ASVA

Onboard Equipment

TECHNICAL DATA SHEET

Ref: M - LMB23ASVA - V1.3-EN

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CONTENTS

FOREWORD

Object of this technical manual

This technical manual describes the ASVA equipment supplied by Balogh and fitted onboard the carriages.
The manual provides details on equipment installation and operation.
The performances and general characteristics of each of the system's components are quoted in the technical data sheets applicable to the relevant component.

Technical manual reference

The technical manual has been given the following generic reference:

M - <equipment designation> - Vx.y - L where

M stands for Manual

x is the equipment version number

y is the document change index

L is the language used.

Updates

Indice	Date	Nature de la modification
1	12/09/03	creation
2	26/09/03	- tree structure modification - modification of default values for some config. parameters. - modification of markings on HE 302 base - antenna overall dimensions and configuration example added in appendix - minor amendments
3	07/01/04	- Presentation chapter added - block diagram replaced by photo, improved iconography - interconnection diagram and section on supervisor interface added - a connector technology nomenclature and configuration added as an appendix - document coding altered

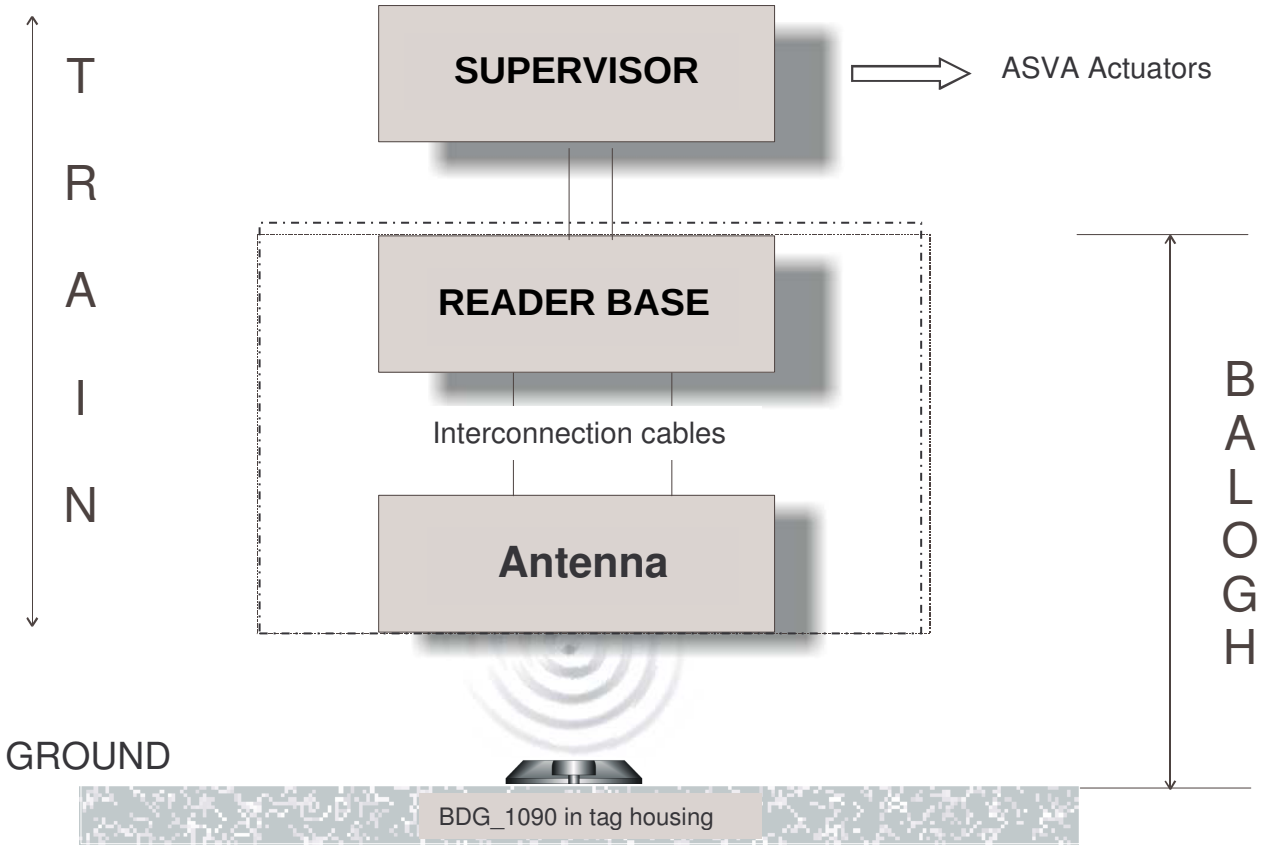
Note

The information contained in this manual is subject to change without any advance notification. The BALOGH Company cannot be held liable for consequences ensuing on any errors or omissions, nor for the misinterpretation of information.

1 PRESENTATION

Balogh equipment comprises:

- onboard equipment: reader, antenna and interconnection jumper cables,
- fixed equipment: data collection tags recessed into their shoes fixed to the ground.



2 DESCRIPTION

2.1 EXTERNAL DESCRIPTION

The reader is an LMB_7023-E comprising:

- a reader base LMB_7003-E,
- an AT2_2720 antenna equipped with 30 cm coaxial connectors,
- two jumper cables used as extensions to connect the two subassemblies:

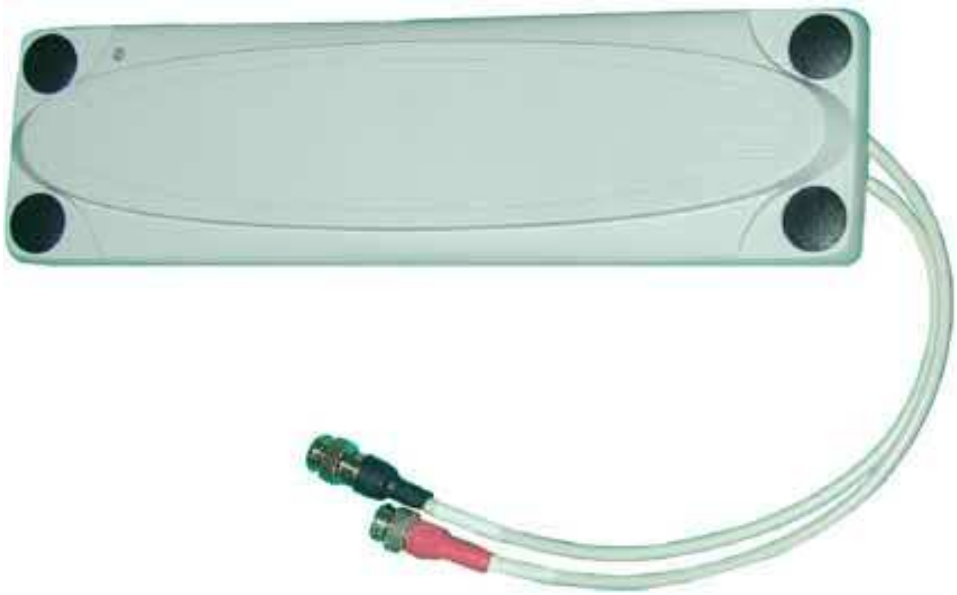
The LMB_7003-E reader base is housed in a stainless steel box closed off by a U-shaped cover fixed by means of four Ø6 Allen screws:

Height: 90 mm
Depth: 270 mm.
Box width: 190 mm.
Cover footprint: 270 x 230 mm.
4 oblong holes 7 x 14 mm drilled through the cover for fixing (centre-centre distances: 210 x 210 mm).

The connection panel comprises:

- two TNC bases marked « ANT IN » and « ANT OUT » (the ANT OUT base has a red collar) for antenna connection,
- one HE302 bayonet 6-contact base used to connect the power supply and the RS 485 interface:

The AT2_2720 antenna is a one-piece moulded casting measuring 325 x 90 x 22 mm; the stainless steel base plate is covered with a radome and equipped with two coaxial connectors, each terminating in a male TNC connector marked «ANT IN» (black) or «ANT OUT» (red):



A two colour indicator light (visible on the left) relays the information from the internal indicator light to the reader (see following). Each of the fixing holes drilled through the four corners of the antenna are blanked off with plastic connectors.

Les deux câblots ont un câble et des connecteurs identiques ; seul le marquage ‘‘ANT IN’’ / ‘‘ANT OUT’’ les différentie :

They comprise:

- on one side, a male angled TNC connector for easy connection to the reader base:

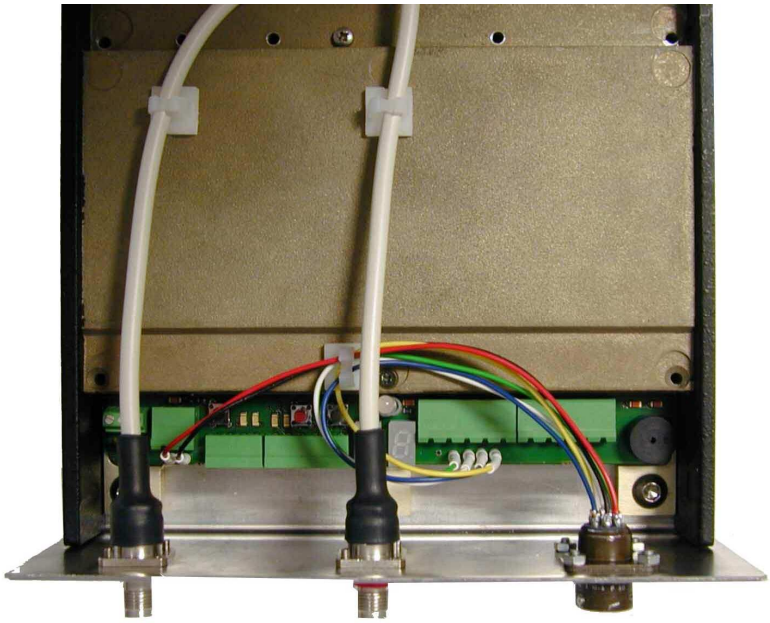
- on the other, a female TNC connector with an assembly plate for connection into the antenna:

N.B. jumper cables may be of different colours (e,g, black or white) depending on the series.

2.2 INTERNAL DESCRIPTION OF THE READER UNIT

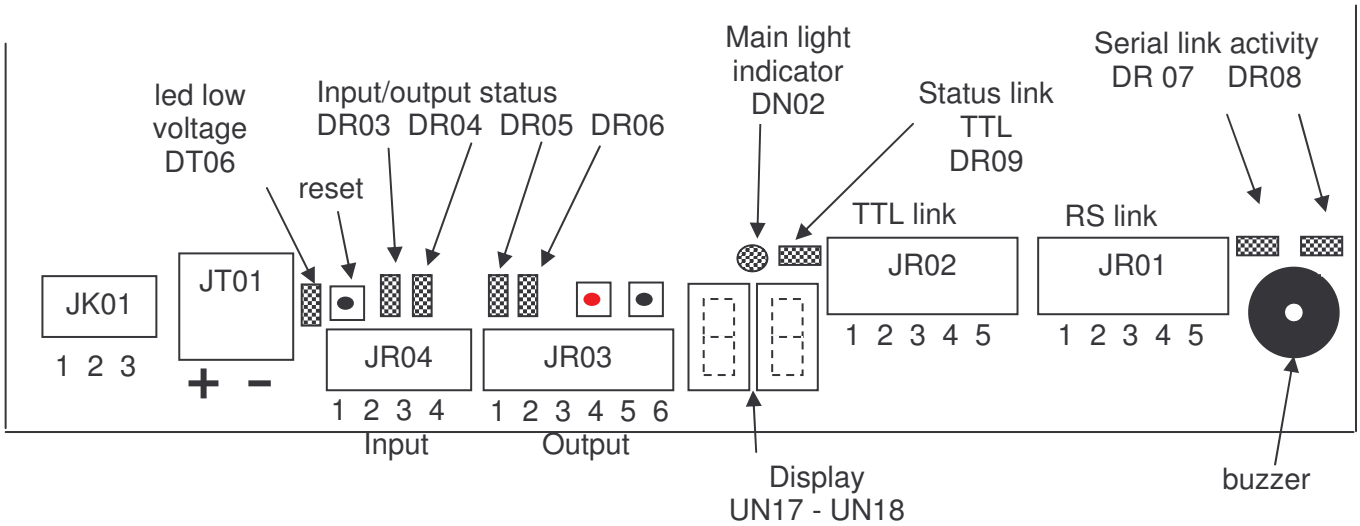
Internal connections

After passing through the TNC bases, the antenna links terminate on the inter-antenna plate. After passing through base HE302, the power supply and the serial link are connected to the reader by means of wires crimped on to contacts soldered onto the printed circuit:



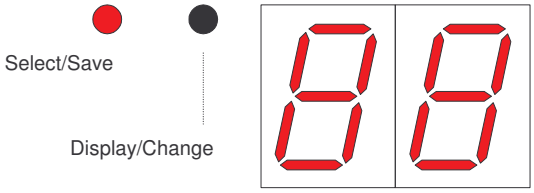
ANT IN ANT OUT RS 485 serial link and power supply

Reader base man-machine interface: instrument panel:



The following constitute the main control elements:

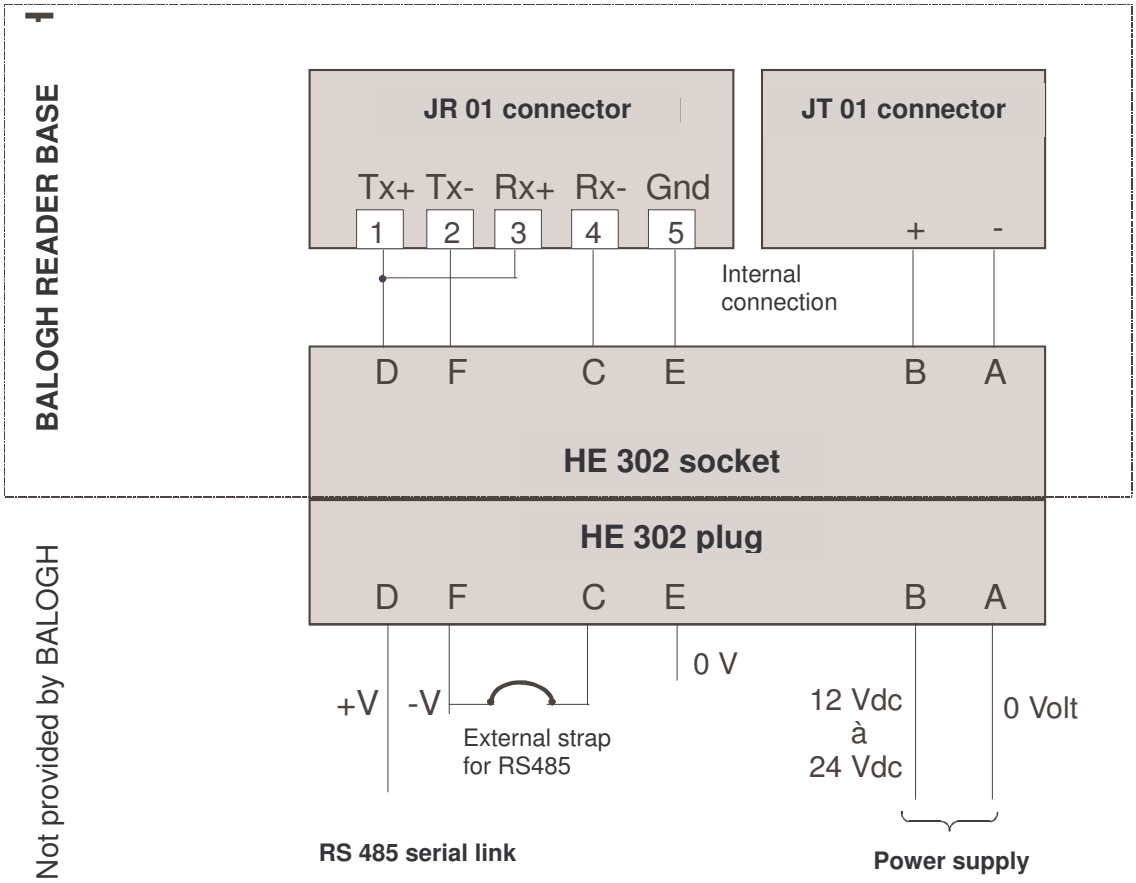
- a two-colour indicator light (DN02) indicating reader status and the presence of a data collection tag,
- a buzzer (if activated) that sounds when a data collection tag is detected,
- a reset pushbutton (black),
- a control panel comprising two 7-segment display units (UN17-UN18) and two push buttons:



3 INTERFACE WITH THE MIMIC PANEL

Physical interface:

The reader base and the mimic panel communicate through an RS 485 link:



N.B.

1) The serial link and power supply cables, the HE 302 connector and the strap are not supplied by Balogh.

2) The "+V" line is high when inactive and low when active; the reverse applies to the "-V" line.

3) We recommend using a shielded cable to protect against interference.

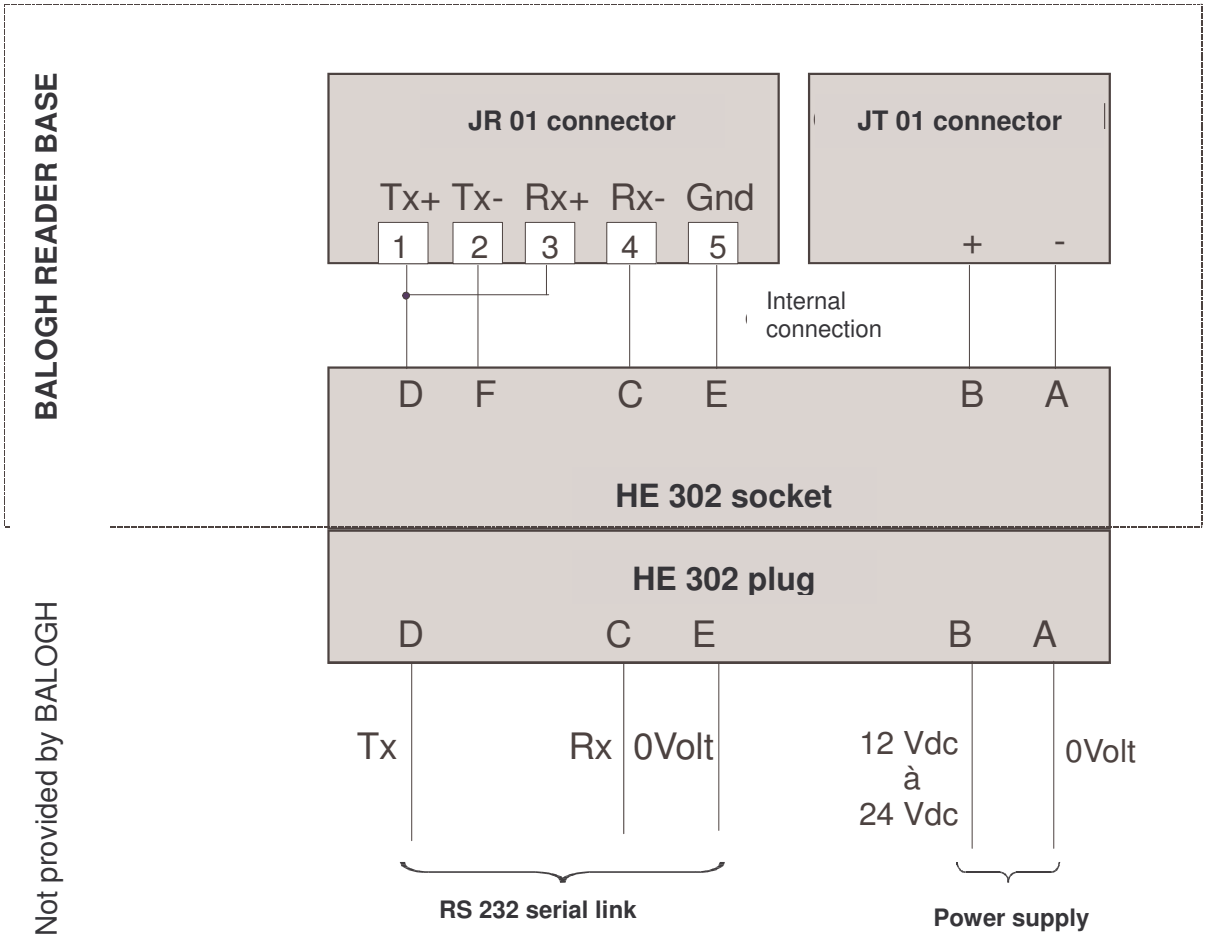
4) In order to adapt a line, a friction resistance mechanism may have to be inserted between wires +V and –V (please refer to the Hyper X reader interfaces Manual, ref. 13053/104).

5) Typical configuration: for instance, when the following values apply to the serial link parameters (please refer to the following section):

- at physical and frame levels: RS 485 (n°11) at 19 200 bauds (n°14), using 8 bits without parity (n°15),
- at protocol level: interr. mode (n°17), 4 transmissions max. (n°19), in JBUS (n°16), at address 2 (n°13):

n°	Parameter	Mnemonic	Typical value	Typical value displayed
11	RS interface type	tA	**RS 485**	48
13	JBUS address	Ad	2	2
14	Rate	br	19 200 bauds	19
15	Character format	Fo	8 bits without parity	8n
16	Frame type	Fr	**JBUS**	Jb
17	Polling/Interr	Po	interruption	oF
19	Max. number transmissions.	nE	4	4

6) Option of connecting an RS 232 link:



Parameter n°11 must be on RS 232.

Typical configuration in this case:

n°	Parameter	Mnemonic	Typical value	Typical value displayed
11	RS interface type	tA	**RS 232**	23
13	JBUS address	Ad	2	2
14	Rate	br	19 200 bauds	19
15	Character format	Fo	8 bits without parity	8n
16	Frame type	Fr	**JBUS**	Jb
17	Polling/Interr	Po	interruption	oF
19	Max. number transmissions.	nE	4	4

7) Log readout: please refer to the section on JBus Commands in the JBus du Hyper X reader interfaces Manual, ref. 13053/104.

4 READER CONFIGURATION

4.1 ACCESSING THE CONTROL PANEL

Remove the reader.

Remove the cover.

4.2 CONTROL PANEL OPERATION

Press the Select (red) button to select a parameter: its mnemonic will be displayed.

Press the Display (black) button: the current parameter value will be displayed.

Press the Select (red) button: the next parameter will be displayed. However, if the Change (black) button is pressed, the next value for the parameter will be displayed and a decimal point will appear, indicating that the value is about to be changed.

If the Change button is pressed several times or held down, all possible values for this parameter can be viewed; display is cyclic.

Press the Save (red) button: the value displayed is saved and becomes the new current value (when this action takes place, “SA” will be displayed for 1 second).

To recap, from a given status and depending on the button selected, the following effects apply:

status		pressing the button	consequence
displays off	⇗	red	displays Mnemonic for 1st Parameter
	⇘	black	none
displays Mnemonic for Parameter n	⇗	red	displays Mnemonic for Parameter n+1
	⇘	black	displays value for Parameter n
displays value for Parameter n	⇗	red	displays Mnemonic for Parameter n+1
	⇘	black	displays next value + “.”
displays value + “.”	⇗	red	displays “SA”, save
	⇘	black	displays next value + “.”

N.B.:

1. When the Change button is pressed but when no change of value is actually required,
   - Allow the 8-second timed period to elapse in order to exit the non functioning status,
   - OR press the Reset button.

2. By default, display units are read using a vertical reader, indicator light at the bottom.
When the reader has to be installed with the indicator light at the top, the scanning direction can be reversed by changing the first parameter. In this case, the two black and red buttons retain their functions.

3. Parameters are displayed cyclically.
Subsequent parameters can be obtained either by briefly pressing the red button or by holding it down. This causes the parameters to be scrolled every 0.3 seconds.
Similarly, parameter values can be made to scroll every 0.3 seconds by holding down the black button.

4. To revert to default values (factory settings): press the Reset button and the Change button together.

4.3 ADJUSTABLE PARAMETERS

Parameters are displayed in the following sequence and are saved to a non-volatile memory (**Factory set parameters** for ASVA production readers ASVA are shown in bold type in the Value column):

n°	Parameter	Mnemonic	Value	Value	Default	Notes
1	**Display direction**	--	**0**	uP	*	indicator light read at bottom of reader
			1	dn		indicator light read at top of reader
2	**Channel Number°**	nC	**0** to 31	0 to 31	9	
3	**Tag Persistence**	tP	0.1 s	0		
			0.5 s	1		
			1 s	2	*	
			2 s	3		
			5 s	4		
			10 s	5		
4	**Buzzer**	bu	OFF	oF		
			ON	on	*	Sound emitted on detection
5	**Ussuer code filtering**	FI	**none**	0	*	
			1st code	1		
			EEPROM	2		According to EEPROM code
6	**Issuer. Code size**	tC	**3**	3	3	
			4	4		
7	**Lamp behaviour**	LE	**normal**	0	*	
			other	1		to be defined
8	**Message mode**	tF	**0**	0	0	
			1	1		spare
			2	2		
			3	3		
9	**Spec function tags**	bF	OFF	oF		
			ON	on	*	pending
10	**Logging**	Jo	none	0		
			1	1		Time stamped events: data collection tags
			2	2		ditto 1 plus resets
			3	3	*	ditto 2 plus errors
11	**RS interface**	tA	RS 232	23	*	
			RS 422	42		
			RS 485	48		

n°	Parameter	Mnemonic	Value	Value	Default	Notes
12	**OC interface**	tO	**not used**	nu	*	
			ISO2 fixed	IF		
			ISO2 var	Ir		
			WIEGAND	IE		
13	**Reader address**	Ad	1, **2**, …,31	1 à 31	1	
14	**Baud Rate**	br	9 600	96	*	
			4 800	48		
			1 200	12		
			19 200	19		
15	**Character format**	Fo	**8 bit without parity**	8n	*	
			7 bit even	7P		
			7 bit odd	7I		
16	**Frame type for tag code**	Fr	ASCII	AS	*	"test" format
			code only	CS		
			Format_td	td		
			JBUS	Jb		
17	**Polling/Interrupt**	Po	**Interrupt**	oF	*	
			Polling	on		
18	**MTBM**	tb	**0.1 s**	0		for ISO2/Wiegand
			0.2 s	1		
			0.5 s	2	*	
			1 s	3		
			2 s	4		
19	**Nb. Emissions**	nE	1 to **4**	1 to 4	1	No. of transmissions in interrupt mode
20	**Output 1**	S1	not used	0		
			buzzer repeater	1		
			2 sec readout	2	*	
			host	3		
21	**Output2**	S2	**not used**	0	*	
			vehicle LF	1		
			Data collection	2		
			host	3		
22	**Range**	Pr	0 to **3**	0 to 3	3	3: max range
23	**Reserved**					
24	**Input1**	E1	**inactive**	oF	*	
			read	on		Data collection tag scan confirmed
25	**Input2**	E2	**inactive**	oF	*	
			log on	on		to be established
26	**Reserved**					

n°	Parameter	Mnemonic	Value	Value	Default	Notes
27	**Hopping period**	PE	100 ms	0	*	
			150	1		
			200	2		
			300	3		
			400	4		
			500	5		
			800	6		
			1000	7		
28	Reader type	tL	not defined	nd		Read only
			6011	1		
			6012	2		
			6013	3		
			6034	4		
			6035	5		
			7023	6		

EXPLANATORY NOTES:

1. DISPLAY DIRECTION

Allows the reader to be installed in two directions, indicator light at the bottom (select "uP") or indicator light at top (select "dn"). Pushbuttons retain their functions.

2. CHANNEL NUMBER

This is the operating channel. The channel-frequency equivalence table can be found in the interface manual.

The special case of channel 0 applies to the "frequency shift" mode; frequency shifts are then determined by parameter n° 27.

3. TAG PERSISTANCE

This is the time during which the data collection tag code remains in the internal memory after its latest detection. Therefore, it is the maximum time during which a data collection tag can remain undetected if it is to remain present for the reader.

4. BUZZER

Confirms or inhibits the emission of a brief sound each time a data collection tag is detected.

5. ISSUER CODE FILTERING

This function is used to filter data collection tag codes on the basis of the integrator code.

The value of 1 refers to filtering as found on traditional readers, i.e. the first code read after reader reset will become the reference code.

A value of 2 or more indicates filtering based on one of more codes saved to the EEPROM.

These codes have to be loaded using the JBUS command.

6. ISSUER CODE SIZE

Do not change this parameter (always equal to 3).

7. LAMP BEHAVIOUR

Used to establish the behaviour of the antenna indicator.

One single value is defined and refers to:

event	indicator light
data collection tag detection	out for 1 second
data collection tag battery dead	red for 0.3 seconds
operation OK	flashing green 3 times per second
default operation	slow red flashing

8. MESSAGE MODE

Provides the following options:

- mode 0 (message generated each time a new data collection tag is detected),
- mode 2 (message generated each time a data collection tag is detected),
- mode 3 (mode 0 plus disappearance message).

Mode 1 is left spare for special use.

9. SPECIAL FUNCTION TAGS (SFT)

Enables the use of the special function tags. These tags allow interacting with the reader at a distance, for example setting up parameters, switching outputs, setting time/date etc.

This function is available from software version v1.1.3.

When this parameter is inhibited (=oF), all special function tags will be blocked.

10. LOGGING

Used for timed recordings of some events. These records can be read using JBUS commands or a special function tags.

11. RS INTERFACE TYPE

Used to select the RS interface type: 232, 422 or 485.
This interface can be used as a host interface or as a maintenance interface. When it is used as a host interface, select "nu" (not used) for the CO interface (see next item).

12. OPPEN COLLECTOR INTERFACE TYPE

Used to define one of the collector interfaces logged on as a host interface.
When this is the host interface RS, select "nu" (not used).

13. READER ADDRESS

Used for addressing networked readers. When there is only one single reader, do not change.

14. BAUD RATE

Used to select the RS link rate for the host.

15. CHARACTER FORMAT

With a JBUS frame, leave it as 8 bits/no parity.
With ASCII or Code Only, select the format according to the host.

16. FRAME FORMAT

Used to define the message transmitted when a data collection tag is detected.
E.g., for data collection tag (0)(123)(CODE_DATA COLLECTION TAG):
In polling mode, select JBUS:

message = 01 03 0e 30 31 32 33 43 4f 44 45 5f 4b 4a 44 47 4e xx xx
In interruption mode, the following modes apply:
JBUS: message = 02 04 0e 30 31 32 33 43 4f 44 45 5f 4b 4a 44 47 4e xx xx
ASCII: message = 1.0.123CODE_DATA COLLECTION TAG(CR)(LF)
Code only: message = 123CODE_DATA COLLECTION TAG

17. POLLING / INTERRUPT

Used to select the method for transmitting a data collection tag code to the host interface.
Polling OFF (interruption mode), when a new data collection tag is detected, this generates a message which is immediately transmitted to the interface.
Polling ON, this message is solely transmitted in response to the appropriate JBUS command. If the reader does not receive the command before the data collection tag disappears, then the message will be lost.

18. MTBM

Used to define the minimum time between two transmissions over the logged on collector link, whether these are messages for different data collection tags or repeated messages (see next parameter).

19. NUMBER OF EMISSIONS

In RS interface and interruption mode, this will be the maximum number of times the same message is transmitted in the absence of any acknowledgement.
In logged on collector interface mode, when this parameter is greater than 1, each code is transmitted twice. The time between two emissions is set by the preceding parameter.

20. OUTPUT 1

Used to define the output's behaviour when a data collection tag is detected.
These values are:

value	displays	description
not used	0	
buzzer repeater	1	activated for 100 ms when a new data collection tag is scanned
2 sec readout	2	activated for 2 seconds when a new data collection tag is read
host	3	activated exclusively by JBUS commands

21. OUTPUT 2

Used to define the output's behaviour when a data collection tag is detected.
These values are:

value	displays	description
not used	0	
Vehicle SFT	1	activated in vehicle mode (see special functions tag data collection document)
data collection tag batt. low	2	activated when data collection tag battery is at the end of its life
host	3	activated exclusively by JBUS commands

22. RANGE

Used for selecting 4 range values, from 0 (minimum) to 3 (maximum).
This parameter acts on the detection threshold while maintaining transmission power at is nominal value.

23. RESERVED

Parameter not accessible to the user.

24. INPUT 1

Used to validate data collection tag readings with an input signal.
In this case, when the input is active (Vin > 6V), data collection tags are read. If not, they are not read.

25. INPUT 2

To be defined

26. CHANNEL BAND

Parameter not accessible to the user.

27. HOPPING PERIOD

Determines the interval between two frequency shifts when operating in random frequency shift mode FTS (channel number = 0, see parameter n° 2).

28 READER TYPE

Identifies the reader model (in read only mode).

5 INSTALLATION

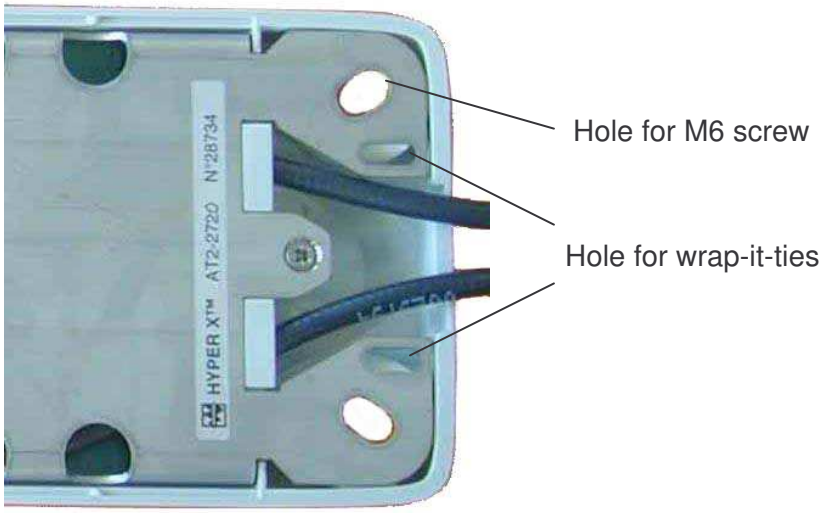
5.1 READER

Fix the reader through the four 7x14 mm oblong holes (average centre-to-centre distance: 210 x 210 mm).

5.2 ANTENNA

The antenna can be fixed using two clamps or four Ø6 mm screws (average centre-to-centre distance: 294 x 59 mm). In the second case:

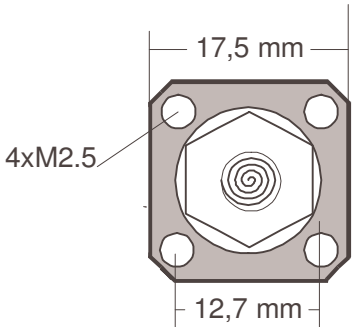
- Insert a metal bushing into the oblong hole at each corner of the radome,
- Offer the antenna up to its mounting surface, threading both coaxial connectors through the surface or the sides in the latter case, cut out the two thin plastic sections),
- Tighten down.



Comment: the antenna can be attached to any surface, including metal surfaces.

5.3 JUMPER CABLES

The square plates of each jumper cable's straight connector can be fixed through the four M2.5 threaded holes (average centre-to-centre distances: 12.7 x 12.7 mm):



Square plate straight connector

Connect the antenna to the reader base:

- connect the first jumper cable marked in black:

  - its TNC male connector connects into the TNC female socket marked in black (ANT IN) in the base:

to the reader base (ANT IN)

- its TNC female socket connects to the antenna' s TNC male connector marked in black (ANT IN):

to the antenna (ANT IN)

- connect the second jumper cable in the same way to the reader (ANT OUT) and to the antenna (ANT OUT).

6 OPERATION

6.1 POWER SUPPLY

The reader can be powered by between 12 VDC (stabilised consumption: 1 A max.) and 24 VDC (stabilised consumption: 0.6 A max.).

ATTENTION:
The extreme operating limits are 11 VDC and 28 VDC: it is imperative the power does not drop below 11 V nor rise above 28 V as this could destroy the voltage detector or cause it to malfunction.

Inside the unit, a ‘‘low voltage’’ LED (DT6, see Internal Description) indicates that the voltage supplied to the detector is below 11 VDC.

When a low voltage is detected, the reader activates a pause of approximately ten seconds. Once this pause elapses, the reader will attempt to restart:

- if the voltage is at the right level, the reader will start up,
- if the voltage is still low, the timer is reset and so forth.

6.2 POWERING UP

Each time the system is powered up or reset, it self tests. This self test can be monitored via the antenna indicator light and, if the reader has been removed, via the internal display units which will display the mnemonic for each test in succession.

Once initialisation is complete and if the result of all internal tests is satisfactory, the display units will turn off.

Therefore, in the absence of any breakdown, the following series of events will be seen:

n°	test on	main indicator light	displays	buzzer	duration
1	Working RAM	red steady	P	on	< 1 s
2*	RAM Log p 0	red steady	P0	off	3 s
3	RAM Log p 1	red steady	P1	off	4 s
4	Checksum flash	red steady	PE	off	1 s
5		Flashing green N.B.nt at 2 Hz	out	off	ad infinitum

In fact, other tests take place, but within less than 50 ms and with fleeting displays. The display will only be of use if the test is frozen.

* When the ‘‘Log’’ parameter (n°10) is confirmed, i.e. different from 0, test 2 (displays = P0) does not take place. On production completion, the Log is confirmed by default; accordingly, from the 2nd start, test 2 does not actually take place.

6.3 DATA COLLECTION TAG SCANNING

When a data collection tag is detected, this causes the following to occur:

- a buzzer sounds (when validated),
- the detection is logged (when validated),
- reader (internal) and antenna (external) LEDs light up as detailed in the following table:

event	indicator light
data collection tag detection	out for 1 second
data collection tag battery dead	red for 0.3 seconds
operation OK	flashing green twice per second
faulty operation	flashing red slowly

6.4 FAULT FINDING

When a fault that could jeopardise reader operation is recorded at a higher level through JBus interrogation, a reader operating test needs to be carried out:

- switch off power supply,
- remove the reader,
- remove its cover,
- re-connect power supply.

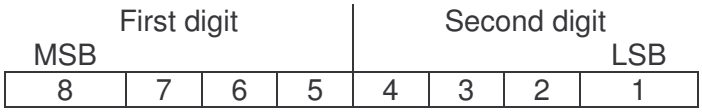
Local error codes

Fault finding is carried out at a higher level.

Locally (inside the reader), a hexadecimal error code indicates that the test has failed (one bit per test). Depending on the fault type, the reader may or may not operate.
The following table lists all tests and associated error bits:

n°	displays	test	error code bit(s)
1	P	External RAM (working part)	2
2	P0	External RAM (Log page 0)	2
3	P1	External RAM (Log page 1)	2
4	PE	Flash memory checksum	1
5	EE	EEPROM memory	3
6	SC	Serial Circuit Controller	4, 5
7	Sn	Serial number component	7
8	rt	RTC (real time chronometer) component	8
9	IS	RS electrical interface	6

Error code octet:



bit	description	consequence
1	memory checksum error	reader unavailable
2	external RAM access error	reader unavailable
3	EEPROM access error	reader unavailable
4	SCC bus access error	reader unavailable
5	SCC error	reader unavailable
6	RS interface error	reader unavailable
7	serial number component access error	reader unavailable
8	circuit RTC circuit error	No Log date stamping

Examples:

displays	meaning
04	EEPROM access error
18	SCC component error
40	serial number component access error

APPENDICES

1 EC Notice

DECLARATION OF CONFORMITY

CE 0682 ⓘ

BALOGH Toulouse
105 Avenue du Général Eisenhower
31023 TOULOUSE cedex 1
FRANCE

This declaration certifies that the LMB* apparatus meets the essential requirements of the European directive R&TTE 1999/5/EC designed to encourage convergence of legislations applicable in the various member States on the use of the radio-electric spectrum, electromagnetic compatibility and electrical safety.
This declaration applies to all units constructed in accordance with the technical documentation described in Appendix II to the directive. Apparatus conformity with the essential requirements of article 3 R&TTE was assessed in accordance with the requirements of appendix IV to the directive and with the following standards:

Radio frequency spectrum:	EN 300 440
EMC FOM:	EN 301 489
Electrical safety:	EN 60 950
Exposure to electromagnetic fields:	EN 50 371

*: LMB_6012/6013/6033/6034/6035/7012/7013/7023/7033

Fire resistance:
The reader and the antenna can be regarded as two separate components, broken down as follows:

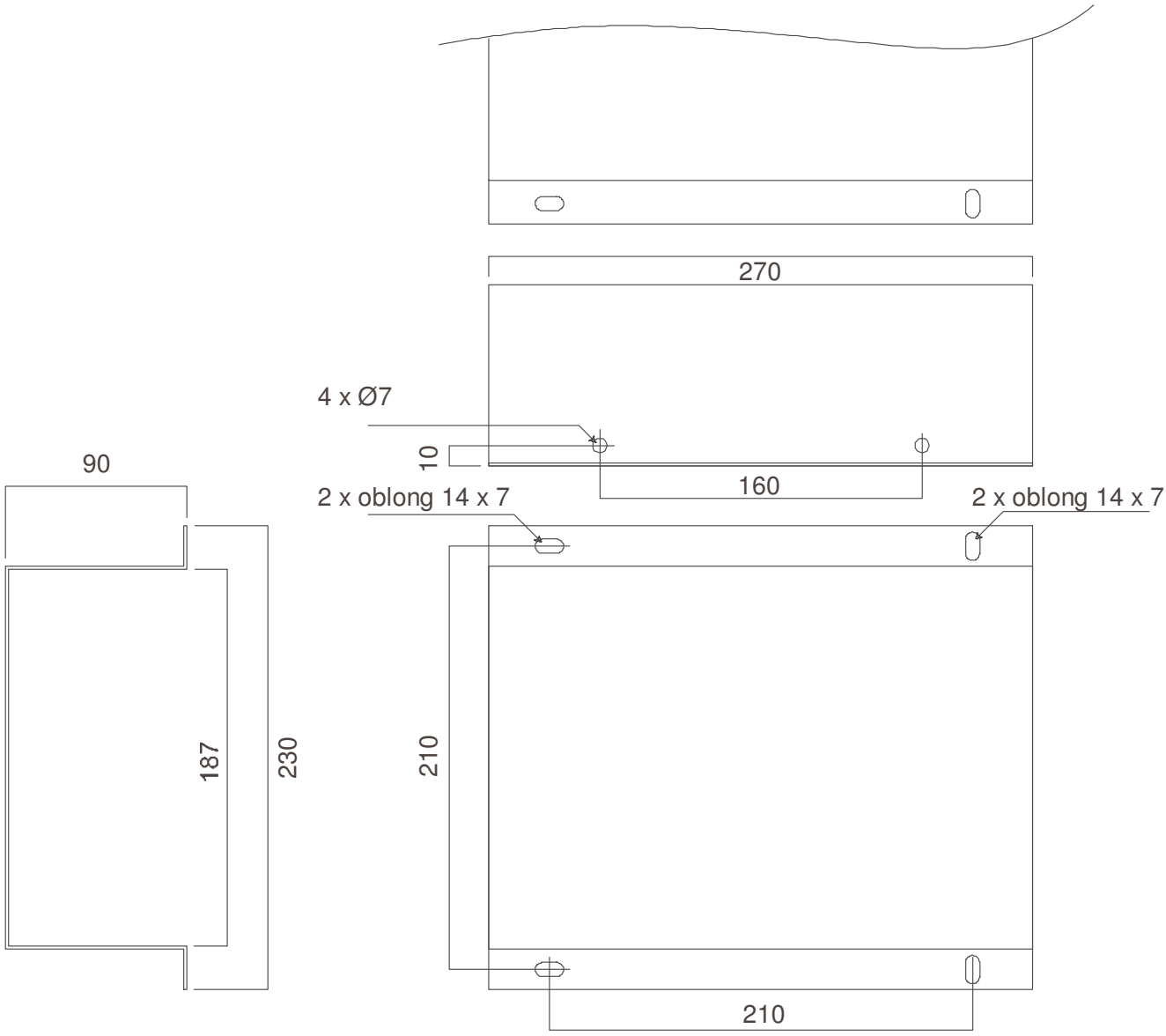
Base reader LMB_7003			**Antenna AT2_2720**		
elements	**material**	**mass**	**elements**	**material**	**mass**
printed circuit (UL V0)		260 g	printed circuit (UL V0)		65 g
inter-antenna plate printed circuit (UL V0)		30 g	radome	plastic	160 g
			encapsulation resin	polyurethane	60 g
total combustible		290 g	**total combustible**		285 g
shield unit	metal	1 230 g	rear plate	metal	275 g
cover + unit base	metal	2 480 g	shield unit	metal	70 g
general total		4 000 g	**general total**		630 g

Total combustible materials given for each element are below 300g, consequently the reader rack LMB_7003 and the antenna AT2_2720 individually meet the 0 requirement of standard NF F16-102.

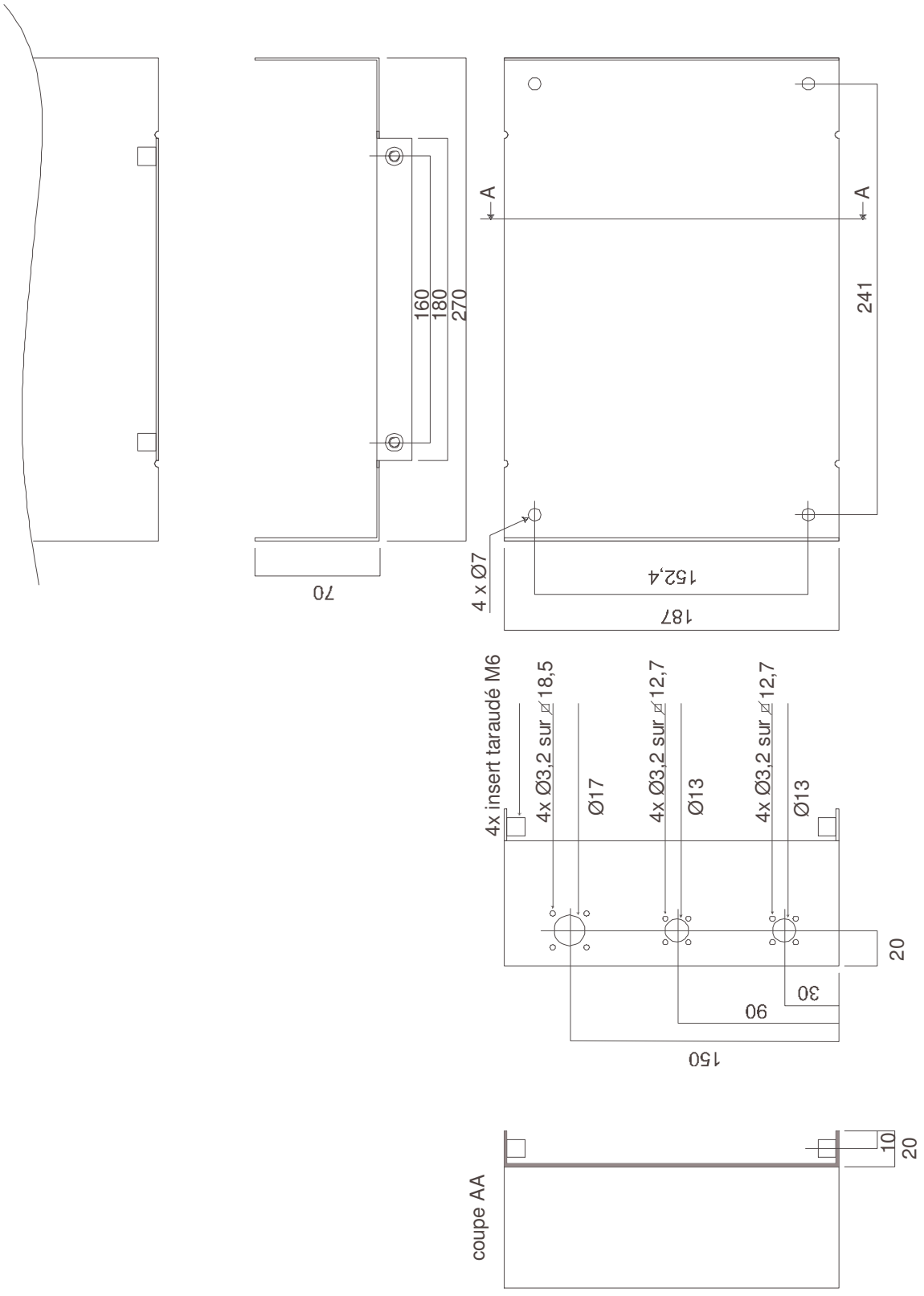
Jumper cables LMR-200-FR together with the coaxial cables for the antenna and base reader are made of UL CATVR and guaranteed halogen-free and ‘‘fire retardant’’.

2 Overall dimensions

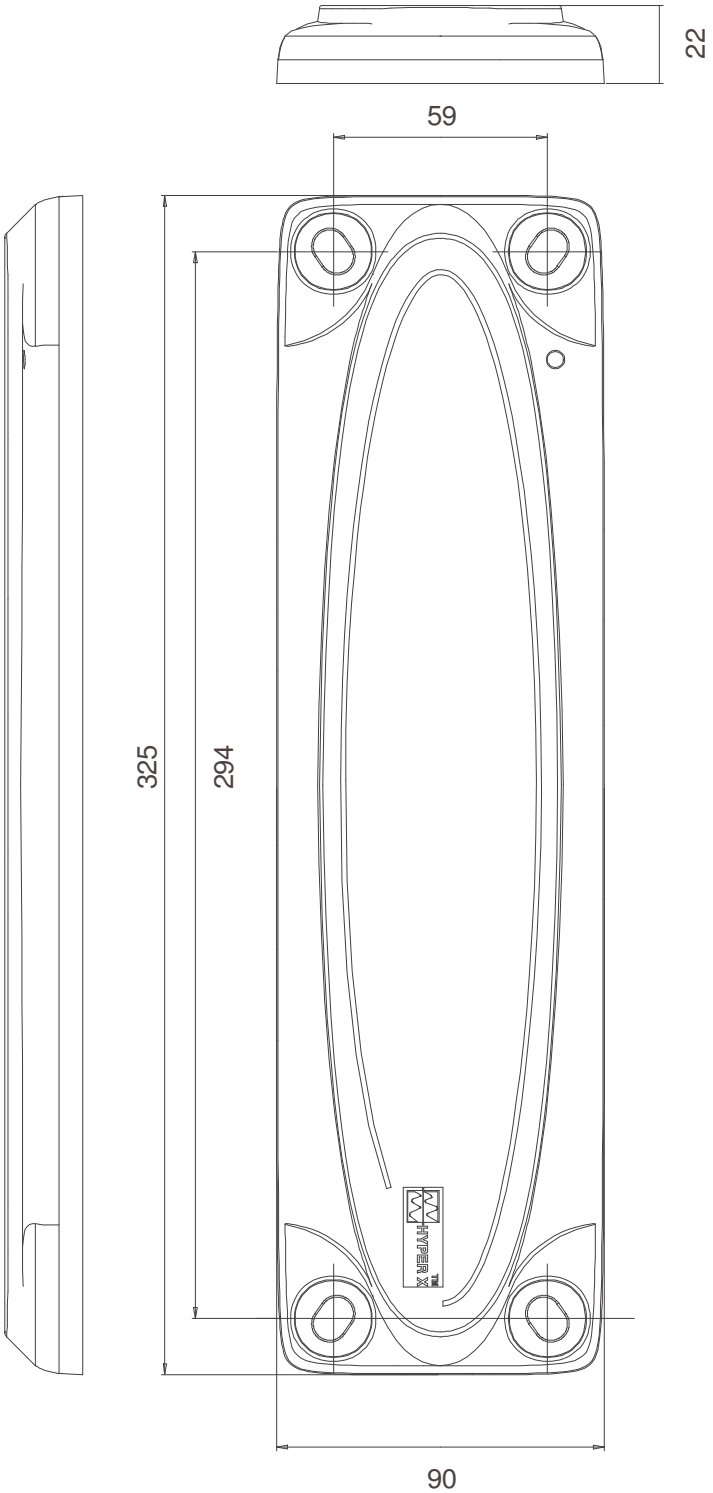
Cover :



Base :


A
A
160
180
270
241
70
4 x Ø7
152,4
187
4x insert taraudé M6
4x Ø3,2 sur ⌀18,5
Ø17
4x Ø3,2 sur ⌀12,7
Ø13
4x Ø3,2 sur ⌀12,7
Ø13
20
30
90
150
coupe AA
10
20

Antenna :



3 Bill of material of the connection

Base reader:

qty	description	manufacturer	manufacturer's ref.
1	HE302 bayonet 6-pin socket	Deutsch FCI	FDBA 50-10-6 PN-K 8525-10R-10B6-PNH
6+6	Crimped pin	Deutsch FCI	006-0937-20A 8526-1348
2	TNC straight female socket 50 Ω with square plate (screw/nut mounted) OR TNC straight female socket 50 Ω with square plate (mounted using a M2.5 screw only)	Télégartner Radiall Rosenberger	JO1011A0045 R143.258 56K406006

Jumper cables:

qty	description	manufacturer	manufactuer's ref.
2	TNC male angled connector 50 Ω	Télégartner	JO1010A0009
2	TNC straight female socket 50 Ω with square plate	Radiall Rosenberger	R143.258 56K406006

AT2 antenna:

qty	description	manufacturer	manufactuer's ref.
2	TNC male 50 Ω connector	Télégartner	JO1010A2608

4 Base reader factory configuration

All parameters featured in the following table are saved to the non volatile memory.

In the following table, the number in the second column gives the sequence in which the parameters appear on the reader's 7-segment display screens.

Most of the parameters are default parameters. The final column shows the factory set configuration for mass produced LMB_7023-ASVA readers.

Parameter		Mnemo	Value	Displays	Default	Notes	conf.LMB_7023-ASVA
Display direction	**1**	--	0	**uP**	*	IHM readout at bottom	**0**
			1	dn		IHM readout at top	
Channel Number°	**2**	nC	1 to 31	0 to 31	9		**0**
Tag Persistence	**3**	tP	0.1s	0			
			0.5s	1			
			1s	**2**	*		**1s**
			2s	3			
			5s	4			
			10s	5			
Buzzer	**4**	bu	OFF	oF		Sounded on detection	
			ON	**on**	*		**ON**
Ussuer code filtering	**5**	FI	No filtering	**0**	*		**No filtering**
			1st code	1			
			EEPROM	2		s per EEPROM code	
Issuer. Code size	**6**	tC	3	**3**	3		**3**
			4	4			
Lamp behaviour	**7**	LE	NORMAL	**0**	*		**NORMAL**
			OTHER	1		to be established	
Message mode	**8**	tF	0	**0**	0		**0**
			1	1		spare	
			2	2			
			3	3			
Spec function tags	**9**	bF	OFF	oF			
			ON	**on**	*		**ON**
Logging	**10**	Jo	none	0		Time/dated events	
			1	1		data collection tags only	
			2	2		ditto 1 + reset	
			3	**3**	*	ditto 2 + errors	**3**
RS interface	**11**	tA	RS232	23	*		
			RS422	42			
			RS485	**48**			**RS485**
OC interface	**12**	tO	not used	**nu**	*		**Not used**
			ISO2 fix	IF			
			ISO2 var	Ir			
			WIEGAND	IE			
Reader address	**13**	Ad	1 to 31	1 to 31	1		**2**
Baud Rate	**14**	br	9600	96	*		
			4800	48			
			1200	12			
			19200	**19**			**19200**

Parameter		Mnemo	Value	Displays	Default	Notes	conf.LMB_7023-ASVA
Character format	**15**	Fo	8bit without	**8n**	*		**8 bit without parity**
			7bit even	7P			
			7 bit odd	7I			
Frame type for tag code	**16**	Fr	ASCII	AS	*	Test format with header	
			code only	CS		ASCII without header	
			spare	td		TimeDesigna format	
			JBUS	**Jb**			**JBUS**
Polling/Interrupt	**17**	Po	Interrupt	**oF**	*		**Interruption**
			Polling	on			
MTBM	**18**	tb	0.1s	**0**		forISO2/Wiegand	**0,1s**
			0.2s	1	*		
			0.5s	2			
			1s	3			
			2s	4			
Nb. Emissions	**19**	nE	1 to 4	1 to 4	1	No. emissions in interr. mode	**4**
Output 1	**20**	S1	not used	0			
			buzzer repeater	1			
			l2s reading	**2**	*		**2s readout**
			host	3			
Output2	**21**	S2	not used	**0**	*		**Not used**
			vehicle LF	1			
			data collection tag battery low	2			
			host	3			
Range	**22**	Pr	0 to 3	0 to 3	3	3 = Max range	**3**
Reserved	**23**	-					
Input1	**24**	E1	inactive	**oF**	*		**Inactive**
			reading	on		valid. data collection tag reading	
Input2	**25**	E2	inactive	**oF**	*		**Inactive**
			log on	on		to be established	
Reserved	**26**	-					

Parameter		Mnemo	Value	Displays	Default	Notes	conf.LMB_7023-ASVA
Hopping period	27	Pe	100 ms	0	*	beyond v1.0.7	
			150	1			
			200	2			
			300	**3**			**300ms**
			400	4			
			500	5			
			800	6			
			1000	7			
Reader type	28	tL	not defined	nd			
			6011	1			
			6012	2			
			6013	3			
			6034	4			
			6035	5			
			7023	**6**			**7023**