CONFIGURATION AND USER MANUAL
RP75HL REMOTE DISPLAY

Software N°	Manual N°	Edition
V2.1	**REP_Gb_RP75HL_rev03.doc**	**03**

LES MAÎTRES DU PESAGE INDUSTRIEL

CONFIGURATION AND USER MANUAL RP75HL REMOTE DISPLAY

Date	Edition number	Subject of the modification
08/06/2009	00	Original
30/06/2009	01	Correction of the jumpers' description and addition of the remote display protocol.
25/03/2010	02	Update of the maximum length for the links.
29/11/2010	03	Update. (Communication Protocol)

SUMMARY

1.   GENERALITIES.

The **RP75HL** remote display is a device allowing repeating the main indication of the indicator.

It has a color display of 75mm height, composed of 6 digits, 5 warning lights (NET, ZERO, DATA, kg, t) and a traffic light.

ATTENTION:
Only the indicators' softawres dating from the beginning of 2009 can manage the traffic light and the color of the Leds.

The remote display is equipped with a light sensor allowing the adaptation of the display luminosity and power according to the ambient luminosity. (From 2 Watts for nocturne luminosity to 100 Watts for full sun luminosity)

Two fixing modes are possible:
➢ Wall fixation.
➢ Post fixation.

It is possible to connect several remote displays on the same indicator.

The data transfer can be done:
➢ With a current loop serial link active or passive, maximum distance 150 m.
➢ With an RS485 serial link, maximum distance 1000 m.
➢ With a CAN bus link, maximum distance 500 m. (Without line repeater)

2.   DIMENSIONS/ FIXATION.

560 mm

130 mm

103 mm

300 mm

270 mm

190 mm

kg
t

NET   ZERO   DATA

RP75HL

71 mm

61 mm
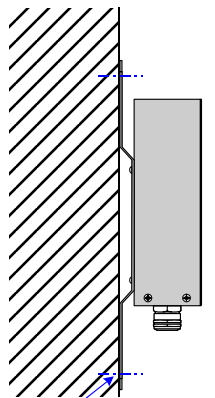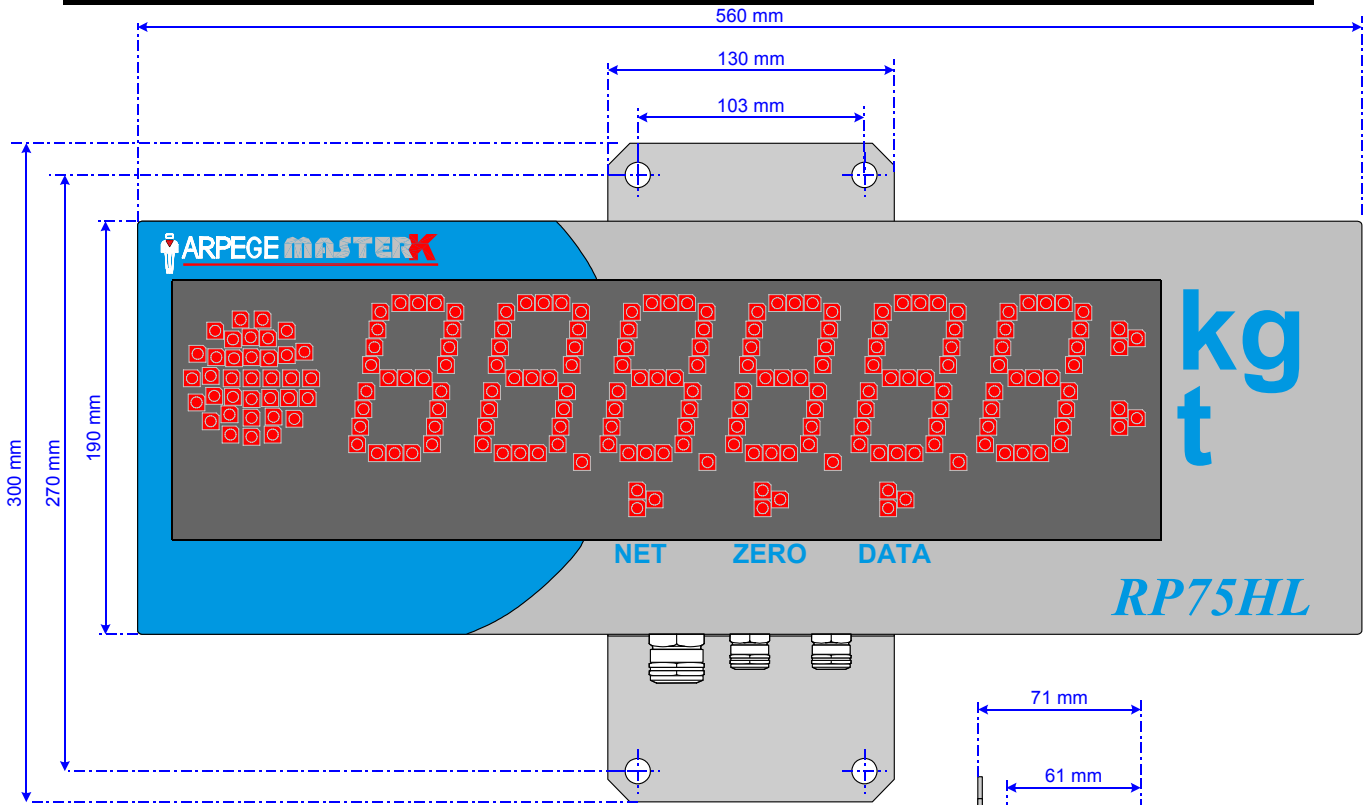
Wall mount fixing 4 screws
M10 + dowels not furnished
by Arpege MasterK
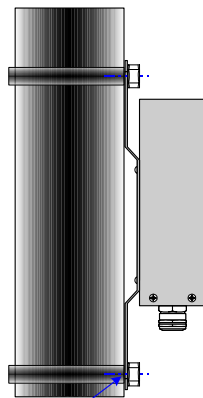
Post mount fixing 2 stirrup
M10 in U form + nuts not
furnished by Arpege MasterK
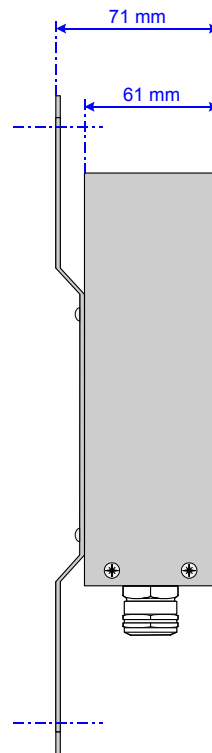
3. CONNECTION / CONFIGURATION.

3.1. Board layout.
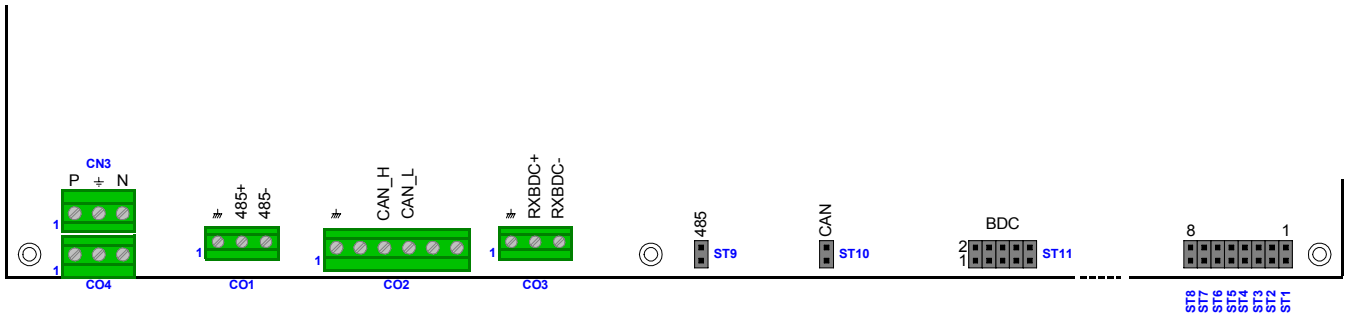
3.2. Connection.

The connection of the 230 V_{AC} power supply and of the communication link is done on the connectors present at the bottom side of the electronic board.

Connector name / Pin N°	CO1 (RS485)	CO2 (CAN Bus)	CO3 (current loop)	CO4 (Mains)
1	⏚	⏚	⏚	**Mains Phase 230 V_{AC}**
2	**485 + (RxTx +)**	*N.C.*	**RXBDC +**	⏚
3	**485 - (RxTx -)**	**CAN_H**	**RXBDC -**	**Mains neutral 230 V_{AC}**
4		**CAN_L**		
5		*N.C.*		
6		*N.C.*		

3.3. Assignment of the jumpers.

The configuration of the link type and of the remote display address is done on the electronic board located inside the remote display.

| Jumper	Factory configuration	Designation
ST1	**0** [1]	Station N°. (Refer to 3.4. Station N°.)
ST2	**0** [1]	Station N°. (Refer to 3.4. Station N°.)
ST3	**0** [1]	Station N°. (Refer to 3.4. Station N°.)
ST4	**0** [1]	Station N°. (Refer to 3.4. Station N°.)
ST5	**-** [2]	Display color. (Refer to 3.5. Weight display color.)
ST6	**-** [2]	Display color. (Refer to 3.5. Weight display color.)
ST7	**-** [2]	Special configurations. (Refer to 3.6. Special configurations.)
ST8	**-** [2]	Special configurations. (Refer to 3.6. Special configurations.)
ST9	**0** [1]	RS485 line adaptation resistor.
ST10	**0** [1]	CAN bus line adaptation resistor.
ST11	**3 Jumpers in active**	Active/Passive configuration of the current loop in reception. (Refer to 3.7. Active/Passive configuration of the current loop.)

1 : Jumper present but not connected.
2 : Jumper not delivered.

3.4. <u>Station N°.</u>

ST4	ST3	ST2	ST1	Designation
0	0	0	0	Normal operating mode without a station number.
0	0	0	1	Normal operating mode with the station number 1.
0	0	1	0	Normal operating mode with the station number 2.
0	0	1	1	Normal operating mode with the station number 3.
0	1	0	0	Normal operating mode with the station number 4.
0	1	0	1	Normal operating mode with the station number 5.
0	1	1	0	Normal operating mode with the station number 6.
0	1	1	1	Normal operating mode with the station number 7.
1	0	0	0	Normal operating mode with the station number 8.
1	0	0	1	Normal operating mode with the station number 9.
1	0	1	0	Normal operating mode with the station number 10.
1	0	1	1	Normal operating mode with the station number 11.
1	1	0	0	Normal operating mode with the station number 12.
1	1	0	1	Reserved.
1	1	1	0	Reserved.
1	1	1	1	Test of the internal light sensor and of the internal temperature sensor.

<u>Remarks:</u>
 - 0 = Jumper not positioned.
 - 1 = Jumper positioned.
 - The station number is displayed in hexadecimal during the start up, for the station number 10, the letter "A" will be displayed, for the station number 11 the letter "B" will be displayed and for the station number 12, the letter "C" will be displayed.

3.5. <u>Weight display color.</u>

ST6	ST5	Designation
0	0	Weight displayed in the color chosen by the indicator or in red by default.
0	1	Weight displayed in yellow.
1	0	Weight displayed in red.
1	1	Reserved.

<u>Remarks:</u>
 - 0 = Jumper not positioned.
 - 1 = Jumper positioned.

3.6. <u>Special configurations.</u>

Jumper	Designation
ST7	If positioned, it allows disabling the regulation of the display luminosity according to the ambient luminosity. The display luminosity is fixed to its maximum.
ST8	If positioned, it allows the test of the segments, the warning lights and the traffic light in the three basic colors (red, green and blue).

3.7. <u>Active/Passive configuration of the current loop.</u>

ST11	Designation
₂ ₁ ▪▪	Current loop configured in active. (3 jumpers)
₂ ₁ ▪ ▪	Current loop configured in passive. (2 jumpers)

3.8. <u>Configuration of the indicator.</u>

In all the cases, the indicator must be configured to manage the remote display on the communication port to which the remote display(s) is (are) connected.

The parameters of the communication port must be:
9600 Bauds, **8** bits of data, **no** parity, **1** stop bit

In case of a multi-measurement channels indicator (IDX), it is necessary to configure a STATION N° on the remote display; in this case:
- Station 1 will repeat the display of the channel 1
- Station 2 will repeat the display of the channel 2
- …..
- Station n will repeat the display of the channel n

4.   COMMUNICATION PROTOCOL.

The communication frame of the RP75HL weight remote display is composed of a first byte for the synchronization (**SYN** = 16 h), then of 6 or 7 bytes (coded in ASCII) containing the message to be displayed, of an indicator byte type "z" (6z h), of an indicator byte type "t" (7t h) and a byte for the CRC. In the case of using a station number, the byte of the station number is the first of the frame.

For the management of the traffic signal, on each 5th frame, the first byte of the message to be displayed will be replaced an indicator byte type "c" for the traffic signal management and for the display color of the message.

The CRC is the sum modulo 256 of the byte for the synchronization (**SYN**), the bytes containing the message to be displayed, the indicator byte type "z" and the indicator byte type "t". The bit 5 of the CRC must be forced to 1 after the addition of all of its bytes.

Example of weight frames of 6 digits without decimal point:

Byte n°:	1	2	3	4	5	6	7	8	9	10
	SYN	1	2	3	4	5	6	6z	7t	CRC
In hexadecimal:	16 h	31 h	32 h	33 h	34 h	35 h	36 h	6z h	7t h	xx h

On each 5th frame, you will have the following frame:

Byte n°:	1	2	3	4	5	6	7	8	9	10
	²	cc	2	3	4	5	6	6z	7t	CRC
In hexadecimal:	16 h	cc h	32 h	33 h	34 h	35 h	36 h	6z h	7t h	xx h

Example of weight frames of 6 digits without decimal point with the station number at 1:

Byte n°:	1	2	3	4	5	6	7	8	9	10	11
	Station	SYN	1	2	3	4	5	6	6z	7t	CRC
In hexadecimal:	01 h	16 h	31 h	32 h	33 h	34 h	35 h	36 h	6z h	7t h	xx h

On each 5th frame, you will have the following frame:

Byte n°:	1	2	3	4	5	6	7	8	9	10	11
	Station	SYN	cc	2	3	4	5	6	6z	7t	CRC
In hexadecimal:	01 h	16 h	cc h	32 h	33 h	34 h	35 h	36 h	6z h	7t h	xx h

Example of weight frames of 6 digits with decimal point:

Byte n°:	1	2	3	4	5	6	7	8	9	10	11
	SYN	1	2	3	4	,	5	6	6z	7t	CRC
In hexadecimal:	16 h	31 h	32 h	33 h	34 h	2E h	35 h	36 h	6z h	7t h	xx h

On each 5th frame, you will have the following frame:

Byte n°:	1	2	3	4	5	6	7	8	9	10	11
	SYN	cc	2	3	4	,	5	6	6z	7t	CRC
In hexadecimal:	16 h	cc h	32 h	33 h	34 h	2E h	35 h	36 h	6z h	7t h	xx h

Indicator byte type "z":

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
In binary =	0	1	1	0	-	-	-	-
Designation =	N.U.	N.U.	N.U.	N.U.	Unit		W1	DATA

Bit 0	⇒ DATA		Bit 3	Bit 2	⇒ Unit
0	⇒ DATA LED turned off.		0	1	⇒ Ton.
1	⇒ DATA LED turned on.		1	0	⇒ Kilogram.

Bit 1	⇒ W1
0	⇒ W1 LED turned off.
1	⇒ W1 LED turned on.

Indicator byte type "t":

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
In binary =	0	1	1	1	-	-	-	-
Designation =	N.U.	N.U.	N.U.	N.U.	W2	ZERO	NET	PT

Bit 0	⇒ PT		Bit 2	⇒ ZERO
0	⇒ PT LED turned off.		0	⇒ ZERO LED turned off.
1	⇒ PT LED turned on.		1	⇒ ZERO LED turned on.

Bit 1	⇒ NET		Bit 3	⇒ W2
0	⇒ NET LED turned off.		0	⇒ W2 LED turned off.
1	⇒ NET LED turned on.		1	⇒ W2 LED turned on.

Indicator byte type "c":

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
In binary =	1	0	-	-	-	-	-	-
Designation =	N.U.	N.U.	Traffic signal management			Display color of the message		

Bit 2	Bit 1	Bit 0	⇒ **Display color of the message**
0	0	0	⇒ Color by default. (Red)
0	0	1	⇒ Red.
0	1	0	⇒ Green.
0	1	1	⇒ Yellow.
1	0	0	⇒ Blue.
1	0	1	⇒ Purple.
1	1	0	⇒ Light blue.
1	1	1	⇒ Reserved.

Bit 5	Bit 4	Bit 3	⇒ **Management of the traffic signal**
0	0	0	⇒ Traffic signal turned off.
0	0	1	⇒ Red traffic signal turned on.
0	1	0	⇒ Green traffic signal turned on.
0	1	1	⇒ Yellow traffic signal turned on.
1	0	0	⇒ Blue traffic signal turned on.
1	0	1	⇒ Purple traffic signal turned on.
1	1	0	⇒ Light blue traffic signal turned on.
1	1	1	⇒ Reserved.

5.   FAST CONFIGURATION / CONNECTION MEMO.

5.1. Configuration in ACTIVE Current Loop.

ST11 :

RP 75HL	Indicator	IDM PEP	IDS ACCORD 3000	IDe100/200/300/400/500 ACCORD 100 / 200	IDX	TIM	TDX	MAGIC
	Connector	C1 or C2	C4	COM2	COM1* or COM2*	C07	CN5*	CO2
2		8	3	8	-	5	-	5
3		9	4	9	-	4	-	7

*Configuration in current loop is impossible with the IDX or the TDX*

5.2. Configuration in PASSIVE Current Loop.

ST11 :

RP 75HL	Indicator	IDM PEP	IDS ACCORD 3000	IDe100/200/300/400/500 ACCORD 100 / 200	IDX	TIM	TDX	MAGIC
	Connector	C1 or C2	C4	COM2	COM1* or COM2*	C07	CN5	CO2
2		8	3	8	-	5	-	5
3		9	4	9	-	4	-	7

Configuration in current loop is impossible with the IDX or the TDX

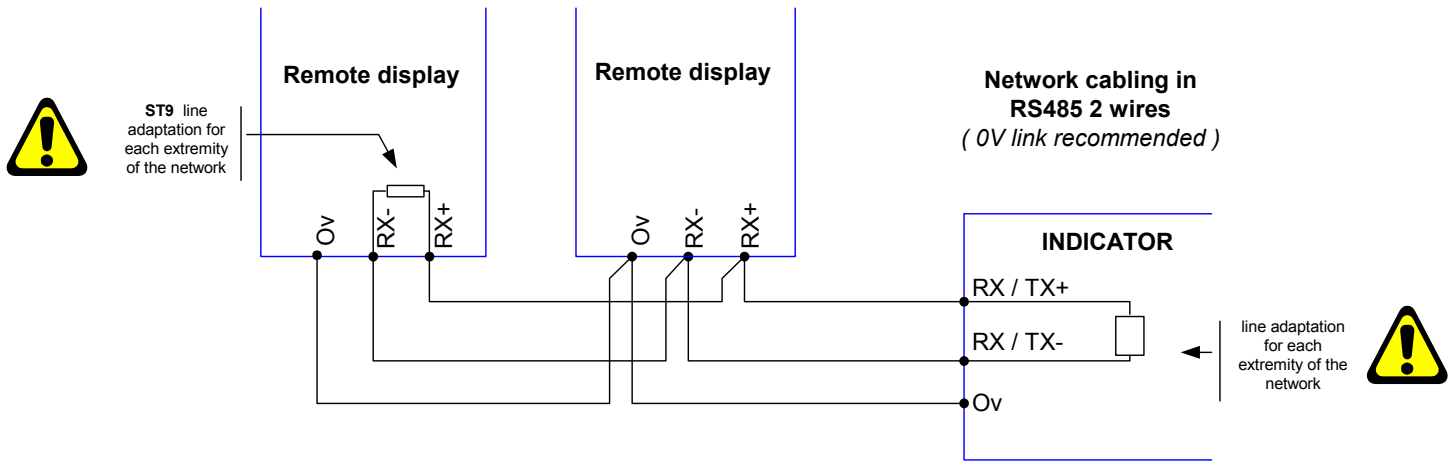## 5.3. Cabling example of 2 remote displays in a current loop network.
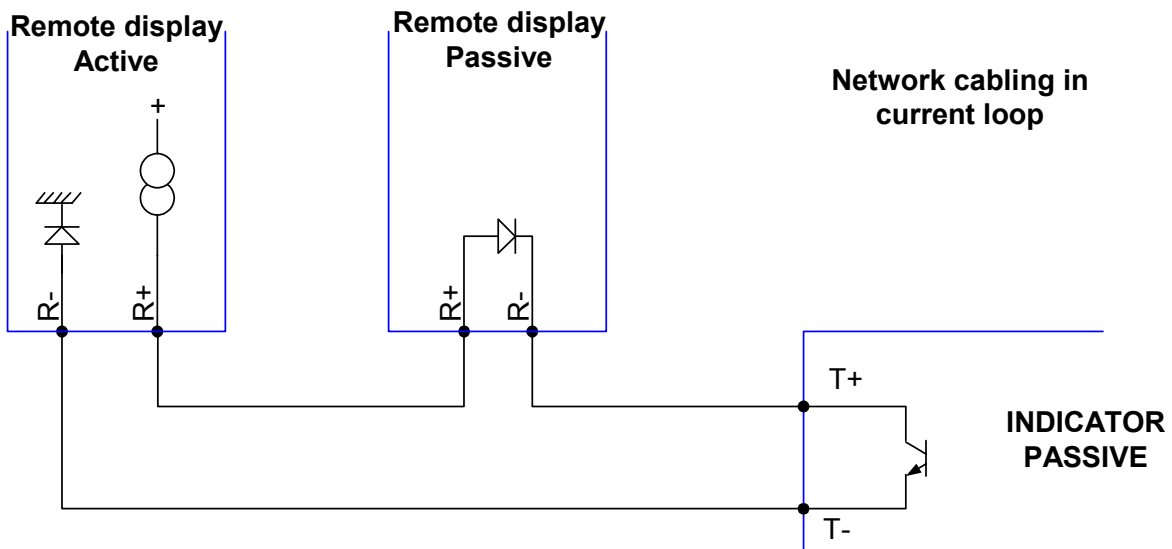
5.4. Configuration in RS 485. (2 wires)

ST9 : Line adaptation <u>only</u> at each extremity of the network.

RP 75HL	Indicator	IDM PEP	IDS ACCORD 3000	IDe100/200/300/400/500 ACCORD 100 / 200	IDX	TIM	TDX	MAGIC
	Connector	C1 or C2	C4	COM2*	COM1* or COM2*	C07	CN5	CO2
2		4	3	4	4	5	8	6
1		5	4	5	5	4	9	8
5		7		7	7	7	7	7

* Requires RS485 option board.

5.5. Cabling example of 2 remote displays in a RS 485 network.
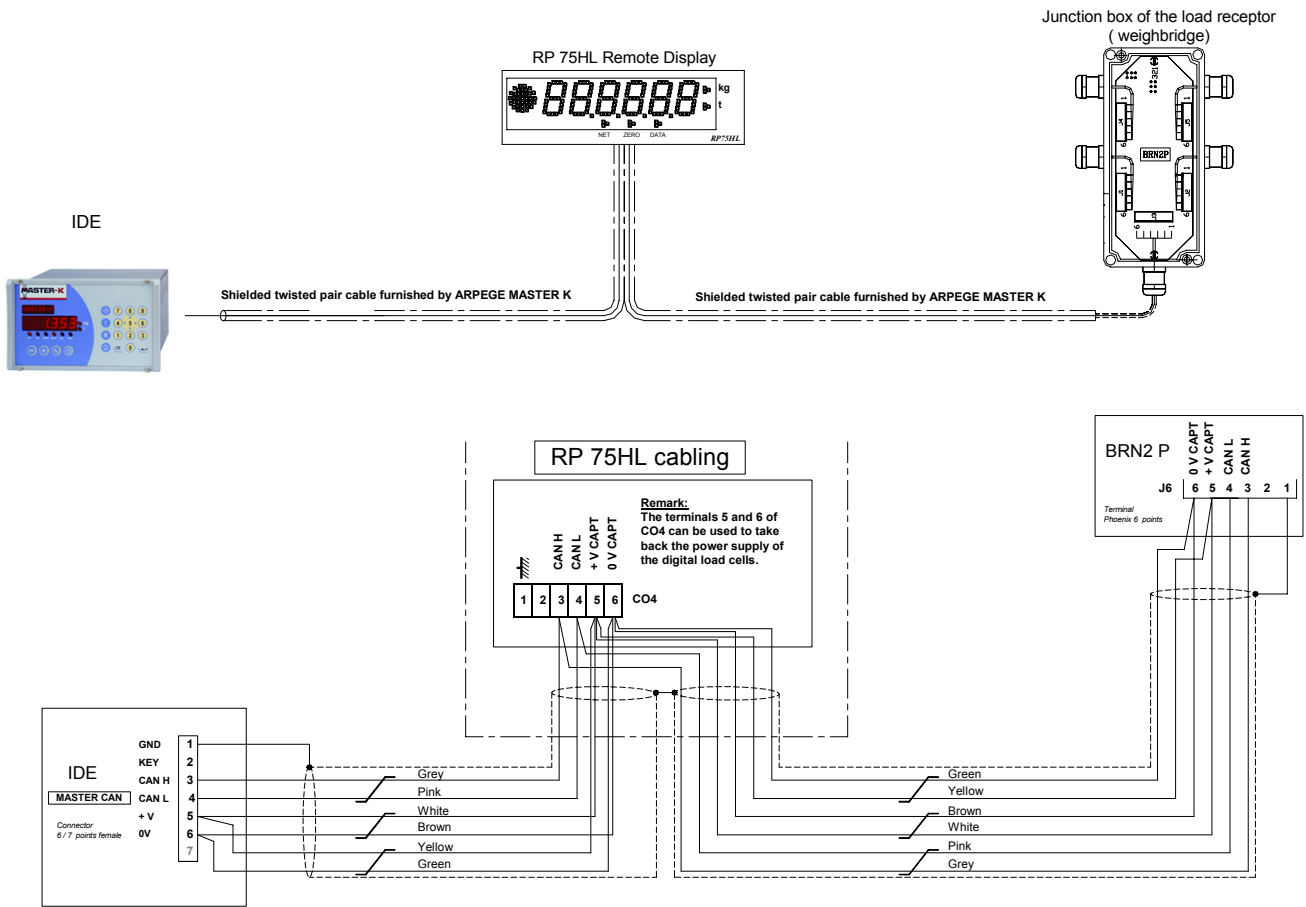

5.6. Configuration in CAN.

ST10 : Line adaptation <u>only</u> at each extremity of the network.

RP 75HL	Indicator	IDe100/200/300/400/500 ACCORD 100 / 200	IDX
	Connector	MASTER CAN	C4 MASTER CAN
3		3	4
4		4	5
7		7	7

5.7. Cabling example of a remote display in a CAN network with an IDE indicator and digital load cells.

Junction box of the load receptor (weighbridge)

RP 75HL Remote Display

IDE

Shielded twisted pair cable furnished by ARPEGE MASTER K   Shielded twisted pair cable furnished by ARPEGE MASTER K

RP 75HL cabling

Remark:
The terminals 5 and 6 of CO4 can be used to take back the power supply of the digital load cells.

CAN H / CAN L / + V CAPT / 0 V CAPT

1 2 3 4 5 6 CO4

BRN2 P

0 V CAPT / + V CAPT / CAN L / CAN H

J6   6 5 4 3 2 1

Terminal Phoenix 6 points

IDE

MASTER CAN

Connector 6 / 7 points female

|		
GND	1	
KEY	2	
CAN H	3	Grey
CAN L	4	Pink
+ V	5	White
0V	6	Brown
	7	Yellow
		Green

Green
Yellow
Brown
White
Pink
Grey

Note: In the example above, the line adaptation jumper of the MASTER CAN Bus must be positioned inside the BRN2P and inside the IDE indicator. *(Refer to the technical file of the IDE)*

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6.   DISPLAYED / ERROR MESSAGES.

6.1.   <u>Start up messages.</u>

At the start up, the remote display executes the following cycle:
-   It will get lighted successively in red, green, blue,
-   Then you have the 6 digits of the weight that get lighted in red and then turn off successively,
-   The following message will be displayed during 2 seconds and then you will get the weight.
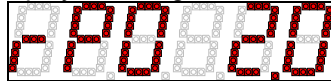
Message "**rP**x $y.y$" avec "x" corresponding to the address of the remote display (station N°, value : **0** by default) and "$y.y$" corresponding the software version.

6.2.   <u>Default messages.</u>

Indication	State	Solution
	The remote display does not receive any data.	▪ Cable disconnected ▪ Indicator wrongly configured