



*Fluid Handling
Innovation*

CUBE MC
MANAGEMENT
SYSTEM
SOFTWARE



**MADE
IN
ITALY**

Use manual

EN

BULLETIN M0103 B EN_00

ENGLISH



BULLETIN MO103 B

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1 GENERAL WARNINGS

IMPORTANT PRECAUTIONS

To ensure operator safety and to protect the pump from potential damage, workers must be fully acquainted with this instruction manual before performing any operation.

SYMBOLS USED IN THE MANUAL

The following symbols will be used throughout the manual to highlight safety information and precautions of particular importance:



ATTENTION

This symbol indicates safe working practices for operators and/or potentially exposed persons.



WARNING

This symbol indicates that there is risk of damage to the equipment and/or its components.



NOTE

This symbol indicates useful information.

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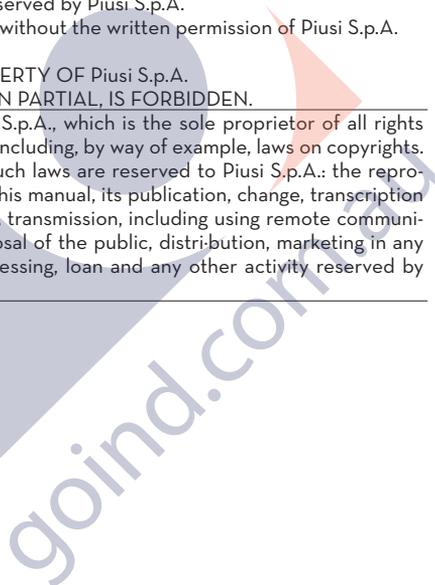
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2 WHAT IS CUBE MC?

MC is an electronic system, integrated in CUBE-MC refuelling stations, for controlling diesel fuel dispensers. The system provides:

- For the system manager: complete control over all functions, during system configuration and data collection/processing
- For users: user-friendly dispensing operations.

3 FUNCTIONS OVERVIEW

ACCESS CONTROL

MC limits access to only to authorized users. MC identifies authorized users in two alternative ways:

- a 4 digit PIN CODE.
- an ELECTRONIC KEY.

USERS

There are two kinds of users, with access privileges:

- MANAGER. Only ONE manager is allowed for every MC system. The manager is assigned a MASTER PIN CODE and/or a MASTER KEY.
- USERS. Up to 50 users are allowed for every MC system. Each user is assigned an individual PIN CODE and/or USER KEY.

NOTE



All MC systems are factory-programmed with a MASTER PIN CODE = 1234.

The system manager can change the MASTER PIN CODE. If the manager loses the MASTER PIN CODE, he will not be allowed to access the functions reserved for the manager. In this case the manager should contact our CUSTOMER SERVICE and request the "SUPER MASTER CODE," which will make it possible to retrieve the lost MASTER PIN CODE. SUPER MASTER CODES are different for each MC system and cannot be changed; they should therefore remain strictly confidential.

CONFIGURATING CUBE MC

Only the MANAGER can access configuration functions, through which CUBE MC can be customized and adapted to meet specific requirements. The main configuration operations are:

- Assigning a name to the station.
- Requesting optional inputs (vehicle plate number and/or odometer reading).
- Determining time out at start or at end of dispensing.
- Using a remote printer.
- Deciding what unit of measurement to use for dispensing.
- Connecting the system to a PC for data collection/processing.
- Changing the MASTER CODE.

MANAGING CUBE MC

Only the MANAGER can access management functions, through which he can control all operations performed with the CUBE MC station. The main management functions include:

- Creating/deleting users.
- Processing system data (memory / date / time).
- Calibrating the on-board flow meter.
- Transferring data from CUBE MC to a PC by the MASTER KEY.

OPTIONAL management functions include:

- Printing different kinds of reports on a remote printer.
- Printing a user list on a remote printer.
- Printing system configuration details on a remote printer.

DISPENSING

Dispensing functions are accessible only by USERS, who can be requested to:

- enter the vehicle's plate number or any identifying number (REG. NUMBER);
- enter the vehicle's odometer reading (ODOMETER);
- pre-select the desired amount of fuel (PRESET).

PROCESSING DATA ON PC (OPTIONAL)

Data regarding the dispensing operations, collected and stored in MC's non-volatile memory, can be transferred to a PC for further processing and permanent storage. To process the data the PC must have installed the SELF CUBE MC MANAGEMENT, provided separately as an optional feature for CUBE MC. There are two ways to transfer data from CUBE MC to a PC:

- Through an RS 485 cable connection. In this case you should install an RS 232/485 CONVERTER on the RS 232 serial port of the PC. The converter is supplied separately.
- Through the MASTER KEY. In this case you should install a KEY READER on the RS 232 serial port of the PC. The key reader is supplied separately

4 HOW CUBE MC WORKS

4.1 OPERATING MODES

MC enters the various OPERATING MODES automatically, depending on what events take place.

1 - SYSTEM MODE

In this operating mode MC performs all the functions related to access control and system management. MC automatically enters SYSTEM mode any time a user presses a button (except buttons used in LEVEL mode), or applies an electronic keyor finishes dispensing. When it is in SYSTEM mode, MC requests and accepts INPUT through the keypad and provides OUTPUT through displays or a printer.

2 - DISPENSING MODE

This is the operating mode in which fuel is dispensed. The system exits dispensing mode when a user presses STOP, when a preset quantity of fuel has been dispensed or when a certain period of time has elapsed without dispensing.

3 - MANUAL MODE

In this mode a user can dispense fuel BYPASSING MC FUNCTIONS. This is a special operating mode - it should be used only under exceptional circumstances, such as when management necessities require fuel to be dispensed without the operation being recorded and/or when you want to simplify setup or maintenance operations that require the pump to be started and stopped repeatedly.

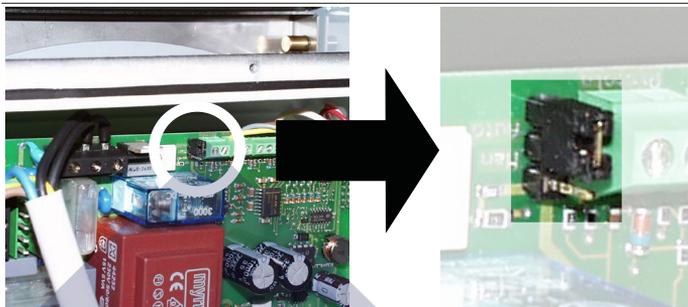
NOTE



When it is in MANUAL mode, MC does not record any dispensing operations.

To enter MANUAL mode, proceed as follows:

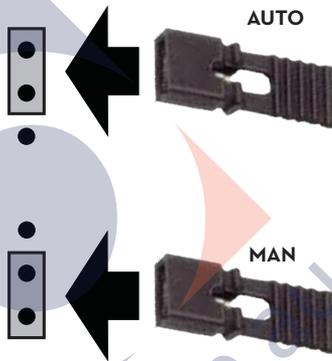
- Unscrew and remove the cover panel from the MC Box to access the circuit boards.
- Move the jumper from the position in which you find it (by default it bridges the two upper contacts in AUTO mode) to the lower position, i.e. the jumper should bridge the two lower contacts.



EN

In MANUAL mode:

- The LCDs will continue to show what was being displayed when switching from AUTO to MAN.
- No PIN CODE or KEY is necessary to start the pump; the pump starts as soon as the nozzle is lifted and stops when it is put back in its place.
- CUBE MC does not show the amount of fuel dispensed in any way.



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4.2 DISPLAYS

FOREWORD

Two backlit displays provide different information, depending on which OPERATING MODE MC is currently in.

1 - NUMERIC DISPLAY

(1 line containing 4 numeric characters)
 - In LEVEL mode shows current time
 - In SYSTEM mode shows current time
 - In DISPENSING mode shows quantity dispensed

2 - ALPHANUMERIC DISPLAY

(2 lines containing 16 alphanumeric characters)
 - In LEVEL mode shows prompt message- In SYSTEM mode shows prompt message and/or data entered- In DISPENSING mode shows unit of measurement and user data



4.3 KEYPAD

Input is provided through a membrane keypad equipped with:

- 10 alphanumeric buttons
- The following “special” buttons:

STOP
 stops the dispenser pump

NUMBER
 used in combination with other buttons for special functions

CANCEL
 cancels data or returns to previous stage

ENTER
 confirms selection or data entered

ARROW UP/ARROW DOWN
 shifts through menu functions

RIGHT ARROW/LEFT ARROW
 selects options proposed (flashing)



4.4 ELECTRONIC KEYS AND KEY READER

FOREWORD MASTER KEY

MC controls access to the system through two kinds of ELECTRONIC KEYS. The MASTER KEY is assigned to the system manager and can also be used for transferring data to the PC - it is supplied with a RED key holder.



USER KEYS

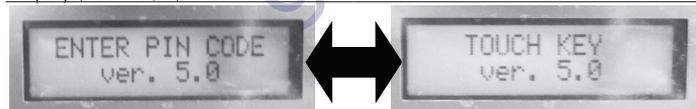
Every user is assigned a USER KEY by the plant manager than can be used only for refuelling at the pump. There are two kinds of USER KEYS:-a version with a GREEN KEY HOLDER having a four-digit code (KEY CODE) on the key-grip which is needed to identify the key at the time of user configuration;-a version with a YELLOW KEY HOLDER without the four-digit code on the key-grip. This version has an internal identification code that is automatically recognized when the key is used.



ELECTRONIC KEYS are used by pressing them to the KEY READER located on the MC's front panel.



The stations to be used with USER KEYS with YELLOW key holder indicate the software release of the station in the second line of the alphanumeric display (ex. ver. 5.0).



This message is displayed only when the station is waiting for pin code entry or key touch. It is never displayed in the menus or during dispensing.



5 USING MC CUBE

5.1 GENERAL INFORMATION

FOREWORD

To use MC and carry put the appropriate FUNCTIONS, operators must know the SOFTWARE governing the system.

NOTE



The system MANAGER should have an IN-DEPTH understanding of the software, since he is likely to use every function at one time or other; the MANAGER should therefore read and understand every part of the present manual. USERS only need to know what is necessary for dispensing.

5.2 SOFTWARE FLOW CHARTS

All the FUNCTIONS supported by the FM SOFTWARE are described in detail below and illustrated through FLOWCHARTS that show the information displayed on the LCDs in the different stages. The indications displayed on the LCDs (more often on the alphanumeric display only) are connected by arrows drawn with a continuous line, next to which the functions of the respective BUTTON are shown. When a button is pressed the display passes from one indication to the one immediately following it, connected to the first one by an arrow. In certain occasions passing from one step to the following does not depend on pressing a button but occurs automatically at the end of activities lasting an unspecified period (e.g.: printing a report); in this case the display will show a dotted line and the image of a clock.

5.3 USING THE BUTTONS

SHORT PRESS



Press button briefly and release immediately.

PRESSING TWO BUTTONS IN COMBINATION



Press first button and hold down while briefly pressing second button, then release.

APPLYING A KEY



Press key to key reader.

LIQUID CRYSTAL DISPLAY (GENERAL)

**ABCDEFGHIJL *
002 PIN 5678**

MAIN INDICATIONS ON LCD

**MASTER CODE
5678**

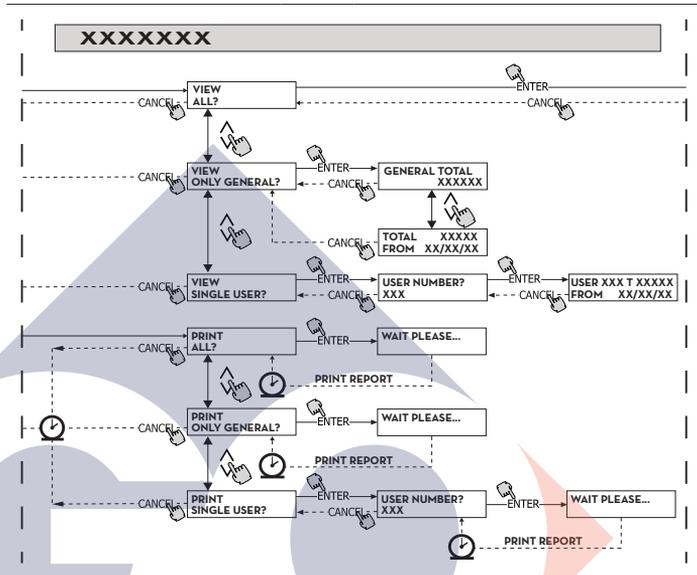
ENTER PIN CODE

INSERT KEY

FLASHING MESSAGES

ALTERNATE FLASHING MESSAGES

FLOW CHART



NOTE



CANC BUTTON

For simplicity, in some FLOW CHARTS the CANC button is not shown, although it can be used at almost any stage. Pressing the CANC button has one of the following effects:- return to previous screen, or- cancel numerical data entered.

TIME OUT

During any function, if no action is taken (pressing a button, applying a key, dispensing fuel) in a fixed period of time (TIME OUT), the system will automatically exit the function. This ensures that MC does not remain in an input-expecting mode and prevents access by unauthorized users. The TIME OUT function is not shown in the FLOW CHARTS.

6 SOFTWARE OVERVIEW

FOREWORD

All the functions provided by CUBE MC SOFTWARE are grouped in SECTIONS. Each SECTION contains functions that are consistent with each other. SECTIONS can be automatically accessed, freely accessed or access-protected by a PIN CODE.

The SOFTWARE OVERVIEW describes the available sections and gives a brief description of each function contained. The SECTIONS are:

BOOT

MC performs a self-diagnosis on the LCDs and displays the MODEL and SERIAL NUMBER.

ENTER: - automatically, at start-up.

EXIT: - automatically, when completed.

SYSTEM MANAGEMENT

Management operations (reports, enabling users, calibrating, transferring data to a PC).

ENTER: - from ACCESS CONTROL, after entering a key or a SYSTEM code number.

EXIT: - when function completed or at time out.

SYSTEM CONFIGURATION

Customizing MC for specific plant requirements.

ENTER: - from SYSTEM in SYSTEM MANAGEMENT menu.

EXIT: - when function completed or at time out.

DISPENSING

Fuel dispensing operations.

ENTER: - from ACCESS CONTROL, after entering a key or a USER code number.

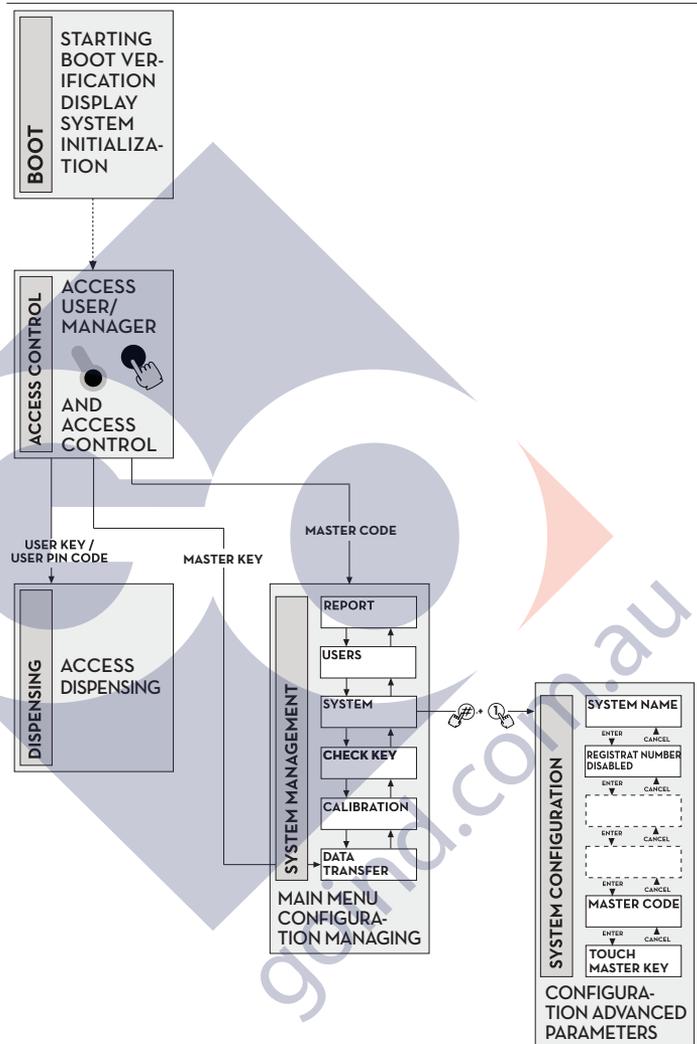
EXIT: - when function completed or at time out.

Some carry out their functions without user input (BOOT, ACCESS CONTROL).

Others require an input to perform a function (SYSTEM CONFIGURATION, DISPENSING). Input must be made in sequence, and MC prompts the user to enter the requested information. After providing the requested input the section will automatically be exited.

Other sections (SYSTEM MANAGEMENT) are more complex and appear in form of MENU. The user (in this case only the MANAGER) accesses the menu and chooses the desired function, which can itself be organized as a lower-level MENU (SUBMENU). Sections are described in detail below.

PHASES REPRESENTATION



6.1 BOOT

The BOOT section is fundamentally a TEST section, in which MC automatically carries out a number of checks. The BOOT section is performed only in one of the following situations:

- When MC is powered up (by a master switch that the installer should place between the power supply and CUBE MC).
- When, without cutting and giving power, the AUTO/MAN jumper is switched from MAN to AUTO (see Sect. 4.1).

In the BOOT section the operator can:

- make sure the displays are working properly (they light up completely for a few seconds)
- check the MODEL
- check the SERIAL NUMBER.

NOTE



The SERIAL NUMBER shown during BOOT is the S/N of the CPU mounted on MC. The S/N is required to access the data collected by MC in case you lose the MASTER KEY and the MASTER PIN CODE. If this happens, you should note down the station's S/N and contact CUSTOMER SERVICE.

6.2 TANK LEVEL ALARM

CUBE MC is designed to be connected to an optional external level alarm equipped with a normally-open dry contact. The contact closes when an alarm signal arrives. The connection must be made directly to MC's junction box through the tank cap, which should be replaced by a PG7 type core hitch. The way MC reacts when reaching alarm level depends on its configuration. LEVEL INPUT = NO / LEVEL OUTPUT = ALARM or LEVEL OUTPUT = PUMP CUTOUT

CONFIGURATION 1

MC does not react to inputs from the level sensor and takes no specific action.

CONFIGURATION 2

LEVEL INPUT = YES / LEVEL OUTPUT = ALARM

MC prints a "WARNING LOW LEVEL" message on the remote printer, if enabled, after the current dispensing is finished. Dispensing remains possible. No message appears on the LCD.

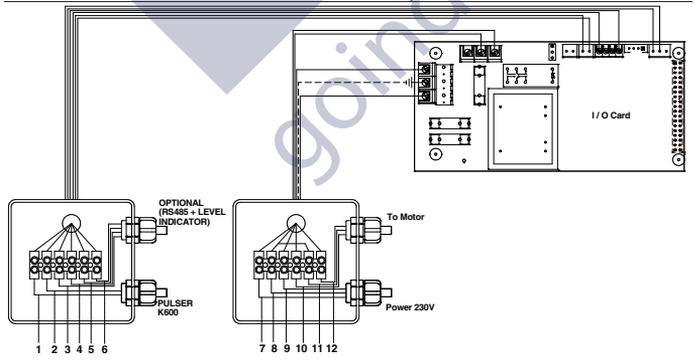
CONFIGURATION 3

LEVEL INPUT = YES / LEVEL OUTPUT = BLOCK

MC disables any further dispensing.

The LCD shows "DISPENSING IMPOSSIBLE / MINIMUM LEVEL".

LEVEL ALARMS SWITCHING DIAGRAM (OPTIONAL)



6.3 ACCESS CONTROL

FOREWORD

The system enters ACCESS CONTROL when start-up booting has been completed or when one of the following events take place:

CONTROL OF THE CODE

Pushing a NUMERIC button as first digit of the PIN CODE:

MC controls if the entered PIN CODE was previously enabled in the system, recognising if it was associated to an USER or to the MANAGER.

UNKNOWN CODE:

MC displays an unknown code message.

CODE ACKNOWLEDGED:

If it is recognised, depending on the type of enabled code:

- if it's USER PIN CODE, it enters the DISPENSING stage

- if it's MASTER PIN CODE, it enters the REPORT activity of the SYSTEM MANAGEMENT menu

KEY CONTROL

Entering a KEY in the KEY READER:

MC controls whether the entered KEY was previously enabled in the system, recognising if it's USER type (green) or MASTER type (red).

UNKNOWN KEY:

If it doesn't recognise the key as enabled, it displays the message "UNKNOWN USER KEY".

KEY ACKNOWLEDGED:

If it is recognised, depending on the type of enabled key:

- if it's USER KEY, MC enters the DISPENSING stage

- if it's MASTER KEY, MC enters the DATA TRANSFER activity of the MASTER MANAGEMENT stage menu

NOTE



Since the MASTER KEY is chiefly used for transferring data from CUBE MC to a PC (if the optional software is installed), when the system recognizes the MASTER KEY it automatically opens the DATA TRANSFER menu. Once in this menu, the user can access any other function available in the menu.

THE MANAGER PIN CODE AND THE MASTER KEY are two SIMILAR ways TO ENTER the activity menu of the SYSTEM MANAGEMENT stage, reserved to the system MANAGER only.

6.4 SYSTEM CONFIGURATION

<p>FOREWORD</p>	<p>In SYSTEM CONFIGURATION the system can be customized and adapted to the specific requirements of the fuelling station. Only the MANAGER (or the installer) can access SYSTEM CONFIGURATION, using either the MASTER PIN CODE or the MASTER KEY. To access the CONFIGURATION section: 1 - enter SYSTEM MANAGEMENT 2 - shift through the menu until you reach SYSTEM 3 - press the “#” and “1” buttons in combination.</p>
<p>SETUP CONFIGURATION</p>	<p>The system must be configured at first installation. Before configuring the system, the installer and the manager should decide which among all available options are more suitable for the fuelling plant. Configuration requires a number of OPERATIONS (selections to make or data to enter) that must be performed in sequence. For each operation the system proposes a DEFAULT value that can be edited or accepted by pressing ENTER (which leads to the next operation). Each operation is described below in full detail. The title of the sections is the same as the indications shown on the LCD in the respective operation.</p>
<p>UNIT NAME (Name of unit)</p>	<p>The name assigned to the station by the system manager. It can be left blank. DEFAULT: none OPTIONS: an ALPHANUMERICAL string of max 16 characters</p>
<p>REGISTRATION NUMBER (Vehicle plate number)</p>	<p>Determines whether the user is required to enter a name (or number) identifying the vehicle. If this option is enabled, the user must enter the required information before being allowed to refuel (the system accepts any value). DEFAULT: DISABLED OPTIONS: DISABLED (name/number not required) ENABLED (name/number required)</p>
<p>ODOMETER (Odometer reading)</p>	<p>Determines whether the user is required to enter the odometer reading of the vehicle. If this option is enabled, the user must enter the required information before being allowed to refuel (the system accepts any value). DEFAULT: DISABLED OPTIONS: DISABLED (information not required) ENABLED (information required)</p>
<p>START TIME OUT (Period before starting dispensing)</p>	<p>Determines the maximum period within which the user must start dispensing fuel from the moment the system enables the pump. If the fixed period elapses before dispensing begins, MC disables the pump and the user is required to identify himself again (using a code number or a key). DEFAULT: 60 seconds RANGE: 001 - 999 seconds</p>
<p>FILLING TIME OUT (Time allowed for interruptions to dispensing)</p>	<p>This activity is used to define the maximum time of suspension of a dispense. After starting dispense, - the user can stop it temporarily, - dispensing can automatically stop due to the intervention of the automatic gun. If dispensing suspension stage (with pump on, but without any counting), continues for a time longer than the set one, the pump is disabled and stops. To resume dispensing, the user need to be recognised by the system again (through code or key), starting a new dispensing. If during dispense suspension time the gun is placed in its dedicated housing, dispensing is definitely stopped (pump disabling). DEFAULT value: 120 sec Allowed values: from 001 to 999 sec</p>

**REMOTE
PRINTER**

Determines whether CUBE MC is to be connected, by an (optional) RS 485 serial line, to a remote printer (e.g. installed inside an office, that can be at a distance of several hundred metres) to automatically print one-line reports for each dispensing (logging) or reports requested by the manager.

NOTE


The printer must be equipped, alternatively, with:

- RS 485 serial port
- RS 232 serial port + RS 232/485 converter (supplied on request)
- Centronics parallel port + RS 232/485 converter + RS 232/Centronics converter (supplied on request)

DEFAULT: NO
Options: YES (printer connected)
 NO (printer not connected)

REMOTE SERIAL PRINTER SETTINGS (optional):

Protocol: 8 - N - 1
BAUD RATE: 2400
Word Length: 8 bit
Parity: None
Bit Stop: 1

If YES (printer connected) is selected, the following options will be proposed:

**REMOTE
PRINTER /
TYPE (Type of
remote printer)**

Determines whether the remote printer should be a:

- 80 column printer (standard office printer)
- 40 column printer (roll-paper printer for tickets)

DEFAULT: 80 COLUMNS
OPTIONS: 80 COLUMNS (80 column printer)
 40 COLUMNS (40 column printer)

**REMOTE
PRINTER /
PRINT OUT
(Type of print-
outs on remote
printer)**

Determines what kind of printouts should be produced by the remote printer:

- tickets (reproduction of a hypothetical receipt printed by the remote printer)
- automatic one-line reports for each dispensing ("logging").

DEFAULT: LOGGING
OPTIONS: LOGGING
 TICKET

**REMOTE
PRINTER /
AUTO CR-LF
(Automatic line
jumping)
NOTE**

This function customizes the commands sent by CUBE MC to the printer to meet printer settings, which may require special "line feed" instructions in order to work properly.



For the first printouts you should leave the default option on; if the printer does not print the report lines correctly, enter configuration mode and change the option.

DEFAULT: NO
OPTIONS: NO (line feed disabled)
 YES (line feed enabled)

**REMOTE
PRINTER /
LINE DELAY
(Printing delay)**

If the printer's buffer is not large enough to handle the printing spool, use this function to change the delay by which the data is sent to the printer, so to facilitate printing without losing data.

NOTE



For the first printouts you should leave the default option on; if the printer fails to receive all the data sent to it, enter configuration mode and change the option.

DEFAULT: 100 x 10 ms
Range: 100-999 x 10 ms

PC CONNECT-ED (Connected to PC - only with optional software)

Determines whether CUBE MC is to be connected, by an RS 485 serial line, to a PC running the (optional) CUBE MC MANAGEMENT software for collecting and processing the data on dispensing operations (see supplied cable connection sheet)

MEASURE-MENT UNIT (Unit of measurement)

Determines the unit of measurement used by the system.
DEFAULT: LITRES
OPTIONS: LITRES
 US GALLONS

DECIMAL DIGIT (Number of decimals)

Determines how many decimals should be shown when displaying the amount of fuel dispensed. If 2 decimals are selected, whenever more than 99.99 units of fuel are dispensed the system will automatically revert to displaying a single decimal.
DEFAULT: 1
Options: 1-2

LOW LEVEL INPUT = YES / NO

This function defines the control of the optional level contact (see sect. 4.3).
 With "YES", the input level is controlled;
 With "NO", the input level is not controlled.

LOW LEVEL INPUT = ALARM / PUMP CUT OUT

This option is visible only if the Low Level Input is set to "YES" (see also sect. 5.2). This selection defines the reply action of the electronics when the level alarm contact closes.
 If alarm is chosen, a printout on any remote printer is possible.
 If "PUMP CUT OUT" is set, MC turns off the pump and fuel dispensing is no longer enabled.

KEY READER (Electronic key reader)

Enables/disables the electronic key reader located on MC's front panel.
DEFAULT: YES
OPTIONS: YES (Reader enabled)
 NO (Reader disabled)

MASTER CODE (Manager's code)

Changes the MASTER CODE, which is factory-programmed as "1234". When you open the function the system displays the current code:
 - press "ENTER" to confirm and go to the next step
 - press any numeric button to enter a new code.

NOTE



The new code must be a 4-digit number. Enter the new code and press ENTER; MC will display both the PREVIOUS code (OLD PIN) and the NEW code (NEW PIN):

- press "ENTER" to confirm the new master code
- press "CANCEL" to cancel the changes and confirm the PREVIOUS code.

MASTER KEY (Replacing manager's key)

This function enables a new MASTER KEY in replacement of the previous one. When MC displays this message, you can:
 - exit SYSTEM CONFIGURATION by pressing "CANCEL"; the existing MASTER KEY remains enabled;
 - apply a new key to the key reader; the key will be enabled as the new MASTER KEY in replacement of the old one.

NOTE



Only one key at a time can be enabled as the MASTER KEY on any given CUBE MC station. A same key, however, can be enabled as the MASTER KEY on different CUBE MC stations.

NOTE



If at any time you want to change a option chosen during the initial configuration, proceed as follows:

- 1 - enter **CONFIGURATION** mode;
- 2 - press **"ENTER"** to confirm all the options you **DO NOT** want to change, until you reach the option you want to edit;
- 3 - go through all remaining functions by pressing **"ENTER"**, until you reach the last one (**NEW MASTER KEY**);
- 4 - exit **CONFIGURATION** mode (unless you want to change the **MASTER KEY**) by pressing **"CANCEL"**.

EN



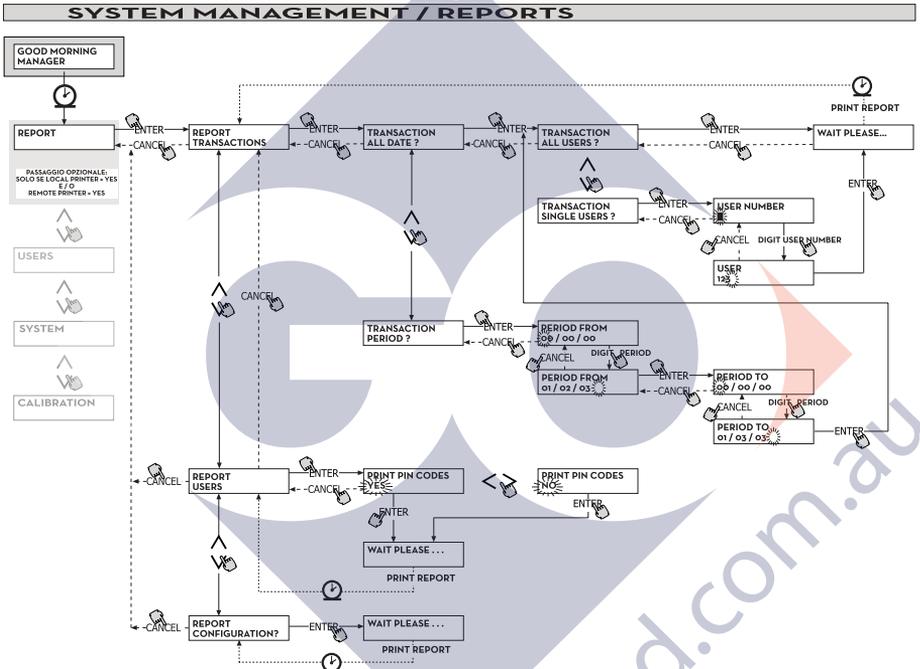
6.5 SYSTEM MANAGEMENT

FOREWORD

The SYSTEM MANAGEMENT section is used by the Manager to handle day-to-day MC operations. The section is organized in menus and submenus to facilitate access to the various functions. The main menu contains six functions, described below.

REPORT

Makes three different kinds of printouts on an (optional) remote printer, as described in the following FLOW CHART.



REPORT/ TRANSACTION NOTE

Prints all the dispensing operations (TRANSACTIONS) contained in MC's memory.



There are two ways to transfer data from CUBE MC's memory to a PC running the optional data-processing software, i.e. through a serial connection or through the MASTER KEY.

NOTE



Only transactions that have not yet been transferred can be printed, because when the data is transferred to a PC it is automatically cancelled from the station's memory.

Data printouts can be:

- complete, i.e. all transactions stored in the memory (select ALL DATE + ALL USERS);
- limited to a period of time between two specified dates (select PERIOD);
- limited to a single day (select PERIOD and enter the date twice);
- limited to a single user (select SINGLE USER) identified by his USER NUMBER (a number from 1 to 50 progressively assigned to each user).

The above limitations can be all applied simultaneously, for example when you want to print all the transactions made by a single user during a specific period of time.

SELF SERVICE	FM	08:40:56	28-03-03
TRANSACTION LIST			
DATE : 28/03/03			
TIME	USER	QUANTITY	ODOMETER REC.NUM
		(LITER)	
08:24	001	6.26	
08:37	005	4.09	
08:37	001	4.16	
08:38	001	3.11	
08:38	002	5.97	
08:38	004	2.92	
08:39	005	1.06	
08:39	003	3.06	
08:39	002	1.06	

REPORT / USERS

NOTE



Prints a list of all enabled users. There are two kinds of lists:
 1 - PRINT CODE > YES Prints a list of users, including a column showing every user's PIN CODE.
 2 - PRINT CODE > NO Prints a list of users without showing the PIN CODES.

Printouts containing user PIN CODES should remain confidential, to avoid revealing users' secret code numbers. For each user, the printout shows:

- Progressive number assigned to user (USER NUMBER)
- Name of user (USER NAME)
- User's secret code number (PIN CODE)
- Electronic key assigned to user (USER KEY)

If a user is assigned an electronic key only, the USER KEY column will contain an asterisk (*) and the PIN CODE column will show "0000". If a user is assigned a PIN CODE only, it will be a 4 digit number different from "0000" and no asterisk will appear in the USER KEY column.

SELF SERVICE	FM	08:40:46	28-03-03
USERS LIST			
NUMBER	NAME	KEY	
001	MARIO	*	
002	JOHN		
003	PAOLO		
004	ROSSI		
005	SMITH	*	
006	HENRY		

SELF SERVICE	FM	08:40:46	28-03-03
USERS LIST			
NUMBER	NAME	CODE KEY	
001	MARIO	0001 *	
002	JOHN	0002	
003	PAOLO	0003	
004	ROSSI	0004	
005	SMITH	0005 *	
006	HENRY	0006	

PRINT CODE - YES

PRINT CODE - NO



REPORT / CONFIGURATION

Prints a list of all selections made in system configuration, as described below:

For details on the single functions please see Sect. 5.5.

SELF SERVICE FM	08:40:23 28-03-03
UNIT CONFIGURATION	

REG. NUMBER	DISABLED
ODOMETER	DISABLED
START TIME OUT	050 sec
FILLING TIME OUT	120 sec
INTERNAL PRINTER	YES
TICKET RECEIPT	AUTO
REMOTE PRINTER	YES
TYPE	40 COLUMNS
PRINT OUT	TICKET REC
AUTO CR-LF	NO
LINE DELAY	10 *10 nSec
PRINT REPORT ON	BOTH PRINTERS
PC CONNECTION	NO
DISPENSING UNIT	LITERS
DECIMAL DIGIT	2
LOW LEVEL INPUT	ALARM
KEY READER	YES
OC10 PRESENT	YES

REPORT / TOTALS

Prints the GENERAL TOTAL, Period Totals (TOTAL FROM XX/XX/XX) and User Totals.

GENERAL TOTAL (CANNOT BE RESET).

Total amount of fuel dispensed from first installation of CUBE system. This value cannot be changed by the manager in any way.

PERIOD TOTAL (CAN BE RESET BY MANAGER). Total amount dispensed since last resetting. This value is the sum of all Users Totals.

USER TOTAL (CAN BE RESET BY MANAGER).

Total amount dispensed to a specific user since last resetting of Period Total. Single User Totals cannot be reset. All User Totals are simultaneously reset every time the Period Total is reset.

Totals can be displayed, printed and reset. This is done by the following sub-menus:

- TOTALS VIEW? Displays the different totals on the LCD (General Total, Period Total, User Total);
- TOTALS PRINT? Prints the different totals (General Total, Period Total, User Total);
- TOTALS RESET PERIOD? Resets the Period Total and consequently all User Totals.

SELF SERVICE 16:13:53 01-12-03 General Total : 383 LITERS Total : 83 LITERS From : 01/12/03 User ID : Name : Total : : : (LITERS) : ----- 001 : MARIO : 19 : 002 : JOHN : 16 : 003 : PAOLO : 19 : 004 : ROSSI : 21 : 005 : SMITH : 0 : 006 : HENRY : 8 :	GENERAL TOTAL PERIOD TOTAL LAST RESET- TING DATE	SELF SERVICE 16:14:26 01-12-03 General Total : 383 LITERS Total : 83 LITERS From : 01/12/03
--	---	--

TOTALS -> PRINT -> ONLY GENERAL

TOTALS -> PRINT -> ALL

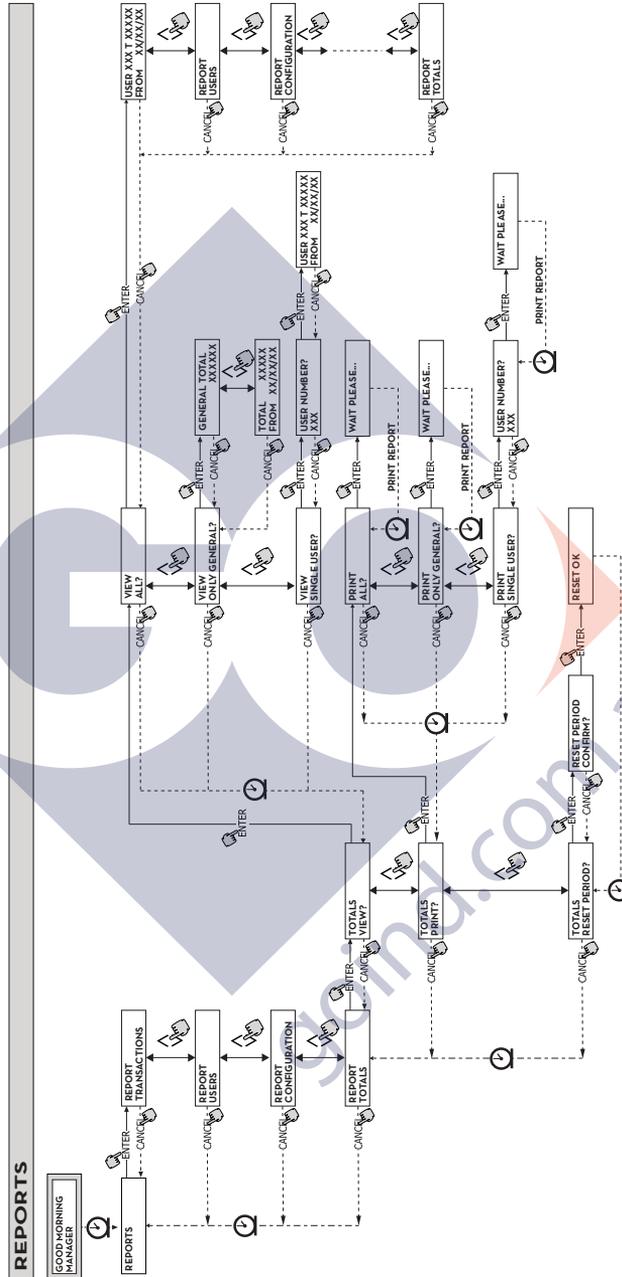
SELF SERVICE 16:14:47 01-12-03 From : 01/12/03 User ID : Name : Total : : : (LITERS) : ----- 001 : MARIO : 19 :
--

TOTALS -> PRINT -> SINGLE -> USER

Here below please find the flowchart of the REPORTS functions

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6.6 USERS

FOREWORD

This function is for managing all users enabled on CUBE MC, through four separate functions contained in a submenu.

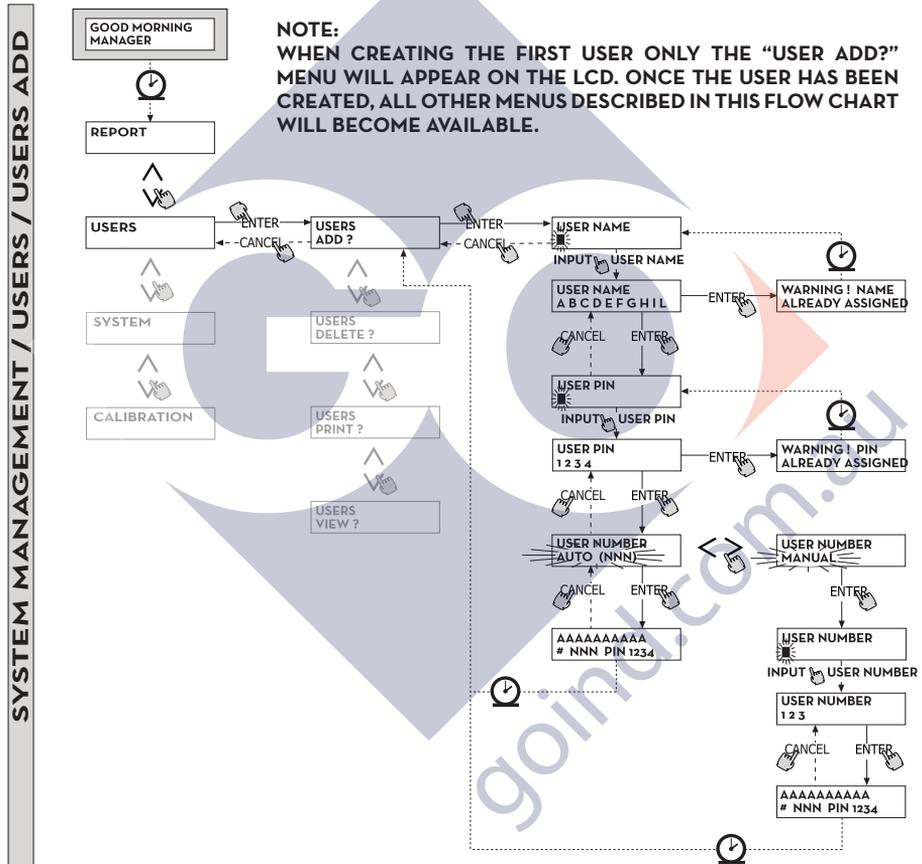
NOTE



If no user is enabled, the only function available is the creation of new users (USER/ADD)

USERS/ADD

Creates (adds) and enables a new user, as described in the flow chart below:



USER NAME

To create a new user follow the steps listed below, in sequence.
 Name of user; this is an alphanumeric field containing from 1 to 10 characters.
 THIS FIELD MUST BE FILLED.



USER PIN

Secret individual code number assigned to each user.
 The options are USER PIN > YES / NO.
 If the option USER PIN > NO is selected, the user is not assigned a secret code but only an electronic key, and the system request the key to be applied to the reader (see below).
 If the option USER PIN > YES is selected, the user's secret individual code (a numeric field containing from 1 to 4 characters) must be entered.

NOTE



At this stage of assigning a user PIN you always have to enter 4 digits. For example, if you want to assign the number "4" as a user's PIN number, you must enter "0004". When refuelling, however, the user only needs to enter "4". If the user enters a USER PIN assigned to another user, MC will not accept it and will ask for another code.

ELECTRONIC KEY

The options are ELECTRONIC KEY > YES / NO.
 If the option ELECTRONIC KEY > YES is selected, the system will ask you to press the key to the key reader, displaying the message TOUCH USER KEY, in order to assign that specific key to the user. The system will exit this stage only when a key is pressed to the reader and pass to the entry stage of the 4-figure code applied on the key.
 If the key has already been assigned to a different user enabled on the same station, the system will not accept the key and display the message "WARNING KEY ALREADY ASSIGNED".

NOTE



Only USER KEYS can be assigned to users. The system will not assign a MASTER KEY to a user.

KEY CODE

The KEY CODE is the 4-figure code applied on the handle of the USER KEY enabling the User Key to be identified by the station. This code is used only during the user's configuration; the final user does not need it in daily use. If the key code is lost or damaged, the user key cannot be configured again but its daily use is possible if previously configured.

NOTE



The key code is required only on models which are provided with Green User Keys. No code is required on models which are provided with Yellow User Keys.

USER NUMBER NOTE



A number from 1 to 50 progressively assigned to every user.
Unlike PIN CODES, USER NUMBERS can be revealed, because they are simple numbers that are associated to users to make it easier for the manager to process user data (printouts and transactions).

The options are USER NUMBER > AUTO (NNN) / MANUAL.
 If the option USER NUMBER > AUTO (NNN) is selected, the user is automatically assigned the number (NNNN) displayed, which is the lowest available number, i.e. not assigned to any other user.
 If the option USER NUMBER > MANUAL is selected, the manager can assign any available USER NUMBER that has not yet been assigned.
 If a USER NUMBER is entered that has been assigned to another user, CUBE MC will not accept it and ask for a new number.
 In both cases (automatic or manual selection), when the selection is confirmed by pressing "ENTER", the system displays all user data for a few seconds and then returns to the USER / ADD menu.

NOTE



The system does not allow partial changes to user data. If data entered and confirmed when creating and enabling a user is found to be incorrect, you must:
- delete the user (see Sect. USERS/DELETE)
- create a new user with correct data.

USERS / DELETE

Deletes enabled users, as described in the flow chart below. To select the user that you want to delete, enter his USER NUMBER. The system will display all the information regarding the user and ask you to confirm deleting the user.

NOTE



DELETE is non-reversible: once a user is deleted he cannot be restored other than by creating a new user. Deleting a user means that:
- the PIN CODE or USER KEY assigned to the user will no longer be accepted to authorize dispensing;
- the USER NUMBER assigned to the deleted user can be assigned to a new user;
- the USER KEY assigned to the deleted user can be assigned to a new user.

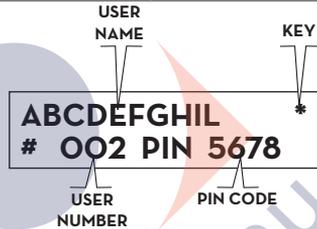
USERS / PRINT

Prints a list of enabled users. Details and printouts regarding this function are the same as those described in Sect. 5.5-REPORT/USERS

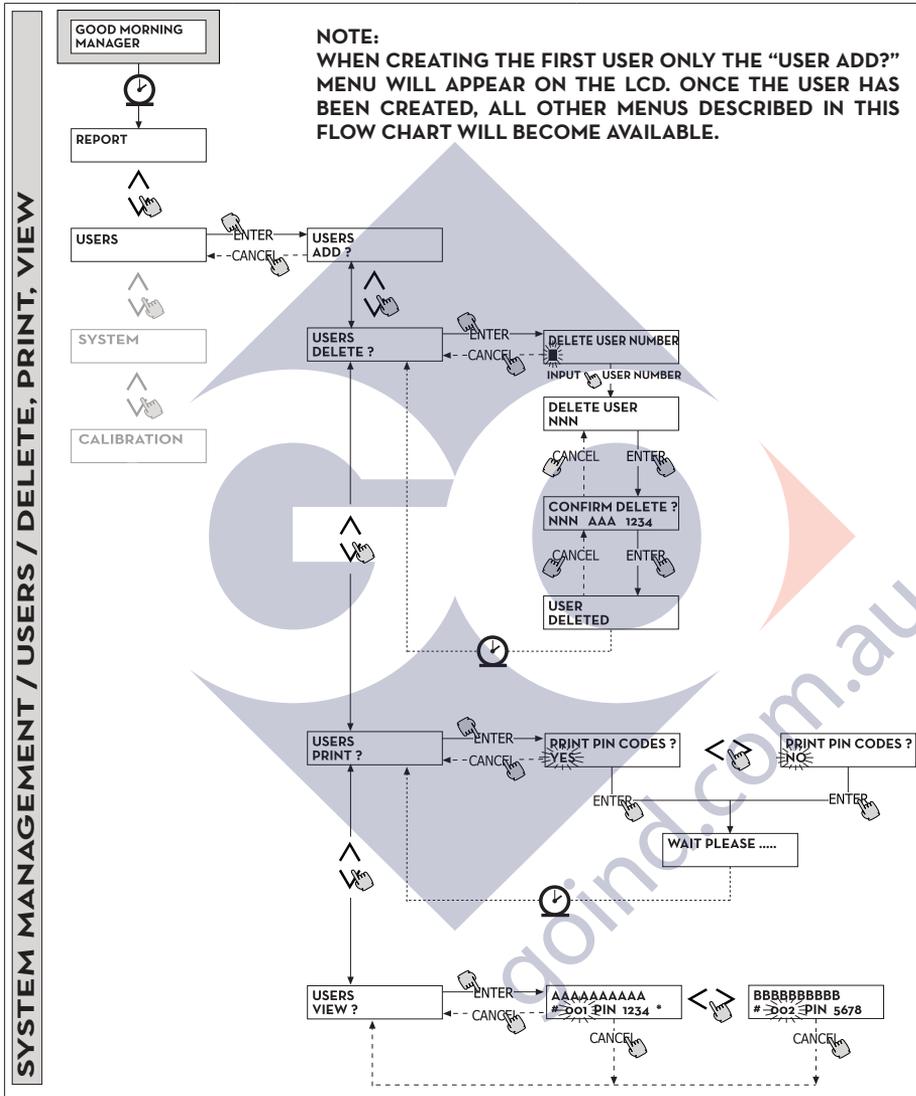
USERS / VIEW

Displays all enabled users. The following information is displayed for each user:

- USER NUMBER
- USER NAME
- PIN CODE
- KEY (if assigned)



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6.7 SYSTEM

FOREWORD

Lets you enter SYSTEM CONFIGURATION (typically used at first installation) described in Sect. 5.5, and also a submenu containing the following four functions.
Displays the SERIAL NUMBER of MC's circuit board.

SYSTEM / SERIAL NUMBER NOTE



This SERIAL NUMBER identifies the circuit board only and is NOT RELATED to the S/N of the station, which appears on the NAMEPLATE affixed to the station.

There are two other ways to display the station's S/N for which neither the MASTER CODE nor the MASTER KEY are necessary:

- 1 - Use the master switch to turn power off and on again; during the BOOT phase the system will briefly display the S/N.
- 2 - In the LEVEL CONTROL section:
 - Press STOP to enter "ACCESS CONTROL"
 - Press "#" and "9" in combination; the system will display the station's S/N.

SYSTEM / MEMORY

Opens a submenu that controls the station's memory, as follows:

1 - SYSTEM / MEMORY / VIEW

Shows how much memory is available, by displaying how many of all 255 memory locations are currently used. Occupied memory locations are made free when:

- The data stored in MC's memory is transferred to the MASTER KEY and then to a PC running the (optional) data processing software. This operation can be done whenever the Manager considers it necessary.
- The data stored in MC's memory is transferred to a PC through an RS connection. This occurs automatically in a few seconds, provided the CUBE MC MANAGEMENT software running on the PC has been launched.

NOTE



Printing transaction details is not considered "data transfer" and therefore does not free occupied memory locations.

If neither of the above data transfer operations is performed, the memory can fill up completely (message displayed: USED MEMORY 255/255); when this happens MC will allow no more transactions and the LCD will display a "FULL MEMORY " message. In this case the Manager must clear the memory in one of the following ways:

- by transferring the data to the MASTER KEY;
- by connecting the station to a PC through an RS 485 line;
- by clearing memory locations through a "MEMORY RESET".

2 - SYSTEM / MEMORY / RESET

Clears all occupied memory locations, allowing the system to record new transactions. The function can be performed regardless of whether the memory is occupied totally or in part.

NOTE



After a "MEMORY RESET" it will no longer be possible to print nor transfer the cancelled data. The "MEMORY RESET" function should therefore be printed before permanently cancelling the data.

Sets the current date and time, which are be required when recording transactions.

SYSTEM / DATA / TIME NOTE

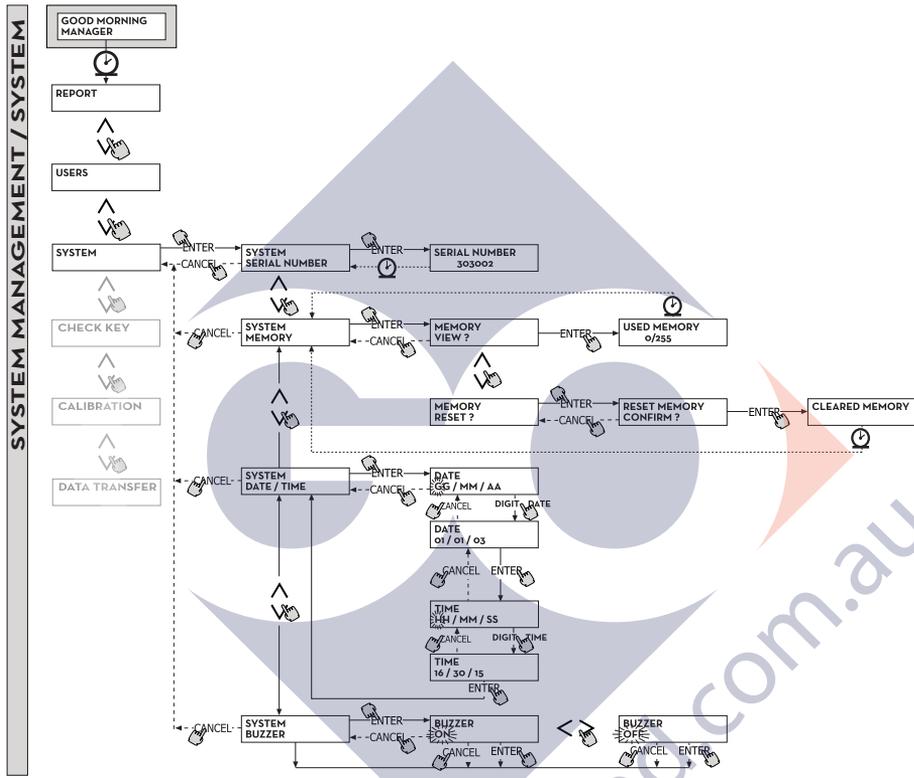


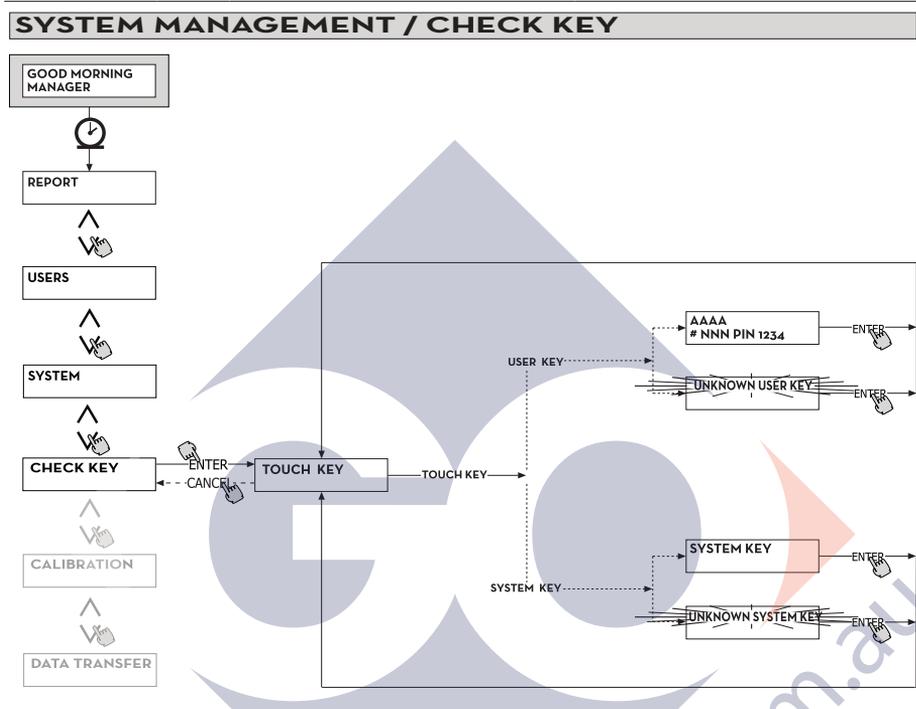
The system contains a perpetual calendar that changes year automatically, including leap years. The calendar DOES NOT pass automatically from solar time to daylight-saving time.

SYSTEM / BUZZER

Associates a sound (BUZZ) to each pressing of a button.

Here below please find the flowchart of the SYSTEM functions





6.9 CALIBRATION

FOREWORD

Opens a submenu where you can check or edit CALIBRATION settings and the K600 FLOW METER/PULSER settings.

1 CALIBRATION VIEW

Displays the CALIBRATION FACTOR in use. All K600 flow meters/pulsers are factory-calibrated for use with DIESEL FUEL, and will display "K FAC 1.0000" as the calibration factor. Calibration changes the K FAC from 1.0000 to another value.

NOTE



Calibration is performed to optimize flow meter accuracy. After calibration, the K FAC will be different from 1.0000 by no more than 5% (higher or lower), i.e. it should remain between 0.9500 and 1.0500. If the difference is larger than 5%, calibration may have been done improperly.

2 CALIBRATION MODIFY CALIBRATION/ DIRECT

Opens a submenu providing two alternative means of calibrating the flow meter.

DIRECT calibration changes the calibration factor (K FACTOR) directly. This is useful when you want to change the calibration f

ATTENTION

Any correction to the K FACT must always be based on the current value. For example, if the current calibration factor is 1.0120 (which is itself the result of a previous calibration, since the factory-set value is 1.0000), and the following conditions are observed:

- Flow meter readings are “on average” 1.5% higher than the “true” reading. Thenew K FACT should be calculated to compensate the mean error observed, as follows:(new) K FACT = $1.0120 * (1 - (1.5/100)) = 0.9968$

- Flow meter readings are “on average” 0.8% lower then the “true” reading. The new K FACT should be calculated to compensate the mean error observed, as follows: (new) K FACT = $1.0120 * (1 + (0.8/100)) = 1.0200$

**CALIBRATION/
BY
DISPENSING**

CALIBRATION BY DISPENSING calibrates the flow meter by dispensing fuel into a GRADUATED CONTAINER of known capacity.

This is the quickest and easiest way of calibrating the flow meter and requires no calculations. Calibration by dispensing can be suspended and restarted at will, and is considered complete when the fuel level can be seen in the container’s graduated section. Press “ENTER” to confirm the end of the calibration dispensing.

NOTE

To calibrate the flow meter properly you should use an accurately graduated container with a capacity of no less than 20 litres. In particular, you should:- Remove all air from the pump, hoses, tubes and flow meter by pumping until the flow is full and regular.- Stop the flow by switching off the nozzle but not the pump.- Do not reduce flow when nearing the container’s graduated section.

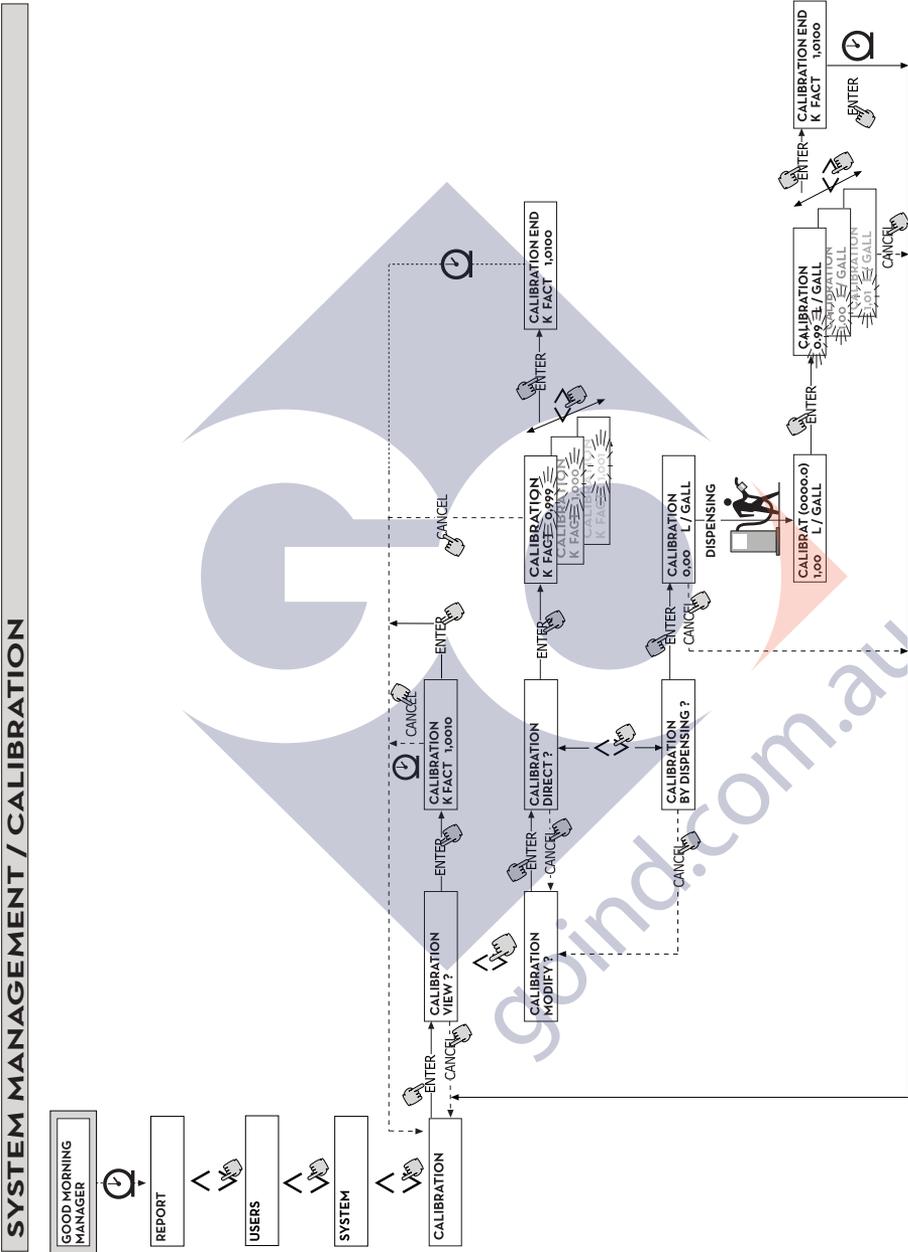
THE CORRECT PROCEDURE IS TO START AND STOP DISPENSING AT A CONSTANT RATE UNTIL REACHING THE DESIRED LIMIT, IF POSSIBLE WITH NO INTERRUPTIONS.

If the quantity displayed by CUBE MC is different from the quantity observed in the graduated container (the “TRUE READING”), the quantity displayed by CUBE MC will have to be changed to the TRUE READING. Press “ENTER” to confirm the correction; the system will recalculate the calibration factor and display the new value for a few seconds. The new calibration factor will remain effective until a new changed.

NOTE

A single dispensing is enough to calibrate the flow meter properly. After calibrating the flow meter, always check the results to make sure the instrument’s accuracy has is within acceptable limits. To do so, make a normal dispensing applying a User Code and not the Master Code.

Here below please find the flowchart of the CALIBRATION functions



6.10 DATA TRANSFER

FOREWORD

Enables the transfer of dispensing data from the station's memory to the memory in the manager's electronic key (MASTER KEY).The data can then be transferred from to key to the mass storage system of a PC equipped with a KEY READER and running the SELF SERVICE MANAGEMENT software.

NOTE



For information on installing the software and transferring data to PC, please consult the specific manual, provided with the (optional) SSM2018 software.

When you press a key against the key reader, the system identifies the key and displays one of the following messages:

1 UNKNOWN MASTER KEY

This means that the key has been identified either as a USER KEY or as a MASTER KEY that is not enabled on that station.

2 KEEP IN PLACE / WAIT

This message means all of the following:

- the key has been identified as the station's MASTER KEY;
- the station contains stored data that has not yet been transferred;
- the key is "EMPTY", i.e. it has already been used to transfer data to PC.

NOTE



The MASTER KEY is "EMPTY" when no data on DISPENSING OPERATIONS is present in its memory. The MASTER KEY is considered "FULL" (message: FULL SYSTEM KEY) when it is storing AT LEAST ONE dispensing operation. When you download ANY NUMBER (from 1 to 255) of transactions from a station to a key, the key passes from EMPTY to FULL and it will not be possible to add any more data to the key's memory. To use the key again to transfer data from the station to the PC you must:- transfer to PC all the data stored on the key; this will "EMPTY" the key;- transfer new data from the station to the key;- empty the key again by transferring the data to the PC. A key can be enabled as a MASTER KEY for more than one station. For the reasons explained above, however, it can be used to transfer to a PC only the data of ONE STATION AT A TIME.

After transferring the station's data to a key, the system will briefly display a message saying whether transfer was successful ("OK") or not ("FAILED").If data transfer was completed successfully ("OK"), the key is considered "FULL" (FULL MEMORY KEY), otherwise it is still "EMPTY" and you should transfer the data from the station to the key again.

NOTE



Depending on the number of transactions stored, transferring data from a station to a key can last from less than one second to a few seconds. During data transfer the key should be held firmly against the reader in the correct position until the system confirms that transfer has been completed; moving the key during a data transfer may cause the transfer to fail.

**FULL
MASTER KEY**

This message means that the key is "FULL" and should therefore be downloaded on a PC. The following two situations may occur:

- 1 - The station's memory is NOT FULL, meaning that there are less than 255 transactions stored. In this case, even if the memory cannot be emptied, it still remains possible to carry out other transactions, up to a maximum of 255.
- 2 - The station's memory is FULL, meaning the station is storing 255 transactions that have NOT YET BEEN TRANSFERRED. In this case no further transaction is possible until the station's memory has been cleared. The system displays the message "CONFIRM M. KEY / OVERWRITE?". Pressing ENTER will authorize the system to overwrite 255 new transactions on the data stored on the key and not yet transferred to PC.

NOTE

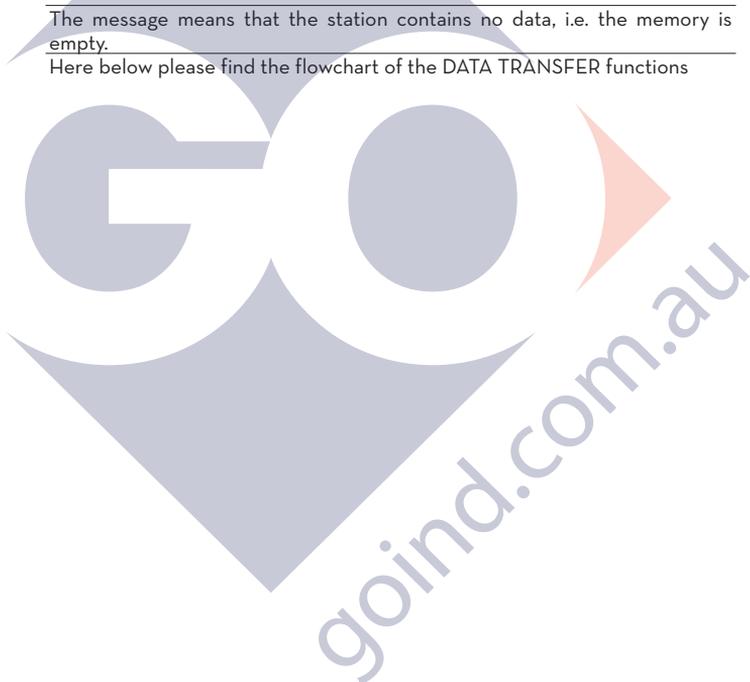


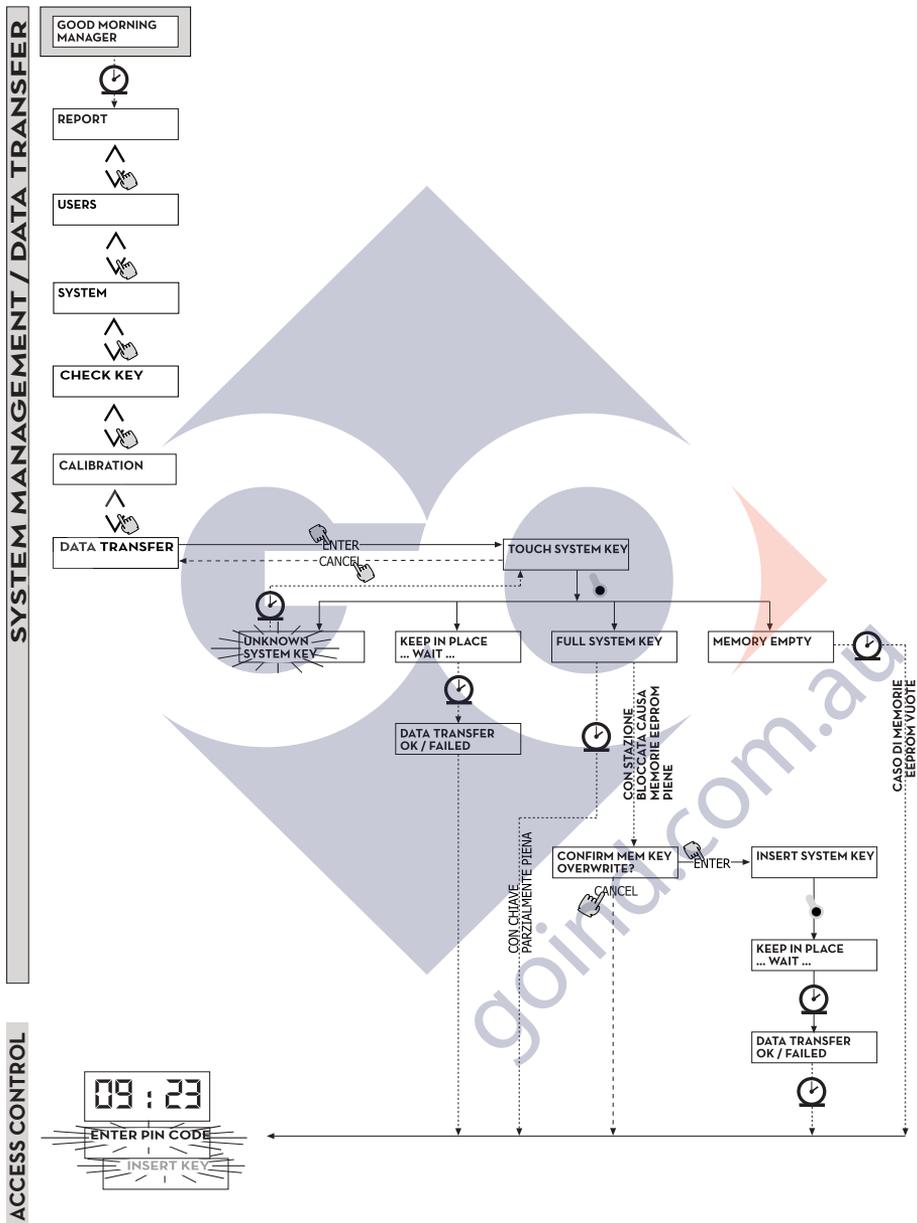
Overwritten data is permanently lost, but the station will be available for new transactions.

**MEMORY
EMPTY**

The message means that the station contains no data, i.e. the memory is empty.

Here below please find the flowchart of the DATA TRANSFER functions





7 DISPENSING

DISPENSING enables fuel dispensing.

7.1 ALERT MESSAGES

FOREWORD

When a USER enters a USER PIN CODE or applies a USER KEY to the station's reader, the system processes the input through its ACCESS CONTROL section and displays one of the following messages:

FULL MEMORY NOTE

The station's memory is full and no dispensing is possible.



To make dispensing possible again the user must apply to the plant manager. The manager can proceed in three ways:-make a data transfer using the MASTER KEY as described in Sect. 4.6.6;- if the station is connected to an RS 485 line, launch the "CUBE MANAGEMENT" software and wait for the system to automatically download the data from the station's memory;- if neither of the above options are possible, perform a MEMORY RESET (see Sect. 5.7).

DISPENSING IMPOSSIBLE/ MINIMUM LEVEL WRONG CODE

The level in the tank is below the allowed minimum limit, disabling any further dispensing. This occurs only if the level sensor is connected to an external level gauge.

The station does not recognize the USER PIN CODE that has been entered and does not enable dispensing. The message disappears after a few seconds and the user can enter the code again.

UNKNOWN USER KEY NOTE

The station does not recognize the USER KEY that has been applied to the reader and does not enable dispensing.



The system displays this message when the key has been properly detected but its number is not among those enabled on that station.

GOOD MORNING "USER"

This message appears when the user applies a USER KEY to the key reader or enters a USER PIN CODE that the system recognizes as enabled on that station. The system identifies the user and displays the associated USER NAME.

7.2 OPTIONAL INPUTS

FOREWORD

Depending on the SYSTEM CONFIGURATION, the user may be requested to enter the following data before dispensing can start:

REGISTRATION NUMBER

The PLATE number or other number identifying the vehicle.

The system accepts up to 10 alphanumeric characters.

The user must enter at least one alphanumeric character before proceeding.

ODOMETER

The odometer reading of the vehicle.

The system accepts up to 6 numeric characters.

The user must enter at least one numeric character before proceeding.

7.3 DISPENSING

After it has identified the user and processed any additional information, the system will enable dispensing. The NUMERIC LCD goes from displaying the current time to displaying the dispensed quantity, showing “000.0” or “00.00”, depending on how many decimals the system is configured to display. The ALPHANUMERIC LCD displays the USER NUMBER while alternatively flashing:
 - the UNIT (LITRES or GALLONS)
 - the word “DISPENSING”.

NOTE



The flashing message “DISPENSING” means that dispensing has been enabled and that the pump is ready to start as soon as the nozzle is lifted. The user must start dispensing within a certain time (see START TIME OUT, under CONFIGURATION) from when the word “DISPENSING” begins to flash on the LCD. If this period elapses before the user starts dispensing, the pump will be disabled and the displays will revert to showing the time and requesting a PIN or KEY.

Dispensing can be stopped and started at will. However, if the interruption lasts longer than a fixed period of time (see FILLING TIME OUT, under CONFIGURATION), the pump will be disabled. When dispensing is finished, the pump stops as soon as the nozzle is put back in its place.

NOTE



If necessary the pump can be stopped by pressing the “STOP” button, even if the nozzle is not in its place.

If the station is connected to a remote printer and the connection is active, after each dispensing the printer will print a dispensing report, regardless of whether the “TICKET RECEIPT” function under configuration is set on “AUTO” or “ON REQUEST”.

NOTE



If the system has returned to “LEVEL CONTROL”, you must press “STOP” to return to “ACCESS CONTROL” before you can manually request a printed ticket.

7.4 PRESET DISPENSING

FOREWORD

Before starting to dispense fuel, but after the system has enabled the pump and started to flash the message “DISPENSING”, the user can enter a PRESET quantity on the numeric keypad.

NOTE



If the decimal point is used, the amount of fuel that can be selected is 1 to 999.9 L/Gal. If the decimal point is not used, the amount of fuel that can be selected is 1 to 9999 L/Gal.

The pump will be temporarily disabled until the user confirms the quantity by pressing “ENTER”.The ALPHANUMERIC display will show the preset value during the whole dispensing operation.

NOTE



Dispensing stops automatically when the preset quantity is reached. It will not be possible to continue dispensing in a manual mode, because when the preset quantity is reached the system disables the pump and prints the ticket (if the ticket receipt function is on AUTO or if requested by the user).









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