What is the resolution along x, i.e. what is Δx

The resolution along x is given by the FOV divided by the Base Resolution:

$$\Delta x = \frac{FOV}{Base\ Resolution} = \frac{250\ mm}{256\ pixels} = 0.977\ mm/pixel$$

What is the readout bandwidth?

The readout bandwidth is given by the Sampling Bandwidth per Pixel multiplied by the Base Resolution:

$$\begin{aligned} Readout\ Bandwidth &= (Sampling\ Bandwidth\ per\ Pixel) * (Base\ Resolution) \\ &= (320\ Hz/pixel) * (256\ pixels) = 81920\ Hz = 81.92\ kHz \end{aligned}$$

What is the sampling period, i.e. what is Δt?

The sampling period is given by the inverse of the Readout Bandwidth:

$$Sampling\ Period = \frac{1}{Readout\ Bandwidth} = \frac{1}{81.92\ kHz} = 0.0122\ ms = 12.2\ \mu s$$

What is the value of N_1 in the Fourier Transform equation?

N_1 is equal to the Base Resolution, so $N_1 = 256\ pixels$.

Given that we will be collecting all N_1 measurements, $F[k_1]$, in a single readout, what should be the value of G_x?

First we solve for Δk_x:

$$\Delta k_x = \frac{1}{FOV_x} = \frac{1}{250 * 10^{-3}\ m} = 4\ m^{-1}$$

Now that we have Δk_x, we can solve for G_x:

$$\Delta k_x = \bar{\gamma} G_x \Delta t \rightarrow G_x = \frac{\Delta k_x}{\bar{\gamma} \Delta t}$$

$$G_x = \frac{4\ m^{-1}}{(42.577 * 10^6\ Hz/T)(12.2 * 10^{-}6\ s)} = 0.0077\ T/m = 7.7\ mT/m$$