

# **HYPER X PRODUCT**

## **ENHANCED COMPACT READER**

### **LMB\_6000 and LMB\_7000**

## **INSTALLATION MANUAL**

Rédigé par / Written by : Philippe GOBRECHT

Date :

Signature :

Approuvé par / Approved by : Bruno WIEDEMANN

Date :

Signature :

Autorisé par / Authorized by : Philippe GOBRECHT

Date :

Signature / :

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## 1. FUNCTIONS AND PERFORMANCE

Hyper X system uses a reader which emits a microwave signal to an identification area . The range of this identification area varies from a few centimeters to several meters. When a tag enters this zone, it modulates this radiation, thereby sending its code back to the reader, which then processes the received signal and extracts the code.

The LMB reader contains all the functional parts of the reading unit. For the LMB\_6000 readers, the antenna is integrated inside the reader. The LMB\_7000 readers use an external monolithic antenna such as AT1, AT2, AT3 or AT5.

The principal functions are :

- Reading distance from 2 to 8m depending on model
- Reading distance adjustment by selection of 3 positions.
- Directivity of the microwave signal :
  - Identification relatively insensitive to environment
  - Adjustable beam
  - Installation of reading antenna against metal walls without range reduction
- Simultaneous identification of 5 tags in 1 second
  - Several tags can be present in identification zone, intentionally or not
  - Identification of the tag in all positions : recto/verso ; horizontal/vertical
- Coexistence of several readers in same area : 31 in Europe and 119 in US

Precautions:

- Metallic surfaces or persons coming between tags and the reading antennas create shadow zones in the identification area.
- The proximity of a tag to a metallic surface or a person (<5mm) reduces the reading distance.

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## 2. TECHNICAL CHARACTERISTICS

|                            |                                   |
|----------------------------|-----------------------------------|
| Operating temperature      | -20°C to +70°C                    |
| Storage temperature        | -25°C to +80°C                    |
| Relative humidity          | 90% without condensation          |
| Protection level           | IP40 or IP56 with waterproof case |
| Power supply               | 12 Vdc to 24Vdc- 12W              |
| Frequency band             | 2,450 GHz                         |
| Number of reading channels | 31 for Europe or 119 for US       |
| Data rate                  | 30 000 bauds                      |
| Error Detection            | HDLC                              |
| Code error rate            | 1 E-7                             |
| Reading failure rate       | 1 E-4 (normal conditions of use)  |
| Reading adjustment         | 3 positions                       |

|                  | LMB_6012   | LMB_6013   | LMB_6033   | LMB_6034*  | LMB_6035*  |
|------------------|------------|------------|------------|------------|------------|
| Dimensions in mm | 263x178x32 | 263x178x32 | 297x297x85 | 297x297x85 | 297x297x85 |
| Weight           | 1,5kg      | 1,5 kg     | 5,2kg      | 5,2kg      | 5,2kg      |
| EIRP             | 10mW       | 75mW       | 75mW       | 200mW      | 350mW      |
| Range            | 2m         | 3m         | 5m         | 5m         | 5m         |
| Antenna          | internal   | internal   | internal   | internal   | internal   |
| Directivity      | 90° x 90°  | 90° x 90°  | 45° x 45°  | 45° x 45°  | 45° x 45°  |
| Waterproof case  | Optional   | Optional   | Yes        | Yes        | Yes        |

|                  | LMB_7012     | LMB_7013     | LMB_7023     | LMB_7033     |
|------------------|--------------|--------------|--------------|--------------|
| Dimensions in mm | 297x297x85   | 297x297x85   | 297x297x85   | 297x297x85   |
| Weight           | 5,2kg        | 5,2kg        | 5,2kg        | 5,2kg        |
| EIRP             | 10mW         | 75mW         | 75mW         | 75mW         |
| Range            | 2m           | 3m           | 5m           | 5m           |
| Antenna          | External AT1 | External AT1 | External AT2 | External AT3 |
| Directivity      | 90° x 90°    | 90° x 90°    | 45° x 45°    | 45° x 45°    |
| Waterproof case  | Yes          | Yes          | Yes          | Yes          |

\* : not available in US

EIRP :Equivalent Isotropic Radiated Power

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### 3. THE POWER SUPPLY

The reader supply must be between 12Vdc and 24Vdc.

With 12Vdc, the current is less than 1A

With 24Vdc, the current is less than 0.6A

The extreme limits for the power supply are 11Vdc to 28Vdc : it's very important to respect these limits for correct operation of the readers and to avoid damage.

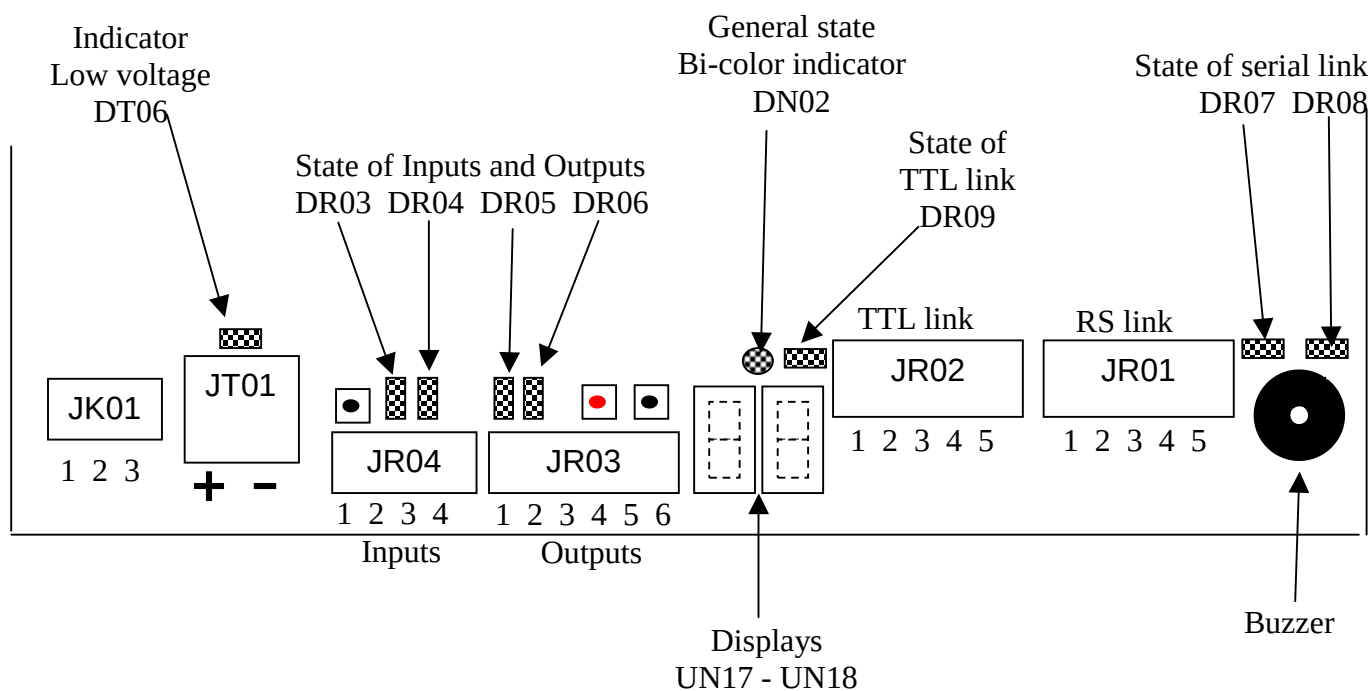
A led « low voltage », near the power supply connector, indicates the voltage supply is less than 11Vdc.

At the time of the “low voltage” detection, the reader enables a timer of about twenty seconds. After this time, the reader tries to power on. If the voltage is right, the reader will turn on, if the voltage is still too low, it enables the timer again and so one.

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## 4. VERIFICATION OF THE READER

This verification is made during the powering on of the reader with all the interfaces and the inouts/Outputs disconnected.



We can sume the successive states :

### Phase 1 :

- Buzzer emits a bip during 1s
- Indicator light DR09 red on during 4s
- Displays UN17 and UN18 with "P1" during 4s
- Bi-color Indicator light DN02 red on during 5s

### Phase 2:

- Displays UN17 and UN18 with "PE" during 1s

### Phase 3:

- Displays UN17 and UN18 off
- Bi-color Indicator light blinks green 0,5s on and 0,5s off.

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## 5. INSTALLATION

### 5.1. LMB 6010 family

The reader is made of a solid aluminium cast on which the circuits boards are fixed and a plastic radome fixed with two screws.

To open the reader :

- Unscrew and remove the two screws at each end of the reader
- Remove the radome

The reader must be mounted on a support (wall...) with 4 screws (maximum diameter is 6mm) at the corners of a rectangle of 151 x 241 mm.

The procedure for closing the reader is the reverse of that for opening.

### 5.2. LMB 6030 family

The LMB\_6030 family uses the same base as the LMB\_6010, but has a different antenna and a waterproof case.

To open the reader :

- Remove the black plastic bushings located in the 4 angles of the grey waterproof case.
- Use the special tool and turn the 4 locking gear (  $\frac{1}{4}$  of turn)
- Remove the plastic cover of the waterproof case.

### 5.3. LMB 7000 family

The LMB\_7000 family uses the same base as the LMB\_6010 with an external monolithic antenna and a waterproof case.

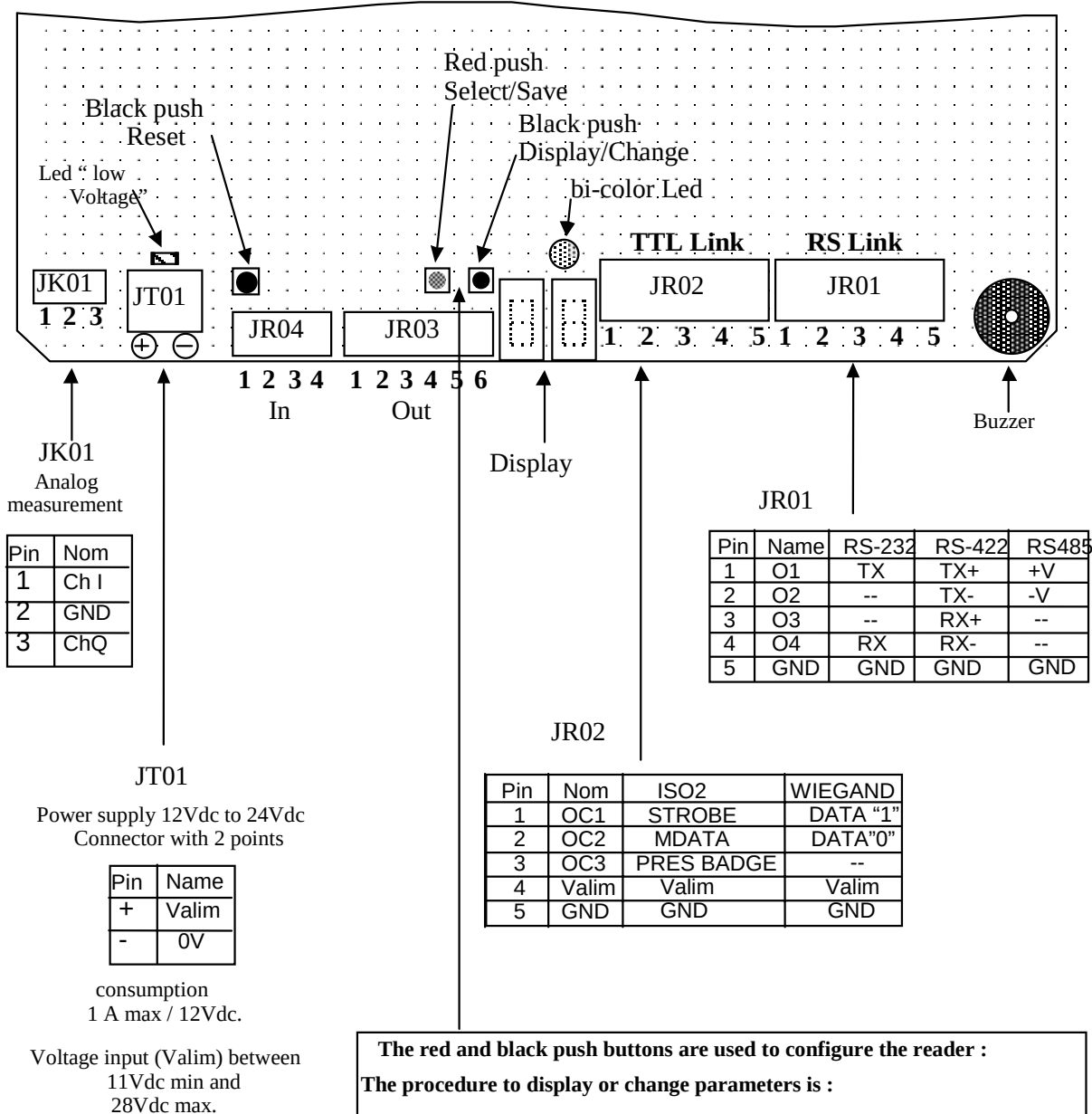
To open the reader :

- Remove the black plastic bushings located in the 4 angles of the grey waterproof case.
- Use the special tool and turn the 4 locking gear (  $\frac{1}{4}$  of turn)
- Remove the plastic cover of the waterproof case.

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## 6. EXTERNAL CONNECTIONS



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JK01 is a connector to measure the analog signal receive by the reader. These test points allow measuring the noise with a scope and therefore the quality of the electromagnetic environment for the installation. These test points allow measuring the analog signals from the tag.

JT01 : is the connector for the supply voltage. A female connector with screw (Phoenix with 2 points pitch 5.08mm ref. MSTB 2,5/2-ST-5,08) must be used.

JR01 : is the connector for the open collector output . A female connector with screw (Phoenix with 5 points pitch 5.08mm ref. MSTB 2,5/5-ST-5,08) must be used.

JR02 : is the connector for the serial link (RS) . A female connector with screw (Phoenix with 5 points pitch 5.08mm ref. MSTB 2,5/5-ST-5,08) must be used.

JR03 : is the connector for the outputs . A female connector with screw (Phoenix with 6 points pitch 3.81mm ref. MSTB 1,5/6-ST-3,81) must be used.

JR04 : is the connector for the inputs . A female connector with screw (Phoenix with 4 points pitch 3.81mm ref. MSTB 1,5/4-ST-3,81) must be used.

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## **7. INSTALLATION AND CONNECTION PROCEDURES FOR THE ASYNCHRONOUS LINKS**

### **7.1. Cable to be used for serial link RS422 or RS485**

1. In a "clean" electromagnetic environment - twisted pairs, without screen.
2. In a "noisy" electromagnetic environment - twisted pairs, individual screen for each pair

The cables are electrically characterised by :

- characteristic impedance ( $Z_0$  in ohms)
- distributed capacity ( $C_L$  in pF/m).
- distributed resistance ( $R_L$  in ohms/m)

For short cable lengths, normal cables are satisfactory.

For cable lengths greater than 1000 metres, high quality cables (low  $C_L$  and  $R_L$ ) should be used for all baud rates.

### **7.2. Line termination**

For a simplex link, the termination (if present) should be placed at the receiving end of the line.

For a duplex link, the termination (if present) should be placed at the each end of the line.

For baud rates less than 1200 bauds, no termination is necessary. For baud rates greater than 9600 bauds and line lengths greater than 1000 metres, a resistor equal to the line impedance (120 ohms) is usually necessary. For cases in-between, there is no clear-cut rule and depends on individual installations (combination of baud-rate, line-length, cable quality, emitter/receiver characteristics).

### **7.3. Electrical connections**

For an RS-232 link , wiring up is straightforward, the TX and RX lines of both equipments are connected together.

For a differential link (RS-422 or RS-485), the polarities are not always clearly defined. Normally the "+" line is at a high level at rest and is active low. For the "-" line, the opposite is true. This is the case for the differential interface for the HYPERX readers. However if the differential signals are generated by a converter acting on RS-232 signals, then the "+" line can be at a low level at rest and active high. In this case, the "+" line of one equipment must be connected to the "-" line of the other equipment.

### **Connection of 0V**

Whether this is necessary or not, depends on the installation. If host and reader are distant with different local ground potentials, then an RS-232 link may not work if the 0V references are not connected. However connecting them will cause ground currents to circulate. In general, for large link lengths, a differential link should be used. This also tolerates a large common-mode voltage difference.

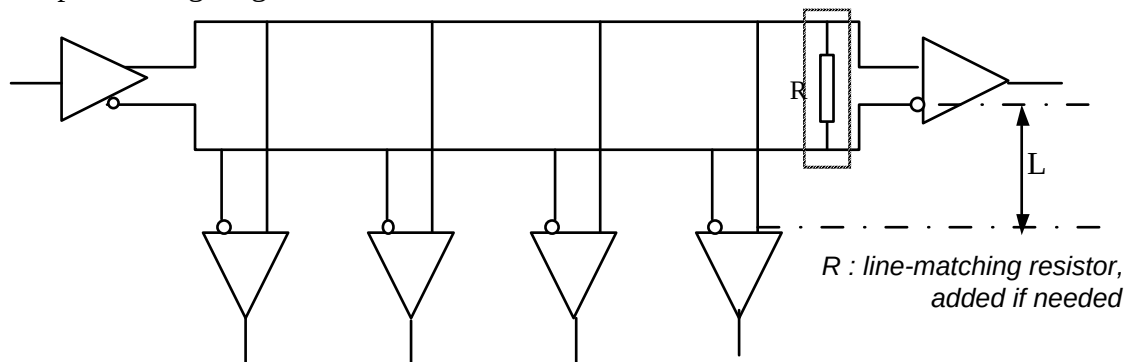
### **7.4. Networking**

#### **7.4.1. Topology**

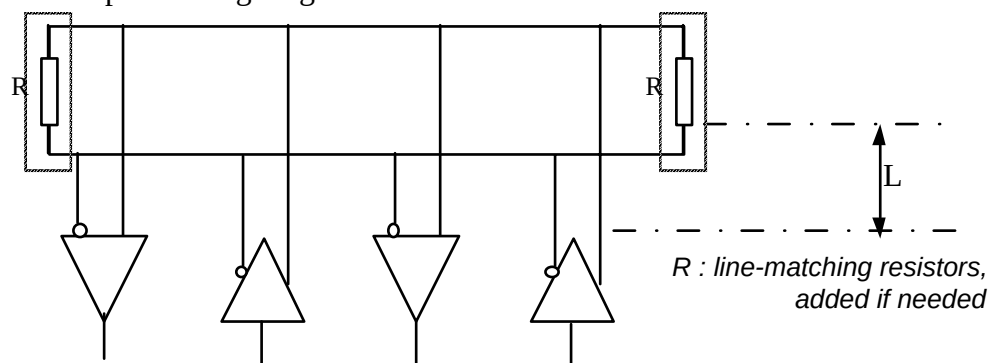
The preferred topology is the bus.

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### Simplex wiring diagram:



### Half-duplex wiring diagram:



The length of the derivation should be as short as possible (< 30 cm).

The maximum length allowed can be calculated from the cable characteristics using the equation below.

$$L < 1300 / (Z_0 \times C_L) \quad L \text{ in metres, } Z_0 \text{ in ohms and } C_L \text{ in pF}$$

#### 7.4.2. Line biasing

For RS-485, line biasing may prove necessary and must be done externally and only at one point on the line.

The line “+” is connected to +5V via a 4K7 resistor.

The line “-” is connected to 0V via a 4K7 resistor.

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## 8. OPEN COLLECTOR INTERFACE

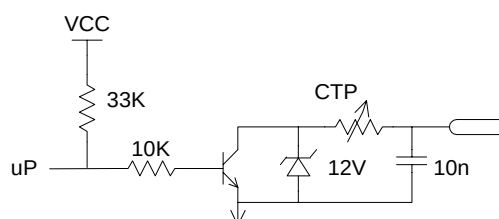
Both the ISO2 and the WIEGAND interfaces use an Open-collector interface. For correct operation, pull-up resistors (typical values are 1K) must be connected to any voltage supply between 5V and 12V. For the ISO2 interface, this concerns the three signals STROBE, MDATA and PRES\_BADGE, for the WIEGAND interface this concerns the two signals DATA1 and DATA0.

The pins are associated with different signals, depending on the type of link used. The JR2 connector is used.

| pin | ISO2       | WIEGAND  |
|-----|------------|----------|
| 1   | STROBE     | DATA "1" |
| 2   | MDATA      | DATA "0" |
| 3   | PRES_BADGE | —        |
| 4   | Valim      | Valim    |
| 5   | GND        | GND      |

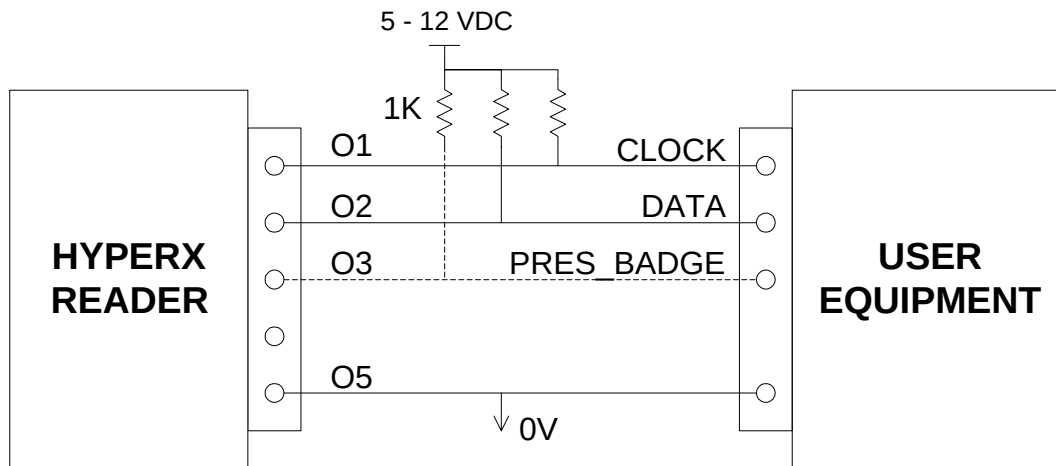
Note : the Valim on pin 4 is internally connected to the supply voltage.

Circuit diagram for open collector output stage inside the reader :

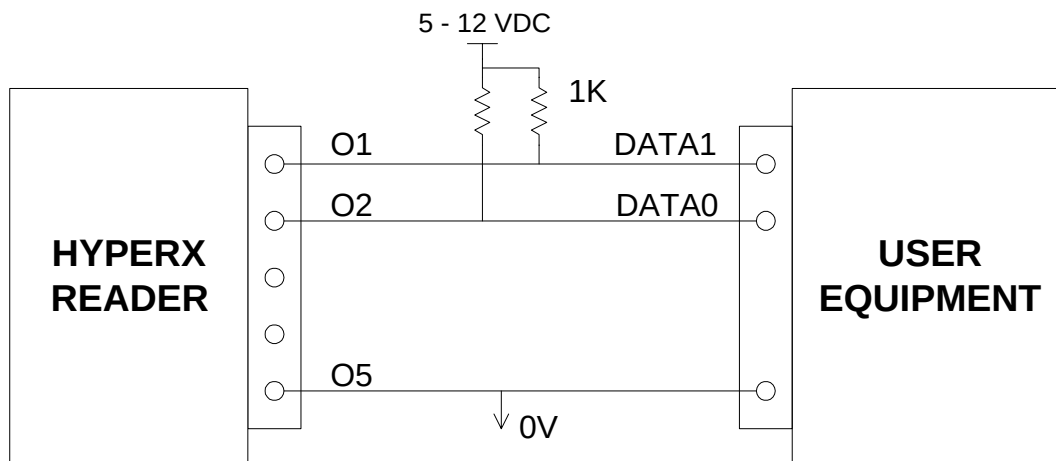


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For the ISO2 system :



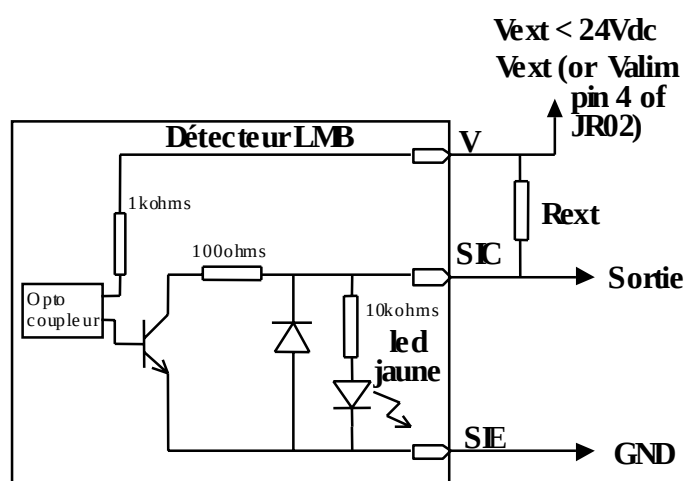
For Wiegand system :



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## 9. THE OUTPUTS (JR3)

| pin | name | description                 |
|-----|------|-----------------------------|
| 1   | VI1  | Supply voltage for output 1 |
| 2   | SIC1 | Collector output 1          |
| 3   | SIE1 | Emitter output 1            |
| 4   | VI2  | Supply voltage for output 2 |
| 5   | SIC2 | Collector output 2          |
| 6   | SIE2 | Emitter output 2            |



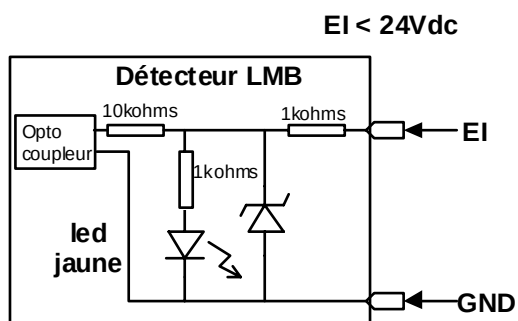
The external voltage must not exceed 24Vdc

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## 10. THE INPUTS (JR4)

| pin | name | description           |
|-----|------|-----------------------|
| 1   | EI1  | Signal for input 1    |
| 2   | GND1 | Reference for input 1 |
| 3   | EI2  | Signal for input 2    |
| 4   | GND2 | Reference for input 1 |

EI must not exceed 24Vdc.



| <b>JR04</b>     |     |       |
|-----------------|-----|-------|
|                 | Pin | Nom   |
| <b>Entrée 1</b> | 1   | EI 1  |
|                 | 2   | GND 1 |
| <b>Entrée 2</b> | 3   | EI 2  |
|                 | 4   | GND 2 |

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## 11. OPERATING FREQUENCY CHANNEL

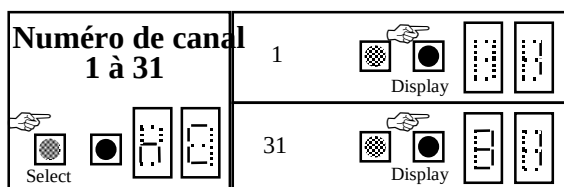
The enhanced compact reader LMB can operate using 119 different channels (31 for Europe). Each channel corresponds to a separate microwave frequency band. This is useful when several readers must be positioned close together. Using different channels on each reader eliminates mutual interference.

119 channels are available (31 for Europe), the frequency band is between 2435.25MHz and 2464.75MHz (2446.25MHz and 2453.75MHz for Europe) with a channel spacing of 250KHz.

### Checking the channel number :

Push the red push-button "select" until the "nC" is displayed.

Then push the black button once : the channel number appears.



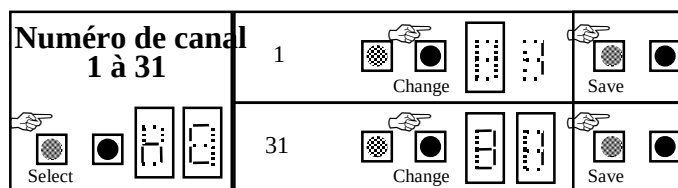
After 2 or 3 seconds, the display switches off automatically.

### Modifying the channel number :

Push the red button "select" until "nC" is displayed.

Then push the black button "change" until the wanted channel number appears.

When the channel number is right, push the red button "save" once to save the new channel number.



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## 12. ADJUSTMENT OF THE READING RANGE

All the readers are delivered with an adjustment with the maximum reading range.

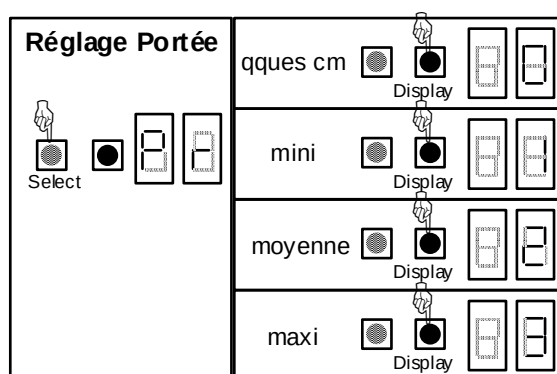
There are 4 positions for the adjustment :

- Maximum reading range
- Middle reading range
- Minimum reading range
- A few centimeters.

### 12.1. Verification of the the position of the adjustment of the reading range :

Push the red push-button "select" until the "Pr" is displayed.

Then push the black button "display" once : the number corresponding to the reading range appears.



The displays light off automatically after 2s.

### 12.2. Modification of the position of the reading range :

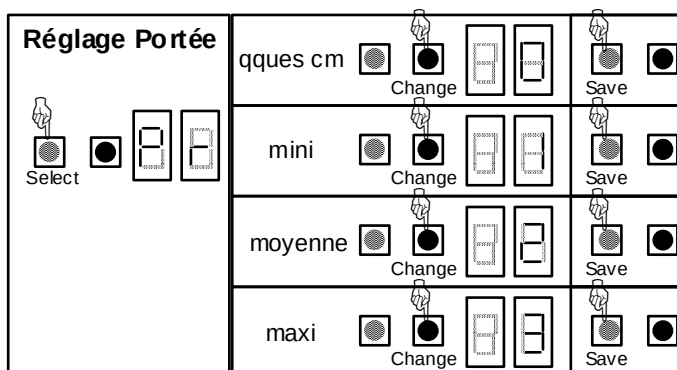
Push the red push-button "select" until the "Pr" is displayed.

Then push the black button "change" once : the number corresponding to the reading range appears.

Push the black push-button "change" until the wanted position number appears.

When the position number is right, push the red button "save" once to save the new position number.

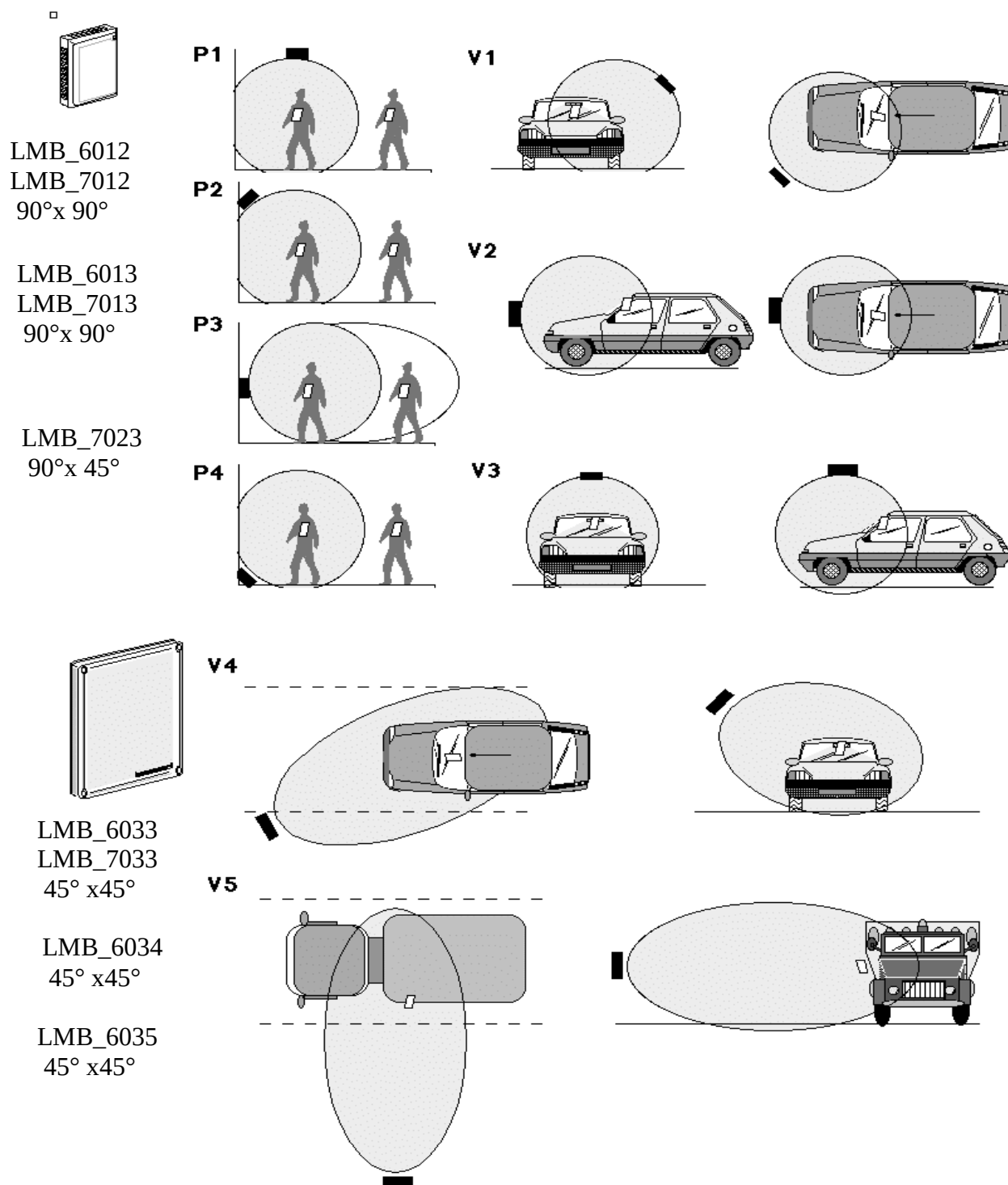
The new position number is memorised.



The displays light off automatically after 2s.

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## 13. ORIENTATION OF THE ANTENNA



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## 1. FCC Notice

This equipment has been tested and found to comply with the limits for a classB digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If the equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures :

- Reorient or relocate the receiving antenna.
- increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

| REFERENCE DU DOCUMENT / DOCUMENT REFERENCE |                 |                       |                         |       |
|--------------------------------------------|-----------------|-----------------------|-------------------------|-------|
| Langue/ Language                           | Numéro / Number | Code Doc. / Doc. Code | Indice / Revision Index | Pages |
| FR                                         | 13053           | 108                   | B                       | 20/27 |

## 14. CE Notice

### DECLARATION OF CONFORMITY

CE 0682 !

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

This declaration that the following designated products LMB\* comply with the essential protection requirements of R&TTE Directive 1999/5/CE on the approximation of the law of the Member States relating to Radio Spectrum Matters, EMC and Electrical safety.

This declaration applies to all specimens manufactured with the attached technical documentation described in the annex II of the directive which form parts of the declaration.

Assessment of compliance of the product with the requirements relating to the essential requirements acc. to Article 3 R&TTE was based on Annexe V of the Directive 1999/5/CE and the following standards :

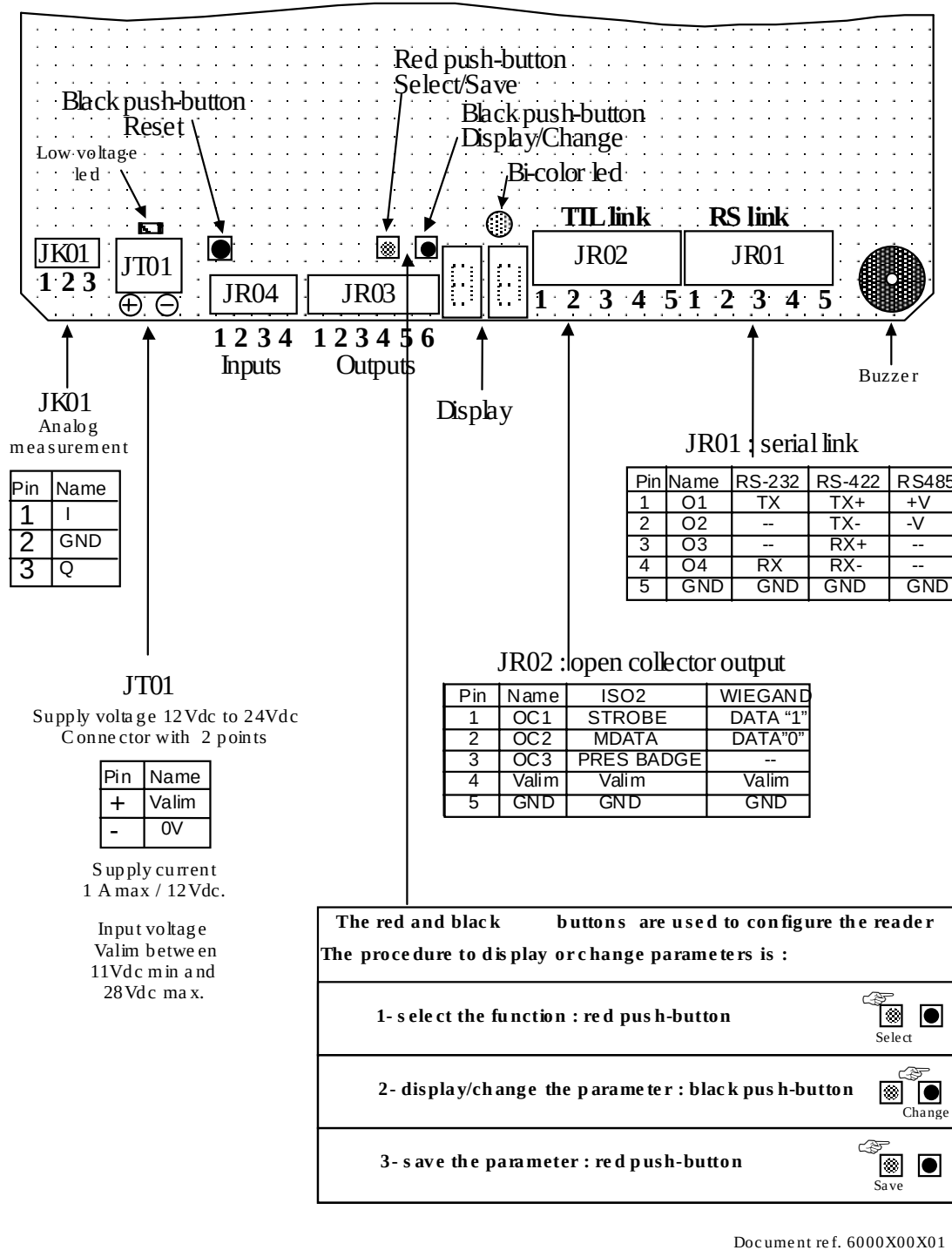
Radio spectrum : EN 300 440  
EMC : EN 401 489  
Electrical safety : EN 60 950  
Health : EN 50 371

\* : LMB\_6012/6013/6033/6034/6035/7012/7013/7023/7033

| REFERENCE DU DOCUMENT / DOCUMENT REFERENCE |                 |                       |                         |       |
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| FR                                         | 13053           | 108                   | B                       | 21/27 |

## Appendix 1 : General presentation

### HYPER X ENHANCED COMPACT READER : LMB

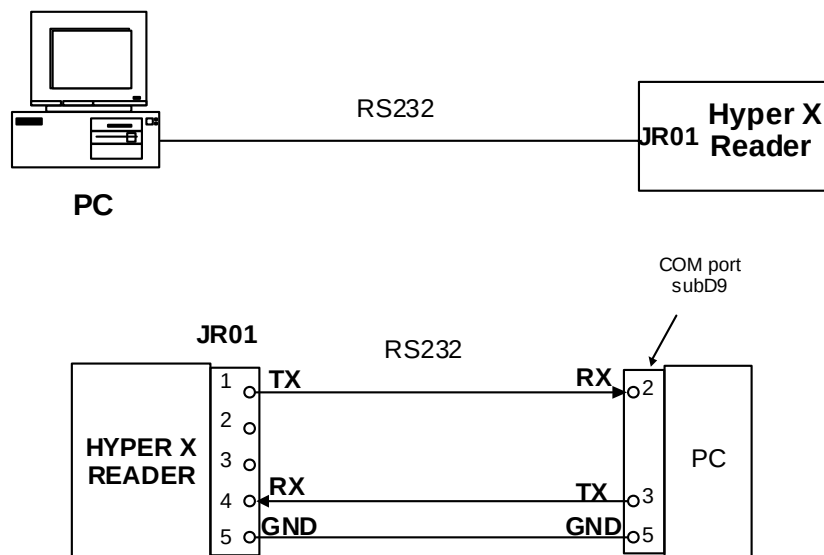


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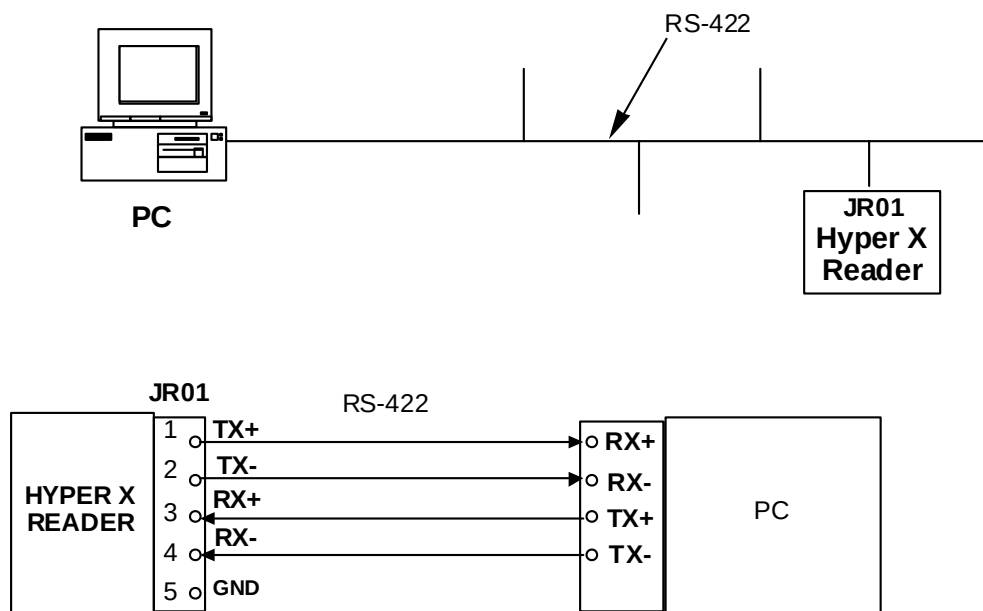
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| FR               | 13053           | 108                   | B                       | 22/27 |

## Appendix 2 : Serial link

### SERIAL LINK : RS-232



### SERIAL LINK : RS-422

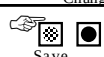
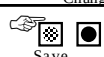
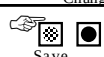


Document ref. 6000X00X01

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| FR                                         | 13053           | 108                   | B                       | 23/27 |

## CONFIGURATION of ENHANCED COMPACT READER : LMB ASYNCHRONOUS SERIAL LINK : RS 232 / 422 / 485

Please see the configuration manual to get a detailed list of all possible configurations

|                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                          |                                                                                     |                                                     |                                                                                     |                                         |                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------------------------------------------------------------|
| <p style="text-align: center;"><b>OPERATING MODE</b></p> <p>Red and black push-buttons are used to configure the reader.<br/>The procedure to display or change parameters is :</p> | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">1- select the function : red push-button</td> <td style="width: 40%; text-align: center;"></td> </tr> <tr> <td>2- display/change the parameter : black push-button</td> <td style="text-align: center;"></td> </tr> <tr> <td>3- save the parameter : red push-button</td> <td style="text-align: center;"></td> </tr> </table> | 1- select the function : red push-button |  | 2- display/change the parameter : black push-button |  | 3- save the parameter : red push-button |  |
| 1- select the function : red push-button                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                          |                                                                                     |                                                     |                                                                                     |                                         |                                                                                     |
| 2- display/change the parameter : black push-button                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                          |                                                                                     |                                                     |                                                                                     |                                         |                                                                                     |
| 3- save the parameter : red push-button                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                          |                                                                                     |                                                     |                                                                                     |                                         |                                                                                     |

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| <p><b>RS interface</b></p> <table style="width: 100%;"> <tr> <td style="width: 30%;">RS 232</td> <td style="width: 30%; text-align: center;"> </td> </tr> <tr> <td>RS 422</td> <td style="text-align: center;"> </td> </tr> <tr> <td>RS 485</td> <td style="text-align: center;"> </td> </tr> </table>                                                                                                                                                                                                                                         | RS 232                                                                                                                                                                      |       | RS 422   |       | RS 485                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       | <p><b>Message mode</b></p> <table style="width: 100%;"> <tr> <td style="width: 30%;">0</td> <td style="width: 30%; text-align: center;"> </td> </tr> <tr> <td>2</td> <td style="text-align: center;"> </td> </tr> <tr> <td>3</td> <td style="text-align: center;"> </td> </tr> </table>                                                                                                                                                                                                                                                                     | 0                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 2        |       | 3        |       |        |                                                                                                                                                                             |
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| <p><b>Polling / Interrupt</b></p> <table style="width: 100%;"> <tr> <td style="width: 30%;">Interrupt.</td> <td style="width: 30%; text-align: center;"> </td> </tr> <tr> <td>Polling</td> <td style="text-align: center;"> </td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Interrupt.                                                                                                                                                                  |   | Polling  |   | <p><b>Channel number 1 to 31</b></p> <table style="width: 100%;"> <tr> <td style="width: 30%;">1</td> <td style="width: 30%; text-align: center;"> </td> </tr> <tr> <td>31</td> <td style="text-align: center;"> </td> </tr> </table> | 1                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 31                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |                                                                                                                                                                             |          |                                                                                                                                                                             |        |                                                                                                                                                                             |
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| 31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |                                                                                                                                                                         |          |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |                                                                                                                                                                             |          |                                                                                                                                                                             |        |                                                                                                                                                                             |
| <p><b>Character Format</b></p> <table style="width: 100%;"> <tr> <td style="width: 30%;">8 / none</td> <td style="width: 30%; text-align: center;"> </td> </tr> <tr> <td>7 / even</td> <td style="text-align: center;"> </td> </tr> <tr> <td>7 / odd</td> <td style="text-align: center;"> </td> </tr> </table>                                                                                                                                                                                                                    | 8 / none                                                                                                                                                                    |   | 7 / even |   | 7 / odd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   | <p><b>Reader range</b></p> <table style="width: 100%;"> <tr> <td style="width: 30%;">few cm</td> <td style="width: 30%; text-align: center;"> </td> </tr> <tr> <td>short</td> <td style="text-align: center;"> </td> </tr> <tr> <td>medium</td> <td style="text-align: center;"> </td> </tr> <tr> <td>long</td> <td style="text-align: center;"> </td> </tr> </table> | few cm                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | short    |   | medium   |   | long   |   |
| 8 / none                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                                                                                                                                                         |          |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |                                                                                                                                                                             |          |                                                                                                                                                                             |        |                                                                                                                                                                             |
| 7 / even                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                                                                                                                                                         |          |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |                                                                                                                                                                             |          |                                                                                                                                                                             |        |                                                                                                                                                                             |
| 7 / odd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                                                                                                                                                         |          |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |                                                                                                                                                                             |          |                                                                                                                                                                             |        |                                                                                                                                                                             |
| few cm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |                                                                                                                                                                         |          |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |                                                                                                                                                                             |          |                                                                                                                                                                             |        |                                                                                                                                                                             |
| short                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |                                                                                                                                                                         |          |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |                                                                                                                                                                             |          |                                                                                                                                                                             |        |                                                                                                                                                                             |
| medium                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |                                                                                                                                                                         |          |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |                                                                                                                                                                             |          |                                                                                                                                                                             |        |                                                                                                                                                                             |
| long                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |   |                                                                                                                                                                         |          |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |                                                                                                                                                                             |          |                                                                                                                                                                             |        |                                                                                                                                                                             |

|                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>DEFAULT CONFIGURATION</b></p>                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                        |
| <p> Reset</p> <ul style="list-style-type: none"> <li>- Interface : RS 232</li> <li>- J-BUS Address : 1</li> <li>- Baud rate : 19 200 bauds</li> <li>- Protocol : Polling</li> <li>- Character format : 8 / none</li> <li>- Frame format: J-BUS</li> </ul> | <p> Change</p> <ul style="list-style-type: none"> <li>- Message mode : 0</li> <li>- Buzzer : ON</li> <li>- Dist. code filter : disabled</li> <li>- Channel number : 9</li> <li>- Reader range : 3</li> </ul> | <ul style="list-style-type: none"> <li>- Output 1 : reading 100ms</li> <li>- Output 2 : reading 2s</li> <li>- Input 1 : Disabled</li> <li>- Input 2 : Disabled</li> <li>- Interface TTL : not used</li> <li>- Log : all (3)</li> </ul> |

Document ref. 6000X00X01

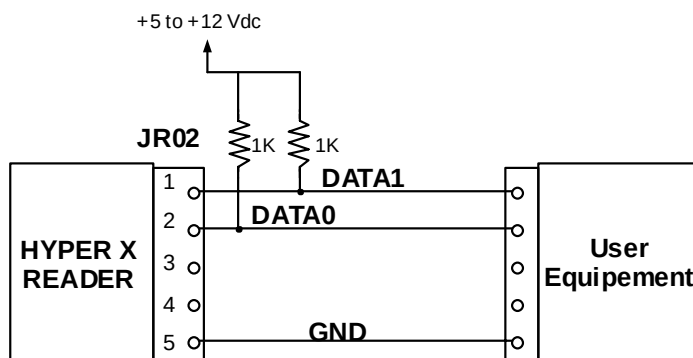
### REFERENCE DU DOCUMENT / DOCUMENT REFERENCE

| Langue/ Language | Numéro / Number | Code Doc. / Doc. Code | Indice / Revision Index | Pages |
|------------------|-----------------|-----------------------|-------------------------|-------|
| FR               | 13053           | 108                   | B                       | 24/27 |

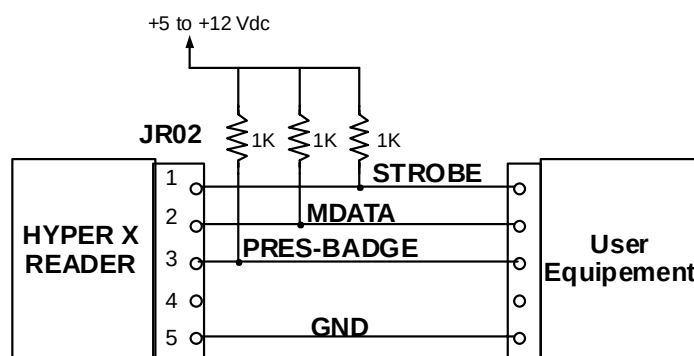


## Appendix 3 : Open collector output

### Connection to a WIEGAND system



### Connection to an ISO2 system



The use of the third wire (PRES-BADGE) is optional

| REFERENCE DU DOCUMENT / DOCUMENT REFERENCE |                 |                       |                         |       |
|--------------------------------------------|-----------------|-----------------------|-------------------------|-------|
| Langue/ Language                           | Numéro / Number | Code Doc. / Doc. Code | Indice / Revision Index | Pages |
| FR                                         | 13053           | 108                   | B                       | 25/27 |

## CONFIGURATION OF ENHANCED COMPACT READER : LMB OPEN COLLECTOR INTERFACE WIEGAND AND ISO 2

Please see the configuration manual to get a detailed list of all possible configurations

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p style="text-align: center;"><b>OPERATING MODE</b></p> <p>Red and black push-buttons are used to configure the reader.<br/>The procedure to display or change parameters is :</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p style="text-align: center;">1- select the function : red push-button </p> <p style="text-align: center;">2- display/change the parameter : black push-button </p> <p style="text-align: center;">3- save the parameter : red push-button </p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p><b>Open collectors interface</b></p> <p>   </p> <p>not used  </p> <p>ISO 2 fixe  </p> <p>ISO 2 Var.  </p> <p>WIEGAND  </p>                                                                                                                                                                                                                                                                                                                                                             | <p><b>Message mode</b></p> <p>0  </p> <p>2  </p> <p>3  </p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <p><b>MTBM Mean Time Between Messages</b></p> <p>   </p> <p>0,5 s  </p> <p>1 s  </p> <p>2 s  </p> <p>5 s  </p> <p>10 s  </p>                                                                                                                                                                                | <p><b>Buzzer</b></p> <p>OFF  </p> <p>ON  </p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p><b>Hold time</b></p> <p>   </p> <p>0,1 s  </p> <p>0,5 s  </p> <p>1 s  </p> <p>2 s  </p> <p>5 s  </p> <p>10 s  </p> | <p><b>Distributor code filter</b></p> <p>   </p> <p>disabled  </p> <p>1st code  </p> <p>EEPROM  </p>                                                                                                                                                                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p><b>Channel number 1 to 31</b></p> <p>   </p> <p>1  </p> <p>31  </p>                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p><b>Reader range</b></p> <p>   </p> <p>few cm  </p> <p>short  </p> <p>medium  </p> <p>long  </p> |
| <div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <h3 style="text-align: center;">DEFAULT CONFIGURATION</h3> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <ul style="list-style-type: none"> <li>- Interface : RS 232</li> <li>- J-BUS Address : 1</li> <li>- Baud rate : 19 200 bauds</li> <li>- Protocol : Polling</li> <li>- Character format : 8 / none</li> <li>- Frame format: J-BUS</li> </ul> </div> <div style="width: 48%;"> <ul style="list-style-type: none"> <li>- Message mode : 0</li> <li>- Buzzer : ON</li> <li>- Dist. code filter : disabled</li> <li>- Channel number : 9</li> <li>- Reader range : 3m</li> </ul> </div> </div> </div> <div style="width: 35%;"> <ul style="list-style-type: none"> <li>- Output 1 : reading 100ms</li> <li>- Output 2 : reading 2s</li> <li>- Input 1 : Disabled</li> <li>- Input 2 : Disabled</li> <li>- Interface TTL : not used</li> <li>- Log : all (3)</li> </ul> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  <p>Reset</p> </div> <div style="text-align: center;">  <p>Change</p> </div> </div>                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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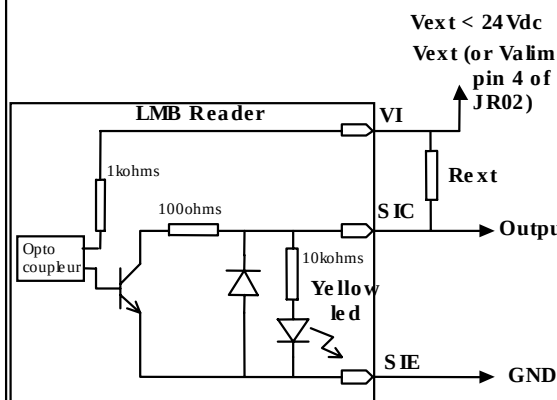
| REFERENCE DU DOCUMENT / DOCUMENT REFERENCE |                 |                       |                         |       |
|--------------------------------------------|-----------------|-----------------------|-------------------------|-------|
| Langue/ Language                           | Numéro / Number | Code Doc. / Doc. Code | Indice / Revision Index | Pages |
| FR                                         | 13053           | 108                   | B                       | 26/27 |

## Appendix 4 : Inputs / Outputs

### HYPER X ENHANCED COMPACT READER : LMB

#### Configuration of OUTPUTS : connector JR 03

| JR03     | Pin | Name  |
|----------|-----|-------|
| Output 1 | 1   | VI 1  |
|          | 2   | SIC 1 |
|          | 3   | SIE 1 |
| Output 2 | 4   | VI 2  |
|          | 5   | SIC 2 |
|          | 6   | SIE 2 |



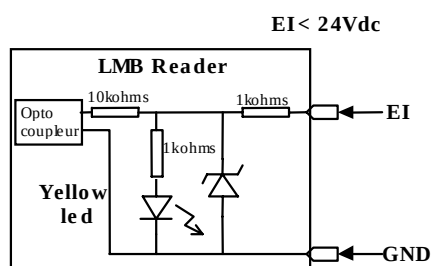
| Output 1 | Not used     | Change | Save |
|----------|--------------|--------|------|
| Select   | read.100ms   | Change | Save |
|          | reading. 2 s | Change | Save |
|          | host         | Change | Save |

| Output 2 | Not used     | Change | Save |
|----------|--------------|--------|------|
| Select   | read.100ms   | Change | Save |
|          | reading. 2 s | Change | Save |
|          | host         | Change | Save |

#### Configuration of INPUTS : connector JR 04

| JR04    | Pin | Name  |
|---------|-----|-------|
| Input 1 | 1   | EI 1  |
|         | 2   | GND 1 |
| Input 2 | 3   | EI 2  |
|         | 4   | GND 2 |



| Input 1 | Disabled | Change | Save |
|---------|----------|--------|------|
| Select  | Reading  | Change | Save |

| Input 2 | Disabled | Change | Save |
|---------|----------|--------|------|
| Select  | Reading  | Change | Save |

Document ref. 6000X00X01

#### REFERENCE DU DOCUMENT / DOCUMENT REFERENCE

| Langue/ Language | Numéro / Number | Code Doc. / Doc. Code | Indice / Revision Index | Pages |
|------------------|-----------------|-----------------------|-------------------------|-------|
| FR               | 13053           | 108                   | B                       | 27/27 |