

## Analog Transmitters

From 500Wps to 20kWps

Providing market leading solutions.  
Enabling the broadcaster to do more with less.



IS720LA  
500Wps  
(Optional rack 8U)



IS701HA  
1,000Wps  
(Optional rack 8U)



IS702HA  
2,000Wps



IS705HA  
5,000Wps



IS710HA  
10,000Wps

Analog TV transmitters for all standards, Digital Ready, fully solid state LDMOS, with exceptional linearity and performance in the UHF band.

Designed using state-of-the-art technology, employs first rate components to fulfill not only the wide variety of broadcaster's requirements and needs, but also ATSC, DVB and ISDB digital TV innovations.

It is equipped with the modern DigiAna modulator, which processes the analog signals digitally and has an excellent modern linearization solution.

Transmitter measurements are displayed in its front panel, in a computer that can be locally connected to the equipment, or at a remote location.

Web Server and SNMP protocol telemetry systems.

Being manufactured as Analog/Digital Ready, the transmitter may easily be converted from analog to ATSC, ISDB, or DVB.



# ISCHIO SERIES

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### HIGHLIGHTS:

High performance amplifying drawers with 6th generation LDMOS transistors (Hi-Voltage);

Automatic control of fan rotation speed: lower acoustic noise levels, lower power consumption and longer lifespan.

Power Supplies with Power Factor Correction  $\geq 0,98$ ;

I-rush circuit, for start current control;

Isolated combiner allowing hot swap;

Measurements and alarms and through frontal display or remote access;

VSWR and overdrive protection by hardware with power reduction;

Power modules temperature increase protection by software;

Digital IF pre-correction;

Telemetry: WEB Server / SNMP, for local or remote management;

Air cooling;

Transistors AGING adjustment via computer interface;

Automatic gm-temperature compensation;

Individual gain and phase adjustment by drawer.

### INCLUDES:

External low-pass and channel filters;

General Control software;

Drivers for USB communication;

Manual in portuguese, spanish or english (in format digital).

### OPTIONS:

Digital excitador (DUAL);<sup>(\*)</sup>

Time base through GPS or GPS + Rubidium;

Telemetry via GPRS interface;

Combined operation (1+1; N+1);<sup>(\*)</sup>

Double exciter;

Network protection;

Mask filter with constant impedance (facilitates the combination of transmitters on the same antenna);

<sup>(\*)</sup> For DUAL configuration, the main breaker has to be dimensioned for the analog standard. In case of digital only operation, the main breaker should be replaced to maintain the current protection characteristics. (Consult with Hitachi's Technical Assistance when digital operation time arrives).

<sup>(\*)</sup> Allows transmitter combining:  
Digital + Analog (different channels)  
Digital + Digital (different or same channels)  
Analog + Analog (different or same channels)  
N+1 (different digital channels)  
Digital combiners always use reflexive filters.

<sup>(\*)</sup> 20,000Wps power considering a combined 10,000Wps transmitter.



2 x IS710HA – Combined configuration

MODEL	PAL-M NOMINAL POWER (Wps)	DRAWERS	RACK
IS720LA	500	one	-
IS701HA	1,000	one	-
IS702HA	2,000	two	28U
IS705HA	5,000	five	36U
IS710HA	10,000	ten	36U + 36U

**Hitachi Kokusai Linear Equipamentos Eletrônicos S/A**

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PAL-M Analog Transmitters Specifications	IS720LA – Transmitter 500Wps	IS701HA – Transmitter 1,000Wps	IS702HA – Transmitter 2,000Wps
<b>INPUT</b>			
Type	Audio and Video	Audio and Video	Audio and Video
Connector	Female BNC	Female BNC	Female BNC
Impedance	balanced audio = $600\Omega$ / Video= $75\Omega$	balanced audio = $600\Omega$ / Video= $75\Omega$	balanced audio = $600\Omega$ / Video= $75\Omega$
Levels	audio = 0dBm / video = 1Vpp	audio = 0dBm / video = 1Vpp	audio = 0dBm / video = 1Vpp
Return loss	34dB	34dB	34dB
Frequency responses ( $\pm 1$ dB)	audio = 30Hz to 15kHz video = 25Hz to 4.2MHz (M/N)	audio = 30Hz to 15kHz video = 25Hz to 4.2MHz (M/N)	audio = 30Hz to 15kHz video = 25Hz to 4.2MHz (M/N)

<b>OUTPUT</b>			
Operation frequency	Channel 14 - 69 UHF 470MHz to 806MHz	Channel 14 - 69 UHF 470MHz to 806MHz	Channel 14 - 69 UHF 470MHz to 806MHz
Output Power	500Wps after filter	1000Wps after filter	2000Wps after filter
Impedance / connector	$50\Omega$ / Flange EIA 7/8" VSWR $\leq 1.15$	$50\Omega$ / Flange EIA 7/8" VSWR $\leq 1.15$	$50\Omega$ / Flange EIA 1 5/8" VSWR $\leq 1.15$
TV standard	M/N; B/G and I	M/N; B/G and I	M/N; B/G and I
Intermodulation	Better than -52dB, with modulated ramp	Better than -52dB, with modulated ramp	Better than -52dB, with modulated ramp
Harmonics / spurious	Better than -62dBc with modulated ramp	Better than -62dBc with modulated ramp	Better than -62dBc with modulated ramp
Differential Gain (DG)	Better than $\pm 3\%$	Better than $\pm 3\%$	Better than $\pm 3\%$
Differential Phase (DP)	Better than $\pm 3^\circ$	Better than $\pm 3^\circ$	Better than $\pm 3^\circ$
Sync. Compression	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 0.5\%$
TV System	PAL, NTSC or SECAM	PAL, NTSC or SECAM	PAL, NTSC or SECAM

<b>GENERAL</b>			
Communication interface	USB / Ethernet / SNMP	USB / Ethernet / SNMP	USB / Ethernet / SNMP
Time base	10MHz OCXO	10MHz OCXO	10MHz OCXO
Frequency stability	$\pm 0.3$ ppm	$\pm 0.3$ ppm	$\pm 0.3$ ppm
AC input - 50/60Hz	90 – 240 Vac	Monophasic 220Vac or Biphasic 220Vac	Monophasic 220Vac or Biphasic 220Vac
Typical consumption	1,400VA	3.3kVA	6.7kVA
Heat load (BTU)	3,072	7,850	16,100
Power factor	$\geq 0.98$	$\geq 0.98$	$\geq 0.98$
Operating altitude	Up to 4.000m a.m.s.l.	Up to 4.000m a.m.s.l.	Up to 4.000m a.m.s.l.
Ambient temperature range	-10° C to +50° C	-10° C to +50° C	-10° C to +50° C
Ambient humidity range	from 0 to 95% (noncondensing)	from 0 to 95% (noncondensing)	from 0 to 95% (noncondensing)
Dimensions (mm)	483 (W) x 700 (D) x 266 (H) (w/o rack) <sup>(*)</sup>	483 (W) x 700 (D) x 311 (H) (w/o rack) <sup>(*)</sup>	600 (W) x 900 (D) x 1,320 (H)
Net weight	55 kg	66 kg	254 kg

<sup>(\*)</sup> The transmitters IS720LA and IS701HA have the option of rack mount 8U - 489 (H) x 600 (W) x 800 (D).

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PAL-M Analog Transmitters Specifications	IS705HA – Transmitter 5,000Wps	IS710HA – Transmitter 10,000Wps
<b>INPUT</b>		
Type	Audio and Video	Audio and Video
Connector	Female BNC	Female BNC
Impedance	balanced audio = 600Ω / Video= 75 Ω	balanced audio = 600Ω / Video= 75 Ω
Levels	audio = 0dBm / video = 1Vpp	audio = 0dBm / video = 1Vpp
Return loss	34dB	34dB
Frequency responses (±1dB)	audio = 30Hz to 15kHz video = 25Hz to 4.2MHz (M/N)	audio = 30Hz to 15kHz video = 25Hz to 4.2MHz (M/N)

<b>OUTPUT</b>		
Operation frequency	Channel 14 - 69 UHF 470MHz to 806MHz	Channel 14 - 69 UHF 470MHz to 806MHz
Output Power	5,000Wps after filter	10,000Wps after filter
Impedance / connector	50Ω / Flange EIA 1 5/8" VSWR ≤ 1.15	50Ω / Flange EIA 3 1/8" VSWR ≤ 1.15
TV standard	M/N; B/G and I	M/N; B/G and I
Intermodulation	Better than -52dB, with modulated ramp	Better than -52dB, with modulated ramp
Harmonics / spurious	Better than -62dBc with modulated ramp	Better than -62dBc with modulated ramp
Differential Gain (DG)	Better than ±3%	Better than ±3%
Differential Phase (DP)	Better than ±3°	Better than ±3°
Sync. Compression	±0.5%	±0.5%
TV System	PAL, NTSC or SECAM	PAL, NTSC or SECAM

<b>GENERAL</b>		
Communication Interface	USB / Ethernet / SNMP	USB / Ethernet / SNMP
Time base	10MHz OCXO	10MHz OCXO
Frequency stability	±0.3ppm	±0.3ppm
AC input - 50/60Hz	Three-phase 220Vac or 380Vac	Three-phase 220Vac or 380Vac
Typical consumption	16.67kVA	33.33kVA
Heat load (BTU)	40,000	80,000
Power factor	≥ 0.98	≥ 0.98
Operating altitude	Up to 4.000m a.m.s.l	Up to 4.000m a.m.s.l.
Ambient temperature range	-10° C to +50° C	-10° C to +50° C
Ambient humidity range	from 0 to 95% (noncondensing)	from 0 to 95% (noncondensing)
Dimensions	600 (W) x 900 (D) x 1,850 (H)	1200 (W) x 900 (D) x 1.850 (H) (*)
Net weight	378 kg	694 kg

(\*) Equipment consists of two racks.

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