Co-ordinated Linear Motion (Section 10.1.5 in manual)

Co-ordinated **linear** motion - each axis moves at constant speed and all axes move from their starting positions to their end positions at the same time, also defined as control the axes so that, at all times, each axis has completed the same fraction of its required motion as the other axes
- IE; any two axes (x,y or z) produces motion in a straight line
- the motion can be done at prevailing or rapid feedrate and may default to the slower axis feedrate

FEEDRATE (unless G93 is used) Section 10.1.6 in manual

1. **X, Y, Z** + A, B, C - without simultaneous rotation - F =length / minute (along the linear path)
2. **X, Y, Z** + **A, B, C** - with simultaneous rotation - F =length / minute (for the XYZA combination linear path ~ modified F based on a diameter)
3. X, Y, Z + **A or B or C** - with simultaneous rotation - F= Degrees / minute of A or B or C
3. X, Y, Z + **A B C** F= Degrees / minute using a blended ABC / conceptual angular motion for total time

3 Feed Rate Modes - (Section 10.7.25 in manual)

G93 - inverse time feed rate - F = 1/F# minutes (if the F number is 2.0, the move should be completed in half a Minute)
- if active, an F word must appear on every line which has a G1, G2, or G3 motion
- an F word on a line that does not have G1, G2, or G3 is ignored.
- does not affect G0 (rapid traverse) motions.

It is an error if: inverse time feed rate mode is active and a line with G1, G2, or G3 (explicitly or implicitly) does not have an F word

G94 - units per minute feed rate F= inches / minute, mm / minute, or degrees / minute, determined by length units are being used and which axis or axes are moving

G95 units per rev feed rate F= number of inches / mm / degrees per spindle revolution, determined by what length units are being used and which axis or axes are moving.

You should run at the lowest kernel speed you can that will allow you to generate the maximum pulse rate you need for your machine.
In other words stay with 25 kHz UNLESS it will not pulse fast enough for your needs.
A faster kernel speed than what you need will not improve a thing.

If you want to calculate out your max pulse frequency start with the max velocity of your machine.

Max_Velocity(IPM) * Steps/Unit = max_step_min (a.k.a. #steps in one minute at max velocity)
max_step_min / 60 = max_pulse_frequency

Your kernel frequency needs to the the lowest choice you have that is greater than your max_pulse_frequency.