# iMTQ Option Sheet

**How to use this Option Sheet:**

- Please fill-in this Option Sheet carefully. In case you have questions we advise contacting ISIS prior to sending the Option Sheet at: info@isispace.nl. Note that you are responsible to make sure the inputs you make are correct, since ISIS will produce the product accordingly, and shall not be responsible to verify your inputs or liable to provide refunds, make alterations or send a new product in case your input does not reflect your needs correctly.

- Fill in the form digitally. You will need to have Adobe Acrobat reader installed (free download available at **http://get.adobe.com/reader/**)

- Press the check button at the end of the document to verify if your Option Sheet is complete.

- Once you are ready, press the Enable Read Only button to prevent accidental changes, save the file and send the digitally filled-in Option Sheet by email to your Sales Representative.

## Customer Contact Information

| | |
|---|---|
| **Contact Name:** | |
| **Email Address:** | |
| **Phone Nr:** | |
| **Organization/ Company / Institution** | |
| **Address:** | |
| **Address (Cont'd):** | |
| **Country:** | |

## For ISIS Use – Leave Blank –

| | |
|---|---|
| **Order Confirmation:** | |
| **Allocated WO:** | |
| **Sales responsible:** | |
| **Project/Ref.:** | |

Applicable to iMTQv2

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Revision:    2

## General configuration

*Intended Use*

**Flight Model (FM) (Default)**          **Engineering Model (EM)**
*A Temperature Characterization report is delivered with all Flight Model units. Mechanical parts are secured with Epoxy.*

## Software configuration

*I2C Protocol Settings*

*iMTQ Address*

Default (0x10).

Alternative.

Alternative 7 bit Address (0x##)

**Note:** The users can specify any other address if the default is not compatible with their system. The address can be any 7-bit number with the exception of the reserved addresses, specified in the I2C bus specification (http://www.nxp.com/documents/user_manual/UM10204.pdf) and listed in Table 1.

| Slave address (binary) | Slave address (hex) |
|---|---|
| 0000 000 | 0x00 |
| 0000 001 | 0x01 |
| 0000 010 | 0x02 |
| 0000 011 | 0x03 |
| 0000 1XX | 0x04 – 0x07 |
| 1111 XXX | 0x78 – 0x7F |

**Table 1 – I²C reserved addresses**

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*I2C watchdog*

The I2C watchdog is implemented for safety reasons. It works in the following manner: if the iMTQ does not receive any command from the main OBC for a given duration, the iMTQ will reset itself and shut down the magnetorquer. This safety measure can be disabled by the user if required. This feature cannot be changed without having the system reprogrammed by ISIS.

I2C watchdog enabled, timeout of 60 seconds (default).

I2C watchdog enabled, user defined seconds.

*Value must be equal or greater than 30s.*

Timeout (s):

I2C watchdog disabled

## Electrical configuration

*External vs. internal actuation[1]*

**Internal actuation (default)**
*The coils are driven by the internal H-bridge (in response to an I2C command).*

**External actuation**
*The coils are driven by an external actuation voltage (supplied through the MTQ breakout).*

*The autonomous detumble mode and the self-test are not available in this case*

*MTQ breakout pigtail option*

No breakout pigtail (default).

Breakout pigtail soldered.

Length (mm):

Breakout pigtail soldered with a connector (non standard).
*For Alternative Harness configurations please leave a note in the designated area below detailing your requirement. ISIS will review your request and contact you as soon as possible.*
***Please note that non standard options need to be evaluated and agreed upon. In some cases, they might incur into additional cost which shall be determined per case.***
Connector Manufacturer:

Connector Part Number:

Length (mm):

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[1] Please refer to the Datasheet for further information regarding the iMTQv2 actuation

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*On-board vs. external Magnetometer (MTM)[2]*

More than one sub-option might be selected below:

Qty

### Internal MTM only (default).

*MTM soldered to the iMTQ mainboard. This magnetometer is always delivered.*

### Additional external MTM.

*Additional cost associated, please contact your sales representative for further information.*

*An external MTM module can be connected to the iMTQ by means of dedicated harness in addition to the one already mounted on the board.*

*The user can switch from one MTM to the other by changing a parameter in the iMTQ software (this can be done by sending an I2C command).*

*Only one additional MTM can be connected to the iMTQ at any given time.*

*MTM breakout pigtail option*

Breakout pigtail with connector to the MTM module (default).

*Connector mounted is an Omnetics Nano-D / Bi-Lobe® Single row, with part number A54000-015*

Length (mm):

No breakout pigtail

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[2] Please refer to the Datasheet for further information regarding the iMTQv2 magnetometer options.

*I2C pull-up resistors*

In order to be compatible with most CubeSat OBC, the iMTQ leaves the choice of the place where the pull-up resistors are placed: either on the OBC, or on the iMTQ.

No pull-up resistors (default).

Pull-up resistors soldered.
*The values of the resistors must be specified by the user.*
*They must be values available in the 0603 SMD form factor.*
Value (kΩ):

*CSKB Pinout*

*I2C Pin-out*

| $I^2$C Clock (SCL) | $I^2$C Data (SDA) |
|---|---|
| H1-43 (Default) | H1-41 (Default) |
| H1-21 (Alternative) | H1-23 (Alternative) |

*Main 5.0V power input[3]*

H2-25 + H2-26 (Default)

H1-47 (Alternative 5.0V switched line 1)

H1-49 (Alternative 5.0V switched line 2)

H1-51 (Alternative 5.0V switched line 3)

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**Important note**: The list above does not detail all the CSKB pins used by the iMTQ.

Please refer to the iMTQ datasheet for more details.

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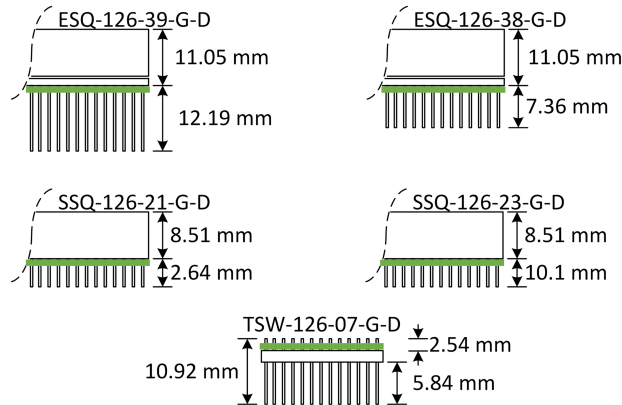*Mounting holes Grounding*

Holes grounded (default).

Holes NOT Grounded.

**NOTE**: *By default, the mounting holes are grounded by means of a 0Ω resistor. For alternative grounding schemes, please leave a comment on the Additional comment section. ISIS will review your request and contact you as soon as possible.*

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[3] Note that pin H2-25 and H2-26 are **always** electrically connected.

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## CSKB *Connector type and placement*

ESQ-126-39-G-D — 11.05 mm — 12.19 mm

ESQ-126-38-G-D — 11.05 mm — 7.36 mm

SSQ-126-21-G-D — 8.51 mm — 2.64 mm

SSQ-126-23-G-D — 8.51 mm — 10.1 mm

TSW-126-07-G-D — 2.54 mm — 10.92 mm — 5.84 mm

> **Note:** The board location with respect to the connector is marked by the green line in the drawing above. The iMTQv2 board is 1.6mm thick (represented by the green line on the figure above).

| | |
|---|---|
| **Standard Stack Through**<br>*Other CSKB components possible on top and bottom* | Samtec ESQ-126-39-G-D (Default) |
| | Samtec ESQ-126-38-G-D |
| | Samtec SSQ-126-23-G-D |
| **Stack Termination Bottom**<br>*No other CSKB components possbile below the iMTQ* | Samtec SSQ-126-21-G-D |
| **Stack Termination Top**<br>*No other CSKB components possible above the iMTQ* | Samtec TSW-126-07-G-D |
| **Alternative**<br>*All alternative connector requests need to be reviewed and approved by ISIS.* | Samtec Part Number: |
| **None**<br>*Non stack mount* | |

## Additional Comments

Applicable to iMTQv2

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