Ultrasonic distance measure

# 1. General requirements

Req 1-1 The system must use ultrasonic sensor for distance measurement.

Req 1-2 LCD display must be used to display measured distance

Req 1-3 Distance should be shown in cm.

Req 1-4 Supplier must document the possible range and accuracy of the device. This data should be provided in metric system.

Req 1-5 The measured distance should be displayed not less than 5 seconds.

Req 1-6 The measurement should be manually activated.

Req 1-7 The system is always on. Sleep mode is not allowed.

# 2. Safety requirements

## Req 2-1 The supplier must ensure no data corruption if interrupts are used.

Req 2-2 Dynamic memory allocation is not allowed.

# 3. Diagnostic requirements

Req 3-1 The system must use UART interface to read and write diagnostic information.

Req 3-2 The baud rate must be fixed to 9600 bps.

Req 3-3 The following commands and responses must be supported.

|  |  |  |
| --- | --- | --- |
| Command | Action | Response |
| DEVICE | Send a device name | *Device name1* |
| SUPPLIER | Send supplier names | *Supplier names1* |
| LAST | Send raw value of last measurement. | *Last measure taken1* |
| UNLOCK xxxx3 | Unlock the write command | *OK/FAIL2* |
| WRITE device\_name4 | Write a device name | OK/FAIL2 |
| LOCK | Lock the write command | OK |

1 – The text in italic is a description of what shall be sent.

2 – The response depends on the result of security check

3 – Four-digit pin

4 – New device name to be written

Req 3-4 The device name must be always set to default value during startup.

Req 3-5 The default device name is “Ultrasonic Measure” (without parenthesis)

Req 3-6 Every command must end with carriage return code

# Internal requirements

INTREQ 1-1 The system must use a scheduler.

INTREQ 1-2 The system to be interrupted by timer only.

INTREQ 1-3 Every function must be documented using Doxygen tags.

INTREQ 1-4 State machines must be documented by graphs.

INTREQ 1-5 The system must have a hierarchical design.