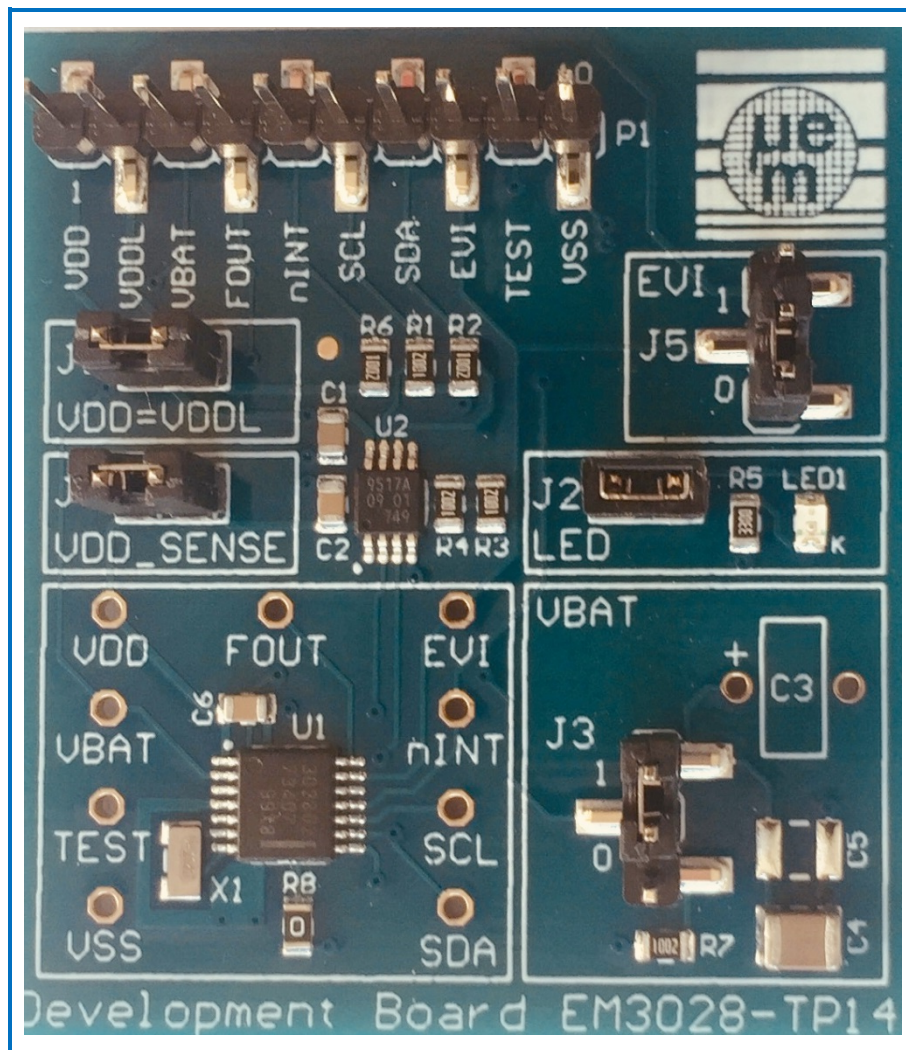




# EM3028-TP14 Development Board

## Extreme Low Power RTC



## TABLE OF CONTENTS

1. General Description .....	3
2. Jumper settings .....	3
3. Development Board-Components .....	3
4. Development Board .....	4
5. Schematics .....	4
6. Package / Pin Out .....	5
7. Pin Description .....	5
8. Ordering info .....	6

## 1. GENERAL DESCRIPTION

This development board is aimed to be used either directly connected to the target MCU or via the USB-I2C adapter (i.e. USB-I2C\_kit from ELV).

Minimal connectivity is: SCL, SDA, VDD, VSS on the 10 pol connector.

In case your host only drives a fixed voltage on SCL, SDA, VDD (i.e. USB-I2C\_kit from ELV always drives 5V levels) you can exercise the EM3028 on lower supply voltages by connecting a secondary supply on VDDL. IC U2 will do the necessary level translating.

## 2. JUMPER SETTINGS

<b>J1</b>	if in place; Removed;	VDD=VDDL You need to supply VDDL on the 10 pin connector P1, pin2. Use this configuration only if you if your Host driver is on a different voltage level than your target.
<b>J2</b>	if in place; Removed;	LED 1 will light when connected to host (attention host need to be able to supply the current) LED 1 disconnected
<b>J3</b>	on 1 position on 0 position	C3, C4, C5 (if present) are connected as power Backup sources. the Backup pin (VBAT) is pulled to GND.
<b>J4</b>	if in place; Removed;	directly connects the EM3028 to the power source allows measuring the current consumption of the EM3028
<b>J5</b>	on 1 position on 0 position	EVI input is pulled to VDDL EVI input is pulled to GND

## 3. DEVELOPMENT BOARD-COMPONENTS

The EM3028-TP14 is soldered onto the Development Board. Every pin is accessible at SMD-10 pol connector and at the test points situated around the device. The following passive components are directly soldered on the board:

Symbol	Value	Description
X1	Xtal 32768Hz	CM7V-T1A
U1	EM3028-TP14	Extreme low power RTC device
U2	PCA9517ADP	Level translating I2C-bus repeater
C1	10nF	Decoupling capacitor between V <sub>SS</sub> and V <sub>DD</sub> of the level translating I2C-bus repeater
C2	10nF	Decoupling capacitor between V <sub>SS</sub> and V <sub>DLL</sub> of the level translating I2C-bus repeater
C3	Option	To place alternative capacitors or battery for back-up power
C4	100uF	Capacitor for Back-up power
C5	Option	To place alternative capacitors or battery for back-up power
C6	10nF	Decoupling capacitor between V <sub>SS</sub> and V <sub>DD</sub> of the RTC
R1	10 kΩ	Pull-up resistor SCL to V <sub>DD</sub>
R2	10 kΩ	Pull-up resistor SDA to V <sub>DD</sub>
R3	10 kΩ	Pull-up resistor SCL to V <sub>DLL</sub>
R4	10 kΩ	Pull-up resistor SDA to V <sub>DLL</sub>
R5	330 Ω	Current limiting resistor for LED
LED1	green	Supply, current consumption of the LED has to be considered, J2 to switch off
R6	10 kΩ	Pull-up resistor nINT to V <sub>DLL</sub>
R7	10 kΩ	Pull-down resistor to define V <sub>BAT</sub> /V <sub>BACKUP</sub> input in case it is not used
R8	0 Ω	Pull-down resistor to tied TESTEM to V <sub>SS</sub>

### 4. DEVELOPMENT BOARD

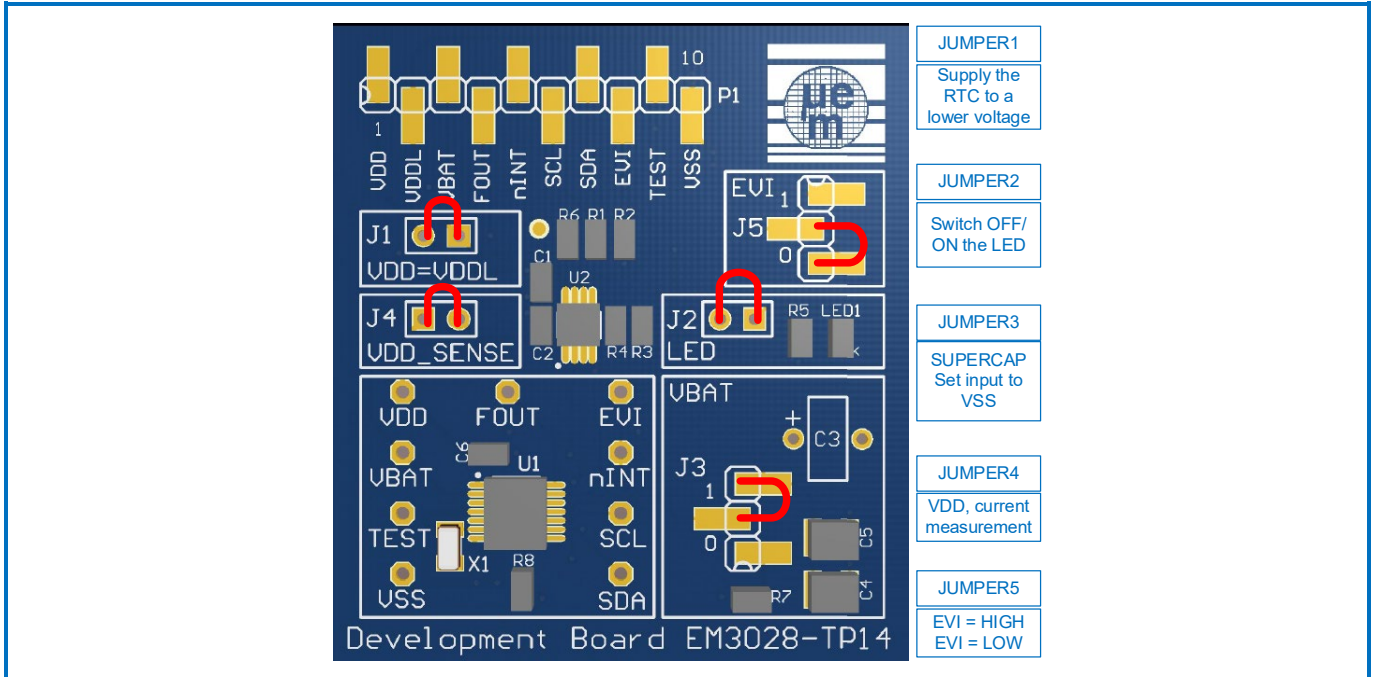


Figure 4-1 Dongle Board Top Side Components

### 5. SCHEMATICS

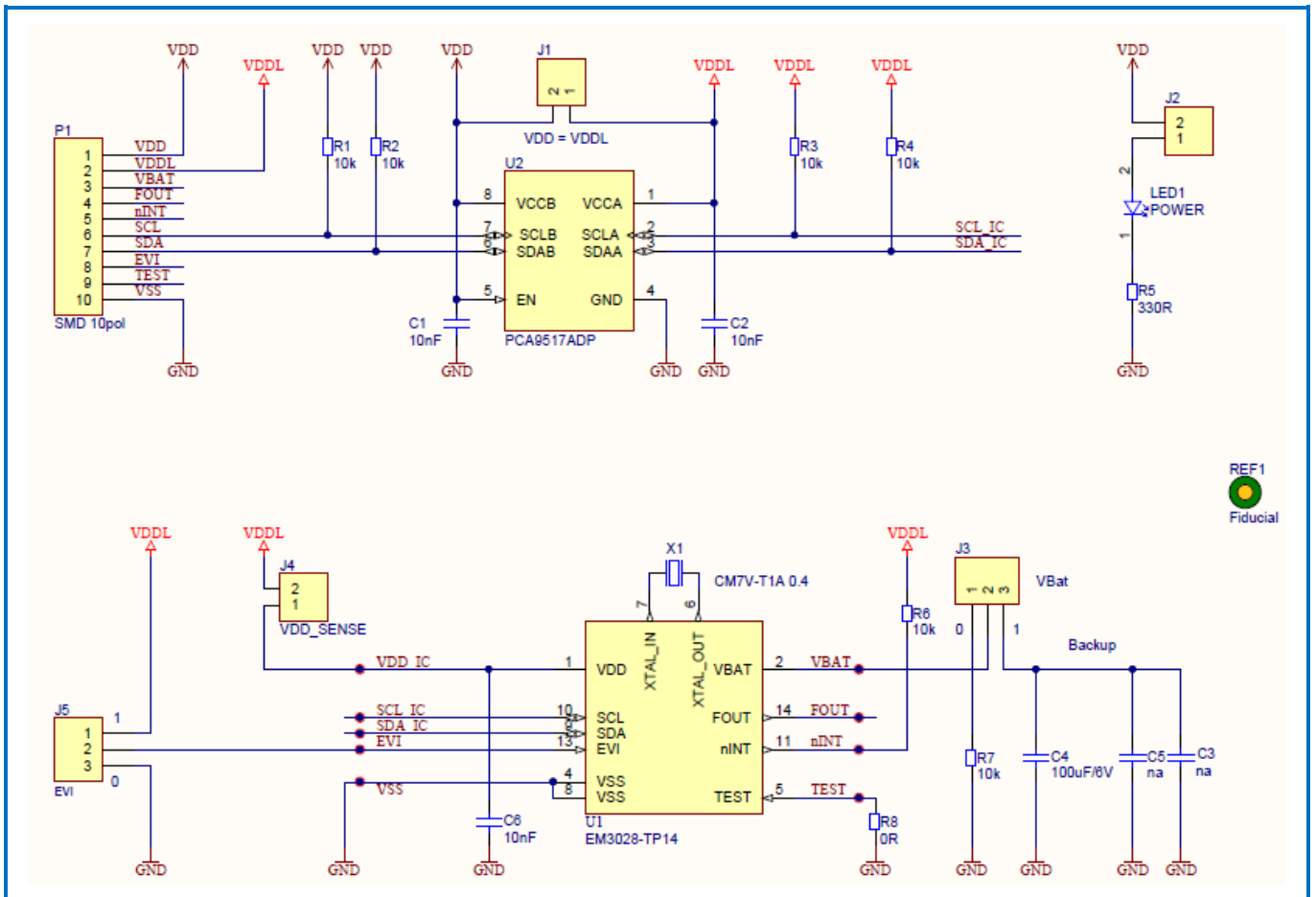


Figure 5-1 Dongle Block Diagram

## 6. PACKAGE / PIN OUT

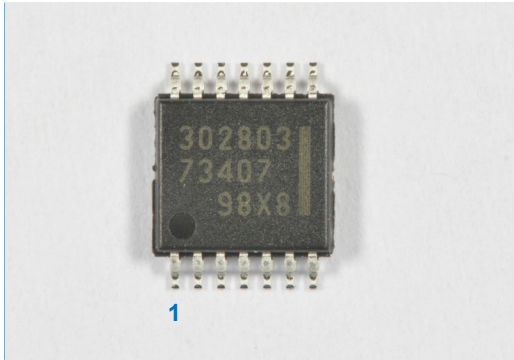
14LD TSSOP: (top view)		NO.	NAME
		1	V <sub>DD</sub>
		2	V <sub>Backup</sub> (V <sub>BAT</sub> )
		3	N.C.
		4	V <sub>SS</sub>
		5	TESTEM
		6	Xtal_out
		7	Xtal_in
		8	N.C.
		9	SDA
		10	SCL
		11	nINT
		12	N.C.
		13	EVI
		14	FOUT

Figure 6-1 Dongle 14LD TSSOP

## 7. PIN DESCRIPTION

PIN		I/O TYPE		DESCRIPTION
NO.	NAME	DIRECTION	SUPPLY	
1	V <sub>DD</sub>			Positive power supply
2	V <sub>Backup</sub> (V <sub>BAT</sub> )			Battery Supply Voltage. When the backup switchover function is not needed, V <sub>BACKUP</sub> must be tied to V <sub>SS</sub> with a 10 kΩ resistor.
3	V <sub>SS</sub>		V <sub>SS</sub>	Ground
4	TESTEM	I	V <sub>DD</sub>	Test input for factory test. Connect to V <sub>SS</sub>
5	Xtal_out	O		Oscillator output Wire length between quartz and package shall be minimized.
6	Xtal_in	I		Oscillator input Wire length between quartz and package shall be minimized.
7	SDA	I/O	V <sub>DD</sub>	I <sup>2</sup> C Serial Data Input-Output; open-drain; requires pull-up resistor. In V <sub>BACKUP</sub> Power state, the SDA pin is disabled (high impedance).
8	SCL	I	V <sub>DD</sub>	I <sup>2</sup> C Serial Clock Input; requires pull-up resistor. In V <sub>BACKUP</sub> Power state, the SCL pin is disabled.
9	nINT	O	V <sub>DD</sub> or V <sub>BACKUP</sub>	Interrupt Output; open-drain; active LOW; requires pull-up resistor; used to output Periodic Countdown Timer, Periodic Time Update, Alarm, External Event, Automatic Backup Switchover and Power On Reset Interrupt signals. Interrupt output also in V <sub>BACKUP</sub> Power state.
10	EVI	I	V <sub>DD</sub> or V <sub>BACKUP</sub>	External Event Input; used for interrupt generation, interrupt driven clock output and time stamp function. Remains active also in V <sub>BACKUP</sub> Power state. This pin should not be left floating.
11	FOUT (CLKOUT)	O	V <sub>DD</sub>	Clock Output; push-pull; Normal and Interrupt driven clock output can be activated concurrently. <ul style="list-style-type: none"> <li>1. Normal clock output is controlled by the CLKOE bit. When CLKOE is set to 1 (default), the FOUT pin drives the square wave on the FOUT pin. When CLKOE bit is set to 0, the FOUT pin is LOW.</li> <li>2. Interrupt driven clock output is controlled by an interrupt event. When CLKIE is set to 1 the occurrence of the interrupt selected in the Clock Interrupt Mask Register (12h) allows the square wave output on the FOUT pin. Writing 0 to CLKIE will disable new interrupts from driving square wave on FOUT. When CLKF flag is cleared, the FOUT pin is LOW.</li> </ul> <p>Depending of the settings in the XO field, the FOUT pin can drive the square wave of 32.768 kHz (default), 8192 Hz, 1024 Hz, 64 Hz, 32 Hz or 1 Hz, or the predefined periodic countdown timer interrupt. When XO field is 111 the FOUT pin is LOW.</p> <p>When CLKS<sub>Y</sub> bit set to 1, the enabling and disabling of the clock output is synchronized. CLKS<sub>Y</sub> has no effect on the timer interrupt signal. In V<sub>BACKUP</sub> Power state, the FOUT pin is LOW.</p>



## 8. ORDERING INFO

- 1) Development board EM3028-TP14: **EM3028TP14-EVB**  
The delivery contains the fully mounted development board as shown on the cover page
- 2) USB-I2C\_kit from ELV with GUI (graphical user interface): **EM3028TP14-USB-I2C-GUI**  
The delivery contains
  - the development board EM3028TP14-EVB
  - the USC-I2C kit **ELV-USB-I2C**
  - the drivers and the GUI exe file (download from EM-website, EM3028 product folder)

EM Microelectronic-Marine SA ("EM") makes no warranties for the use of EM products, other than those expressly contained in EM's applicable General Terms of Sale, located at <http://www.emmicroelectronic.com>. EM assumes no responsibility for any errors which may have crept into this document, reserves the right to change devices or specifications detailed herein at any time without notice, and does not make any commitment to update the information contained herein.

No licenses to patents or other intellectual property rights of EM are granted in connection with the sale of EM products, neither expressly nor implicitly.

In respect of the intended use of EM products by customer, customer is solely responsible for observing existing patents and other intellectual property rights of third parties and for obtaining, as the case may be, the necessary licenses.

**Important note: The use of EM products as components in medical devices and/or medical applications, including but not limited to, safety and life supporting systems, where malfunction of such EM products might result in damage to and/or injury or death of persons is expressly prohibited, as EM products are neither destined nor qualified for use as components in such medical devices and/or medical applications. The prohibited use of EM products in such medical devices and/or medical applications is exclusively at the risk of the customer.**