

CF100 – Operation manual (Issue 0111)

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holkirk
communications

Operation manual CF100



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Limited Twelve (12) Month Warranty

This Holkirk Communications Ltd equipment is warranted to be free from defects in material and workmanship under normal use and service. Holkirk Communications Ltd shall repair or replace defective equipment, at no charge, or at its option, refund the purchase price, if the equipment is returned to Holkirk Communications Ltd not more than twelve (12) months after shipment.

Removal or reinstallation of equipment and its transportation shall not be at cost of Holkirk Communications Ltd except Holkirk Communications Ltd shall return repaired or replaced equipment freight prepaid.

This Warranty shall not apply to equipment which has been repaired or altered in any way so as to affect its stability or durability, or which has been subject to misuse, negligence or accident.

This Warranty does not cover equipment which has been impaired by severe weather conditions such as excessive wind, ice, storms, lightning, or other natural occurrences over which Holkirk Communications Ltd has no control, and this Warranty shall not apply to equipment which has been operated or installed other than in accordance with the instructions furnished by Holkirk Communications Ltd.

Claimants under this Warranty shall present their claims along with the defective equipment to Holkirk Communications Ltd immediately upon failure. Non-compliance with any part of this claim procedure may invalidate this warranty in whole or in part.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER AGREEMENTS AND WARRANTIES, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY. HOLKIRK COMMUNICATIONS LTD DOES NOT AUTHORISE ANY PERSON TO ASSUME FOR IT THE OBLIGATIONS CONTAINED IN THIS WARRANTY AND HOLKIRK COMMUNICATIONS LTD NEITHER ASSUMES NOR AUTHORISES ANY REPRESENTATIVE OR OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE EQUIPMENT DELIVERED OR PROVIDED.

IN NO EVENT SHALL HOLKIRK COMMUNICATIONS LTD BE LIABLE FOR ANY LOSS OF PROFITS, LOSS OF USE, INTERRUPTION OF BUSINESS, OR INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND.

In no event shall Holkirk Communications Ltd be liable for damages in an amount greater than the purchase price of the equipment.

Holkirk Communications Ltd has the right to void the warranty when the antenna is installed by someone other than a certified installer.

Product Serial Number :

Date Purchased :

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United Kingdom
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SAFETY

ELECTRICAL

Fusing The unit is protected by a fuse in the live/phase power supply line of the unit.

Care should be taken to ensure that the power cable is correctly connected to the power source such that the live/phase connection of the unit is connected to the live/phase terminal of the supply.

When replacing the fuse be sure to do so with one of the correct value and type.

Earthing

It is important that the electrical supply has a good and proper earth which is connected through to the unit via the power cable.

EMC

The unit is designed to meet the requirements of the EC EMC Directive and conforms to the relevant standards for EMC emissions and immunity.

WARNING

POSSIBLE LETHAL POTENTIALS EXIST WITHIN THIS EQUIPMENT

THE COVERS SHOULD NOT BE REMOVED EXCEPT BY QUALIFIED PERSONNEL.

SWITCH OFF POWER AND ISOLATE SUPPLY BEFORE REMOVING COVERS.

IF IT IS NECESSARY TO OPERATE THE EQUIPMENT WITH THE COVERS

REMOVED FOR SERVICING PURPOSES ALL NECESSARY PRECAUTIONS

SHOULD BE TAKEN TO PROTECT AGAINST ELECTRIC SHOCKS

PREPARATION FOR THE INSTALLATION OF THE CF100

WARNINGS

RADIATION HAZARD. PHYSICAL INJURY. ALWAYS STAY WITHIN THE SAFE ZONE WHEN THE EQUIPMENT IS TRANSMITTING.

WORKING AT HEIGHT HAZARD. A WORKING AT HEIGHT ASSESSMENT MUST BE CARRIED OUT BEFORE WORKING ON THIS EQUIPMENT AT HEIGHT.

ELECTRIC SHOCK HAZARD. HAZARDOUS VOLTAGES EXIST WITHIN THIS EQUIPMENT. ENSURE THE EQUIPMENT IS SWITCHED OFF BEFORE CARRYING OUT WORK.

Before the installation of the CF100, consideration should be given to the following factors:

- A suitable location must be chosen for the 1.0M Antenna, less than 10 meters from the location of the ancillary equipment and mains power supply.
- Ensure an unobstructed line of sight to the satellite can be observed

The foundation base for the antenna will require either:

- A clear, level surface that is capable of supporting the CF100
- A roofing structure that is capable of supporting the antenna and ensures a suitable earth point for the equipment is available and weight of personnel.
- Make a check to ensure no other services are present and can cause interference i.e pipes, water supplies, fibre optic channel etc.

Ensure the chosen site is as far as practicable from known sources of Radio Frequency (RF) emissions, such as generators, mobile phone masts, tactical terminals etc

NOTE

Line of sight to the satellite must be clear for the total deployment time of the CF100



1. Introduction

The purpose of this document is to technically describe the component parts of the CF100 Broadcaster and how these parts are integrated together to produce a complete 1.0m Ku- Band Terminal Sub-system. Upon reading this document a complete understanding of the system should be realized.

Each system requires a minimum of one trained personnel for deployment and recovery.

2. CF100 (KU) - General Description

The complete system is housed in two flight cases that weigh less than 23kg each, making the **CF100** a single-person deployable flyaway that can be transported world-wide with no IATA export restrictions.

The CF100 can be supplied with System EIRP's of: - X-Band 54dBw (max), Ku-Band 56dBw (max) and Ka-Band 61dBw (Max)

Once at location, the CF100 only takes minutes to set-up, point and acquire your desired satellite. Within the weight limit of 23kg the CF100 includes GPS receiver, inclinometer, flux gate compass and ACU, ensuring fast accurate satellite line up anywhere in the world without the need for expensive equipment and resource.

The CF100 can be fitted with X, Ku and Ka-Band RF assemblies which consists of a BUC, waveguide and feed OMT (including LNB).

The band change-over mechanism has been designed to allow fast reliable inter-change without the need for any tool's, making the CF100 a highly versatile unit designed for War-fighters, Peace-Keepers and News Gathers worldwide.

3. Case description

Description	Dimensions(cm)	Weight(kg)
Case 1 Reflector and feed arm with BUC	660 X 510 X 430	22.15kg
Case 2 Base unit, feed and control PC	660 X 510 X 430	16.00kg
Broadcaster Options:-		
Case 3 Monitor Case	630 X 600 X 300	21.70
Case 4 Tx Case	630 X 600 X 400	23.00

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4. Data sheet

SEMATRON

Rev A, Jan 11.

CF-Broadcaster
Ultra Lightweight Flyaway Antenna


- 1.0m antenna system
- Full auto-pointing solution
- X, Ku, and Ka-bands
- 80W SSPA / 180W HPA
- DVB-S encoder / modulator
- RK integrated receiver decoder (IRD)
- Audio / video monitoring

Compact and Powerful
The complete system is housed in two flight cases that weigh less than 23kg each, making the CF-Broadcaster a single-person deployable flyaway that can be transported world-wide with no IATA export restrictions.

The CF-Broadcaster can be supplied with System EIRP's of: X-Band 54dBw (max), Ku-Band 56dBw (max) and Ka-Band 61dBw (Max)


Once at location, the CF-Broadcaster only takes minutes to set-up, point and acquire your desired satellite.

Within the weight limit of 23kg the CF-Broadcaster includes GPS receiver, inclinometer, flux gate compass and ACU, ensuring fast accurate satellite line up anywhere in the world without the need for expensive equipment and resource.



Highly Versatile
The CF-Broadcaster can be fitted with X, Ku and Ka-Band RF assemblies which consists of a BUC, waveguide and feed OMT (including LNB).

The band change-over mechanism has been designed to allow fast reliable inter-change without the need for any tools, making the CF-Broadcaster a highly versatile unit designed for War-fighters, Peace-keepers and News gatherers worldwide.



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www.sematron.com

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Rev A, Jan 11.

	Ku-Band	X-Band	Ka-Band
Antenna Size	1.0M		
Operating Frequency			
Receive (GHz)	10.9 -12.75	7.25-7.75	18.0-22.0
Transmit (GHz)	13.75-14.5	7.9-8.4	27.7-30.0
(Tx Appendix 30B (GHz)	12.75-13.25	-	(30.0-31.0)
Mid-band Gain			
Receive	40.1 dBi	35.0dBi	45.6dBi
Transmit	41.8 dBi	36.7dBi	47.6dBi
Cross-Polarization (Linear)	35dB on axis		
VSWR	1.3:1 Max.		
System EIRP	56.7dBW	55dBw	54.6dBw/51.6dBw
BUC Power (P1dB)	30W	50W	5W/25W
Azimuth range Manual	/ Coarse: ±180°		
	/ Fine: ±90°		
Elevation range	±90°		
Polarization	±90°		
Ambient temperature Operational:	-20°C to +50°C (Antenna only)		
Storage:	-40°C to +70°C		
Solar radiation	1,200 W/m2		
Wind speed (with ballast or anchors)	20m/s (45 mph)		
Operating humidity	100% condensing		
Rainfall Maximum	100 mm/h (4 in/h), excluding link budget effects		
Altitude	Up to 3,000 m (9,850 ft)		
Survival:	Up to 10,000 m (32,800 ft)		
COMPLIANCE			
	• Eutelsat/Intelsat and HispaSat Compliant		

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5. Case Contents

Case 1 – Reflector / Feed Arm



Case 2 – Base Unit and Feed Assembly and cables



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Broadcaster Options:-

Case 3 – Monitor Case



BEL Audio/Visual Monitoring
Rx IRD

Case 4 – Transmit Case



The Transmit case contains the HPA controller, ACU100 and the DVB-S Satellite modulator and the video encoder. *Other configurations available.*



Assembly Instructions

1.0 Base unit set up


Before the installation of the CF100, consideration should be given to the following factors:

- A suitable location must be chosen for the 1.0M Antenna, less than 10 meters from the location of the ancillary equipment and mains power supply.
- Ensure an unobstructed line of sight to the satellite can be observed


Step 1.1

	<p>a) Remove the base unit from Case 2 and place it on level, even ground.</p> <p>b) Orientate the ODU box to roughly point in the direction of the satellite.</p> <p><i>Warning Base unit weight 12.20kg</i></p>	
---	---	--

Step 1.2

	<p>a) Spread the two legs on the base unit to roughly form a 120 degree angle.</p>	
--	--	--

Step 1.3

	<p>a) Swing round the locating struts and clip to the ball joints on the rear of the base unit.</p> <p>b) Rotate the height adjustment cams at the end of each leg to eliminate any rocking of the ODU base.</p>	
--	--	--

2.0 Raising the Elevation Backing Structure

Step 2.1

- a) Identify the elevation gear disengagement button on the RH side of the base unit.



Step 2.2

- a) Press in the button with one hand to disengage the gear and at the same time lift the Antenna mount section to just past the vertical position as shown.
- b) Release the button.
- c) Remove the Velcro cable securing strap.



Step 2.3

- a) Fold out the forward leg.
- b) Ensure the securing clip points vertically down to engage the leg in its lower position.



Step 2.4

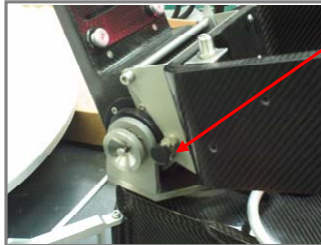
- a) Rotate the clip towards the rear of the base unit to lock the leg in position.



3.0 Feed arm assembly

Step 3.1

- a) Remove the Feed arm / BUC Assembly from Case 1 and clip the round bar at the rear of the BUC Assembly onto the base unit cradle point.
- b) Pull out the two knobs on either side of the BUC Assembly to fully locate and lock the unit onto the base unit.

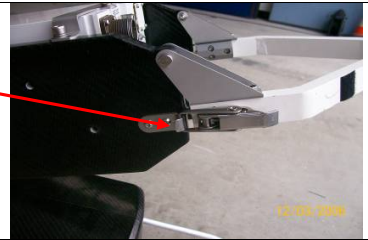


Step 3.2

- a) Swing out the Feed Arm and locate the over-centre latches onto the clips on each side of the ODU Box as shown.



Warning Tighten both the over-centre clamps together to avoid placing any stress on the Feed Arm alignment.



Feed Arm weight = 8.80kg

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4.0 Fitting the reflector

Step 4.1

- a) remove the base petal from case 1
- b) remove the lower securing petal from case 1
- c) align the two petals and lock together with over centre catch



Step 4.2

- a) locate the two assembled petals onto the base unit and secure with two toggle clamps



Step 4.3

- a) remove the next petal from case 1
- b) using button location offer the petal to the mating surface
- c) lock the petal with the joint clamps
- d) repeat for remaining 4 petals



Step 4.4

The antenna is now ready to accept the feed assembly




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5.0 Fitting the Feed Assembly

Step 5.1



<p>a) Remove the Feedhorn Assembly from Case 2.</p> <p>b) Locate the Feedhorn on the Feed arm mounting plate.</p> <p>c) Tighten the black screw to lock the Feedhorn in place.</p>	
--	--

(Note – The black screw may have to be unscrewed a bit in order to get the Horn Assembly to locate on the plate)

Step 5.2

<p>a) Fit the GPS connector and the blue LNB coax connector.</p>	
--	---

Step 5.3

<p>a) Connect the flexi-twist waveguide using the Holkirk Qick Connectors</p> <p> <i>Ensure the dust caps are mated to prevent sand/dust ingress</i></p>	
---	--

6.0 Connecting the BUC

Step 6.1

a) Fit the red BUC Tx coax cable to the BUC N-Type socket.



Step 6.2

a) Fit the flexi-twist quick connector



Note: Depending on the BUC / HPA denotes whether the 10MHz and prime power is supplied from the unit or from the Modem / Encoder

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Operation

A typical usage sequence would be:

Unpack and setup the antenna system. Apply prime power. Make connections: USB, Tx and Rx.

Ensure that satellite channel data exists for a number of locally visible satellites including the required reference and, preferably, the target satellites. Data does not need to exist for the target, but, if it is available, it allows confirmation that the correct satellite has been acquired.

Note that if the UIU is to be used for selecting the Reference and Target satellites, then those satellites must appear in the first 10 slots of satellite data. Ensure that the reference and target satellites are as required and that the final pol and final LNB settings match the settings required to access the satellite after acquisition.

Command <**Deploy**>

The CF100 can be operated from either:-

1.0 Base Unit Local Control (BULC)

On the local control interface on the base band unit there are two control buttons

GREEN - initiates the **Deploy** sequence

RED - initiates the **STOW** sequence

*Note: the ACU will need to be programmed for the desired satellite



The **RED** button is not an emergency stop



2.0 IPOINT Graphical User Interface (GUI)

As well as being used for management of the parameters and the satellite database, the GUI can be used to control the system.

Reference and Target satellites can be set in:

Configuration > User > Target / Reference

When the set has been accepted the two longitudes will appear in the small boxes above the Deploy button. Clicking the **Deploy** button will cause the system to auto acquire using those satellites.

Other buttons available are:

Stow – stows the antenna

Unstow – unstows the antenna to the unstow position

Orientation – not normally used by user as performed automatically as part of a Deploy.

Calibrate – should not be used unless setting up a new system

GoTo – commands motion to a particular set of angles.

Standby – can be used at any time to stop the antenna moving.

Set LNB – brings up a window allowing the LNB parameters to be immediately changed. The parameters are LO frequency, Power, Volts and Tone. These should be set as described in the LNB settings section below. This function is primarily provided to allow the Tone (and hence band) to be manually changed after a satellite has been acquired. These settings will be overridden by the LNB, Default LNB and Final LNB settings when the next Deploy is invoked.

Switch Pol – commands an immediate rotation of the pol feed by 90 degrees so that the opposite linear pol can be used.

The GUI can also be used to manually jog the antenna using the jog screen that appears from:

Configuration > Jog

In this mode the keyboard arrow keys will also operate to give Az and El movement.

LNB Settings The LNB settings can be set in menus available under Configuration > Installation.

There are three sets of LNB parameters accessed by:

Configuration>Installation > LNB and

Configuration>Installation > Default LNB.

Configuration > User > Final LNB

The LNB parameters define how the LNB will be set up when the system is searching channels and the Default LNB parameters define how it will be set up when performing the initial searches. The Final LNB parameters define how the LNB will be set after the target has been acquired.

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The LNB parameters to set are LO frequency, Power and Polarisation.

For fixed LO LNBs the LO frequency should be set to the actual LO frequency (in GHz). For universal LNBs where the LO is changed by a tone (22kHz) on the Coax, the LO frequency should be set to 0.0.

Power should be set to 0 if the LNB is separately powered, or 1, if it expects power up the Coax cable.

The Polarisation parameter should be set to indicate the polarisation that would be seen by the LNB when the feed is in its nominal zero degree position (for a satellite on the same longitude). 0 indicates horizontal and 1 indicates vertical. Normally this parameter is set to 0.

The Default LNB parameters defined in the GUI to set are LO frequency, Power, Volts and Tone. LO frequency should be set as for the LNB. Power should be set to 0 if the LNB is separately powered, or 1, if it expects power up the Coax cable. If the Volts is set to 0 then 18V will be applied to the cable, if it is set to 1 then 13V will be applied. Tone should be set to 0 for no tone (low band) or 1 for active tone (high band).

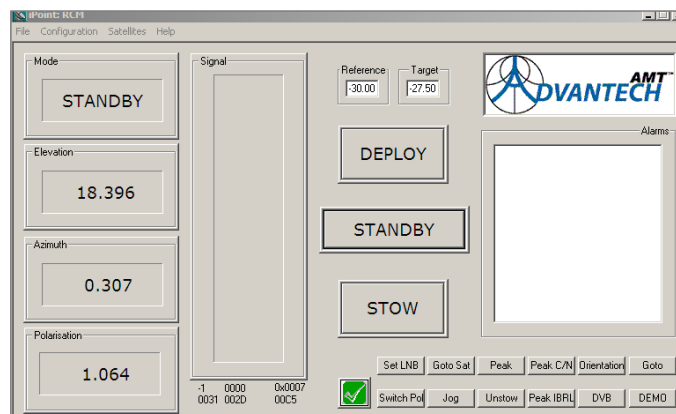
The Final LNB parameters to set are Power and Volts and Tone. Power should be set to 0 if the LNB is separately powered, or 1, if it expects power up the Coax cable. If the Volts is set to 0 then 18V will be applied to the cable, if it is set to 1 then 13V will be applied. Tone should be set to 0 for no tone (low band) or 1 for active (22kHz) tone (high band).

Final POL The Final Pol parameter should be set using Configuration > User > Final Polarisation.

This parameter defines the polarisation settings of the feed following acquisition. If it is set to 0 then horizontal reception will be enabled. If the parameter is set to 1, then the feed will be rotated 90 degrees to enable Vertical Pol reception. Note that most antennas to which the Ipoint is fitted will use a two port feed. When reception is on Horizontal polarisation, the transmission (without rotating the feed) will be on Vertical polarisation. Similarly with the feed rotated for Vertical polarisation reception, the transmission will be Horizontally polarised.

Final Band The Final Band parameter should be set using Configuration > User > Final LNB. This parameter defines the LNB settings to be invoked following acquisition.

The Final LNB parameters to set are Power and Volts and Tone. Power should be set to 0 if the LNB is separately powered, or 1, if it expects power up the Coax cable. If the Volts is set to 0 then 18V will be applied to the cable, if it is set to 1 then 13V will be applied. Tone should be set to 0 for no tone (low band) or 1 for active (22kHz) tone (high band).



Appendix – Broadcaster

Rx Case

The receive monitor case contains the Rx IRD and the audio visual monitoring.
There is a RX monitor port for the spectrum analyser



RX IRD



Designed for satellite based video distribution networks, RX8315 offers an integrated satellite input with capability to demodulate highly efficient DVB-S2 transmissions. The RX8315 receiver is designed to decrypt a transport stream and output the decrypted channels over an industry standard ASI interface or optionally over an IP interface. The capability of the RX8315 can be further extended through the option for the receivers to decrypt multiple services within one unit. The receivers can be further licensed to decode one service and output analog SD video and audio allowing the RX8315 to simultaneously address both digital and legacy analog tiers.

Audio visual monitoring



The Bel BM-AV2 is a 4 channel high quality 2U video/audio monitor with alarm facilities. It accepts 3 composite video inputs with automatic selection between PAL and NTSC sources. The resulting image is displayed on a high quality 4" TFT video display. Audio inputs provided are analogue (4) and AES (2 pairs).

Input levels are displayed on 4 high-resolution, tricolour bargraph meters with user-adjustable colour transition points and peak hold facility. Six standard scales and ballistics are user-selectable. Analogue input and output levels can be independently adjusted. The audio source selected for monitoring is available as a line output and at a headphone front panel socket. High quality magnetically screened speakers are used to provide high-SPL audio reproduction. A limiter circuit is included to prevent speaker damage

TX Case



2 stereo pairs (XLR)
Composite
SDI

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Encoder Modulator



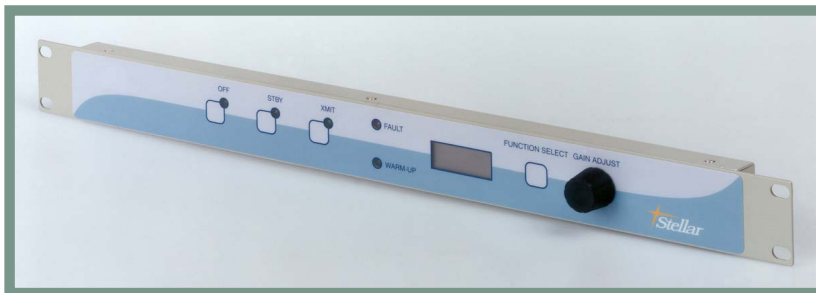
The E5714 is an extremely powerful, high-end encoder and modulator in a 1RU chassis. It delivers world-class MPEG-2 encoding at extremely low bit-rates for an affordable price. Ericsson's twenty years of in-house encoding development experience are featured in the E5714, which has extensive video-processing capabilities to clean the video stream and deliver exceptional picture quality, including advanced noise reduction and auto concatenation features. The E5714 also includes an array of high performance audio options including Dolby® Digital AC3 encoding and DTS sound.

With optional 4:2:2, RAS/BISS, and two stereo audio pairs as standard with the ability to handle pass-through encoding of Dolby® Digital 5.1, Dolby®E, and DTS, the DSNG credentials of the E5714 are excellent. Built on top of this are even more advanced features.

DVB-S2 offers up to a 35 percent improvement in transmission efficiency compared to DVB-S. DVB-S2 is a modem technology so the benefits are in addition to savings offered by Ericsson's premium encoding technology.

The E5714 L-band comes with a DVB-S2 capable modulator a standard which can be activated via license key to enable its advanced features.

HPA Controller



The N6081 Series controllers are compact and user-friendly units providing remote control for the Stellar Outdoor Unit amplifier.

FEATURES

- * User-friendly – Easy to use controls with clear, high visibility displays.
- * Small, light and very compact unit.
- * Internally powered from the amplifier.
- * Dual power reading (dBW/watts).

As soon as power is supplied to the amplifier and the control cabling is connected, the N6081 will initiate the amplifier search process. This will be apparent as the following message will be momentarily displayed on the N6081 display (if the HPA is found quickly, this message may not be seen):

The N6081 will now search through the 64 available addresses at a Baud rate of 9600 until communication is established. This process will continue until an amplifier is found. When an amplifier is found, a message will appear on the display, This message indicates that communication has been established with the amplifier whose address is 40H. This message will be displayed for 2 seconds. It should be noted that if at any time communication is lost with the amplifier, this process will be repeated.

The amplifier fan will be rotating at low speed and the controller "OFF" LED will be lit. **axis jog controller**

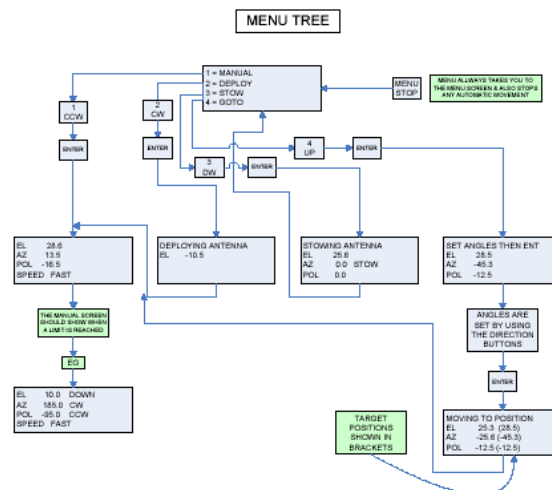
Appendix - ACU100



The ACU100 is a robust 3-axis jog controller designed for use with Holkirk RM, VM and TP series of satellite antennas.

The main interface is via a clear LCD viewing screen and interactive membrane touch pad matrix which is mounted in a 2RU IDU.

The ACU100 controller's normal operating mode allows for the current antenna position sensor readings for all three axis may be viewed simultaneously.



Menu structure

- 1) MANUAL: allows for movement of the antenna
- 2) DEPLOY: instructs the antenna to deploy (out of carriage stow position)
- 3) STOW : instructs the antenna to stow (into carriage stow position)
- 4) GOTO: moves to desired AZ,EL and POL

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RMA Procedure

If a fault occurs with the system please either email Support@sematron.com or fax the attached form.

Date:

RMA Request Form – To be completed in as much detail as possible. Lack of information may seriously delay expediting repair. Fax back (+44 (0) 1256 812666).

Please ship goods to the above address in either the original packaging or a suitable container to avoid damage in transit and incurring further costs to you for repackaging. Failure to do so may void any warranties or cause further damage to your product. RMA number will be issued upon receipt of completed form. Please do not return goods without an RMA number.

Company Name:

RMA #:

Invoice Address:

Delivery Address:

Contact name:

Telephone Number:

Fax Number:

E-mail address:

Your Job Number/Reference:

Item Description

Manufacturer:

Model & Serial Number:

Options:

Fault description (as accurately as possible) Include measurement configuration if applicable.

Please Note! Any warranty unit with No Fault Found will incur an evaluation fee

Is fault intermittent? Y/N

Is fault immediately apparent? Y/N

Is fault only apparent when used with other equipment? Y/N

Date of Purchase

Was Equipment Supplied by Sematron? Y/N

Has this equipment been returned to the service center on a previous occasion? Y/N

If Yes Repair dates:

Support@Sematron

Sandpiper House, Aviary Court, Wade Road

Basingstoke, Hampshire, RG24 8GX

Tel: +44 (0)1256 812222 Fax: +44 (0)1256 812666

Email: support@sematron.com

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