Software installation

Download the software from www.rls.si/UPRGAM4096 by clicking the Documentation tab and selecting the file UPRGAM4096_Software. Once downloaded open the Setup.exe file and follow the installation wizard to complete installation.

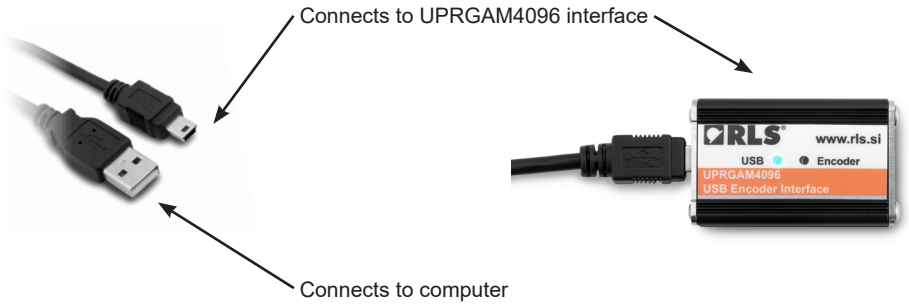
> **NOTE:** You should install the UPRGAM4096 software BEFORE connecting the UPRGAM4096 interface.

Note: Administrator rights are required to install the software.

Compatible operating systems: Windows XP, Windows Vista, Windows 7, Windows 10, Windows 11

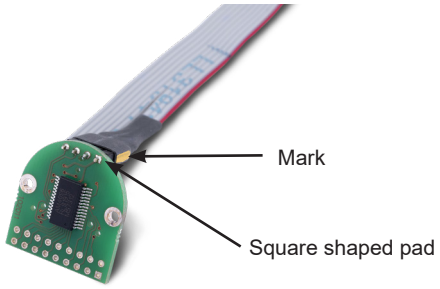
Connecting the UPRGAM4096 interface and RMK4

After software installation connect the UPRGAM4096 to the computer using the USB cable.

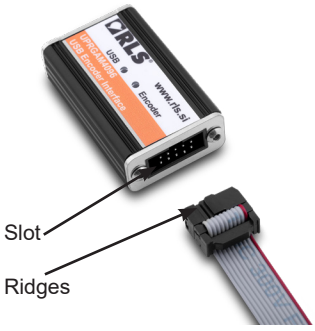


Connect the RMK4 as shown.

Make sure that the dot on the connector is on the same side as the square shaped pad on the RMK4.



Make sure that the slot on the interfaces is on the same side as the two ridges on the connector.

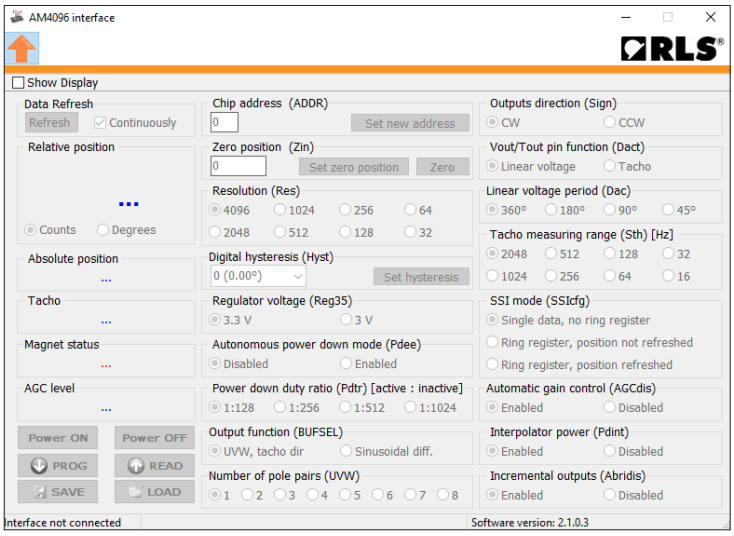


Final assembly should look as shown

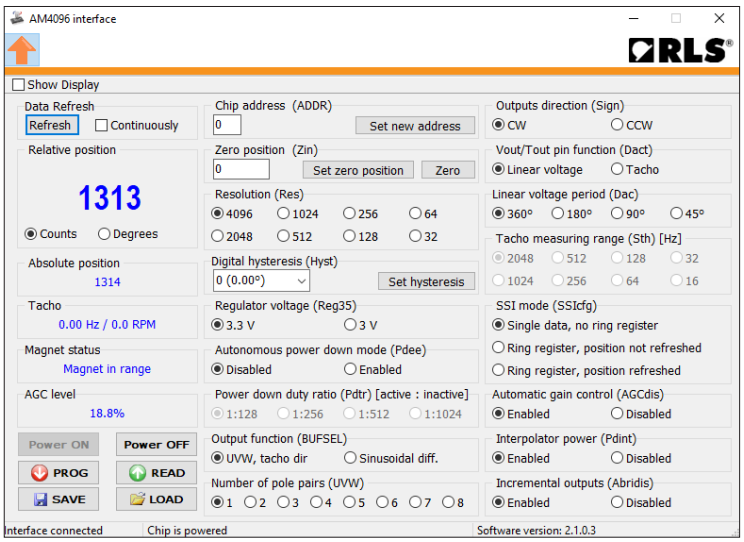
Starting the AM4096 interface program

Start the program by clicking the Desktop icon  which has been created during installation or by selecting the program from the Start menu.

Once the application is started, you will see the following screen. Click the ‘Power on’ button.



The interface will now read the current programming / settings of the RMK4 and the screen should look something like this depending on the settings previously loaded.



During ‘Power on’ the interface reads the data stored inside the internal EEPROM of the AM4096 chip and the software interface displays the read information graphically.

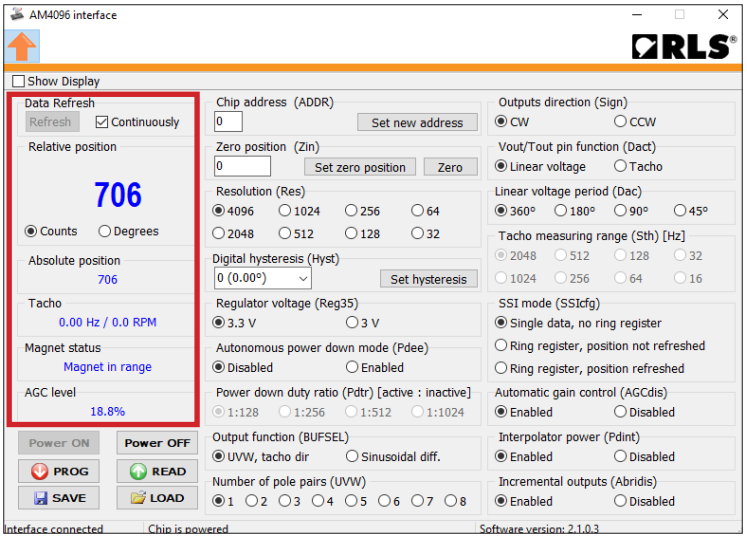
Programming and reading

The AM4096 can be re-programmed by changing the parameters within the software. Once the desired parameters have been selected, the 'PROG' button has to be clicked in order to save the changes to the chip.

The 'READ' button reads the current programming of the AM4096 chip. (If, for example, the parameters on the screen have been changed, but not saved, and the current programming needs to be read again, this can be done by pressing the 'READ' button.)

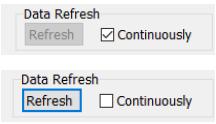
Different settings can be stored to the computer by pressing the 'SAVE' button. Previously saved settings can be uploaded by pressing the 'LOAD' button.

Parameter description: FIRST COLUMN



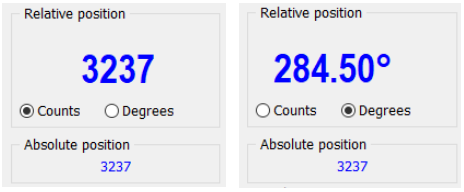
Refreshing data

The data from sensor can be refreshed continuously or manually. If data is refreshed continuously, the displayed position and other encoder data will constantly be refreshed whilst by **disabling the continuously refreshed** option the encoder data will only be refreshed once each time the user clicks the 'Refresh' button.
By default, the continuously refreshed option is enabled.



Position display

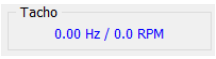
The software displays the position as relative and absolute. By default, the Relative position displays the position as a number (e.g. 686/4096, where the first number represents the relative position and the second number represents the full number of counts, or the resolution the chip is set to). This can be changed to 'Degrees' and the display now shows the relative position in degrees.
The Absolute position always shows the position as an absolute number.



The position can also be displayed as a graphic form by ticking the 'Graphic representation' option.

Tacho output

When the Tacho output is used, the Tacho section displays the speed in Hertz and RPM (rotations per minute).

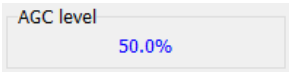


Magnet status

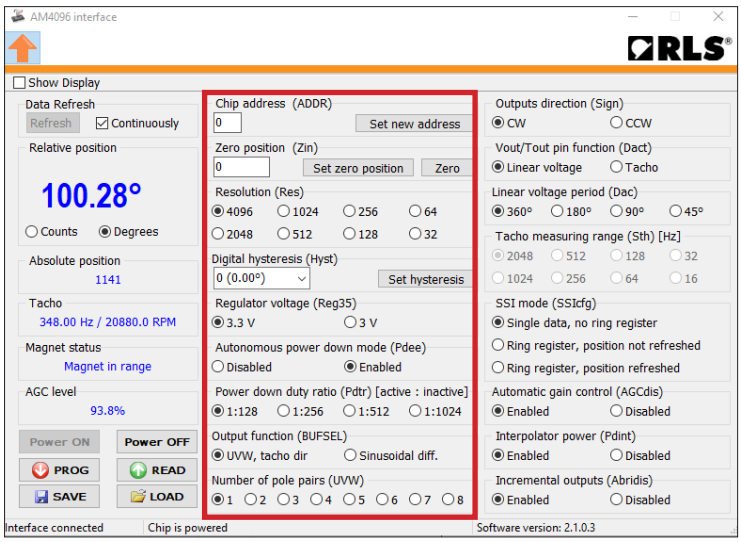
The 'Magnet status' section indicates whether the magnet is in range too close or too far.
This helps control the distance between the magnet and the AM4096 chip.

Automatic gain control (AGC gain)

The AGC gain section displays the percentage of the automatic gain control. When AGC is disabled the AGC gain is fixed at 50.0%. If the AGC is enabled, then the AGC gain varies, depending on the magnet to chip distance. See AGC section on how to enable or disable.

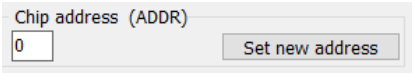


Parameter description: SECOND COLUMN



Chip address

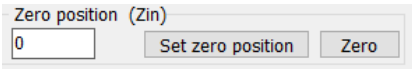
In the Chip address section the address of the device can be set from 0 to 127. This is used when more devices are interconnected, where each device needs to have an individual address. Type a number from 0 to 127 into the text box and confirm by pressing the 'Set the new address' button.



See page 6 of the AM4096D01 datasheet for a detailed description of this functionality.
NOTE – AM4096 chips with serial numbers AA3509 and AB3509 do not allow connecting more than one slave device to the TWI bus. This functionality is being added to the next revision of the product.
The RMK4 default setting is '0'.

Zero position

Zero position section user can set the relative zero position of the chip. The number represents the absolute position at which the relative zero position is (to be) set. There are two options to set the zero position of the chip:



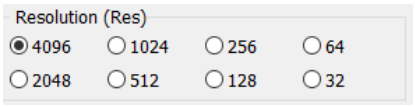
By pressing the 'Set zero position' button virtual zero position will be set to the absolute zero position value inserted to the edit box. The value must be between 0 and resolution -1 otherwise an Error message will appear. E.g. with the resolution of 4096, the zero position value of 2048 will set the virtual zero position 180° to the absolute zero (note that the encoder position is displayed to the virtual zero position).

By pressing the 'Zero' button, current absolute position will be written to the zero position edit box and set the relative zero position according to the value. Therefore the displayed encoder position will be set to zero.

Any manual change of zero position value in the edit box has to be confirmed by clicking the 'Set zero position' button otherwise no change will be triggered (This is not the case for the change triggered by the 'Zero' button).

Resolution

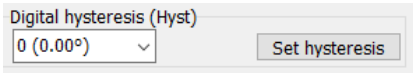
Here can be set resolution by selecting the required radio button. Resolution can be set to binary resolutions from 32 cpr (5 bit) to 4096 cpr (12 bit). It is in CPR (counts per revolution) or PPR (positions per revolution).



The RMK4 default setting is '4096' (12 bit).

Digital hysteresis (Hyst)

Setting the digital hysteresis enables the user to prevent backcounting although also contributes to the overall measuring inaccuracy. Certain hysteresis value means that when switching the rotation direction encoder position will be freezed until the hysteresis angle is reached.



To set the hysteresis the user has to select the desired value (angle) from the drop box and click the 'set hysteresis' button.

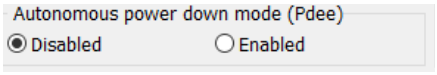
Regulator voltage

You can set regulator voltage if a power supply of 5 V is used, the 3.3 V option should be selected or if a power supply of 3 V is used, the 3 V option should be selected.

The RMK4 default setting is '3.3 V' (for 5 V power supply).

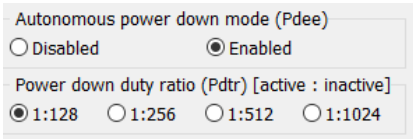
Autonomous power down mode and Power down duty ratio (active : inactive)

In this part the power save mode can be enabled or disabled by selecting the appropriate button.



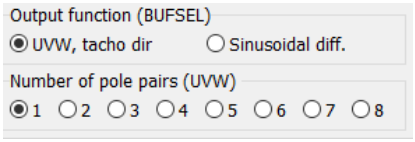
If enabled, the power down duty ratio can be selected. This means that the position is not read continuously, but in intervals as selected.

The RMK4 default setting is 'Disabled'.



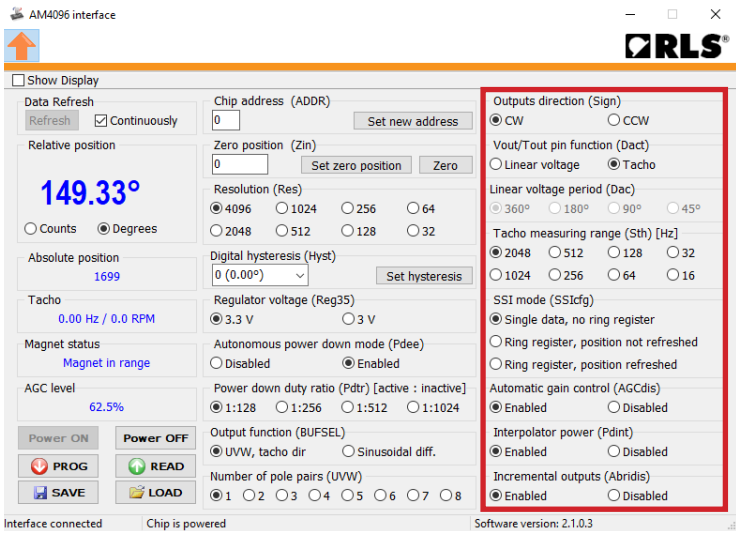
Bufsel and UVW – number of pole pairs

The output on pins 5, 6, 7 and 8 can be selected between UVW/Tacho and differential sinusoidal.
If the UVW outputs are selected, the number of pole pairs of the UVW commutation signals can be selected.



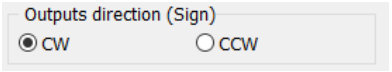
The RMK4 default setting is 'UVW, tacho dir' and the default number of pole pairs is 1.

Parameter description: THIRD COLUMN



Outputs direction

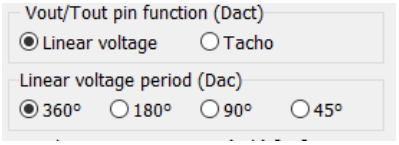
Output direction can be selected to be either CW (clockwise) or CCW (counter clockwise).
The RMK4 default setting is ‘CW’.



Vout/Tout pin function, DA data period and Tacho measuring range [Hz]

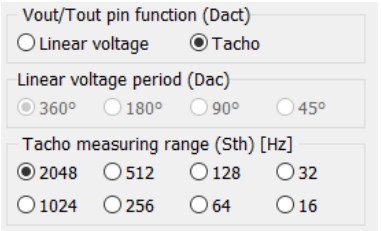
In this part the output on pin 20 can be selected between Linear voltage (‘Vout’) and Tacho (’Tacho’).

If ‘Vout’ is selected, the period of the linear voltage output can be selected.
See page 14 of the AM4096D01 datasheet for a detailed description of the Linear voltage output.



If ‘Tacho’ is selected, the measuring range can be selected (in Hz).
See page 13 of the AM4096D01 datasheet for a detailed description of the Tacho output.

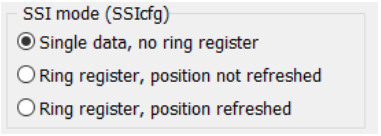
The RMK4 default setting is ‘Vout’ and the default period is ‘360°’.
The default setting for the Tacho measuring range [Hz] is ‘2048’.



SSI mode

Here you can select an operating mode of the SSI output. See page 11 of the AM4096D01 datasheet for a detailed description of this functionality.

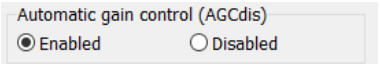
The RMK4 default setting is ‘Single data, no ring register’.



AGC

You can select that AGC (automatic gain control) can be enabled or disabled.

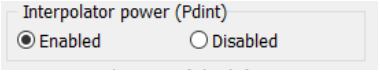
The RMK4 default setting is ‘Enabled’.



Interpolator power

Here you can selected that the interpolator power can be enabled or disabled.

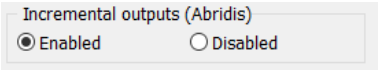
The RMK4 default setting is ‘Enabled’.



Incremental outputs

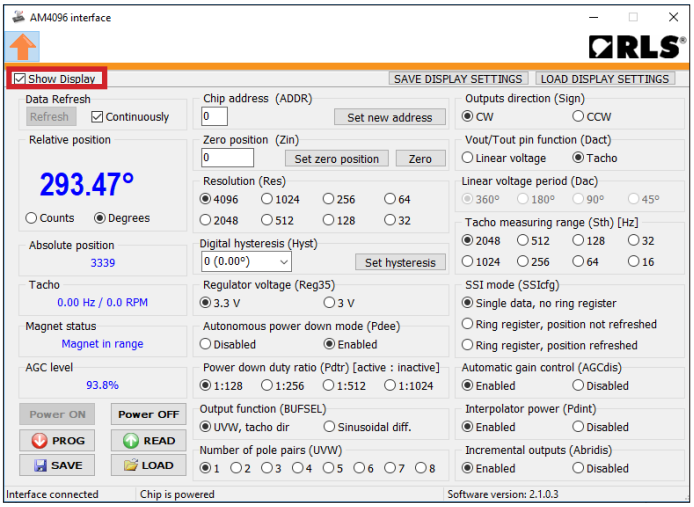
In this section the incremental outputs can be enabled or disabled.

The RMK4 default setting is ‘Enabled’.

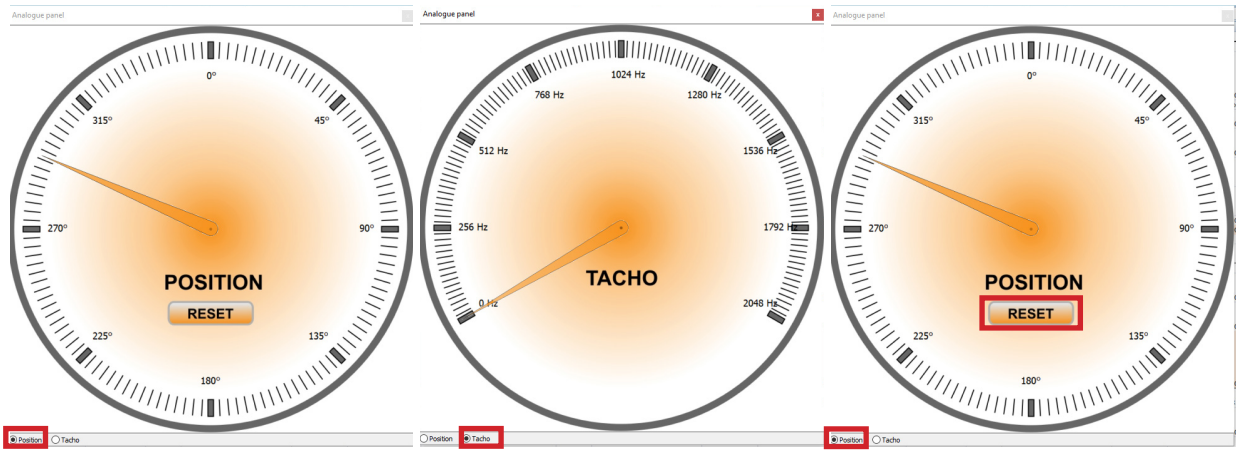


Show display

For the purpose of presentations, the large analogue display panel was designed. The display can be shown by checking the ‘show display’ check box on the top of the main interface.

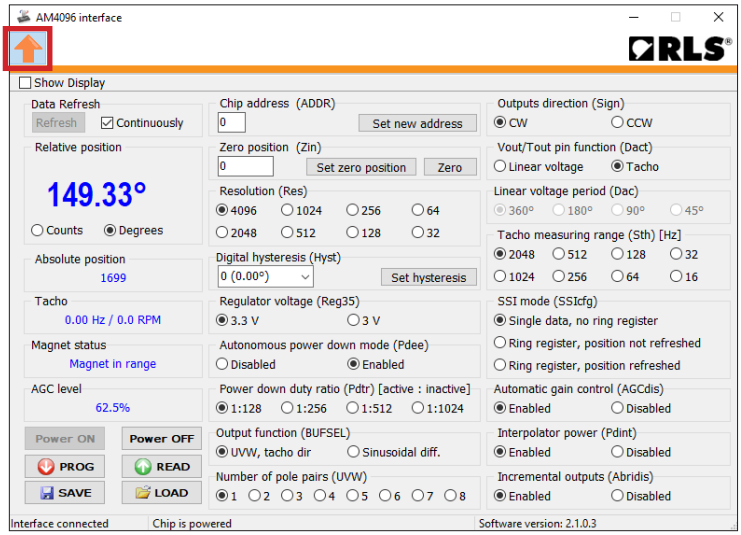


The analogue display enables the user to select one of the two display modes: the angular position display (by selecting the ‘Position’ radio button on the bottom) or the tachometer (the ‘Tacho’ radio button) which displays the rotating velocity in number of turns per second (Hz). The position display also enables resetting the position by clicking the ‘RESET’ button which acts the same way as the ‘Zero’ button on the main interface (see ‘Zero position’ section on the top).



Another display feature is the orange arrow on the very top left hand corner of the main interface. Pressing the arrow will reduce the main interface by hiding the operating board, and moving the digital position display to the top of the interface. Reduced interface can be combined with the analogue display so that the analogue display does not cover the main interface on the screen.

The original full-sized interface with the operating board can be restored by pressing the orange arrow on the reduced board.



NOTE: All of the changes made will not be programmed to the encoder until the PROG button has been clicked.

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Document issues

Issue	Date	Page	Corrections made
1	20. 11. 2009	-	New document
2	25. 5. 2018	General	Software version: 2.1.0.3
3	18. 12. 2024	1	Windows 11 added