

MESCHAL
DATA ACQUISITION SOFTWARE
FOR SEA TRIALS

by

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Abstract

Scientists and sometimes professional skippers who want to correlate fishing results with fishing conditions, and those who want to keep a record of fishing conditions as a help in decision making for future fishing operations are interested in storing all the available information under a format which makes as easy as possible all comparisons, correlations and data processing, all these operations being possible with the same PC computer.

A data acquisition software has been developed to record data from analog/digital inputs, Scanmar system and GPS navigation system.

Analog/Digital Input

A multifunction high speed analog/digital input expansion board from NAUTIL Interfaces is used. This card is the Nautil-ANA 12-T. Specially designed for Personal Computer, this card allows 1 to 16 simple analog inputs. The digital conversion is made on 12 bits and gives a 4096 points resolution for 1-10 V input range. A calibration process is available and a specific driver delivers functions for programming the card.

The tension sensors, engine temperature and rating, propeller pitch, surface boat speed loch, rudder are usually connected.

1 to 16 input lines are used and each signal can be filtered by low and high filter values. The analog value is adjusted by linear coefficient calculated according to the sensor calibration before the trial. At the end of a test, the filter values can be changed to re-calculate averages and mini-maxi in the new interval of data and the active results page can be printed. All the data are recorded on disk and used with a data sheet program like Excel. The maximum sampling frequency is 100 Hz.

Scanmar Serial Input

The Scanmar Plasma Display delivers a 20 mA current loop interface. We use a special conversion unit to convert the current loop to the RS232C host computer interface. The logging is controlled by sending commands to the cabinet which transmits data after each request. We collect all the information delivered by the Scanmar system. 1 to 6 channels (+2) are available and filtered each one by a low and a high filter values. At the end of a test, the filter values can be changed to re-calculate averages and mini-maxi in the new interval of data and the active results page can be printed. All the data are recorded on disk and use with a data sheet program like Excel. The maximum sampling frequency is 1 Hz.

GPS Serial Input

A GPS system from the French MLR Corp. is used to get the information about navigation parameters (position of the boat, bottom speed and heading referred to the bottom). This part of program is in development, the purpose is to calculate the actual trail length during sampling trawlings operations (for stock assessment) when it is important to accurately know the trail length. All data are recorded on disk and use with a data sheet program like Excel. The maximum sampling frequency is 1 Hz.

Hardware and Software Requirements

IBM PC or BIOS compatible (386 SX at least) with math coprocessor chip, fixed disk drive, one parallel printer interface, two RS232 serial communication ports, EGA or VGA color video monitor, DOS 3.1 or higher, real time clock supported by PC, Epson compatible printer, virtual disk emulation for real time data acquisition.

PROGRAM

The first page invites for configuration of every part:

- virtual disk
- analog input
- Scanmar input
- Position input
- Timers

Virtual disk

A virtual disk is used to record in real-time as fast as possible the raw data. You must give the letter used by your computer for this drive. At the end of the program they are copied on a hard disk. The size depends on the duration and number of analog input used on test.

Analog Input

The system loads the last configuration in use during the last test. So, for the same kind of recording you just keep the active configuration. You can also modify the parameters, create a new configuration or use an old one. You can also exit.

You can select any input you want (from 1 to 16), in any order. The following parameters can be changed:

- linear regression analysis slope (pente)
- linear regression analysis intercept (o.o.)
- minimum filter value (mini)
- maximum filter value (maxi)
- unit of the value after regression (unité)
- title of the value (titre)

+ See appendix for examples.

Scanmar Input

The system loads the last configuration in use during the last test. So, for the same kind of recording you just keep the active configuration. You can also modify the parameters, create a new configuration or use an old one. You can also exit.

The Scanmar system gives all the channel codes (6+2) supported by the system, anyway if one or more are not used. The system delivers the code sensor used on concerned channel in order, from 1 to 6, each sensor with it's own description. The following parameters can be changed:

- minimum filter value (mini)

- maximum filter value (maxi)
- title of the channel (nom)

+ See appendix for examples.

Positioning Input

We are developing the interface for a GPS. This work will give to the real distance, the heading and the speed referred to bottom.

Timers

The system loads the last configuration in use during the last test. So, for the same kind of recording you just keep the active configuration. You can also modify the parameters, create a new configuration or use an old one. You can also exit.

The following parameters can be changed:

- total time for the test
- time interval for analog input readings
- time of sampling for analog input readings
- number of readings by analog input sample
- total number of records for analog inputs
- time interval for Scanmar inputs
- time interval for GPS inputs

+ See appendix for examples.

RESULTS

The results and all general conditions are on three pages: one for analog inputs and the other one for Scanmar. Each page can be refiltered by the change of values:

- mini and maxi values
- slope and intercept values only for analog page

+ See appendix for examples (only page 1 and 2).

The third page (in development) will resume the general conditions from the GPS and draw a line through every position point recorded to show the real trail done.

Files with an appropriate format can be open by data sheet like Excell from Microsoft.

Meschal

Mesures des paramètres
d'un
chalut au travail

Continue
Quitte

Programme Turbo-Pascal Y.CADIOU et G.BAVOUZET - IFREMER

Meschal

Préparer 19-04-1994
Disque virtuel : D ↓
Voies analogiques
Série Scanmar
Série position
Temps
Continue
Quitte

Programme Turbo-Pascal Y.CADIOU et G.BAVOUZET - IFREMER

Meschal

Préparer 19-04-1994
Disque virtuel : E ✓
Voies analogiques
Série Scanmar
Série position
Temps
Continue
Quitte

Programme Turbo-Pascal Y.CADIOU et G.BAUOUZET - IPREMER

Meschal

configuration actuelle : S4T3H

		pente	o.o.	nini	maxi	unité	titre
voie	1	9.095	-0.110	-2.000	10.000	noeuds	LOCH_BEN
voie	2	3.158	-11.820	-6.000	10.000	cran	PAS_HELICE
voie	3	200.035	1.380	0.000	1000.000	degres	TEMPMOTEUR
voie	4	11.555	-58.575	-40.000	40.000	degres	ANGLEBARRE
voie	5	1.000	0.000	0.000	10.000	volts	REFALIM

action
D'accord Modifier Créer Récupérer Abandonner

Programme Turbo-Pascal Y.CADIOU et G.BAUOUZET - IPREMER

Meschal
configuration actuelle : S4T3H

	pen	o.o.	mini	maxi	unité	titre
définitions (sortie avec (ESC))						
voie 1	9.095	-0.110	-2.000	10.000	noeuds	LOCH_BEN
voie 2	3.158	-11.820	-6.000	10.000	cran	PAS_HELICE
voie 3	200.035	1.380	0.000	1000.000	degres	TEMPMOTEUR
voie 4	11.555	-58.575	-40.000	40.000	degres	ANGLEBARRE
voie 5	1.000	0.000	0.000	10.000	volts	REPALIM

Programme Turbo-Pascal Y.CADIOU et G.BAUOUZET - IPREMER

Meschal
configuration actuelle : S4T3H

	pen	o.o.	mini	maxi	unité	titre
voie 1	9.095	-0.110	-2.000	10.000	noeuds	LOCH_BEN
voie 2	3.158	-11.820	-6.000	10.000	cran	PAS_HELICE
voie 3	200.035	1.380	0.000	1000.000	degres	TEMPMOTEUR
voie 4	11.555	-58.575	-40.000	40.000	degres	ANGLEBARRE
voie 5	1.000	0.000	0.000	10.000	volts	REPALIM

COUR	TE000030	TEST04
S4T2	TE010000	
S4T2H	TEST01	
S4T3H	TEST02	
TE000010	TEST03	

Programme Turbo-Pascal Y.CADIOU et G.BAUOUZET - IPREMER

Meschal							
configuration actuelle : S4T3H							
	pen	o.o.	mini	maxi	unité	titre	
voie 1	9.	choix	0	-2.000	10.000	noeuds	LOCH_BEN
voie 2	3.	fin	0	-6.000	10.000	cran	PAS_HELICE
voie 3	200.	→voie 1	0	0.000	1000.000	degres	TEMPMOTEUR
voie 4	11.	→voie 2	5	-40.000	40.000	degres	ANGLEBARRE
voie 5	1.	→voie 3	0	0.000	10.000	volts	REPALIM
		→voie 4					
		→voie 5					
		voie 6					
		voie 7					
		voie 8					
		voie 9					
		voie 10					
		voie 11					
		voie 12					
		voie 13					
		voie 14					
		voie 15					
		voie 16					

Programme Turbo-Pascal Y.CADIOU et G.BAUOUZET - IFREMER

Meschal						
configuration actuelle : S4T3H						
	pen	o.o.	mini	maxi	unité	titre
définitions (sortie avec <ESC>)						
voie 1	1	0	0	10	volts	XXXXXX
voie 2	1	0	0	10	volts	XXXXXX
voie 3	1	0	0	10	volts	XXXXXX
voie 4	1	0	0	10	volts	XXXXXX
voie 5	1	0	0	10	volts	XXXXXX

Programme Turbo-Pascal Y.CADIOU et G.BAUOUZET - IFREMER

Meschal
configuration actuelle : S4T3H

	pente	o.o.	mini	maxi	unité	titre
voie 1	9.095	-0.110			noeuds	LOCH_BEN
voie 2	3.158	-11.820			cran	PAS_HELICE
voie 3	200.035	1.380			degres	TEMPMOTEUR
voie 4	11.555	-58.575			degres	ANGLEBARRE
voie 5	1.000	0.000			volts	REFALIM

Préparer 19-04-1994

Disque virtuel : E

Voies analogiques

Série Scanmar

Série position

Temps

Continue

Quitte

Programme Turbo-Pascal Y.CADIOU et G.BAUOUZET - IFREMER

Meschal

j'ecoute scanmar (2 secondes max)

Programme Turbo-Pascal Y.CADIOU et G.BAUOUZET - IFREMER

Meschal

configuration série : COM1:9600,e,8,1 config : S4T3H

code	mini	maxi	nom
TS1	0	5Vit.Long.	(n)
CC	-5	5Vit.Trans.	(n)
DI1	0	80Panneaux	(n)
DE	0	0-----	
DI2	0	30Ptes Ailes	(n)
DE	0	0-----	
CS1	0	0-----	
DI3	0	0-----	
DE	0	0-----	
CS2	0	0-----	
HG1	0	50uv.Vert.	(n)
DE	0	0-----	
QU	0	0-----	
TS2	0	5Vit.Grille	(n)
CC	-45	45Ang.Grille	(d)

Action

D'accord Modifier **Créer** Récupérer Abandonner

Programme Turbo-Pascal Y.CADIOU et G.BAVOUZET - IFREMER

Meschal

configuration série : COM1:9600,e,8,1 config : S4T3H

code	mini	maxi	nom
TS1		5Vit.Long.	(n)
CC		5Vit.Trans.	(n)
DI1		80Panneaux	(n)
DE		0-----	
DI2		30Ptes Ailes	(n)
DE		0-----	
CS1		0-----	
DI3		0-----	
DE		0-----	
CS2		0-----	
HG1	0	50uv.Vert.	(n)
DE	0	0-----	
QU	0	0-----	
TS2	0	5Vit.Grille	(n)
CC	-45	45Ang.Grille	(d)

CODE	VALEUR
sortie	COM 1
vitesse	9600
parité	PAIRE
donnée	8
bit stop	1
contrôle	matériel
fin ligne	CR-LF
continuer	

Programme Turbo-Pascal Y.CADIOU et G.BAVOUZET - IFREMER

Meschal

configuration série : COM1:9600,e,8,1 config : S4T3H

code	mini	maxi	nom
TS1	0	5	vit.Long. (m)
CC	-5	5	vit.Trans. (m)
DI1	0	80	Panneaux (m)
DE	0	0	-----
DI2	0	30	Ptes Ailes (m)
DE		0	-----
CS1		0	-----
DI3		0	-----
DE		0	-----
CS2		0	-----
HG1		5	Ouv.Vert. (m)
DE		0	-----
QU	0	0	-----
TS2	0	5	vit.Grille (n)
CC	-45	45	Ang.Grille (d)

code	mini	maxi	nom
COUR	TE000030	TEST04	
S4T2	TE010000		
S4T2H	TEST01		
S4T3H	TEST02		
TE000010	TEST03		

Programme Turbo-Pascal Y.CADIOU et G.BAOUZET - IFREMER

Meschal

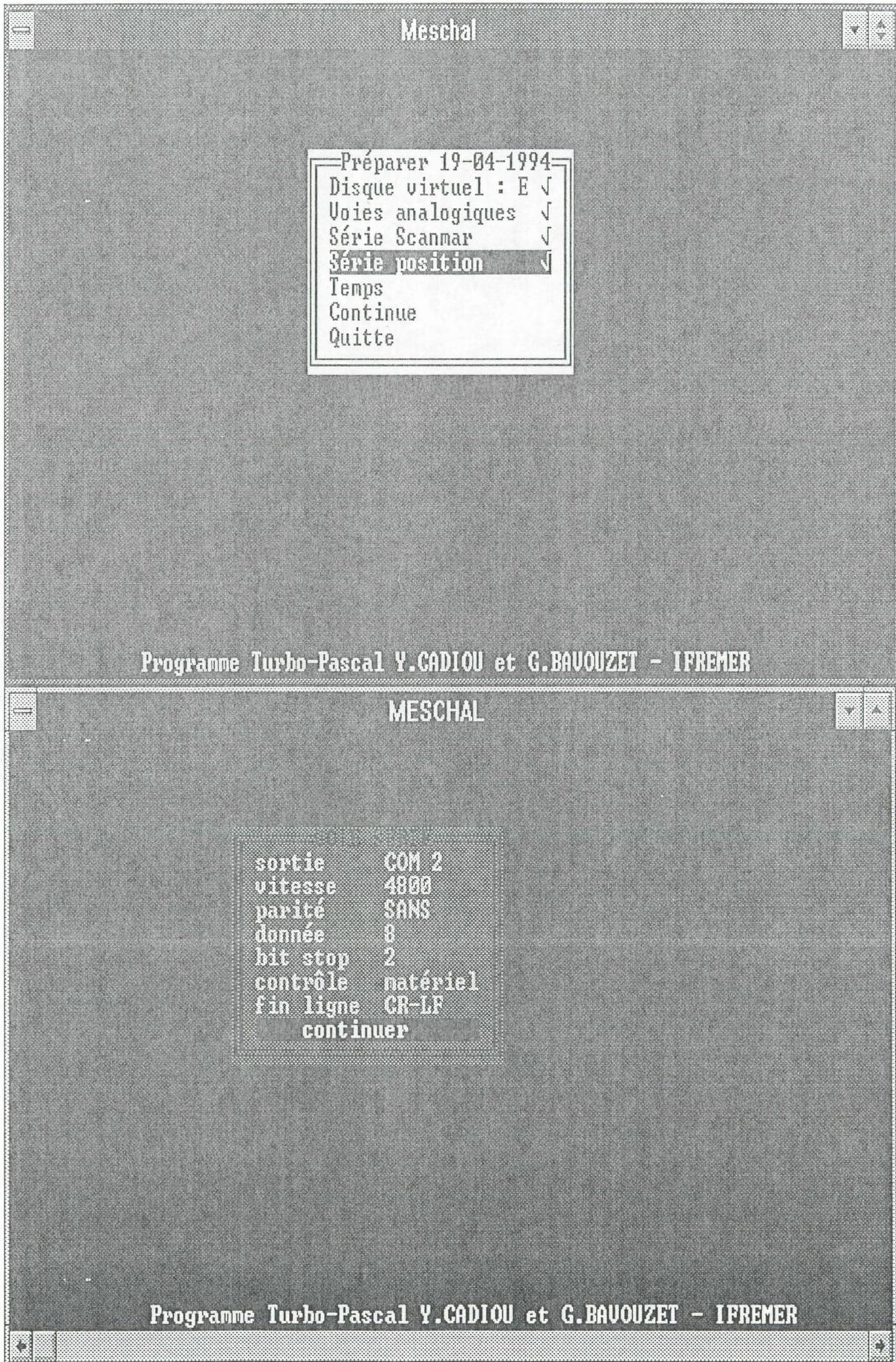
configuration série : COM1:9600,e,8,1 config : S4T3H

code	mini	maxi	nom
TS1			
CC			
DI1			
DE			
DI2			
DE			
CS1			
DI3			
DE			
CS2			
HG1			
DE			
QU			
TS2			
CC			

definitions (sortie avec <ESC>)

code	mini	maxi	nom
TS1	0	5	vit.Long. (m)
CC	-5	5	vit.Trans. (m)
DI1	0	80	Panneaux (m)
DE	0	0	-----
DI2	0	30	Ptes Ailes (m)
DE	0	0	-----
CS1	0	0	-----
DI3	0	0	-----
DE	0	0	-----
CS2	0	0	-----
HG1	0	5	Ouv.Vert. (m)
DE	0	0	-----
QU	0	0	-----
TS2	0	5	vit.Grille (n)
CC	-45	45	Ang.Grille (d)

Programme Turbo-Pascal Y.CADIOU et G.BAOUZET - IFREMER



Meschal
config : *****

Durée totale	Disque virtuel : E <input checked="" type="checkbox"/>	03h 00m 00.0s
Intervalle de	Voies analogiques <input checked="" type="checkbox"/>	00h 00m 10.0s
Durée d'un éc	Série Scanmar <input checked="" type="checkbox"/>	00h 15m 00.0s
Nombre de mes	Série position <input checked="" type="checkbox"/>	90 ██████████
Nombre total de mesures	Temps <input checked="" type="checkbox"/>	1000 ██████████
	Continue	
	Quitte	
Intervalle de scrutation du Scanmar		00h 00m 10.0s
Intervalle de scrutation GPS		00h 01m 00.0s

Programme Turbo-Pascal Y.CADIOU et G.BAVOUZET - IPREMER

Meschal
config : S4T3H

Durée totale de la manip		03h 00m 00.0s
Intervalle de scrutation		00h 00m 10.0s
Durée d'un échantillon		00h 15m 00.0s
Nombre de mesures par échantillon		90 ██████████
Nombre total de mesures		1000 ██████████
Intervalle de scrutation du Scanmar		00h 00m 10.0s
Intervalle de scrutation GPS		00h 01m 00.0s

Action

D'accord Modifier Récupérer Abandonner

Programme Turbo-Pascal Y.CADIOU et G.BAVOUZET - IPREMER

Meschal
config : *****

11h 42m 58s

Durée totale de la manip	03h 00m 00.0s
Intervalle de scrutation	00h 00m 10.0s
Durée d'un échantillon	00h 15m 00.0s
Nombre de mesures par échantillon	90
Nombre total de mesures	1080
Intervalle de scrutation du Scannar	00h 00m 10.0s
Intervalle de scrutation GPS	00h 01m 00.0s

action
D'accord Modifier Récupérer Abandonner

Programme Turbo-Pascal Y.CADIOU et G.BAVOUZET - IFREMER

Meschal

action
Bon et je continue Sauvegarde config Abandonner

Programme Turbo-Pascal Y.CADIOU et G.BAVOUZET - IFREMER

Meschal
config : S4T3H

	Préparer 19-04-1994	
Durée totale	Disque virtuel : E ✓	03h 00m 00.0s
	Voies analogiques ✓	
Intervalle de	Série Scanmar ✓	00h 00m 10.0s
	Série position ✓	
Durée d'un éc	Temps ✓	00h 15m 00.0s
	Continue	
Nombre de mes	Quitte	90 ██████████
Nombre total de mesures		1080 ██████████
Intervalle de scrutation du Scanmar		00h 00m 10.0s
Intervalle de scrutation GPS		00h 01m 00.0s

Programme Turbo-Pascal Y.CADIOU et G.BAVOUZET - IFREMER

Meschal

nom du nouveau fichier de configuration (sans extension) S4T3H ██████████

Programme Turbo-Pascal Y.CADIOU et G.BAVOUZET - IFREMER

MESCHAL

???????. fichier : MESURES.txt

date : 21-04-1994. duree scrutation : 0.1 s
 duree echantillonnage : 5.0 s, nombre de mesures : 100
 duree de la mesure : 10.0 s, nombre de voies : 5

heure debut mesure : 12:17:45.6

			mini	moyenne	maxi
1 100	LOCH_BEN	noeuds	-0.110	-0.110	-0.110
2 100	PAS_HELICE	cran	3.989	4.078	4.205
3 100	TEMPMOTEUR	degres	939.762	942.057	944.646
4 100	ANGLEBARRE	degres	-3.184	-2.976	-2.818
5 100	REFALIM	volts	0.000	0.000	0.000

Mesures Imprime Page Filtre Quitte

MESCHAL

???????. fichier : MESURES.txt

date : 21-04-1994. duree scrutation : 0.1 s
 duree echantillonnage : 5.0 s, nombre de mesures : 100

définitions (sortie avec <ESC>)

	pente	0.0	mini	maxi	unité	titre
voie 1	9.095	-0.110	-2.000	10.000	noeuds	LOCH_BEN
voie 2	3.158	-11.820	-6.000	10.000	cran	PAS_HELICE
voie 3	200.035	1.380	0.000	1000.000	degres	TEMPMOTEUR
voie 4	11.555	-50.575	-40.000	40.000	degres	ANGLEBARRE
voie 5	1.000	0.000	0.000	10.000	volts	REFALIM

5 100	REFALIM	volts	0.000	0.000	0.000
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MESCHAL

???????. fichier : MESURES.xsm

date : 21-04-1994. duree scrutation : 1.0 s
 duree de la mesure : 10.0 s

heure debut mesure : 12:17:45.6 mini moyenne maxi

TS1	10	10	3.6	3.6	3.9
CC	10	10	-0.6	-0.6	-0.6
DI1	10	10	48.4	48.4	48.4
DE	10	10	0.0	0.0	0.0
DI2	10	0	99999.0	0.0	-99999.0
DE	10	10	0.0	0.0	0.0
CS1	0	0	99999.0	0.0	-99999.0
DI3	0	0	99999.0	0.0	-99999.0
DE	0	0	99999.0	0.0	-99999.0
CS2	0	0	99999.0	0.0	-99999.0
HG1	10	10	1.5	1.6	1.6
DE	10	10	0.0	0.0	0.0
QU	10	0	99999.0	0.0	-99999.0
TS2	10	10	1.8	1.9	2.1
CC	10	10	0.8	0.8	0.8

Mesures Imprime Page Filtre Quitte

MESCHAL

???????. fichier : MESURES.xsm

date : 21-04-1994. duree scrutation : 1.0 s
 duree de la mesure : 10.0 s

heure	code	mini	maxi	nom	maxi
	TS1	0	5	Vit.Long. (n)	
TS1	CC	-5	5	Vit.Trans. (n)	
CC	DI1	20	70	Panneaux (n)	
DI1	DE	0	0		
DE	DI2	10	30	Ptes Ailes (n)	
DI2	DE	0	0		
DE	CS1	0	0		
CS1	DI3	0	0		
DI3	DE	0	0		
DE	CS2	0	0		
CS2	HG1	0	5	Ouv.Vert. (n)	
HG1	DE	0	0		
DE	QU	0	0		
QU	TS2	0	5	Vit.Grille (n)	
TS2	CC	-45	45	Ang.Grille (d)	
CC					