OPERATING MANUAL

MU 7051 EN D

GPL TRONIQUE

Issue	Date	Nature of modifications	Written by	Approved by
D	2018/09/24	Display of one-tenth volume, calibration VM or VB, volume conversion at 20°C *[MDV622]*	DSM	XS
C	2017/12/21	Configuration of density in SUPERVISOR MODE or METROLOGICAL mode *[MDV587]*	DSM	XS
B	2012/09/20	New software ergonomics, internationalization, linearization, delivery ways menu, V15, V20, Vm/Vb display, events recorded	DSM	AH
A	2010/12/06	Creation	DSM	MV

CONTENTS

1 GENERAL PRESENTATION AND DESCRIPTION

The GPL TRONIQUE measuring system must be fitted on road tankers only for measurement of quantities of liquefied gases under pressure.

The GPL TRONIQUE measuring system comprises:

- ⇨ An ALMA turbine meter for liquefied petroleum gas
- ⇨ A MICROCOMPT+ electronic calculator-indicator
- ⇨ An gas separator
- ⇨ A pump which flowrate and pressure characteristics are compatible with the meter used
- ⇨ An automatic pressure control valve, regulated to maintain pressure at least 1 bar higher than the saturated vapour pressure in the tank
- ⇨ A set of devices by two ways of delivery, controlled by a valve which allows the choice between a full flexible hose or a direct release
- ⇨ If required, a Pt100 temperature sensor to calculate and display the mean temperature of the liquid measured during metering
- ⇨ A printer

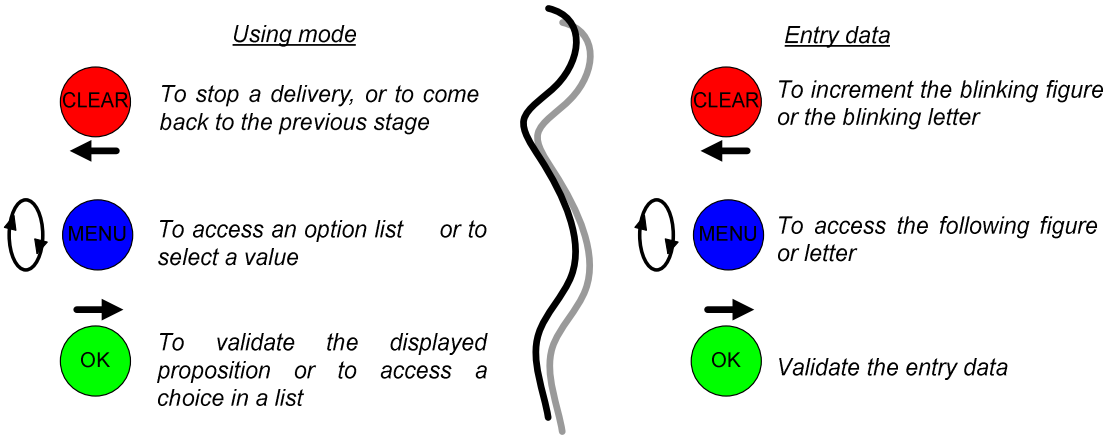
There are two models of GPL TRONIQUE: volume at temperature or volume at 15°C or 20°C (measure and compensation of temperature at 15°C or at 20°C). The “embedded computing” and “remote control” (GPL TRONIQUE CD) options are also available. This document presents all the possibilities. Some menus are the same; others are specific and are differently identified.

Identification of the different models of GPL TRONIQUE in the following pages:

V15 or V20 model (Vb)
Vt model (Vm)

Presentation of the MICROCOMPT+ calculator-indicator:

Buttons function:



The MICROCOMPT+ calculator-indicator manages measuring operation and computerizes the measuring system defaults.

2 OPERATING RECOMMENDATIONS

Safety valves may be incorporated in the GPL TRONIQUE measuring system. If they are located downstream of the turbine meter they must open to the atmosphere or be connected to the receiving tank.

3 CONFIGURATION, SETTING AND CALIBRATION

3.1 Configuration

To access the METROLOGICAL mode, the MICROCOMPT+ has to be unsealed. Only an authorized person can remove the seal. This mode allows setting all metrological parameters. It's done at the putting into use of the measuring system and sometimes during metrological controls.

Refer to METROLOGICAL MODE.

3.2 Setting

To access the SUPERVISOR mode, the magnetic or RFID key must be set at the right of the MICROCOMPT+ display. This mode is used to set the measuring system and to access the calibration menu. Before using the GPL TRONIQUE, it has to be set up:

- Products settings
- Density curves (if required)
- Vehicle identification
- Volume, flowrate and timing settings
- Printer settings
- Choose the language display

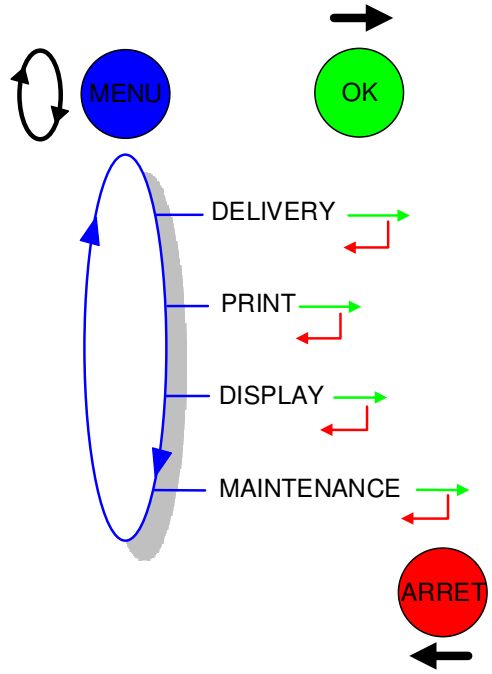
Refer to SUPERVISOR MODE.

3.3 Calibration

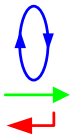
Having made the proving of the metering, this menu CALIBRATION/GAUGE allows calculating the error and the new coefficient

Refer to SUPERVISOR MODE for details about the gauging procedure.

4 USER MODE



LEGEND:

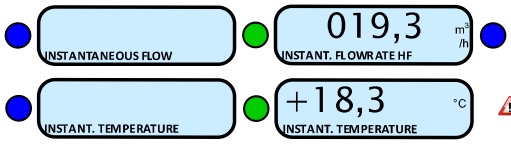


Press the button (red, blue or green) as many times as necessary to display the next message

During delivery, the following information may be displayed:

- ⇨ The instantaneous flow rate in high or low flowrate (m^3/h or L/min; depending on the display unit set)
- ⇨ The temperature (°C) if it is taken into account.

Simply follow the indications below:



Change flowrate (HF/LF).
Unit: m^3/h or L/min

⚠ with active option

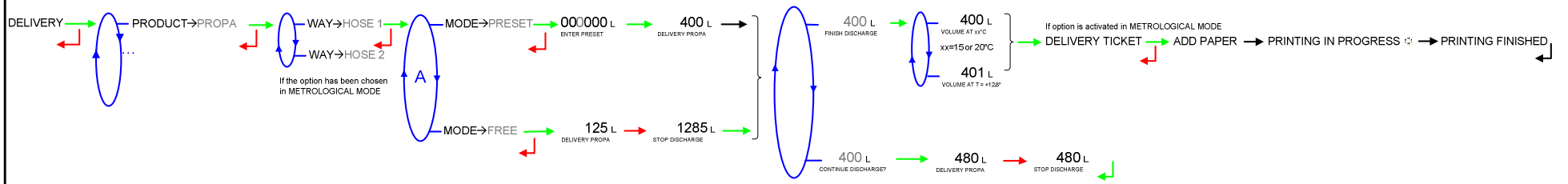
Back to normal display is automatic:
DO NOT PRESS RED CLEAR BUTTON TO KEEP FROM INTERRUPTING DELIVERY.

4.1 Menu DELIVERY

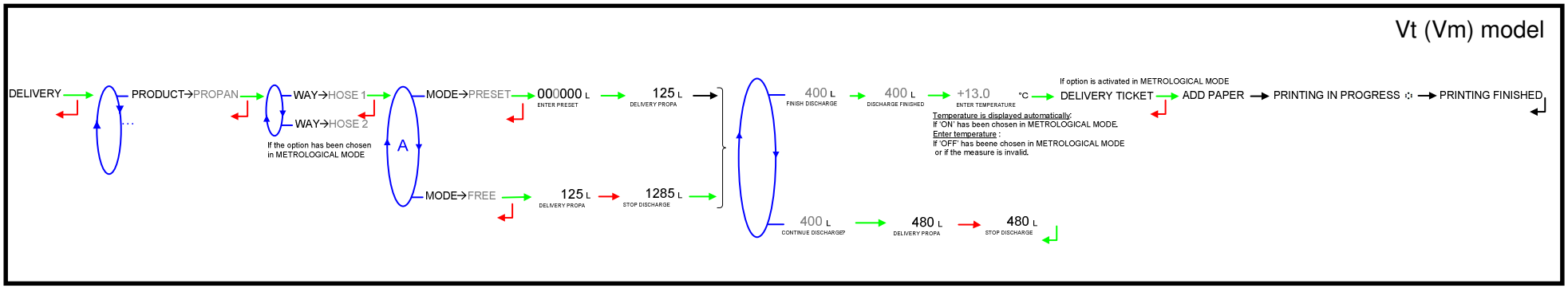
During delivery, press blue pushbutton then green button to visualize instantaneous flow rate. It's possible to switch high and low flow by pressing the blue button.

Press a second time to display the temperature (°C) if it is used

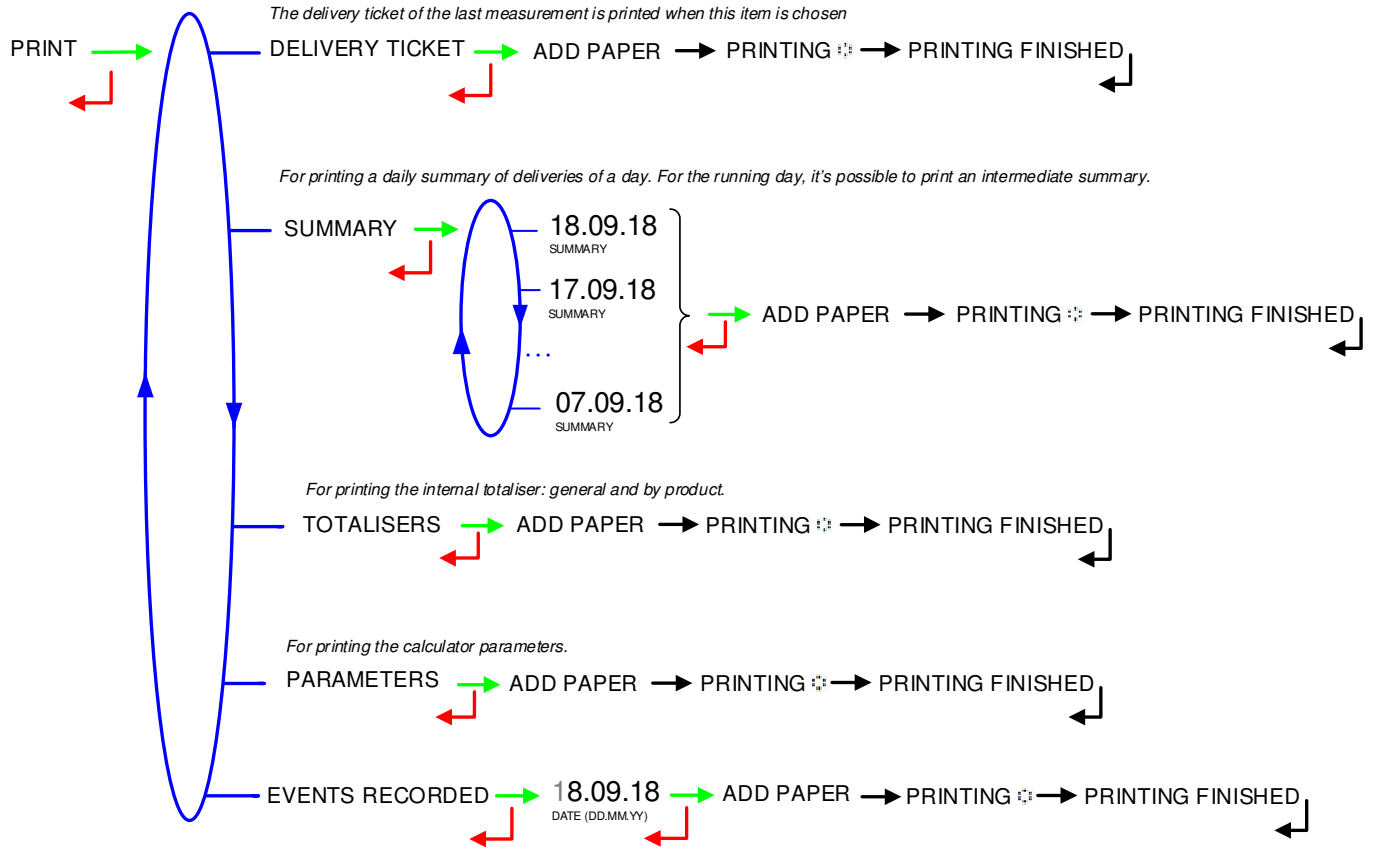
V15/V20 (Vb) model



Vt (Vm) model

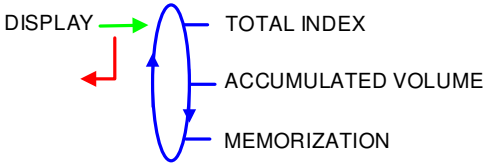


4.2 Menu PRINT



4.3 Menu DISPLAY

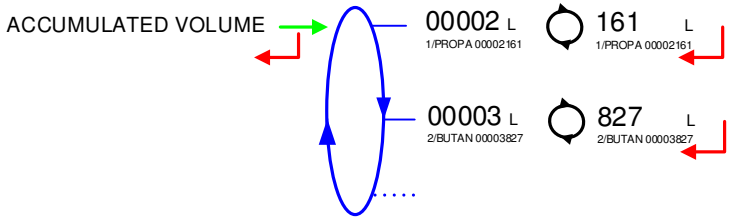
This menu is available in stand-by mode or during an intermediate stop. It allows the proofreading of totaliser and measurement results.



4.3.1 Sub-menu TOTAL INDEX

4.3.2 Sub-menu ACCUMULATED VOLUME

Display of the accumulated measured volume for each product.



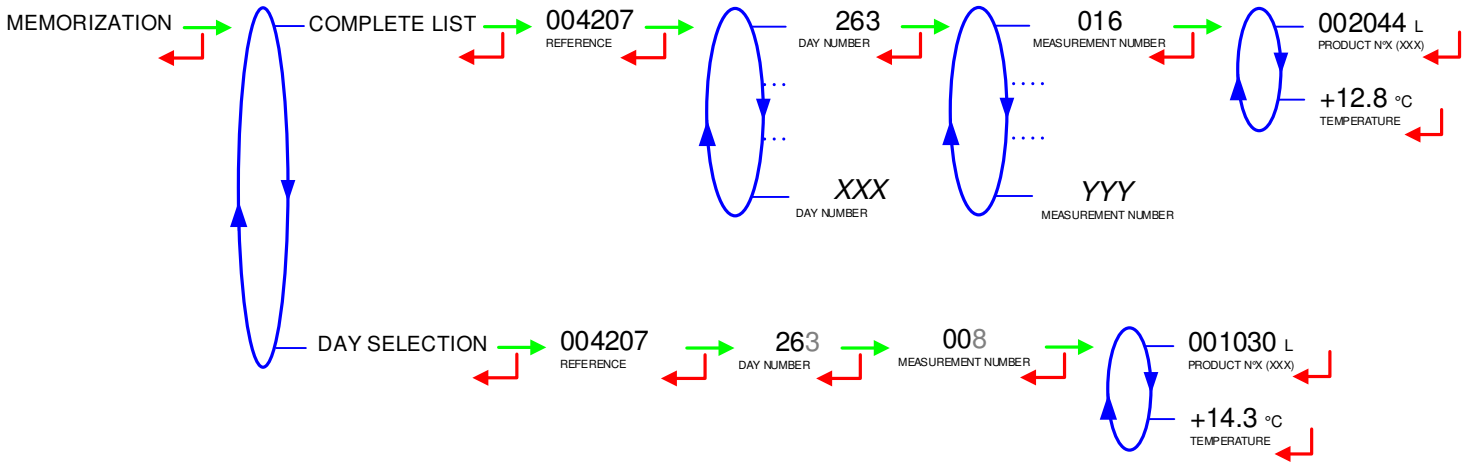
4.3.3 Sub-menu MEMORIZATION

Memorization allows the proofreading of all the measurement results stored by the calculator-indicator. That can be done in two ways:

COMPLETE LIST: Display all the measurement details recorded, from the newest to the oldest, sorted by day then by measurement number.

DAY SELECTION: Display a specific measurement by selecting the day number.

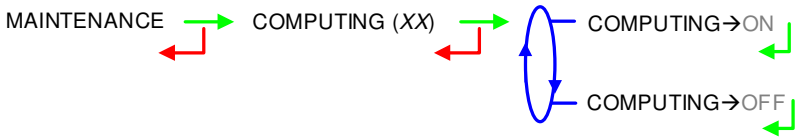
For each measurement, are displayed: the product number and name, the measured quantity, the temperature.



4.4 Menu MAINTENANCE

This menu depends on the configuration of the GPL TRONIQUE.

It is used to activate or not the operation with embedded computing. It appears if the relevant option has been configured in METROLOGICAL mode (menu EMBEDDED COMPUTING). It allows to work without embedded computing in case of failure (degraded mode).



With active option
Operating with embedded computing or not:
- ON: enable the option
- OFF: disable the option

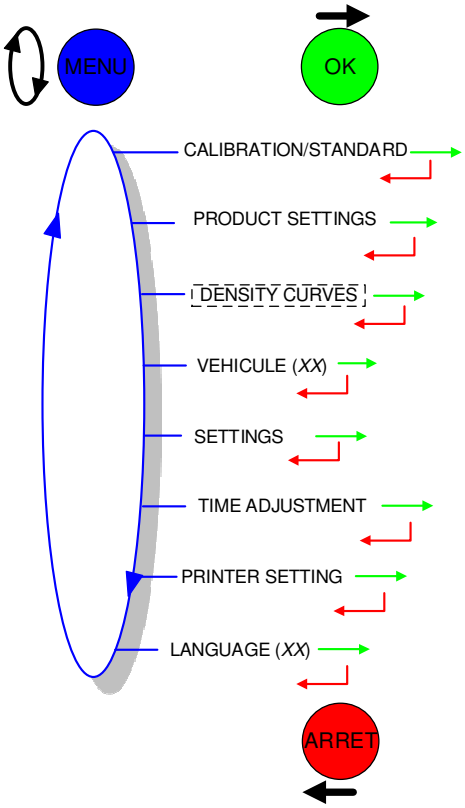
You can read the instantaneous temperature if the option is active:

With active option

4.5 List of alarms

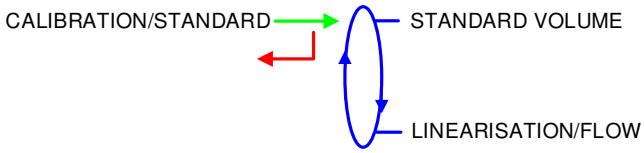
		DISPLAY	MEANING	ACTION
USER		STOP DISCHARGE	Intentional interruption of discharge	Continue or end the delivery
		COMMUNICATION DEFAULT	Communication with the printer lost	Check the connection cable, on-off switch and fuse
		POWER SUPPLY PROBLEM	Power outage during delivery	Check the cause / Restore power supply
		ZERO FLOW DEFAULT	Zero flow	Check if the pulse transmitter is powered (red indicators)
		LOW FLOW DEFAULT	Low flowrate (lower than minimal flowrate)	Check if the pulse transmitter is powered (red indicators)
		HIGH FLOW DEFAULT	High flowrate (greater than maximal flowrate)	Check the parameters / Reduce flowrate
		METERING PROBLEM	Metering problem with the measuring device	Check if the pulse transmitter is powered (red indicators)
		PTO DEFAULT	Coherence failure with power take-off	Check the power take-off status in driver's cab
		HOSE BURST	Flowrate variation caused by a hose burst	The delivery is stopped automatically
		DIARY DEFAULT	Reset of the events diary	Acknowledge the alarm, check the date in supervisor mode (supervisor key)
REPARATOR	NON BLOCKING	DISPLAY DEFAULT	Problem with display card	If steady alarm, substitution of the display card
		WATCHDOG DEFAULT	Fault with display or power card or AFSEC+ card	Switch on-off the MICROCOPT+ / If steady alarm, substitution of the faulty card
		TOTALISER LOST	Loss of totaliser	Substitution of the backup battery
		TEMPERATURE DEFAULT	Temperature determination failure	Check the temperature probe / If steady alarm, see a reparator for trouble shooting
	BLOCKING	MEMORY LOST (PILE)	Loss of saved memory	Substitution of the backup battery
		MEMORY LOST	Error on SIM memorization	Enter and exit the METROLOGICAL MODE / If steady alarm, substitution of the backup battery
		DATE AND TIME LOST	Loss of date and time	Set date and time in SUPERVISOR MODE
		COEFFICIENTS DEFAULT	Deviation between coefficient LF/HF greater than 0.5%	Modification of the low flow coefficient (K1)
		PROM DEFAULT	Loss of software or resident integrity	Substitution of the AFSEC+ electronic card
		RAM DEFAULT	Saved memory fault	Substitution of the AFSEC+ electronic card
		EEPROM MEMORY LOST	Loss of metrological configuration	Substitution of the AFSEC+ electronic card
		MEMORY OVER LOADED	SIM memory full	Substitution of the AFSEC+ electronic card

5 SUPERVISOR MODE



SUPERVISOR key, magnetic or RFID

5.1 Menu CALIBRATION/STANDARD



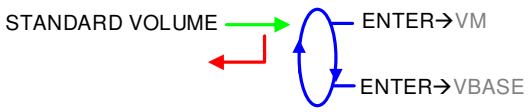
5.1.1 Sub-menu ENTER GAUGE VOLUME

This menu allows you to check the accuracy of the measuring system by calculating the measuring device error and the new corrected coefficient..

First, fill the gauge (USER mode) with predetermination of the volume.

Switch to SUPERVISOR mode, choose CALIBRATION/STANDARD>STANDARD VOLUME and validate.

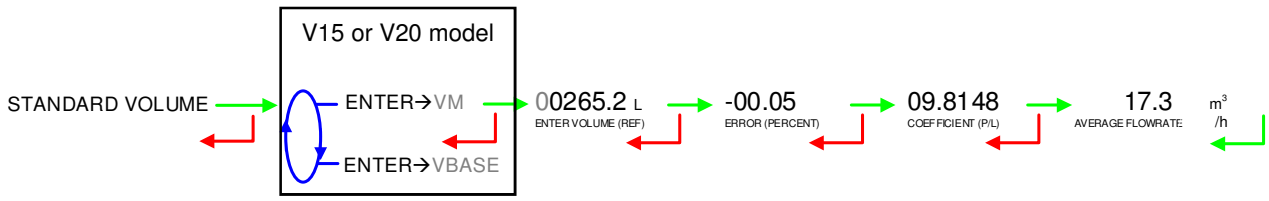
If conversion is active, you can choose to compare compensated or not-compensated volumes. If conversion is not active, this step is not proposed:



Enter the reference volume and validate. The following information is then displayed:

- The signed error in %

- The coefficient revised as a function of the error
- The average flow of the delivery.



5.1.2 Sub-menu LINEARISATION/FLOW

This menu is used to make a flow-correction for two measuring points (at low and high flowrate). The MICROCOMPT+ stores flowrate and coefficient calibrated values in order to define both correction points: at low and high flowrate.

When you validate the menu LINEARISATION/FLOW, the calibrated values are displayed; you need to unseal the MICROCOMPT+ to switch in METROLOGICAL mode and enter the values via the EMA>METER COEFFICIENT menu.

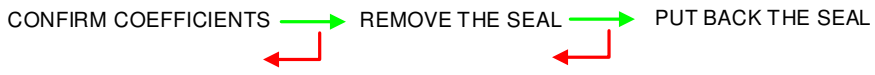
To linearise the curve, follow these instructions:

- Fill the gauge in high flow [$flow_{min}$×3]≤high flow<[$flow_{max}$], and enter the volume read on the gauge in the menu 'CALIBRATION/STANDARD>STANDARD VOLUME' as described above
- Fill the gauge in low flow [$flow_{min}$]≤low flow≤[$flow_{min}$×2], enter the volume read on the gauge in the menu CALIBRATION/STANDARD>STANDARD VOLUME as described above
- Choose CALIBRATION/STANDARD>LINEARISATION/FLOW and validate. It is then possible to read the coefficients and the flow rates data for the two tests carried out.

If the procedure failed, the following alarms may be displayed:

- LARGE GAP K1/K2: correction between both measuring points >0.5%
- FLOWS TOO CLOSE: High flowrate value is out of range. It needs to be: [$flow_{min}$×3] ≤high flow< [$flow_{max}$]
- LO-FLOW OUT OF RANGE: Low flowrate value is out of range. It needs to be: [$flow_{min}$] ≤low flow≤$flow_{min}$×2]
- ONLY ONE GAUGE: One of the tests has not been done (at low or high flowrate)
- NO VALID GAUGE: Both tests have not been done (at low and high flowrate)

When the procedure is completed, the following sequence is displayed:



The new coefficient and flow rates values are taken into account.

5.2 Menu PRODUCT SETTINGS

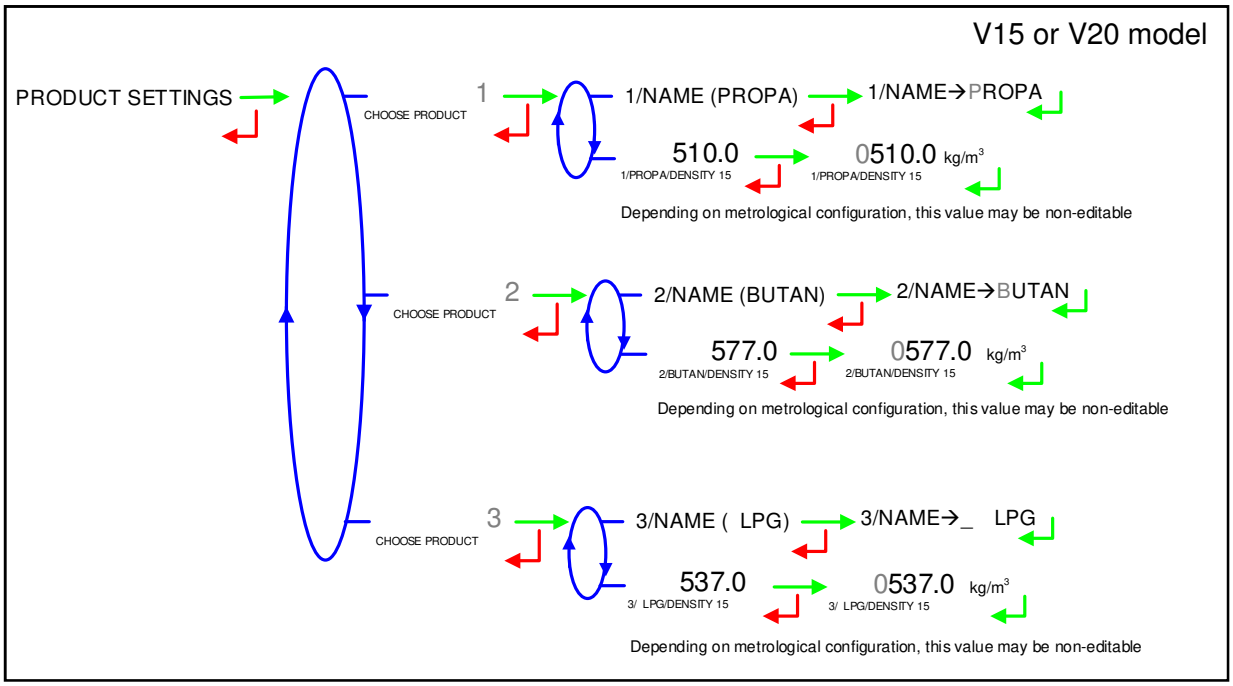
This menu depends on the GPL TRONIQUE model (V15, V20 or Vt) and on the METROLOGICAL configuration.

5.2.1 With conversion

METROLOGICAL configuration:

- CONFIGURATION>CONVERSION→AT 15° – MAIN DISPLAY→VBASE, or
- CONFIGURATION>CONVERSION→AT 15° – MAIN DISPLAY→VM, or
- CONFIGURATION>CONVERSION→AT 20° – MAIN DISPLAY→VBASE, or
- CONFIGURATION>CONVERSION→AT 20° – MAIN DISPLAY→VM.

Depending on the metrological configuration (CONFIGURATION>CONVERSION>PRODUCT SETTINGS), the setting of density may be prohibited in SUPERVISOR mode. In that case, values are displayed but non-editable. Example with V15 conversion:



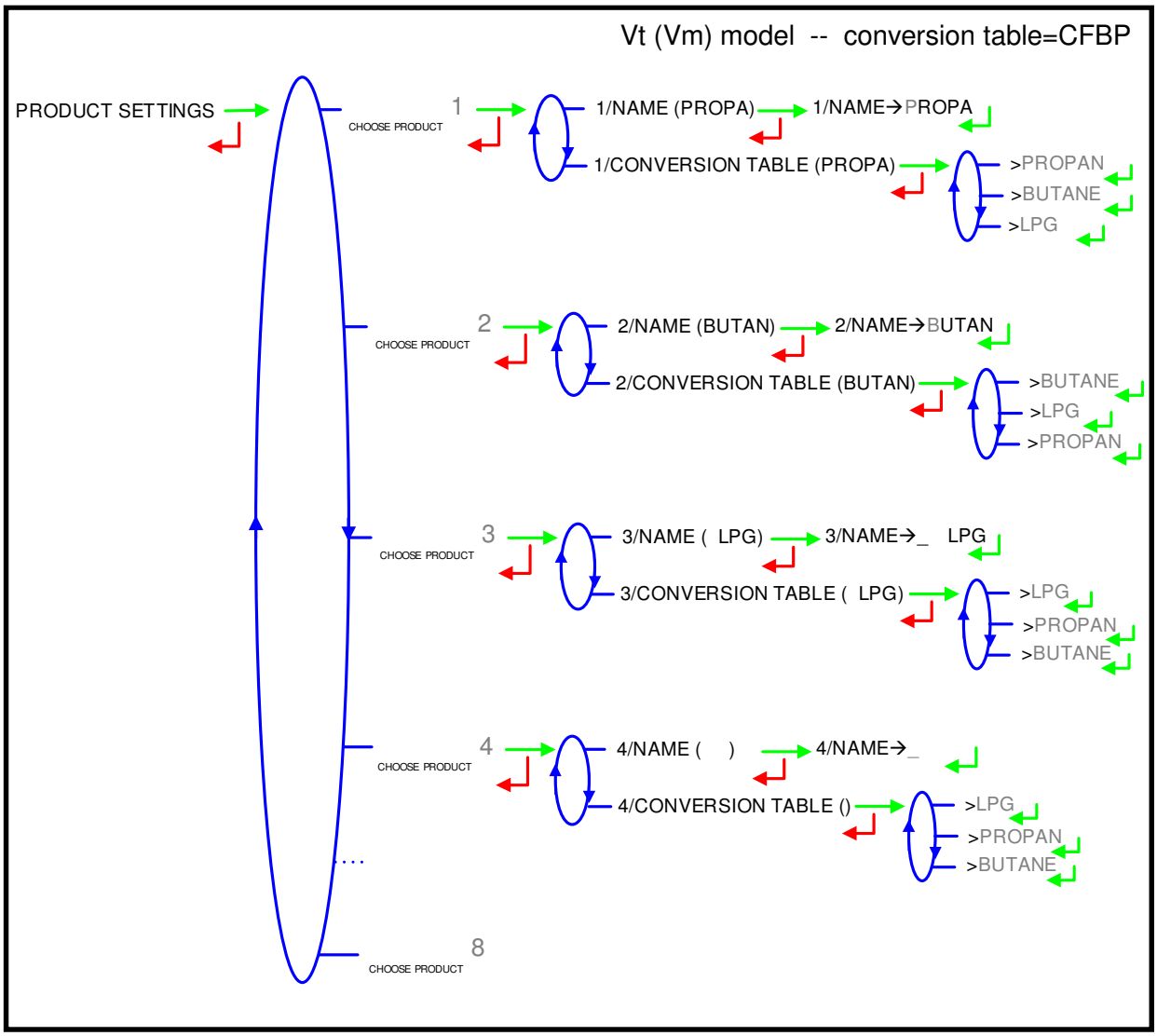
5.2.2 Without conversion

METROLOGICAL configuration:

CONFIGURATION>CONVERSION→OFF **and**

CONFIGURATION>DENSITY CALCULATION→CFBP.

A maximum of 8 products may be configured. Each time, set or validate the name and then choose the conversion table for calculation of the mass: PROPANE, BUTANE or LPG (mixture butane/propane).

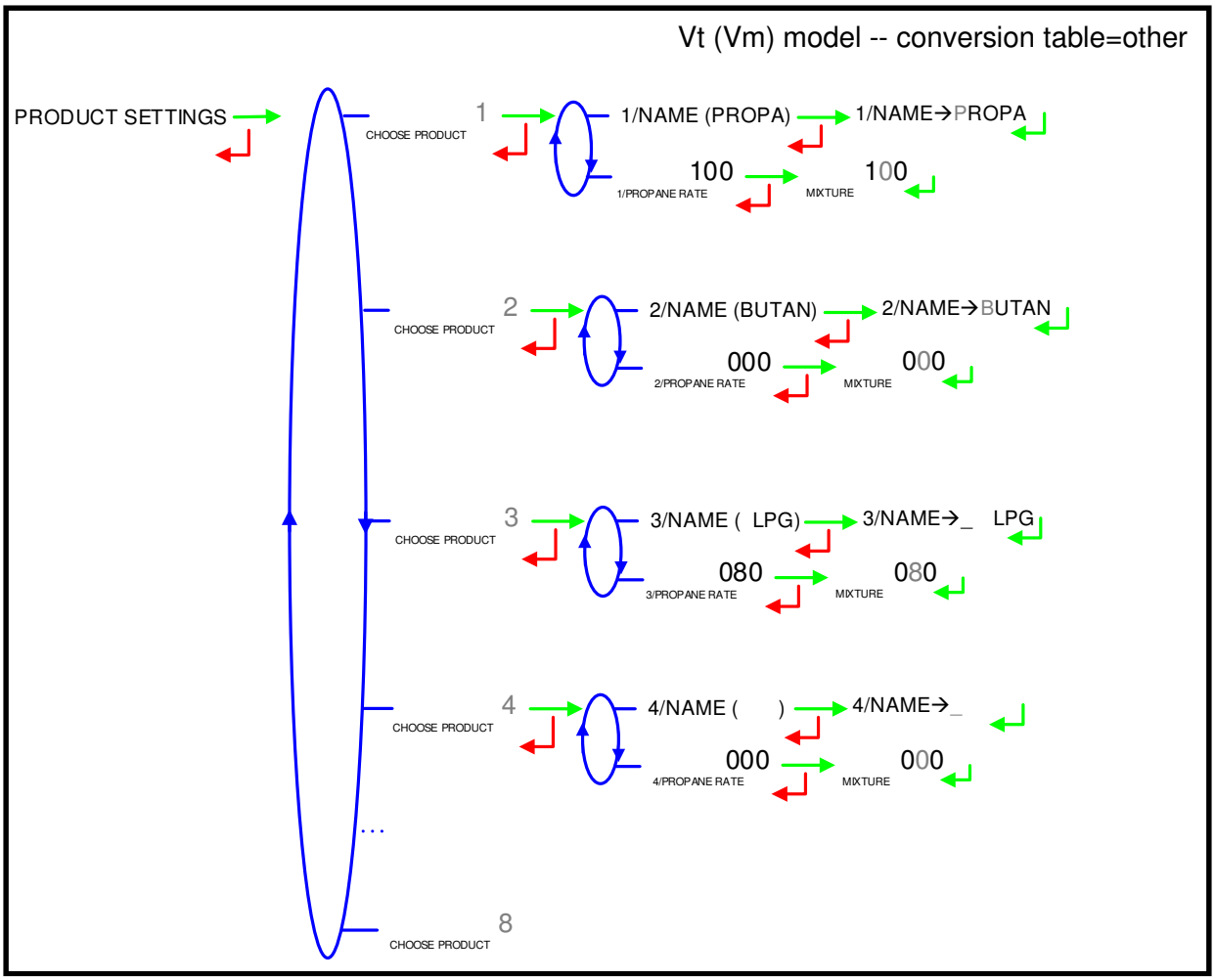


METROLOGICAL configuration:

CONFIGURATION>CONVERSION→OFF **and**

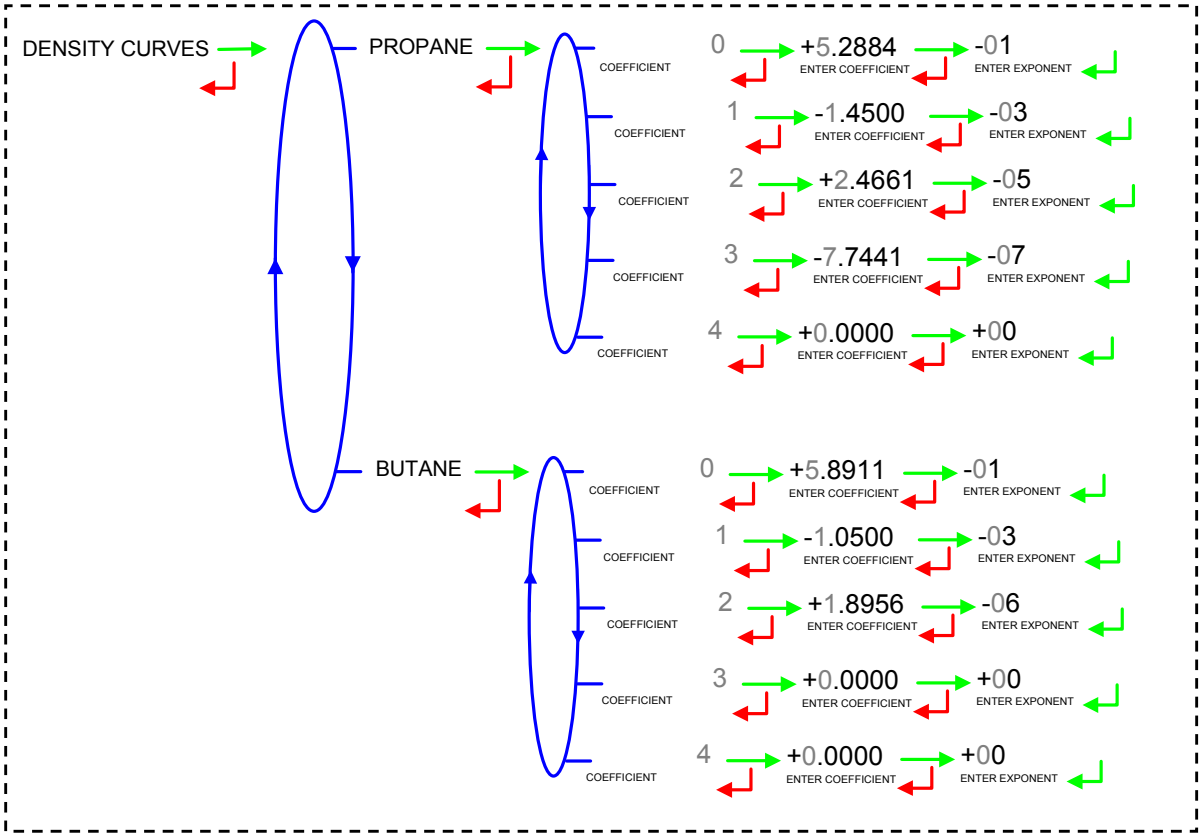
CONFIGURATION>DENSITY CALCULATION→OTHER.

A maximum of 8 products may be configured. Each time, set or validate the name and the propane rate.



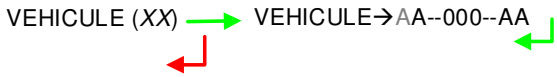
5.3 Menu DENSITY CURVES

This feature is specific: a manual curve is used for density calculation instead of conversion tables. If the option is enabled in METROLOGICAL mode (CONFIGURATION>DENSITY CALCULATION→OTHER), the coefficients of the polynomial must be entered in the menu below.

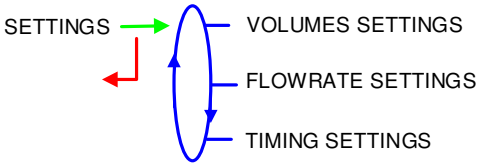


5.4 Menu VEHICULE

Enter vehicle identification: set the vehicle registry number on which the measuring system is installed. This number will be printed on delivery tickets, invoices…



5.5 Menu SETTINGS

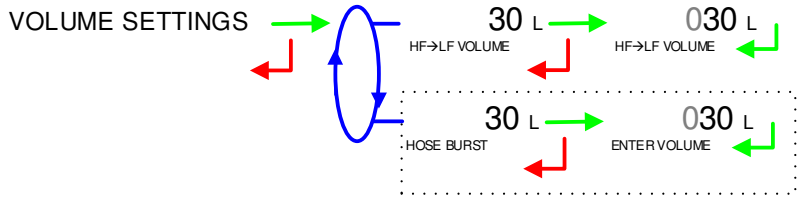


5.5.1 Sub-menu VOLUME SETTINGS

This menu allows you to configure the volume parameters:

HF→LF VOLUME: Volume (in liters) below which the GPL TRONIQUE drives the low flowrate at the end of a preset measurement. Ex: the GPL TRONIQUE will control the low flowrate 30 litres before the end of the preset volume

HOSE BURST: This menu appears if the option has been activated during the commissioning of the measuring system (CONFIGURATION>HOSE BURST menu). Volume (litres) beyond which the GPL TRONIQUE controls a material flowrate variation that may happen during a hose burst.

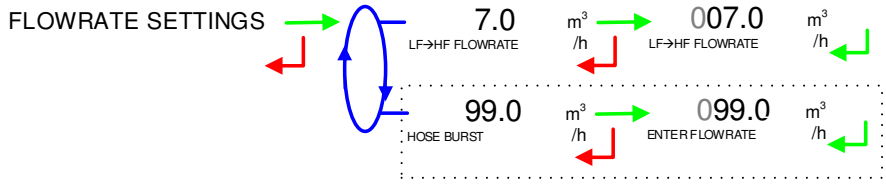


5.5.2 Sub-menu FLOWRATE SETTINGS

This menu allows you to configure the flowrates parameters:

LF→HF VOLUME: Flowrate beyond which the GPL TRONIQUE (running in low flowrate) drives the high flowrate (m^3/h).

HOSE BURST: This menu appears if the option has been activated during the commissioning of the measuring system (CONFIGURATION>HOSE BURST menu). Flowrate gradient ($m^3/h/sec$) beyond which the GPL TRONIQUE stops the delivery.



5.5.3 Sub-menu TIMING SETTINGS

This menu allows setting the duration parameters:

SHORT TIME FLOW_0: Time out (seconds) before operating the 'zero flow default' without any flow of liquid

LONG TIME FLOW_0: Time out (seconds) before operating the 'zero flow default' after a flow of liquid

T.O DECLUTCHING (S): Time out (seconds) between pushing start and declutching

T.O DECLUTCH→PTO(S): Time out (seconds) between declutching and PTO switching on

T.O PTO→VALVE (S): Time out (seconds) between PTO switching on and the valve opening

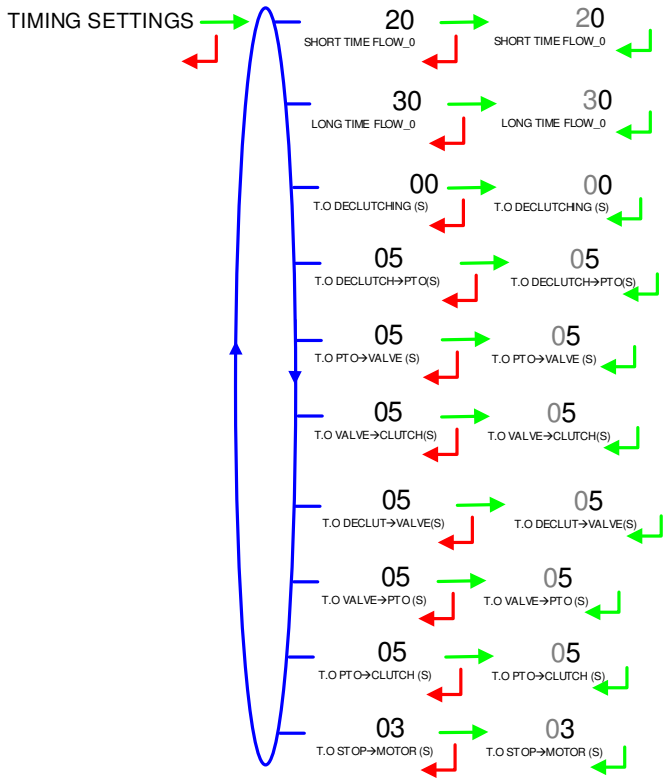
T.O VALVE→CLUTCH (S): Time out (seconds) between valve opening and clutching

T.O DECLUTCH→ VALVE(S): Time out (seconds) between declutching and the valve closing

T.O VALVE→PTO (S): Time out (seconds) between the valve closing and the PTO switching off

T.O PTO→CLUTCH (S): Time out (seconds) between the PTO switching off and the clutching

T.O STOP→MOTOR (S): Time out (seconds) between pushing stop and the engine cut.



5.6 Menu TIME ADJUSTMENT

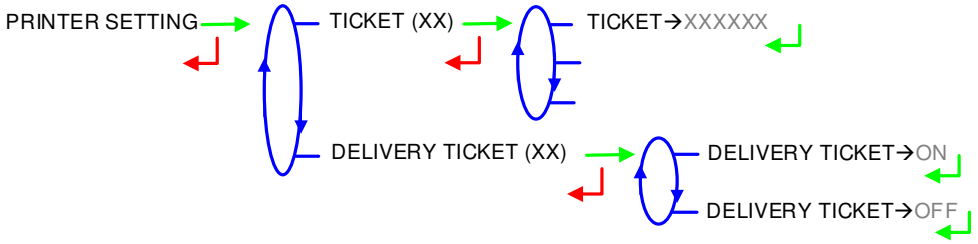
Date and time are set in METROLOGICAL mode. The hour may be adjusted (±2h) one time a day through this menu (use French format: 14.41 means 2.41 pm).

5.7 Menu PRINTER SETTINGS

This menu is used to configure printing options.

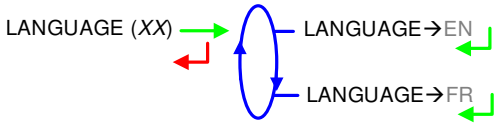
TICKET: Choose the ticket format for printing the delivery ticket.

DELIVERY TICKET: If DELIVERY TICKET→ON is chosen, the printing of the delivery ticket is proposed at the end of the delivery. If DELIVERY TICKET→OFF is chosen, the printing of the delivery ticket is not proposed at the end of the delivery; it may be printed later through the USER>PRINT>DELIVERY TICKET menu.

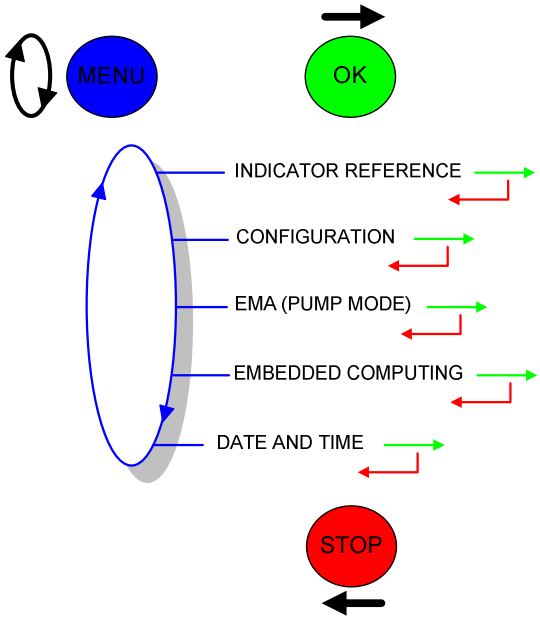


5.8 Menu LANGUAGE

This menu allows you to choose the display language. It is available if a translation catalogue has been uploaded in the MICROCOMPT+.

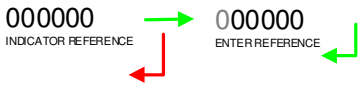


6 METROLOGICAL MODE

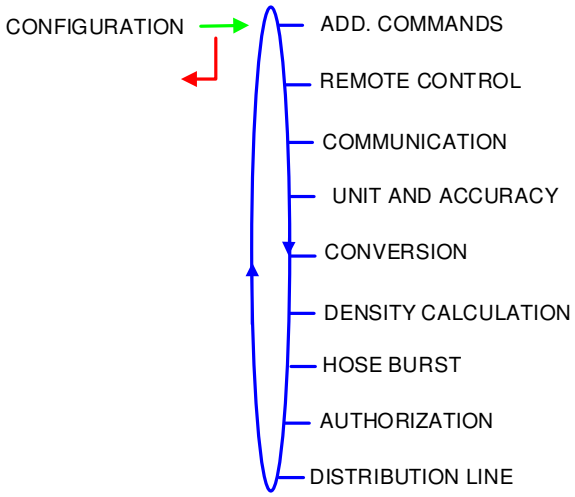


6.1 Menu INDICATOR REFERENCE

Set the GPL TRONIQUE serial number (5 numeric values).



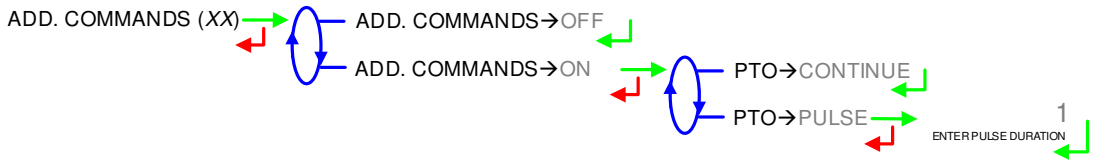
6.2 Menu CONFIGURATION



6.2.1 Sub-menu ADD. COMMANDS

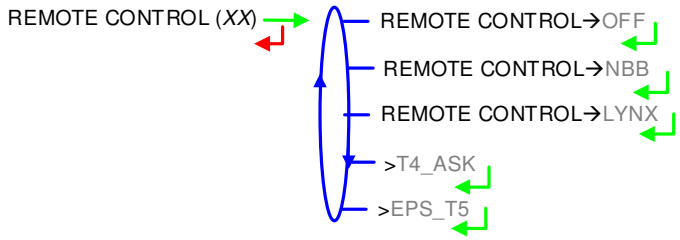
This menu allows to operating with or without additional commands.

PTO: When additional commands is active, choose the type of command for power take off: non-stop command PTO→CONTINUE or by pulse PTO→PULSE



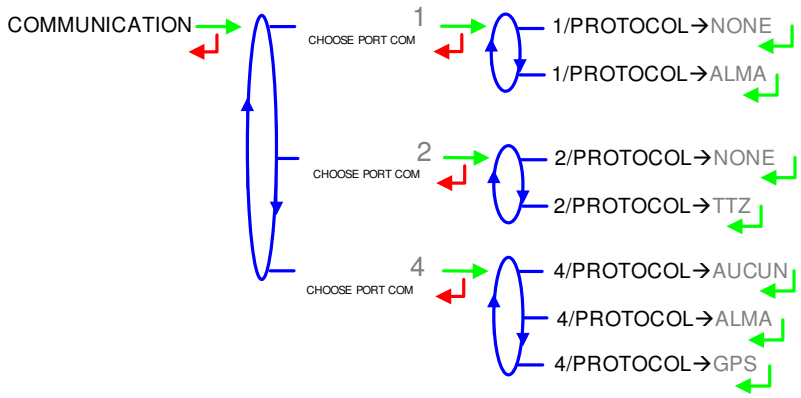
6.2.2 Sub-menu REMOTE CONTROL

This menu allows to choose the remote control model.



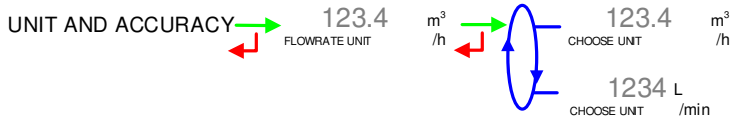
6.2.3 Sub-menu COMMUNICATION

Choose the network communication port: COM 1 (RS232), COM 2 (RS485), COM 4 (RS232) and then for each port, choose the communication protocol.



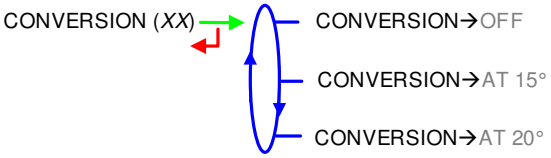
6.2.4 Sub-menu UNIT AND ACCURACY

Choose the unit of the flowrate that will be displayed and printed.



6.2.5 Sub-menu CONVERSION

This menu is used to operate with conversion of the volume at 15°C or at 20°C, or without any conversion of volume.

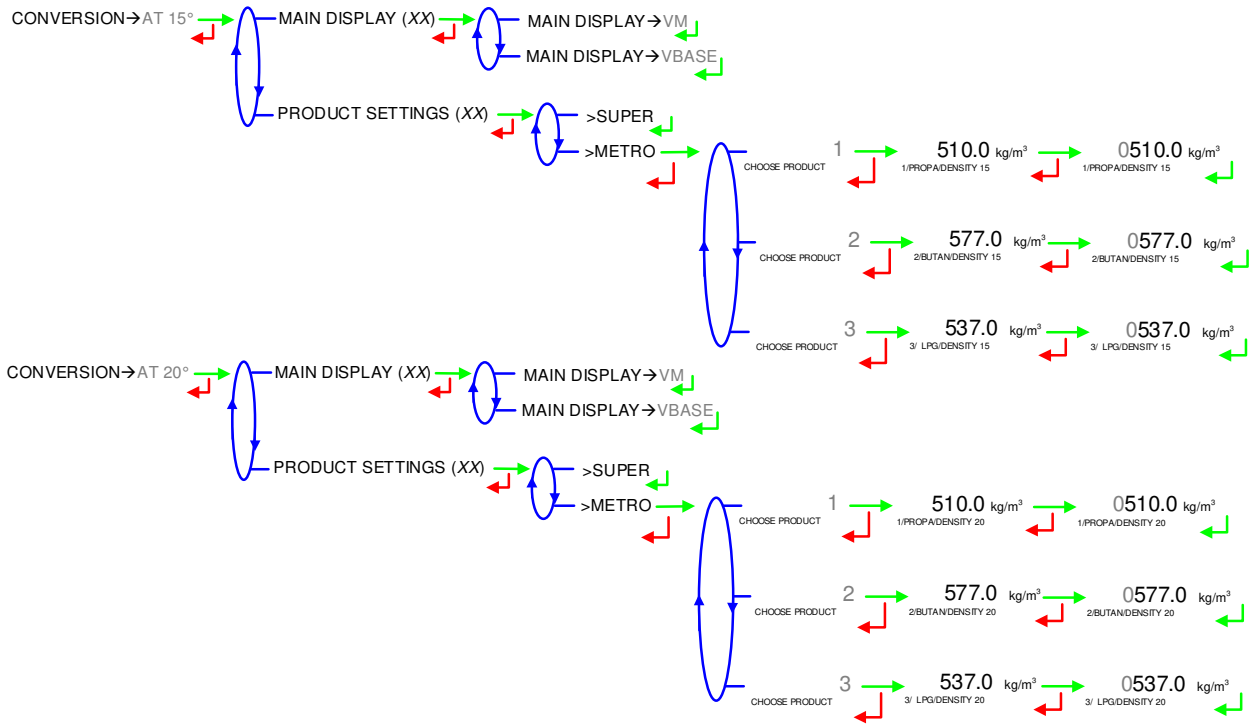


When conversion at 15°C or 20°C is active, the following parameters must be set:

MAIN DISPLAY: Choose the type for displayed volume (VM: volume in metering conditions or VBASE: volume converted to base conditions)

PRODUCT SETTINGS: Choose whether density setting is possible in SUPERVISOR or METROLOGICAL MODE.

- If **PRODUCT SETTINGS>SUPER** is chosen, the density value for each product can be set in SUPERVISOR mode with the menu PRODUCT SETTINGS.
- If **PRODUCT SETTINGS>METRO** is chosen, validate or enter the density value for each product. The non-editable values will be displayed in SUPERVISOR mode with the menu PRODUCT SETTINGS.

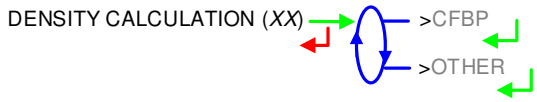


6.2.6 Sub-menu DENSITY CALCULATION

This menu is used without any conversion of volume: CONVERSION→OFF. Density can be calculated in two ways:

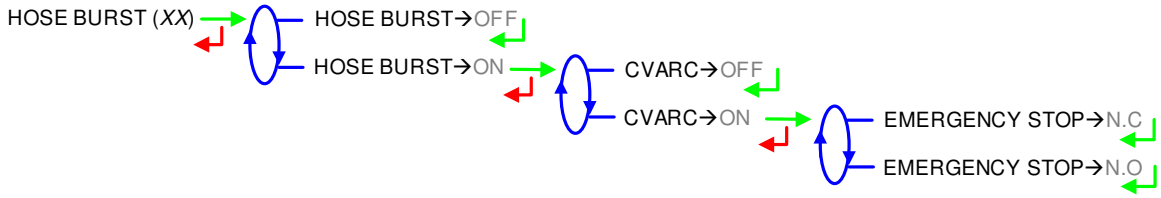
>CFBP: By using the CFBP table

>OTHER: By using another curve. If the option is enabled, the coefficients of the polynomial must be entered in the menu DENSITY CURVES of the SUPERVISOR MODE



6.2.7 Sub-menu HOSE BURST

This menu is used to configure an emergency stop in case of hose burst.

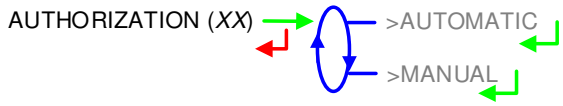


6.2.8 Sub-menu AUTHORIZATION

This menu is used to configure how the delivery starts:

AUTOMATIC: The delivery starts automatically

MANUAL: The beginning of the delivery is manual, it must be enabled by pressing OK (green button)

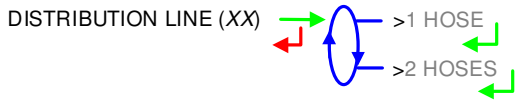


6.2.9 Sub-menu DISTRIBUTION LINE

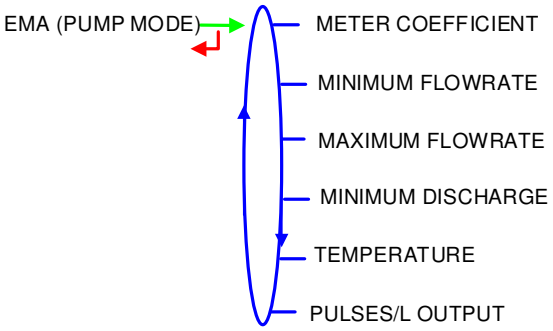
This menu allows to set the number of distribution ways:

1 HOSE: Operation with 1 hose

2 HOSES: Operation with 2 hoses.



6.3 Menu measuring system EMA (PUMP MODE)



6.3.1 Sub-menu METER COEFFCIENT

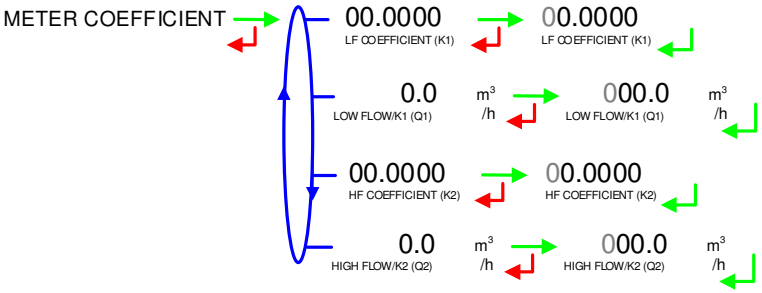
This menu is used to set the coefficient of the measuring system meter (pulses/litre)

LF COEFFICIENT (K1): Coefficient for low flow (pulses/litre)

LOW FLOWRATE/K1 (Q1): Low flow reference (m^3/h)

HF COEFFICIENT (K2): Coefficient for high flow (pulses/litre)

HIGH FLOWRATE /K2 (Q2): High flow reference (m^3/h)



6.3.2 Sub-menu MINIMUM FLOWRATE

Set the metrological minimum flowrate of the measuring system in m^3/h or l/min, depending on the configured flow unit.

6.3.3 Sub-menu MAXIMUM FLOWRATE

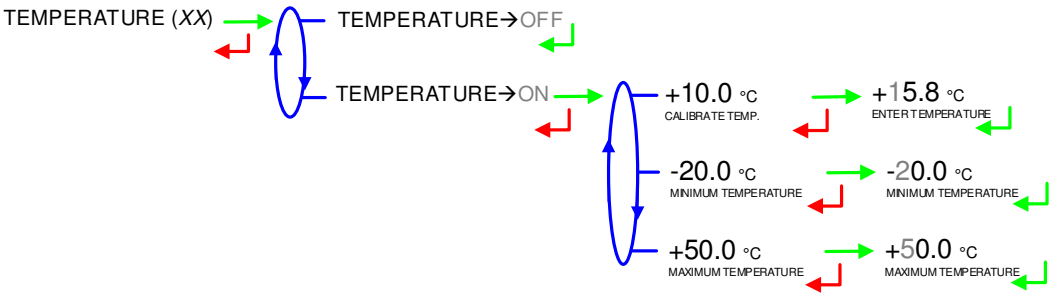
Set the metrological maximum flowrate of the measuring system in m^3/h or l/min, depending on the configured flow unit.

6.3.4 Sub-menu MINIMUM DISCHARGE

This menu is used to set the minimum quantity of the measuring system in litres, given by the association of the meter device, the MICROCOMPT+ indicating device and other parts of the measuring system.

6.3.5 Sub-menu TEMPERATURE

This menu is an option. It is used to calibrate the temperature into the MICROCOMPT+. Refer to FM 8510



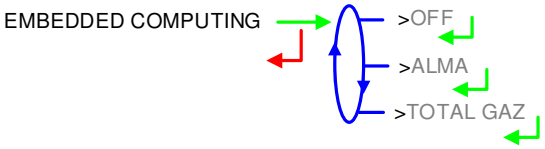
6.3.6 Sub-menu PULSES/L OUTPUT

Copy out the volume measured by measuring system.

Enter the number of pulses that the MICROCOMPT+ must generate for each display-unit counted in the totaliser. Enter a null value to disable the function

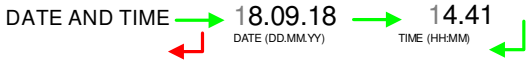
6.4 Menu EMBEDDED COMPUTING

Choose the communication for embedded computing.



6.5 Menu DATE AND TIME

Enter the day, the month and the year and validate. Then enter the time at French format and validate (e.g. 14.41 means 2.41 pm).



ANNEXE

SUMMARY

GPLTRONIQUE 384+ carte rev8
Version 3.03.04 dated 07/09/18
Printed 18/09/18 at 11h55
Vehicule : AA215EL
Indicator : 03201

Summary
of measurements of 18.09.18
Day 261 003 memorised results

Ticket number: 005

*** DAILY TOTALISERS ****

PROPA (1) : 00026000 L
BUTAN (2) : 00005000 L
LPG (3) : 00000000 L

Total from 1 to 8: 00031000 L

********** SUMMARY **********

hr beg	hr end	Nb measu	prod	(L) volume	(°C) temp
09:40	09:50	001	propa	1400	+11,3
09:51	10:01	002	buta	1200	+11,3
10:02	10:23	003	buta	0500	+10,6

TOTALISERS

GPLTRONIQUE 384+ carte rev8
Version 3.03.04 dated 07/09/18
Printed 18/09/18 at 11h55
Vehicule : AA215EL
Indicator : 03201

********** TOTALISERS**********

General totaliser: 00056638 L

PROPA (1) : 00028000 L
BUTAN (2) : 00028000 L
LPG (3) : 00000000 L

Total from 1 to 8: 00056000 L

PARAMETERS

```
GPLTRONIQUE 384+  carte rev8
Version 3.03.04 dated 07/09/18
Printed 18/09/18 at 11h55
Vehicule :  AA215EL
Indicator :  03201

********** PARAMETERS **********
EC option            : off
Remote control       : off
Conversion           : V15
Density curve        : off
Hose burst           : on
  Hose flowrate      : 99.0 m3/h
  Hose vflowrate     : 30 L
  VARC               : N.C
Authorization        : Automatic
Ticket               : xxx
Delivery ticket      : on
EMA pompe
  Coefficient K1     : 09.8148p/l
  Flowrate Q1 (PD):      5.5m3/h
  Coefficient K2     : 09.7926imp/l
  Flowrate Q2 (GD):   17.3m3/h
  Min flow: 6.0m3/h / Max:24.0m3/h
  Minimum quantity  : 000200 L
  Temperature          :+12.8 °C
Computing
     COM1  : Alma v1.10
     COM2  : None
     COM4  : None
Pulse coefficient    :    +1  imp/L
  ********** PRODUCTS **********

  PROPA   (510.0 kg/m3)
  BUTA    (577.0 kg/m3)
  GPL     (537.0 kg/m3)
  (DENSITY AT 15 SUPER)
 ********** SETTINGS **********

 LF end volume                 : 30 L
 Flowrate for HF               : 7.0 m3/h
 Short time flow_0             : 20.00
 Long time flow_0              : 30.00
 T.O declutching (s)           : 0
 T.O declutch→pto(s)           : 5
 T.O pto→valve (s)             : 5
 T.O valve→clutch(s)           : 5
 T.O declut→valve(s)           : 5
 T.O valve→pto (s)             : 5
 T.O pto→clutch (s)            : 5
 T.O stop→motor (s)            : 5
 Stop flowrate  5.0m3/h with 0.21 L
```

EVENTS RECORDED

```
GPLTRONIQUE 384+  carte rev8
Version 3.03.04 dated 07/09/18
Printed 18/09/18 at 18h20
Vehicule :  AA215EL
Indicator :  03201
Events of            18/09/18



137 recordings(s)

14:33:33 Driver mode
14:30:03 Switch on
14:24:33 Reset application
...


09:47:15 Param@15=          0
09:47:06 Param@  5=         1
09:42:57 Param@16=          2
08:59:02 Metrological mode
08:58:57 temperature default
```

RELATED DOCUMENTS

GU 7051	User Guide
FM 8001	Diagnostic support for power supply failure
FM 8002	Diagnostic support for a display failure
FM 8003	Diagnostic support for DEB_0 or ZERO FLOW DEFAULT alarm
FM 8005	Diagnostic support for METERING PROBLEM alarm
FM 8006	Diagnostic support for DATE AND TIME LOST alarm
FM 8007	Diagnostic support for MEMORY LOST or DEF MEMO alarm
FM 8010	Diagnostic support for EEPROM MEMORY LOST alarm
FM 8011	Configuration of jumpers and adjustment of metering thresholds on the AFSEC+ electronic board
FM 8013	Replacement of the backup batteries on the AFSEC+ electronic board
FM 8510	Adjustment of a temperature chain into the MICROCOMPT+ by software settings