CODAN

SATELLITE COMMUNICATIONS

Ku-Band Transceiver
5900 series

Codan's 5900 series Ku-Band transceivers offer a wide range of distinctive advantages and enhanced features for satellite communications systems based in remote or challenging geographic regions.

Available in all common Ku-Band operating frequencies and 70 or 140 MHz IF configurations—and a range of power outputs—the 5900 provides industry leading technical performance.

KEY FEATURES

Durability

The 5900 series is designed and tested to meet its performance specifications in an ambient temperature range from –40°C to +55°C and up to 100% relative humidity, ensuring long-term survival in extreme conditions.

The thermal protection provided allows operation up to +60°C ambient. Field experience shows that MTBFs of greater than 100,000 hours can be expected.

Ku-Band transceiver 5900 series with optional power supply unit

RF performance

RF performance is superb, particularly: intermodulation performance, gain stability over temperature and flatness across the IF band.

The 5900 also boasts industry leading spurious and harmonics specifications while guaranteed RF performance ensures expensive system link margins do not have to be used to cope with RF transceiver variations. The 5900's high linearity and low spurious characteristics contribute to superior multi-carrier performance.

Output power options

Output ratings of 8 and 16 watts are standard, while a higher power option is also available.

The 8 and 16 watt SSPAs include an output power monitoring capability via the monitor and control serial interface.

Power consumption

Codan's Ku-Band transceivers all feature low power consumption and low temperature rise, ensuring internal components do not suffer undue stress.

Power supply

The 5900 features a 48 V DC floating input (37 V to 72 V range) with reverse polarity protection. This is ideal for battery backup and solar-powered systems. In addition, the 5900 may be supplied with an optional AC power supply unit with field selectable 115/230 V operation.

The AC power supply unit is extremely robust and particularly suited for operation from poor quality AC supplies.

Internal protection

Internal protection against high temperature and short or open circuit RF output is standard. As well, input voltage detection ensures reliable shutdown and restart under brownout or blackout conditions.

External protection

All user access is via a transparent cover, which can be removed without exposing major internal electronics to the elements. Special sealant is used to ensure the sealing integrity of all connectors.

RF modules are fully sealed and pressure tested to 34 kPa (5 psi). Particle and moisture penetration is rated to IP68 and the units are submersible to 3 metres.

ADVANCED FEATURES

Enhanced monitor and control

All operating functions can be controlled and monitored via the serial interface. The operating configuration is stored in EEPROM to ensure the setup parameters are restored in the event of a power failure.

Universal interface compatibility

The 5900 has universal interface compatibility capable of operating with dumb terminals, laptop/PC emulating terminals, hand-held terminals and personal organisers without requiring proprietary software. The versatile configuration options support: contact closure, RS232, RS422 and RS485 (2 or 4 wire).

Two dedicated controllers are available from Codan:

- 5560 Hand-Held Controller, suitable for in the field installation setup
- 5570 Remote Controller, suitable for indoor rack mounting to provide permanent monitoring and control capabilities

Redundancy switching system

A redundancy switching system is available to provide an automatic changeover to a second transceiver to maximise link availability and minimise any disruption to service.

This system is fully outdoor mounted, but can be supplied with the 5587 Redundant System Monitor to provide indoor monitor and control.

MAJOR CONFIGURATION OPTIONS

Transmit frequency band (GHz)	
1	14.0–14.5
2	13.75–14.50
Receive frequency bands (GHz)	
1	10.95–11.7
2	11.7–12.2
3	12.25–12.75

All systems use the common 5900 series converter module, which has an RF input of 950–1700 MHz. Receive bands are selected by the use of an appropriate LNB. Standard frequency bands are listed above whilst other bands are available on request.

A selection of LNBs (phase locked to the internal 10 MHz reference in the 5900 converter module) is available to best meet noise temperature and configuration needs.

Bandwidth	
N	Narrow band (40 MHz); field selectable 70 or 140 MHz IF
W	Wide band (80 MHz); 140 MHz IF
SSPA	
WR75	Waveguide output
Options and accessories	
Hand-held Controller	
Remote Controller	
Redundancy Switching System	

5570 Remote Controller

Redundancy Switching System

5560 Hand-held Controller

CODAN QUALITY AND SERVICE

All Ku-Band transceivers are built and tested in Codan's ISO9001 quality certified manufacturing facility, and undergo 100% burn in and performance monitoring over the temperature range specified.

Codan's fully trained staff and agents provide in-factory and in-country training services, and complete installation and on-site assistance. This service is backed up by a 24 hour customer service line and a warranty of three years on manufacturing, design or component defects.

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Equipment descriptions and specifications are subject to change without notice or obligation

Head Office

Codan Limited
ABN 77 007 590 605
81 Graves Street
Newton SA 5074
AUSTRALIA
Telephone +61 8 8305 0311
Facsimile +61 8 8305 0411
www.codan.com.au

Asia Pacific

Codan Limited
81 Graves Street
Newton SA 5074
AUSTRALIA

Telephone +61 8 8305 0311
Facsimile +61 8 8305 0411
asiasales@codan.com.au

EMEA

Codan (UK) Ltd
Unit C4 Endeavour Place
Coxbridge Business Park
Farnham Surrey GU10 5EH
UNITED KINGDOM
Telephone +44 1252 717 272
Facsimile +44 1252 717 337
uksales@codan.com.au

Americas

Codan US, Inc.
8430 Kao Circle
Manassas VA 20110
USA

Telephone +1 703 361 2721
Facsimile +1 703 361 3812
ussales@codan.com.au

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SPECIFICATIONS

TRANSMIT SECTION

IF input

Frequency range	
Narrow BW option	70 ± 20 MHz/140 ± 20 MHz selectable
Wide BW option	140 ± 40 MHz
Impedance	50/75 Ω selectable
Connector	N female
Return loss	18 dB minimum

Gain specification

Gain	
8 W*	68 dB nominal
16 W*	71 dB nominal
Attenuator range	0 dB to 25 dB nominal
Attenuator step size	1 dB nominal
Gain flatness	
Over IF	
Narrow BW option	±1.0 dB maximum, 40 MHz
Wide BW option	±2.0 dB maximum, 80 MHz
Over frequency range	±2.0 dB maximum
Gain stability	±1.5 dB maximum, –40°C to +55°C

RF output

Frequency range	
Band 1	14.0 to 14.5 GHz
Band 2	13.75 to 14.50 GHz
Connector	WR75, PBR120 flange with M4 tapped holes
VSWR	1.5:1 maximum

8 W SSPA

Output power (1 dB GCP)**	+39.5 dBm (9 W) typical +39.0 dBm (8 W) minimum
Carrier to intermodulation ratio	–26 dBc, two carriers each @ 6 dB OPBO from 1 dB GCP

16 W SSPA

Output power (1 dB GCP)**	+42.3 dBm (17 W) typical +42.0 dBm (15.9 W) minimum
Carrier to intermodulation ratio	–25 dBc, two carriers each @ 6 dB OPBO from 1 dB GCP

Spurious output

Meets EN 301 428 with 54 dBi antenna gain

Phase noise (SSB)***

100 Hz	–60 dBc/Hz maximum
1 kHz	–70 dBc/Hz maximum
10 kHz	–75 dBc/Hz maximum
100 kHz	–85 dBc/Hz maximum

Synthesiser step size

1 MHz

Frequency stability

–40°C to +55°C	$\pm 2 \times 10^{-8}$
Aging	$\pm 1 \times 10^{-7}$/year

RECEIVE SECTION (EXCLUDING LNB)

RF input

Frequency range	950 to 1700 MHz
Impedance	50 Ω
Connector	N female
VSWR	1.4:1 maximum
Noise figure	20 dB typical
DC output (switch selectable)	+15 V @ 30 to 425 mA
10 MHz output	0 dBm ± 1 dB

IF output

Frequency range	
Narrow BW option	70 ± 20 MHz/140 ± 20 MHz selectable
Wide BW option	140 ± 40 MHz
Impedance	50/75 Ω selectable
3rd order intercept	+15 dBm minimum
Connector	N female
Return loss	18 dB minimum

Gain specification

Gain	35 dB nominal
Attenuator range	0 dB to 25 dB nominal
Attenuator step size	1 dB nominal
Gain flatness	
Over IF	
Narrow BW option	±1.0 dB maximum, 40 MHz
Wide BW option	±2.0 dB maximum, 80 MHz
Over frequency range	±2.0 dB maximum
Gain stability	±3.0 dB maximum, –40°C to +55°C

Image rejection

50 dB minimum

Spurious output

–65 dBm maximum

Phase noise (SSB)***

100 Hz	–60 dBc/Hz maximum
1 kHz	–70 dBc/Hz maximum
10 kHz	–80 dBc/Hz maximum
100 kHz	–90 dBc/Hz maximum

Synthesiser step size

1 MHz

Frequency stability

–40°C to +55°C	$\pm 2 \times 10^{-8}$
Aging	$\pm 1 \times 10^{-7}$/year

L-Band IF monitor port

Output frequency range	950 to 1700 MHz
Gain	10 ± 3 dB Rx RF I/P to L-Band monitor
Gain ripple	±2 dB maximum
Connector	N female
Impedance	50 Ω
Return loss	15 dB minimum

* 3 dB less for Band 2

** 2 dB less for Band 2

*** Meets Intelsat Phase Noise requirement using Limit-2 for data rates up to 8 Mbps. Excludes mains related sidebands.

LOW NOISE BLOCK CONVERTER

Indicative specifications.

Input

Frequency range

Band 1	10.95 to 11.7 GHz
Band 2	11.7 to 12.2 GHz
Band 3	12.25 to 12.75 GHz
Interface	WR75
VSWR	2.5:1 typical

Noise figure 1.2 dB @ 25°C maximum
1.0 dB typical

Gain specification

Gain	60 dB typical
Gain flatness	±1.5 dB maximum full band

Output

1 dB GCP	0 dBm minimum
3rd order intercept	+11 dBm minimum
Impedance	50 Ω
Connector	N female
VSWR	1.5:1 typical

TRANSMIT REJECT FILTER (OPTIONAL)

Pass band	10.95 to 12.75 GHz
Insertion loss	0.05 dB maximum
Reject band	13.75 to 14.5 GHz
Rejection	55 dB maximum

GENERAL

Input voltage 42 to 72 V DC (floating input) standard
115/230 V AC ± 15%
with power supply unit

Power consumption

DC	8 W	165 W maximum SSPA On
	16 W	250 W maximum SSPA On
		50 W maximum SSPA Off
AC	8 W	260 VA typ. @ nom. AC voltage SSPA On
	16 W	390 VA typ. @ nom. AC voltage SSPA On

MONITOR AND CONTROL

Control panel facilities

Indicators: Standby, On, Warm-up, SSPA activated, Converter fault, LNB fault, SSPA fault, Temperature fault, Fan fault

Controls: Power control (off/standby/on), SSPA (inhibit/remote/activate), Serial interface settings, LNB supply via Rx RF input connector, Mains/Battery supply select

Remote monitor and control facilities

Serial interface standards:	RS232, RS422 (RS485)
Protocol standards:	ASCII, Packet (RS485)
Protocol address range:	0 to 127

Remote monitoring functions (serial interface): Standby, On, Warm-up, SSPA activated, SSPA output power (8 and 16 watt transceivers only), Converter and SSPA temperatures, Converter fault, LNB fault, SSPA fault, Temperature fault, Fan fault, SSPA inhibit control, SSPA activate control, Transmit frequency, Receive frequency, Transmit attenuation, Receive attenuation, Cable compensation, Reference oscillator override, SSPA alarm enable, LNB alarm enable, Temperature compensation select, Packet address (ASCII mode only), Packet address range (ASCII mode only), Packet protocol select (ASCII mode only), SSPA mode select, Converter lock, Status change poll, Power-up mode

Remote control functions (serial interface): Power control (standby/on), SSPA inhibit control, SSPA activate control, Transmit frequency, Receive frequency, Transmit attenuation, Receive attenuation, Cable compensation, Reference oscillator override, SSPA alarm enable, LNB alarm enable, Temperature compensation select, Address range select (ASCII mode only), Packet protocol select (ASCII mode only), SSPA mode select, Reset, Reset change bits, Power-up mode

Remote monitoring functions (contact closure): Standby, Warm-up, SSPA activated, Converter fault, LNB fault, SSPA fault, Temperature fault, Fan fault

Remote control functions (contact closure): Power control (standby/on), SSPA inhibit control, SSPA activate control

ENVIRONMENTAL

Converter module and SSPA module

Temperature	–40°C to +55°C
Relative humidity	100%
Cooling	Converter—Convection 8 W, 16 W—Forced air
Weatherproofing	Sealed to 34 kPa

Power supply unit

Temperature	–40°C to +55°C
Relative humidity	100%
Cooling	Convection
Weatherproofing	Sealed to IP65

PHYSICAL

All dimensions are measured over the connectors.

Size

Converter module	110 mm W x 410 mm D x 240 mm H
SSPA module, 8 W, 16 W	140 mm W x 335 mm D x 195 mm H
Power Supply Unit	200 mm W x 160 mm D x 370 mm H

Weight

Converter module	8 kg
SSPA module, 8 W, 16 W	6 kg
Power Supply Unit	9 kg

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Head Office
Codan Limited
ABN 77 007 590 605
81 Graves Street
Newton SA 5074
AUSTRALIA
Telephone +61 8 8305 0311
Facsimile +61 8 8305 0411
www.codan.com.au

Asia Pacific
Codan Limited
81 Graves Street
Newton SA 5074
AUSTRALIA
Telephone +61 8 8305 0311
Facsimile +61 8 8305 0411
asiasales@codan.com.au

EMEA
Codan (UK) Ltd
Unit C4 Endeavour Place
Coxbridge Business Park
Farnham Surrey GU10 5EH
UNITED KINGDOM
Telephone +44 1252 717 272
Facsimile +44 1252 717 337
uksales@codan.com.au

Americas
Codan US, Inc.
8430 Kao Circle
Manassas VA 20110
USA
Telephone +1 703 361 2721
Facsimile +1 703 361 3812
ussales@codan.com.au

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