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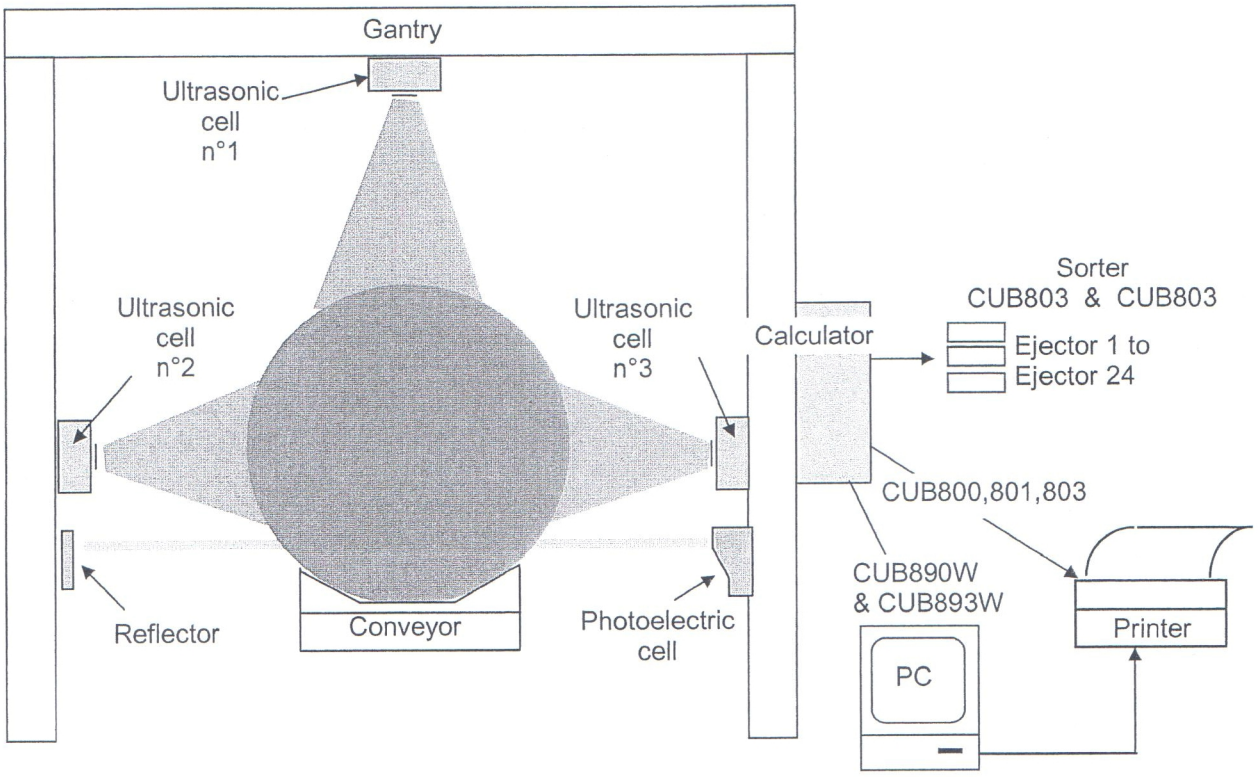
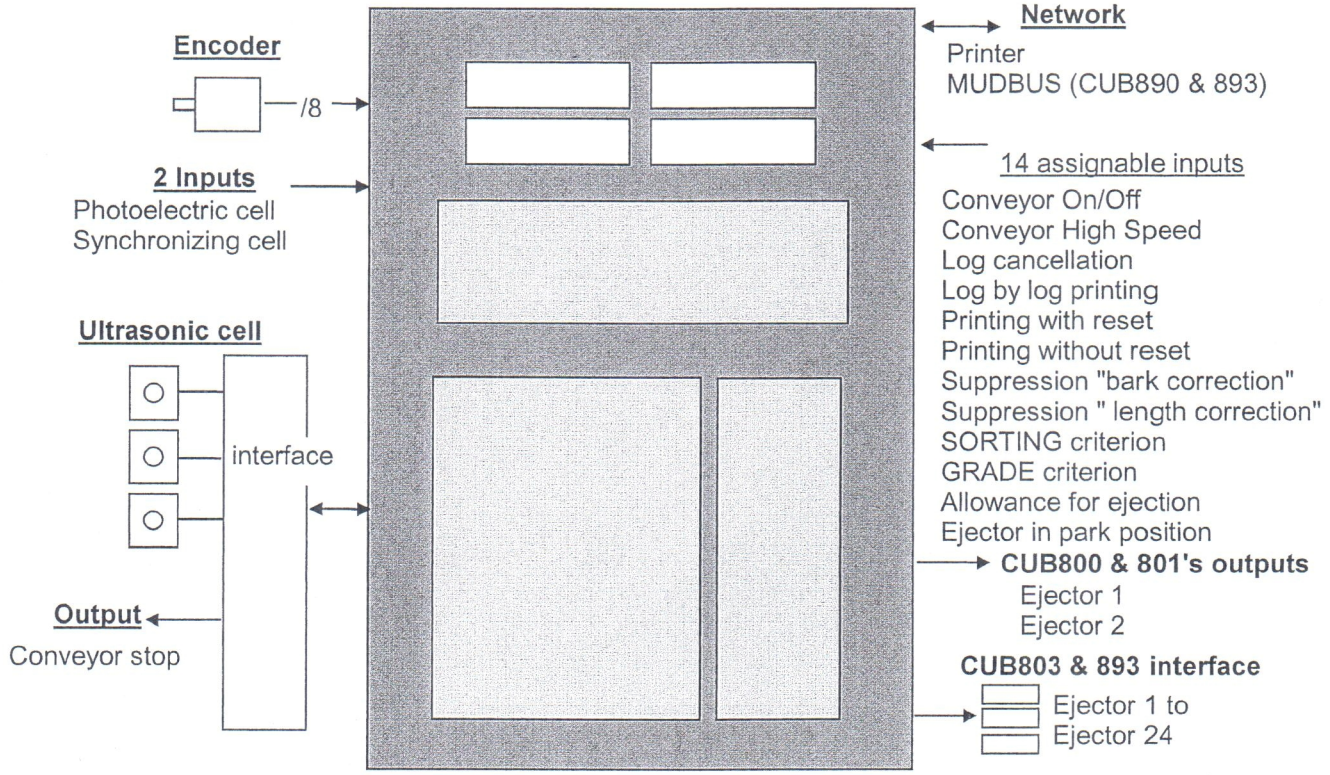
ULTRASONIC SCANNING SYSTEM



IMPORTANT NOTES :

- The MUDATA scanning system takes automatically into account the temperature variations.
- Ultrasonic logs and boards scanning systems described in this catalogue are of "flat type", they are designed to measure logs (after crosscutting) which must be flat and stable onto the conveyor while their passing under the gantry

CUB800/801/803/890W/893W



EQUIPMENT SUPPLIED BY MUDATA

- **1 waterproof metal cabinet** to guard the calculator
- **1 metal cabinet,** fitted inside the waterproof metal cabinet, featuring keyboard, displays, calculator, power supply and screw connectors.
- **3 pre-wired ultrasonic cells** for diameters measurement
- **1 photoelectric cell** for length measurement
- **1 printer (80 columns)** for printings
- **1 or several relays interface cards** (CUB803 and CUB893) to control ejectors
- **1 MUDBUS network license**(CUB890 and 893)
- **1 User's, installation and troubleshooting manual**

EQUIPMENT SUPPLIED BY THE INSTALLATOR

- The scanning system's gantry
- The shielded electric wires of connection including the encoder one (minimum 8 wires)
- The 12 VDC intermediate relays, if necessary
- The eventual switches for inputs
- The ejectors (sorters), if necessary
- An encoder driving system, if necessary
- The installation and the maintenance on site

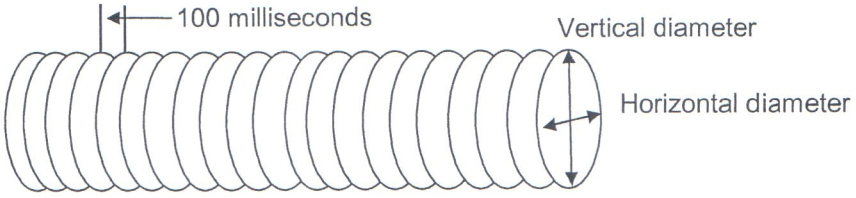
Additional equipment

- **One encoder** if the conveyor's speed is not regular or if the conveyor features a rear motion.
- **One PC computer** for CUB890W and CUB893W models
- **One warming reflector**

PRINCIPLE OF SCANNING

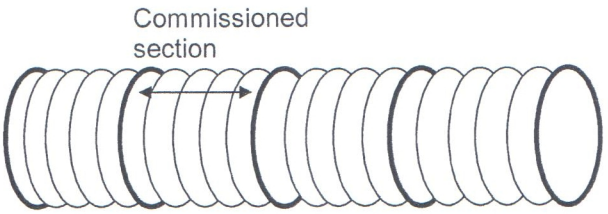
- Real volume measurement

The log scanning system measures one vertical diameter and one horizontal diameter every 100 ms while log passing. At the end of the log passing, the calculator computes the average of all horizontal diameters and the average of all vertical diameters, then it computes the medium diameter of the log which is multiplied the log length so as to give global volume of the log.



- - Volume measurement by section, German way

The log is "cut" in several sections whose length is set up in the general parameters of the system.
In each section, the calculator memorizes the 5 smallest horizontal and vertical diameters and classifies them from 1 to 5 by increasing order, then it selects the section whose order number corresponds to a parameter. (this way of calculation allows to standardize the measurements according to the timber).
At the end of the log passing, the calculator computes the average of vertical and horizontal diameters of each section, then computes a medium diameter which is multiplied to the length so as to give the global volume of the log.



- Trading volume

The log length taken into account for the calculation of the volume is the nearest trading length in accordance with the real measurement.

- Volume under bark

The volume can be calculated according to a proportional or constant thickness of bark parameter.

- Japanese Agricultural Standard formula

The new models of log scanning systems features the JAS (Japanese Agricultural Standard) formula of calculation and can be easily operated by parameter setting.

- Explanation of the calculation formula of the minimum diameter and maximum diameter for the sorting

The calculator memorizes the 5 smallest diameters and the 5 biggest diameters (horizontal & vertical) and classifies them from 1 to 5 by increasing order, then, it takes into account only the diameter of each type whose order number corresponds to a parameter. At the end of the log passing, it computes the average of the 2 minimum diameters and the 2 maximum ones so as to give the minimum and maximum diameters of the log.

Note : It is possible to set a parameter which allows to not take into account diameters which are not significant at the beginning and the end of the log

CUB800 *- Standard editions*
- 2 ejectors

Log by log edition

The printer gives at each end of log :

N°	DMIN	DMAX	DMED	LENG	CUBE	T °C	EJ	QU
0025	0304	0315	0311	0132	0099	22C	1	4
0026	0302	0316	0312	0209	0157	22C	1	3

N° : log number
DMIN, DMAX, DMED : minimum diameter, maximum diameter, medium diameter (all in mm)
LENG : length in cm
CUBE : volume of the log in dm^3
T°C : environmental temperature
EJ : sorting bin's number.
QU :grade given by the operator

Global edition

The MUDATA ultrasonic scanning system allows up to 6 different summing up which are set by parameters . These 6 summing up use different counters, therefore they can be used in the same time:

- Automatic summing up :
  . monthly
  . weekly
  . daily
  . up to 4 times a day
  . hourly

- Summing up ordered by pressing a key on the calculator's keypad or by closing a switch.

Automatic global edition

In usual operation, the operator does not need accessing to the calculator. He will have automatically a periodic summing up on printer.

Example : DAILY SUMMING UP
FROM 15/05/95 AT 18H00 TO 16/05/95 AT 18H00
NUMBER OF LOGS : 00101
MEDIUM DIAMETER : 0410 mm
TOTAL LENGTH : 00404,012 m
TOTAL CUBE : 00053,340 m^3
TEMPERATURE : 22C

First numbers of the first line give the date and time of the last daily summing up.

The latest line informs about the environmental temperature (± 1.8°F) so as to check the well functioning of the system.

At each summing up, the counter of this summing up is reset.

NOTE :
The total volume is calculated by addition of all the volume of each log.

Automatic edition by SORTING BIN
Sorting bins must be controlled by the calculator's outputs.

Example :

DAILY EDITION FROM 06/10/94 16h16 TO 06/10/94 16h20

DAILY EDITION FROM 06/10/94 16h16 TO 06/10/94 16h20

DESTINATION	NUMBER	TOT LG	MED LG	MED DIAM	TOT CUBE	MED CUBE
	meter	cm	mm	m^3	dm^3	
0001	00010	00006	0065	0324	00000,639	0066
0002	00005	00007	0144	0364	00000,743	0149

Automatic edition by GRADE
The grade has to be given to the operator by means of switches wired to the calculator.

Example :
DAILY EDITION FROM 06/10/94 16h16 TO 06/10/94 16h20

DESTINATION	NUMBER	TOT LG	MED LG	MED DIAM	TOT CUBE	MED CUBE
	metre	cm	mm	m^3	dm^3	
0001	00010	00006	0065	0324	00000,639	0066
0002	00005	00007	0144	0364	00000,743	0149

The two automatic ejections

The log scanning system allows to sort automatically logs to two sorting bins :
- according to two categories of diameters (minimum, medium or maximum)
- according to two categories of lengths
- according to two categories of lengths and two categories of diameters

The sorting mode: alignment at the beginning, the centre or the end of the bin can be selected by parameters
The sorting conveyor's length is not limited.

Controlled ejections (or sorting according to logs's quality)

The operator has at his disposal two buttons which allow him to assign a sorting number to each log when the log passes under the gantry

CUB801 *- Editions of production statistics*
- 2 ejectors

Log by log edition

The printer edits at each end of logs :

N°	DMIN	DMAX	DMOY	LONG	CUBE	T °C	EJ	QU
0025	0304	0315	0311	0132	0099	22C	1	4
0026	0302	0316	0312	0209	0157	22C	1	3

N° : log number
DMIN, DMAX, DMED : diameters in mm
LENG : length in cm
CUBE : cube of the log in dm^3
T°C : environmental temperature
EJ : Sorting bin's number.
QU : grade number given by the operator

Edition of statistics

24 categories of length
24 categories of diameter
24 grades
2 sorting bins

For each type of edition (daily, monthly, etc...), the calculator shares according to 2 criteria chosen among 4: sorting bin, quality, length and diameter:

- Number of log
- Total length in meter
- Medium length in centimeter
- Medium diameter in millimeter
- Total volume in cubic meter
- Medium volume in cubic decimeter.

Sorting bins must be controlled by the calculator's outputs.
The grade has to be given by the operator by means of switches wired to the calculator.

EXAMPLE OF STATISTICS

DAILY EDITION FROM 06/10/94 16h16 TO 06/10/94 16h20

: LENGTH :	NUMBER:	TOT LG :	MED LG :	MED DIAM :	TOT CUBE :	MED CUBE :
: cm	meter	cm	mm	m^3	dm^3	
:0000 to 0120 :	00010 :	00006 :	0065 :	0324 :	00000,639 :	0066 :
:0120 to 0150 :	00005 :	00007 :	0144 :	0364 :	00000,743 :	0149 :
:0150 to 0200 :	00006 :	00011 :	0183 :	0337 :	00000,944 :	0157 :
:0200 to 0220 :	00001 :	00002 :	0212 :	0226 :	00000,000 :	0000 :
:0220 to 0300 :	00008 :	00021 :	0262 :	0305 :	00001,259 :	0157 :
:0300 to 6552 :	00007 :	00028 :	0406 :	0356 :	00002,805 :	0401 :
	:00037 :	00076 :	0206 :	0331 :	00006,409 :	0173 :

DAILY EDITION FROM 06/10/94 16h16 TO 06/10/94 16h20

DIAMETRE cm	NUMBER	TOT LG meter	MED LG cm	MED DIAM mm	TOT CUBE m^3	MED CUBE dm^3
0000 to 0100	00010	00001	0051	0000	00000,000	0000
0100 to 0150	00000	00000	0000	0000	00000,000	0000
0150 to 0200	00000	00000	0000	0000	00000,000	0000
0200 to 0300	00005	00012	0236	0226	00000,000	0000
0300 to 0400	00031	00064	0206	0358	00006,409	0207
0400 to 0450	00000	00000	0000	0000	00000,000	0000
0450 to 0500	00000	00000	0000	0000	00000,000	0000
0500 to 6552	00000	00000	0000	0000	00000,000	0000
	00037	00076	0206	0331	00006,409	0173 :T 14C

The two automatic ejections

The log scanning system allows to sort automatically logs to two sorting bins :
- according to two categories of diameters (minimum, medium or maximum)
- according to two categories of lengths
- according to two categories of lengths and two categories of diameters

The sorting mode: alignment at the beginning, the center or the end of the bin can be selected by parameters
The sorting conveyor's length is not limited.

Controlled ejections

The operator has at his disposal two buttons which allow him to assign a sorting number to each log when the log passes under the gantry

Sorting by grade

The operator has at his disposal an 8-position selector or encoding wheels (99 positions) which allow him to assign a grade to each log.

CUB803 *- Editions of production statistics*
- Sorting up to 24 bins

Edition log by log
(Please refer to the example of edition in chapter CUB801)

Edition of statistics
(Please refer to the example of edition in chapter CUB801)

24 categories of lengths
24 categories of diameters
24 grades
24 sorting bins

Automatic sorting according two criterions

The ultrasonic scanning system allows to sort automatically logs :
- by (minimum, medium or maximum) diameters in a maximum of 24 categories
- by lengths in 24 categories
- by diameters and lengths.

Controlled sorting

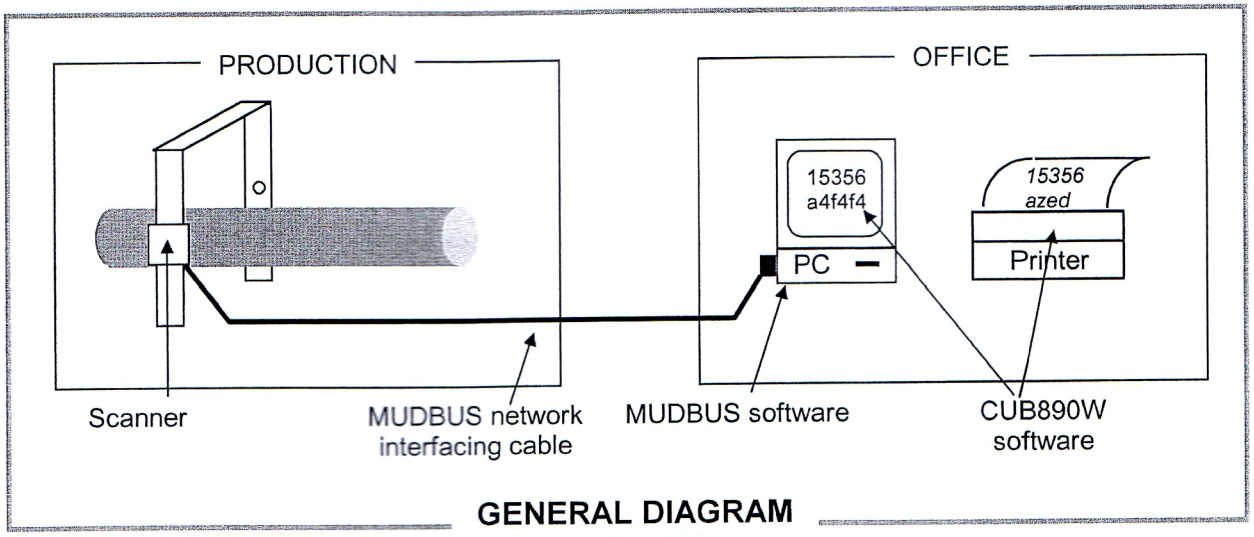
The operator uses a selector (maximum of 8 positions) or encoding wheels (99 positions) which allow to assign a sorting number to each log when the log passes under the gantry.

Sorting by grade

The operator uses a selector (maximum of 8 positions) or encoding wheels (99 positions) which allow to assign a grade to each log when the log passes under the gantry.

NOTE :
- Each category can be assigned to one or several sorting bins by basic parameter setting with or without stoppage of the chain.
- The number of sorting bins is limited to 24 as standard (if not enough please contact us).
- The sorting mode: alignment at the beginning, the center or the end of the bin can be selected by parameters
- The sorting conveyor's length is not limited.

CUB890W ***- Connection to a computer (PC)***
- 2 ejections



GENERAL DIAGRAM
CUB890W

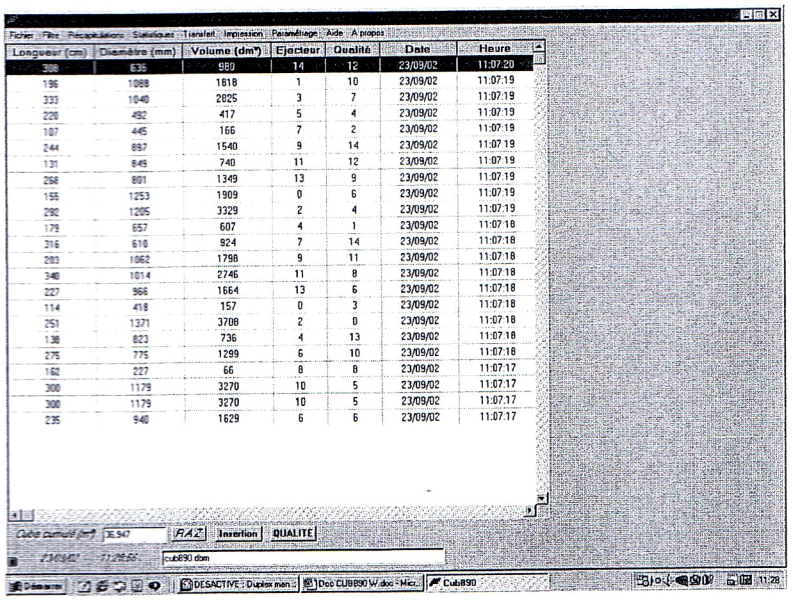
Minimum specification of the computer (PC) (not supplied): WINDOWS 95, 98, 2000 or XP and serial port

Data processing

This log scanning system is envisaged to be connected directly on the port series of a PC. The MUDBUS cable is provided. Several log scanner MUDATA can be connected on the same PC. Software CUB890W, provided on CD, allows the reading in the calculator the characteristics of each log passed in the sca nner. All this information is memorized in a data base, on the hard disk of the PC.

Editions in real time

Software CUB890W makes it possible to visualize in real time on the screen of work of the PC the characteristics of each log (length, diameter, volume, bin's number, quality) and the cube cumulated with a clearing button. This information can be used by the sawyer of head.

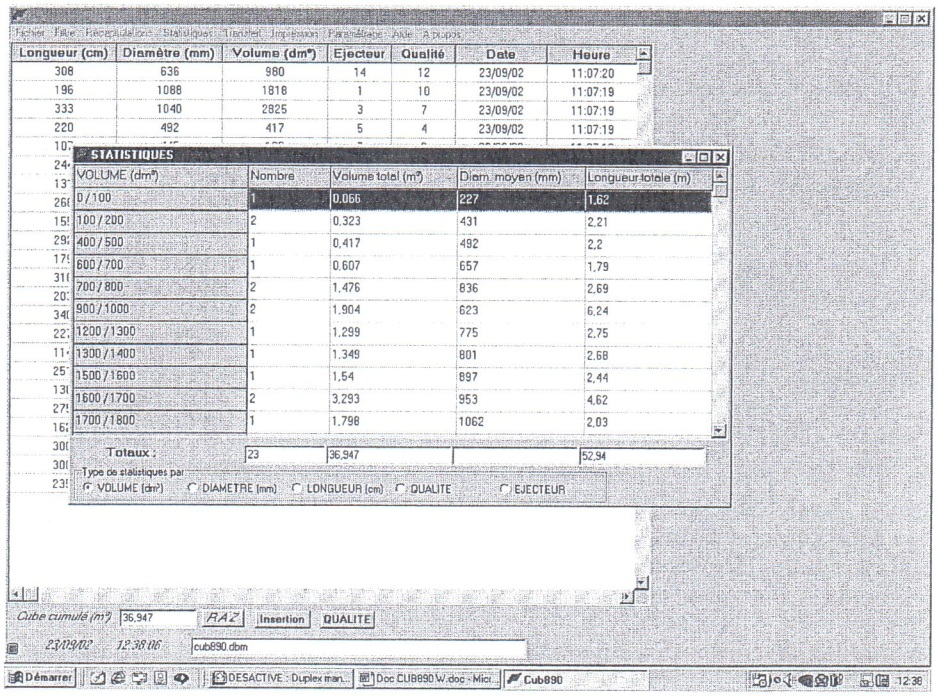


Statistical editions

Software CUB890W makes it possible to visualize on the screen of the PC and to publish on the printer of the statistics of the number of logs, the total cube, the average diameter and total length:

- by classes lengths
- by classes of diameters
- by quality
- by ejector

The classes are defined in the parameters.
The lengths can be the subject of a commercial round-off
The type of diameter (minimum, average, maximum) is defined in the parameters.



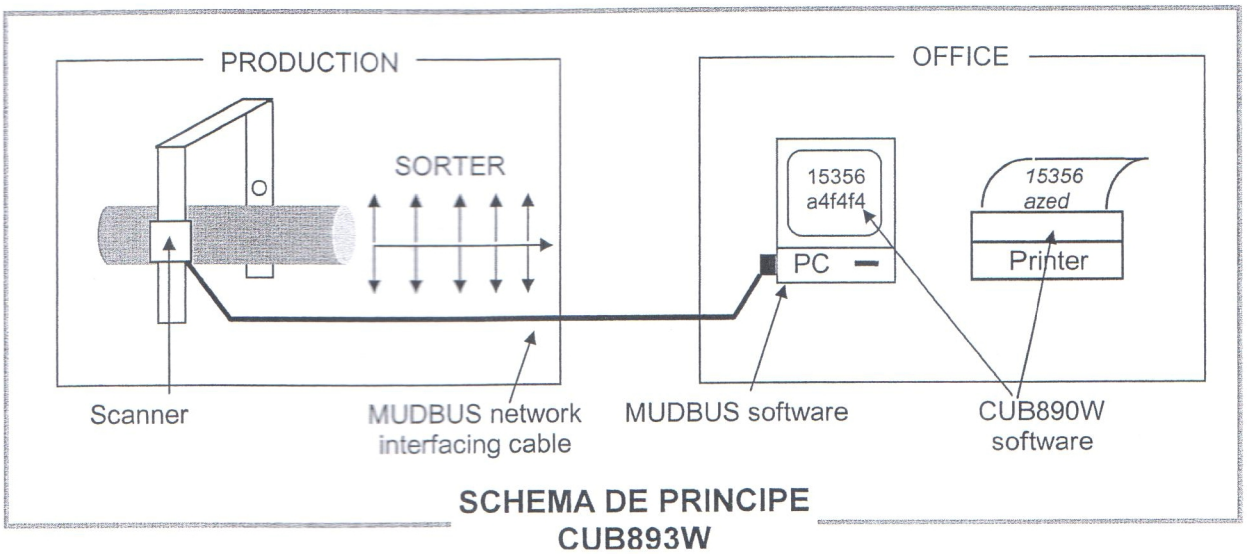
2automatic ejections

Identical to CUB800

Forced ejections

Identical to CUB800

CUB893W ***- Connection to a personal computer(PC)***
- Sorting up to 24 bins



SCHEMA DE PRINCIPE
CUB893W

The automatic sorting according to two criterions
(Please refer to the example of edition in chapter CUB803)

Controlled ejections
(Please refer to the example of edition in chapter CUB803)

Sorting by grade
(Please refer to the example of edition in chapter CUB803)