

**SAGEMCOM**

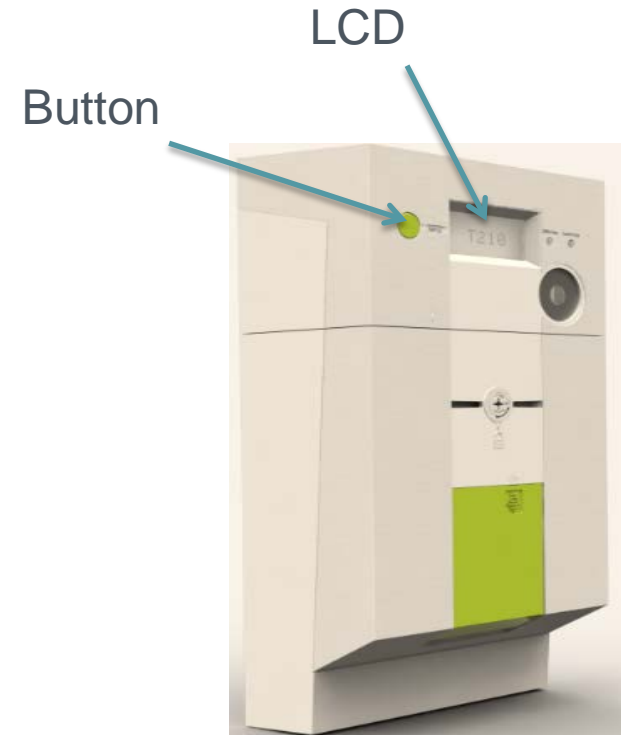
# LUXMETERING METER LCD DISPLAY MMI

*July 2016*



## General presentation

- ❑ The display menus MMI of the T210 is realized by :
  - 1 LCD dot matrix 48 characters (3x16 characters)
  - 1 front button
  
- ❑ The informations that can be displayed are :
  - End-user consumption (kwh, kvarh,...)
  - Obis code
  - Phases presence
  - Current / Energy direction
  - Auxiliaries relays status
  - Disconnecter status
  - LAN communication status
  - MID relevant screen indicator

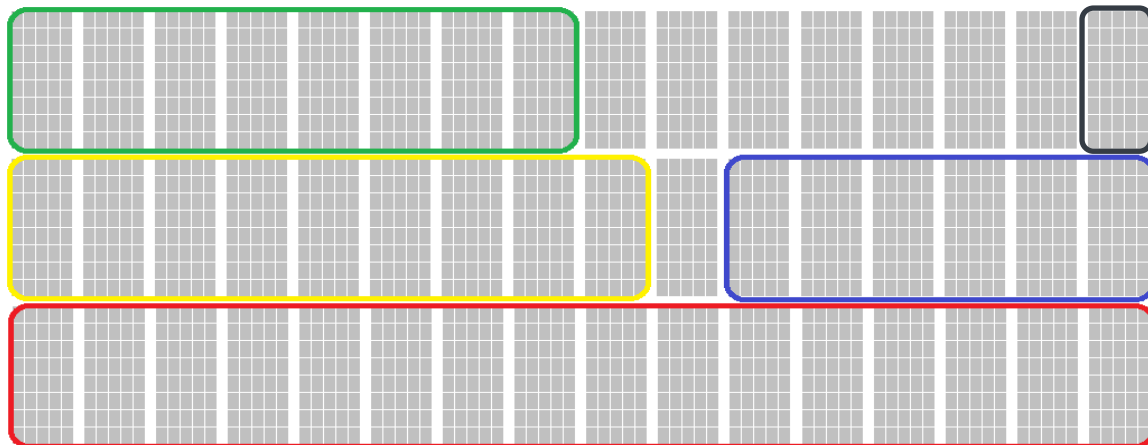


## Button description

- ❑ The button is used to access to the different modes of the display :
  - In Idle mode, the display is in Auto-Scroll Mode with 5 seconds interval between each screen.
  - A short push displays the next screen in the « Manual Scrolling »  
Note : in the « Manual Scrolling mode», if there is no activity during 15 seconds, the « Auto-Scrolling mode» is reestablished
  - A long push (> 3 seconds) disables the « Auto Scrolling » mode and displays the first screen of the « Engineering mode »  
Note1: A “#” is displayed to identify the Engineering Mode.  
Note 2: in the « Engineering mode», if there is no activity during 15 seconds, the « Auto-Scrolling mode» is reestablished

## Screen layout

- ❑ The meter display is composed of 3 lines of 16 characters . Each character is a 5\*8 dot matrix.
- ❑ The display is split into 4 fonctionnal areas:
  - ID (in green )
  - Data (in yellow)
  - Unit (in blue)
  - Status (in red)
  - Engineering Mode Screen Indicator (in black)







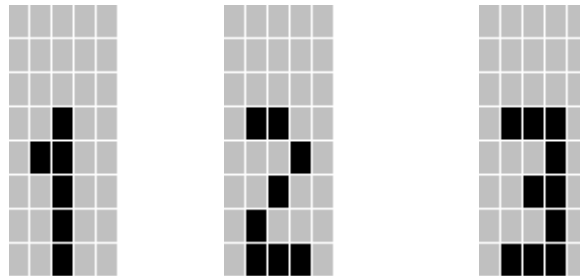
## Status area

- The third line of the meter display is dedicated to status indicators and is refreshed every second, independently from the MMI state machine. Each indicators has a predefined position.

1	2	3	+		O	F		-	/	-		*			C
Phase presence indicator			Energy Flow indicator		Relay 1 status	Relay 2 status		Breaker status indicator				MID Indicator			Connection status C.: connected

## Phase presence

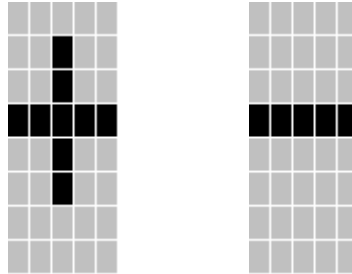
- ❑ There are 3 phases presence indicators. One per phase . These indicators are displayed in positions 1 ,2,3, and shaped as follow :
- ❑ For each phase the corresponding indicators is displayed
- ❑ The phase indicators blink if the field rotation is indirect





## Energy direction

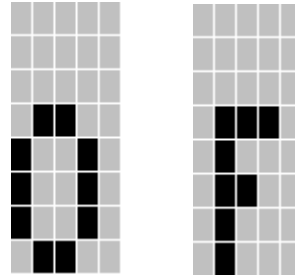
- ❑ The indicator is displayed in position 4 as follow :



- ❑ The energy direction shows the sign of the instantaneous active power .
- ❑ When the active power is positive , the indicator is shaped like a « + » sign.
- ❑ When the active power is negative the indicator is shaped like a « - » sign
- ❑ When there is no active power , the indicator is left blank

## Relay logical state

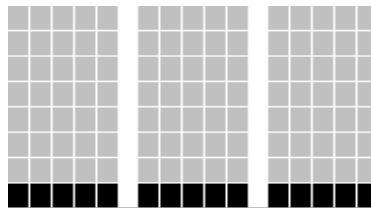
- ❑ The indicator for relay 1 ,2 is in position 6 ,7 as follow :



- ❑ Each relay logical state is represented with an indicator .
- ❑ When the relay is closed , the indicator is shaped as a « F » (Fermé)
- ❑ When the relay is open ; the indiicator is shaped as a « 0 » (Ouvert)

## Breaker logical state

- ❑ The indicator is displayed in position 9 to 11.
- ❑ When the breaker is connected , the indicator is as follow:



- ❑ When the breaker is disconnected or ready for reconnection, the indicator is shaped as an open circuit breaker.



## MID indicator

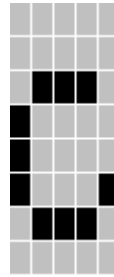
- ❑ The indicator is displayed in position 13 as follow :



- ❑ When the screen is legally relevant , the MID indicator is displayed.
- ❑ When the screen is non legally relevant , the indicator is left blank.

## G3-PLC network indicator (for PLC meters only)

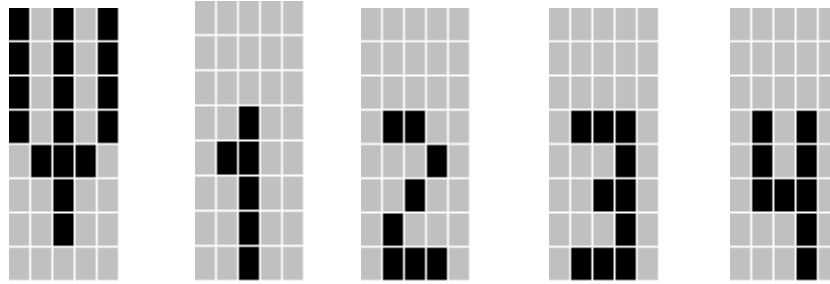
- The indicator is un position 16 as follow :



- When the meter is registered, the indicator is shaped as a « c »; for CPL connected.
- When the meter is no registered , the indicator is left blank.

## Cellular network signal indicator (for P2P meters only)

- The indicator is in position 16 and shaped :



- When the meter is not connected, the indicator is left blank.
- When the meter receives a cellular network signal, the indicator displays an antenna symbol.
- When the meter has joined the network, the RSSI signal number is displayed (1,2,3,4).

# Backlight Management

- The backlight is enabled only on the following situation :
  - The meter is in Manual scroll mode
  - The meter is in Engineering mode
  - The breaker is open ready for closing
- For all other situation the backlight is off.

## Auto scroll mode

- ❑ By default, the display is in auto-scroll mode and display each five seconds different values
- ❑ Each values represent a different obis codes and are listed in the next slides



**Table 1 – Manual and Auto-scroll mode values displayed**

screen code	value displayed	unit
1.8.0	Total Active energy import	kwh
2.8.0	Total Active energy export	kwh
3.8.0	Total Reactive energy import	kvarh
4.8.0	Total Reactive energy export	kvarh
1.7.0	Instantaneous active import power	kw
2.7.0	Instantaneous active export power	kw
3.7.0	Instantaneous reactive import power	kvar
4.7.0	Instantaneous reactive export power	kvar
9.7.0	Instantaneous apparent import power	kva
10.7.0	Instantaneous apparent export power	kva

**Table 2 – Engineering Mode values displayed**

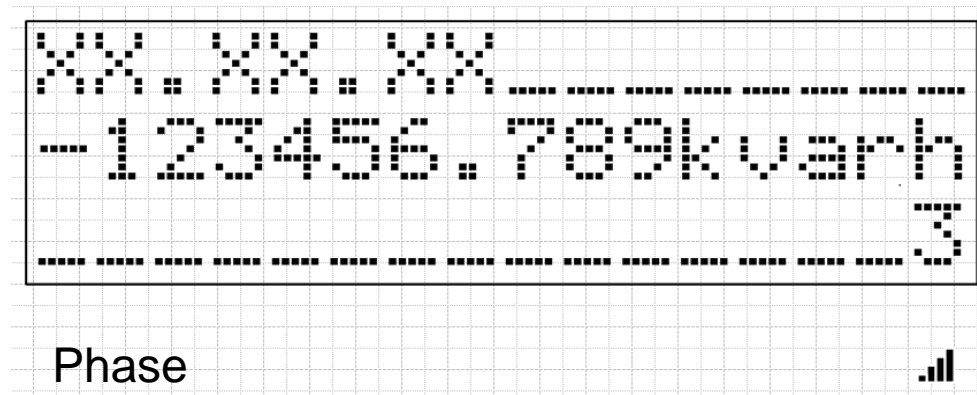
screen code	value displayed	unit
-	Test Screen	-
1..8.0	Total Active energy import	kwh
2.8.0	Total Active energy export	kwh
3.8.0	Total Reactive energy import	kvarh
4.8.0	Total Reactive energy export	kvarh
32.7.0	Instantaneous voltage L1	V
52.7.0	Instantaneous voltage L2	V
72.7.0	Instantaneous voltage L3	V
31.7.0	Instantaneous current L1	A
51.7.0	Instantaneous current L2	A
71.7.0	Instantaneous current L3	A
1.7.0	Instantaneous active import power	kw
2.7.0	instantaneous active export power	kw
3.7.0	Instantaneous reactive import power	kvar
4.7.0	Instantaneous reactive export power	kvar
9.7.0	Instantaneous apparent import power	kva
10.7.0	Instantaneous apparent export power	kva
17.0.0	Limiter : import apparent power	kva
31.4.0	Limiter : current monitor (+/-)	A
0.2.0	Active firmware version	-
0.2.8	Active firmware version signature	-

## Data Concentrator HMI (1/2)

- Communication usage :
  - GPRS → Signal strength : LCD and LED indicator
  - Ethernet for WAN connection : LED indicator
  - Local Ethernet for maintenance : LED indicator
- Visualization of electrical measurements:
  - In scrolling mode:
    - Instantaneous voltages for L1, L2, L3
    - Instantaneous currents:  $I_{tot}$ ,  $I_1$ ,  $I_2$ ,  $I_3$  with direction (+ and -)
    - Instantaneous powers: S, P, Q with direction (+ and -)
  - Expert mode with historical values that can be accessed via a push button: (push button for more or equal 5s, expert mode will be left automatically after 30s inactivity)

## Data Concentrator HMI (1/2)

- Different periods: last 24h, last 7 days, last month, last year:
  - Voltages:
    - Instantaneous values for L1, L2, L3
    - Max and Min for L1, L2 and L3 (for a certain period)
  - Currents:
    - Instantaneous values for Itot, I1, I2, I3 with direction
    - Max and Min for Itot, I1, I2 and I3 (export and import for a certain period)
  - Power:
    - Instantaneous values for S, P and Q with directions
    - Max and Min for S, P and Q (for export and import)



# Metrology –Display Elements

