Network output and protocols

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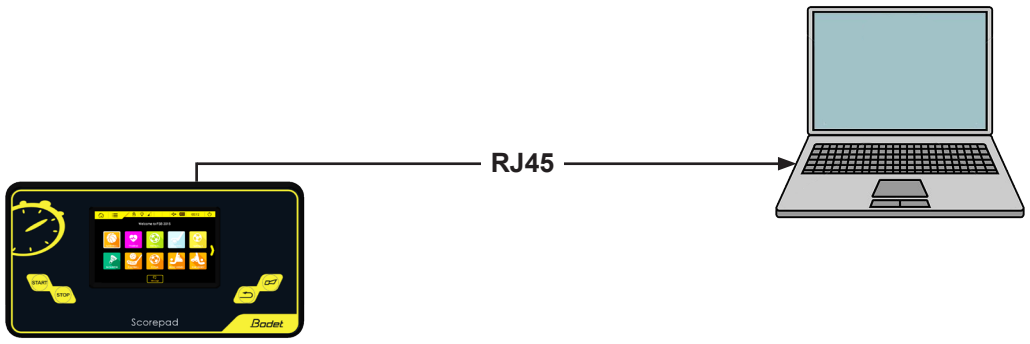
1. Installation

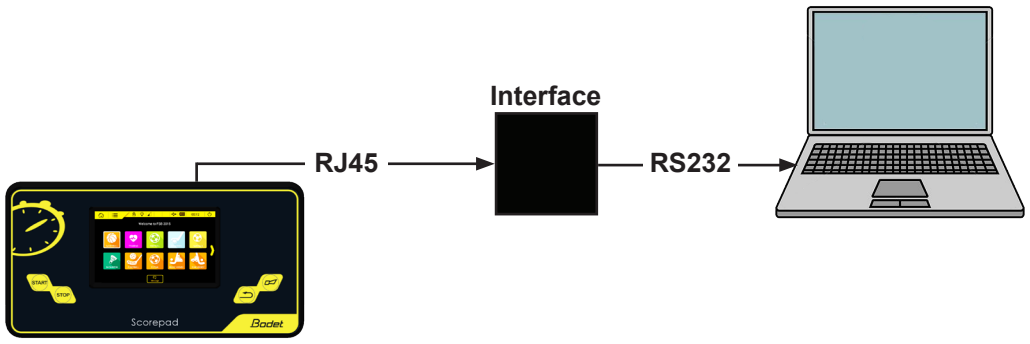
The Scorepad keyboard is equipped with a RJ45 output. This output can also be connected to a RJ45/ RS232 interface.

There are two ways for transmitting the match data:

1 : from the RJ45 port of Scorepad keyboard to the IP address of the external PC.



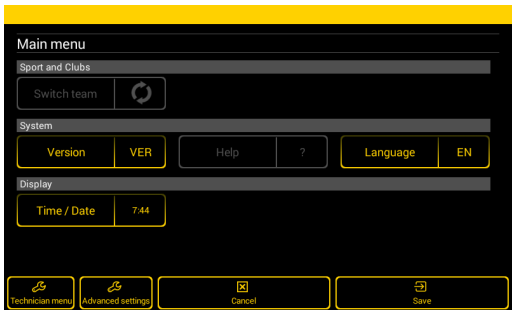
2 : from the RJ45 port of the Scorepad to the RS232 com port of the external PC via an RJ45/RS232 interface.



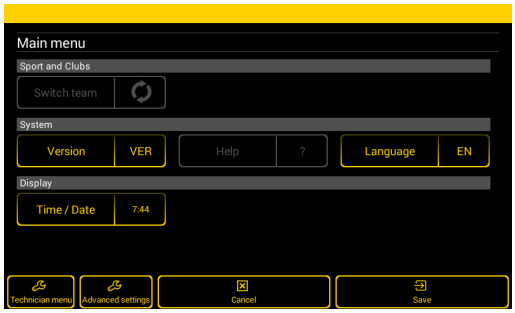
Note: the protocol output is only available on the Scorepad MAIN keyboard.

2. Keyboard Parameter Settings

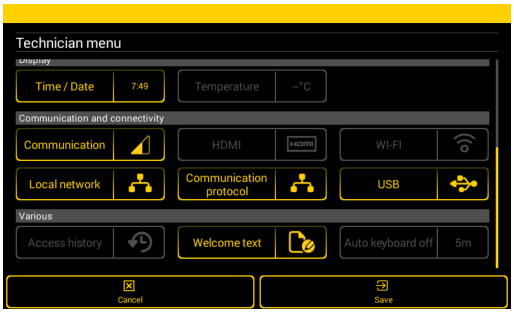
1) On the welcome screen press :



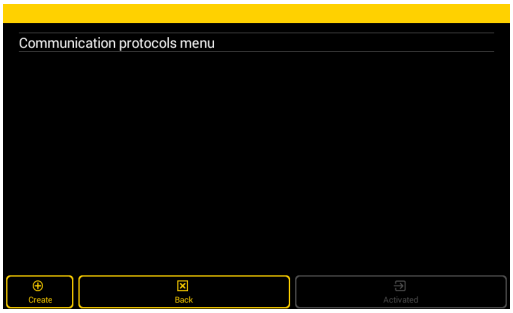
2) Press Technician menu and enter the technician code (4934).



Scoll down to display the Communication protocols

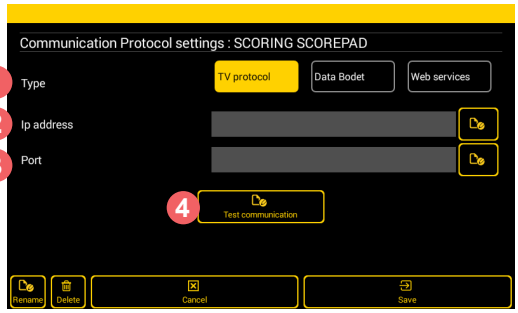


3) Press Communication protocols :



Note: no protocol is created on the first use.

4) Press + Create and enter the name of the protocol (ex. Scoring Scorepad):



1. Select the type of communication protocol.
2. Enter the IP address of the PC link.
3. Enter the communication port (identical to that of the PC) or the communication interface.
4. Test of the configuration :
   - If OK: green rectangle displayed at the bottom of the Scorepad screeen
   - If NOT OK: orange rectangle displayed at the bottom of the Scorepad screeen

5) Save the configuration.

6) Launch the selected sport and start the match. The protocol will be automatically transmitted on the RJ45 output.

3. General information about the protocol output

Thuis protocol transmit ASCII messages (8 bits) only.
The format of the data is: 8 bits + 1 start bit + 1 stop bit + no parity.
Data transmission baud rate: 9600 Bauds.

The keyboad sends frame of type: « SOH address STX CTRL Message ETX LRC », some of these frames are necessary to retreive the useful information.

SOH = 01 hexadecimal
Address = 1 byte, to be ignored (attention : : useful to calculate the LRC).
STX = 02 hexadecimal
CTRL = 1 byte, to be ignored (attention : : useful to calculate the LRC).
Message = several bytes (cf details)
ETX = 03 hexadecimal
LRC = 1 byte: exclusif OR of the bytes between SOH(excluded) and ETX(included)
The LRC is then calculated as follow:

LRC = LRC and 0x7f
IF (LRC < 32)
THEN LRC = LRC + 32 (32 decimal = 0x20)

4. Configuration of the RJ45/RS232 interface

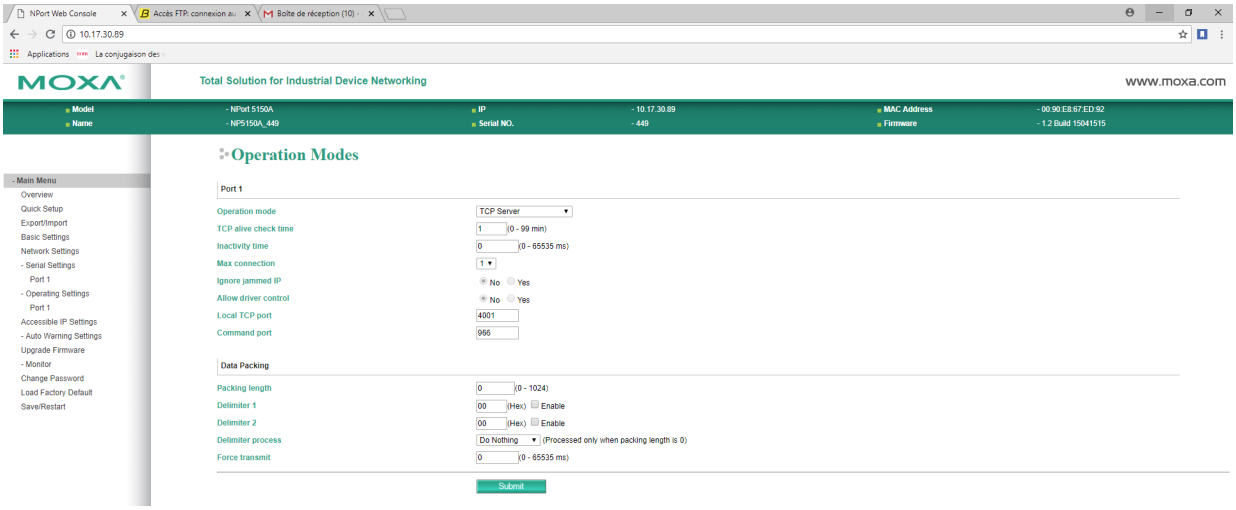
The RJ45/RS232 interface must be configured in TCP server mode. For this, two possibilities:

Web Interface

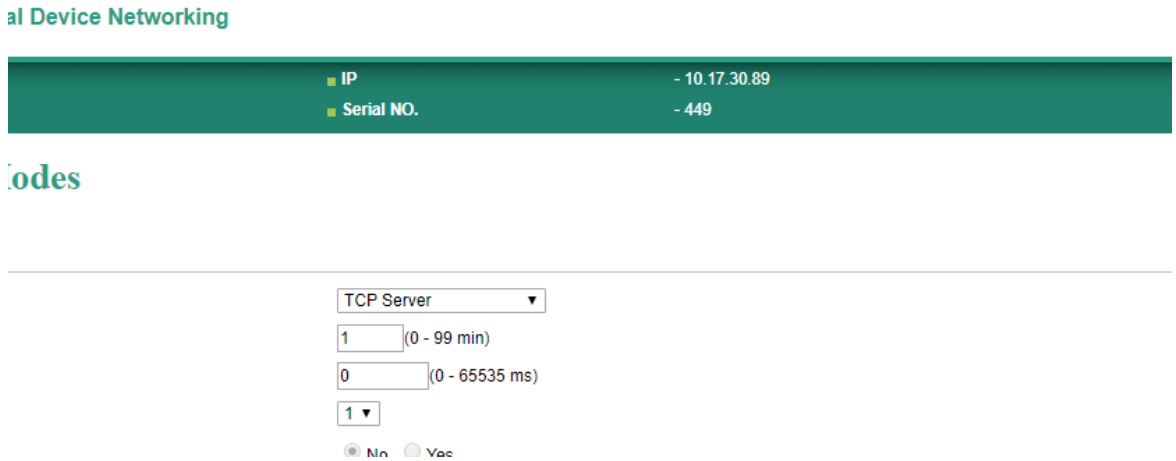
1- Make sure that the PC is configured on the same network that the interface.

2- Enter the IP address of the interface in the web browser. The IP address, by default, of the interface is indicated on the back of the product.

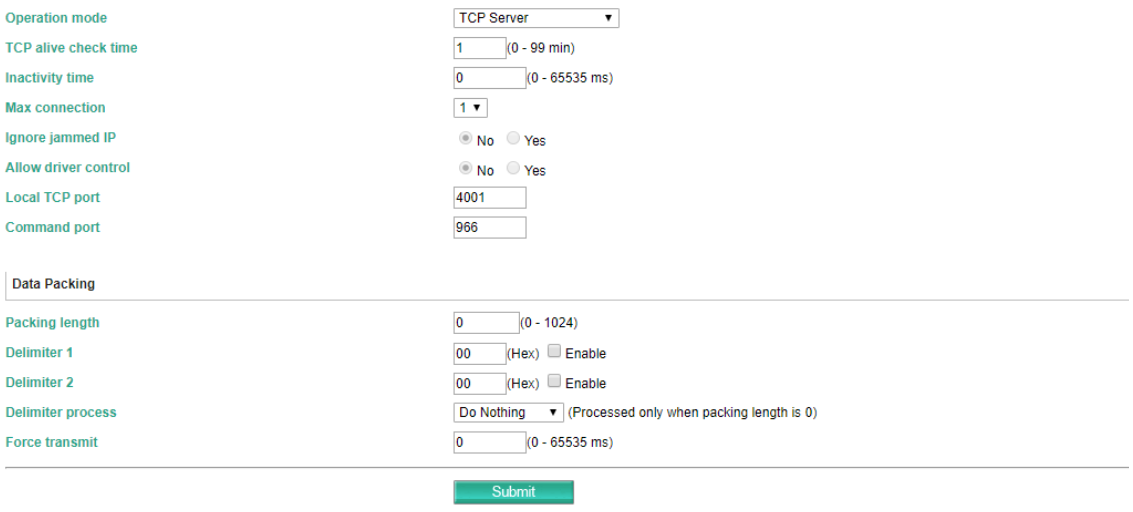
3- Left menu: Operating Settings > port 1



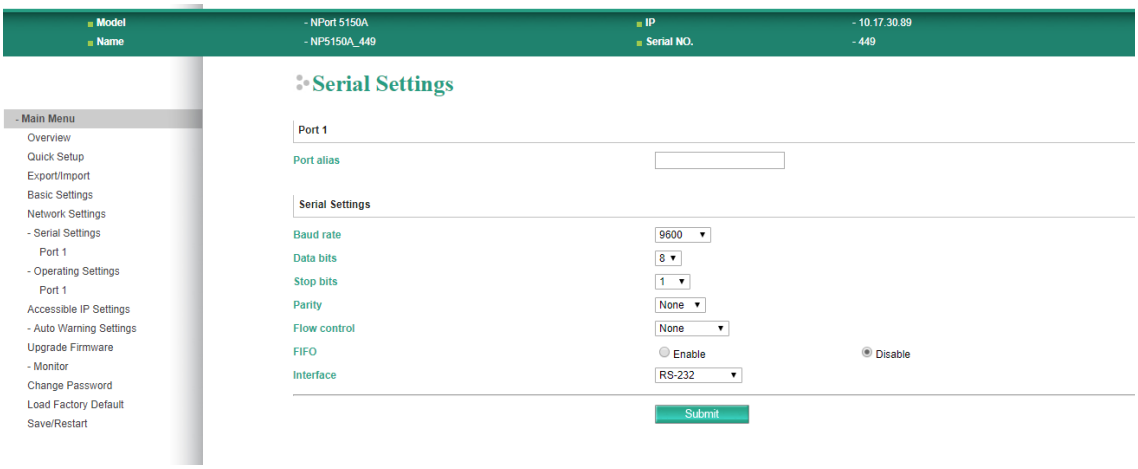
4- The IP address corresponds to the one entered in the Scorepad keyboard in the protocol configuration.



5- Configuration to be respected:



6- Serial port configuration. Left menu: Serial Settings > port 1



PC Software: NPort Administrator

1- Make sure that the PC is configured to be on the same network as the interface.

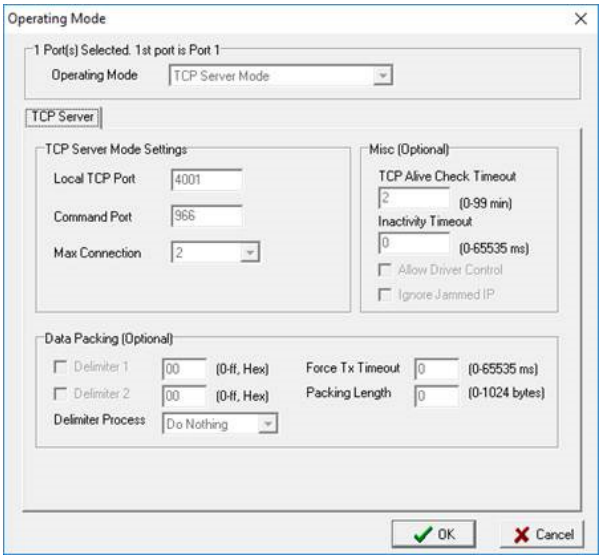
2- Download NPort Administrator (setup in the ZIP file : Npadm_Setup_VerX.XX_Build_xxxxxxxx.zip).

3- Install NPort Administrator software and start it.

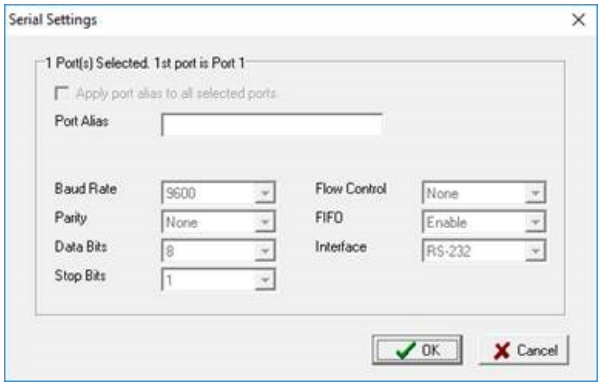
4- Search and select the Moxa interface.

5- Configure as follow:

a. « Operating Mode » tab, view Setting:



b. Serial tab: view Setting



5- The IP address corresponds to the one entered in the Scorepad keyboard in the protocol configuration.

5. Basketball

› Message 18: game clock message, period number or extra time message as well as the number of time out (before the last minute of play)

Example: Game clock = 16Min. 54Sec.

Time out Home team = 1.

Time out Guest team = 3.

Period number = 2.

Byte	Content		
1	«1» (31H)		
2	«8» (38H)		
3	Status word*		see detail
4	«5» = Basketball		
5	Minutes * 10 « 1 » (31H)	Game clock 16:54	
6	Minutes * 1 « 6 » (36H)		
7	Seconds * 10 « 5 » (35H)		
8	Seconds * 1 « 4 » (34H)		
9	Number of time out Home team	« 1 » 31H	
10	Number of time out Guest team	« 3 » 33H	
11			
12			
13	Period number or extra time**	« 2 » 32H	see detail
14			

* Detail of the status word of messages 18:

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0

b0: ignore.

b1: status of the game clock (ON/OFF):

= 1: game clock OFF.

= 0: game clock ON.

b2: status of the game clock horn (ON/OFF):

= 1: horn ON.

= 0: horn OFF.

b3: ignore.

b4: indicates if the possession time is second or in 1/10th:

= 0: possession time in second.

= 1: possession time in 1/10th of second.

b5: ignore

b6: match status (new/in progress):

= 1: new match.

= 0: match in progress.

b7: = 1.

** period number or extra time.

› **Message 18: game clock message, period number or extra time message as well as the number of time out (before the last minute of play)**

Exemple : Game clock = 56Sec 4.

Time out Home team = 1.

Time out Guest team = 3.

Period number = 2.

Byte	Content		
1	«1» (31H)		
2	«8» (38H)		
3	Status word*		see detail
4	«5» = Basketball		ignore
5	Seconds * 10 « 5 » (35H)	temps de jeu 56.4	
6	Seconds * 1 « 6 » (36H)		
7	D (44H)		
8	Seconds * 0,1 « 4 » (34H)		
9	Number of time out Home team	« 1 » 31H	
10	Number of time out Guest team	« 3 » 33H	
11			
12			
13	Period number or extra time**	« 2 » 32H	see detail
14			

* Detail of the status word of messages 18:

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0

b0: ignore.

b1: status of the game clock (ON/OFF):

= 1: game clock OFF.

= 0: game clock ON.

b2: status of the game clock horn (ON/OFF) :

= 1: Horn ON.

= 0: Horn OFF.

b3: ignore.

b4: indicates if the possession time is second or in 1/10th:

= 0: possession time in second.

= 1: possession time in 1/10th of second.

b5: ignore.

b6: indicates if the possession time is second or in 1/10th:

= 0: possession time in second.

= 1: possession time in 1/10th of second.

b7: = 1.

** period number or extra time.

During extra time the transmitted character is ‘E’, otherwise it’s the period number.

› Message 36: tenth of second message (during the last minute of the play)

Byte	Content	
1	« 3 » (33H)	
2	« 6 » (36H)	
3	Seconds * 10 « 5 » (35H)	game clock 56:4
4	Seconds * 1 « 6 » (36H)	
5	Seconds * 0,1 « 4 » (34H)	

› Message 50: possession timer message

Bit b4 of the status word = 0

Byte	Content		
1	« 5 » (35H)		
2	« 0 » (30H)		
3	Status word*		see detail
4	Seconds * 10 « 2 » (32H)	28 seconds	
5	Seconds * 1 « 8 » (38H)		

Bit b4 of the status word = 1

Byte	Content		
1	« 5 » (35H)		
2	« 0 » (30H)		
3	Status word *		see detail
4	Seconds * 1 « 4 » (34H)	4 seconds 3 1/10	
5	Seconds * 0,1 « 3 » (33H)		

* Detail of the status word of messages 50:

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0

b0: ignore.
b1: status of the possession timer (ON/OFF):
= 1: timer OFF.
= 0: timer ON.
b2: status of the plossession horn (ON/OFF):
= 1: Horn ON.
= 0: Horn OFF.
b3: status of the shot clock :
= 1: shot clock blanked.
= 0: display odf the possession timer.
b4: indicates if the possession time is in seconds or in 1/10th:
= 0: possession time in second.
= 1: tpossession time in 1/10th.
b5: ignore.
b6: ignore.
b7: = 1.

› Message 30: home and guest score message

Byte	Content			
1	« 3 » (33H)			
2	« 0 » (30H)			
3	« 5 » = Basket Ball			
		Score < 10	10 <= Score < 100	score >= 100
4	score Home	« » 20H ▌ « 5 »35H 5 « » 20H ▌	« » 20H ▌ « 1 »31H 1 « 2 »32H 2	« 1 »31H 1 « 0 »30H 0 « 4 »34H 4
5	score Home			
6	score Home			
		Score < 10	10 <= Score < 100	score >= 100
7	score Guest	« »20H ▌ « 7 »37H 7 « »20H ▌	« 1 »31H 1 « 8 »38H 8 « » 20H ▌	« 1 »31H 1 « 1 »31H 1 « 8 »38H 8
8	score Guest			
9	score Guest			

› Message 31: personal fouls and team fouls message

Byte	Content		
1	« 3 » (33H)		
2	« 1 » (31H)		
3	« 5 » = Basket Ball		
4			Ignore
5	Home team fouls	« 3 » 33H	
6			Ignore
7	Guest team fouls	« 5 » 35H	
8	player nbr * 10	« 1 » 31H	*
9	player nbr * 1	« 0 » 30H	
10	number of fouls of the player	« 3 » 33H	
11	team of the player = (31H) Home = (32H) Guest	« 1 » 31H	

NB : The total of the team fouls is limited to configured number .

* after about 10 seconds, the number of the player and his number of personal fouls are equal to 20 hex (blanking of the display).

› Message 19 : message du chrono temps morts et plots temps morts

Byte	Content	
1	« 1 » (31H)	
2	« 9 » (39H)	
3	« 5 » = Basket Ball	
4	Home team Time Out indicator *	
5	Guest team Time Out indicator *	
6	Seconds * 10 « 2 » (32H)	28 seconds
7	Seconds * 1 « 8 » (38H)	

*** : description of the Time Out indicators.**

Example: 1 Time Out

- countdown in progress: the value alternates between 0x30 and 0x31. (0x2F + number of Time Out and 0x30 + number of Time Out).
- Time Out stopped: the value = 0x31 (0x30 + 1 Time Out).

› Message 33: personal fouls of all the Home team players message

Byte	Contenu
1	« 3 » (33H)
2	« 3 » (33H)
3	« 5 » = Basket Ball
4	Value of the personal foul indicator for Home player n°4
5	Value of the personal foul indicator for Home player n°5
6	Value of the personal foul indicator for Home player n°6
7	Value of the personal foul indicator for Home player n°7
8	Value of the personal foul indicator for Home player n°8
9	Value of the personal foul indicator for Home player n°9
10	Value of the personal foul indicator for Home player n°10
11	Value of the personal foul indicator for Home player n°11
12	Value of the personal foul indicator for Home player n°12
13	Value of the personal foul indicator for Home player n°13
14	Value of the personal foul indicator for Home player n°14
15	Value of the personal foul indicator for Home player n°15

NB: for the value of the personal foul indicator the principle is the same as the one for frame n°32.

› Message 33 : personal fouls of all the Guest team players message

Byte	Content
1	« 3 » (33H)
2	« 4 » (34H)
3	« 5 » = Basket Ball
4	Value of the personal foul indicator for Guest player n°4
5	Value of the personal foul indicator for Guest player n°5
6	Value of the personal foul indicator for Guest player n°6
7	Value of the personal foul indicator for Guest player n°7
8	Value of the personal foul indicator for Guest player n°8
9	Value of the personal foul indicator for Guest player n°9
10	Value of the personal foul indicator for Guest player n°10
11	Value of the personal foul indicator for Guest player n°11
12	Value of the personal foul indicator for Guest player n°12
13	Value of the personal foul indicator for Guest player n°13
14	Value of the personal foul indicator for Guest player n°14
15	Value of the personal foul indicator for Guest player n°15

Match in 0 personal foul:

Nb of fouls	1	0	F	E	D	C	B	A		code
0	1	0	0	0	0	0	0	0		0x80

Match in 1 personal foul:

Nb of fouls	1	0	F	E	D	C	B	A		code
0	1	0	0	0	0	0	0	0		0x80
1	1	0	0	0	1	0	0	0		0x88

Match in 2 personal fouls:

Nb of fouls	1	0	F	E	D	C	B	A		code
0	1	0	0	0	0	0	0	0		0x80
1	1	0	0	0	1	0	0	0		0x88
2	1	0	0	0	1	1	0	0		0x8c

Match in 3 personal fouls:

Nb of fouls	1	0	F	E	D	C	B	A		code
0	1	0	0	0	0	0	0	0		0x80
1	1	0	0	0	1	0	0	0		0x88
2	1	0	0	0	1	1	0	0		0x8c
3	1	0	0	0	1	1	1	0		0x8e

Match in 4 personal fouls:

Nb of fouls	1	0	F	E	D	C	B	A		code
0	1	0	0	0	0	0	0	0		0x80
1	1	0	0	0	1	0	0	0		0x88
2	1	0	0	0	1	1	0	0		0x8c
3	1	0	0	0	1	1	1	0		0x8e
4	1	0	0	0	1	1	1	1		0x8f

Match in 5 personal fouls:

Nb of fouls	1	0	F	E	D	C	B	A		code
0	1	0	0	0	0	0	0	0		0x80
1	1	0	0	0	1	0	0	0		0x88
2	1	0	0	0	1	1	0	0		0x8c
3	1	0	0	0	1	1	1	0		0x8e
4	1	0	0	0	1	1	1	1		0x8f
5	1	0	1	0	1	1	1	1		0xaf

Match in 6 personal fouls:

Nb of fouls	1	0	F	E	D	C	B	A		code
0	1	0	0	0	0	0	0	0		0x80
1	1	0	0	0	1	0	0	0		0x88
2	1	0	0	0	1	1	0	0		0x8c
3	1	0	0	0	1	1	1	0		0x8e
4	1	0	0	0	1	1	1	1		0x8f
5	1	0	1	0	1	1	1	1		0xaf
6	1	0	1	1	1	1	1	1		0xbf

NB : Value of the indicator = code

› Message 56: player individual score message

Byte	Content	
1	« 5 » (35H)	
2	« 6 » (36H)	
3	« 5 » = Basket Ball	
4	Player's team = (31H) Home = (32H) Guest = (20H) Initialisation	« 1 » 31H
5	PLayer n° * 10	« 1 » 31H
6	PLayer n° * 1	« 0 » 30H
7	Total score * 10	« 2 » 32H
8	Total score * 1	« 3 » 33H

› Message 37 : Home team players' numbers message

Byte	Contenu	
1	« 3 » (33H)	
2	« 7 » (37H)	
3	Player's n° * 10 for the Home player n°4	« »
4	Player's n° * 1 for the Home player n°4	« 4 »
5	Player's n° * 10 for the Home player n°5	« »
6	Player's n° * 1 for the Home player n°5	« 5 »
7	Player's n° * 10 for the Home player n°6	« »
8	Player's n° * 1 for the Home player n°6	« 6 »
9	Player's n° * 10 for the Home player n°7	« »
10	Player's n° * 1 for the Home player n°7	« 7 »
11	Player's n° * 10 for the Home player n°8	« »
12	Player's n° * 1 for the Home player n°8	« 8 »
13	Player's n° * 10 for the Home player n°9	« »
14	Player's n° * 1 for the Home player n°9	« 9 »
15	Player's n° * 10 for the Home player n°10	« 1 »
16	Player's n° * 1 for the Home player n°10	« 0 »
17	Player's n° * 10 for the Home player n°11	« 1 »
18	Player's n° * 1 for the Home player n°11	« 1 »
19	Player's n° * 10 for the Home player n°12	« 1 »
20	Player's n° * 1 for the Home player n°12	« 2 »
21	Player's n° * 10 for the Home player n°13	« 1 »
22	Player's n° * 1 for the Home player n°13	« 3 »
23	Player's n° * 10 for the Home player n°14	« 1 »
24	Player's n° * 1 for the Home player n°14	« 4 »
25	Player's n° * 10 for the Home player n°15	« 1 »
26	Player's n° * 1 for the Home player n°15	« 5 »
27	Player's n° * 10 for the Home player n°16	« 1 »
28	Player's n° * 1 for the Home player n°16	« 6 »
29	Player's n° * 10 for the Home player n°17	« 1 »
30	Player's n° * 1 for the Home player n°17	« 7 »
31	Player's n° * 10 for the Home player n°18	« 1 »
32	Player's n° * 1 for the Home player n°18	« 8 »

› Message 38: Guest team players' numbers message

Byte	Content	
1	« 3 » (33H)	
2	« 8 » (38H)	
3	Player's n° * 10 for the Guest player n°4	
4	Player's n° * 1 for the Guest player n°4	
5	Player's n° * 10 for the Guest player n°5	
6	Player's n° * 1 for the Guest player n°5	
7	Player's n° * 10 for the Guest player n°6	
8	Player's n° * 1 for the Guest player n°6	

9	Player's n° * 10 for the Guest player n°7	
10	Player's n° * 1 for the Guest player n°7	
11	Player's n° * 10 for the Guest player n°8	
12	Player's n° * 1 for the Guest player n°8	
13	Player's n° * 10 for the Guest player n°9	
14	Player's n° * 1 for the Guest player n°9	
15	Player's n° * 10 for the Guest player n°10	
16	Player's n° * 1 for the Guest player n°10	
17	Player's n° * 10 for the Guest player n°11	
18	Player's n° * 1 for the Guest player n°11	
19	Player's n° * 10 for the Guest player n°12	
20	Player's n° * 1 for the Guest player n°12	
21	Player's n° * 10 for the Guest player n°13	
22	Player's n° * 1 for the Guest player n°13	
23	Player's n° * 10 for the Guest player n°14	
24	Player's n° * 1 for the Guest player n°14	
25	Player's n° * 10 for the Guest player n°15	
26	Player's n° * 1 for the Guest player n°15	
27	Player's n° * 10 for the Guest player n°16	
28	Player's n° * 1 for the Guest player n°16	
29	Player's n° * 10 for the Guest player n°17	
30	Player's n° * 1 for the Guest player n°17	
31	Player's n° * 10 for the Guest player n°18	
32	Player's n° * 1 for the Guest player n°18	

› Message 98: Home team name message

Byte	Content
1	« 9 » (39H)
2	« 8 » (38H)
3	1st character
4	2nd character
5	3rd character
6	4th character
7	5th character
8	6th character
9	7th character
10	8th character
11	9ith character
12	10th character
13	11th character
14	12th character
15	13th character
16	14th character
17	15th character
18	16th character
19	17th character
20	18th character

› Message 99: Guest team name message

Byte	Content
1	« 9 » (39H)
2	« 8 » (39H)
3	1st character
4	2nd character
5	3rd character
6	4th character
7	5th character
8	6th character
9	7th character
10	8th character
11	9th character
12	10th character
13	11th character
14	12th character
15	13th character
16	14th character
17	15th character
18	16th character
19	17th character
20	18th character

› Message 20: Local time message

Byte	Content	
1	« 2 » (32H)	
2	« 0 » (30H)	
3	Hours * 10 « 1 » (31H)	Hour 14:38
4	Hours * 1 « 4 » (34H)	
5	Minutes * 10 « 3 » (33H)	
6	Minutes * 1 « 8 » (38H)	

¦ Mode: Reception	Baud rate: 9600 ¦
¦ Visu: hexadecimal	Data bits: 8 ¦
¦ Port: COM1	Stop bits: 1 ¦
¦ End of frame code: 3	Parity: None ¦

/* frame n°18 timer last minute of play time ON */

01 7F 02 47 31 38 80 35 33 36 44 39 30 30 20 20 31 20 03 6C

/* frame n°36 last minute of play time */

01 7F 02 47 33 36 33 36 39 03 20

01 7F 02 47 33 36 33 36 38 03 21

01 7F 02 47 33 36 33 36 37 03 2E

01 7F 02 47 33 36 33 36 36 03 2F

01 7F 02 47 33 36 33 36 35 03 2C

01 7F 02 47 33 36 33 36 34 03 2D

01 7F 02 47 33 36 33 36 33 03 2A

01 7F 02 47 33 36 33 36 32 03 2B

01 7F 02 47 33 36 33 36 31 03 28

01 7F 02 47 33 36 33 36 30 03 29

/* frame n°18 timer last minute of play time ON */

01 7F 02 47 31 38 80 35 33 35 44 39 30 30 20 20 31 20 03 6F

/* frame n°36 last minute of play time */

01 7F 02 47 33 36 33 35 39 03 23

01 7F 02 47 33 36 33 35 38 03 22

/* frame n°18 timer last minute of play time OFF */

01 7F 02 47 31 38 82 35 33 35 44 38 30 30 20 20 31 20 03 6C

¦ Port: COM1 Stop bits: 1 ¦

¦ End of frame code: 3 Parity: None ¦

+----------+

+----------+

/* frame n°18 : game clock ON */

01 7F 02 47 31 38 80 35 20 31 35 36 30 30 20 20 31 20 03 26

/* frame n°50 : 24 sec timer ON */

01 7F 02 47 35 30 80 32 34 03 39

01 7F 02 47 31 38 80 35 20 31 35 35 30 30 20 20 31 20 03 25

01 7F 02 47 35 30 80 32 33 03 3E

01 7F 02 47 31 38 80 35 20 31 35 34 30 30 20 20 31 20 03 24

01 7F 02 47 35 30 80 32 32 03 3F

+ Mode: Reception Baud rate: 9600 ¦

¦ Visu: hexadecimal Data bits: 8 ¦

¦ Port: COM1 Stop bits: 1 ¦

¦ End of frame: 3 Parity: Nonoe ¦

+----------+

frame n°18 : game clock ON

01 7F 02 47 31 38 80 35 20 31 33 36 30 30 20 20 31 20 03 20

frame n°50 : 24sec timer ON

01 7F 02 47 35 30 80 20 31 03 2E

frame n°18: game clock ON

01 7F 02 47 31 38 80 35 20 31 33 35 30 30 20 20 31 20 03 23

frame n°18: game clock OFF (following the 24 sec at Zéro)

01 7F 02 47 31 38 82 35 20 31 33 35 30 30 20 20 31 20 03 21

frame n°50: 24sec timer OFF, horn ON

01 7F 02 47 35 30 86 20 30 03 29

frame n°50: 24sec timer OFF, horn OFF

01 7F 02 47 35 30 82 20 30 03 2D

+- Soft Control RS - Version 1.1b du 16-11-93 ----------+
¦ Mode: Reception Baud rate: 9600 ¦
¦ Visu: hexadecimal Data bits: 8 ¦
¦ Port: COM1 Stop bits: 1 ¦
¦ End of frame code: 3 Parity: None ¦
+----------+

/* frame n°18: game clock ON */

01 7F 02 47 31 38 80 35 30 30 44 39 30 30 20 20 31 20 03 69

/* frame n°36 last minute of play time */

01 7F 02 47 33 36 30 30 39 03 25
01 7F 02 47 33 36 30 30 38 03 24
01 7F 02 47 33 36 30 30 37 03 2B
01 7F 02 47 33 36 30 30 36 03 2A
01 7F 02 47 33 36 30 30 35 03 29
01 7F 02 47 33 36 30 30 34 03 28
01 7F 02 47 33 36 30 30 33 03 2F
01 7F 02 47 33 36 30 30 32 03 2E
01 7F 02 47 33 36 30 30 31 03 2D

/* frame n°18: game clock OFF , horn ON */

01 7F 02 47 31 38 86 35 30 30 44 30 30 30 20 20 31 20 03 66
01 7F 02 47 31 38 86 35 30 30 44 30 30 30 20 20 31 20 03 66

/* frame n°36: last minute of play time */

01 7F 02 47 33 36 30 30 30 03 2C

/* trame n°18 : game clock OFF, horn OFF */

01 7F 02 47 31 38 82 35 30 30 44 30 30 30 20 20 31 20 03 62

+Mode: Reception Baud rate: 9600 ¦
¦ Visu: hexadecimal Data bits: 8 ¦

6. Handball

› Message 01: game clock, period number and time out number message

Byte	Content		
1	« 0 » (30H)		
2	« 1 » (31H)		
3	Status word*		see detail
4	« 4 » = Hand Ball		
5	Minutes * 10 « 1 » (31H)	game clock 16:54	
6	Minutes * 1 « 6 » (36H)		
7	Seconds * 10 « 5 » (35H)		
8	Seconds * 1 « 4 » (34H)		
9	Number of time out Home team	« 1 » 31H	
10	Number of time out Guest team	« 3 » 33H	
11	Period number		

* Details of status word of the meassges 01:

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0

b0: ignore.
b1: game clock status (ON/OFF) :
= 1: game clock OFF.
= 0: game clock ON.
b2: game clock horn status (ON/OFF) :
= 1: horn OFF.
= 0: horn ON.
b3: ignore.
b4: ignore.
b5: ignore.
b6: ignore.
b7: = 1.

› Message 02: Home and Guest scores message

Byte	Content
1	« 0 » (30H)
2	« 2 » (32H)
3	« 4 » = Hand Ball
4	score Home * 100
5	score Home * 10
6	score Home * 1
7	score Guest * 100
8	score Guest * 10
9	score Guest * 1

› Message 03: Home and Guest penalty time message

Byte	Content		
1	« 0 » (30H)		
2	« 3 » (33H)		
3	« 4 » = Hand Ball		
4	Minutes * 1 « 0 » (30H)	0:50	1st penalty Home
5	Seconds * 10 « 5 » (35H)		
6	Seconds * 1 « 0 » (30H)		
7	Minutes * 1 « 1 » (31H)	1:45	2nd penalty Home
8	Seconds * 10 « 4 » (34H)		
9	Seconds * 1 « 5 » (35H)		
10	Minutes * 1 « 1 » (31H)	1:54	3rd penalty Home
11	Seconds * 10 « 5 » (35H)		
12	Seconds * 1 « 4 » (34H)		
13	Minutes * 1 « 1 » (31H)	1:38	1st penalty Guest
14	Seconds * 10 « 3 » (33H)		
15	Seconds * 1 « 8 » (38H)		
16	Minutes * 1 « 1 » (31H)	1:44	2nd penalty Guest
17	Seconds * 10 « 4 » (34H)		
18	Seconds * 1 « 4 » (34H)		
19	Minutes * 1 « 0 » (30H)	0:00	3rd penalty Guest
20	Seconds * 10 « 0 » (30H)		
21	Seconds * 1 « 0 » (30H)		

› Message 04: time out timers and time out indicators message

Byrte	Content		
1	« 0 » (30H)		
2	« 4 » (34H)		
3	« 4 » = Hand Ball		
4	Home Time Out indicator *		
5	Guest Time Out indicator *		
6	Seconds * 10 « 2 » (32H)	28 seconds	
7	Seconds * 1 « 8 » (38H)		

* : description of the Time Out indicators:

Example : 1 Time Out:

- countdown in progress: the value alternates between 0x30 and 0x31. (0x2F + number of Time Out and 0x30 + number of Time Out).
- Time Out stopped: the value = 0x31 (0x30 + 1 Time Out).

7. Ice Hockey

› Message 11: game clock, home and guest score and period number message

Ex : the Home team is leading 18 to 2 (or 111 to 110), in the second period.

Byte	Content			
1	« 1 » (31H)			
2	« 1 » (31H)			
3	Status word*			see detail
4	« 7 » = Ice Hockey			
5	Minutes * 10	« » (20H)		game clock 6:54
6	Minutes * 1	« 6 » (36H)		
7	Seconds * 10	« 5 » (35H)		
8	Seconds * 1	« 4 » (34H)		
			Score < 100 « » 20H ▒ « 1 » 31H 1 « 8 » 38H 8	Score > 100 « 1 »31H 1 « 1 »31H 1 « 1 »31H 1
9	Score Home * 100			
10	Score Home * 10			
11	Score Home * 1			
			score < 100 « »20H ▒ « 0 »30H 0 « 2 »32H 2	Score > 100 « 1 »31H 1 « 1 »31H 1 « 0 »30H 0
12	Score Guest * 100			
13	Score Guest * 10			
14	Score Guest * 1			
15	Number of the current period	« 2 » (32H) 2		

* Detail of the status word for the messages 11:

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0

b0: ignore.

b1: game clock status (ON/OFF) :

= 1 : game clock OFF.

= 0 : game clock ON.

b2: game clock horn status (ON/OFF) :

= 1 : horn OFF.

= 0 : horn ON.

b3: ignore.

b4: ignore.

b5: ignore.

b6 ignore.

b7: = 1.

› Message 12: Home team players 1 & 2 penalty time message

Byte	Content	
1	« 1 » (31H)	
2	« 2 » (32H)	
3	« 7 » = Ice Hockey	
4	Home player penalty indicator 1 *2	
	Penalty time for Home player 1	
5	Minutes * 1 « 1 » (31H)	game clock 1:34
6	Seconds * 10 « 3 » (33H)	
7	Seconds * 1 « 4 » (34H)	
8	Home player penalty indicator 2 *2	
	Penalty time for Home player 2	
9	Minutes * 1 « 1 » (31H)	game clock 1:56
10	Seconds * 10 « 5 » (35H)	
11	Seconds * 1 « 6 » (36H)	

› Message 13: Guest players 1 & 2 penalty time message

Byte	Content	
1	« 1 » (31H)	
2	« 3 » (33H)	
3	« 7 » = Ice Hockey	
4	Guest player penalty indicator 1 *2	
	Penalty time for Guest player 1	
5	Minutes * 1 « 0 » (30H)	game clock 0:37
6	Seconds * 10 « 3 » (33H)	
7	Seconds * 1 « 7 » (37H)	
8	Guest player penalty indicator 2 *2	
	Penalty time for Guest player 2	
9	Minutes * 1 « 1 » (31H)	game clock 1:08
10	Seconds * 10 « 0 » (30H)	
11	Seconds * 1 « 8 » (38H)	

› Message 14: Home team and Guest team players 3 penalty time message

Byte	Content	
1	« 1 » (31H)	
2	« 4 » (34H)	
3	« 7 » = Ice Hockey	
4	Home player penalty indicator 3*	see detail
	Penalty time for Home player 3	
5	Minutes * 1 « 0 » (30H)	game clock 0:37
6	Seconds * 10 « 3 » (33H)	
7	Seconds * 1 « 7 » (37H)	
8	Plot pénalité joueur visiteurs 3 *2	
	Penalty time for Guest player 3	
9	Minutes * 1 « 1 » (31H)	game clock 1:08
10	Seconds * 10 « 0 » (30H)	
11	Seconds * 1 « 8 » (38H)	

* Detail of the penalty indicator

B7	B6	B5	B4	B3	B2	B1	B0	transmitted byte
1	G	F	E	D	C	B	A	code of a 7-segment display
	Penalty 5’			Penalty 10’			Penalty 2’	

Example 1:

One 2 minutes penalty is assigned

B7	B6	B5	B4	B3	B2	B1	B0
1	G	F	E	D	C	B	A
1	0	0	0	0	0	0	1

The byte will alternate between the value 0x81and 0x80

Example 2:

One 2-minute penalty is assigned and is counting down, and during the countdown a 5-minute penalty is assigned.

B7	B6	B5	B4	B3	B2	B1	B0
1	G	F	E	D	C	B	A
1	1	0	0	0	0	0	1

The byte will alternate between the values 0xc1 and 0xc0

› Message 15: penalty player number message

Byte	Content
1	« 1 » (31H)
2	« 5 » (35H)
3	« 7 » = Ice Hockey
4	Ten of the number of home player 1
5	Unit of the number of home player 1
6	Ten of the number of home player 2
7	Unit of the number of home player 2
8	Ten of the number of home player 3
9	Unit of the number of home player 3
10	Ten of the number of guest player 1
11	Unit of the number of guest player 1
12	Ten of the number of guest player 2
13	Unit of the number of guest player 2
14	Ten of the number of guest player 3
15	Unit of the number of guest player 3

- No display of the player's number: Ten = 0x20 and Unit = 0x20.
- Player's nber = 3 : Ten = 0x20 and Unit = 0x33.
- Player's nber = 12 : Ten = 0x31 and Unit = 0x32.
- No display of the player's number but assignment of a penalty: Ten =.

› Message 16: Home and Guest time out message

Byte	Content	
1	« 1 » (31H)	
2	« 6 » (36H)	
3	« 7 » = Ice Hockey	
4	Home time out indicator *	
5	Guest time out indicator *	
6	Seconds * 10 « 2 » (32H)	28 seconds
7	Seconds * 1 « 8 » (38H)	

* : description of the time out indicator:

Example: 1 Time Out:

- countdown in progress: the value alternates between 0x30 and 0x31. (0x2F + number of time out and 0x30 + number of time out).
- time out stopped: the value = 0x31 (Ox30 + 1 time out).