

AC6992 TRANSPONDER



AC6992 is a DOCSIS 3.1 frequency range compatible CATVisor / HMS transponder containing a RF modem and a level measurement unit. It can be used to add remote monitoring and control, ALSC, automatic forward and return path alignment, forward path spectrum analyser, return path ingress analyser and return path pilot generator to 1.2 GHz ACx and ACE amplifiers and nodes.

Features

General

- Compatible with AC3010, AC3210, AC8710, AC9100, ACE3 and ACE8 platforms
- Plug-in unit with no additional cables
- Lid status monitoring with light sensor
- Pushbutton for true Plug-and-Play: full automatic alignment of both forward and return path signal paths

Modem and management

- Frequency agile SCTE 25-1 (HMS005) compatible RF modem with extended forward and return path frequency ranges
- Supports both CATVisor and HMS compatible MAC layer
- Allows remote monitoring and control of all parameters
- Remote download of platform embedded software

Level measurement and ALSC

- Fast and accurate level measurement unit can measure any forward path channel level with selectable peak / average detection
- ALSC pilot frequencies are user programmable with automatic reserve pilot switching; full gain and slope control with two pilots, automatic switching to gain-only control with only one pilot
- Fast forward path spectrum analyser functionality with user programmable frequencies, graphical display and automatic limit testing with alarms

Ingress monitoring and control

- Ingress Buster, the return path signal monitoring system with measurement dynamic range extended down to noise level can detect and report ingress
- Return path can be attenuated or even cut off while still maintaining return path signal measurement functionality and remote modem connection
- Ingress Buster can be used for automated actions against ingress: return path can be automatically attenuated by user specified amount, or preconfigured ingress filter can be automatically activated, or both, with user-selectable thresholds and timeouts

Return path pilot generator

- Up to 4 pilots with user programmable level and frequency

Technical specifications

Parameter	Specification	Note
RF modem		
Data rate	38400 bps	
Modulation method	FSK, $\Delta f = 67$ kHz	
Channel bandwidth	400 kHz	1)
* Downstream frequency range	80...88 MHz 108...132 MHz 160...176 MHz 216...264 MHz	2)
Upstream frequency range	5...65 MHz	
Frequency raster	0.1 MHz	
Frequency inaccuracy	< 10 kHz	
* Downstream input level range	60...90 dB μ V	3)
Upstream output level range	75...104 dB μ V	4)
Transmit power delta ("0" vs. "1")	< 1 dB	
Transmitter spurious (Tx on)	< -55 dBc	
Transmitter spurious (Tx off)	< 25 dB μ V	
Off state attenuation	> 60 dB	
Forward path RF level measurements: ALSC and spectrum analyser		
* Forward path measurement range	50...1218 MHz, 0.25 MHz steps	
Measurement bandwidth	0.35 MHz	5)
Measurement inaccuracy	< 1.0 dB	6)
Dynamic range	80...120 dB μ V	7)
Detection mode	Analog / Digital	
Return path RF level measurements: Ingress Buster		
* Return path measurement range	5...204 MHz, 0.25 MHz steps	
Measurement bandwidth	0.35 MHz	5)
Measurement inaccuracy	< 1.5 dB	8)
Dynamic range	20...75 dB μ V	9)
Detection mode	Analog / Digital	
Return path pilot generator		
Number of pilots	up to 4	10)
Pilot frequency range	5...65 MHz, 0.1 MHz steps	
Pilot level range	75...100 dB μ V	11)
Pilot level inaccuracy	< 1.5 dB	
Spurious tones	< -50 dBc	12)
General information		
* Power consumption	1.8 W	
Dimensions	80 x 52 x 21 mm	h x w x d
Operating temperature range	see platform specifications	
EMC	EN 50083-2	

* Items marked with asterisk have changed from AC6991

Notes

- 1) Typically < -55 dBc @ channel edge.
- 2) Fully agile within each frequency range.
- 3) Data channel level measurement inaccuracy is < 3 dB, typical -3 dB bandwidth is 200 kHz. Levels are referenced to transponder RF input, which typically has -19 dB offset to amplifier / node output port 1, depending on output configuration (see platform specs).
- 4) Auto levelling with inaccuracy < 1 dB. Maximum true transmit level is lower above 45 MHz, and can go down to 100 dB μ V at 65 MHz. Spurious performance may be worse than specified when using > 100 dB μ V transmit levels. Levels are referenced to transponder RF output, which typically has -37 dB offset to return path input at full gain, depending on platform and gain setting (see platform specs).
- 5) Typical -3 dB bandwidth. Typical -45 dB bandwidth is 0.5 MHz.
- 6) This is the typical performance over band 50...740 MHz for analog signals. For analog signals between 740...1218 MHz and all digital signals the inaccuracy is typically < 1.5 dB.
- 7) For analog detection. For digital detection the dynamic range is ~6 dB higher. Digital detection measures a ~1.5 MHz band and calculates the level for a 6.875 Mbaud signal. Signal levels are referenced to forward path output port.
- 8) Typical performance for analog detection.
- 9) For analog measurement. For digital detection the dynamic range is ~6 dB higher. Return path signal levels are referenced to return path input port. Dynamic range typically extends down to 15 dB μ V, but is not guaranteed due to internal spurious signals.
- 10) Pilots they are output sequentially one at a time with user specified duration. Pilot transmission is turned off while RF modem is transmitting.
- 11) Levels are referenced to transponder RF output, which typically has -37 dB offset to return path input at full gain, depending on platform and gain setting (see platform specs).
- 12) Specified at >0.2 MHz from pilot frequency in 5...65 MHz range. Valid for 5...45 MHz pilot frequencies, reduced to < -45 dBc for 45...65 MHz pilot frequencies.