Phalcon-NT Equipment Manual.

(Trained and Approved Technicians)

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Approval:

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Table of Contents

Introduction.

This manual provides a brief description of the Transponder and its functions. It also details the initial setup and installation procedures.

Equipment Description.

The Phalcon-NT Transponder is a marine radar beacon system (RACON) capable of responding to S-band and X-band pulsed radars in compliance with the ITU recommendations ITU-R M.824-2 'Technical Parameters of Radar Beacons'. The RACON is a receiver/transmitter transponder device used as a navigation aid, identifying landmarks or buoys on a shipborne marine radar display. The RACON responds to a received radar pulse by transmitting an identifiable mark back to the radar set. The displayed response has a length on a radar monitor corresponding to a few nautical miles and is encoded as a Morse character beginning with a dash for identification.

Equipment Identification

The RACON is labelled with the manufacturer's part number as well as the purchaser's name and logo.

Manufacturer Part: Phalcon-NT

Manufacturer: Pharos Marine
Automatic Power

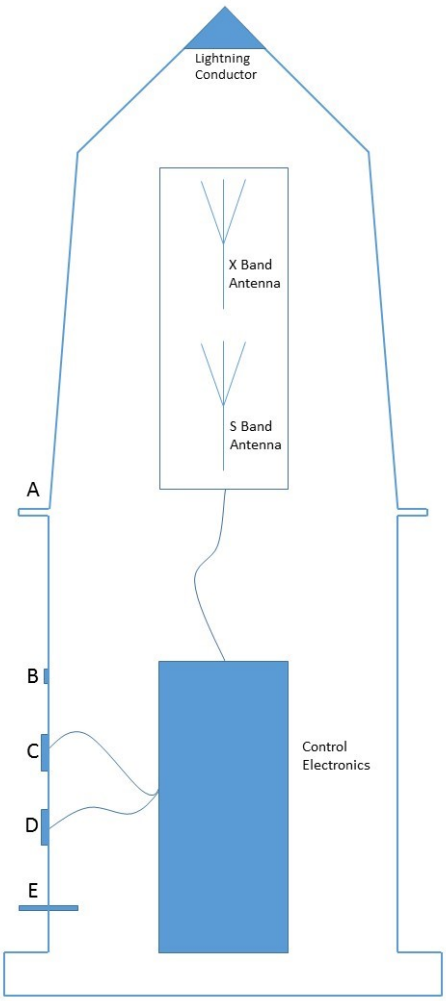
Unit 2 Lancelot Road

Beacon Business Park

Great Yarmouth

NR31 7BF

Block Diagram and Construction



A. Flange Joint.
B. Breather.
C. Comms Connection.
D. Power connection.
E. Lightning Ground connection.

The Transponder comprises one major assembly that contains the S-band and X-band receivers, transmitters and antennas, together with the signal processing and power conditioning sub-systems.

The Transponder can be considered as being two sub-assemblies: the Base Housing and the Radome. These sub-assemblies are joined at the main flange where a gasket is used to prevent water ingress during severe climatic conditions or accidental submersion to a depth of 2m.

The Base Housing is below the main flange and made from RIM plastic painted with two pack polyurethane primer and top coat. Inside the Base Housing is the Main Electronics Assembly which is a hermetically sealed unit designed to additionally protect the electronics from the environment. The Base Housing also contains two sealed connectors;

one for power and the other for communication. Additionally, a water impervious breather is used to allow pressure equalisation for air transport and the daily change in atmospheric pressure. This negates the need to pressurise the assembly.

Above the main flange is the radome which contains and protects the antennas. This is made from polyethylene which is transparent to RF signals.

Specification

Frequency of Operation	
S band	2.9 to 3.1GHz
X band	9.2 to 9.5GHz
Output power to antenna	30dBm min
Lightning protection – Surge protection (1ms)	3000V

X band	
Gain	6dBi
Polarisation	Horizontal
Vertical divergence	22 degrees min
Effective Isotropic Radiated Power (EIRP)	36dBm

S band	
Gain	1dBi horizontal, 0dBi vertical
Polarisation	Horizontal and vertical
Vertical divergence	22 degrees min
Effective Isotropic Radiated Power (EIRP)	30 to 31dBm

Amplitude Detection	
Terminal sensitivity (Firmware programmable)	-50dBm min
Side lobe rejection	Automatic detection via amplitude mapping
Frequency performance	
Frequency accuracy (50ns to 200ns pulse widths)	±3.5MHz
Frequency accuracy(>200ns pulse widths)	±1.5MHz
Modulation – Plain Pulse	
Morse pulse	As per IALA legislation
Output Duration for Morse Letter (750 m to 8 km)	5us to 53 us
Modulation – Response to Linear Chirp Pulse	
Morse Pulse	Derived from IALA legislation
Output Duration for Morse Letter (750 m to 8 km)	Chirp Duration + 5us to 53 us
Response Timing	
Range to start position	As per IALA legislation
Angular width of displayed response	Minimum angle emitter rotates in 8 PRI or selectable multiples of this
Firmware control functions (via terminal and RS232/USB interface)	
Morse selections	

Firmware updates	
Firmware version number	
Transmitted pulse length vs received pulse length	
Wake up timing	
Turn on / off timings (for a pulse stream)	
BITE Monitoring / communication (via terminal and RS232 interface)	
Input voltages	
Firmware version	
Serial number	
Unit ID	
Alarms	
Alarm/Siren Control	
Closed fully floating contacts on fault	Internal Fault detected

Environmental

Environmental Operating ranges	
GMU and ATEX Category 3	-40°C to +70°C
ATEX Category 2	-20°C to +40°C
Altitude	<2000m
IP Rating	Designed to meet IP67

Interface

External interface	
+10V to +36V DC (operating – 10% Tx duty cycle)	< 10 W
+10V to +36V DC (standby)	<0.1W
Current	3A max
Power	Connector types – MIL-C-38999 . See appendix B
Control Interface Monitor and Control (M&C) and in field programming	RS 232 Connector types – MIL-C-38999 . See appendix B

Mechanical

Height	794mm nom
Diameter (including lift ring)	390mm nom
Weight (Transponder with standard base ring)	10.5kg
Housing	Plastic Moulding
Submersion Capability (Survival - Non operating)	2m min.
Lifting	2 painted metal handles attached to mid section

Parts List

The following list identifies those parts that the end user will have interaction with, i.e. the external parts of the RACON. Additionally the main assemblies inside the RACON are detailed, although it is not expected that the unit will be disassembled at any time unless returned to the manufacturer, and disassembly should only be undertaken by trained and approved technicians.

External Parts

SA00-701191	ANTENNA ASSEMBLY	Qty 1
0000-793222	BASE HOUSING FOR Phalcon-NT	Qty 1

Main Internal Parts

SA00-701190	MAIN ELECTRONICS ASSEMBLY	Qty 1

Software and Transponder Setup

The Transponder does not require the user to load any software. In normal operation the Transponder runs autonomously with the necessary firmware already embedded in the unit.

In addition the following software and hardware for a PC is required for the installer to be able to communicate and change the settings that are under user control:

Docklight Terminal Emulator

USB to Serial communications cable

Installation

The Transponder is supplied in custom packaging for safety during transportation. Should the unit need to be relocated at any time it is recommended that it is carried in a crate to avoid the potential for damage.

After the unit has been unpacked it should be inspected for any signs of damage that may have occurred during shipping. Also included in the package is a communication cable required to change the default settings of the Transponder if required.

The Transponder is secured to a platform using three or more bolts (suitable for M10 bolts torqued to a max of 15 Nm), arranged in the pattern given in Appendix A.

As the manufacturer of the equipment, Pharos Marine Automatic Power, do not know the specifics of each installation site and so the supply of the fixing and any other parts required are left to the customer's discretion however a clear line of sight to intended radars is necessary for correct operation.

Note: A low impedance (<20mΩ) connection capable of carrying 20A to earth is necessary to the Lightning Ground Connector (See page 5. Connection E) to meet the surge protection specification.

See Appendix A for mechanical details.

Electrical Connection

The Transponder is intended to operate from a single DC power supply of between +10V and +36V via an Amphenol connector. The source impedance of the DC supply applied to the Transponder must be less than 1 Ohms. Information on the fitted connector type and connections to the Transponder can be found in Appendix B and the Block Diagram above. The alternate mating half of the connector is required for the external power cable.

Correct choice of wire gauge for the cabling is left to the customer but must be sufficient to supply the required 10V to 36V DC, with a nominal peak current up to 2A, at the terminals to the device and be appropriate for the external operating environment. For reference the internal wiring to the main power connector is made up of three parallel 26AWG wires, made of 7 strands 34AWG tinned copper wire, with a voltage rating of 300V and with PVC Insulation. It may be necessary to consider a larger gauge than this for long cable runs to the transponder device where the voltage drop across the supply cable may drop the applied voltage below the 10V minimum requirement for correct operation.

A fuse rated in excess of 2A but less than 3A fitted in series with the positive voltage connection wires is recommended for additional fault protection purposes and should be used in all battery based applications.

In order to meet conducted emissions requirements of BS EN60945, through the power cables, the floor of the transponder must be situated more than 25mm away from a ground plane if other electronic equipment is connected to the common supply.

Connection process

The two circular cable connectors are designed to be fitted by hand. This is done by grasping the connector firmly, aligning the outer connector to match the alignment pins on the mating half in the housing and then pressing towards the body of the transponder whilst twisting the outer body of the connector clockwise until the connector mates with the mating half fitted to the transponder housing. The connector incorporates a sprung locking mechanism to maintain connection once correctly mated.

Operation

Once the DC power cable has been connected to the unit the power should be turned on. The Transponder will enter a start up routine and then commence normal operation using its default programmed settings. Should it be necessary to make changes to the default settings, or to monitor the operation of the unit, the comms cable supplied should be connected between the Comms Connector on the Transponder and a serial or USB socket on a PC or laptop. Using the Docklight Terminal Emulator it is then possible to alter default values as well as carrying out monitoring of the unit transmit and receive operations.

After removing the comms cable, the dust cap must be fitted to the Transponder comms connector.

See Appendix C for command details.

Battery Operation

If operating off a standalone battery i.e. one not continually being replenished by means of a secondary charging system then consideration should be given to the required operation times in order to select a battery with sufficient capacity to provide charge for the required period of operational time. Configuration of the operating modes and the amount of radar traffic around the transponder can significantly affect this capacity requirement but a worse case figure of 4Ah/day from a 12V battery may be considered to aid in the selection process.

Disconnection in the event of a fault

In the event of a fault power should be removed from the device by uncoupling the power lead from the input connector. This is done by grasping the connector firmly, pressing towards the body of the transponder, to release the sprung locking mechanism, and then twisting the outer body of the connector anti-clockwise until the connector un-mates from the mating half fitted to the transponder housing.

Fault Diagnosis and Repair

In addition to programming the Transponder settings, the Docklight PC interface can be used for diagnostic purposes. By entering a security code, access is given to the data generated by the electronics. This can be used to check for correct processing of signals during normal operation as well as any alarms that may have been raised. Only trained and approved technicians should utilise this interface.

Safety

Only trained and approved technicians should attempt to disassemble the transponder or attempt to repair or replace any items with the transponder. RF power levels and surface temperatures within the transponder may exceed safe limits if the unit is still operating and/or has been recently operating at temperatures in excess of 60°C.

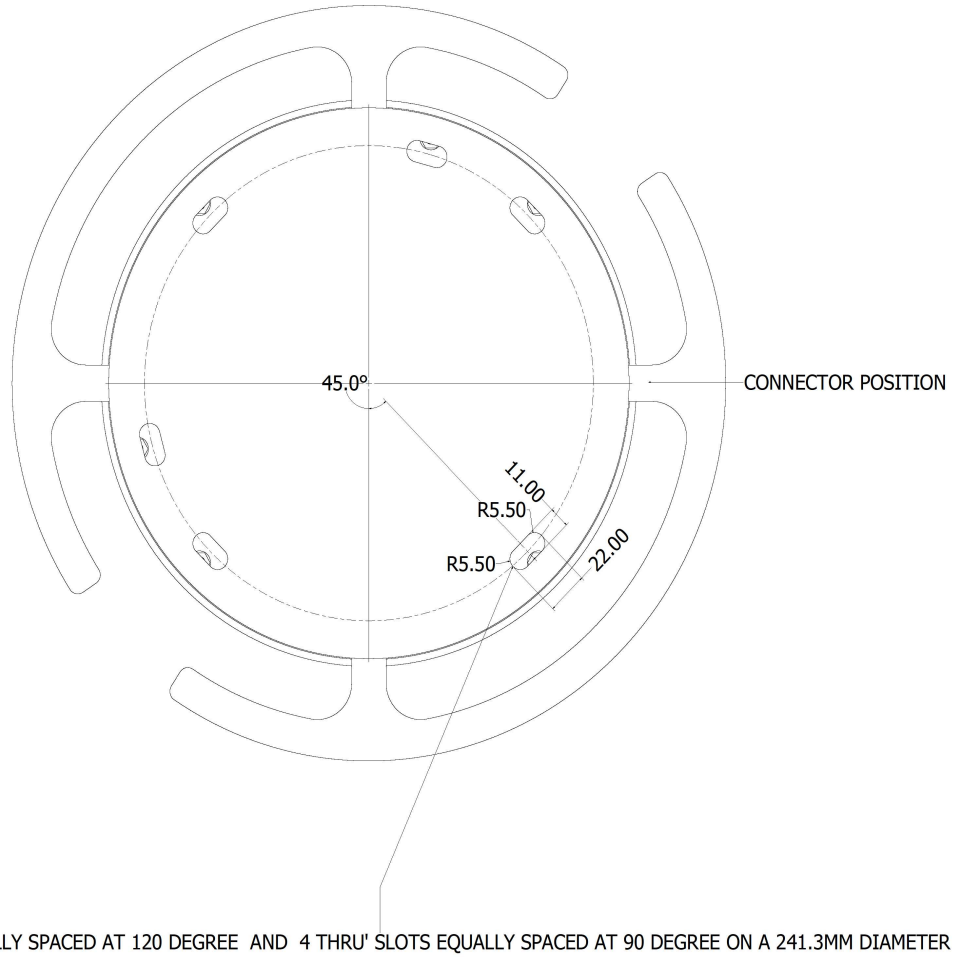
Before attempting to disassemble the device in any way it is therefore mandated that the power connection is to be removed from the device and that the device is allowed to stabilise at a temperature of less than 60°C for at least an hour before the external cover is removed.

Regulatory Compliance

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

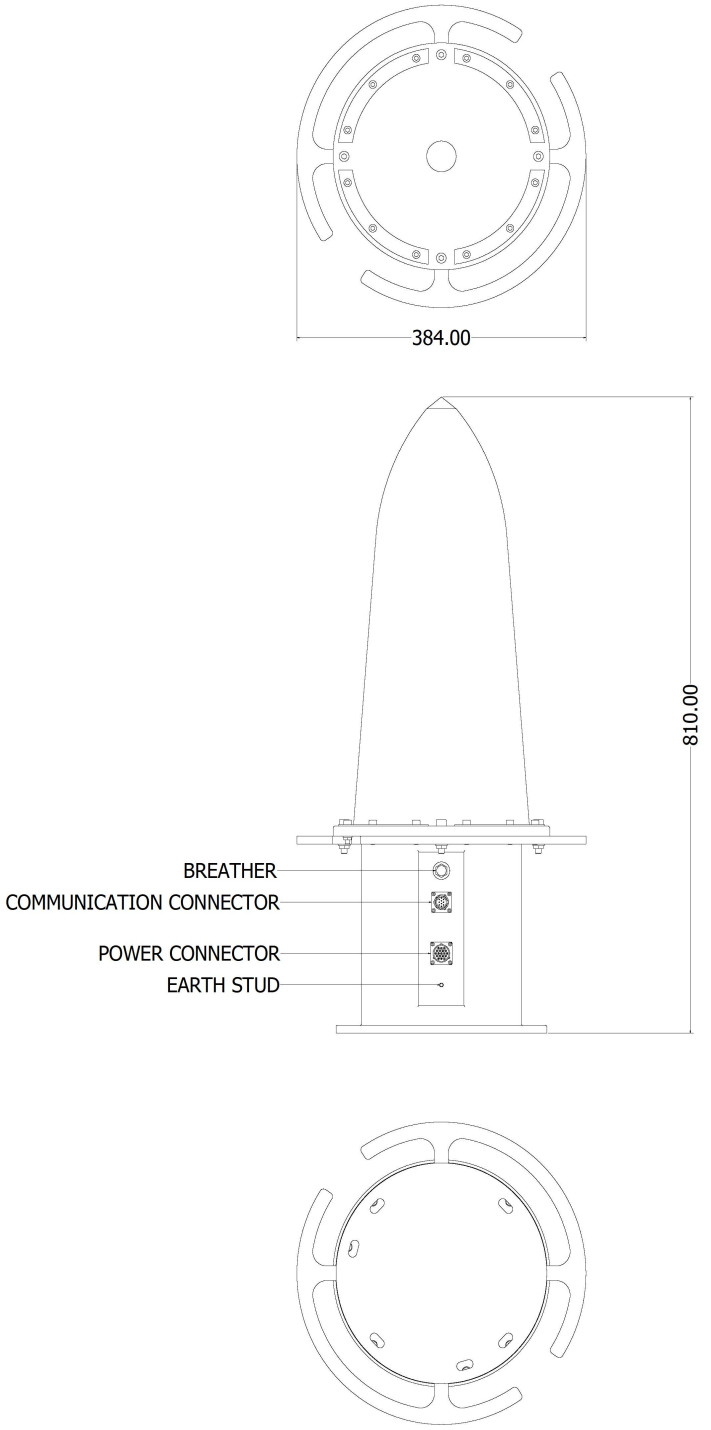
Appendix A. Mechanical Details

Mounting hole locations (distribute fixings evenly about the circumference)



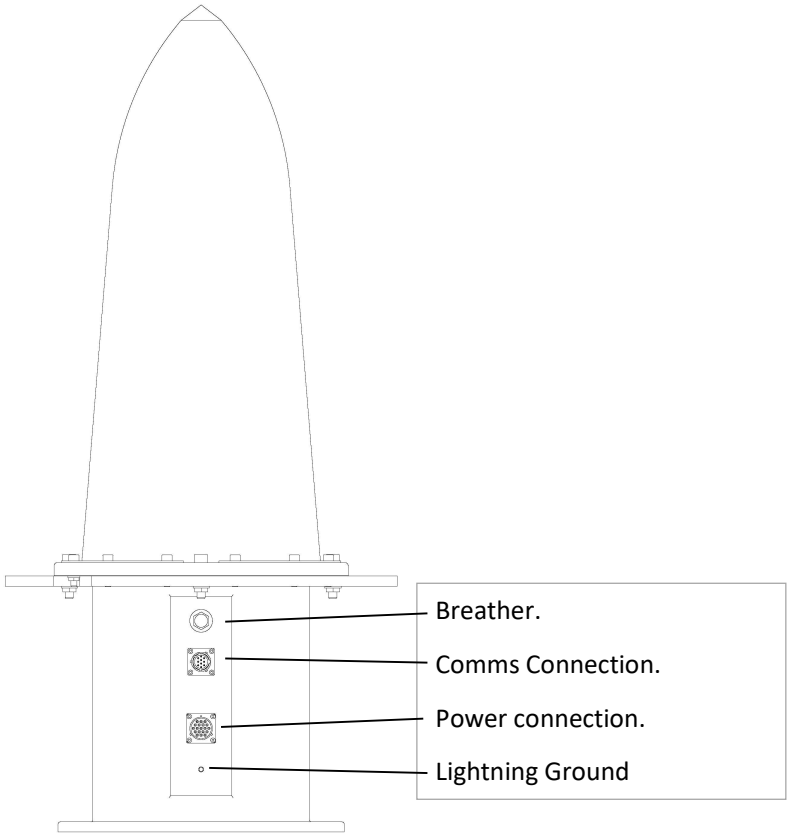
3 THRU' SLOTS EQUALLY SPACED AT 120 DEGREE AND 4 THRU' SLOTS EQUALLY SPACED AT 90 DEGREE ON A 241.3MM DIAMETER

External Dimensions



Appendix B. Electrical Connection Points

Connector Positioning



Connector Pin outs

Comms Connector: Amphenol 62GB-12E12-10SN

12-10

Function	Signal	10-Way Metal Circular Bulkhead Connector COMMS BLANKING
BLANKING	Inhibit + (Inhibit Low if Inhibit + >Inhibit -)	A
BLANKING	Inhibit - (Inhibit Low if Inhibit + >Inhibit -)	B
COMMS	U3_RX232	C
COMMS	U3_TX232	D
COMMS	SER_BOOT_N	E
COMMS	MAN_RST_N	F
POWER	+V	G
POWER	0V	H

Power Connector: Amphenol 62GB-12E14-19PN

14-19

Function	Signal	19-Way Metal Circular Bulkhead Connector POWER BITE
BITE	On - Normally Open Relay Contact (Closed if Fault A High)	L
BITE	Middle - Relay Contact	M
BITE	Off - Normally Closed Relay Contact (Open if Fault A High)	A
BITE	Fault Ref	B
BITE	Neg Fail - Opto Pulled to Fault Ref when Fault A High	C
POWER	+V	J
POWER	+V	H
POWER	+V	G
POWER	0V	K
POWER	0V	T
POWER	0V	S
BITE	Relay Enable A (Link to Relay Enable B to enable relay)	D
BITE	Relay Enable B (Link to Relay Enable B to enable relay)	E

Console Interface

A console interface may be utilized to monitor and control the Firmware running on the digital board for the RACON Transponder. The interface allows the user to configure the unit and read the operational status. Various commands and operating modes can be set via the console and they are explained in this document.

Console Configuration

The console runs over the RS232 port with the following configuration defined in Table 1 Console Port Settings and an example shown in Figure 1 Example Comport Settings.

Setting	**Parameter**
Baud Rate	115,200 default [1]
Parity	None
Data Bits	8
Stop Bits	1

Table 1 Console Port Settings

[1] The product allows configurable baud rates that can be set at the factory configuration time, by default the baud rate is 115,200 but this could be different depending on configuration.

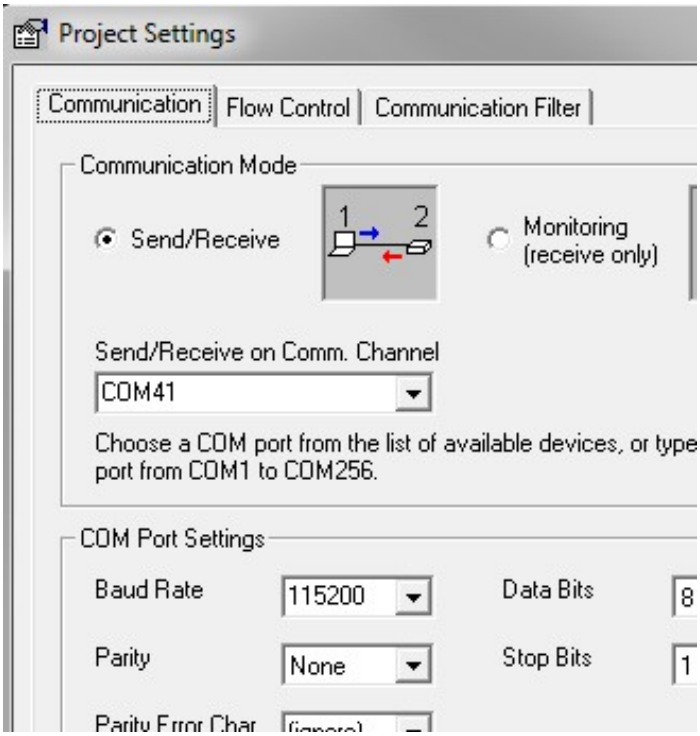


Figure 1 Example Comport Settings

Computer Tools

The users preferred console application can be used, there are many freely available, but the following one is recommended and will be utilised in the following examples:

Docklight: http://docklight.de/

Commands

Commands are typed into the console interface but depending on the user login rights different functions are available. By default the unit starts up in the client mode. Each of the commands is explained further in this document and these are listed in the sections below.

Command Structure

Command followed by Line Feed, Carriage Return.

All Commands return an ‘OK’ or ‘ERR’ String

```
BANDX ON


OK
```

Figure 2 Example Return 'OK'

```
[ERROR] no implementation for  (CMI
ERR 1 []

FIMO>>
```

Figure 3 Example Return Error from Command not known

Client (End User) Commands Index

Most of the commands are listed in the Docklight configuration file: CNF-3187 Config File 248-0009 Docklight Client Commands[P039-1955]

ID	Command Title	Command	Section
1.	Get Alarms	ALARMS	1.1
2.	Set Band S On or Off	BANDS	1.2
3.	Set Band X On or Off	BANDX	1.3
4.	Set Beacon ID	BEACONID	1.4
5.	Get Configuration	CFGGET	1.5
6.	Built In Test	BIT	1.6
7.	Set Morse Length Auto On or Off	MORSELENAUTO	1.7

8.	Set Morse Length	MORSELEN	1.8
9.	Set Morse Character	MORSE	1.9
10.	Set Number Of Radar Responses	RADARRES	1.10
11.	Get Run Time Log	RLOG	1.11
12.	Reset and re-start transponder	RST	1.12
13.	Start the transponder running	RUN	1.13
14.	Save configuration information	SAVE	1.14
15.	Configure Sleep cycles	SLEEP	1.15
16.	Stop the transponder running	STOP	1.16
17.	Get Version of firmware	VER	1.17
18.	Help List commands available	HELP	1.18

1 Commands

1.1 Get Alarms – "ALARMS"

1.1.1 Description

Return the system alarms.

1.1.2 User Rights

	Client	Linwave	Factory
User Rights	YES	YES	YES

1.1.3 Command and Parameters

Command	ALARMS

Parameter	Title	Type	Min	Max	Description
P1	NONE	NONE	NONE	NONE	NONE

1.1.4 Command Return

Command	ALARMS

Parameter	Title	Type	Min	Max	Description
R1	FPGA_CFG	STRING	CLEAR	ACTIVE	
R2	SELF_CAL	STRING	CLEAR	ACTIVE	
R3	MEM_SRAM	STRING	CLEAR	ACTIVE	
R4	MEM_FLASH_0	STRING	CLEAR	ACTIVE	
R5	MEM_FLASH_1	STRING	CLEAR	ACTIVE	
R6	MEM_FLASH_2	STRING	CLEAR	ACTIVE	
R7	MEM_FLASH_3	STRING	CLEAR	ACTIVE	
R8	SELF_TEST	STRING	CLEAR	ACTIVE	
R9	CFG_IMG	STRING	CLEAR	ACTIVE	

1.1.5 Example

```
ALARMS

ALARMS  FPGA_CFG     : CL
ALARMS  SELF_CAL     : CL
ALARMS  MEM_SRAM     : CL
ALARMS  MEM_FLASH_0  : CL
ALARMS  MEM_FLASH_1  : CL
ALARMS  MEM_FLASH_2  : CL
ALARMS  MEM_FLASH_3  : CL
ALARMS  FPGA_IMG1    : CL
ALARMS  SELF_TEST    : CL
ALARMS  CFG_IMG      : CL
```

Figure 4 Alarm Outputs showing all clear

1.2 Set Band S “BANDS”

1.2.1 Description

Enable the S Band Channel ON or OFF during operation.

To commit the changes to memory use the Save Configuration “SAVE” command and Get Configuration “CFGGET” command to confirm the operation.

1.2.2 User Rights

	Client	Linwave	Factory
User Rights	YES	YES	YES

1.2.3 Command and Parameters

Command	BANDS

Parameter	Title	Type	Min	Max	Description
P1	State	STRING	ON	OFF	Set if the S Band channel is ON or OFF

1.2.4 Command Return

Command	BANDS

Parameter	Title	Type	Min	Max	Description
R1	NONE				

1.2.5 Example

```
BANDS ON

OK
```

Figure 5 Setting S Band ON

1.3 Set Band X “BANDX”

1.3.1 Description

Enable the X Band Channel ON or OFF during operation.

To commit the changes to memory use the Save Configuration “SAVE” command and Get Configuration “CFGGET” command to confirm the operation.

1.3.2 User Rights

	Client	Linwave	Factory
User Rights	YES	YES	YES

1.3.3 Command and Parameters

Command	BANDX

Parameter	Title	Type	Min	Max	Description
P1	State	STRING	ON	OFF	Set if the X Band channel is ON or OFF

1.3.4 Command Return

Command	BANDX

Parameter	Title	Type	Min	Max	Description
R1	NONE				

1.3.5 Example

```
BANDX ON

OK
```

Figure 6 Setting X Band ON

1.4 Set Beacon ID – "BEACONID"

1.4.1 Description

Set the Beacon ID.

To commit the changes to memory use the Save Configuration "SAVE" command and Get Configuration "CFGGET" command to confirm the operation.

1.4.2 User Rights

	Client	Linwave	Factory
User Rights	YES	YES	YES

1.4.3 Command and Parameters

Command	BEACONID

Parameter	Title	Type	Min	Max	Description
P1	Beacon ID	STRING	1	13	Up to 13 Characters can be set for the BEACONID.

1.4.4 Command Return

Command	BEACONID

Parameter	Title	Type	Min	Max	Description
R1	NONE				

1.4.5 Example

```
BEACONID LOC_BD177I

OK
```

Figure 7 Setting of the Beacon ID to LOC_BD177DB

1.5 Get Configuration "CFGGET"

1.5.1 Description

Returns the configuration settings of the transponder. Note that if the user is configuring the unit, for example setting the Beacon ID, using "CFGGET" will display how the user has currently configured the unit. These value will only persist if the user has saved "SAVE" the configuration. Verification that the values are stored can be achieved by power cycling the unit or sending the Reset command "RST".

The output from the "CFGGET" command depends on who is logged into the unit. For example if 'Linwave' are logged in additional information is displayed compared to the client (end user).

1.5.2 User Rights

	Client	Linwave	Factory
User Rights	YES	YES	YES

1.5.3 Command and Parameters

Command	CFGGET

Parameter	Title	Type	Min	Max	Description
P1	NONE				

1.5.4 Command Return

Command	CFGGET

Parameter	Title	Type	Min	Max	Description
R1	See Examples below				

1.5.5 Example

```
HEADER CONFIGURATION  : TRANAPP_US
MORSE CODE INDEX      : 2
MORSE BIT LENGTH      : 7
TX SPOKES             : 2
TX TIME DELAY         : 0
SLEEP TIME            : 30
SLEEP TIME RX         : 7
SLEEP PULSE WAKE CNT  : 200
SLEEP WAKE RX THRESH  : 200
X BAND                : ON
S BAND                : ON
MODE                  : RUNNING
AUTO MORSE LEN        : ON
RADAR RESPONSES       : 3
Beacon ID             : LOC_BD177D
Serial Number         : SD01234567
```

Figure 8 Example CFGGET Output Client

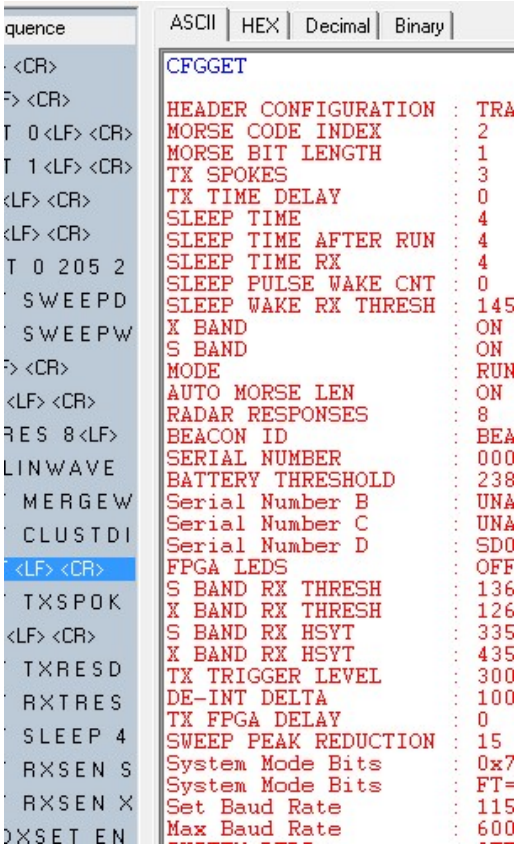


Figure 9 Example CFG Output Linwave Login

1.6 Built In Test – "BIT"

1.6.1 Description

Function runs a built in self-test that tests key parts of the system including:

- SRAM Devices
- FLASH Devices
- Configuration Image

If any of the test fails, the part of the system that has failed will be output on the console.

1.6.2 User Rights

	Client	Linwave	Factory
User Rights	YES	YES	YES

1.6.3 Command and Parameters

Command	BIT

Parameter	Title	Type	Min	Max	Description
P1	None				

1.6.4 Command Return

Command	BIT

Parameter	Title	Type	Min	Max	Description
R1	STATUS	BOOL	PASS	FAIL	Returns if the system Passes or Fails. If a failure exists the system will output the alarms list 1.1.
R2					
R3					

1.6.5 Example

```
BIT

SELF TEST: RUNNING
SELF TEST: PASS

OK
```

Figure 10 Running built in test

1.7 Set Morse Length Auto On or Off "MORSELENAUTO"

1.7.1 Description

Enable or Disable the Auto Morse Length Feature. When enabled the system will automatically adjust the response length timing depending on the pulse duration received. The received Pulse Length to Response Length is factory configured in the auto mode.

If the transponder is only required to output a fixed length the function should be disabled "OFF". The fixed length can be set via the Set Morse Length command 1.8.

To commit the changes to memory use the Save Configuration "SAVE" command and Get Configuration "CFGGET" command to confirm the operation.

1.7.2 User Rights

	Client	Linwave	Factory
User Rights	YES	YES	YES

1.7.3 Command and Parameters

Command	MORSELENAUTO

Parameter	Title	Type	Min	Max	Description
P1	STATE	STRING	ON	OFF	Set if the function is ON or OFF
P2					
P3					

1.7.4 Command Return

Command	MORSELENAUTO

Parameter	Title	Type	Min	Max	Description
R1	NONE				

1.7.5 Example

```
MORSELENAUTO ON


OK

ELMO>>
MORSELENAUTO OFF


OK
```

Figure 11 Setting the Morse Length to Auto Operation On and Off

1.8 Set Morse Length "MORSELEN"

1.8.1 Description

Function allows the Morse length to be configured and stored in the unit, see Table 2 Morse Length

The Morse length is set using an index that references the required length. The unit default is 7, which is equal to 22us or approx. 3.3km. This will be for the longer Morse letters e.g. "Q" and "Y" which are made up of a combination of three dashes and one dot. However, characters such as "D" (which is made up of a dash and two dots), will be displayed proportionately shorter because, although the individual lengths of the dashes and dots will be the same, fewer of these will be displayed on the radar screen.

This fixed length will only be used if the unit is set to Morse Length Auto OFF.

To commit the changes to memory use the Save Configuration "SAVE" command and Get Configuration "CFGGET" command to confirm the operation.

1.8.2 User Rights

	Client	Linwave	Factory
User Rights	YES	YES	YES

1.8.3 Command and Parameters

Command	MORSELEN

Parameter	Title	Type	Min	Max	Description
P1	Morse Length Index.	UINT8	1	15	Morse Length Index. See Table 2 Morse Length

Index	Maximum Message Time (us)	Apparent length (m) of Morse "Q" or "Y"
0	reserved	reserved
1	6	900
2	8	1200
3	10	1500
4	12	1800
5	15	2250
6	18	2700
7	22	3300
8	26	3900
9	30	4500
10	35	5250
11	37	5550
12	42	6300
13	48	7200
14	53	7950
15	60	9000

Table 2 Morse Length

1.8.4 Command Return

Command	MORSELEN

Parameter	Title	Type	Min	Max	Description
R1	None				

1.8.5 Example

```
MORSELEN 8


OK
```

Figure 12 Setting the Morse length to 8 (26us)

1.9 Set Morse Character "MORSE"

1.9.1 Description

Function allows the user to set the Morse code character that will be used for the output response. The user sets this via a look up table and index.

To commit the changes to memory use the Save Configuration "SAVE" command and Get Configuration "CFGGET" command to confirm the operation.

1.9.2 User Rights

	Client	Linwave	Factory
User Rights	YES	YES	YES

1.9.3 Command and Parameters

Command	MORSE

Parameter	Title	Type	Min	Max	Description
P1	Morse Index	UINT8	0	12	Set Morse Code Index as per Table 3 Morse Index Table

		Morse Code Bit Pattern										
Index	Letter	19	18	17	16	15	14	13	12	11	10	9
0	B	1	1	1	0	1	0	1	0	1	0	0
1	C	1	1	1	0	1	0	1	1	1	0	1
2	D	1	1	1	0	1	0	1	0	0	0	0
3	G	1	1	1	0	1	1	1	0	1	0	0
4	K	1	1	1	0	1	0	1	1	1	0	0
5	M	1	1	1	0	1	1	1	0	0	0	0
6	N	1	1	1	0	1	0	0	0	0	0	0
7	O	1	1	1	0	1	1	1	0	1	1	1
8	Q	1	1	1	0	1	1	1	0	1	0	1
9	T	1	1	1	0	0	0	0	0	0	0	0

Table 3 Morse Index Table

1.9.4 Command Return

Command	MORSE

Parameter	Title	Type	Min	Max	Description
R1	None				

1.9.5 Example

```
MORSE 0


OK

ELMO>>
MORSE 1


---
```

Figure 13 Setting the Morse Character to B and then C

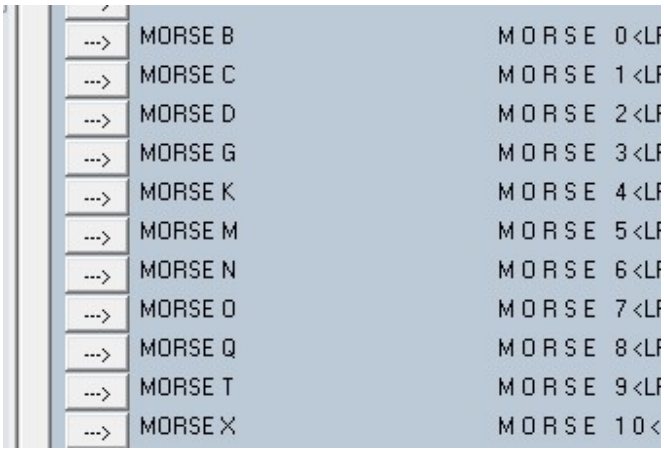


Figure 14 Morse Characters in Docklight

1.10 Set Number Of Radar Responses "RADARRES

1.10.1 Description

Set Radar Response sets the number of times the transponder will respond to an incoming Radar synchronised to the ships main Radar lobe.

For example setting to 1 will output once to the ships radar system, 3 would output 3 responses when it sees the ship. If the transponder does not detect the ships Radar on any of the required output response, no output Morse response will be attempted.

The relationship to the output responses and the time the system is running is linked to the number of responses and the ship's sweep period. For example if the output response is set to 3 and the ship's sweep rate, which was received is once every 2.5 seconds it would take 7.5 seconds before all the output responses are completed. The system only enables the transmitter if the correct ship characteristics are matched during the receive cycle.

To commit the changes to memory use the Save Configuration "SAVE" command and Get Configuration "CFGGET" command to confirm the operation.

1.10.2 User Rights

	Client	Linwave	Factory
User Rights	YES	YES	YES

1.10.3 Command and Parameters

Command	RADARRES

Parameter	Title	Type	Min	Max	Description
P1	Number of Responses	UINT8	1	8	Number of responses
P2					
P3					

1.10.4 Command Return

Command	RADARRES

Parameter	Title	Type	Min	Max	Description
R1	None				

1.10.5 Example

```
RADARRES 2


OK
```

Figure 15 Setting the number responses to 2

1.11 Get Run Time Log "RLOG"

1.11.1 Description

Return the unit Run Time Log statistical information. This log is reset on the system power up or a software reset. See Example 1.11.5

1.11.2 User Rights

	Client	Linwave	Factory
User Rights	YES	YES	YES

1.11.3 Command and Parameters

Command	RLOG

Parameter	Title	Type	Min	Max	Description
P1	None				

1.11.4 Command Return

Command	RLOG

Parameter	Title	Type	Min	Max	Description
R1	SLEEP CYCLES	UINT32	0	4294967295	Number of times the system has gone into sleep
R2	WAKE UP CYCLES	UINT32	0	4294967295	Number of times the system has woke up from RX Pulses and started a system RX.
R3	X BAND ATTEMPTS	UINT32	0	4294967295	Number of attempts to output a response.
R4	X BAND RESPONSES	UINT32	0	4294967295	Number of successful out responses. (Success is the system responding to 1 or more radar pulses)
R5	S BAND ATTEMPTS	UINT32	0	4294967295	Number of attempts to output a response.
R6	S BAND RESPONSES	UINT32	0	4294967295	Number of successful out responses. (Success is the system responding to 1 or more radar pulses)
R7	HOURS ALIVE	UINT32	0	4294967295	Hours system has been powered and running.
R8	ALARMS	UINT16	0	0xFFFF	Hex Output.

0 = No Alarms

Any other value indicates an alarm. Use the Alarms Function to read back 1.1

1.11.5 Example

```
RLOG

SYSLOG  SLEEP CYCLES      : 0
SYSLOG  WAKE UP CYCLES    : 1
SYSLOG  SLEEP AFTER CYCLE : 1
SYSLOG  TOTAL CYCLES      : 1
SYSLOG  X BAND ATTEMPTS   : 12
SYSLOG  X BAND RESPONSES  : 11
SYSLOG  S BAND ATTEMPTS   : 59
SYSLOG  S BAND RESPONSES  : 58
SYSLOG  HOURS ALIVE       : 0
SYSLOG  ALARMS            : 0x0

OK

ELMO>>
```

Figure 16 Example Output from the Run Time Log

1.12 Reset and re-start transponder "RST"

1.12.1 Description

Reset the transponder, this is a software reset. Calling the function will restart the system.

1.12.2 User Rights

	Client	Linwave	Factory
User Rights	YES	YES	YES

1.12.3 Command and Parameters

Command	RST

Parameter	Title	Type	Min	Max	Description
P1	NONE				

1.12.4 Command Return

Command	RST

Parameter	Title	Type	Min	Max	Description
R1	System Boot Information	STRING			Output boot information. See Figure 17 Example output after reset

1.12.5 Example

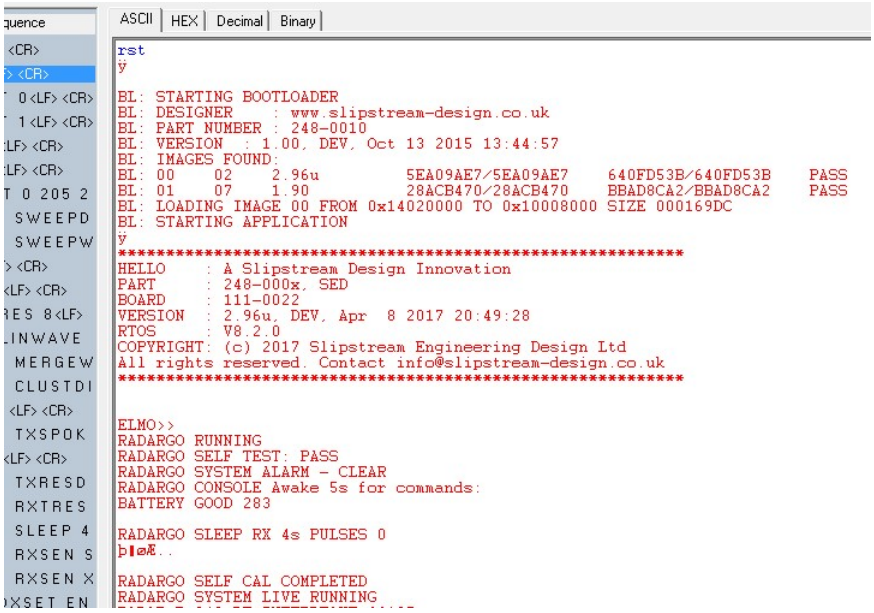


Figure 17 Example output after reset

1.13 Start the transponder running "RUN"

During configuration of the system it is advised that the system is stopped, this stops transponder outputs to the console and allows the user to easily type commands. When completed the user can run the system using the "RUN" command.

1.13.1 User Rights

	Client	Linwave	Factory
User Rights	YES	YES	YES

1.13.2 Command and Parameters

Command	RUN

Parameter	Title	Type	Min	Max	Description
P1	NONE				

1.13.3 Command Return

Command	RUN

Parameter	Title	Type	Min	Max	Description
R1	NONE				System will run after this command

1.13.4 Example

```
ELMO>>RUN


OK

ELMO>>
RADARGO RUNNING
RADARGO SELF TEST: PASS
RADARGO SYSTEM ALARM - CLEAR
RADARGO CONSOLE Awake 5s for commands:
BATTERY GOOD 281

RADARGO SLEEP RX 4s PULSES 0
þt@Æ..

RADARGO SELF CAL COMPLETED
RADARGO SYSTEM LIVE RUNNING
RADARGO PROCESS 0 RADARS, COMPLETED
RADARGO SYSTEM POWER DOWN
SYSLOG  SLEEP CYCLES      : 0
SYSLOG  WAKE UP CYCLES    : 1
SYSLOG  SLEEP AFTER CYCLE : 0
SYSLOG  TOTAL CYCLES      : 1
SYSLOG  X BAND ATTEMPTS   : 18
SYSLOG  X BAND RESPONSES  : 18
SYSLOG  S BAND ATTEMPTS   : 60
SYSLOG  S BAND RESPONSES  : 59
SYSLOG  HOURS ALIVE       : 0
SYSLOG  ALARMS            : 0x0
```

Figure 18 Example run command and output

1.14 Save Configuration “SAVE”

1.14.1 Description

Save user configuration into the configuration memory. Ensure that the unit is connected to a stable power supply before “SAVE” is applied.

If the unit power should fail during programming of the configuration memory, it is likely that the memory will become corrupted. When the unit powers back up the unit will attempt to recover the configuration from backup memory and restore these to the main transponder configuration which was set before the programming failure. If this happens the user should verify their settings using ‘CFGGET’ and re-apply and save if required.

Should both the backup and the main configuration image be corrupt the unit will stop, an alarm will be raised and the following message displayed during the bootup on the console; *Main Config and Backup are corrupted, System Stopped.* If the configuration memory becomes corrupted during ‘normal’ operation then normal operation may cease the user may observe this affecting the output and operating conditions.

The reason for both images to become corrupted should be investigated further. It could be possible depending on the situation to recover the unit in this condition by applying a factory reset. However key configuration could be changed during this process depending on how the unit was configured in the factory. Further configuration could be required.

1.14.2 User Rights

	Client	Linwave	Factory
User Rights	YES	YES	YES

1.14.3 Command and Parameters

Command	SAVE

Parameter	Title	Type	Min	Max	Description
P1	NONE				

1.14.4 Command Return

Command	SAVE

Parameter	Title	Type	Fixed Text	Description
R1	System Stop	STRING	System Stop	System is stopped
R2	Programming		Programming Configuration Into Memory	Programming into configuration memory. Do not power down.
R3	Confirmation		PASS or FAIL	Result

1.14.5 Example

```
System Stop
Programming Configuration Into
PASS

OK

ELMO>>
```

1.15 Configure Sleep cycles "SLEEP"

1.15.1 Description

The Sleep Command allows the following modes:

Unit Mode:

- Sleep
- Sleep and RX
- Wake up on number of pulses received

1.15.2 User Rights

	Client	Linwave	Factory
User Rights	YES	YES	YES

1.15.3 Command and Parameters

Command	SLEEP

Parameter	Title	Type	Min	Max	Description
P1	SLEEP TIME no traffic	UINT32	4		Time Set in Seconds
P2	Listening period to detect traffic	UINT32	4		Time Set in Seconds
P3	SLEEP TIME if traffic present	UINT32	4		Time Set in Seconds
P4	Min' Number Pulses to Wake (if pulses detected during listening period)	UINT16	0	65535	Number of pulses to count to wake up the unit, within the set Sleep and RX Time.

1.15.4 Command Return

Command	SLEEP

Parameter	Title	Type	Min	Max	Description

R1	None

1.15.5 Example

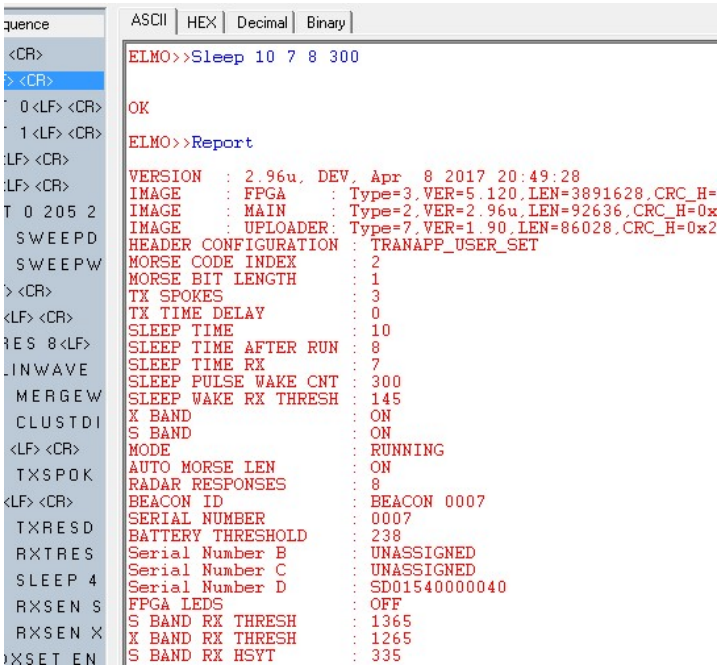


Figure 19 Example Sets Sleep mode to 7s Sleep,10s Sleep (no traffic) and 8s (traffic present) RX, 300 minimum Pulses counted during the listen period for full wake up from sleep mode.

1.16 Stop the transponder running "STOP"

1.16.1 Description

During configuration of the system it is advised that the system is stopped. This stops the transponder outputs to the console and allows the user to easily type commands. When completed the user can run the system using the "RUN" command.

The system will only stop after its cycle has been completed. Stop can also be applied after a reset or power cycle at the command prompt. The user has approximately 10 seconds before the system automatically runs.

1.16.2 User Rights

	Client	Linwave	Factory
User Rights	YES	YES	YES

1.16.3 Command and Parameters

Command	STOP

Parameter	Title	Type	Min	Max	Description
P1	NONE				

1.16.4 Command Return

Command	STOP

Parameter	Title	Type	Min	Max	Description
R1	None				

1.16.5 Example

```
ELMO>>
STOP


OK
```

Figure 20 Example Stop Command

1.17 Get Version of firmware "VER"

1.17.1 Description

Returns the firmware version and time stamp of its build.

1.17.2 User Rights

	Client	Linwave	Factory
User Rights	YES	YES	YES

1.17.3 Command and Parameters

Command	VER

Parameter	Title	Type	Min	Max	Description
P1	NONE				

1.17.4 Command Return

Command	VER

Parameter	Title	Type	Min	Max	Description
R1	Version	STRING			See example

1.17.5 Example

```
ver

VERSION  : 0.37, DEV, Aug 25 2015 11:

OK
```

Figure 21 Example Version Output

1.18 Help List commands available "HELP"

1.18.1 Description

Help outputs the available commands to the user. This is dependent on the login authorisation.

1.18.2 User Rights

	Client	Linwave	Factory
User Rights	YES	YES	YES

1.18.3 Command and Parameters

Command	HELP

Parameter	Title	Type	Min	Max	Description
P1	NONE				

1.18.4 Command Return

Command	HELP

Parameter	Title	Type	Min	Max	Description
R1	Command List	STRING			List of commands, see example Figure 22 List of available commands

1.18.5 Example

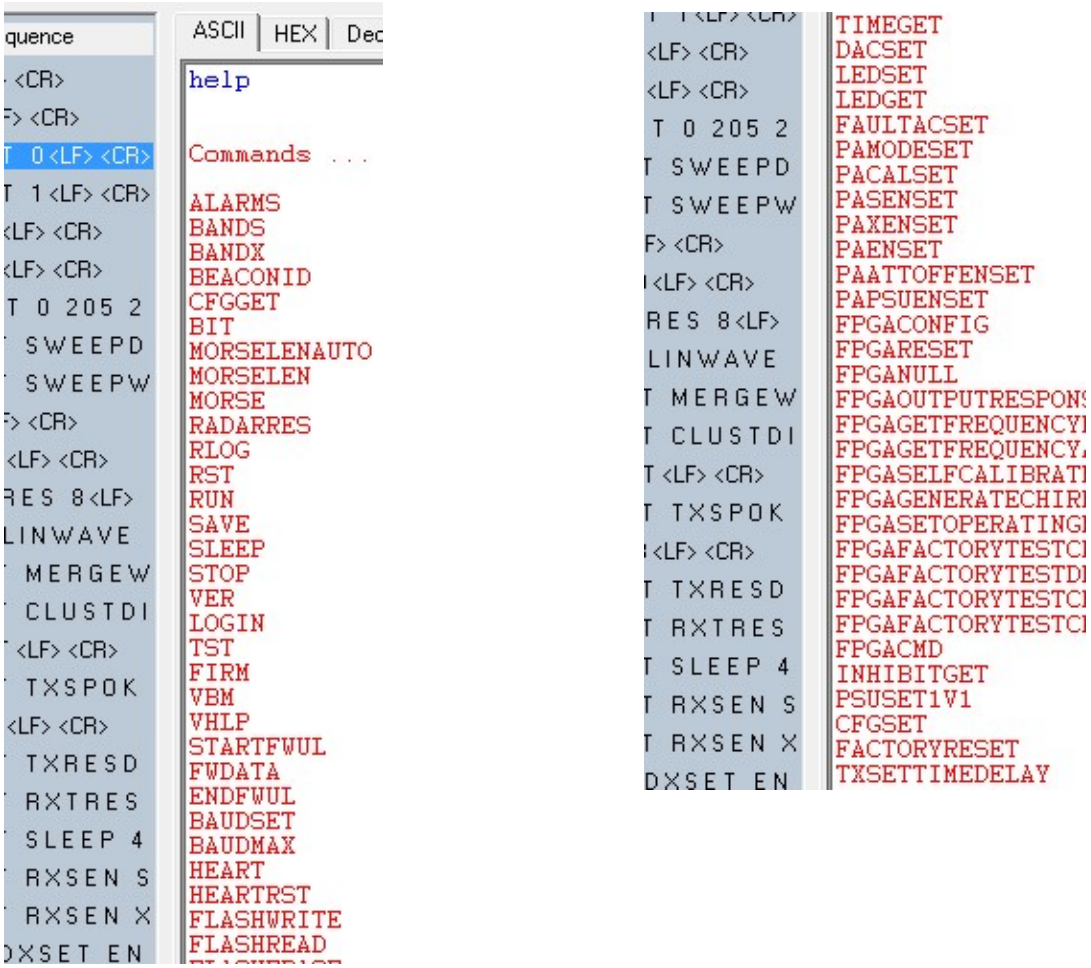


Figure 22 List of available commands