

ERC 1500 INSTALLATION

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23/05/2006	4	D3E	BF		
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1 FONCTIONNEMENT



1.1 PRINCIPLE OF FONCTION

L' ERC 1500 is a **digital** transmission system, with bidirectionnal data over monomode or multimode optical fiber. Signals to transmit are digitized before optical transmission and are restored on the receiver.

Equipments assume real time video transmission (PAL or NTSC format), closure contact and bidirectionnal data (RS 422 or RS 485).

Transmitter is available in stand-alone boxes with DC power supply.
Module of 2 or 3 receivers can be plug in chassis 19" 3U ERC 17-001 or in stand alone housing ERC 17- SA. with its main or DC power supply.

System is composed:

- ERC 1510 E, video transmitter (+ data transceiver).
- ERC 1512 R, double video receiver (+ data transceiver).
- ERC 1513 R, triple video receiver

Connections are through:

- BNC connector, for video,
- SUB D9 HD connector, 15 females contacts for data and contact closure, on the 2 video receiver module.
- WAGO « MICRO » series connector bloc for data, closure contact and power supply of the video transmitter
- SC/PC optical connector.

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1.2 VIDEO TRANSMITTER ERC 1510

Note: Data configuration of the transmitter is done on the board of the corresponding *video receiver*.

1.2.1 TRANSMISSION PART

An Automatic Gain Control at the video input control the video signal level, this function optimizes the video coding, and avoids saturation of the Analog to Digital Converter. (Video signal compliant with CCIR 567 recommendation).

Video signal, amplified, aligned at the bottom of synchronization is digitized on 10 bits, with over sampling 2x and digital filtering before multiplexing.

RS 422 and RS 485 signals are processed by specialized inline interfaces.

Contact closure interface is processed by short circuit of the input signal to the ground.

Whole signals are multiplexed and applied to the optical transmitter (1300nm).

Line data rate is 189 Megabits per second.

1.2.2 RECEPTION PART

Data signal coming from *video receiver* ERC 1512 R is restoring in accordance with the protocol configured, RS485 or RS422.

1.3 ERC 1512 VIDEO RECEIVER

1.3.1 RECEPTION PART

The optical signal received is converted to electrical signal and deserialized and demultiplexed to be applied on video or data output.

The digital video signal is over sampling 2x before analog conversion.

The signal is converted by data interface into RS232/422 or 485 in accordance with the protocol configured.

Over more processed data of the *video receiver* can be shared with many *video receivers* in the same chassis ERC17 data transfer is done directly through the back panel of the ERC17 chassis. Wiring of the data is widely simplified.

A double video output on SMB connector is available to prevent the use of a video distributor or monitoring of the video link.

1.3.2 TRANSMISSION PART

Data signal are processed in accordance with protocol configured on the *video receiver*

Data are multiplexed and coded to be transmitted to the video transmitter, ERC 1510 E, with a data rate of 6.75 Mbits/s.

Data interface restore the signal, RS422 or 485, in accordance with the protocol configured on the *video receiver*.

1.4 ERC 1513 VIDEO RECEIVER

The optical signal received is converted to electrical signal and deserialized and demultiplexed to be applied on video output.

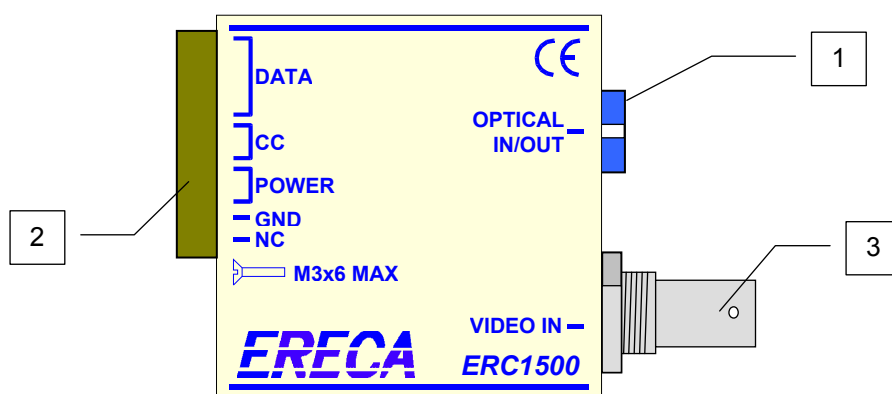
The digital video signal is over sampling 2x before analog conversion.

No data signal are delivered by this board, if any remote control are needed, data are available through the back panel of the ERC 17-001 chassis.

A double video output on SMB connector is available to prevent the use of a video distributor or monitoring of the video link.

2 CONFIGURATION AND CONNECTOR

2.1 TRANSMITTER BOX



- ① SC/PC optical connector
- ② WAGO connector bloc
- ③ BNC 75 Ω video input connector

2.1.1 VIDEO CHANNEL

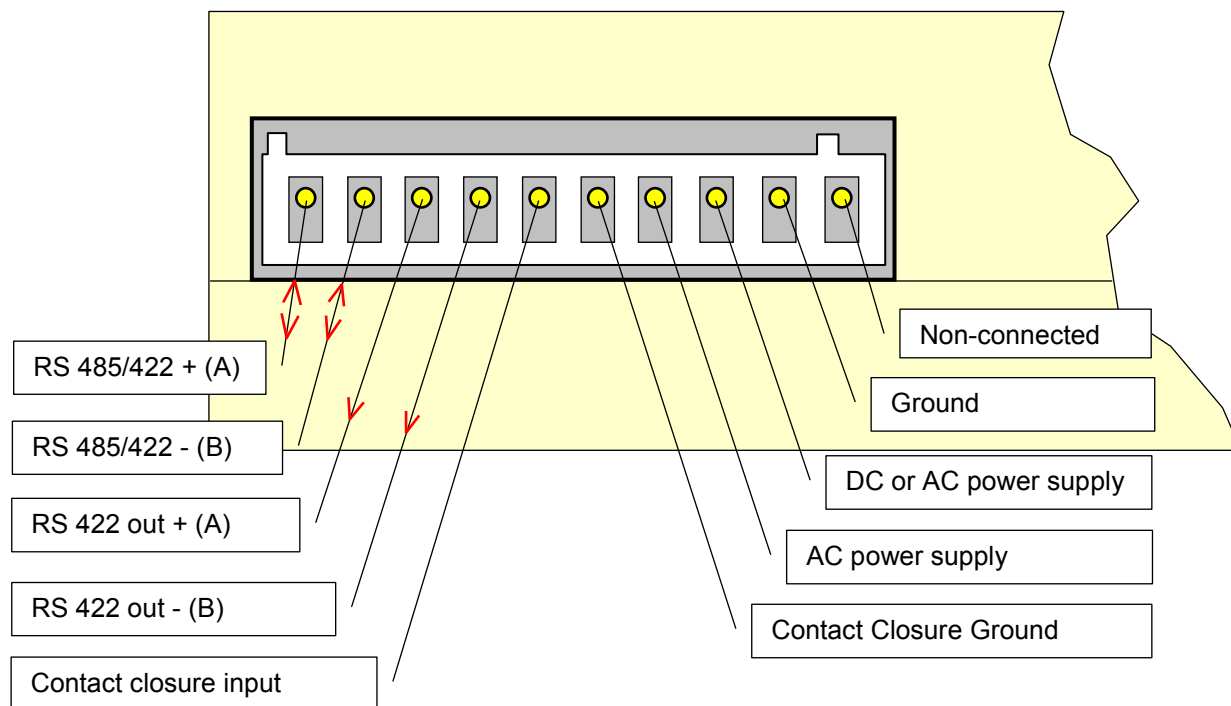
Input and output connector are BNC 75 Ω .

2.1.2 DATA, CLOSURE CONTACT, POWER SUPPLY

2.1.2.1 GENERAL LAYOUT

Data, contact closure and power supply inputs are shared on « WAGO Micro » 10 contacts connector block.

Wiring description of the connector for data and contact closure:



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2.1.2.2 DATA INTERFACE

RS485 half duplex, Input and Output are on pairs:

- RS 485/422 + (A)
- RS 485/422 – (B).

RS422 full duplex, Input is on pairs:

- RS 485/422 + (A)
- RS 485/422 – (B).

And output is on pairs:

- RS 422 out + (A)
- RS 422 out – (B).

Stand by status of the line is permanently provided by internal polarization of the equipment (3.3volts / 20 K Ω) on data input only.

In case of terminal bus module it is necessary to add an external load of 110 Ω on the connector in parallel on input and output pairs.

For general manner to respect the standard common mode voltage of theses interfaces, it is required to wire the ground of the different modules where data are shared.

Configuration is done from video receiver board (see data configuration chapter 7.1.1)

2.1.2.3 CLOSURE CONTACT CONFIGURATION

Contact closure is remote by short circuit of pins:

- Closure contact input
- Ground of contact closure

Ground pin of the contact closure is welded to the general ground of the power supply.

Contact threshold for contact closure is 1.9 volts. Serial diodes and resistance protection is integrated (10 K Ω).

Contact closure input is compatible with TLL, LVCMOS and 0 to 24 volts.

2.1.3 POWER SUPPLY

Take care: internal power supply of the transmitter isn't floating to the ground of the input signals (video / data / C.C.). So take care to the shared ground of the different sources before connection, this doesn't damage the module.

AC power supply (12 to 24 volts) between pins:

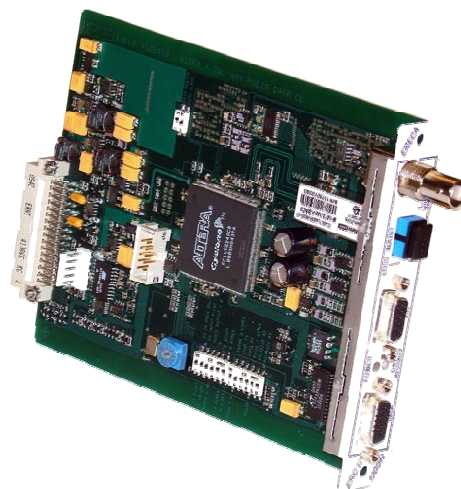
- DC or AC power supply
- AC power supply

DC power supply (10 to 30 volts) between pins:

- DC or AC (plus) power supply
- Ground (minus) power supply

2.2 TRANSMITTER FOR CHASSIS

Presentation of the transmitter as board for chassis or stand alone box. All function are identical to the mini transmitter. Data connector is Sub D E HD 15 female contacts. Power supplies are directly applied through the back panel.



2.3 DATA CHANNEL

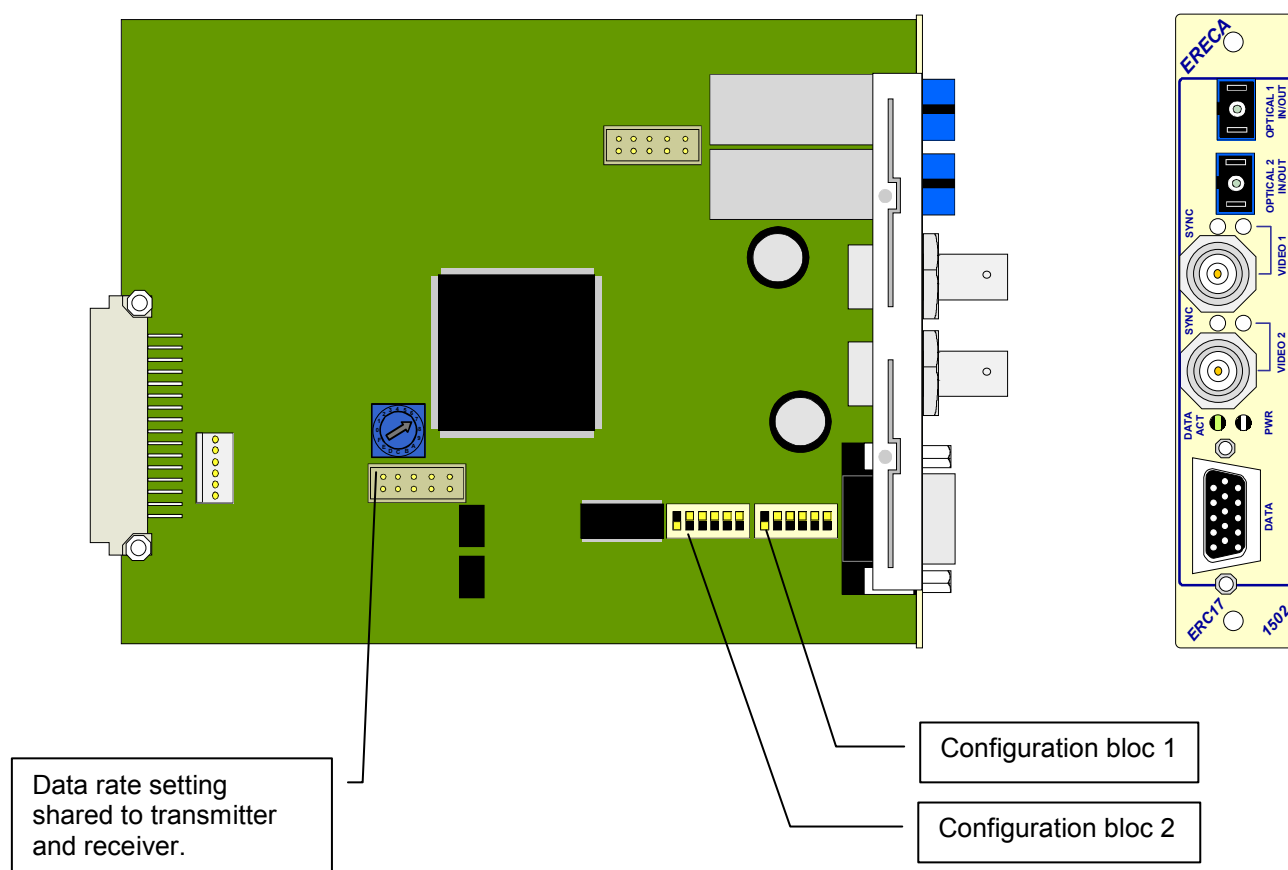
Data can be RS 422 or RS 485 type on the *video transmitter* module and RS 422, RS 485 or RS232 on the *video receiver* module; equipments provide conversion to the right protocol.

ERC 1500 equipments must be configured in accordance with the signal to transmit. Configuration is realized by sliding micro-switch only on the video reception board. See after the different configurations.

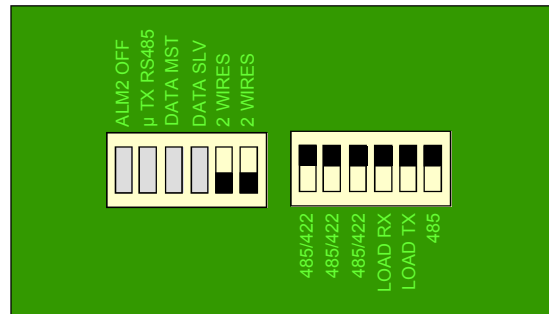
Connector is a SUB-D9 HD 15 females contacts.

Internal impedance control for RS485 is assumed by « auto-gating ». So when using module in RS485 mode it is imperative to know the data rate to establish the right configuration of the equipments.

2.3.1 CONFIGURATION

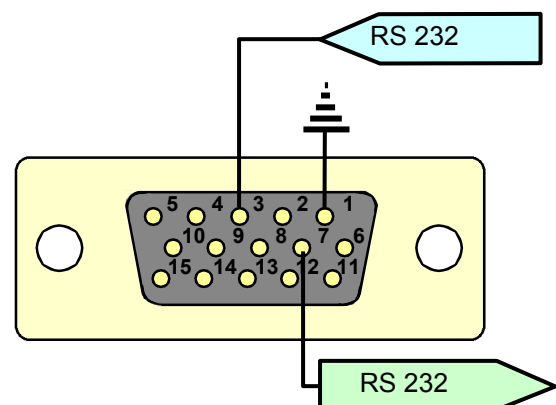


2.3.1.1 Board configuration to RS 232

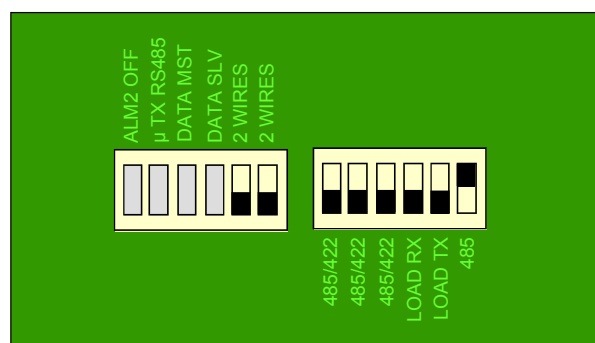


Data rate setting is useful only if video transmitter is set in RS 485 mode.

1	Ground
2	
3	RS232 input
4	
5	
6	
7	RS232 output
8	
9	
10	
11	
12	
13	
14	
15	

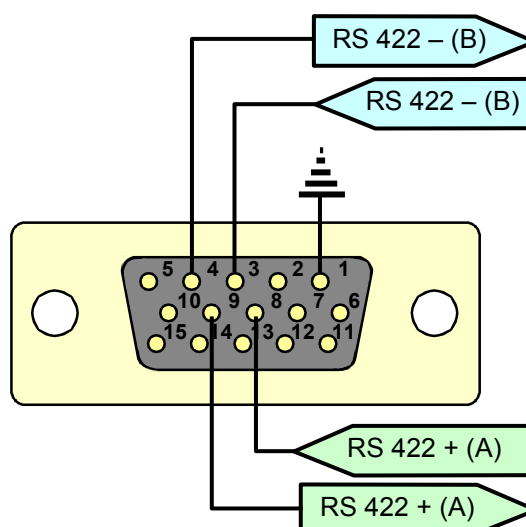


2.3.1.2 Board configuration to RS422 Full duplex (4 WIRES)

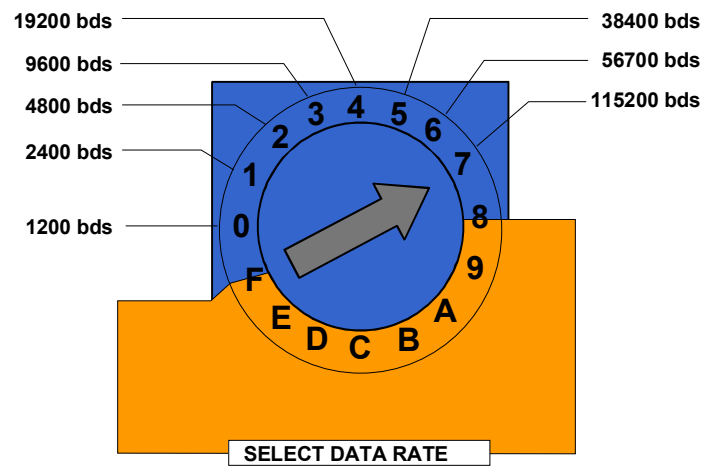
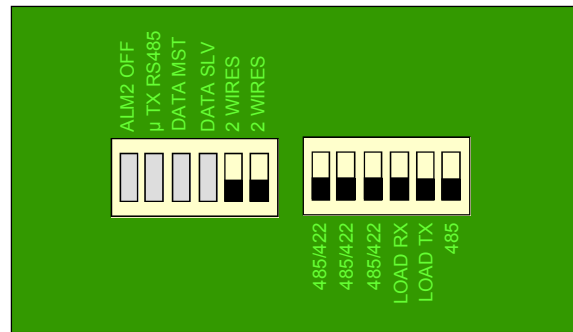


Data rate setting is useful only if video transmitter is set in RS 485 mode

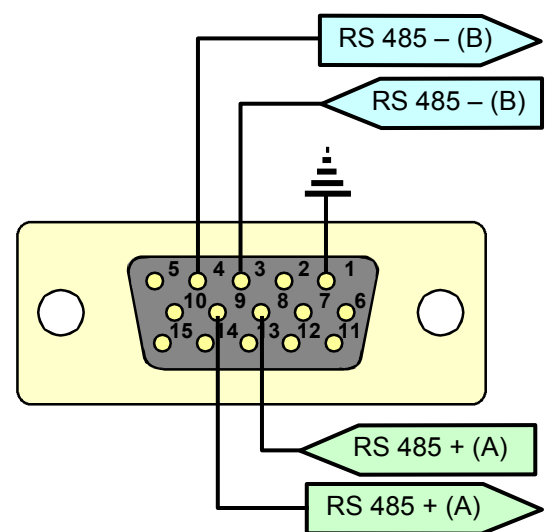
1	Ground
2	
3	RS422 – (B) input
4	RS422 – (B) output
5	
6	
7	
8	RS422 + (A) input
9	RS422 + (A) output
10	
11	
12	
13	
14	
15	



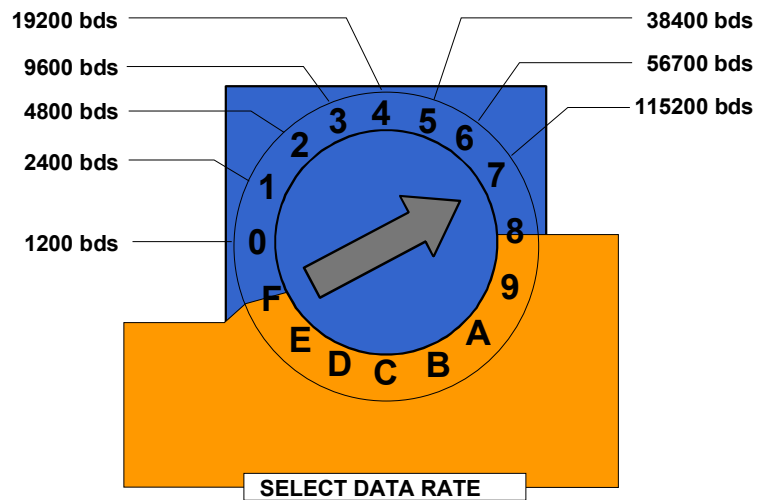
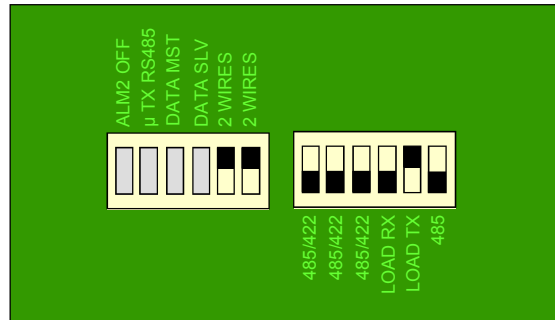
2.3.1.3 Board configuration to RS485 Full duplex (4 WIRES)



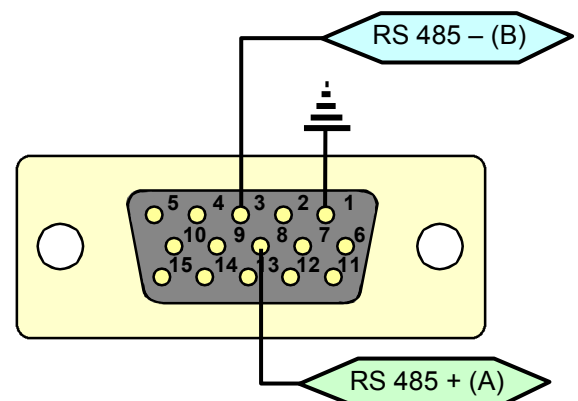
1	Ground
2	
3	RS485 – (B) input
4	RS485 – (B) output
5	
6	
7	
8	RS485 + (A) input
9	RS485 + (A) output
10	
11	
12	
13	
14	
15	



2.3.1.4 Board configuration to RS485 Half duplex (2 WIRES)



1	Ground
2	
3	RS485 – (B)
4	
5	
6	
7	
8	RS485 + (A)
9	
10	
11	
12	
13	
14	
15	



2.4 DATA SHARED THROUGH DATA BUS

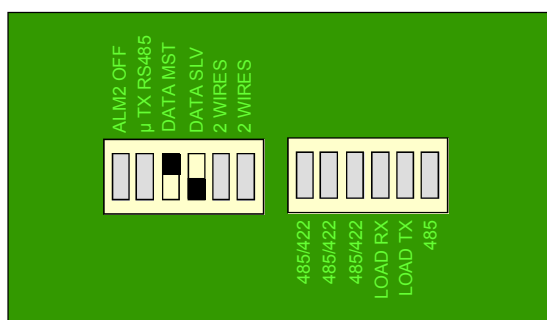
As describe before the differents ERC1512 RX are able to share data through the data bus. This configuration is useful when distant equipments are link on a bus and selection is only done by addresses.

2.4.1 MASTER DATA.

In the mode data master, This ERC1512 board makes the junction to the back-panel and its SUBD connector is the general communication port.

So all data from this board and all boards in the same chassis (configured in data slave mode) are going through the unique SUBD connector of this board.

Setting is the following:



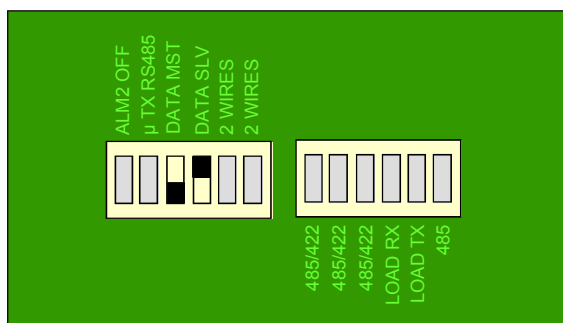
Note: Isn't possible to have 2 ERC 1512 module set as MASTER in the same chassis

2.4.2 SLAVE DATA.

In the slave data mode, ERC1512 boards collect data on the back-panel of the chassis and transmit this data to the distant video transmitter. The data received from distant video transmitter are dispatched on the back-panel.

Whole data are available on the connector of the ERC1512 in master mode.

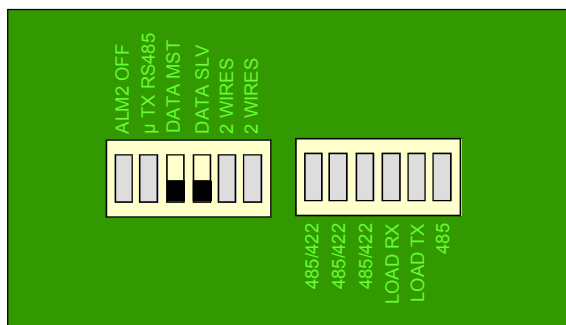
Setting is the following:



2.4.3 INDEPENDENT DATA

In this mode ERC1512 video receiver modules and its associated optical transceivers work independently from back-panel chassis for data transfer. Data In and Output from the SUBD are process only with the 2 transceivers of this board.

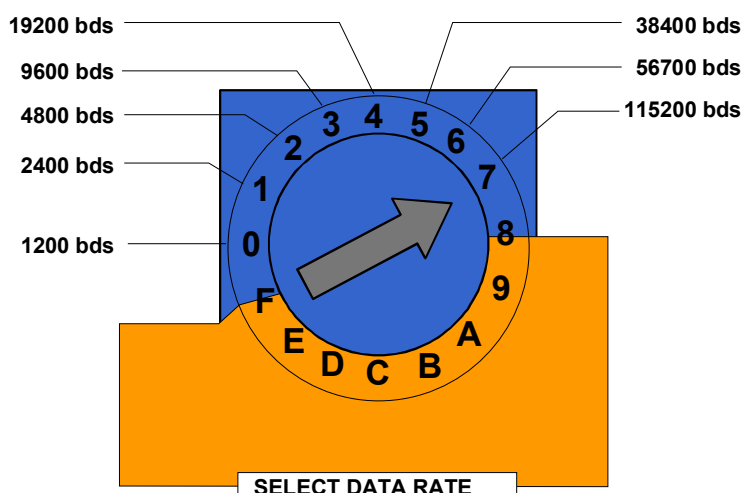
Setting is the following:



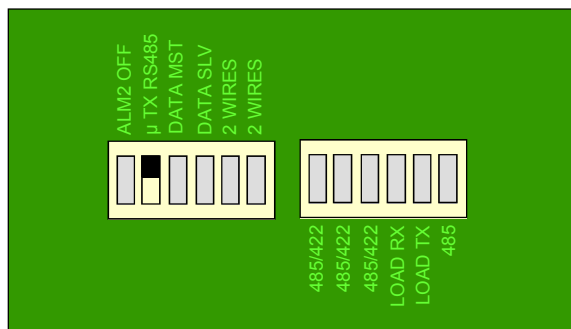
2.5 DISTANT MODULE CONFIGURATION

As indicated before, distant module configuration is done from the ERC1512 video receiver board. The 2 elements to set are coding reel for data rate in RS485 mode and dip-switch for distant video transmitter selection mode RS422 or RS232.

Coding reel for the selection of the data rate in RS 485 mode for receiver and transmitter together:



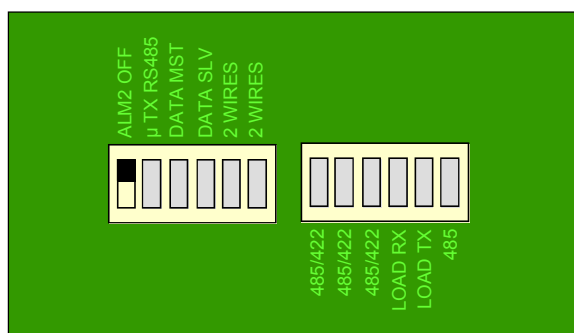
RS 485 configuration for the two associated transmitter:



When the dip-switch is slide in the bottom (off position) video transmitter are in RS 422 mode.

2.6 RECEIVER SECOND CHANNEL UNUSED

If only one receiver (number 1) is used on ERC1512, the dip-switch shown below is used to masque synchronization loss alarm of the receiver 2. So the supervision system doesn't display an alarm for this receiver module.



2.7 CONTACT CLOSURE OUTPUT LAYOUT

Contact closure output are shared on the SUBD data connector

1	Ground
2	
3	
4	
5	Contact receiver 1 STAND BY
6	
7	
8	
9	
10	Contact receiver 1 COMMON
11	
12	Contact receiver 2 ON
13	Contact receiver 2 COMMON
14	Contact receiver 2 STAND BY
15	Contact receiver 1 ON

3 OPTICAL TRANSMISSION

3.1 TRANSMITTER

Optical connector is « SC/PC » type.

3.2 RECEIVER

Optical connector is « SC/PC » type.

4 RECEIVER MODULE FOR CHASSIS

This module can be plugged in a 19" sub-rack chassis.

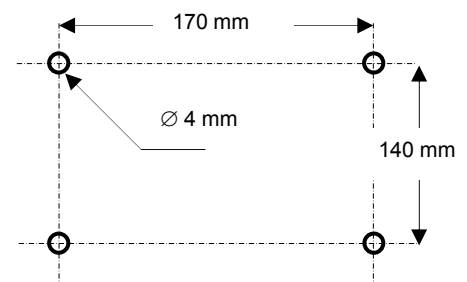
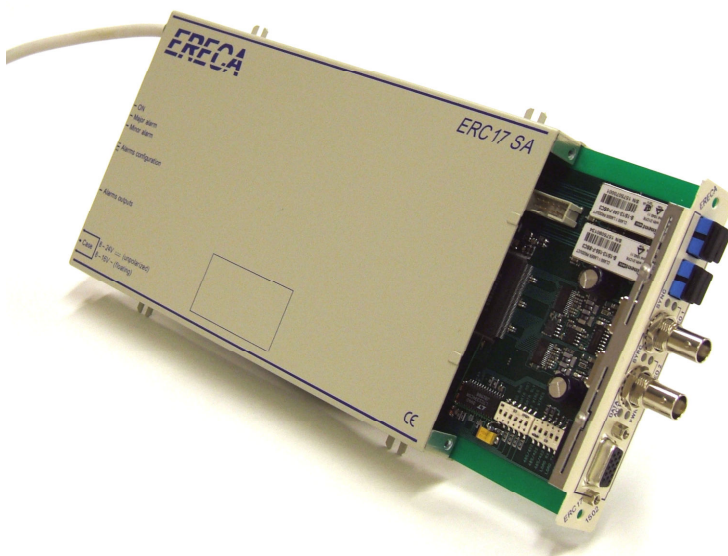
Capacity is 13 modules ERC 1512 or ERC 1513 or 12 modules plus one supervision HTTP or SNMP module.



5 STAND ALONE BOX

This box powered by main 230 volts or low voltage (DC or AC) can received one ERC1512, 1513 or 1510 module .

Size : L x l x h 240 x 135 x 30 mm



6 SPECIFICATIONS

Video

Format	PAL, NTSC.
Input level	1 volt +/- 3 dB.
Output level	1 volt (video AGC).
Differential gain	< 1%.
Differential phase	< 1°.
Impedance	75 Ω .
Bandwidth	+/- 0,2 dB from 0 to 5,8 MHz.
Group delay	< 10 ns at 4.43Mhz.
S/N ratio CCIR 567	> 67 dB.
Connector	BNC. Or SMB on receiver distributor
Display	Video presence.

Data

Protocol on ERC1510TX	RS 422 4 wires or RS 485 2 wires.
Protocol on ERC1512RX	RS232 or RS 422 4 wires or RS 485 2 / 4 wires.
Data rate	0 to 230 000 bauds.
Mode	Asynchronous.
Impedance control	Internal.
Display TX + Rx signals activity.	
Connector	Wago "micro" 10 contacts on the transmitter. SubD 9 HD on the receiver.

Closure Contact

Input on ERC 1510	by short circuit to the ground. By level, threshold 1.9 volts.
Output on ERC 1512	Static relay protected by transil diodes. Switching load 100V 100mA.

Optical

Reference	ERC1510 C	ERC1510 B
Wavelength	1310 et 1550	1310 et 1550
Tx optical power	-11.5 dBm	- 0 dBm
Receiver dynamic	-3 to -32 dBm	-3 to - 32 dBm

Connector	SC/PC.
Display	Synchronization of the receiver.

Mechanical and power supply

Transmitter module:

Size	45 X 45 x 22 mm.
Power supply	10 to 30 Vcc or 12 to 24 Vac.
Consumption	1,0 Watt. (For 12 Vcc).
Weight	70 g
Fixing	2 holes M3 on ERC 1510.
Protection	Fuses and transil diode.

Module receiver:

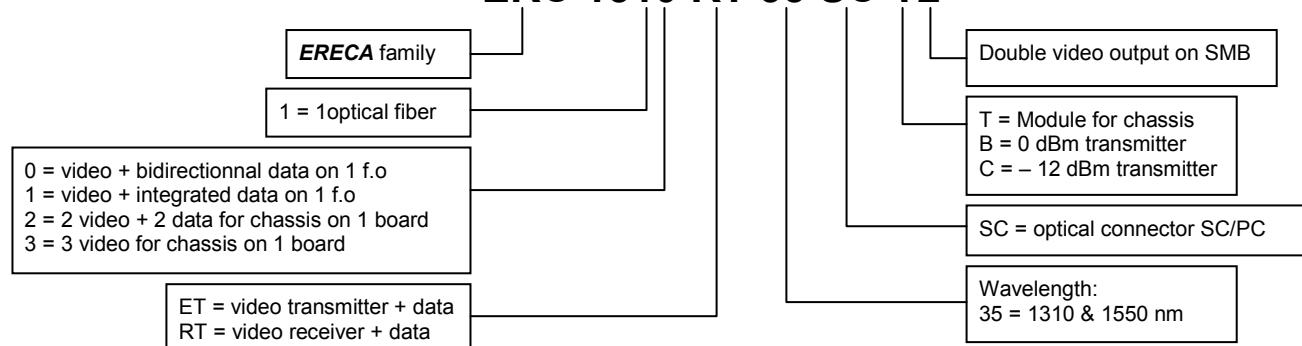
Housing	Chassis ERC 17-001.
Stand alone	Box ERC17-SA.
ERC1512 R 35 SC-T	2.7 W for 2 receivers.
Display	Internal voltage right.
Weight	210 g

Environmental

Transmitter operating T°	-10 to + 80°C.
Receiver operating T°	-10 to + 70°C.
Storage	-10 to + 80°C.
Humidity	95% non-condensing.
EMC	In accordance with UTE C70-201 & C70-202 standard.
Qualify by	France Telecom

Reference

ERC 1510 RT 35 SC-T2



7 FIRST TIME SERVICE

7.1 CONFIGURATION

7.1.1 DATA CHANNEL

- Set the equipments in accordance with signals to transmit (see 2.3.1 chapter).
- Verify the data presence on the input connector.

7.1.2 CONTACT CLOSURE

- Verify the data presence on the input connector.

7.1.3 VIDEO CHANNEL

- No setting.

7.2 FIRST SERVICE

- Power equipments.
Verify the supply of equipments, DEL "PWR" on receiver.

7.2.1 Transmitter ERC 1510 E to Receiver ERC 1512 or 1513 R

- Input video signal on the BNC connector of the **ERC 1510 E**.
- Check that optical power is in accordance with specification ordered.
- Wire the data on ERC 1510 E as indicated in 2.3.1 chapter.
- Link contact closure as indicated in 2.1.2.1 chapter.
- Plug the optical fiber on the transmitter ERC 1510 E.
Check optical power at the reception ERC 1512 or 1513 R,
It must be upper than **-32 dBm**.
- Plug the optical connector to the receiver module **ERC 1512 R**.
- The led SYNC is illuminated showing synchronization of the receiver with the transmitter
- Check the presence of video signal led "VIDEO", then on the BNC connector.
- As fiber is connected the Led "DATA ACT" is "on".
- Check contact closure operation.

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7.2.2 Receiver ERC 1512 R to Transmitter ERC 1510 E

- Wire the data as indicated in 2.3.1 chapter on the ERC 1512 R.
Check signal detection of the data to transmit.
- As the optical fiber is plugged led "DATA ACT", of receiver ERC 1512 R, must blink if there is data activity between the modules.
- Check data presence on the video transmitter ERC 1510 E.

Correct Disposal of this product

(Waste electrical & electronic equipment)



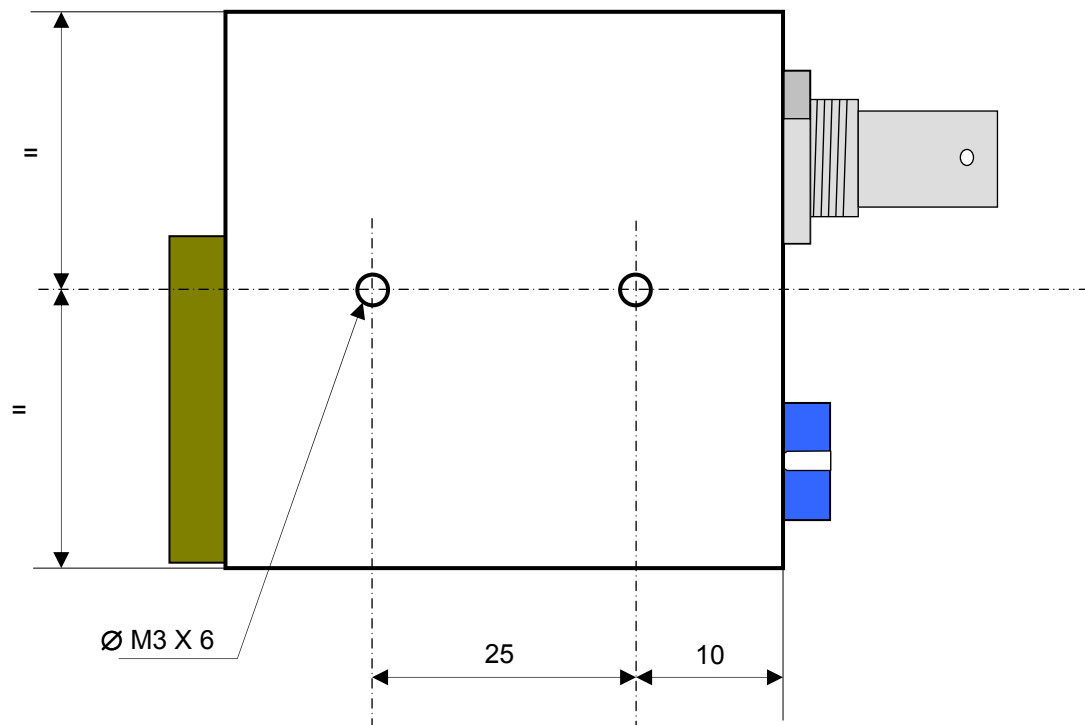
(Applicable in the European Union and other European countries with separate collection systems)

This marking shown on the product or its literature, indicates that it should not be disposed with other household wastes at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of waste and recycle it responsibly to promote the sustainable reuse of material resources. Household user should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this item for environmentally safe recycling.

Business user should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other commercial wastes for disposal.

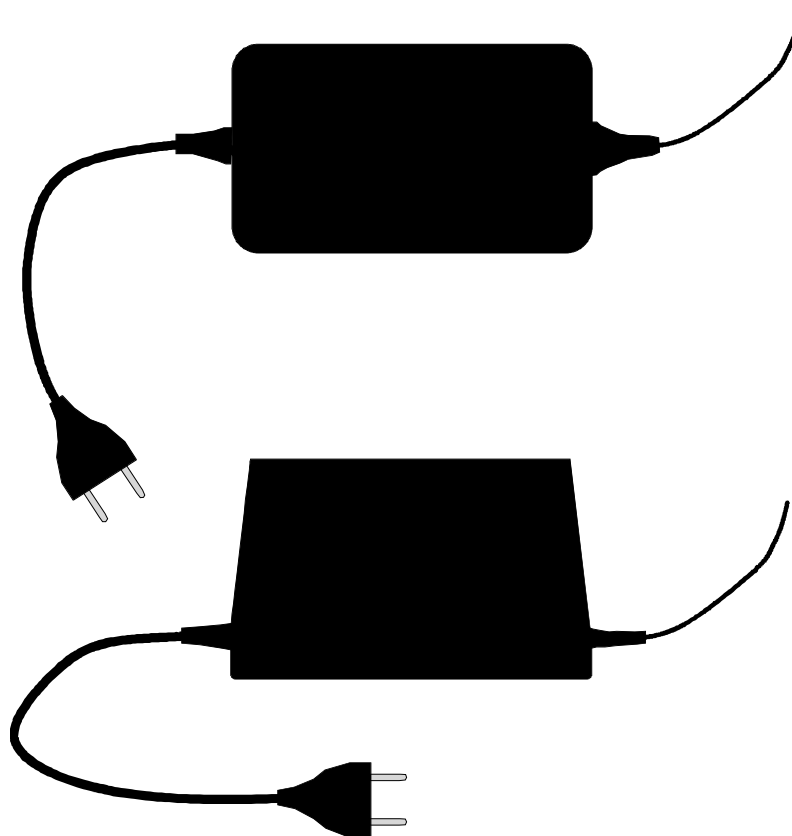
1. ANNEXES

2. STAND ALONE TRANSMITTER FIXING



M3 screws must be no longer than 5mm in the module. An over length can destroy the module.

3. TRANSMITTER POWER SUPPLY



Specifications:

- Electrical

Main voltage : 230 Volts AC. 50/60 Hz +10/-15%

Output voltage : 12 Vac.

Main connector : IEC.

Low voltage connector : Two wires to connect on the WAGO terminal block

- Mechanical

L x H x l : 50mm * 55mm * 82mm

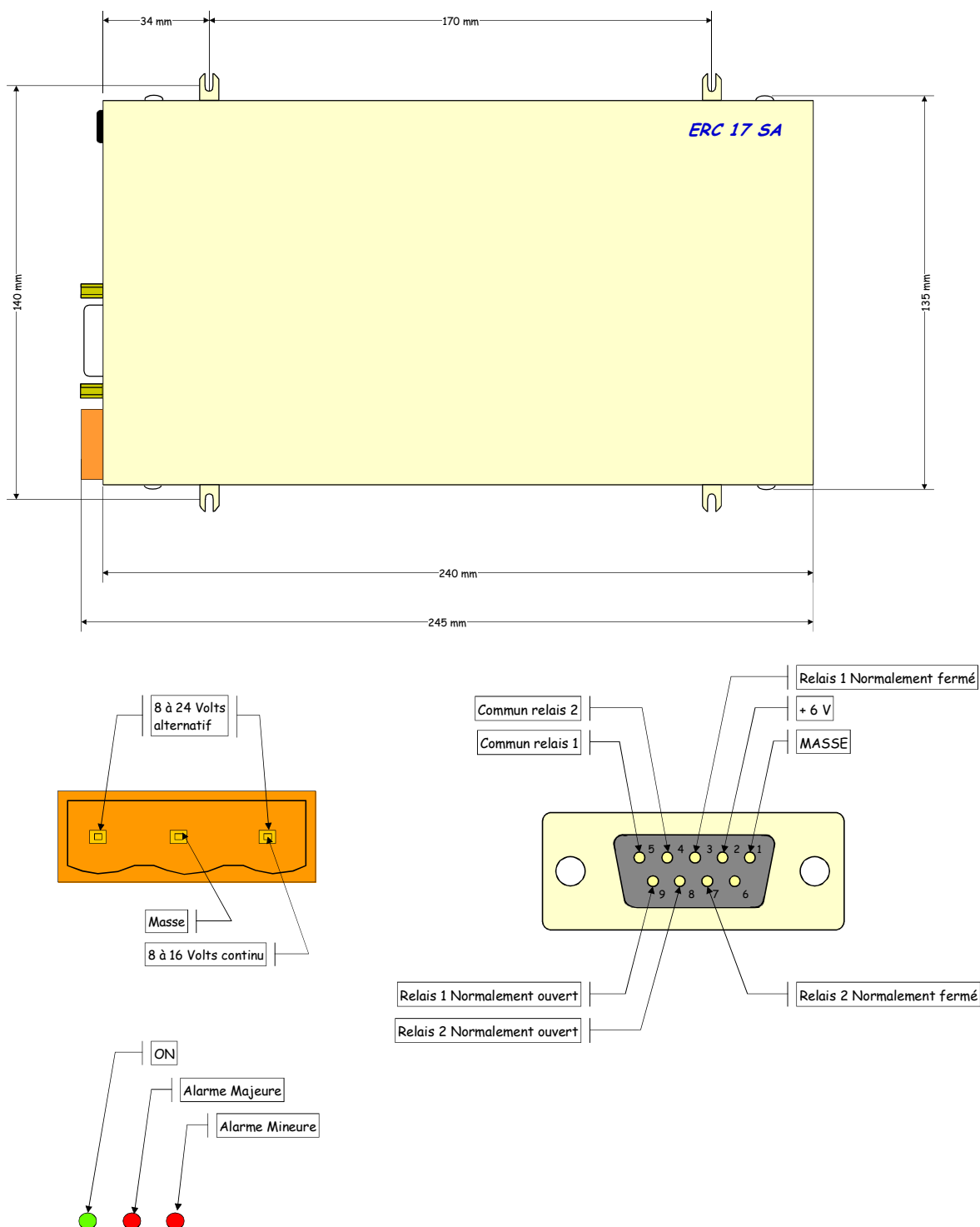
- Environmental :

Operating temperature : - 20 to + 60 °C for 1VA power consumption.

Storage temperature : - 20 to + 70° C

Humidity : 95 % non-condensing

1. STAND ALONE BOX



For more detail see technical data sheet ERC 17 SA

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