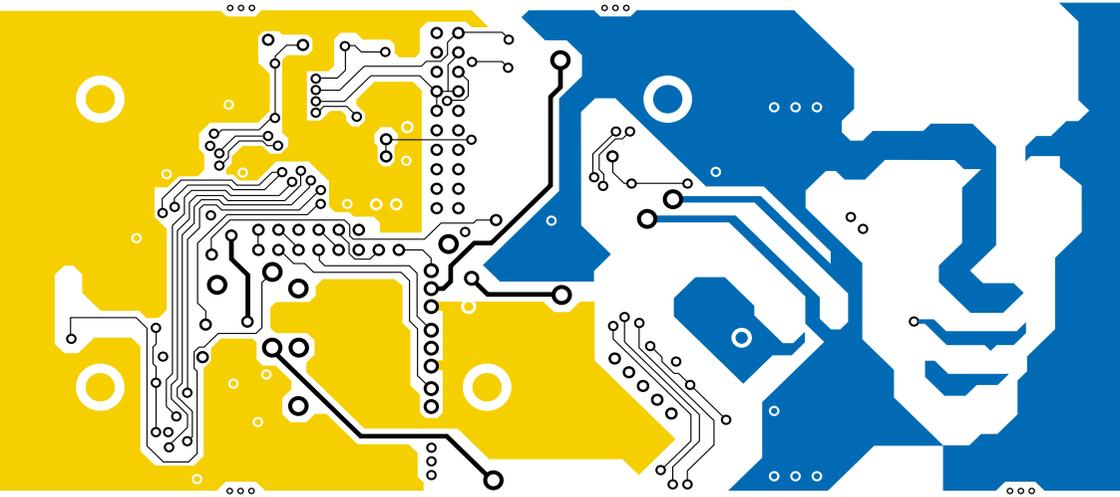




# Hand-Held Controller

## 5560

SATELLITE COMMUNICATIONS



USER GUIDE

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# 1 About this user guide

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This user guide describes how to use the Hand-Held Controller 5560 to monitor and change the major operating parameters of the C-Band Transceiver 5700 series and the Ku-Band Transceiver 5900 series.

This guide assumes that you already know how to operate the transceivers and their power supplies, which are supplied separately.

The user guide contains six chapters:

- Chapter 1** [About this user guide](#)—provides lists of all the terms, abbreviations and units used in this guide
- Chapter 2** [Hand-held controller compliance](#)—describes how to ensure that compliance of the hand-held controller is maintained
- Chapter 3** [Overview](#)—provides a general overview of the hand-held controller, including its specifications and the parameters it controls, how to use the controller and the differences between the transceivers it controls
- Chapter 4** [Installation and setup](#)—describes how to install the hand-held controller and check that is operating correctly
- Chapter 5** [Using the controller](#)—describes the general operation of the hand-held controller and how it is used to change the parameters and settings of the C-Band Transceiver 5700 series and the Ku-Band Transceiver 5900 series
- Chapter 6** [Display messages](#)—lists the messages you may see displayed and explains their nature and the course of action required for each message

An index can be found at the end of this guide.

# Standards and icons

The following standards and icons are used in this guide:

<b>This typeface</b>	<b>Means...</b>
<b>Bold</b>	the name of a button, knob, connector or LED and a segment of text from the display
<i>Italic</i>	a cross-reference or text requiring emphasis

<b>This typeface</b>	<b>Means...</b>
	A step within a task
	Warning: it is possible that you will seriously damage yourself or the equipment
	Caution: proceed with caution as your actions may lead to loss of data, privacy or signal quality
	Note: the text provided next to this icon may be of interest to you

# Definitions

## Acronyms and abbreviations

<b>Abbreviation</b>	<b>Means...</b>
DIP	dual inline package
H	hexadecimal
HPA	high power amplifier
IF	intermediate frequency
Insat	Indian satellite system
Intelsat	International Telecommunications Satellite Consortium
LCD	liquid crystal display
LED	light emitting diode
LNA	low noise amplifier
LNB	low noise block converter
modem	modulator-demodulator
MS	military style
RF	radio frequency
Rx	receive
SSPA	solid state power amplifier
TRF	transmit reject filter
Tx	transmit

## Glossary

<b>This term</b>	<b>Means...</b>
ASCII protocol	Serial communication method— American Standard Code for Information Interchange.
C-Band	Band of frequencies nominally covering the range 3.9 GHz to 6.2 GHz.
Carrier	RF signal used to carry information.
Demodulator	Device used to extract digital information from a modulated RF carrier.
Ku-Band	Band of frequencies nominally covering the range 11.0 GHz to 14 GHz.
Modem	Device used to convert digital information to a modulated RF carrier and to extract digital information from a modulated RF carrier.
Packet protocol	Serial communication method using a structured addressable packet of ASCII characters.
Palapa C	Indonesian satellite system.
Transceiver	Equipment comprising the converter, solid state power amplifier and low noise amplifier/low noise block converter.

## Units

<b>Measurement</b>	<b>Unit</b>	<b>Abbreviation</b>
Attenuation	decibel	dB
Data rate	bits per second	bps
Frequency	hertz	Hz
Impedance	ohm	$\Omega$
Power	watt	W
Voltage	volt	V

## Unit multipliers

<b>Unit</b>	<b>Name</b>	<b>Multiplier</b>
d	deci	$10^{-1}$
k	kilo	1000
M	mega	$10^6$
G	giga	$10^9$

## About this issue

This is the first issue of the Hand-Held Controller 5560 User Guide covering the CE compliance regulations introduced in April 2001. This guide is applicable to hand-held controllers with software version 2.01. Version 2.01 software provides operation with both the C-Band Transceiver 5700 series and the Ku-Band Transceiver 5900 series.



Any references to the C-Band Transceiver 5700 series and Ku-Band Transceiver 5900 series also include the high power versions of this equipment and their respective manuals.

## Associated documents

This user guide is one of a series of publications related to the C-Band Transceiver 5700 series and the Ku-Band Transceiver 5900 series. Other associated publications are:

- Remote Controller 5570 User Guide (Codan part number 15-44010-EN)
- C-Band Transceiver 5700 series Reference Manual (Codan part number 15-44001-EN)
- C-Band High Power Transceiver 5700 series Reference Manual (Codan part number 15-44002-EN)
- Ku-Band Transceiver 5900 series Reference Manual (Codan part number 15-44005-EN)
- Ku-Band High Power Transceiver 5900 series Reference Manual (Codan part number 15-44006-EN)

## 2 Hand-held controller compliance

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This chapter describes how to ensure the Hand-Held Controller 5560 complies with the European Electromagnetic Compatibility Directive and the European Low Voltage Directive.

# Electromagnetic compatibility and safety notices

The Hand-Held Controller 5560 has been tested and complies with the following standards:

- ETSI EN 301 489-1 V1.2.1 (2000–08) ‘Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements’
- ETSI EN 301 489-12 V1.1.1 (2000–12) ‘Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 12: Specific conditions for Very Small Aperture Terminal, Satellite Interactive Earth Stations operated in the frequency ranges between 4 GHz and 30 GHz in the Fixed Satellite Service (FSS)’
- EN 60950 ‘Safety of Information Technology Equipment, including electrical business machines’, 2000

Compliance with these standards is sufficient to fulfil the requirements of the following directives:

- European EMC Directive, 89/336/EEC
- European Low Voltage Directive, 73/23/EEC with no lower voltage limit

Equipment supplied by Codan that satisfies these requirements is identified by the **CE 0682** markings on the model label of the product.

## Complying with the European EMC and Low Voltage Directives

### Electromagnetic compatibility

To ensure compliance with the EMC Directive is maintained, you must:

- Use the standard shielded cables supplied by Codan for all connections.
- Ensure the covers for the equipment are correctly fitted.



If it is necessary to remove the covers at any stage, they must be re-fitted correctly before using the equipment.

### Electrical safety

All circuits within the Hand-Held Controller 5560 are SELV circuits and no special precautions are required.

### Earth symbol

A protective earth connection point has been provided on the controller. To comply with the European Low Voltage Directive, the symbol shown in [Table 2-1](#) is used to identify the connection.

Table 2-1: Earth symbol

Symbol	Meaning
	Protective earth

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# 3 Overview

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This chapter provides an overview of the hand-held controller and the transceivers it controls. It describes how to use the controller and distinguishes between the C-Band Transceiver 5700 series and the Ku-Band Transceiver 5900 series.

This chapter describes:

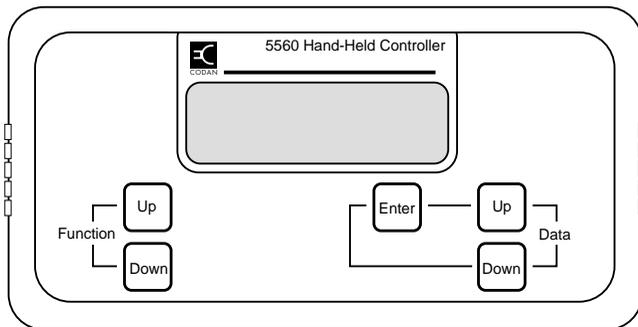
- the Hand-Held Controller 5560 (3-2)
- general specifications of the controller (3-5)
- the layout of the display and controls (3-7)
- the C-Band Transceiver 5700 series (3-9)
- the Ku-Band Transceiver 5900 series (3-12)

## About the Hand-Held Controller 5560

The Hand-Held Controller 5560 provides a user-friendly monitoring and programming facility for the C-Band Transceiver 5700 series and the Ku-Band Transceiver 5900 series.

The hand-held controller allows you to display and change the major operating parameters of the transceiver without having to remove the sealed control panel of the converter.

Figure 3-1: Hand-Held Controller 5560



The parameters that can be monitored and controlled by the hand-held controller are:

Control parameter

- SSPA activation

Main parameters

- Transmit frequency
- Receive frequency
- Transmit attenuation
- Receive attenuation

## Auxiliary parameters for the C-Band transceiver:

- LNA fault control
- Fan fault control
- SSPA fault control
- IF impedance
- IF frequency
- Transmit cable compensation
- Converter temperature compensation type
- SSPA temperature compensation type
- SSPA control mode
- Reference oscillator override
- Packet protocol
- Packet address
- Power up mode

Auxiliary parameters for the Ku-Band transceiver:

- LNB fault control
- SSPA fault control
- SSPA alarm mode
- SSPA alarm threshold
- IF impedance
- IF frequency
- Transmit cable compensation
- Converter temperature compensation type
- SSPA temperature compensation type
- SSPA output power detection type
- SSPA control mode
- Reference oscillator override
- Packet protocol
- Packet address
- Power up mode
- Receive range

# General specifications

## Power

The hand-held controller obtains power from the converter, therefore it does not require its own power supply.

Power to the controller is always available whenever the controller is connected to the converter and the converter is in Standby mode or is on.

Supply voltage      12.5 to 15 V DC

Power consumption   2.0 W maximum at 13.0 V

## Interface

Interface standard   RS232 serial interface (DIP switch on converter must be set appropriately)

Interface protocol   ASCII<sup>a</sup> (DIP switch on converter must be set appropriately)

Data rate<sup>b</sup>            1.2, 2.4, 4.8 or 9.6 kbps (auto-selecting)

Parity<sup>b</sup>                None, odd or even (auto-selecting)

Number of data bits<sup>b</sup> 7 or 8 (auto-selecting)

Number of stop bits<sup>b</sup> 1 or 2 (auto-selecting)

- a. After communications have been established, the interface operates in a packet protocol mode.
- b. Communication with the converter will be established in whatever interface setting has been set on the converter.

## Cabling

The controller is connected to the converter via a 6-way cable with an MS3116F14-19P MS connector. The cable is 2 metres in length and is hard-wired to the controller.

Table 3-1: Pin assignments

Pin	Assignments
A	+13 V
D	0 V
H	Tx data from controller to transceiver
J	Rx data from transceiver to controller
G	Not used (spare interface connection)
T	Not used (spare interface connection)

## Environment

The optimum operating temperature for the hand-held controller is between  $-10^{\circ}\text{C}$  and  $+40^{\circ}\text{C}$ .

The hand-held controller will operate correctly at a relative humidity of up to 90% non-condensing at  $+40^{\circ}\text{C}$ .

# Layout of display and controls

## The display

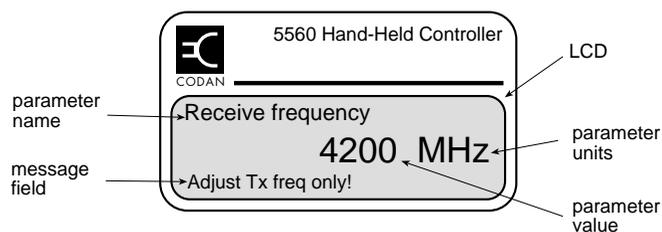
The operating parameters of the transceiver are displayed one at a time on the LCD of the hand-held controller.

Parameter details are shown in four fields (see Figure 3-2).

The details displayed are:

- parameter name
- current parameter value
- parameter data units (if applicable)
- message (if applicable)

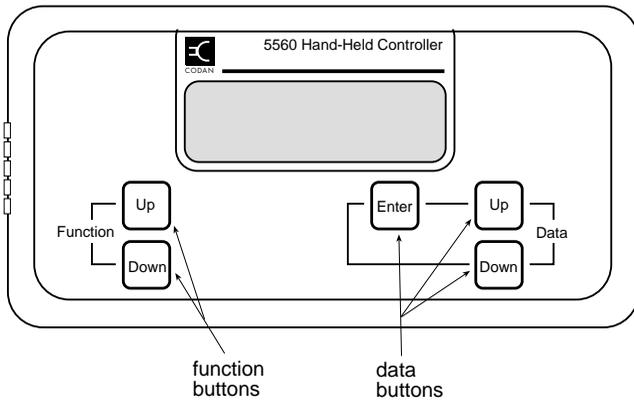
Figure 3-2: LCD of the hand-held controller



## The controls

The hand-held controller has two sets of membrane soft-touch control buttons—the **Function** buttons and the **Data** buttons (see Figure 3-3).

Figure 3-3: Position of buttons on the hand-held controller



You use the **Up** and **Down Function** buttons to display the next or the previous parameter.

You use the **Up** and **Down Data** buttons to increment or decrement the parameter value.

You use the **Enter Data** button to store the new value.

## About the C-Band Transceiver 5700 series

The C-Band Transceiver 5700 series is a high performance transceiver for use in a satellite earth station. It is ideally suited to single or multicarrier rural and remote area telephony and data communications. For a complete description of the transceiver, see the *C-Band Transceiver 5700 series Reference Manual*.

The C-Band Transceiver 5700 series comprises:

- an Up/Down Converter module 5700
- an SSPA 5705, 5710, 5720, 5730, 5740, 5760 or 5712H
- an LNA
- a Power Supply Unit 5582 (if required)

For details of each of the transceiver components, see *Chapter 5, How the transceiver works* in the *C-Band Transceiver 5700 series Reference Manual*.

The converter is available with several frequency, bandwidth and synthesiser options. The model label on your converter will indicate the options that have been fitted. The options available are discussed in the following sections.

## Frequency band options

The converter may be supplied for operation on one of four different frequency bands. The range of transmit and receive frequencies depends upon the band option of the transceiver (see Table 3-2).

Table 3-2: Transmit frequency band options of the C-Band Transceiver 5700 series

Band	Description	Transmit frequency (MHz)	Receive frequency (MHz)
2	C-Band, Extended	5850 to 6425	3625 to 4200
3	Insat	6725 to 7025	4500 to 4800
4	Palapa C & Intelsat VIII-A	6425 to 6700	3400 to 3675

The frequency band used by your converter is indicated by the first number in the options section on the model label. For example, **2/W/D** indicates the transceiver operates on extended C-Band (Band 2).

## Bandwidth options

The converter may be supplied to provide one of two IF bandwidths:

**Narrow** 40 MHz (indicated by an **N** in the second position in the options section on the model label of the converter)

**Wide** 80 MHz (indicated by a **W** in the second position in the options section on the model label of the converter)

If the converter is a narrow bandwidth model, you can select IF operation at either 70 MHz or 140 MHz.

If the converter is a wide bandwidth model, IF operation is at 140 MHz only.

## Synthesiser options

The converter may be fitted as one of two synthesiser options:

**Dual** allows you to select the transmit and receive frequencies independently (indicated by a **D** in the third position in the options section on the model label of the converter)

**Single** receive frequency is calculated automatically and determined by the transmit frequency (indicated by an **S** in the third position in the options section on the model label of the converter)

## About the Ku-Band Transceiver 5900 series

The Ku-Band Transceiver 5900 series is a high performance transceiver for use in a satellite earth station. It is ideally suited to single or multicarrier rural and remote area telephony and data communication. For a complete description of the transceiver, see the *Ku-Band Transceiver 5900 series Reference Manual*.

The Ku-Band Transceiver 5900 series comprises:

- an Up/Down Converter module 5900
- an SSPA 5902, 5904, 5908, 5916 or 5940
- an LNB
- a Power Supply Unit 5582 (if required)

For details of each of the transceiver components, see *Chapter 5, How the transceiver works* in the *Ku-Band Transceiver 5900 series Reference Manual*.

The converter is available with several frequency and bandwidth options. The model label on your converter will indicate the options that have been fitted. The options available are discussed in the following sections.

## Transmit frequency band options

The converter may be supplied for operation on a number of different transmit frequency bands. The range of transmit frequencies depends upon the band options of the converter (see Table 3-3).

Table 3-3: Transmit frequency band options of the Ku-Band Transceiver 5900 series

Band	Transmit frequency (MHz)
1	14000 to 14500
2	13750 to 14500

The frequency band used by your converter is indicated by the first number in the options section of the model label. For example, **1/N** indicates the transceiver operates in the transmit frequency band 14000 to 14500 MHz.

## Bandwidth options

The converter may be supplied with one of two IF bandwidths:

**Narrow** 40 MHz (indicated by an **N** in the second position in the options section on the model label of the converter)

**Wide** 80 MHz (indicated by a **W** in the second position in the options section on the model label of the converter)

If the converter is a narrow bandwidth model, you can select IF operation at either 70 MHz or 140 MHz.

If the converter is a wide bandwidth model, IF operation is at 140 MHz only.

## Synthesiser setting

The Ku-Band Transceiver 5900 series converter is fitted as a dual synthesiser. It does *not* have the single synthesiser option.

# 4 Installation and setup

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This chapter describes how to:

- connect the hand-held controller to the transceiver (4-2)
- check that the hand-held controller is operating correctly (4-4)
- disconnect the hand-held controller (4-5)

# Connecting the hand-held controller to the transceiver

The hand-held controller is supplied already assembled and has just one hard-wired cable.

It is assumed that either the C-Band Transceiver 5700 series or the Ku-Band Transceiver 5900 series has already been correctly installed and is powered up.

It should be noted that the converter must be set to RS232 interface and ASCII protocol (using the switches on the control panel of the converter). In the case of the C-Band Converter 5700, the converter software must be version 1.20 or later.



You do not have to turn the power to the transceiver off before connecting the hand-held controller.

To connect the hand-held controller to the transceiver:

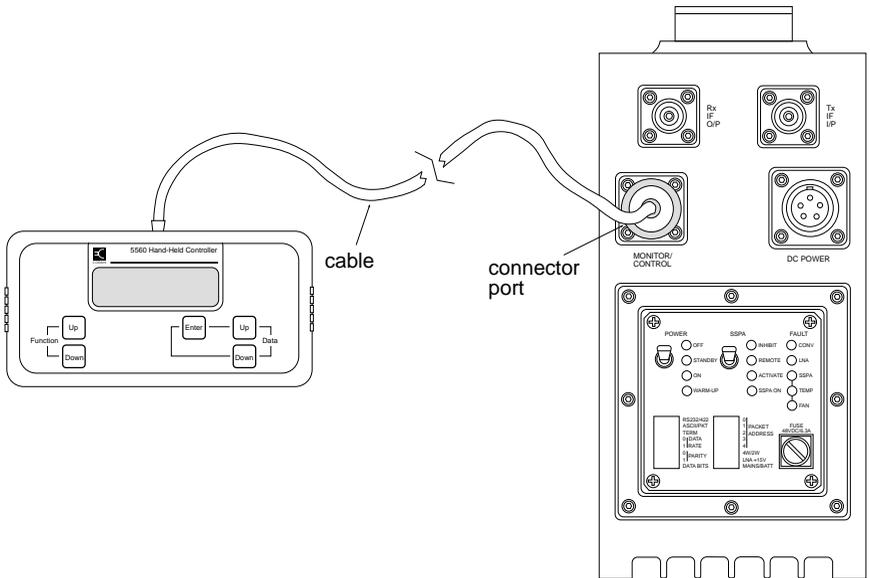
- Push the MS connector on the end of the hand-held controller cable into the **MONITOR/CONTROL** connector port on the converter.

The connector and port are polarised with small locating lugs.

- When the connector is in position, tighten the locking collar by turning it clockwise.

The locking collar will click into position.

Figure 4-1: Connecting the controller to the converter



## Checking controller operation

To check that the hand-held controller is installed properly and ready for use:

- ❑ Ensure that power to the transceiver is in standby or on (see *Chapter 7, Setting up the transceiver* in the *C-Band Transceiver 5700 series Reference Manual* or the *Ku-Band Transceiver 5900 series Reference Manual*).

The **ON** LED or the **STANDBY** LED on the control panel of the converter will be on when the power is on or in standby. Other LEDs may also be on, including fault LEDs.

The LCD on the hand-held controller will display the Codan logo for a few seconds. The LCD will then display **Connecting....** and a version number for the controller software.

The first parameter to be displayed will be **SSPA activation**.

The converter model number and software details will be displayed in the message field at the bottom of the display (see page 3-7, *Layout of display and controls*).

During this connecting period, if the controller displays a message, other than that described, see *Chapter 6, Display messages*.

- ❑ Press the **Up Function** button repeatedly to scroll through each parameter in turn.

If you want to go back to a previous parameter, press the **Down Function** button. When you have scrolled through all the available parameters, the first parameter, **SSPA activation**, will be displayed again.

If the controller responds as above, it is ready for use.

## Disconnecting the hand-held controller

To disconnect the hand-held controller from the transceiver:

- Undo the locking collar by turning it counter-clockwise.
- Remove the connector from the **MONITOR/CONTROL** connector port on the converter.

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# 5 Using the controller

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This chapter explains how the hand-held controller is used to set the parameters of the C-Band Transceiver 5700 series or the Ku-Band Transceiver 5900 series.

This chapter contains the following sections:

- control parameters (5-2)
- main parameters (5-3)
- auxiliary parameters (5-10)

## Control parameters

Control parameters activate or deactivate components of the transceiver.

### Activating/deactivating the SSPA

You can use the hand-held controller to activate or deactivate the SSPA as required. The **SSPA** switch on the converter must be set to **REMOTE**.

To activate or deactivate the SSPA:

- Press the **Up Function** button repeatedly to scroll through each parameter until **SSPA activation** is displayed.

If you want to scroll backwards, press the **Down Function** button.

- Press the **Up Data** button to toggle between **On** and **Off**. The unstored setting will flash.

- When the required setting is displayed, press the **Enter Data** button.

The new setting is now stored and the data field will stop flashing.

If you press the **Up** or **Down Function** button to move to the next parameter without pressing the **Enter Data** button first, the new setting will not be stored.

## Main parameters

The main parameters are used to control general operational functions. The main parameters are:

- transmit frequency
- receive frequency
- transmit attenuation
- receive attenuation

## Changing the transmit frequency

The transmit frequency can be set in 1 MHz increments. The range of frequencies available depends on the band option of the converter.

See [Table 5-1](#) to determine the appropriate transmit frequency for your particular transceiver.

Table 5-1: Transmit frequencies

Band	C-Band Transceiver 5700 series (MHz)	Ku-Band Transceiver 5900 series (MHz)
1		14000 to 14500
2	5850 to 6425	13750 to 14500
3	6725 to 7025	
4	6425 to 6700	



It is good practice to deactivate the SSPA before changing the transmit frequency (see [page 5-2, Activating/deactivating the SSPA](#)).

To view or change the transmit frequency of the converter:

- ❑ Press the **Up Function** button repeatedly to scroll through each parameter until the **Transmit frequency** parameter is displayed.

If you want to scroll backwards, press the **Down Function** button.

- ❑ If you want to change the transmit frequency, press the **Up Data** button or the **Down Data** button until the required frequency is displayed.

If you hold the button down for more than two seconds, the controller will fast scroll through the values.

The unstored value will flash.

- ❑ When the required value is displayed, press the **Enter Data** button.

The new value is now stored and the data field will stop flashing.

If you press the **Up** or **Down Function** button to move to the next parameter without pressing the **Enter Data** button first, the new value will not be stored.

- ❑ If you deactivated the SSPA before changing the transmit frequency, you may want to reactivate it now.

## Changing the receive frequency

### C-Band Transceiver 5700 series

The ability to change the receive frequency depends on whether the converter is fitted with the dual or single synthesiser option.

Single synthesiser operation is indicated by an **S** in the third position in the options section on the model label of the converter. Dual synthesiser operation is indicated by a **D**.

If the converter is fitted with the single synthesiser option, the receive frequency is calculated automatically; determined by the transmit frequency with a 2225 MHz offset. In this case, you will be able to view the value for the receive frequency on the hand-held controller LCD, but will not be able to change it. If you attempt to change the receive frequency, a message is displayed (see [Chapter 6, Display messages](#)).

If the converter is fitted with the dual synthesiser option, you will be able to set the transmit and receive frequencies independently.

The receive frequency can be set in 1 MHz increments. The range of frequencies available depends on the band option of the converter.

See [Table 5-2](#) to determine the appropriate receive frequency for your converter.

Table 5-2: Receive frequencies of the C-Band Transceiver 5700 series

Band	Rx frequency minimum (MHz)	Rx frequency maximum (MHz)
2	3625	4200
3	4200	4800
4	3400	3675

### Ku-Band Transceiver 5900 series

The converter is fitted as a dual synthesiser, therefore you are able to set the transmit and receive frequencies independently.

The receive frequency can be set in 1 MHz increments. The range of frequencies available depends on the receive range setting of the converter. The receive range of the converter must be set to match the receive frequency range of the connected LNB.

See [Table 5-3](#) to determine the appropriate receive frequency for your receive range setting.

Table 5-3: Receive frequencies of the Ku-Band Transceiver 5900 series

Receive range setting	Rx frequency minimum (MHz)	Rx frequency maximum (MHz)
L-Band	950	1700
Band 1	10950	11700
Band 2	11700	12200
Band 3	12250	12750

The L-Band setting is provided for test purposes. These frequencies correspond directly to the converter’s Rx input, and not the LNB input.

 Before adjusting the receive frequency, ensure the receive range is set correctly (see page 5-38, *Changing the receive frequency range (Ku-Band transceiver only)*).

## Changing the receive frequency

To view or change the receive frequency of the converter:

- Press the **Up Function** button repeatedly to scroll through each parameter until the **Receive frequency** parameter is displayed.

If you want to scroll backwards, press the **Down Function** button.

- If you want to change the receive frequency, press the **Up Data** button or the **Down Data** button until the required frequency is displayed.

If you hold the button down for more than two seconds, the controller will fast scroll through the available values.

The unstored value will flash.

- When the required value is displayed, press the **Enter Data** button.

The new value is now stored and the data field will stop flashing.

If you press the **Up** or **Down Function** button to move to the next parameter without pressing the **Enter Data** button first, the new value will not be stored.

## Changing the transmit attenuation

The transmit attenuation value sets the attenuation of the up converter and hence can be used to set the output level of the SSPA.

It is good practice to monitor the SSPA output power when changing the transmit attenuation.



You must deactivate the SSPA before disconnecting the SSPA output from the antenna or power meter (see page 5-2, *Activating/deactivating the SSPA*).

To adjust the transmit attenuation:

- Disconnect the SSPA output from the antenna.
- Connect the SSPA output to an appropriately rated load and a power meter.
- Set the modem (or other IF signal source) to transmit a carrier at the required IF frequency.
- Use a power meter or spectrum analyser to check that the IF level is correct.
- Connect the hand-held controller to the converter.
- Reactivate the SSPA ([see page 5-2, Activating/deactivating the SSPA](#)).
- Press the **Up Function** button on the hand-held controller repeatedly to scroll through each parameter until the **Transmit attenuation** parameter is displayed.

If you want to scroll backwards, press the **Down Function** button.

- Press the **Up** or **Down Data** buttons to change the transmit attenuation setting.

Reducing attenuation increases the output level.

- Press the **Enter Data** button to store the new setting.
- Continue to adjust the transmit attenuation until the RF level is within  $\pm 1$  dB of the required level.

The transmit attenuation can be set between 0 and 30 dB for the C-Band Transceiver 5700 series with serial number prefix C or earlier, and between 0 and 25 dB for the C-Band Transceiver 5700 series with serial number prefix D or later and all Ku-Band Transceiver 5900 series.

- Deactivate the SSPA, set the modem to the transmit **Off** state, disconnect all test equipment and reconnect the SSPA output to the antenna.
- Reactivate the SSPA.

## Changing the receive attenuation

The receive attenuation sets the received carrier level presented to the demodulators.

To adjust the receive attenuation:

- Connect a spectrum analyser to the **Rx IF O/P** connector of the converter.
- Select a carrier at a level suitable for reception at the earth station.

If no such carrier is available, arrange for a carrier to be transmitted either from another earth station, or by looping back via the satellite from your earth station.

- Connect the hand-held controller to the converter.
- Press the **Up Function** button on the hand-held controller repeatedly to scroll through each parameter until the **Receive attenuation** parameter is displayed.

If you want to scroll backwards, press the **Down Function** button.

- Press the **Up** or **Down Data** buttons to change the receive attenuation setting.

Reducing attenuation increases the receive IF output level.

- Press the **Enter Data** button to store the new setting.
- Continue to adjust the receive attenuation until the IF level is within  $\pm 2$  dB of the required level.

The receive attenuation can be set between 0 and 30 dB for the C-Band Transceiver 5700 series and between 0 and 25 dB for the Ku-Band Transceiver 5900 series.

- Turn off the loop back carrier (if used) and disconnect all test equipment.

## Auxiliary parameters

The auxiliary parameters are set during the installation of the transceiver and should not need to be changed unless the installation is changed. The auxiliary parameters of the C-Band Transceiver 5700 series and the Ku-Band Transceiver 5900 series are listed below.

Auxiliary parameters for the C-Band transceiver:

- LNA fault control
- Fan fault control
- SSPA fault control
- IF impedance
- IF frequency
- Transmit cable compensation
- Converter temperature compensation type
- SSPA temperature compensation type
- SSPA control mode
- Reference oscillator override
- Packet protocol
- Packet address
- Power up mode

Auxiliary parameters for the Ku-Band transceiver:

- LNB fault control
- SSPA fault control
- SSPA alarm mode
- SSPA alarm threshold
- IF impedance
- IF frequency
- Transmit cable compensation
- Converter temperature compensation type
- SSPA temperature compensation type
- SSPA output power detection type
- SSPA control mode
- Reference oscillator override
- Packet protocol
- Packet address
- Power up mode
- Receive range

The auxiliary parameters of the C-Band transceiver and the Ku-Band transceiver are described in the following sections.

## Fault indicators

The converters may be used with a range of SSPAs or LNAs/LNBs, some of which may not require fault reporting via the converter module. Simply disconnecting the SSPA or LNA/LNB will not prevent faults being indicated. In these installations, the unwanted fault indicators may be disabled using the hand-held controller.

There are five red **FAULT** LEDs on the control panel of the converter. These LEDs will illuminate to indicate faults in the converter, LNA/LNB and SSPA, including SSPA temperature, and/or SSPA fan fault.

## C-Band Transceiver 5700 series

You can enable or disable the LNA, SSPA, SSPA temperature and SSPA fan faults as required. However, there is no facility to disable the converter (**CONV**) fault.



If the SSPA fault control is disabled, the fan fault control will automatically be disabled and the SSPA, SSPA temperature and SSPA fan fault indicators will be prevented from operating.

Use the following tables to determine the required setting of the fault controls for the installation of your C-Band transceiver.

## Converter in stand-alone situation

If the converter in your installation is stand-alone, such as in a major earth station where the HPA and LNA systems are independent and not monitored with the converter, see [Table 5-4](#) for the fault control settings.

Table 5-4: Fault control settings in a stand-alone situation

<b>Fault control</b>	<b>Status</b>
LNA fault	Disabled
SSPA fault	Disabled
Fan fault	Disabled (this setting automatically occurs when the SSPA fault control is disabled)

## Converter used with LNA and SSPA

If the converter in your installation is used with an LNA and either a 5705, 5710, 5720, 5730, 5740, 5760 or 5712H SSPA, see [Table 5-5](#) for the fault control settings.

Table 5-5: Fault control settings for a converter used with an LNA and SSPA (extended interface)

<b>Fault control</b>	<b>Status</b>
LNA fault	Enabled
SSPA fault	Enabled
Fan fault	Enabled for 5710, 5720, 5730, 5740 Disabled for 5705, 5760 and 5712H

For operation with other C-Band HPAs, contact your Codan representative.

## Converter used with Basic SSPA

If the converter in your installation is used with a Basic SSPA, see [Table 5-6](#) for the fault control settings.

Table 5-6: Fault settings for a converter used with a Basic SSPA

Fault control	Status
SSPA fault	Enabled
Fan fault	Disabled (if an SSPA with a suitable fan interface is used, the fault indicator may be enabled)

## Ku-Band Transceiver 5900 series

You can enable or disable the LNB, SSPA, and SSPA temperature faults as required. However, there is no facility to disable the **CONV** fault or the **FAN** fault. The Ku-Band transceiver does *not* have a fan fault control. The converter automatically detects whether or not the SSPA that is connected has a fan. If the SSPA connected does not have a fan, the fan fault indicators are automatically disabled.



If the SSPA fault control is disabled, the SSPA and SSPA temperature fault indicators and alarm outputs will automatically be disabled.

Use the following tables to determine the required setting of the fault controls for the installation of your Ku-Band transceiver.

## Converter in stand-alone situation

If the converter in your installation is stand-alone, such as in a major earth station where the HPA and LNB systems are independent and not monitored with the converter, see [Table 5-7](#) for the fault control settings.

Table 5-7: Fault control settings in a stand-alone situation

<b>Fault control</b>	<b>Status</b>
LNB fault	Disabled
SSPA fault	Disabled

## Converter used with LNB and SSPA

If the converter in your installation is used with an LNB and either a 5902, 5904, 5908, 5916 or a 5940 SSPA, see [Table 5-8](#) for the fault control settings.

Table 5-8: Fault control settings for a converter used with an LNB and 5902–5940 SSPA

<b>Fault control</b>	<b>Status</b>
LNB fault	Enabled
SSPA fault	Enabled

For operation with other Ku-Band HPAs, contact your Codan representative.

## Enabling/disabling fault controls

To enable or disable the fault controls:

- ❑ Press the **Up Function** button repeatedly to scroll through each parameter until **LNA fault control/LNB fault control**, **SSPA fault control**, or **Fan fault control** (C-Band Transceiver 5700 series only), as required, is displayed.

If you want to scroll backwards, press the **Down Function** button.

- ❑ Press the **Up Data** or **Down Data** button to toggle between **Enabled** and **Disabled**.

The unstored setting will flash.

- ❑ When the required setting is displayed, press the **Enter Data** button.

The new setting is now stored and the data field will stop flashing. If you try to set the Fan fault control to **Enabled** when the SSPA fault control is **Disabled**, the LCD will display an error message (see [Chapter 6, Display messages](#)).

If you press the **Up** or **Down Function** button to move to the next parameter without pressing the **Enter Data** button first, the new setting will not be stored.

## Changing the IF impedance

To view or change the IF impedance:

- Press the **Up Function** button repeatedly to scroll through each parameter until the **IF impedance** parameter is displayed.

If you want to scroll backwards, press the **Down Function** button.

The IF impedance is displayed in ohms. There are two values, 50 or 75 ohms.

- If you want to change the IF impedance, press the **Up Data** button or the **Down Data** button until the required value is displayed.

The unstored value will flash.

- When the required value is displayed, press the **Enter Data** button.

The new value is now stored and the data field will stop flashing.

If you press the **Up** or **Down Function** button to move to the next parameter without pressing the **Enter Data** button first, the new value will not be stored.

## Changing the IF frequency

The ability to change the IF frequency depends on whether your converter is fitted with the narrow or wide bandwidth option.

If your converter is fitted with the narrow bandwidth (40 MHz) option, you will be able to select IF operation at either 70 MHz or 140 MHz.

If your converter is fitted with the wide bandwidth (80 MHz) option, the IF frequency is preset to 140 MHz. In this case, you will be able to view the value for the IF frequency on the hand-held controller LCD, but you will not be able to change it.

Narrow bandwidth operation is indicated by an **N** in the second position in the options section on the model label of the converter. Wide bandwidth operation is indicated by a **W** in the same position on the model label.

To view or change the IF frequency of the converter:

- Press the **Up Function** button repeatedly to scroll through each parameter until the **IF frequency** parameter is displayed.

If you want to scroll backwards, press the **Down Function** button.

The IF frequency is displayed in MHz. With narrow bandwidth there are two values, 70 or 140 MHz. With wide bandwidth there is one valid value, 140 MHz.

- If you want to change the IF frequency, press the **Up Data** button or the **Down Data** button until the required frequency is displayed.

The unstored value will flash.

- When the required value is displayed, press the **Enter Data** button.

The new value is now stored and the data field will stop flashing.

If you press the **Up** or **Down Function** button to move to the next parameter without pressing the **Enter Data** button first, the new value will not be stored.

## Changing the transmit cable compensation



5700 and 5900 converters with a serial number prefix of D or later are not provided with a cable compensation facility. When connected to one of these converters, the hand-held controller shows the cable compensation setting as N/A.

The cable compensation can be changed to allow the frequency response of the transmit IF cable to be corrected.

The transmit cable compensation must be set when the transceiver is first installed. Additionally, it may be necessary to change the cable compensation if the type or length of the transmit IF cable in your installation is changed.

There are 16 boost increments for cable compensation, ranging from 0 dB to 1.2 dB boost for the 70 MHz IF (see [Table 5-9](#)), and from 0 dB to 2.5 dB boost for the 140 MHz IF (see [Table 5-10](#)).

You do not need to set or change the transmit cable compensation value for narrow bandwidth single carrier applications.

For multiple carrier or IF frequency agile applications, see [Tables 5-9](#) and [5-10](#) to determine the most suitable setting for your installation.

Table 5-9: Cable compensation settings (70 MHz IF)

Cable Length		RG58	RG8	FSJ1-50A Heliax	Belden 9913	RG6	RG11	Belden 9116
metres	feet	50 Ω	50 Ω	50 Ω	50 Ω	75 Ω	75 Ω	75 Ω
0–5	0–16	1	0	0	0	0	0	0
6–10	17–33	3	1	1	1	1	1	1
11–15	34–49	5	2	2	1	2	2	3
16–20	50–66	7	3	3	2	3	3	4
21–25	67–82	9	4	3	2	5	4	5
26–30	83–98	12	5	4	3	6	5	6
31–35	99–115	14	6	5	3	6	6	7
36–40	116–131	15	7	6	3	7	7	8
41–45	132–148	-	7	6	4	8	7	9
46–50	149–164	-	8	7	4	9	8	10
51–55	165–180	-	9	8	5	11	9	11
56–60	181–197	-	10	9	5	12	10	12
61–65	198–213	-	11	9	6	12	11	13
66–70	214–230	-	12	10	6	13	12	14
71–75	231–246	-	12	11	7	14	12	15
76–80	247–262	-	13	12	8	15	13	-
81–85	263–279	-	14	12	8	-	14	-
86–90	280–295	-	15	13	9	-	15	-
91–95	296–312	-	-	14	9	-	-	-
96–100	313–328	-	-	15	10	-	-	-

Table 5-10: Cable compensation settings (140 MHz IF)

Cable Length		RG58	RG8	FSJ1-50A Heliax	Belden 9913	RG6	RG11	Belden 9116
metres	feet	50 Ω	50 Ω	50 Ω	50 Ω	75 Ω	75 Ω	75 Ω
0-5	0-16	1	0	0	0	0	0	0
6-10	17-33	2	1	1	1	1	1	1
11-15	34-49	4	2	1	1	2	2	2
16-20	50-66	5	2	2	1	2	2	3
21-25	67-82	7	3	2	2	3	3	4
26-30	83-98	8	3	3	2	4	3	5
31-35	99-115	10	4	3	3	5	4	5
36-40	116-131	11	5	4	3	5	5	6
41-45	132-148	13	5	4	4	6	5	7
46-50	149-164	14	6	5	4	7	6	8
51-55	165-180	15	6	6	4	7	6	9
56-60	181-197	-	7	6	5	8	7	10
61-65	198-213	-	8	7	5	9	8	11
66-70	214-230	-	8	7	6	10	8	11
71-75	231-246	-	9	8	6	10	9	12
76-80	247-262	-	10	8	7	11	10	13
81-85	263-279	-	10	9	7	12	10	14
86-90	280-295	-	11	9	7	12	11	15
91-95	296-312	-	11	10	8	13	11	15
96-100	313-328	-	12	10	8	14	12	-

The settings in [Tables 5-9](#) and [5-10](#) typically provide compensation to within  $\pm 0.2$  dB over the IF range.

If you require a more accurate compensation, use a signal generator and a power meter to measure the total system frequency response from IF to RF. For further details, see *Chapter 7, Setting up the transceiver* in the *C-Band Transceiver 5700 series Reference Manual* or the *Ku-Band Transceiver 5900 series Reference Manual*.

To view or change the transmit cable compensation value:

- Press the **Up Function** button repeatedly to scroll through each parameter until the **Transmit cable comp** parameter is displayed.

If you want to scroll backwards, press the **Down Function** button.

- Set the cable compensation to the value determined from either [Table 5-9](#) or [5-10](#). Press the **Up Data** button or the **Down Data** button until the required value is displayed.

The unstored value will flash.

- When the required value is displayed, press the **Enter Data** button.

The new value is now stored and the data field will stop flashing.

If you press the **Up** or **Down Function** button to move to the next parameter without pressing the **Enter Data** button first, the new value will not be stored.

## Changing the converter temperature compensation type

The gain versus temperature compensation characteristic of the converter is normally set to the standard type. For special applications where more accurate compensation is required, the converter can be individually characterised and the characteristic uploaded into the converter. When an alternative converter characteristic is loaded, it may be selected using the converter temperature compensation type parameter.

To view or change the converter temperature compensation type:

- Press the **Up Function** button repeatedly to scroll through each parameter until **Conv temp comp** is displayed.

If you want to scroll backwards, press the **Down Function** button.

- Press the **Up Data** button to toggle between **Standard** and the other setting (an eight-character name). If a second temperature compensation type has not been loaded, you will only be able to select **Standard**.

The unstored setting will flash.

- When the required setting is displayed, press the **Enter Data** button.

The new setting is now stored and the data field will stop flashing.

If you press the **Up** or **Down Function** button to move to the next parameter without pressing the **Enter Data** button first, the new setting will not be stored.

## Changing the SSPA temperature compensation type

### C-Band Transceiver 5700 series

The gain versus temperature compensation characteristic for the SSPA selected in the converter needs to equate to the type of SSPA connected. Therefore, the converter must be set with the temperature compensation type of the SSPA used in your installation.

If the converter in your installation is in a stand-alone situation, such as where the HPA system is independent and not monitored with the converter, the SSPA temperature compensation type should be set to **Off**.



The SSPA temperature compensation type is automatically set to **Off** when the SSPA fault control is disabled.

If you are using a 5760, 5712H SSPA or another SSPA that is internally temperature compensated, the SSPA temperature compensation type should be set to **Off**.

If the converter is used with a 5705–5740 SSPA, the SSPA temperature compensation type should be the model number of the SSPA (see [Table 5-11](#)). Additionally, there may be up to three custom SSPA types.

Table 5-11: SSPA temperature compensation type for the C-Band Transceiver 5700 series

<b>SSPA</b>	<b>SSPA temperature compensation type</b>
5705	5705
5710	5710
5720	5720–5740
5730	5720–5740
5740	5720–5740
5760	Off
5712H	Off
internally compensated	Off

For special applications, where more accurate compensation is required, the SSPA may be individually characterised and the characteristic uploaded into the converter. When such an alternative SSPA characteristic is loaded, it will appear as an additional temperature compensation table in the menu list and can then be selected.

### Ku-Band Transceiver 5900 series

The gain versus temperature compensation characteristic for the SSPA is provided by the SSPA. Therefore, the setting automatically changes when a different SSPA is connected.

The SSPA compensation type for the Ku-Band Transceiver 5900 series can be either **Off** (for an internally temperature compensated SSPA such as the 5940), a standard characteristic for SSPAs 5902, 5904, 5908 or 5916, or a custom characteristic (if loaded).

If the converter is used with an SSPA 5902–5940, the standard compensation characteristic should be selected. The standard characteristic displayed is dependent upon the model number of the SSPA used. For example, if an SSPA 5902 is connected, the display shows **5902 Std** (see [Table 5-12](#)).

Table 5-12: SSPA temperature compensation type for the Ku-Band Transceiver 5900 series

SSPA	SSPA temperature compensation type
5902	5902 Std
5904	5904 Std
5908	5908 Std
5916	5916 Std
5940	Off
internally compensated	Off

For special applications, where more accurate compensation is required, the SSPA may be individually characterised and the characteristic uploaded into the SSPA. When such an alternative SSPA characteristic is loaded, it will appear as an additional temperature compensation table in the menu list and can then be selected.

## Changing the SSPA temperature compensation type

To view or change the type of SSPA temperature compensation type:

- Press the **Up Function** button repeatedly to scroll through each parameter until **SSPA temp comp** is displayed.

If you want to scroll backwards, press the **Down Function** button.

- Press the **Up** or **Down Data** button to scroll through the SSPA types.

The unstored types will flash.

- When the required SSPA type is displayed, press the **Enter Data** button.

The new setting is now stored and the data field will stop flashing. If you try to set the SSPA type to a setting other than **Off** when the SSPA fault control is **Disabled** or the SSPA control mode is **Basic**, the LCD will display an error message (see Chapter 6, *Display messages*).

If you press the **Up** or **Down Function** button to move to the next parameter without pressing the **Enter Data** button first, the new setting will not be stored.

## Changing the SSPA control mode

The SSPA control mode sets the interface mode to the SSPA. The Extended mode allows for more data feedback from the SSPA than the Basic mode.

If the converter in your installation is in a stand-alone situation, such as where the HPA system is independent and not monitored with the converter, it does not matter how the SSPA control mode is set.

When the converter is used with an SSPA, set the SSPA control mode according to the SSPA model that you have (see [Tables 5-13](#) and [5-14](#)).

Table 5-13: SSPA control mode for the C-Band Transceiver 5700 series

SSPA	Mode
5705	Extended
5710	Extended
5720	Extended
5730	Extended
5740	Extended
5760	Basic
5712H	Basic

Table 5-14: SSPA control mode for the Ku-Band Transceiver 5900 series

SSPA	Mode
5902	Extended
5904	Extended
5908	Extended
5916	Extended
5940	Basic

For interfacing with SSPAs other than those listed in [Tables 5-13](#) and [5-14](#), contact your Codan representative.

When selecting **Basic**, you must set the SSPA temperature compensation to **Off** (see [page 5-24](#), *Changing the SSPA temperature compensation type*).

To select the SSPA control mode:

- Press the **Up Function** button repeatedly to scroll through each parameter until **SSPA mode** is displayed.

If you want to scroll backwards, press the **Down Function** button.

- Press the **Up Data** button to toggle between **Extended** and **Basic**.

The unstored mode will flash.

- When the required mode is displayed, press the **Enter Data** button.

The new mode is now stored and the data field will stop flashing.

If you press the **Up** or **Down Function** button to move to the next parameter without pressing the **Enter Data** button first, the new mode will not be stored.

## Changing the power up mode



The power up mode facility is only available in converters with serial number prefix D or later. For converters with serial number prefix A, B or C, this parameter setting is shown as N/A.

CE approval requires that upon power up, the transceiver shall not enter the transmit state (SSPA on). When the power up mode is set to **TxOff**, the SSPA is not activated upon application of power to the transceiver. When the power up mode is set to **LastState** the SSPA returns to the same activation state that existed prior to power off. For further information on power up mode, see *Chapter 8, Operating the transceiver* in the *C-Band Transceiver 5700 series Reference Manual* or the *Ku-Band Transceiver 5900 series Reference Manual*.

To set the power up mode:

- Press the **Up Function** button repeatedly to scroll through each parameter until **Power Up** is displayed.

If you want to scroll backwards, press the **Down Function** button.

- Press the **Up Data** button to toggle between **LastState** and **TxOff**.

The unstored mode will flash.

- When the required mode is displayed, press the **Enter Data** button.

The new mode is now stored and the data field will stop flashing.

If you press the **Up** or **Down Function** button to move to the next parameter without pressing the **Enter Data** button first, the new mode will not be stored.

## Enabling/disabling the reference oscillator override

When the transceiver is switched from off to the standby or operating mode, the internal reference oscillator has to warm up. This may take only 30 seconds or as long as 15 minutes, depending on the ambient temperature and how long the transceiver has been switched off.

If the reference oscillator override is disabled, the **WARM-UP** LED on the control panel of the converter will be on during the warm-up period. During this time, transmission from the converter is prevented. The **WARM-UP** LED goes off when the oscillator reaches its correct operating temperature. Transmission can then occur.

If the reference oscillator override is enabled, the transmit disable function during the warm-up period is overridden. In this situation, the **WARM-UP** LED on the control panel of the converter flashes during the warm-up period. During this time, transmission from the converter can occur, but it should be noted that the accuracy of the transmit frequency may not be within specifications.



Transmit frequency accuracy may not be within specifications while the **WARM-UP** LED is flashing.

To enable or disable the reference oscillator override:

- Press the **Up Function** button repeatedly to scroll through each parameter until **Reference override** is displayed.

If you want to scroll backwards, press the **Down Function** button.

- Press the **Up Data** button to toggle between **Enabled** and **Disabled**.

The unstored setting will flash.

If you enable the override, the transceiver will be able to transmit during the warm-up period.

- ❑ When the required setting is displayed, press the **Enter Data** button.

The new setting is now stored and the data field will stop flashing.

If you press the **Up** or **Down Function** button to move to the next parameter without pressing the **Enter Data** button first, the new setting will not be stored.

## Changing the packet protocol

Communication with the transceiver can be via ASCII or various packet protocols. For more information on protocols, see *Chapter 8, Operating the transceiver in the C-Band Transceiver 5700 series Reference Manual* or the *Ku-Band Transceiver 5900 series Reference Manual*.

The hand-held controller allows you to select one of four packet protocols (depending on the version of software in the converter).

To change the packet protocol:

- ❑ Press the **Up Function** button repeatedly to scroll through each parameter until **Packet protocol** is displayed.

If you want to scroll backwards, press the **Down Function** button.

- ❑ Press the **Up** or **Down Data** button to scroll through the protocols.

The unstored protocol will flash.

- ❑ When the required protocol is displayed, press the **Enter Data** button.

The new protocol is now stored and the data field will stop flashing.

If you press the **Up** or **Down Function** button to move to the next parameter without pressing the **Enter Data** button first, the new protocol will not be stored.

## Changing the packet address

In a system using packet protocol control, the address of the transceiver is set at the time of installation, or when replacing a transceiver.

The hand-held controller allows you to select one of four serial interface address ranges. The ranges are in increments of 32, from 0 (00H) to 127 (7FH).

The actual address within the range selected on the hand-held controller is set using the DIP switches on the control panel of the converter.



The **ASCII/PKT** DIP switch on the control panel of the converter must be set to **PKT** (ON) for the packet address to be applicable.



The packet address should *not* be set to 0 or 127. Address 0 is reserved for the controlling source and address 127 is a global address for all Codan converters.

To change the packet address:

- Press the **Up Function** button repeatedly to scroll through each parameter until **Packet address** is displayed.

If you want to scroll backwards, press the **Down Function** button.

- Press the **Up** or **Down Data** button to display the address range you require. The ranges are:

0 to 31  
32 to 63  
64 to 95  
96 to 127

- Using the packet address DIP switches on the control panel of the converter, select the required address within the range (see [Table 5-15](#) for switch positions).

Table 5-15: Switch positions for setting the packet address

Switch 0	Switch 1	Switch 2	Switch 3	Switch 4	Packet Address
OFF	OFF	OFF	OFF	OFF	0
ON	OFF	OFF	OFF	OFF	1
OFF	ON	OFF	OFF	OFF	2
OFF	OFF	ON	OFF	OFF	4
OFF	OFF	OFF	ON	OFF	8
OFF	OFF	OFF	OFF	ON	16
ON	ON	ON	ON	ON	31



The DIP switches can be changed at any time.

The selected address will be shown on the display of the hand-held controller. If the address range has been changed from the previous setting, it will be flashing.

- When the required address range has been selected, press the **Enter Data** button.

The new address range is now stored and the display will stop flashing.

If you press the **Up** or **Down Function** button to move to the next parameter without pressing the **Enter Data** button first, the new address range will not be stored.

## Changing the SSPA alarm mode (Ku-Band transceiver only)

The SSPA alarm mode controls the mode of the SSPA alarm output.

- |           |  |
|-----------|--|
| On/Off    | The SSPA alarm output from the transceiver is <b>On</b> when the SSPA is not activated                               |
| O/P level | The SSPA alarm output from the transceiver is <b>On</b> when the SSPA output power is below the SSPA alarm threshold |

To view or change the SSPA alarm mode:

- Press the **Up Function** button repeatedly to scroll through each parameter until the **SSPA alarm mode** parameter is displayed.

If you want to scroll backwards, press the **Down Function** button.

- If you want to change the SSPA alarm mode, press the **Up Data** button or the **Down Data** button until the required mode is displayed.

The unstored mode will flash.

- When the required mode is displayed, press the **Enter Data** button.

The new mode is now stored and the data field will stop flashing.

If you press the **Up** or **Down Function** button to move to the next parameter without pressing the **Enter Data** button first, the new mode will not be stored.

## Changing the SSPA alarm threshold (Ku-Band transceiver only)

The SSPA alarm threshold can be set between 20 and 55 dBm.

To view or change the SSPA alarm threshold:

- Press the **Up Function** button repeatedly to scroll through each parameter until the **SSPA alarm threshold** parameter is displayed.

If you want to scroll backwards, press the **Down Function** button.

- If you want to change the alarm threshold, press the **Up Data** button or the **Down Data** button until the required alarm threshold value is displayed.

The unstored value will flash.

- When the required value is displayed, press the **Enter Data** button.

The new value is now stored and the data field will stop flashing.

If you press the **Up** or **Down Function** button to move to the next parameter without pressing the **Enter Data** button first, the new value will not be stored.

## Changing the SSPA output power detection type (Ku-Band transceiver only)

The SSPA output power detection characteristic of the SSPA is normally set to the standard setting.

The standard characteristic displayed is dependent upon the model number of the SSPA used. For example, if an 5902 SSPA is connected, the display shows **5902 Std.**

For special applications, where more accurate detection is required, the SSPA detector can be individually characterised and the characteristic uploaded into the SSPA. When an alternative SSPA characteristic is loaded, it can then be selected. Contact your Codan representative for further details.

To view or change SSPA output power detection type:

- Press the **Up Function** button repeatedly to scroll through each parameter until **SSPA O/P detection** is displayed.

If you want to scroll backwards, press the **Down Function** button.

- Press the **Up Data** button to toggle between **59XX Std** and the other setting (an eight-character name). If a second output power detection type has not been loaded, you will only be able to select **59XX Std**.

The unstored setting will flash.

- When the required setting is displayed, press the **Enter Data** button.

The new setting is now stored and the data field will stop flashing.

If you press the **Up** or **Down Function** button to move to the next parameter without pressing the **Enter Data** button first, the new setting will not be stored.

## Changing the receive frequency range (Ku-Band transceiver only)

The receive frequency range of the converter must match the receive frequency range of the LNB. See [Table 5-16](#) for the appropriate receive range and the corresponding receive frequency range for the LNB options.

Table 5-16: Receive frequency range for the LNB options

Receive range	Rx frequency minimum (MHz)	Rx frequency maximum (MHz)
L-Band	950	1700
Band 1	10950	11700
Band 2	11700	12200
Band 3	12250	12750

To view or change the receive frequency range of the converter:

- Press the **Up Function** button repeatedly to scroll through each parameter until the **Receive range** parameter is displayed.

If you want to scroll backwards, press the **Down Function** button.

- If you want to change the receive frequency range, press the **Up Data** button or the **Down Data** button until the required receive range is displayed.

The unstored value will flash.

- When the required value is displayed, press the **Enter Data** button.

The new value is now stored and the data field will stop flashing.

If you press the **Up** or **Down Function** button to move to the next parameter without pressing the **Enter Data** button first, the new value will not be stored.

## Resetting the controller

When the hand-held controller is initially connected to a transceiver and switched on, it obtains identity and table information from the transceiver, i.e. model number, software version, temperature compensation names etc. In the case of the Ku-Band transceiver, some of the information is obtained from the SSPA. If the SSPA is disconnected or reconnected, or the SSPA control mode is changed, the current, valid SSPA information can be obtained by resetting the hand-held controller without disconnecting or reconnecting the controller.

To reset the hand-held controller:

- Press the **Up and Down Function** buttons on the control panel of the hand-held controller simultaneously until you see the **Reset** message on the display.

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## 6 Display messages

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This chapter describes the messages that may be displayed in the Message field at the bottom of the LCD on the hand-held controller, and suggests the course of action you should take for each of the messages you may receive.

This chapter contains:

- a description of the message field (6-2)
- a list of the different types of display messages (6-3)

# Message field

Parameter details are shown in four fields on the LCD. The Message field is at the bottom of the display.

Figure 6-1: Location of the Message field



# Display messages

## Communication messages

Table 6-1: Communication messages

Message	Meaning	Action
<b>Cannot connect!</b>	The hand-held controller is not connecting with the converter within the initial timeout period.	<p>Check that the cable is connected to the converter correctly.</p> <p>Check for a faulty cable.</p> <p>If possible, change the hand-held controller and then the converter to establish which component is causing the problem.</p>
<b>Connecting....</b>	The hand-held controller is in the process of establishing a connection with the converter. The software version of the hand-held controller is displayed with the <b>Connecting....</b> message.	None.
<b>5900 Conv S/W X.XX</b>	This message appears once connection between the converter and the hand-held controller is obtained. The software version ( <b>S/W X.XX</b> ) of the converter is displayed with this message.	Press any key and the message will disappear.

Table 6-1: Communication messages (cont.)

Message	Meaning	Action
<b>5700 Conv S/W X.XX</b>	This message appears once connection between the converter and the hand-held controller is obtained. The software version ( <b>S/W X.XX</b> ) of the converter is displayed with this message.	Press any key and the message will disappear.
<b>Incompatible conv.!</b>	The converter is not responding to communications.	<p>Check that the converter has software version 1.20 or later.</p> <p>Check with your Codan representative that the software in the hand-held controller and the converter are compatible.</p> <p>If possible, change the hand-held controller and then the converter to establish which component is causing the problem.</p>
<b>Loss of connection</b>	Communication between the hand-held controller and the converter has been lost after connection was obtained. The controller then displays <b>Connecting....</b> , indicating that it is trying to establish connection again.	<p>Check that the cable is connected to the converter correctly.</p> <p>Check for a faulty cable.</p> <p>If possible, change the hand-held controller and then the converter to establish which component is causing the problem.</p>
<b>Reset</b>	The hand-held controller is performing a reset.	Release the <b>Up and Down Function</b> buttons.

## Command response errors

Table 6-2: Command response errors

Message	Meaning	Action
<b>140 MHz only!</b>	You are attempting to set the IF frequency to 70 MHz when the converter is fitted with the wide bandwidth option.	Set the IF frequency to 140 MHz, which is consistent with the wide bandwidth option ( <a href="#">see page 3-10, <i>Bandwidth options</i></a> ).
<b>Adjust Tx freq only!</b> (C-Band Transceiver 5700 series only)	You are attempting to set the receive frequency when the converter is fitted with the single synthesiser option.	Do not attempt to change the receive frequency. Alternatively, fit the converter as a dual synthesiser ( <a href="#">see page 3-11, <i>Synthesiser options</i></a> ).
<b>SSPA faults disabled!</b> (C-Band Transceiver 5700 series only)	<p>You may be attempting to set the fan fault control to <b>Enabled</b> when the SSPA fault control is <b>Disabled</b>. When the SSPA fault control is <b>Disabled</b>, the fan fault control is automatically disabled and cannot be changed.</p> <p>Alternatively, you may be attempting to set the SSPA temperature compensation to a setting other than <b>Off</b> when the SSPA fault control is <b>Disabled</b>. When the SSPA fault control is <b>Disabled</b>, the SSPA temperature compensation type is automatically set to <b>Off</b> and cannot be changed.</p>	<p>Do <i>not</i> change the setting of the fan fault control. Alternatively, change the SSPA fault control to <b>Enabled</b> (<a href="#">see page 5-16, <i>Enabling/disabling fault controls</i></a>).</p> <p>Do <i>not</i> change the setting of the SSPA temperature compensation type. Alternatively, change the SSPA fault control to <b>Enabled</b> (<a href="#">see page 5-16, <i>Enabling/disabling fault controls</i></a>).</p>

Table 6-2: Command response errors (cont.)

Message	Meaning	Action
<p><b>SSPA disabled/basic</b> (Ku-Band Transceiver 5900 series only)</p>	<p>You may be attempting to set the SSPA temperature compensation to a setting other than <b>Off</b> when the SSPA fault control is <b>Disabled</b> or the SSPA mode is <b>Basic</b>. When the SSPA fault control is <b>Disabled</b> and/or the SSPA control mode is <b>Basic</b>, the SSPA temperature compensation type is automatically set to <b>Off</b> and cannot be changed.</p> <p>Alternatively, you may be attempting to set the SSPA output power detection type when the SSPA fault control is <b>Disabled</b> and/or the SSPA control mode is <b>Basic</b>.</p>	<p>Do <i>not</i> change the setting of the SSPA temperature compensation type. Alternatively, change the SSPA fault control to <b>Enabled</b> (see page 5-16, <i>Enabling/disabling fault controls</i>), and/or change the SSPA control mode to <b>Extended</b> (see page 5-28, <i>Changing the SSPA control mode</i>).</p> <p>Do <i>not</i> change the setting of the SSPA output power detection type. Alternatively, change the SSPA fault control to <b>Enabled</b> (see page 5-16, <i>Enabling/disabling fault controls</i>), and/or change the SSPA control mode to <b>Extended</b> (see page 5-28, <i>Changing the SSPA control mode</i>).</p>
<p><b>N/A</b> (Ku-Band Transceiver 5900 series only)</p>	<p>Data is not available. You have selected a parameter that requires data from the SSPA.</p>	<p>Check that the SSPA is connected, and/or the SSPA fault control is <b>Enabled</b> (see page 5-16, <i>Enabling/disabling fault controls</i>), and/or the SSPA control mode is <b>Extended</b> (see page 5-28, <i>Changing the SSPA control mode</i>).</p>

Table 6-2: Command response errors (cont.)

Message	Meaning	Action
<b>Invalid protocol!</b>	You are attempting to set the packet protocol to a mode that is not supported by the converter.	Contact your Codan representative.
<b>Unknown setting!</b>	You have received data outside the controller's expected data range, or the command may not be supported by the converter. You will not be able to change the setting with the <b>Up</b> and <b>Down Data</b> or <b>Enter Data</b> buttons.	Contact your Codan representative.

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