AtoN 1 / 3 AIS

Configuration software

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TABLE OF CONTENTS

1. Product definition

1.1. Purpose

Transponder AIS AtoN is designed to be installed on a buoy to transmit the information relating to this buoy thanks to a VHF transmitter in the 160 MHz band according to AIS FATDMA for KanAtoN 1 AIS and to AIS FATDMA or RATDMA protocols for KanAtoN 3.

To operate, the transponder needs to know any parameters (such as MMSI number, transmission slots, etc). Entering these parameters is carried out by the configuration software.

The main function of this software is to display screens to help the users to correctly enter the necessary data for a correct configuration of the AtoN transmitter.

1.2. Main characteristics

➢ Executable working under Windows®.
➢ Compliant operating systems: Windows® 98, 2000, NT, XP, VISTA.
➢ Light enough to be stored on an USB key.

1.3. Functions

The AtoN transponder configuration software is used for:

➢ Managing the configuration files:
  - Open;
  - Read;
  - Save.
➢ Accessing to the transponder parameters:
  - Read;
  - Send;
  - Re-initialize.
➢ Managing « Port com ».
➢ Transponder configuration:
  - Real AtoN;
  - Synthetic or virtual AtoN;
  - Access to the general parameters of AtoN beacon or particular Kannad transponder.
➢ Managing the reception of on-going messages transmitted by the transponder.

1.4. Optional COM Interface Board

Among transmitted data, indications regarding the current status of buoys and signalization lights of hydrological and meteorological data may also be transmitted.

Acquisition of these AtoN statuses requires an interface used to collect and set the messages to be transmitted: COM AtoN Interface Board

AtoN commands used to remote control on board equipment may also be transmitted.

COM AtoN Interface Board carries out the following functions:

➢ Gathering information regarding AtoN status and transmission to AIS Transponder.
➢ Gathering hydrological and meteorological data and transmission to AIS Transponder.
➢ Positioning of received remote controls towards AtoN's equipment.

COM AtoN Interface Board is easy to integrate in lights and buoys equipment thanks to connections to AIS KanAtoN1 or 3 existing serial interfaces.

The same KanAtoN 1 or 3 transponder configuration software is used to set the COM AtoN Interface Board.

This manual is an updated version of DOOC10091A released on 14/04/2011.

This manual includes the ComAton configuration when the COM AtoN Interface Board is connected to an AIS AtoN.

2. Running the Configuration Software

2.1. Connection

The user shall be connected to the AIS AtoN for an AIS AtoN configuration or to the COM AtoN Interface Board for a COM AtoN Interface Board configuration.

2.2. COM AtoN Interface Board specificities

The COM AtoN Interface Board uses an usb to uart component to carry out a dialog. A specific driver shall be installed to display a new COM port to enter in dialog with the board:

➢ An USB 2.0 AB Type (Male/Male) shall be used to connect a PC or laptop to J5 of the COM AtoN Interface Board.
http://www.silabs.com/products/interface/usbtouart/Pages/usb-to-uart-bridge.aspx

➢ CP210x_VCP_Win_XP_S2K3_Vista_7.exe driver shall be installed into the PC or laptop.
http://www.silabs.com/pages/DownloadDoc.aspx?FILEURL=Support%20Documents/Software /CP210x_VCP_Win_XP_S2K3_Vista_7.exe&src=SoftwardDownloadsWebPart.

2.3. Running the Application

Running the configuration software is carried out from the « KanAton_config.exe » executable file:

The following window is displayed:

In the equipment list, either:

➢ Select KanAton for the AIS AtoN configuration then, refer to Section 3. Description of AIS AtoN Configuration Software, or,
➢ Select ComAton for the ComAtoN Interface Board configuration then refer to Section 4. Description of ComAton Configuration Software.

3. Description of AIS AtoN Configuration Software

3.1. Setting up of AIS Software

Refer to § 2.3 Running the Application.

3.1.1. 1st method: connection at setting up of software

At setting up, the configuration software looks during 2 minutes for the connection of an AtoN to the serial link.

When this window is displayed, the AIS AtoN must be switched on. As soon as the connection is effective, the following window is displayed:

Click to OK to access to the main menu (see § 3.2. Main menu).

3.1.2. 2nd method: software without connection to AIS Aton

At setting up, click to Cancel to access to the main menu (see § 3.2. Main menu).

3.1.3. 3rd method: connection to AIS AtoN after setting up of software

Run the software according to method 2. When ready to read or write an AtoN, switch on the AtoN then, as soon as the red led lights, click on ATON > Read or ATON > Write menu (see § 3.2. Main menu).

When using the software for the first time, a Port COM setting is necessary.

Run the software according to method 2 then go to § 3.8. Settings menu.

3.2. Main Menu

After running the software, the following main menu is displayed:
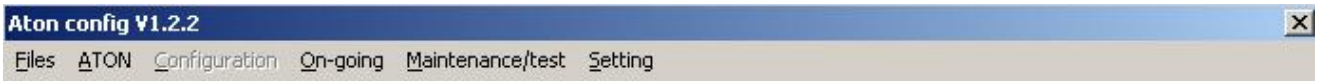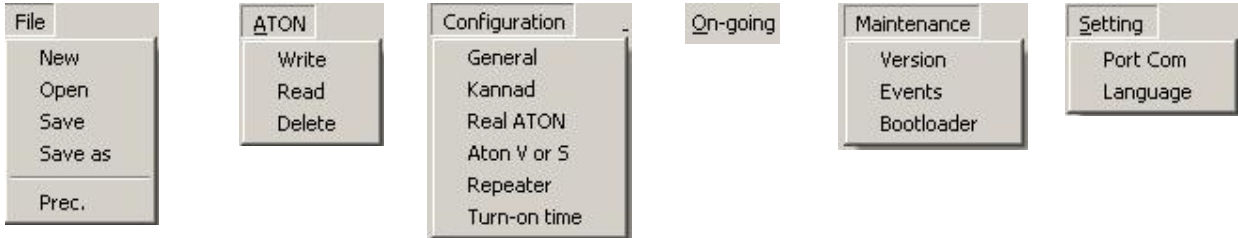
The main menu is used to display the following modes:

⚠️

The `ATON > Write` mode is only accessible if a configuration was loaded either by the `Files > New` mode, or the `Files > Open` mode, or the `ATON > Read` mode.

The `Configuration` mode is only accessible if a configuration was loaded either by the `Files > New` mode, or the `Files > Open` mode, or the `ATON > Read` mode.

The `ComAtoN` mode is only accessible if an AIS Interface Board is connected to the AIS AtoN. For a description of this mode, refer to Section 4 Description of ComAton Configuration Software, § 4.4 ComAtoN Menu.

3.3. Files Menu

3.3.1. Files > New

This mode authorizes the access to the `Configuration` with all the fields set to a default value (see § 3.5 Configuration Menu)

Select `Files > New`

The access to the `Configuration` menu with the default value is now authorized (see § 3.5 Configuration Menu).

3.3.2. Files > Open

This mode is used to launch an exploration window to access to the *.ini* file

This mode also authorizes the access to the `Configuration` menu with all the fields filled according to the opened file (see § 3.5 Configuration Menu).

Select `Files > Open`.

When this mode is selected, the following exploration window is displayed:
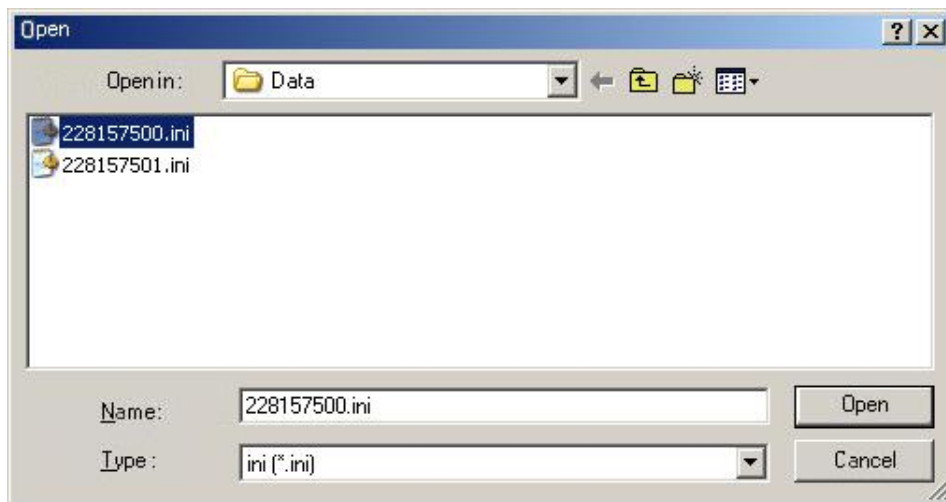
Select the corresponding file, and then click to `Open`.

The access to the `Configuration` menu of this file with these parameters is now saved and authorized (see § 3.5 Configuration Menu).

3.3.3.   Files > Save

This mode is used to save an *.ini* file following an AtoN beacon creation (see §3.3.2 Files > New) or a modification of an AtoN beacon's parameters (see § 3.5 Configuration Menu).

By default, the name of the *.ini* is composed of the 9 digits MMSI numbers of the AtoN beacon.

Select `Files > Save`

The file composed of MMSI number typed during AtoN configuration, is automatically saved in the default saving directory (see § 3.5 Configuration Menu).

3.3.4.   Files > Save as

This mode is used to save an *.ini* file following the creation of an AtoN beacon (see § 3.3.2 Files > New) or a modification of its parameters (see § 3.5 Configuration Menu).

By default, the name of the *.ini* file is composed of the 9 digits MMSI numbers of the AtoN beacon.

Select Files > Save as

The following window is displayed:
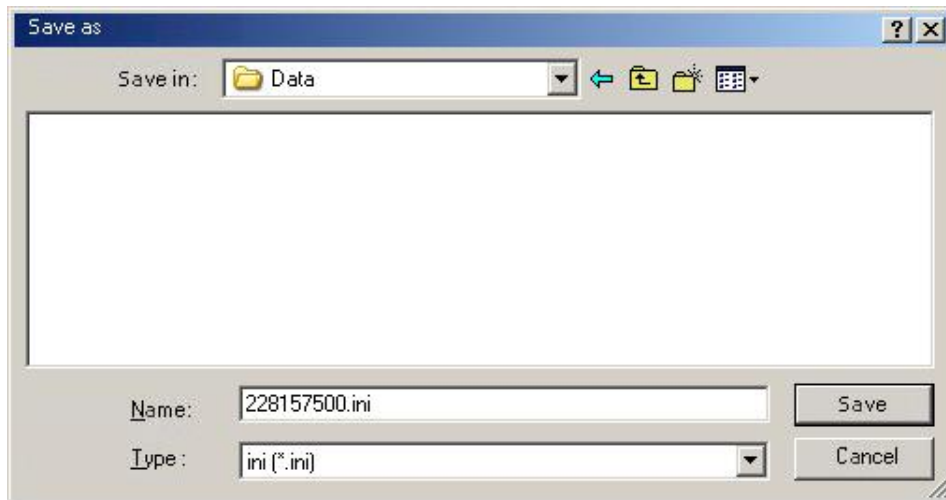
The suggested file name is composed of the MMSI number of the AtoN beacon.

If the name already exists, a pop up window warns the user and suggests to continue or to stop:
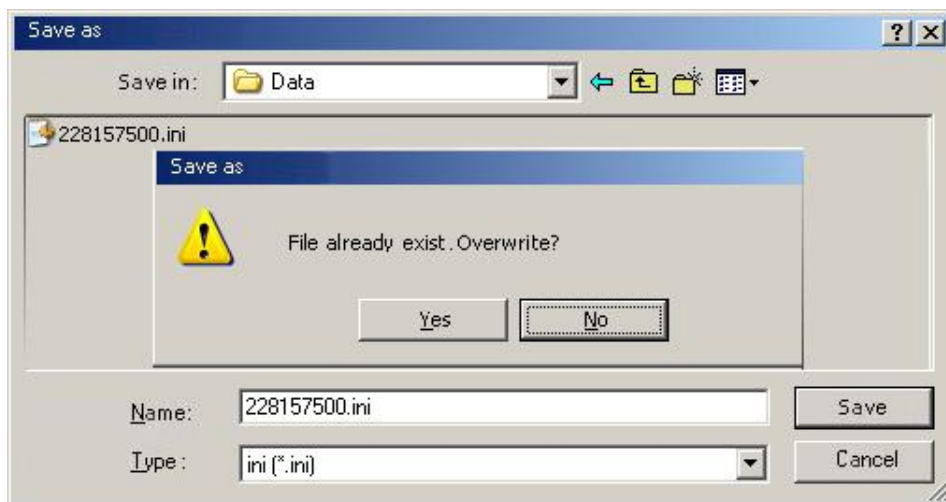
3.4. ATON Menu

3.4.1.   ATON > Write

⚠️ The ATON > Write mode is only accessible if a configuration has been loaded either by the Files > New mode, or by the Files > Open mode.

This mode is used to transmit the displayed configuration, via serial link, to the connected transponder and to reread the downloaded configuration.

Select ATON > Write

A configuration reset is first performed:

Then, the following configuration's data are transmitted via the serial link:
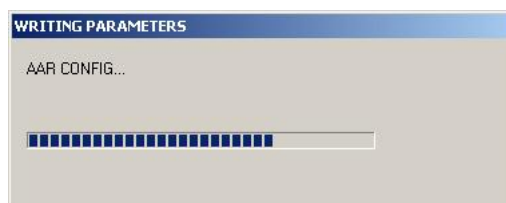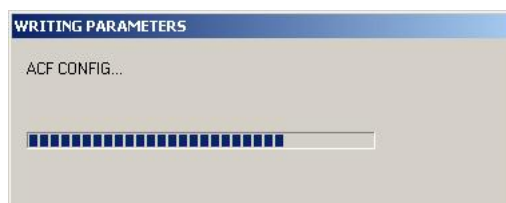
The downloaded configuration is reread:
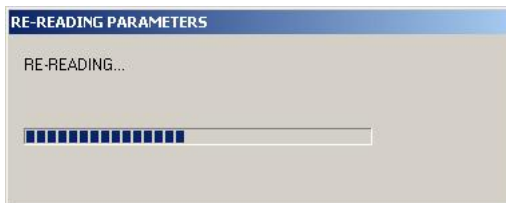
At the end of the writing, an end of loading window is displayed; all the downloaded data are displayed in a drop down menu:
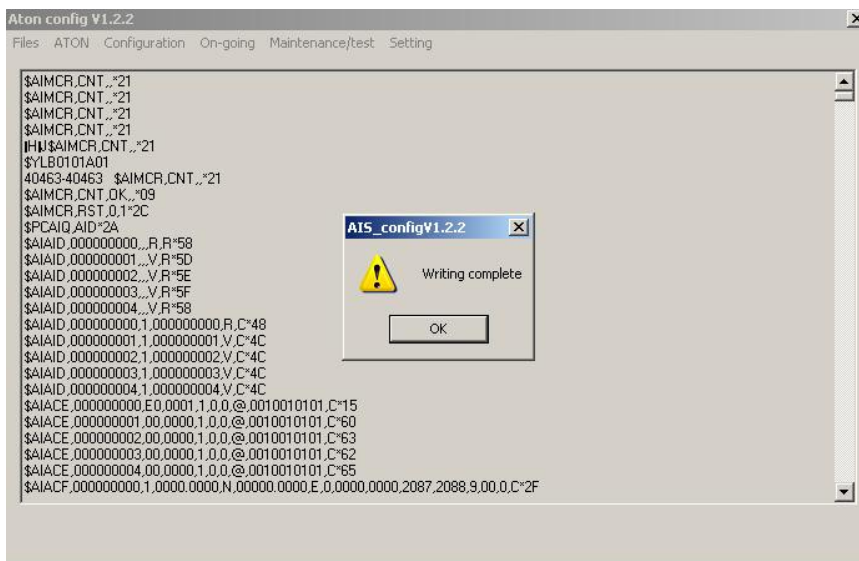
The indications at the end of the loading can be:

- `Writing complete;`
- `Time out on AID Request` (No transponder reply);
- `Different read file.`

3.4.2. ATON > Read

This mode is used to ask, via the serial link, for all the configuration parameters of the connected AtoN.

It also authorizes the access to the `Configuration` menu with all the fields already filled according to the read value.

The read configuration is allocated to a file name composed of the read MMSI number.

Select `ATON > Read`

At the end of the reading, an end of reading window is displayed; all the read data are displayed in a drop down menu:
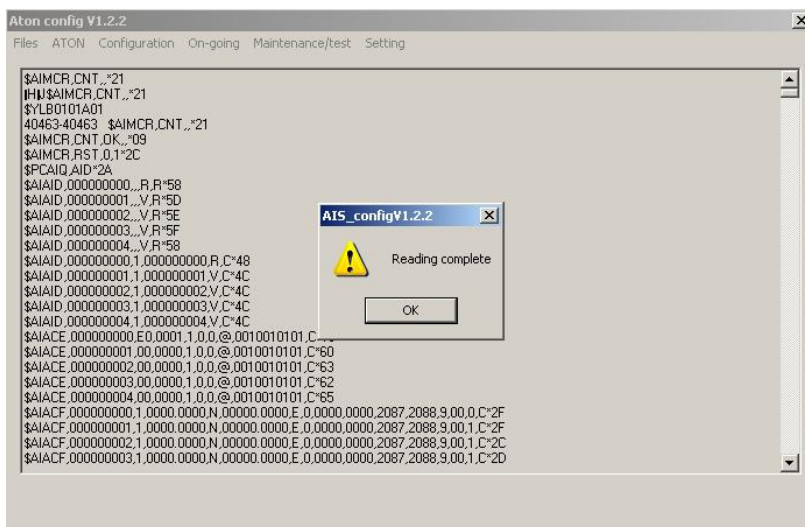
3.4.3. ATON > Delete

This mode is used to restart from a blank configuration by resetting the AtoN transponder to its default values (factory setting).

It also allows access to the Configuration menu with all fields filled in according to the read value.

Select ATON > Delete

All the parameters are reset to their default value:

Note: The initialized set of AIS parameters may differ from the default values set by the configuration software.

3.5. Configuration Menu

⚠️ The Configuration menu is only accessible if a configuration has been loaded either by the Files > New mode, or the Files > Open mode, or the ATON > Read mode.

3.5.1. Configuration > General

This mode is used to access to the list of the general parameters of an AtoN beacon.

Select Configuration > General
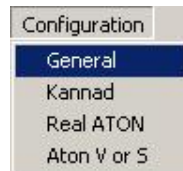
The General parameters window is displayed:

The general parameters are:

- Channel number for frequency 1 according to ITU M.1084 : 2087 (not modifiable)
- Channel number for frequency 2 according to ITU M.1084 : 2088 (not modifiable)
- Encryption key: 32 hexadecimal characters corresponding to the 128 bits of the encryption key used to encrypt / decipher the data of messages 6 and 25 according to IEC62320-2 standard.
- TOR input affectation:
  - Active level: 0, low or 1, high for the 4 inputs
    - 0 for active input if the input is not connected or linked to COMMON.
    - 1 for active input if the input is at a different level from the COMMON.
  - Allocation (not modifiable):
    - TOR1 : 0, Light state
    - TOR2 : 1, Light fault
    - TOR3 : 2, Racon fault
    - TOR4 : 0, Technical message

3.5.2. Configuration > Kannad

This mode is used to access to the list of the specific parameters of a Kannad transponder.

Select Configuration > Kannad

The Kannad parameters window is displayed:

The specific parameters of the Kannad transponder are:

- GPS activation (duration): 10 to 99999 (10 s to permanent, a 30 s value is recommended)
- Active GPS time during 12 mn: 0 to 23 (Acquisition of ephemerides)
- Algo OFF position: OFF position detection algorithm
  - 1. Proprietary: OFF Position is detected if the KanAtoN is out of the circle (reference position and OFF position threshold) for more than 10 minutes.
    Return in normal position is detected if the KanAtoN is in the circle for more than 10 minutes.
    GPS acquisitions are performed at the same rate that AIS transmissions
  - 2. GLA: OFF Position and return in normal position is performed according to IALA A.126 Annex A example 2.
- Message 6 parameters
  - Link: Selection of serial link to transmit the message 6

- 0, No
- 1, RS485 (always select RS485 for a Com AtoN Interface
- 2, RS232
  - Speed: 1200 to 38400 baud (select 38400). Not used.
  - Nb bits: 5 to 9 (select 8). Not used.
  - Parity: (select No). Not used
    - No
    - Even
    - Odd
  - Stop bit: 1 stop or 2 stop (select 1 stop). Not used
  - Time of measurement before msg.: 20 to 86400 s (20 s typical)
    Time for the transponder to acquire technical data before transmission.
- Message 8 parameters (NMEA reception format)
  - Time of measurement before msg.: 20 to 86400 s (20 s typical)
    Time for the transponder to acquire meteorological data before transmission.
  - NMEA Format:
    These parameters are used to indicate the NMEA sentences supplied by the field's sensors
    These parameters are used to indicate headers, fields and coefficient of data scaling supplied by a sensor supplying sentences at 4800 bauds NMEA form.
    The coefficient and offset parameters are used to set the value read to the unit used in message 8.
    Unit Msg8 = (Read Value * Coeff.) + Offset
    Example :
    $WIMDA,,,1010.5,B,20.2,C,10.8,C,82.0,,18.5,C,102.0,T,104.0,M,5.0,2.6,M*
    with :
    1010.5 atmospheric pressure in hpa.
    20.2 air temperature in degrees Celsius.
    10. water temperature in degrees Celsius.
    82.0 relative humidity in percent.
    18.5 dew point in degrees Celsius.
    102.0 wind direction degrees.
    5.0 speed direction in knots.
    - Parameters for atmospheric pressure hpa $\Rightarrow$ hpa (see table 1)
      Field: 8
      HEADER : WIMDA
      Field N°: 3 (3rd comma)
      Coef: 1
      offset: 0
    - Parameters for air temperature °C $\Rightarrow$ 1/10°C (see table 1)
      Field: 5
      HEADER: WIMDA
      Field N°: 5
      Coef: 10
      offset: 0
    - Parameters for water temperature °C $\Rightarrow$ 1/10°C (see table 1)
      Field: 28
      HEADER: WIMDA
      Field N°: 7
      Coef: 10
      offset: 0

- Parameters for relative humidity % $\Rightarrow$ % (see table 1)
  Field: 6
  HEADER: WIMDA
  Field N°: 9
  Coef: 1
  offset 0

- Parameters for dew point °C $\Rightarrow$ 1/10°C
  Field: 7
  HEADER: WIMDA
  Field N°: 11
  Coef: 10
  offset: 0

- Parameters for wind direction Degree $\Rightarrow$ Degree
  Field: 3
  HEADER: WIMDA
  Field N°: 913
  Coef: 1
  offset: 0

Etc.

▪ Proprietary Format
  Only one frame is required; the characters are memorized ones behind the others.
  Reception of end of frame is detected following an absence of characters with a 20 ms duration.
  Example : 1010.5 – 20.2 – 10.8 – 82.0 …

- Parameters for atmospheric pressure
  Field 8
  Rank 1st car: 0
  Data length: 6
  Coef: 1
  offset: 0

- Parameters for water temperature
  Field 5
  Rank 1st car: 7
  Data length: 4
  Coef: 10
  offset: 0

Table 1: Meteorological and Hydrological Data Message

	Parameter	N° of bits	Description	Unit MSg 8
1	Average wind speed	7	Average of wind speed values for the last 10 minutes, in 1 knot steps. 0 - 125 knots 126 = wind 126 knots or greater 127 = not available = default	Knots
2	Wind gust	7	Maximum wind speed reading during the last 10 minutes, in 1 knot steps. 0 - 125 knots 126 = wind 126 knots or greater 127 = not available = default	Knots
3	Wind direction	9	Direction of the average wind during the last 10 minutes, in 1 degree steps. 0 - 359 degrees 360 = not available = default 361 - 511 (reserved for future use)	Degree
4	Wind gust direction	9	Direction of the maximum wind during the last 10 minutes, in 1 degree steps. 0 - 359 degrees 360 = not available = default 361 - 511 (not for use)	Degree
5	Air temperature	11	Dry bulb temperature in degrees Celsius (as per 2's complement), in 0.1 degree steps. -60 to +60 degrees Celsius 601 - 1,023 (reserved for future use) -1,024 = data not available = default -1,023 to -601 (reserved for future use)	1/10 of degree
6	Relative humidity	7	Relative Humidity, in 1% steps. 0 - 100% 101 = not available = default 102 -127 (reserved for future use)	%
7	Dew point	10	Dew point temperature in degrees Celsius (as per 2's complement), in 0.1 degree steps. -20.0 to +50.0 degrees 501 = not available = default 502 - 511 (reserved for future use) -511 to -201 (reserved for future use)	1/10 of degree
8	Air pressure	9	Air pressure, defined as pressure reduced to sea level,in 1 hPa steps. 0 = pressure 799 hPa or less 1 - 401 = 800 - 1200 hPa 402 = pressure 1201 hPa or greater 403 - 510 (reserved for future use) 511 = not available = default	hPa
9	Air pressure tendency	2	0 = steady 1 = decreasing 2 = increasing 3 = not available = default	
10	Horizontal visibility	8	Horizontal visibility, in 0.1 Nautical Miles steps (00000000 to 01111111). 0.0 - 12.6 Nautical Miles The most significant bit (MSB) indicates that the maximum range of the visibility equipment was reached and the reading shall be regarded as > x.x NM. (e.g., if 10110010, then visibility is 5.0 NM or greater) 127 = data not available = default	1/10 Nautical Miles

AIS AtoN3

Configuration Software

PAGE: 15 / 58
DATE: 05/06/2012
INDEX : D
REF.: DOC10091

mcmurdo

	Parameter	N° of bits	Description	Unit MSg 8
11	Water level (incl. tide)	12	Deviation from local chart datum, in 0.01 metre steps. -10.0 to +30.0 metres A value representing 0 - 4,000 is sent by the 12 binary bits. The water level is achieved by adding -10.0 to the sent value. Water level = (Integer value /100) – 10 for Integer = 0-4,000 4,001 = not available = default 4,002 – 4,095 (reserved for future use)	Centimetre (1/100 meter)
12	Water level trend	2	0 = steady 1 = decreasing 2 = increasing 3 = not available = default	
13	Surface current speed (incl. tide)	8	Speed of Current measured at the sea surface, in 0.1 knot steps 0.0 - 25.0 knots 251 = speed 25.1 knots or greater 255 = not available = default 252-254 (reserved for future use)	1/10 knots
14	Surface current Direction	9	Direction of Current at the sea surface, in 1 degree steps. 0 - 359 degrees 360 = not available = default 361 - 511 (reserved for future use)	Degree
15	Current speed, #2	8	Speed of Current 2 measured at a chosen level below the sea surface, in 0.1 knot steps. (Same as Surface Current Speed)	1/10 knots
16	Current direction, #2	9	Direction of Current 2, in 1 degree steps. (Same as Surface Current Direction)	Degree
17	Current measuring level, #2	5	Measuring level below sea surface, in 1 metre increment 0 - 30 metres 31 = not available = default	Metre
18	Current speed, #3	8	Speed of Current 3 measured at a chosen level below the sea surface, in 0.1 knot steps. (Same as Surface Current Speed)	1/10 knots
19	Current direction, #3	9	Direction of Current 3, in 1 degree steps. (Same as Surface Current Direction)	Degree
20	Current measuring level, #3	5	Measuring level below sea surface, in 1 metre steps. 0 - 30 metres 31 = data not available = default	Meter
21	Significant wave eight	8	Height of the waves, in 0.1 metre steps. 0.0 - 25.0 metres 251 = height 25.1 metres or greater 255 = data not available = default 252 - 254 (reserved for future use)	Decimeter (1/10 metre)
22	Wave period	6	Wave period, in 1 second steps. 0 - 60 seconds 61 - 62 (reserved for future use) 63 = not available = default	Second
23	Wave direction	9	Direction of waves, in 1 degree steps. 0 - 359 degrees 360 = data not available = default 361 - 511 (reserved for future use)	Degree
24	Swell height	8	Height of the swell, in 0.1 metre steps. 0.0 - 25.0 metres 251 = height 25.1 metres or greater 255 = data not available = default 252 - 254 (reserved for future use)	Decimeter (1/10 metre)

	Parameter	N° of bits	Description	Unit MSg 8
25	Swell period	6	Swell period, in 1 second steps. 0 - 60 seconds 61 - 62 (reserved for future use) 63 = not available = default	Second
26	Swell direction	9	Direction of swells, in 1 degree steps. 0 - 359 degrees 360 = not available = default 361 - 511 (reserved for future use)	Degree
27	Sea state	4	Beaufort Scale	
28	Water temperature	10	Temperature of the water in degrees Celsius (as per 2's complement), in 0.1 degree steps. -10.0 to +50.0 degrees 501 = data not available = default 502 - 511 (reserved for future use) -511 to -101 (reserved for future use)	1/10 degree
29	Precipitation (type)	3	According to WMO 306 Code table 4.201: 0 = reserved 1 = rain 2 = thunderstorm 3 = freezing rain 4 = mixed/ice 5 = snow 6 = reserved 7 = not available = default	
30	Salinity	9	Salinity, in 0.1‰ (ppt) steps. 0.0 - 50.0 ‰ 50.1 = salinity 50.1 ‰ or greater 510 = not available = default 511 = sensor not available 502 - 509 (reserved for future use)	0.1 ‰
31	Ice	2	0 = No 1 = Yes 2 = (reserved for future use) 3 = not available = default	

AIS AtoN3	PAGE: 17 / 58
Configuration Software	DATE: 05/06/2012
	INDEX : D
	REF.: DOC10091

mcmurdo

3.5.3. Configuration > Real ATON

This mode is used to configure a real AtoN.

Select `Configuration > Real ATON`
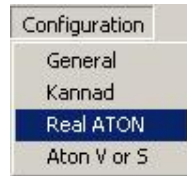
The `Real ATON parameters` window is displayed:
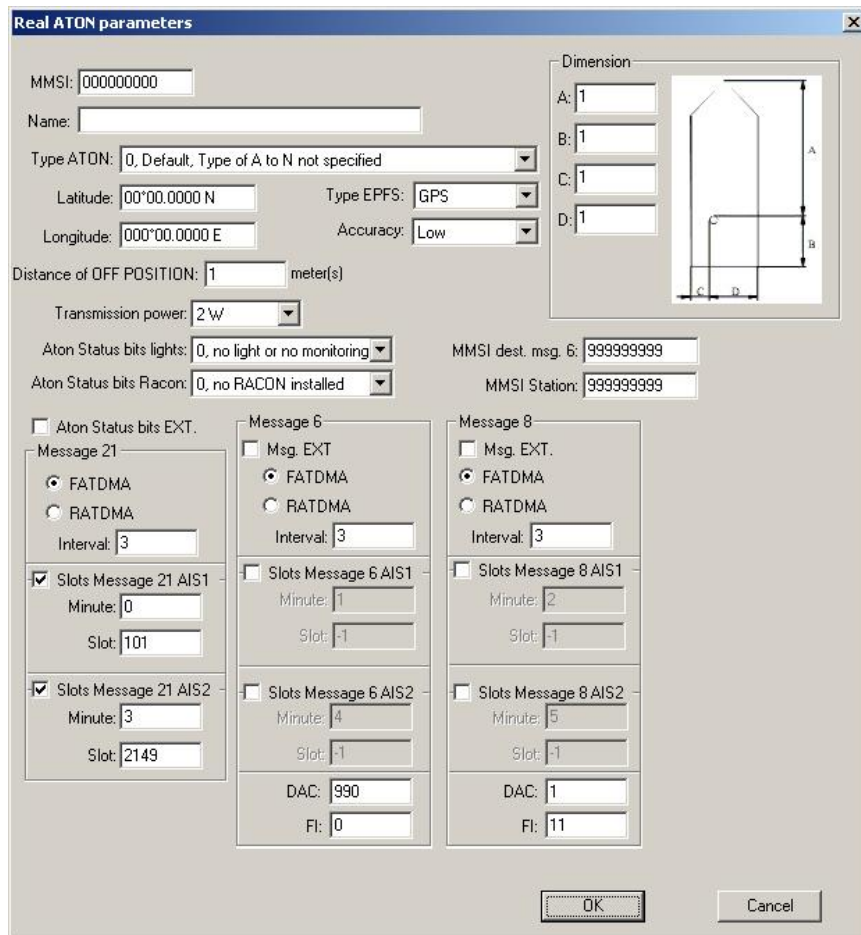
The real AtoN parameters are:

- Specific physical parameters to the AtoN beacon;
- Specific parameters to the message transmission.

3.5.3.1. Physical parameters specific to AtoN beacon

- `MMSI`: Transponder MMSI number (9 digit numbers)
- `Name`: Transponder name (maximum 34 characters)
- `Type ATON`: Nature and type of aid to navigation
  - 0, Default, Type of Aid to Navigation not specified
  - 1, Reference point
  - 2, RACON
  - 3, Fixed structure off shore, such as oil platforms, wind farms
  - 4, Spare, Reserved for future use

<u>Fixed Aid to Navigation</u>

- 5, Light, without sectors
- 6, Light, with sectors
- 7, Leading Light Front
- 8, Leading Light Rear
- 9, Mark, Cardinal N
- 10, Mark, Cardinal E
- 11, Mark, Cardinal S
- 12, Mark, Cardinal W
- 13, Mark, Port hand
- 14, Mark, Starboard hand
- 15, Mark, Preferred Channel port hand
- 16, Mark, Preferred Channel starboard hand
- 17, Mark, Isolated danger
- 18, Mark, Safe water
- 19, Mark, Special mark

<u>Buoyant Aid to Navigation</u>

- 20, Cardinal Buoy N
- 21, Cardinal Buoy E
- 22, Cardinal Buoy S
- 23, Cardinal Buoy W
- 24, Port hand Buoy
- 25, Starboard hand Buoy
- 26, Preferred Channel Port hand Buoy
- 27, Preferred Channel Starboard hand Buoy
- 28, Isolated danger Buoy
- 29, Safe Water Buoy
- 30, Special Buoy
- 31, Light Vessel Buoy / LANBY Buoy / Rigs

- `Latitude:` From 00°00.000 to 89°59.9999. N or S
- `Longitude:` From 000°00.000 to 179°59.9999. W ou E
- `Distance of OFF POSITION:` In meters, authorized values from 0 to 1500.
- `Transmission power :` Select `2W` or `12.5W`
- `Aton Status bits lights:`
  - 0, no light or not monitoring
  - 1, Light ON
- `Aton Status bits Racon:`
  - 0, no RACON installed
  - 1, RACON installed but not monitored
  - 2, RACON operational
- `Type EPFS`
  GPS, Surveyed, Galileo

- ▪ GPS ou GALILEO
  The position transmitted in message 21 is the position transmitted by the GPS. This receiver is compatible with GALILEO. Today, GALILEO is not operational.

- ▪ Surveyed
  The position transmitted in message 21 is the position translated in parameter.

- Accuracy
  This field is copied in message 21 when type EPFS is set to « Surveyed ». Either if low the « Accuracy » field in message 21 is set to low, or if high the « Accuracy » field in message 21 is managed according to IEC 62320-2 and M1371. According the position estimated by RAIM receiver and is the position is corrected or not by the SBAS differential device.

- MMSI dest. msg 6 :
  MMSI number of station to which the message 6 is transmitted.

- MMSI Station:
  MMSI number of base station to which the AIS AtoN is associated. This parameter is optional and is only memorized in the .ini file (see § 2.3).

For each AIS message (21, 6 and 8), three boxes when they are ticked allow KanAtoN to operate with a COMATON interface box.

- Aton Status bits EXT.:
  Not ticked, indicates that the "Status Bits" bit of message 21 is formed by KanAtoN from the information of TOR1, TOR2, TOR3 inputs and the detection or no detection of the "OFF Position"
  Ticked, indicates that the "Status Bits" bit of message 21 is formed by KanAtoN from the information of "Light Status", "Light Fault" inputs or "lantern current sensor" or "Photodiode output" and the eventual "OFF Position" indication supplied by KanAtoN.

- Msg EXT. of Message 6:
  Not ticked, the message 6 is formed by KanAtoN according to the voltage measured at its power supply input, the four TOR inputs. See in Annex 6.1 Format of Message 6 in basic configuration.
  Ticked, the message 6 is formed by the COMATON interface box and according to its setting "Generic", "Stan Turret", "Stan Lighthouse". See in Annex 6.2 Format of Message 6 in generic configuration, Annex 6.3 Format of Message 6 in STAN Turret configuration and Annex 6.4 Format of Message 6 in STAN Light house configuration,.

- Msg EXT. of Message 8:
  Not ticked, the message 8 is formed by KanAtoN according to the data received on the NMEA serial link available on the C16-1 female connector (cable fitted with the male connector).
  Ticked, the message 8 is formed by the COMATON interface box according to the data received on one of the serial links.

3.5.3.2. Specific parameters to messages transmission

Message 21 shall be transmitted to AIS network according to 3 modes and 2 access methods.

These transmissions modes are defined by IEC 62320-2 standard and ITU M1377 Recommendation.

The following parameters allow setting AIS AtoN according to these recommendations.

FATDMA or RATDMA access methods

IMPORTANT: RATDMA not applicable for AIS AtoN 1.

- `FATDMA`: transmission slots are reserved for a base station.
- `RATDMA`: random access to network, preceded by free transmission slots.
- `Interval`: period on transmission in minute common to both channels.
- `Slots`: slot number; only of FATDM mode.

Transmissions modes defined by IEC 65320 and ITU are:

- Mode A: transmission of a new report at each transmission alternating on both channels.
- Mode B: transmission of a new report successively on both channels.
- Mode C: transmission of a new report only on one channel.
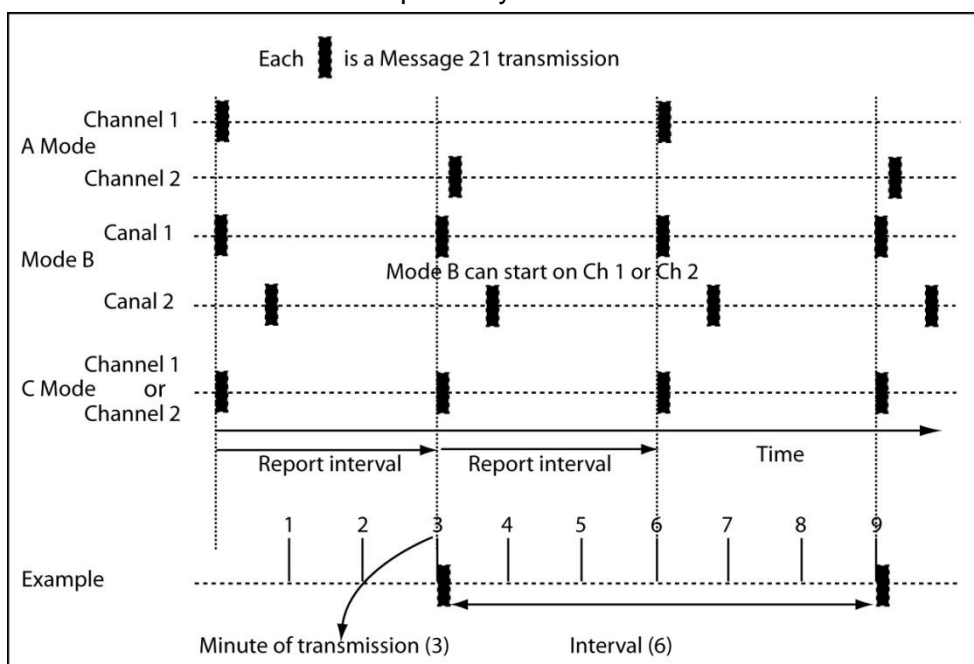
- `Interval`: from 1 to 1440
- `Slots Message 21 AIS1` (Intervals of transmission for MSG 21 AIS1 on)
    - `Minute`: from 0 to the interval.
    - `Slot`: from 0 to 2249 (FATDMA only)
      Note: if the `Slots Message 21 AIS1` box is not ticked, the slot number shifts to -1 to indicate that transmission of message 21 is not possible on this channel.
- `Slots Message 21 AIS2` (intervals of transmission for MSG 21 on the AIS2 frequency).
    - `Minute`: from 0 to the interval
    - `Slot`: from 0 to 2249 (FATDMA only)
      Note: if the `Slots Message 21 AIS2` box is not ticked, the slot number shifts to -1 to indicate that transmission of message 21 is not possible on this channel.

AIS AtoN3

Configuration Software

PAGE: 21 / 58
DATE: 05/06/2012
INDEX : D
REF.: DOC10091

- `Interval`: from 1 to 1440
- `Slots Message 6 AIS1` (intervals of transmission for MSG 6 on the AIS1 frequency)
  - `Minute`: from 0 to the interval
  - `Slot`: from 0 to 2249 (FATDMA only)
    Note: if the `Slots Message 6 AIS1` box is not ticked, the slot number shifts to -1 to indicate that transmission of message 6 is not possible on this channel.
- `Slots Message 6 AIS2` (intervals of transmission for MSG 6 on the AIS2 frequency)
  - `Minute`: from 0 to the interval `Slots Message 6 AIS1` box is not ticked, either depends on the minute of SLOT 6 AIS1
  - `Slot`: from 0 to 2249 (FATDMA only)
    Note: if the `Slots Message 6 AIS2` box is not ticked, the slot number shifts to -1 to indicate that transmission of message 6 is not possible on this channel.
  - `Interval`: from 1 to 1440
- `Slots Message 8 AIS1` (intervals of transmission for MSG 8 on AIS1 frequency)
  - `Minute`: from 0 to the interval
  - `Slot`: from 0 to 2249 (FATDMA only)
    Note: if the `Slots Message 8 AIS1` box is not ticked, the slot number shifts to -1 to indicate that transmission of message 8 is not possible on this channel.
- `Slots Message 8 AIS2` (intervals of transmission for MSG 8 on AIS2 frequency)
  - `Minute`: from 0 to the interval
  - `Slot`: from 0 to 2249 (FATDMA only)
    Note: if the `Slots Message 8 AIS2` box is not ticked, the slot number shifts to -1 to indicate that transmission of message 8 is not possible on this channel.
- `Dimension` (AtoN dimensions)
  - `A`: from 0 to 511 meters
  - `B`: from 0 to 511 meters
  - `C`: from 0 to 63 meters
  - `D`: from 0 to 63 meters
- `DAC` and `FI` MSG 6. : These fields are used both by KanAtoN and COMATON interface box depending on the box `MSG6.EXT` is ticked or not.
  - DAC and FI for GLA application: DAC = 235 (UK & NI) or 250 (ROI); FI = 10
  - DAC and FI for CETMEF application: DAC = 228; FI = 10
- `DAC` and `FI` MSG 8. : These fields are used both by KanAtoN and COMATON interface box depending on the box `MSG8.EXT` is ticked or not.
  DAC and FI shall be set at DAC = 1 and FI = 31.
  Other values could be used for future possible evolutions.

FATDMA Mode A

Transmission on channel 1 and 2 (mode A)

For configuration of a message 21 transmission alternately on channel 1 (AIS1) and channel 2 (AIS2), tick both boxes `Slots Message 21 AIS1` and `Slots Message 21 AIS2`.

The repetition interval "n" is common to both transmissions. Transmission on channel 1 every n minute, and on channel 2 every n minute.

Enter the minute of transmission from 0 to interval for each channel.

Enter the slot of transmission in its minute for the channel 1 and the slot of transmission in its minute for the channel 2.

For example, with the programming shown below, transmission of one message 21 every 3 minutes (every 6 minutes on channel 1 and 6 minutes on channel 2):

Channel 1, starting minute 0, interval 6, slot 123

Canal 2, starting minute 3, intervalle 6, slot 1234
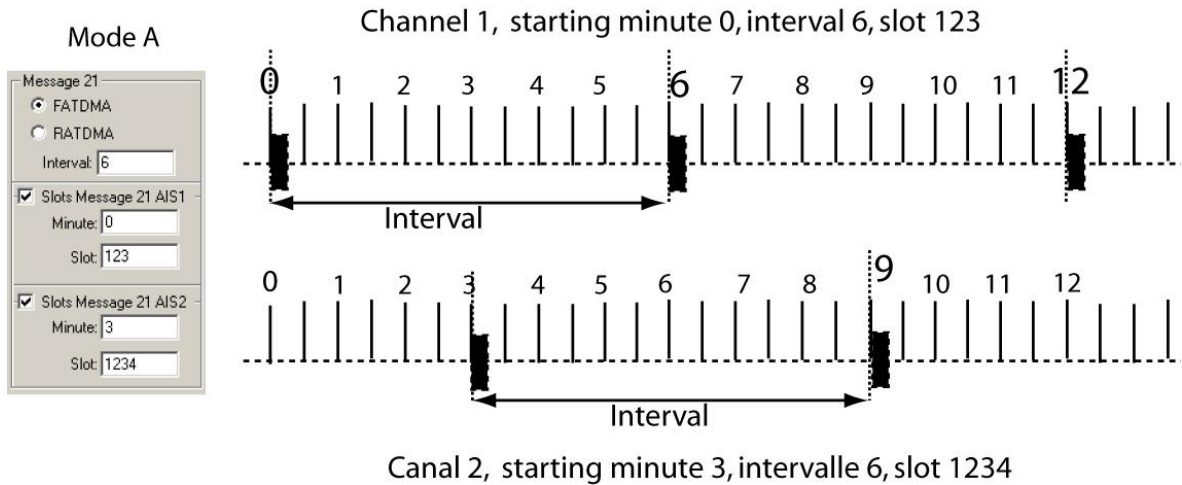
FATDMA Mode B

Transmission of a same message 21 on 2 channels.

The repetition time is common to both transmissions.

Enter the minute of transmission from 0 to interval for each channel.

Enter transmission slot in its minute for channel 1 et transmission slot in its minute for channel 2. In mode B, the time between 2 transmissions shall be less than 4 seconds (< 150 slots).

Example: transmission of message 21 on both channels every 3 minutes.

Channel 1, start minute 1 slot 123

Channel 2, start minute 1 slot 140
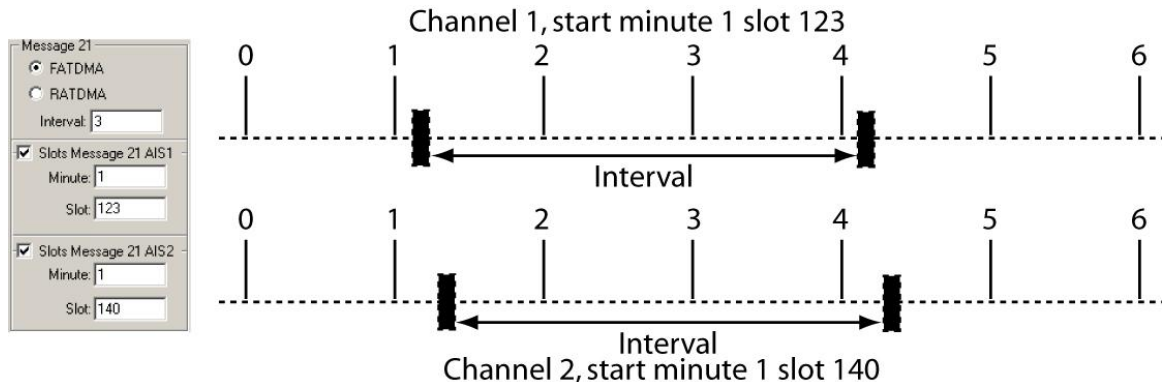
FATDMA Mode C

Transmissions only on channel 1 (C mode)

For configuration of a message 21 transmission only on channel 1 (AIS1), tick only the `Slots Message 21 AIS1` box, enter the interval of transmissions repetition period from 1 to 1439 max (24 hours x 60). Enter the minute of transmission from 0 to the programmed interval and the number of the transmission slot in the minute.

For example, with programming shown below, transmission of a message 21 every minutes at slot 101, starting by minute 0; transmission at 0h00, 0h01, 0h02, 0h03….
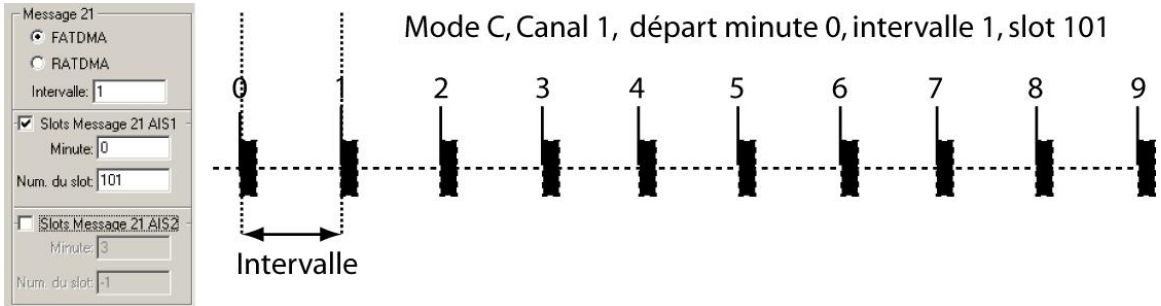
Transmission only on channel 2 (C mode)

For configuration of a message 21 transmission only on channel 2 (AIS2), tick only the `Slots Message 21 AIS2` box, enter the interval of transmissions repetition period from 1 to 1439 max (24 hours x 60). Enter the minute of transmission from 0 to the programmed interval and the number of the transmission slot in the minute.

For example, with programming shown below, transmission of a message 21 every 12 minutes at slot 202 starting by minute 3; transmissions at 0h03, 0h15, 0h27, 0h39…
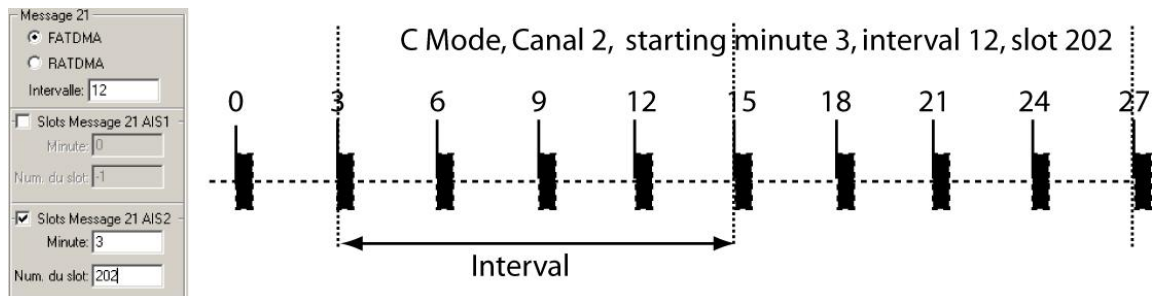
RATDMA Mode A

IMPORTANT: RATDMA not applicable for AIS AtoN 1.

Alternating transmission on both channels.

Repetition interval common to both transmissions.

Minutes of transmission shall be different.

Example: a message 21 alternated on both channels every 3 minutes.
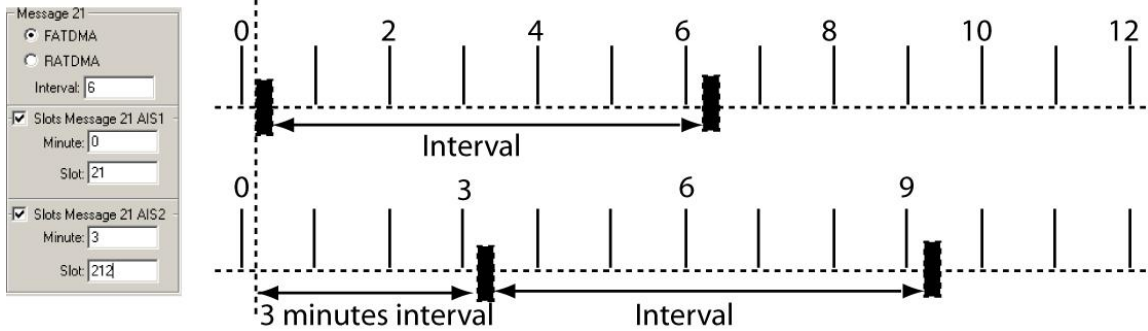
RATDMA Mode B

IMPORTANT: RATDMA not applicable for AIS AtoN 1.

Successive transmission of same message on both channels every 3 minutes.

Minutes of transmission shall be identical.
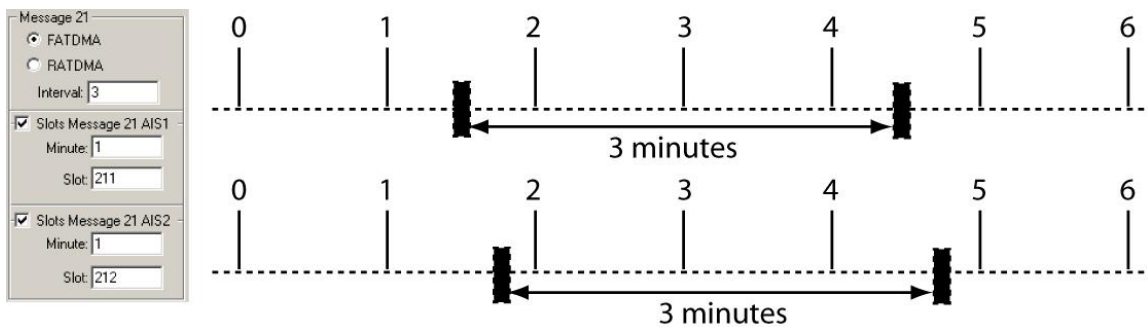
RATDMA Mode C

IMPORTANT: RATDMA not applicable for AIS AtoN 1.

Idem FATDMAC without transmission slot affectation.

3.5.4.   Configuration > Aton V or S

This mode is used to enter the configuration of 1 to 4 virtual or synthetic AtoN transponders.

Select `Configuration > Aton V or S`
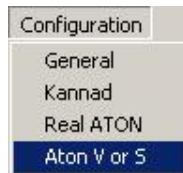
The `Virtual of synthetic ATON parameter` window is displayed:

Parameters for a virtual or synthetic AtoN are:

- `Choice of virtual or synthetic number`: 1 to 4
- `MMSI`: Transponder MMSI number (9 digit numbers)
- `Name`: Transponder name (maximum 34 characters)
- `ATON Type`: Nature and type of aid to navigation
  - 0, Default, Type of Aid to Navigation not specified
  - 1, Reference point
  - 2, RACON
  - 3, Fixed structure off shore, such as oil platforms, wind farms
  - 4, Spare, Reserved for future use

  Fixed Aid to Navigation

  - 5, Light, without sectors
  - 6, Light, with sectors
  - 7, Leading Light Front
  - 8, Leading Light Rear
  - 9, Mark, Cardinal N
  - 10, Mark, Cardinal E

- ▪ 11, Mark, Cardinal S
- ▪ 12, Mark, Cardinal W
- ▪ 13, Mark, Port hand
- ▪ 14, Mark, Starboard hand
- ▪ 15, Mark, Preferred Channel port hand
- ▪ 16, Mark, Preferred Channel starboard hand
- ▪ 17, Mark, Isolated danger
- ▪ 18, Mark, Safe water
- ▪ 19, Mark, Special mark

Buoyant Aid to Navigation

- ▪ 20, Cardinal Buoy N
- ▪ 21, Cardinal Buoy E
- ▪ 22, Cardinal Buoy S
- ▪ 23, Cardinal Buoy W
- ▪ 24, Port hand Buoy
- ▪ 25, Starboard hand Buoy
- ▪ 26, Preferred Channel Port hand Buoy
- ▪ 27, Preferred Channel Starboard hand Buoy
- ▪ 28, Isolated danger Buoy
- ▪ 29, Safe Water Buoy
- ▪ 30, Special Buoy
- ▪ 31, Light Vessel Buoy / LANBY Buoy / Rigs

- `Latitude:` from 00°00.000 to 89°59.9999. N or S to indicate North or South
- `Longitude:` from 000°00.000 to 179°59.9999. W or E to indicate West or East.
- `Choice of virtual or synthetic number:`
  - ▪ 1, Virtual
  - ▪ 2, Synthetic
- `Transmission power:` Select `2W` or `12.5W`
- `Aton Status bits lights:`
  - ▪ 0, no light or not monitoring
  - ▪ 1, Light ON
- `Aton Status bits Racon:`
  - ▪ 0, no RACON installed
  - ▪ 1, RACON installed but not monitored
  - ▪ 2, RACON operational

  If Light on and/or Racon operational status bytes of message 21 is managed by AIS interface.
- `Slots Message 21 AIS1` (intervals of transmission for MSG 21 on AIS1 frequency)
  - ▪ `Interval:` from 1 to 1440
  - ▪ `Minute:` from 0 to the interval
  - ▪ `Slot:` from 0 to 2249
    Note: if the `Slots Message 21 AIS1` is not ticked, the slot number shifts to -1 to indicate that transmission of message 21 is not possible on this channel.

- `Slots Message 21 AIS2` (intervals of transmission for MSG 21 on AIS2 frequency)
  - `Interval :` from 1 to 1440
  - `Minute:` from 0 to the interval
  - `Slot:` from 0 to 2249
    Note: If the `Slots Message 21 AIS2` is not ticked, the slot number shifts to -1 to indicate that transmission of message 21 is not possible on this channel.
- `Dimension` (AtoN dimensions)
  - `A:` from 0 to 511 meters
  - `B:` from 0 to 511 meters
  - `C:` from 0 to 63 meters
  - `D:` from 0 to 63 meters

3.5.5. Configuration > Repeater

IMPORTANT: RATDMA not applicable for AIS AtoN 1.

The AIS AtoN is fitted with a repeater mode allowing retransmitting the received messages. This function is used to expand the AIS network coverage for some types of message.

The repeater mode is compliant with the ITU-R M.1371-4 recommendations, however the purpose of AIS AtoN being not to retransmit all the AIS traffic, the use of filter is recommended to only retransmit the messages considered as important.

- `Repeater Activated`

  Tick this box to activate the repeater mode. A message is retransmitted if it fulfils all the conditions of the selected filters.

- `Repeater Indicator` filter

  Received message for which the `Repeater Indicator` is lower or equal to the value selected in this field are retransmitted. A message with its `Repeater Indicator` equal to 3 is never retransmitted.

- `Distance` filter

    For the messages including a position (Messages type 1, 2, 3, 21, etc.), a positioning calculation is performed between the KanAtoN and the position of the message origin. If the distance is lowers or equal to the value selected in this field, the message is retransmitted.

- `Area` filter

    For the messages including a position (Messages type 1, 2, 3, 21, etc.), a positioning calculation is performed to determine if the position of the message origin is inside or outside an area. The message is retransmitted if the message is inside the zone.

- `MMSI` filter

    Messages retransmitted are those for which the MMSI is indicated.

    If all MMSI are set to -1, the MMSI filter is not active.

- `ID` filter

    Messages transmitted are those for which the type of messages (1, 2, etc.) is ticked

    Specific case of 1, 2, 3 and 14 type of messages

    - Even if 1, 2, 3 types of messages are not ticked, KanAtoN analyzes the received message and retransmit it if the `Navigational Status` field is set at 14 and if the type 14 is ticked.
    - The messages of types 1, 2, 3 with their `Navigational Status` field set at 14 correspond to the `SART ACTIVE` message.

3.5.6.   Configuration > Turn-on time
IMPORTANT: RATDMA not applicable for AIS AtoN 1.
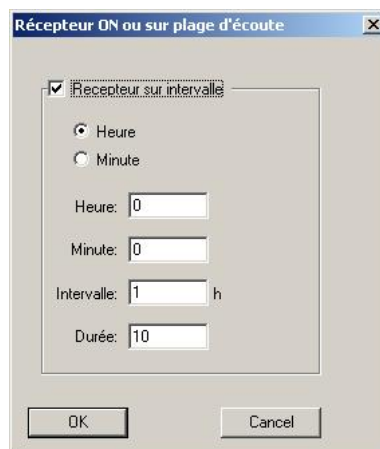
- `Recepteur sur intervalle`

    If this box is not ticked, the receiver is always operating

    If this box is ticked, the receiver is operating according to the period defined by hour or by minute

- Interval in hour

    The first hour of receiver starting is indicated in hour and minutes with the field `Heure` and `Minute`.

    The interval between two operating ranges of the receiver is indicated in hours.

    The duration is indicated in minutes.

    Example:

    `Heure` 10; `Minute` 30; `Intervalle` 6, `Durée` 5

    The receiver operating ranges are the followings:

    10h30 to 10h35, 16h30 to 16h35, 22h30 to 22h35

- Interval in minute

The first hour of receiver starting is indicated in minutes with the `Minute` field.

The interval between two operating ranges of the receiver is indicated in minutes.

The duration is indicated in minutes.

Example:

`Minute` 30; `Intervalle` 45, `Durée` 5

The receiver operating ranges are the followings:

00h30 to 00h35, 01h15 to 01h20, 02h00 to 02h05, etc.

3.6. On-going Menu

This function is used to visualize the frames received from the serial link and to record them in a .txt file.

Select `On-going`

The following drop down window is displayed:
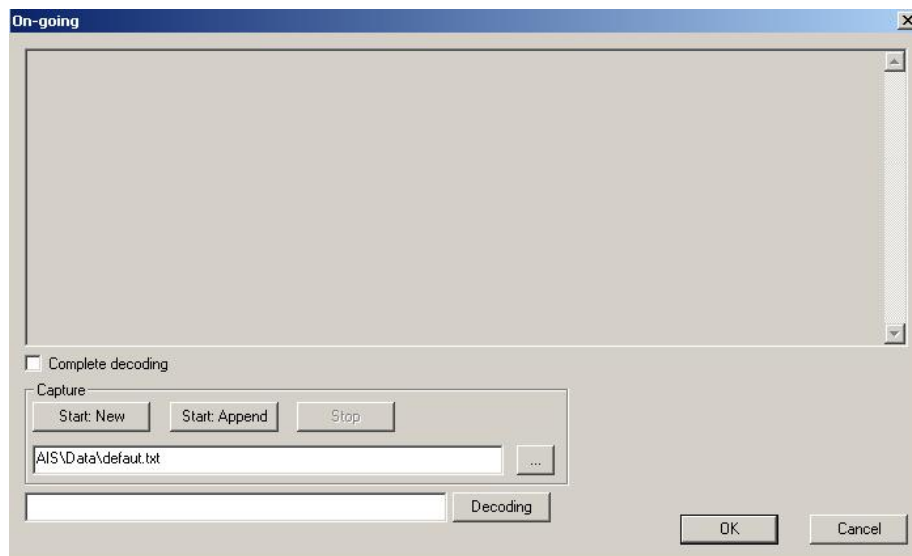
`Complete decoding`

- If this box is ticked, messages 21 (AtoN), 6 (Technical) and 8 (Meteo) are decoded.

New record

- Click on ⬚ to choose a new `.txt` file.
- Click to `Start: New`.
- Press `Stop` to stop the record in the file.
- Visualize the content of the file with a text editor.

Record to follow

- Click on ⬚ to choose an existing file.
- Click to `Start Append`.
- Press `Stop` to stop the record in the file..
- Visualize the content of the file with a text editor.

3.7. Maintenance Menu

3.7.1. Version

This function is used to display the software version of the connected AtoN transponder.

Select `Maintenance > Version`

3.7.2. Events

This function is used to display the list of events stored in the AtoN transponder. Via the serial link, the configuration software transmits a specific command to the transponder, shifts in stand by and saves the received data in a text file at the end of the analyze.

Select `Maintenance > Events`

The list of recorder events is saved under *.csv file.
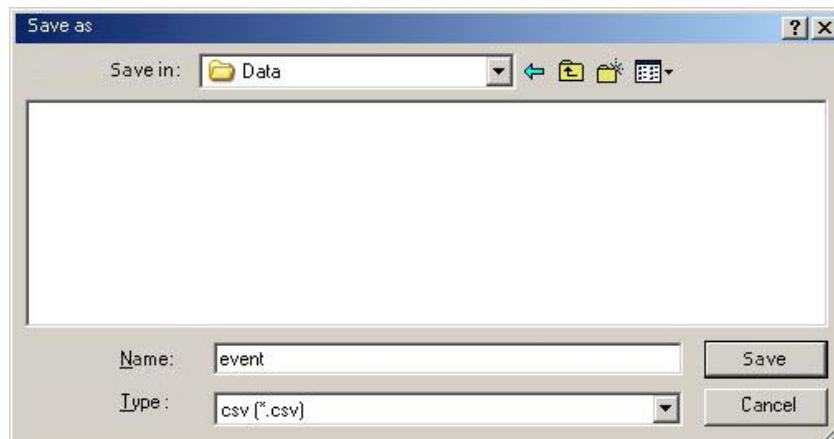
The list of saved events can be displayed by opening the *.csv file.

AIS AtoN3

Configuration Software

PAGE: 31 / 58
DATE: 05/06/2012
INDEX : D
REF.: DOC10091

Table 2: List of events

Type	Information 1	Information 2	Information 3	Daté
1 = Power on	Bit 0 1 if Reset by power on Bit 1 1 if Reset by ext. watch dog. Bit 2 1 if Brown out reset Bit 3 1 if Reset by int. watch dog. Bit 4 1 if Reset by JTAG bus	0	0	N
2 = Reset	Bit 0 1 if Reset by power on Bit 1 1 if Reset by ext. watch dog. Bit 2 1 if Brown out reset Bit 3 1 if Reset by int. watch dog Bit 4 1 if Reset by JTAG bus	0	0	N
3 = Self-test result at power on	Bit 0 Bit 1 1 if Program Flash OK Bit 2 Bit 3 1 if temperature sensor OK Bit 4 1 if input voltage between 10 and16V Bit 5 Bit 6 1 if AIS OK Bit 7 1 if GPS link OK Bit 8 1 if Quartz 32 kHz OK Bit 9 1 if E2prom data OK	0	0	N
4 = Date and time of first GPS acquisition	0	0	0	O
7 = No GPS lock	-1 or 65535 no link with GPS -2 or 65534 incorrect GPS frame reception	0	0	O
8 = Access to configuration menu	0	0	0	N
9 = Internal error	Manufacturer interpretation	Manufacturer interpretation	Manufacturer interpretation	O
10 = Data on power supply voltage by steps of 100 mW	Min. Voltage min.	Max. Voltage	Average voltage	O
11 = Temperature data in °C with 20°C offset	Min. Temperature	Max. Temperature	Average temperature	O
12 = Data on GPS synchronization time	Minimum time	Maximum time	Average time	O
13 = Data on number of AIS transmissions	Number of AIS transmissions	Number of technical data calculation	Number of meteo data calculation	O
14 = Number of TOR Input cutovers	RACON fault	Lights on	Lights fault	O
15 = Number of Output cutovers	OFF POSITION			O

3.7.3.   BootLoader

This function is used to reprogram the transponder via the serial link.

Select `Maintenance > BootLoader`

The following window asks to shift in bootloader mode.
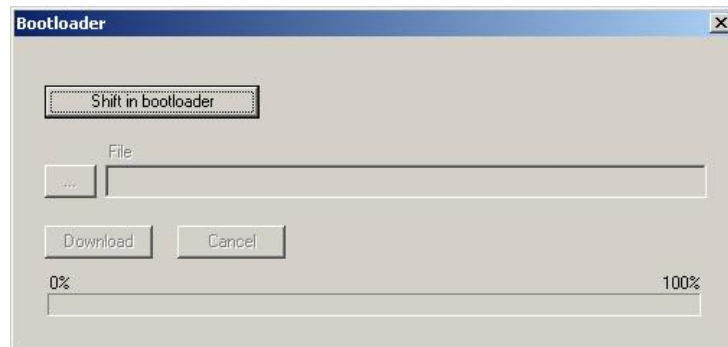
The following pop up window warns that the transponder has shifted in Boot Loader mode.

Click to `OK` to close the window

Click to `Shift in bootloader`.
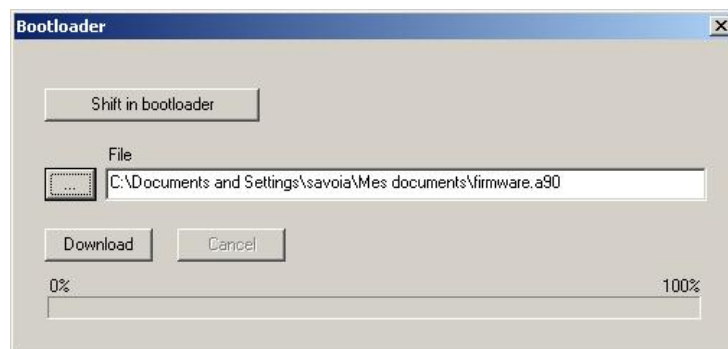
Select the location where the file is saved.

Note: before clicking on `Download`, wait a few seconds (10 to 30 s.) that the Aton be ready to receive the file. The Led on KanAtoN shall quickly flash (green / red).

Click to `Download`: a progress band displays the progress status.

Once, download is completed, switch off then switch on the KanAtoN, the led shall not flash green/red any more.

The new version can be reread by connecting again to KanAtoN.

AIS AtoN3

Configuration Software

PAGE: 33 / 58
DATE: 05/06/2012
INDEX : D
REF.: DOC10091

mcmurdo

3.8. Setting Menu

3.8.1.   Port Com

This function is used to select the COM Port of the serial link and to select the speed.

Select Setting > Port Com

The Setting port com window is displayed:
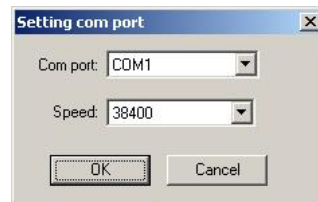
- Port com: display of available Ports COM on the computer.
- Speed: from 1200 to 38400 bauds (select 38400 to communicate with AtoN AIS).

3.8.2.   Language

This function is used to select the language of the interface (English or French)

Select Setting > Language

The language window is displayed.

Select the language then click to OK.

4. **Description of ComAton Configuration Software***Setting up ComAton Configuration Software*

Running the configuration software is carried out from the « KanAton3_config.exe » executable file:

Then by selecting `Equipment` from the Equipment list (refer to Section 2 Running the application).

At setting up, the configuration software looks during 2 minutes for the connection of COM Interface Board.
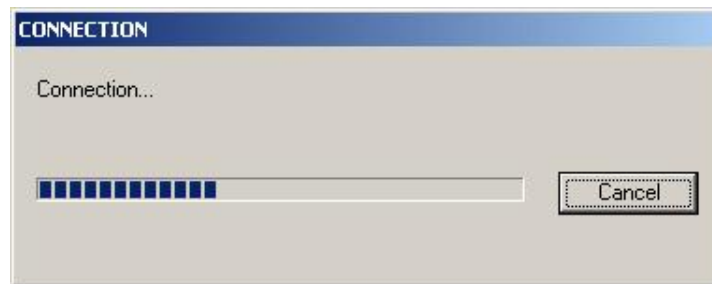
The following window is displayed:

Click to `OK` to access to the main menu (see § 4.2. Main Menu).

4.2. Main Menu

When the connection is completed, the following main menu is displayed:

The main menu is used to display the following modes:
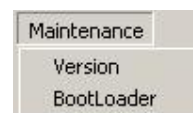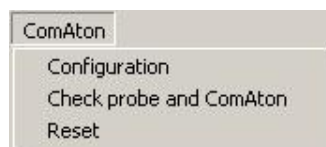
4.3. File Menu

4.3.1. Files > New

This mode authorizes the access to the Configuration with all the fields set to a default value (see § 4.4. ComAton Menu) .

Select Files > New

Files
New
Open
Save
Save as

The access to the Configuration menu with the default value is now authorized (see § 4.4. ComAton Menu) .

4.3.2. Files > Open

CAUTION: Never open an .ini file from the AtoN configuration. AtoN and COM AtoN files shall be saved in different files.

This mode is used to launch an exploration window to access to the *.ini* file

This mode also authorizes the access to the Configuration menu with all the fields filled according to the opened file (see § 4.4. ComAton Menu) .

Select Files > Open.

Files
New
Open
Save
Save as

When this mode is selected, the following exploration window is displayed:
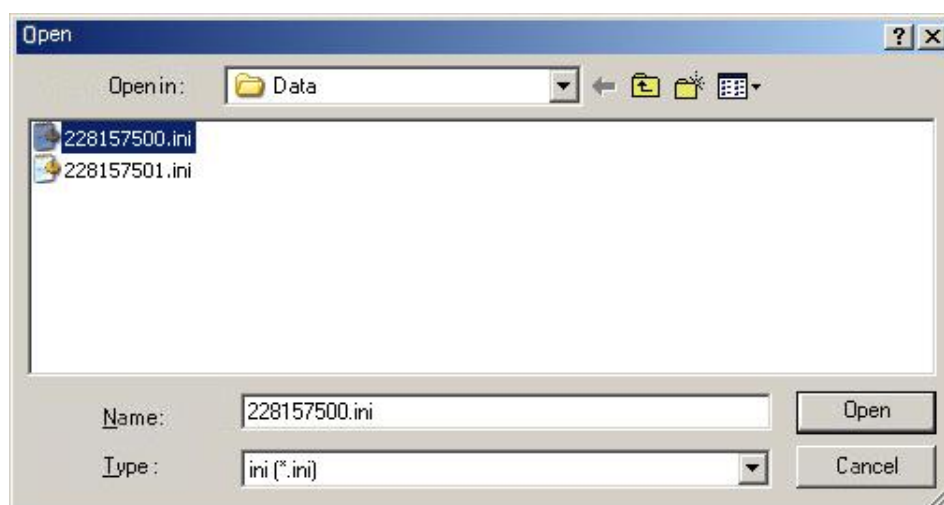
Select the corresponding file, and then click to Open.

The access to the Configuration menu of this file with these parameters is now saved and authorized (see § 4.4. ComAton Menu).

4.3.3. Files > Save

This mode is used to save an *.ini* file following an AtoN beacon creation (see § 4.3.2 Files > New) or a modification of an Com AtoN Interfaces' parameters (see § 4.4. ComAton Menu).

Select Files > Save

The file is automatically saved in the default saving directory (see § 4.4. ComAton Menu).

4.3.4. Files > Save as

This mode is used to save an *.ini* file following the creation of a COM AtoN Interface (see § 4.3.2 Files > New) or a modification of its parameters (see § 4.4. ComAton Menu).

Select Files > Save as

The following window is displayed:
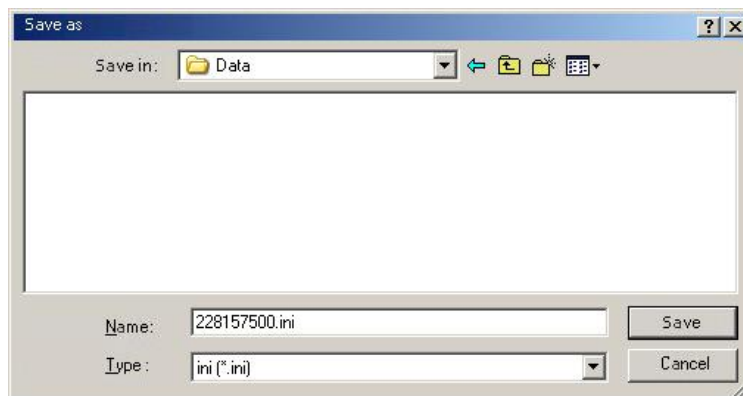
If the name already exists, a pop up window warns the user and suggests to continue or to stop:

4.3.5. Files > Prec.

This mode is used to go back to the Equipment menu.

4.4. ComAton Menu

4.4.1. ComAton > Configuration

When selecting `Configuration` on the ComAton menu, the following window is displayed:
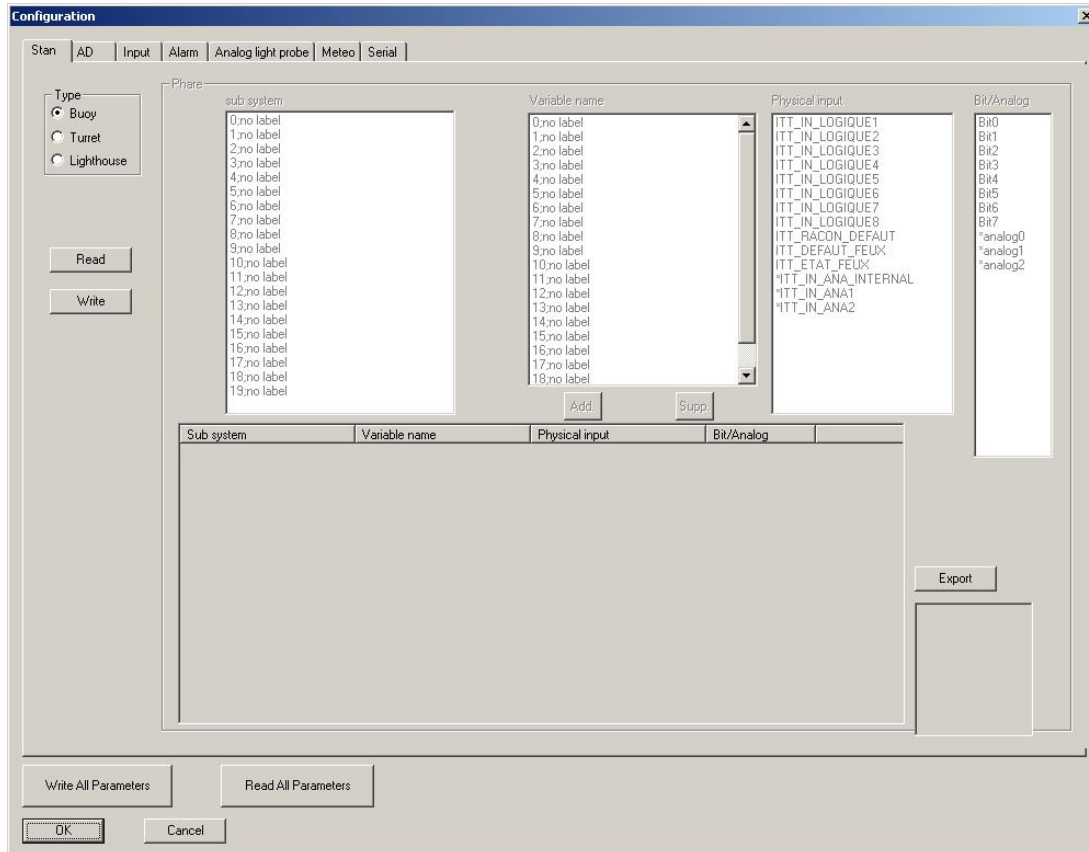
7 tabs compose this menu:

- `Stan`
- `AD`
- `Input`
- `Alarm`
- `Analog light probe`
- `Meteo`
- `Serial`

The buttons `Write All` and `Read All` are independent from the above tabs and displayed on the window when any of them are opened.

`Write All`: use to transmit, via serial link, the entire COM AtoN Interface configuration ([refer to 3.4.1 AtoN > Write](#)).

CAUTION: `Write All` transmits the whole configuration (Appli, Alarm, Analog light probe, Serial) and not only the configuration of the selected tab.

`Read All`: use to ask, via serial link, for all the configuration of the connected COM AtoN Interface in the same way than for AIS AtoN ([refer to 3.4.2 Aton > Read](#)).

- `Stan`

  The fields of the `Stan` tab are only active when the `Turret` or the `Lighthouse` Radio buttons is selected. If the `Buoy` Radio button is selected, they are not active.

- ▪ `Buoy` radio button selected

  The fields of the Stan tab are inactive. Operation with KanAtoN only or with only and message 6. See Annex 6.1 Format of Message 6 in basic configuration (KanAtoN without Interface Box), see Annex 6.2 Format of Message 6 in generic configuration (KanAtoN + ComAtoN).

- ▪ `Turret` Radio button selected.

  Only one COM AtoN interface box is connected to the KanAtoN. The message 6 can be set. See Annex 6.3 Format Message 6 in Stan Turret configuration (KanAtoN + ComAtoN).

- ▪ `Lighthouse` Radio button selected

  This opens the possibility to chain two COM AtoN interface boxes in order to increase the number of inputs to monitor See Annex 6.4 Format Message 6 in Stan Lighthouse configuration (KanAtoN + ComAtoN).

  When the `Turret` or the `Lighthouse` Radio button is selected, the inputs can be assigned to different bits of message 6.

- ▪ `Subsystem` is used to assign a name to an input.

  This name is memorized in the file "`NomSousSystemes.txt`". See Annex 6.5. File "`NomSousSystemes.txt`".

- ▪ `Variable name` is used to assign a function to the selected input. The name of the function is read in the file "`NomVariables.txt`". The assignment of `SousSystemes` and `NomVariables` at one input is memorized in the .ini file and can be reread by an external software to know the nature and function of each bit of the message 6. See Annex 6.6 File "`NomVariables.txt`".

- ▪ `Physical input` is the name of the input defining the terminal strip input on the COMATON box.

Table 3: Table of Physical Inputs

ComAtoN 1	Name of configuration software	Input	Associated common
Isolated Digital Input 1	ITT_IN_LOGIQUE_1	J7-5 (Pin 15)	J7-1 (pin 11)
Isolated Digital Input 2	ITT_IN_LOGIQUE_2	J7-4 (Pin 14)	J7-1 (pin 11)
Isolated Digital Input 3	ITT_IN_LOGIQUE_3	J7-3 (Pin 13)	J7-1 (pin 11)
Isolated Digital Input 4	ITT_IN_LOGIQUE_4	J7-2 (Pin 12)	J7-1 (pin 11)
Isolated Digital Input 5	ITT_IN_LOGIQUE_5	J7-10 (Pin 20)	J7-6 (pin 16)
Isolated Digital Input 6	ITT_IN_LOGIQUE_6	J7-9 (Pin 19)	J7-6 (pin 16)
Isolated Digital Input 7	ITT_IN_LOGIQUE_7	J7-8 (Pin 18)	J7-6 (pin 16)
Isolated Digital Input 8	ITT_IN_LOGIQUE_8	J7-7 (Pin 17)	J7-6 (pin 16)
Digital Input (Racon Information)	ITT_RACON_DEFAUT	J10-4 (Pin 50)	J10-5 (Pin 51)
Digital Input (Light Fault Information)	ITT_DEFAUT_FEUX	J11-3 (Pin 41)	J11-4 (Pin 42)
Digital Input (Light Status Information)	ITT_ETAT_FEUX	J11-1 (Pin 39)	J11-2 (Pin 40)

ComAtoN 2	Name of configuration software	Input	Associated common
Isolated Digital Input 1	ITT_EXT_IN_LOGIQUE_1	J7-5 (Pin 15)	J7-1 (pin 11)
Isolated Digital Input 2	ITT_EXT_N_LOGIQUE_2	J7-4 (Pin 14)	J7-1 (pin 11)
Isolated Digital Input 3	ITT_EXT_IN_LOGIQUE_3	J7-3 (Pin 13)	J7-1 (pin 11)
Isolated Digital Input 4	ITT_EXT_IN_LOGIQUE_4	J7-2 (Pin 12)	J7-1 (pin 11)
Isolated Digital Input 5	ITT_EXT_IN_LOGIQUE_5	J7-10 (Pin 20)	J7-6 (pin 16)
Isolated Digital Input 6	ITT_EXT_IN_LOGIQUE_6	J7-9 (Pin 19)	J7-6 (pin 16)
Isolated Digital Input 7	ITT_EXT_IN_LOGIQUE_7	J7-8 (Pin 18)	J7-6 (pin 16)
Isolated Digital Input 8	ITT_EXT_IN_LOGIQUE_8	J7-7 (Pin 17)	J7-6 (pin 16)
Digital Input (Racon Information)	ITT_EXT_RACON_DEFAUT	J10-4 (Pin 50)	J10-5 (Pin 51)
Digital Input (Light Fault Information)	ITT_ EXT_DEFAUT_FEUX	J11-3 (Pin 41)	J11-4 (Pin 42)
Digital Input (Light Status Information)	ITT_ EXT_ETAT_FEUX	J11-1 (Pin 39)	J11-2 (Pin 40)

- ▪ `Bit/Analog`: assignment of input to bits of message 6. See in Annex 6.4 Format Message 6 in Stan Lighthouse configuration (KanAtoN + ComAtoN).
- ▪ `Add` button: used to validate the bit input selection. The selection is displayed in the window.
- ▪ `Supp.` button: used to suppress the input/bit selection from the list.
- ▪ `Export` button: used to recover the programming in text file by using the copy and paste functions of Windows.

- `AD`

This tab is used to adjust the analogical inputs measurements to the measurement voltage range.

There are two data and parameter zones in this tab:

- ▪ `Measurement calibration` used to automatically calculate, display and report the calibration coefficient.
- ▪ `Parameters` used to read and save the calibration coefficients.

Calibration procedure:

- ▪ Step 1: Click to the `Read` button on the `Parameters` zone to display the calibration coefficients used by the interface box.
- ▪ Step 2: Click to the `Values acquisition` button to display the values read on the three inputs.
- ▪ Step 3: Type the required value in the `REAL value(mV)` field.
- ▪ Step 4: Click to the `Values acquisition` button

   Check that the corrected value, `Final Value(mV)` is really the one that has to be set.

   Either, go back to Step 3 then Step 4.

- ▪ Step 5: Click to `Apply to parameters` then to `Write` in the `Parameters` zone to record the calibration coefficient.

- Input
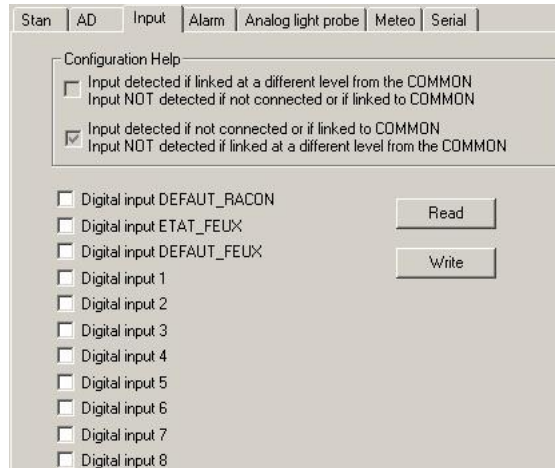
This tab is used to select the activity level of the interface box's digital inputs

- Alarm
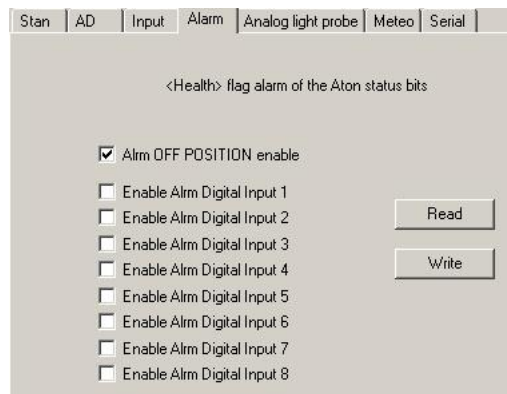
This tab is used to authorize or not the alarm bit configuration.

The alarm bit is Bit 0 "Good Health/Alarm" of message 21's "Status bit" field. If one of these alarms is active, bit alarm is activated.

`Alrm OFF position enable`: OFF position alarm. This alarm is transmitted by the AIS AtoN to the COM AtoN Interface.

`Alrm Digital Input 1…8`: COM AtoN Interface digital input alarms

When any of these boxes (is) are selected, the alarms will be taken into account in the activation of the alarm bit (and vice versa).

`Read` and `Write` buttons have the same functions than those described at the beginning of this paragraph but they only concern the enabled alarms.

- Analog light probe

   This tab is used for the analog light probe configuration.

- Select the `Activate` box if the COM AtoN Interface uses a current or photodiode probe to monitor the light.
   If this box is not selected, the COM AtoN Interface will use the `Light state` or `Light fault` inputs to monitor the light.

- Select either `Current probe` or `Photodiode probe` radio button according to the probe used to monitor the light.
- If a `Photodiode probe` is selected, the `Measure by absolute value` box cannot be selected (inactive field)
- If a `Current probe` is selected, the light ON / OFF detection by current measurement is performed:

   - Either regarding the relative min and max values detected by the COM AtoN Interface. In this case the `Measure by absolute value` box must not be activated. When analyzing the light, the COM AtoN Interface will detect during 10 seconds the min and max values of the current probe. The threshold will be then, the middle of these 2 values. **With this method, no current probe calibration is required**.

   - Or regarding a fix current threshold. Above this threshold, the light will be considered to be ON. In this case the `Measure by absolute value` box must be activated. **With this method, a current probe calibration is required.**

For example if the light consumption is 800 mA when it is ON, the threshold shall be set to 400 mA. When the current is above 400 mA, the light will be detected as to be ON.

▪ Trigger mA:

> Trigger mA: [100]

This field is used to determine the detection threshold between light ON/OFF. Threshold is in mA.

This field is active only if the Measure by absolute value box is activated.

▪ Number of turns:

> Number of turns   [10]

This field is used to indicate the number of turns used by the current probe (1 turn = 1 wrap). If only 1 wire passes through the current probe, turn field is equal to 0.

This field is active only if the Measure by absolute value box is activated.

▪ Light cycle duration (ms):

> Light cycle duration(ms) [5000]

Total duration of light sequence; i.e. light ON duration + light OFF duration (unit is in ms).

▪ Light On duration (ms):

> Light On duration(ms)   [2000]

Light on duration (unit is in ms).

▪ Tolerance (%):

> Tolerance(%)   [10]

This field is used to set the error tolerance of light ON duration.

For example, for a light ON duration of 1 second and a tolerance of 10%, the correct measurement will be between 0.9 and 1.1 second.

▪ Sunset Offset (+/- mn):

> Sunset offset(+/- mn):   [0]

This field is used to set the offset to remove or add for starting the analysis of the night light.

For example, if the sun sets at 6.00 pm UTC and that the offset is set to 60, then the night analysis will start at 7.00 pm UTC.

▪ Sunrise Offset (+/- mn):

> Sunrise offset(+/- mn):   [0]

This field is used to set the offset to remove or add for stopping the analysis of the night light.

For example, if the sun rises at 6.00 am UTC and that the offset is set to - 60, then the night analysis will stop at 5.00 am UTC.

■ `Analysis interval:`

Analysis Interval(sec):	180

This field is used to set the interval between 2 lights detections.

Note regarding the functioning of days and night's analysis (refer to msg 21):

Night analysis (within sunset and sunrise):

- Indicate Light ON if the light period is correct.

- Indicate Light ERROR if the light period is not correct.

Day analysis (out of sunset and sunrise):

- Indicate Light ON if a light period is detected.

- Indicate Light OFF if no light period is detected

■ Probe Calibration:

The calibration is only used when a `Measure by absolute value` is performed.

In this case the probe must be correctly calibrated in order COM AtoN interface correctly converts in current value (mA) the voltage (mV) sent back by the probe. The `Trigger mA` field will be used as comparator to detect is the light is ON or OFF.

It is necessary to use equipment allowing sending periodically a current through the probe in an alternative way. For example, periodically 2 seconds at 0 mA and then 2 seconds at 1000 mA.

Click to `Acquisition values`. 10 seconds after, `Min mV`, `Max mV`, `Diff mV` fields will be automatically filled.

If the `(MUST be superior to 80 mV)` condition is filled, this field shifts to green, either it shifts to red.

If the field is red, try to increase the number of turns, check if the current is strong enough (> 100 mA recommended). (Refer to current probe user manual).

When this field is green, click to `Apply to parameters`.

Once applied, the following 3 fields are filled:

`Mid. point(mV)` is the value sent back by the probe when no current goes through it.

`Ref. point(mV)` is the value sent back by the probe when the max current goes through it.

`Ref. point(mA)` is the max current value.

To save the parameters in the COM AtoN Interface, click to `Write`.

- Advanced options (not used in the `Measure by absolute value`)

These parameters are used to mark the Min. (Light OFF) and Max. (Light ON) current values

`Calculation duration for`: Time of analysis time. Shall be greater that the light cycle

`Minimum range for Min, Max(mV)`: Variation between Min. current and Max. current (in mV) shall be greater than this threshold. If Min. and Max. currents are not found, the light is considered as OFF (fixed lights management shall be performed in absolute).

Note: the middle field is for current probe, the lower field is for photodiode probe.

- Meteo

These parameters are used to indicate the NMEA sentences supplied by the field's sensors. They are used to indicate headers, fields and coefficient of data scaling supplied by a sensor supplying sentences at 4800 bauds NMEA form.
The coefficient and offset parameters are used to set the value read to the unit used in message 8.

- Serial

- ▪ UART0 :
  43: output towards external Rx (pin2 DB-9 connector)
  45: input from external Tx (pin 3 DB-9 connector)
- ▪ UART1:
  10: output towards external Rx (pin 2 DB-9 connector)
  8: input from external Tx (pin 3 DB-9 connector)
- ▪ UART2(METEO/7-8-9-10)
  UART2: COM AtoN internal UART.
  METEO: dialog type by default
  7-8-9-10: Input number of COM AtoN Interface (box connector)
- ▪ Link: Serial communication standard type: RS232, RS485, RS422
- ▪ Speed: Communication speed in Baud
- ▪ Nb bits: Number of data bits
- ▪ Parity: Parity
- ▪ Stop bit: Number of stop bit
- ▪ Allocation: used to indicate at which equipment this link will be connected (AIS, AIS2, METEO, NONE. NONE indicates that no equipment is connected and that no data will be processed.

4.4.2. ComAton > Check Probe and ComAton

When selecting `Check Probe and ComAton` on the ComAton menu, the following window is displayed:
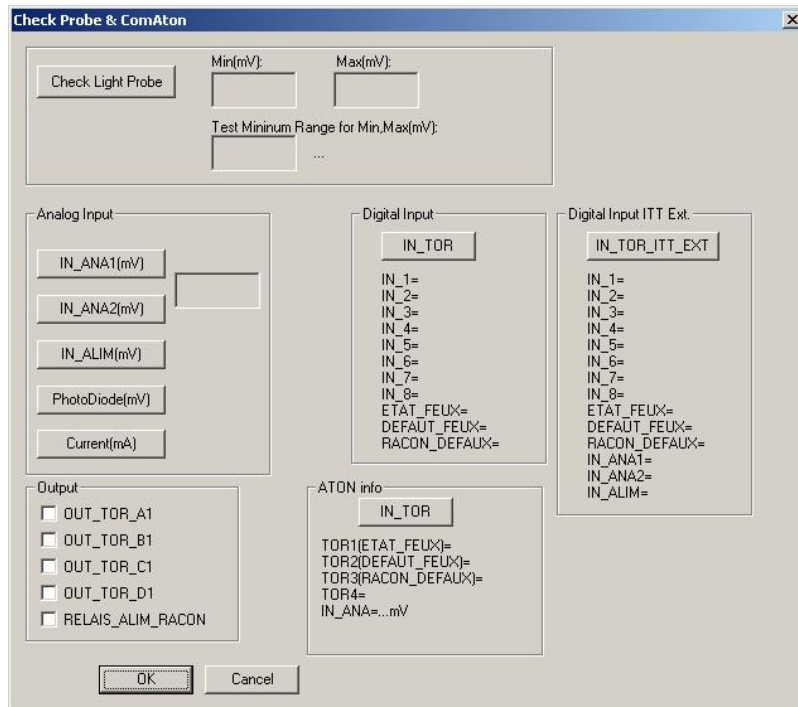
- `Check Light Probe`:

    Probe test is used to check if the measurement conditions are correct.

    The operating mode is the same than the Calibration procedure (refer to § 4.4.1.ComAton > Configuration, Probe Calibration).

    `Test Minimum Range for Min, Max(mV)` field is green when the conditions are fulfilled, either it is red.

    Note: the `Test Minimum Range for Min, Max(mV)` field requires a minimum value to become green.

- `Analog Input`:

    Analog inputs measurements of COM AtoN interface.

    Note: `Current(mA)` measurement is to be taken into account only if a measurement with current probe was selected in the `ComAtoN > Configuration` AND if this probe was correctly calibrated (refer to § 4.4.1.ComAton > Configuration, Probe Calibration).

- `Digital Input`:

    Recovering of COM AtoN interface digital inputs (refer to § 5.3.2 Digital inputs for Digital inputs location).

- `Digital Input ITT Ext`:

    Recovering of the second ComAtoN interface digital inputs.

- ATON info

    Inputs status of KanAtoN connected to the ComAtoN interface box.

- `Output`:

    When a box is selected, the output is opened; if not, this output is closed (refer to § 5.3.4 for output location).

    For `RELAIS_ALIM_RACON`, the relay is opened when the box is selected, if not it is closed

    Note: `RELAIS_ALIM_RACON` stands for Power supply of RACON

4.4.3.   ComAton > Reset

All the parameters are reset to their default value.

4.5. Maintenance

4.5.1.   Maintenance > Version

This function is used to display the software version of the COM AtoN Interface.

Select Maintenance > Version
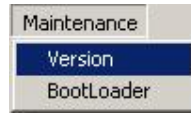
4.5.2.   Maintenance > BootLoader

This function is used to reprogram the transponder via the serial link.

Select Maintenance > BootLoader
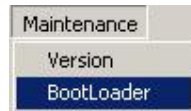
The following window asks to shift in Boot Loader mode.
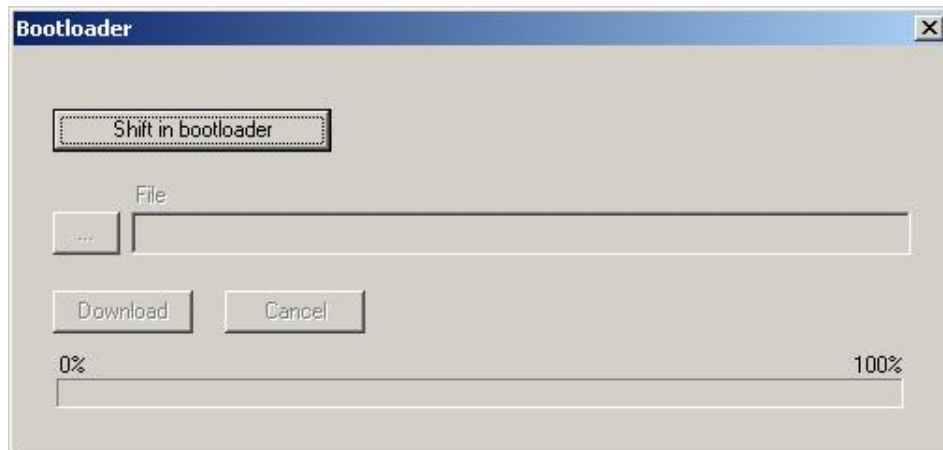
Click to Shift in bootLoader.

The following popup windows warn that the transponder has shifted in Boot Loader mode.
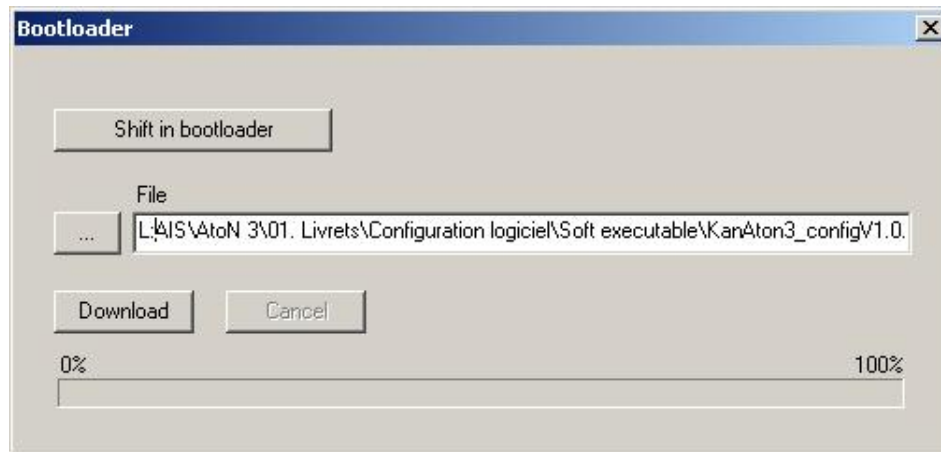
Select the location the file is saved then click to `Download`.

4.6. Setting Menu

4.6.1. Setting > Port Com

This function is used to select the COM Port of the serial link and to select the speed.

Select `Setting > Port Com`

The `Setting port com` window is displayed:
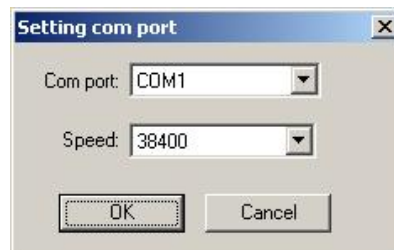
- `Port com:` display of available Ports COM on the computer.

`Speed:` from 1200 to 38400 bauds (select 38400 to communicate with AtoN AIS).

4.6.2. Setting > Language

This function is used to select the language of the interface (English or French)

Select `Setting > Language`

The language window is displayed.

Select the language then click to `OK`.

5. AIS AtoN Interfaces

5.1. *Electrical interfaces*

- RS232 with Tx and RX.
- Controls signals are not supported by the AtoN transmitter.
- Format of characters: 8 bits, 1stop bit, no parity.
- Speed 38,4k.

5.2. *Protocol*

Parameters	Sentences
MMSI	AID
ATON name	ACE
Latitude	ACF
Longitude	ACF
OFF POSITION	ACE
Change of strategy on OFF POSITION	ACE
ATON dimensions	ACE
AIS1 channel	ACF
AIS2 channel	ACF
Definition of transmission slots for messages 21, 6 and 8	AAR
Power 2W or 12,5W	ACF
AtoN type	ACF
Real, virtual or synthetic ATON	ACF
Installed or not installed RACON	MCR
Installed or not installed lights	MCR
TOR input allocation	MCR
GPS duration of activation	MCR
Time of day for acquisition of ephemeris	MCR
Shift in transmission test	MCR
Self-test setting up	MCR
Test stop	MCR
Shift in bootloader mode	MCR

5.3. COM AtoN Interface

5.3.1. Input / Output connections

Pin 29

Pin 1

Pin 51

Pin 28
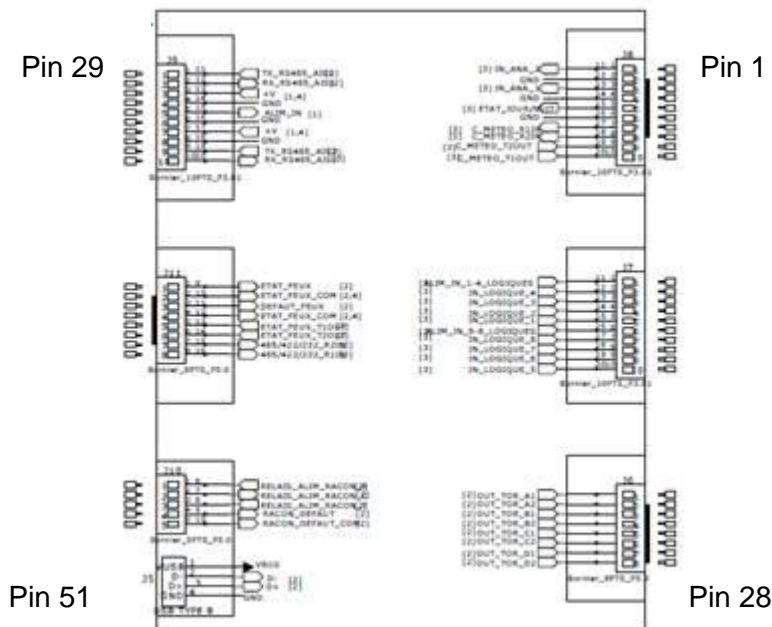
PCB connector	Box connector	Type	Comment
J8-1	1	Analog input n°2	From 0 V DC to 36 V DC (50mV accuracy)
J8-2	2	GND	
J8-3	3	Analog input n°1	Dedicated probe current Max RANGE(0VDC to 6V DC)
J8-4	4	GND	
J8-5	5	Analog input	For photodiode use only
J8-6	6	GND	
J8-7	7	RS485 / RS422 / RS232 input	Selection by configuration software
J8-8	8	RS485 / RS422 / RS232 input	Selection by configuration software
J8-9	9	RS485 / RS422 / RS232 output	Selection by configuration software
J8-10	10	RS485 / RS422 / RS232 output	Selection by configuration software
J7-1	11	Reference for J7-2 / J7-3 / J7-4 / J7-5	
J7-2	12	Isolated Digital input n°4	Current consumption only during measurement
J7-3	13	Isolated Digital input n°3	Current consumption only during measurement
J7-4	14	Isolated Digital input n°2	Current consumption only during measurement
J7-5	15	Isolated Digital input n°1	Current consumption only during measurement
J7-6	16	Reference for J7-7 / J7-8 / J7-9 / J7-10	
J7-7	17	Isolated Digital input n°8	Current consumption only during measurement
J7-8	18	Isolated Digital input n°7	Current consumption only during measurement
J7-9	19	Isolated Digital input n°6	Current consumption only during measurement
J7-10	20	Isolated Digital input n°5	Current consumption only during measurement

J6-1	21	Pin1 for digital output n°1	Dry contact
J6-2	22	Pin 2 for digital output n°1	Dry contact
J6-3	23	Pin1 for digital output n°2	Dry contact
J6-4	24	Pin 2 for digital output n°2	Dry contact
J6-5	25	Pin1 for digital output n°3	Dry contact
J6-6	26	Pin 2 for digital output n°3	Dry contact
J6-7	27	Pin1 for digital output n°4	Dry contact
J6-8	28	Pin 2 for digital output n°4	Dry contact
J9-1	29	RS485 Tx	
J9-2	30	RS485 Rx	
J9-3	31	Power supply output	J9-3 output = J9-5 input
J9-4	32	GND	
J9-5	33	ComAtoN PCB power supply	
J9-6	34	GND	
J9-7	35	Power supply output	J9-7 output = J9-5 input
J9-8	36	GND	
J9-9	37	RS485 Tx	
J9-10	38	RS485 Rx	
J11-1	39	Digital input	
J11-2	40	Reference for J11-1	
J11-3	41	Digital input	
J11-4	42	Reference for J11-3	
J11-5	43	RS485 / RS422 / RS232 output	Selection by configuration software
J11-6	44	RS485 / RS422 / RS232 output	Selection by configuration software
J11-7	45	RS485 / RS422 / RS232 input	Selection by configuration software
J11-8	46	RS485 / RS422 / RS232 input	Selection by configuration software
J10-1	47	Relay output (default)	J10-1 = J10-2 by default The condition for relay activation is configured by software
J10-2	48	Relay input	
J10-3	49	Relay output	J10-1 = J10-2 when relay activated The condition for relay activation is configured by software
J10-4	50	Digital input	
J10-5	51	Reference for J10-5	
J5	USB PORT		Used to configure the ComAtoN

5.3.2. Analogical Inputs

11 inputs insulated by photo coupler

- Insulation voltage: 5300Vrms
- Protected by Transil and polyswitch : protection voltage 36V 600W / 1ms
- Operating voltage: 36V to 3,3V

3 non insulated analogical inputs:

- 1 analogical input for power supply measurement
- 2 external analogical inputs

1 analogical input used for an optical sensor.

- IN_ANA1 $\Rightarrow$ J8-3
- IN_ANA2 $\Rightarrow$ J8-1
- ALIM_IN(mv) $\Rightarrow$ internal
- PhotoDiode $\Rightarrow$ J8-5
- Current(mA) $\Rightarrow$ J8-3

5.3.3. Digital Inputs

Digital inputs are the inputs of J7 connector of the COM AtoN Interface, they are assigned as follows:

- Input 1 $\Rightarrow$ J7-5
- Input 2 $\Rightarrow$ J7-4
- Input 3 $\Rightarrow$ J7-3
- Input 4 $\Rightarrow$ J7-2
- Input 5 $\Rightarrow$ J7-10
- Input 6 $\Rightarrow$ J7-9
- Input 7 $\Rightarrow$ J7-8
- Input 8 $\Rightarrow$ J7-7
- ETAT_FEUX $\Rightarrow$ J11-1
- DEFAUT_FEUX $\Rightarrow$ J11-3
- RACON_DEFAUT $\Rightarrow$ J10-4

5.3.4. Outputs

4 outputs by static relay

- Insulation voltage: 5300 Vrms.
- Max voltage to relay terminals: 200 V.
- Max voltage to input connector: 36 V.
- 10 Ohms Ron resistor.
- OUT_TOR_A1 $\Rightarrow$ J6.1/J6.2
- OUT_TOR_B1 $\Rightarrow$ J6.3/J6.4
- OUT_TOR_C1 $\Rightarrow$ J6.5/J6.6
- OUT_TOR_D1 $\Rightarrow$ J6.7/J6.8

1 available output with NO and NF connector (power cut of a RACON equipment)

- Max power cut current: 2A
- Max voltage to relay terminals: 200 V.
- Max voltage to input connector: 36 V.
- 50 Ohms Ron resistor
- RELAIS_ALIM_RACON $\Rightarrow$ J10-1/ J10-2/ J10-3

5.3.5. I Probe Connection and Configuration with ComAtoN Interface Board

1. I Sensor Connection
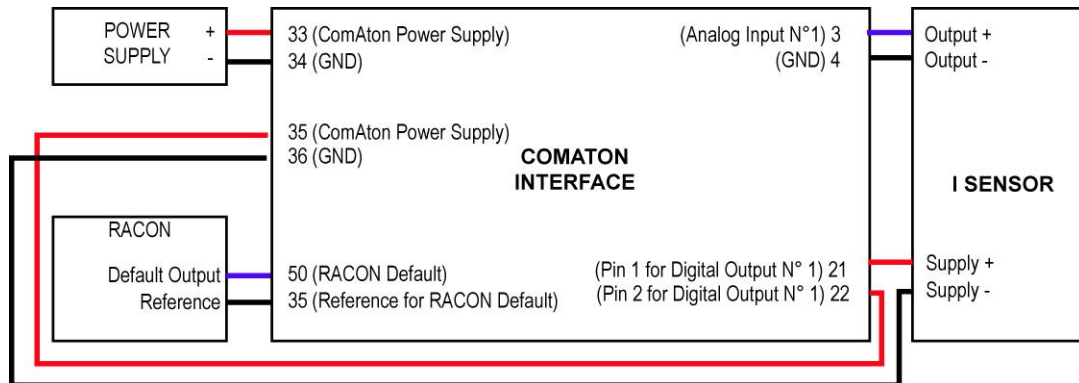
2. I Sensor Configuration
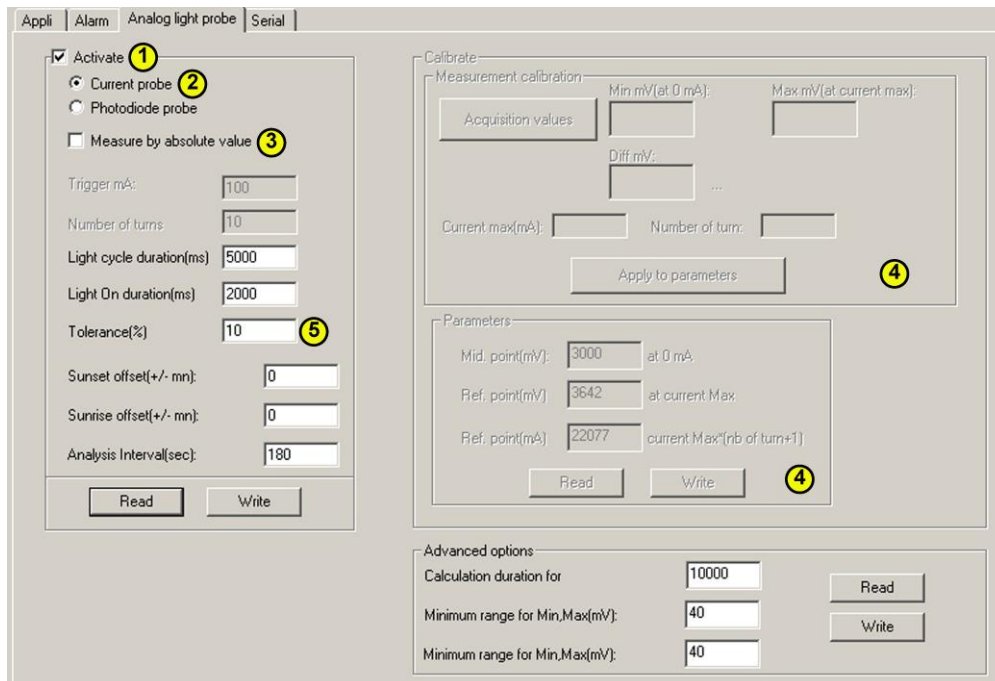
NOTE: Refer to § 4.4.1.ComAton > Configuration ⇒ Analog light probe for detail of each step (numbers in brackets, in the procedure below)

Measure by relative value

- Select the `Activate` box (1).
- Select the `Current Probe` (2).
- Deactivate the `Measure by absolute value` box (3).
- Fill `Tolerance(%)` field with the relevant value (5).

Measure by absolute value

- Select the `Activate` box (1).
- Select the `Current Probe` (2).
- Select `Measure by absolute value` box (3).
- The probe SHALL be calibrated if it has not been before (4)
- Fill the `Tolerance(%)` field with the relevant value (5).

6. Annexes

6.1. Format of Message 6 in basic configuration (KanAtoN without interface box)

Message 6	Number of bits	Description	KanAtoN
DAC	10	Destination Area code	DAC Message 6
FI	6	Function identifier	FI message 6
Analogue (internal)	10	Power supply (0.05 to 36 V) by step of 0.05V	Internal power supply
Analogue (ANA1)	10	Temperature (-40.1 to 62.3) by step of 0.1°C	Internal temperature
Analogue (ANA2)	10	0 (not use)	
Status Bits	5	Idem Status bit of message 21	Copy of bit status byte of message 21
Status Bits	8	Bit 7	Not used
		Bit 6	Not used
		Bit 5	Not used
		Bit 4	Not used
		Bit 3	Pin 2 C16-1 male connector
		Bit 2	Pin 3 C16-1 male connector
		Bit1	Pin 2 C16-1 female connector
		Bit0	Pin 3 C16-1 female connector
Off Position	1		Positioned according to the reference position and the Off position threshold
Spare	4		0

6.2. Format of Message 6 in generic configuration (KanAtoN + ComAtoN)

Message 6	Number of bits	Description	KanAtoN	ComAtoN
DAC	10	Destination Area code	DAC Message 6	
FI	6	Function identifier	FI message 6	
Analogue (internal)	10	Power supply		J9-5 = Vbat+ J9-6 = Vbat-
Analogue (ANA1)	10			J8-3 = 0 to 6V J8-4 = GND
Analogue (ANA2)	10			J8-1 = 0 to 36V J8-2 = GND
Status Bits	5	Idem Status bit of message 21	If box "AtoN Status bits Ext." not ticked (see § 3.5.3.1. Physical parameters specific to AtoN beacon)	If box "AtoN Status bits Ext." ticked, (see § 3.5.3.1. Physical parameters specific to AtoN beacon)
Status Bits	8	Bit 7		J7-7(**)
		Bit 6		J7-8(**)
		Bit 5		J7-9(**)
		Bit 4		J7-10(**)
		Bit 3		J7-2(*)
		Bit 2		J7-3(*)
		Bit1		J7-4(*)
		Bit 0		J7-5(*)
Off Position	1		Positioned according to the reference position and the Off position threshold	Positioned according to the indication supplied by KanAtoN
Spare	4		0	

(*) Common of isolated inputs J7-2, J7-3, J7-4 and J7-5 is identical and located on J7-1 terminal.
(**) Common of isolated inputs J7-7, J7-8, J7-9 and J7-10 is identical and located on J7-6 terminal

mcmurdo

AIS AtoN3
Configuration Software

PAGE: 56 / 58
DATE: 05/06/2012
INDEX : D
REF.: DOC10091

6.3. Format of Message 6 in STAN Turret configuration (KanAtoN + ComAtoN)

Message 6	Number of bits	Description	KanAtoN	ComAtoN
DAC	10	Destination Area code	DAC Message 6	
FI	6	Function identifier	FI message 6	
Analogue (internal)	10	Power supply		J9-5 = Vbat+ J9-6 = Vbat-
Analogue (ANA1)	10			J8-3 = 0 to 6V J8-4 = GND
Analogue (ANA2)	10			J8-1 = 0 to 36V J8-2 = GND
Status Bits	5	Idem Status bit of message 21	If box "AtoN Status bits Ext." not ticked (see § 3.5.3.1. Physical parameters specific to AtoN beacon)	If box "AtoN Status bits Ext." ticked, (see § 3.5.3.1. Physical parameters specific to AtoN beacon)
Status Bits	8	Bit 7		Not used
		Bit 6		J7-9(**)
		Bit 5		J7-10(**)
		Bit 4		J7-4(*)
		Bit 3		J7-5(*)
		Bit 2		J11-3 Digital Input J11-4 Common
		Bit1		J11-1Digital Input J11-2 Common
		Bit 0		J7-3(*)
Off Position	1		Positioned according to the reference position and the Off position threshold	Positioned according to the indication supplied by KanAtoN
Copy of remote control status	4	Bit 3		1 if J6-7 and J6-8 contact closed (***)
		Bit 2		1 if J6-5 and J6-6 contact closed
		Bit 1		1 if J6-3 and J6-4 contact closed
		Bit 0		1 if J6-1 and J6-2 contact closed

(*) Common of isolated inputs J7-3, J7-4 and J7-5 is identical and located on J7-4 terminal.
(**) Common of isolated inputs J7-9 and J7-10 is identical and located on J7-6 terminal.
(***) Relay 4 output (J6-7 and J6-8 contact) is temporized at 1 second. Remote control status is always set at 0.

6.4. Format of Message 6 in STAN Lighthouse configuration (KanAtoN + 2 ComAtoN)

Message 6	Number of bits	Description	KanAtoN	ComAtoN
DAC	10	Destination Area code	DAC Message 6	
FI	6	Function identifier	FI message 6	
Analogue (internal)	10	Power supply		J9-5 = Vbat+ J9-6 = Vbat-
Analogue (ANA1)	10			J8-3 = 0 to 6V J8-4 = GND
Status Bits	10	Bit 17		Settable allocation(*)
		Bit 16		
		Bit 15		
		Bit 14		
		Bit 13		
		Bit 12		
		Bit 11		
		Bit 10		
		Bit 9		
		Bit 8		
Status Bits	5	Idem Status bit of message 21	If box "AtoN Status bits Ext." not ticked (see § 3.5.3.1. Physical parameters specific to AtoN beacon)	If box "AtoN Status bits Ext." ticked, (see § 3.5.3.1. Physical parameters specific to AtoN beacon)
Status Bits	8	Bit 7		Settable allocation(*)
		Bit 6		
		Bit 5		
		Bit 4		
		Bit 3		
		Bit 2		
		Bit1		
		Bit 0		
Off Position	1		Positioned according to the reference position and the Off position threshold	Positioned according to the indication supplied by KanAtoN
Copy of remote control status	4	Bit 3		1 if J6-7 and J6-8 contact closed (**)
		Bit 2		1 if J6-5 and J6-6 contact closed
		Bit 1		1 if J6-3 and J6-4 contact closed
		Bit 0		1 if J6-1 and J6-2 contact closed

(*) Settable allocation: Message 6 status bits of bits 0 to 17 are entirely settable thanks to the configuration software and can be chosen in the table of physical inputs. Refer to § 4.4.1 ComAton > Configuration Table of Physical Inputs.

(**) Relay 4 output (J6-7 and J6-8 contact) is temporized at 1 second. Remote control status is always set at 0.

mcmurdo

AIS AtoN3
Configuration Software

PAGE: 58 / 58
DATE: 05/06/2012
INDEX : D
REF.: DOC10091

6.5. File "NomSousSystemes.txt"

```
00;LIGHT
01;BATTERY
03;SOLAR PANEL
04;Sub system 1
05;Sub system 1
06;Sub system 1
07;Sub system 1
08;Sub system 1
09;Sub system 1
10;Sub system 1
11;Sub system 1
12;Sub system 1
13;Sub system 1
14;Sub system 1
15;Sub system 1
16;Sub system 1
17;Sub system 1
18;Sub system 1
19;Sub system 1
20;Sub system 1
21;Sub system 1
22;Sub system 1
23;Sub system 1
24;Sub system 1
25;Sub system 1
26;Sub system 1
```

Only the numbers are memorized in the `.ini` file of each KanAtoN / COMATON.

The number of lines (quantity of numbers) is not limited.

Caution: two lines cannot have the same number.

The purpose of this file is to be suited to the needs of the user by assigning a text chain to a number assigned to the sub systems or to the variables.

If the `.ini` files of each KanAtoN/COMATON are processed by external software, the number assigned to each input and to each bit of message 6 allow knowing the nature of the information connected or received.

6.6. File "NomVariables.txt"

```
00;ERROR
01;ON
03;VOLTAGE
04;CURRENT
```
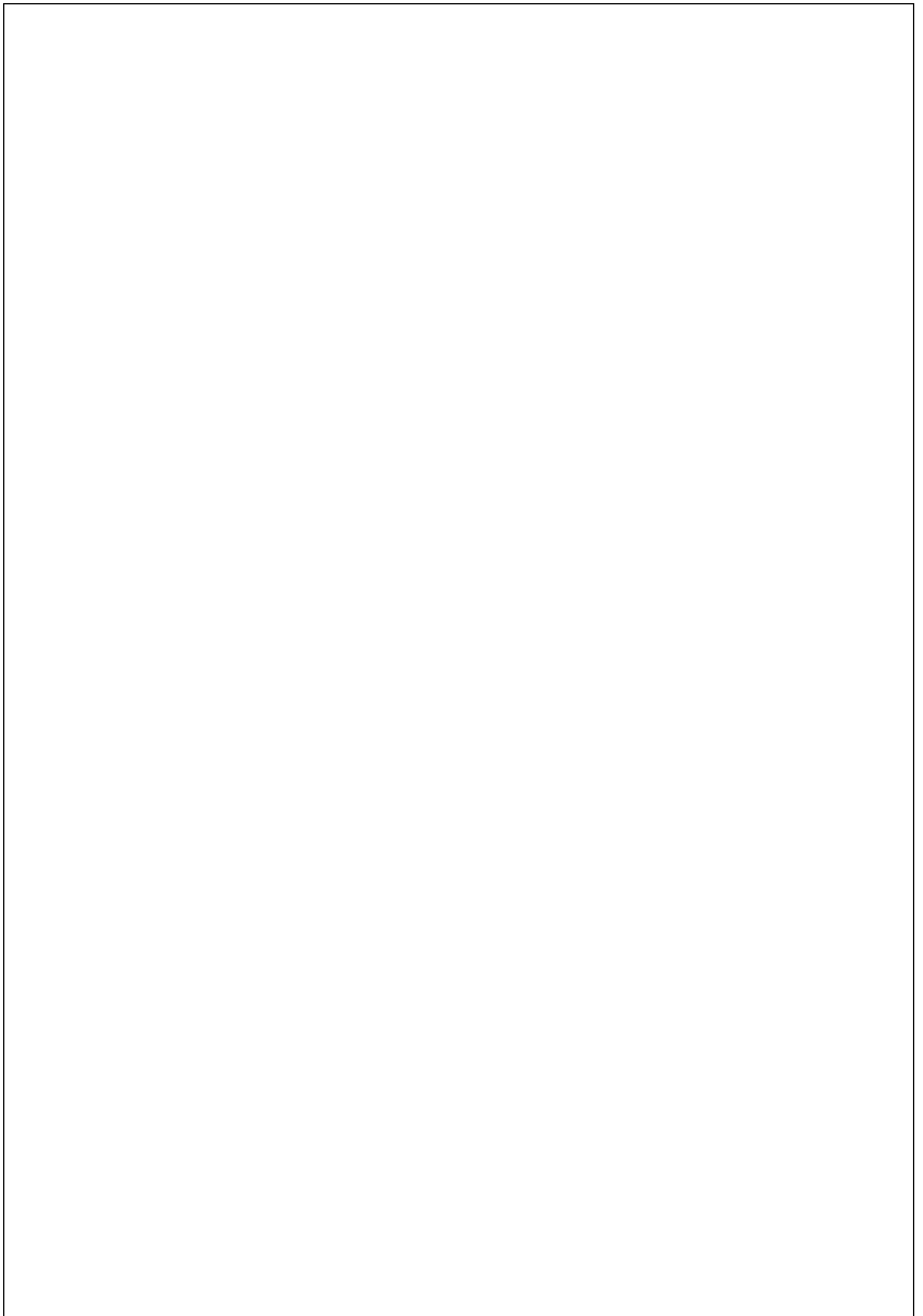
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