system calls the system error function and the *SYS_ERR* event is reported.
The error code is describer below:

- 0x00: Out of memory. Memory pool size is too small.
- 0x01: Invalid memory block release. Buffer data has been written out of boundaries of the allocated memory block.
- 0x02: Link pointer corrupted. Buffer data has been written out of boundaries of the allocated memory block.
- 0x03: No free UDP Sockets. The system has run out of UDP Sockets.
- 0x04: No free TCP Sockets. The system has run out of TCP Sockets.
- 0x05: TCP socket is in an undefined state. System memory has been accidentally overwritten.

3.8.15 System Initialization Event

At every system initialization the event *System Init* is generated.
This event is followed by 25 bytes specifying type and specific code of errors occurred during system initialization.
Each byte refers to an error as described in the following table:

Table 22. Init system event specific data

Byte	Description	Errors code
1°	FS_ERR File System error.	• 0x00: File System ok. • 0x01: FS partition error (invalid FS).
2°	INFO_ERR *.cfg file error.	• 0x00: File ok. • 0x01: File not found or File open error. • 0x02…0x03: Invalid file (syntax errors).
3°	DEF_ERR *.def file error.	• 0x00: File ok. • 0x01: File not found. • 0x02: File open error.
4°	LCD_ERR LCD error.	• 0x00: LCD ok. • 0x01: LCD not found.
5°	PLL_960M_ERR 960 MHz PLL error.	• 0x00: PLL locked. • 0x01: PLL not locked

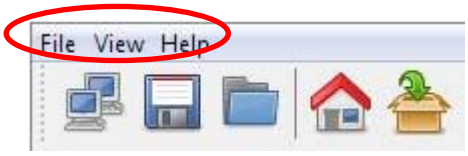
Byte	Description	Errors code
6°	BOOT_ERR FPGA boot error.	• 0x00: FPGA boot ok. • 0x01: FPGA configuration erasing process error. • 0x02: Invalid configuration (the configuration has been correctly loaded, but the FPGA doesn't boot). • 0x10: FPGA file not found. • 0x11 and 0x20: Invalid FPGA file (syntax error).
7°	LOAD_CFG_ERR *.sav file error.	• 0x00: File ok. • 0x01: File open error. • 0x02…0x05: Invalid file (syntax errors). • 0x10: File not found.
8°	SNMP_ERR SNMP file error.	• 0x00: SNMP file ok. • 0x01: SNMP file not found. • 0x02: File open error. • 0x03: UDP socket initialization error. • 0x04: Port 161 open error.

Byte	Description	Errors code
9°	CALIB_ERR *.apwr and *.dpwr files error.	• 0x00: File ok. • 0x01: Analog (Digital) mode (current mode) file not found. • 0x02: Analog (Digital) file open error. • 0x03…0x12: Invalid Analog (Digital) file (syntax error). • 0x20: Digital (Analog) mode file not found • 0x21: Digital (Analog) file open error. • 0x22…0x26: Invalid Digital (Analog) file (syntax error).
10°	PREC_ERR *.apre and *.dpre files error.	• 0x00: File ok. • 0x01: File not found. • 0x02File open error. • 0x03…0x0a: Invalid file (syntax errors).
11°	LINEAR_ERR *.drlin file error file error.	• 0x00: File ok. • 0x01: File not found. • 0x02: File open error. • 0x03…0x06: Invalid file (syntax errors).

Byte	Description	Errors code
12°	DOWNCV_ERR Downconverter PLL not locked error.	• 0x00: PLL locked. • 0x01: PLL not locked • 0x10: PLL disabled.
13°	UPCV_ERR Upconverter error.	• 0x00: Upconverter ready. • 0x01: Upconverter not found. • 0x02: Upconverter doesn't correctly answer.
14°	CH_FILT_ERR *.chf file error.	• 0x00: File ok. • 0x01: File not found. • 0x02: File open error. • 0x03…0x06: Invalid file (syntax errors).
15°	CH_DEFINE_ERR *.cdef file error.	• 0x00: File ok. • 0x01: File not found. • 0x02: File open error.

3.8.16 System menu

Fig. 33: Menu bar



The menu bar allows the access to three menus:

- **File:** allows the enabling of load and save commands
- **View:** allows to manage sections windows showing, java update time and events alert massages
- **Help:** informs about board name, GbE IP address, file system and operator managing system characteristics.

3.8.17 File menu

Fig. 34: File menu

The File menu allows the enabling of the following commands:

- **Save:** allows device configuration saving creating a new *.sav file in the file system.
- **Load:** allows last *.sav file loading from file system.

3.8.18 View menu

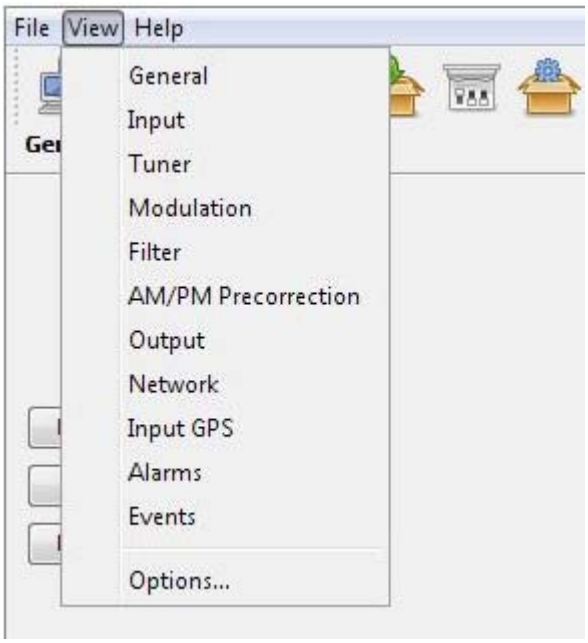


Fig. 35: View menu

The View menu allows the enabling of the following commands:

- **General:** allows accessing the general window.
- **Input:** allows accessing the input window.
- **Tuner:** allows accessing the Tuner window.
- **Modulation:** allows accessing the Modulation window
- **Filter:** allows accessing the Filter window.
- **AM/PM precorrection:** allows accessing the AM/PM precorrection window.
- **Output:** allows accessing the Output window.
- **Network:** allows accessing the Network window.
- **Input GPS:** allows accessing the Input GPS window.
- **Alarms:** allows accessing the Alarms window.
- **Events:** allows accessing the Events window.
- **Options:** allows accessing the Options sub-menu.

3.8.18.1.1 Option sub-menu

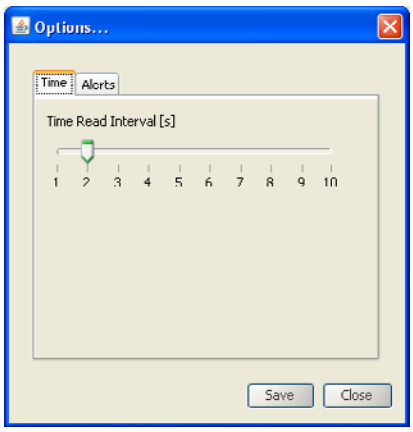
The Option sub-menu allows two controls type:

- **Time:** Time Read Interval [s];
- **Alerts:** the selection of events to display.

Click on the *Save* button to save Java options; a *.properties file will be created.
The device is not loaded with a factory default *.properties file, but it is created and then stored in System File once the properties have been saved.

3.8.18.2 Time

Fig. 36: Time window



This control allows changing the device-to-management PC java update time. The default value is 2 seconds. Click on Close button to quit this sub-window.

3.8.18.3 Alerts

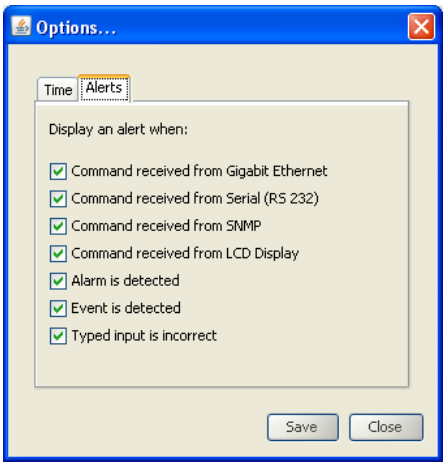


Fig. 37: Alerts window

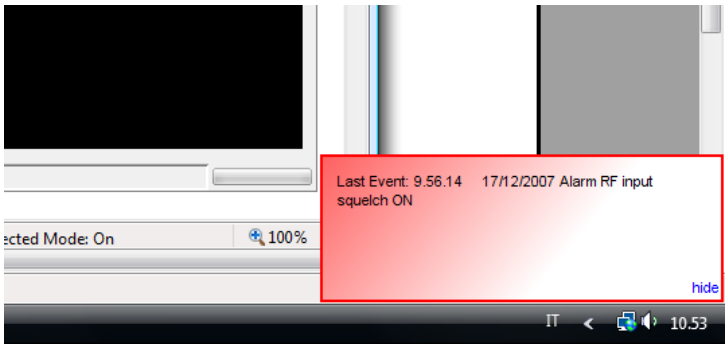
The Alert sub-window allows selecting which types of events will be notified through an Alert box.

Alert boxes appear on the right side of the monitor. The selection is performed among the following types of event:

- **Commands (blue boxes):**
  - Gigabit Ethernet commands;
  - RS232 commands;
  - SNMP commands;
  - LCD Display commands.
- **Alarms (red boxes);**
- **Events (green messages):**
  - Board events.
- **Typing error (yellow messages):**
  - Typed setting is incorrect.

Click on *hide* button to close these alert popup windows.

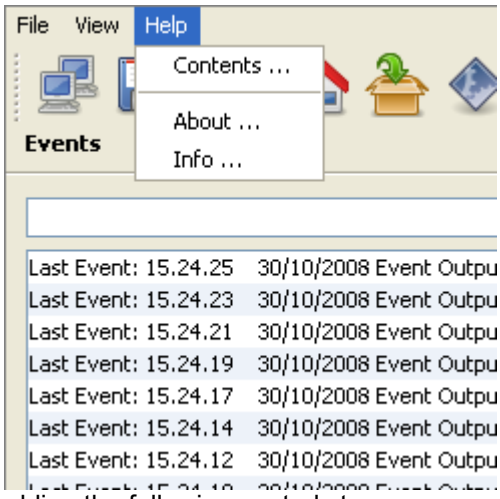
Fig. 38: Alert message



Alert boxes can be disabled through the hide button located on the right side of the box. The hide button, once clicked, disables all boxes belonging to the same class.

3.8.19 Help menu

Fig. 39: Help menu

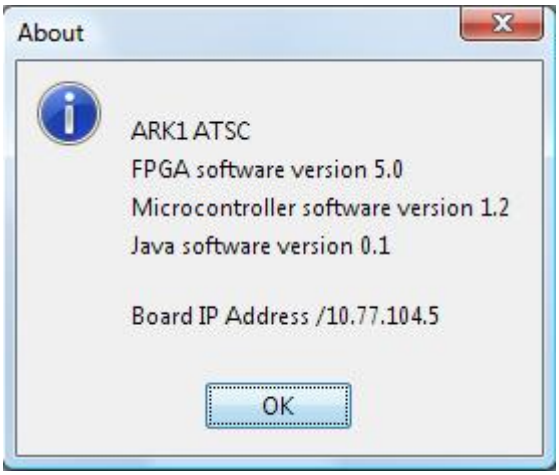


The Help menu allows enabling the following controls type:

- **Contents:** actually not implemented.
- **About:** shows the board name and the GbE IP address. It also informs about the board uC, fpga and java software versions.
- **Info:** shows the board system files list and the operator managing system characteristics.

3.8.19.1 About

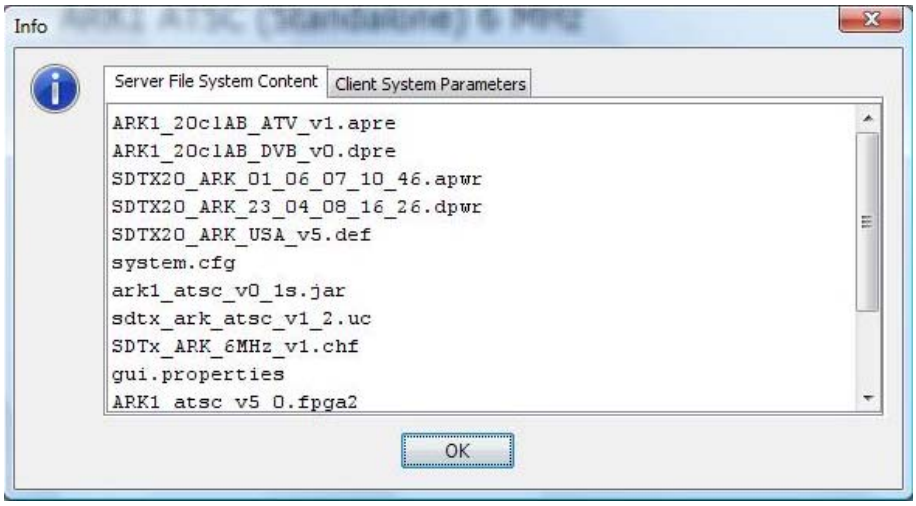
Fig. 40: About window



The “About” window shows the board name and the GbE IP address. It also informs about the board uC, FPGA and Java software versions. Click on OK button to close the window.

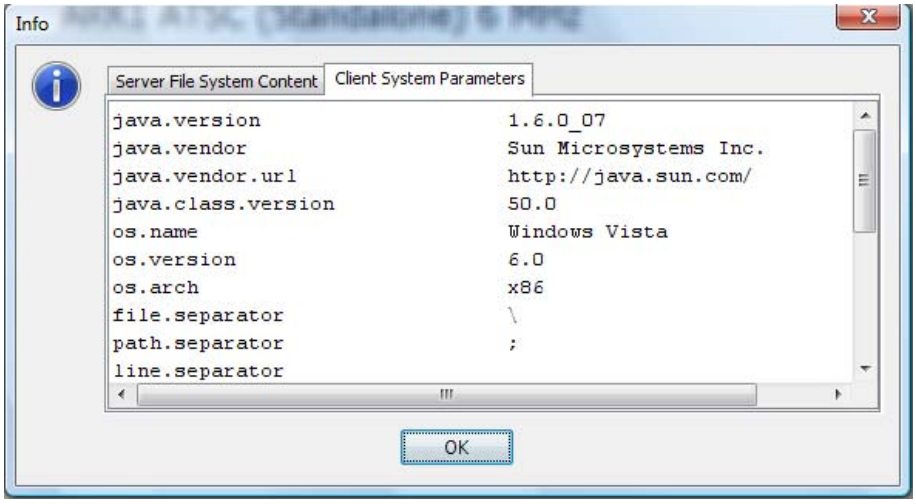
3.8.19.2 Info

Fig. 41: Info window: file system content



The server file system content section of info window shows the entire board system files list. Use scroll bars to view all the items.

Fig. 42: Info window: client system parameters



The client system parameters section of info window shows the operator managing system characteristics list. Use scroll bars to view all the items. Click on OK button to close the window.

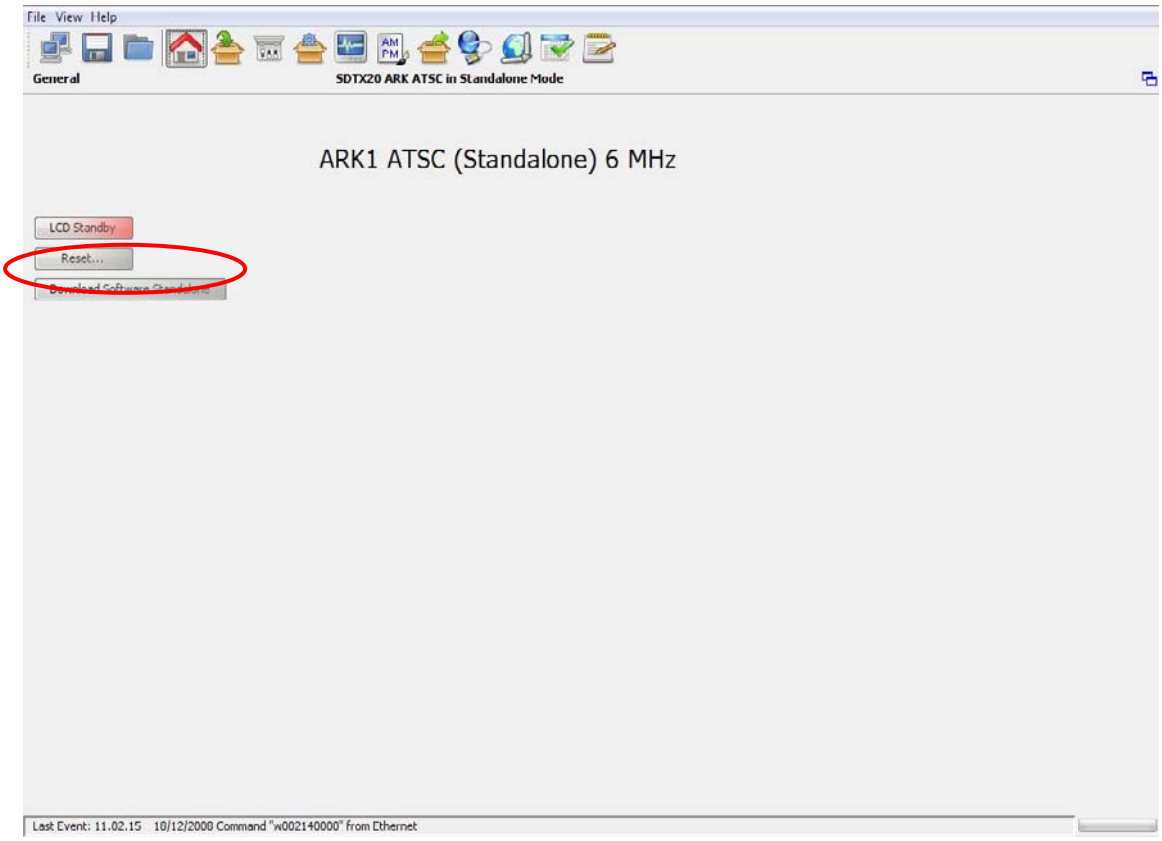
3.8.20 Download Software Standalone

The Download Software Standalone button allows the downloading of standalone java application (executable jar file) based on java applet.
If your browser is Internet Explorer, it may blocks the site from downloading files to your computer. If you want to enable the file downloading, follow the instructions listed below:

- Open Internet Explorer;

- Click on the Tools button and then click on Internet Options;
- Click on the Security tab and then click on Custom level button;
- To turn off the Information bar for file downloads, scroll to the Downloads section of the list, and then, under Automatic prompting for file downloads, click on Enable;
- Click on OK, click Yes in order to confirm that you want to make the change, and then click OK again.

Fig. 43: Download Software Standalone



SDT 200UB – SDT 500UB ARK-1 ATSC
Software Defined Transmitter

OPERATION MANUAL

4 TECHNICAL INFORMATION

CONTENTS

FIGURE AND TABLES LIST

This chapter is left intentionally blank.

SDT 500UB ARK 1
Software DefinedTransmitter

OPERATION MANUAL

5 MANUAL CHANGE INFORMATION

CONTENTS

5.1 INTRODUCTION.....5 - 2

5.1 INTRODUCTION

At Screen Service, we continually try to keep our customers up with the latest technology by adding circuit and component improvements to our equipment as soon as they are developed and tested.

Sometimes, due to printing and shipping requirements, we can't get these changes immediately into printed manuals; therefore this manual may contain new change information on following pages.

A single change may affect several sections. Since the change information sheets are carried in the manual until all changes are permanently entered, some duplication may occur.

If no such change pages appear following this page, this manual is correct as printed.

Special versions and variants required by individual Customers are also described in this section.