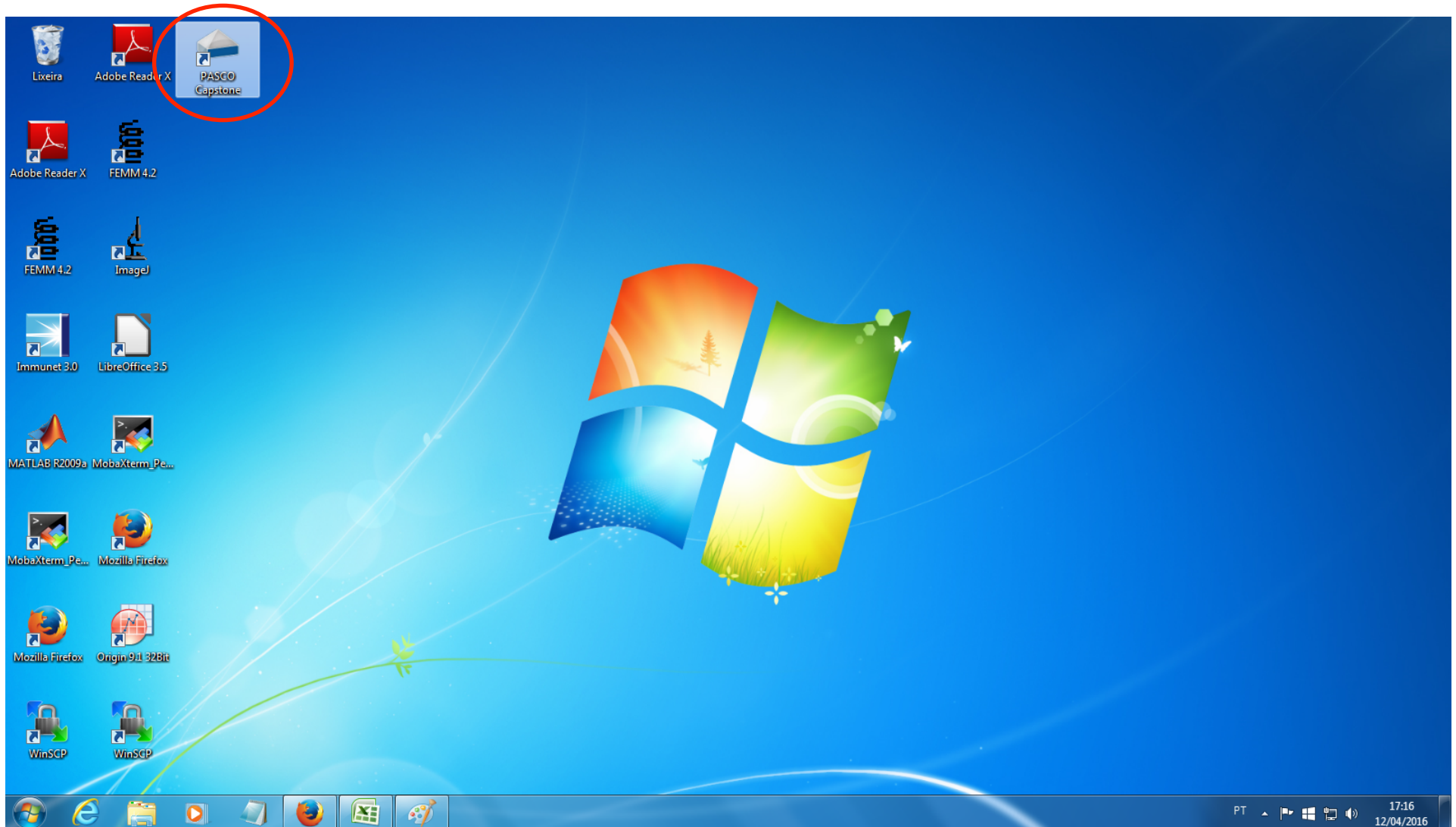
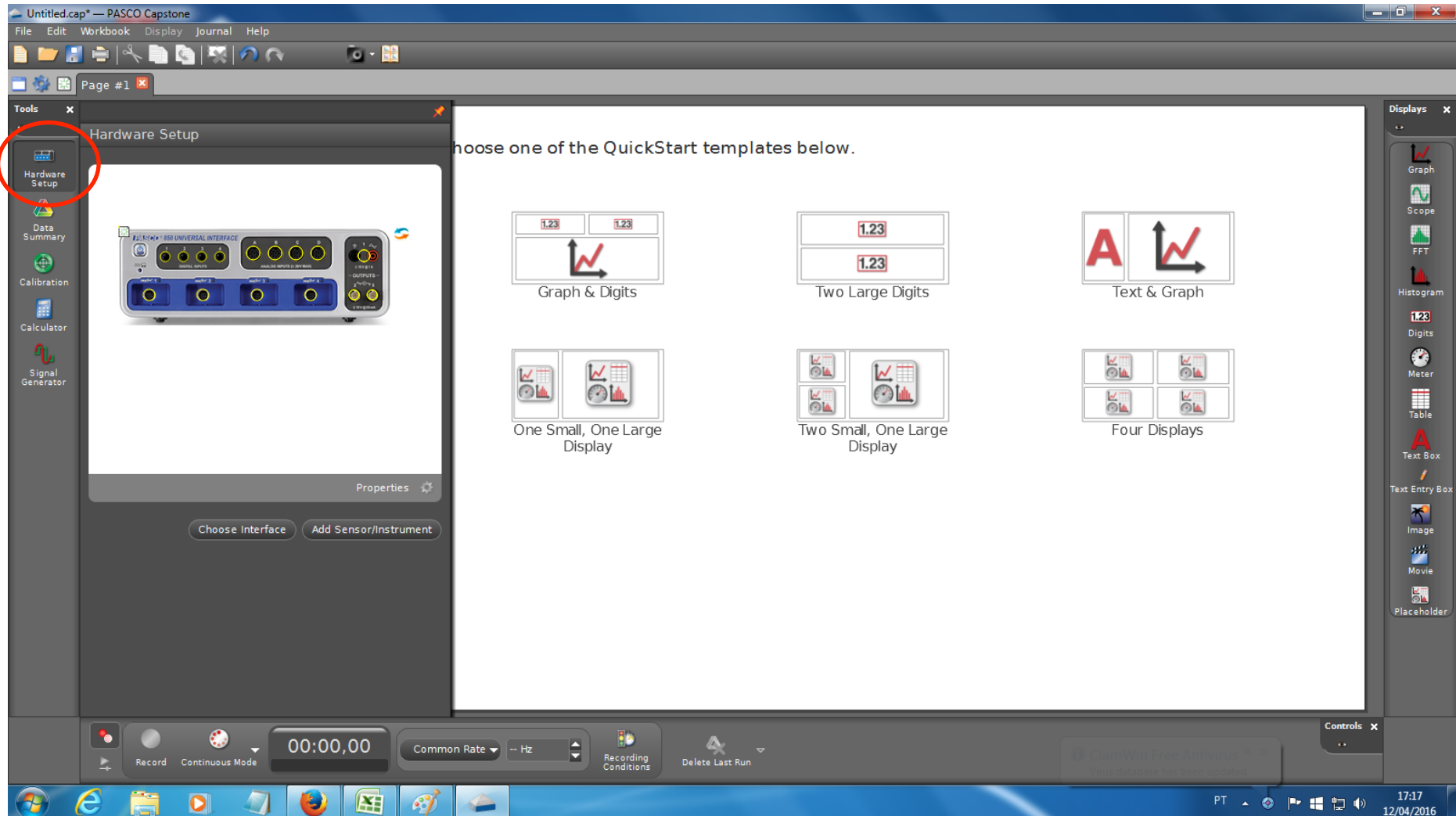


Tutorial para o uso do Capstone com o sensor Hall

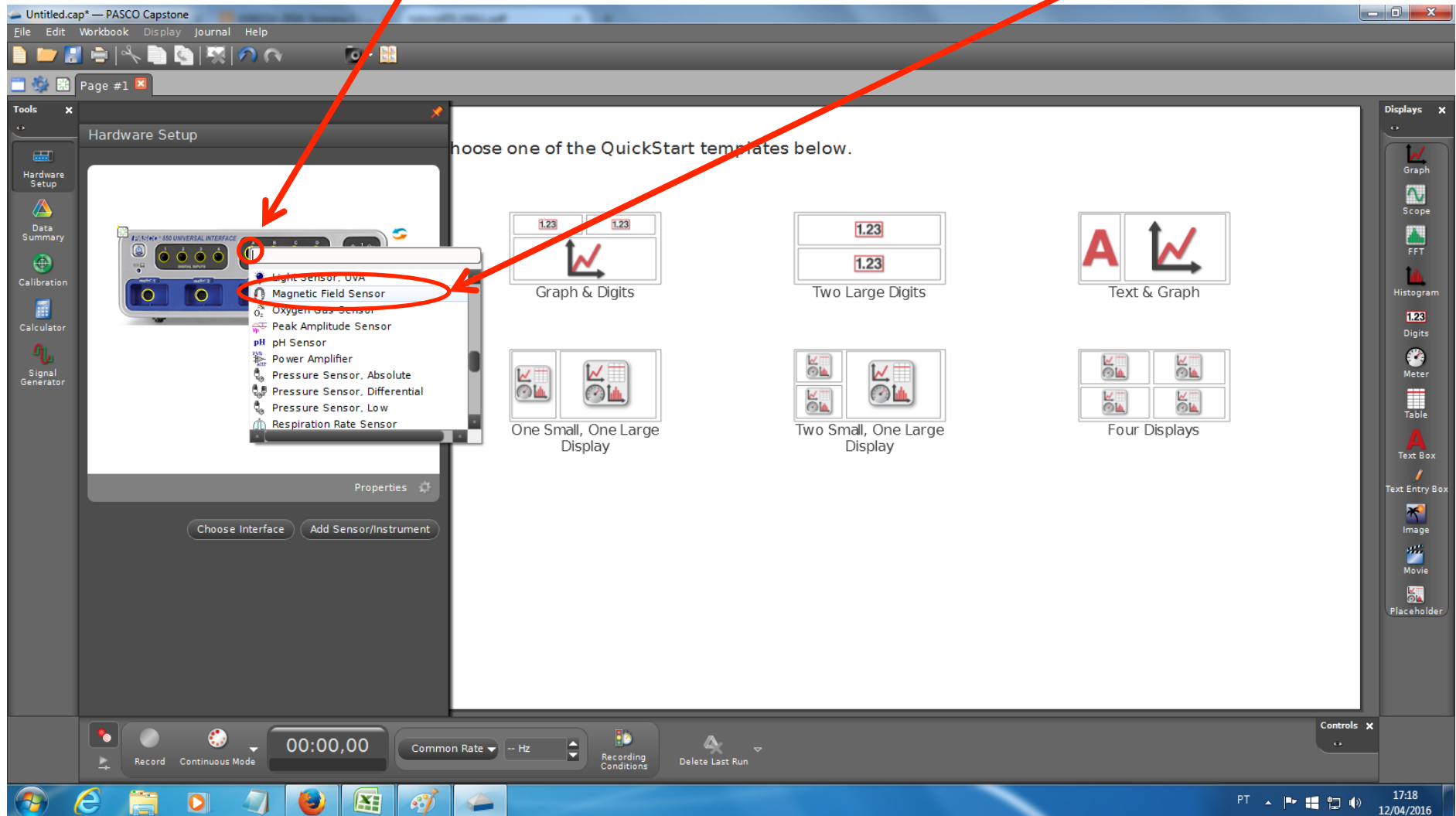
Abra o software PASCO Capstone



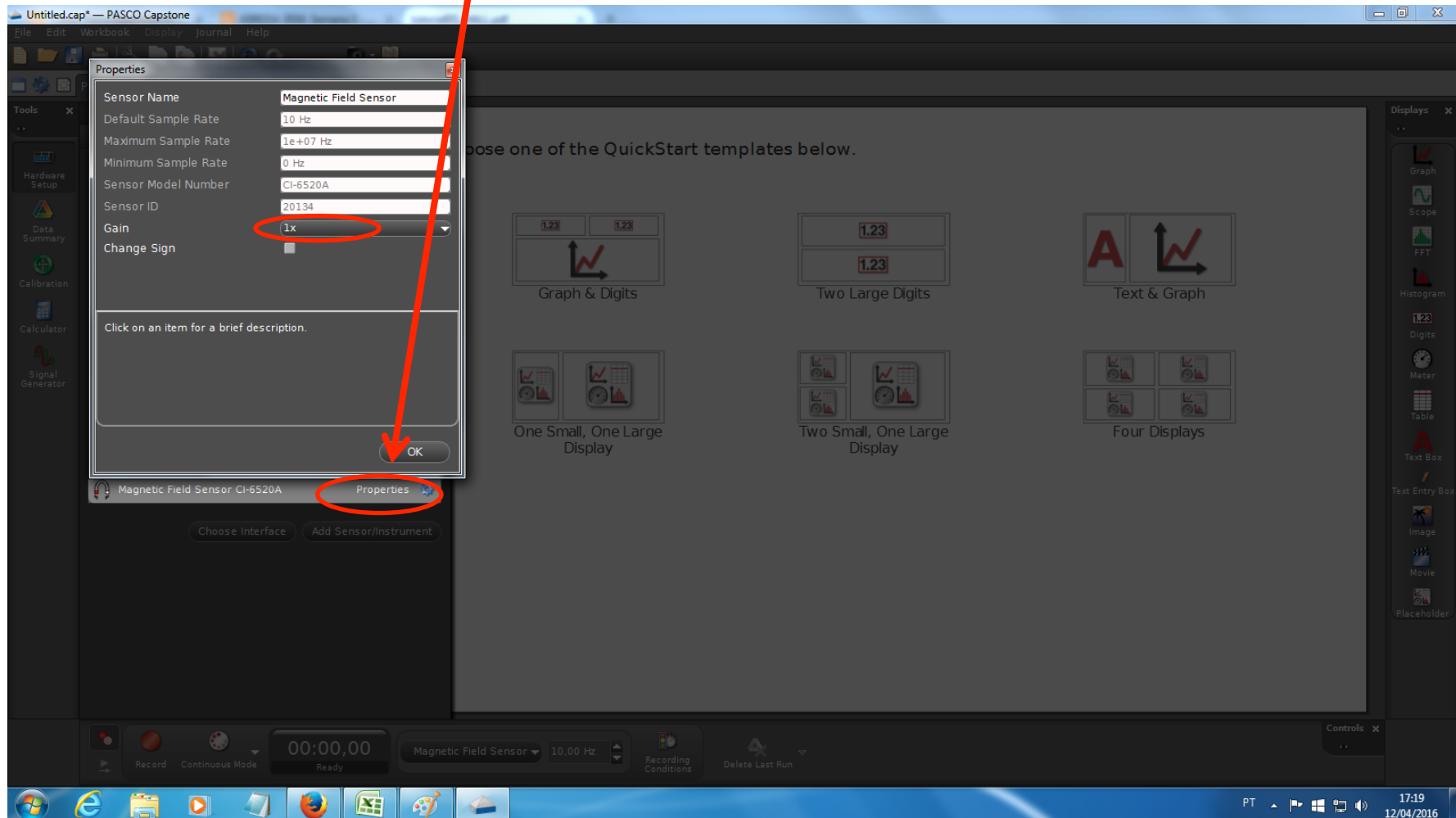
Clique em Hardware Setup Será mostrada a janela abaixo



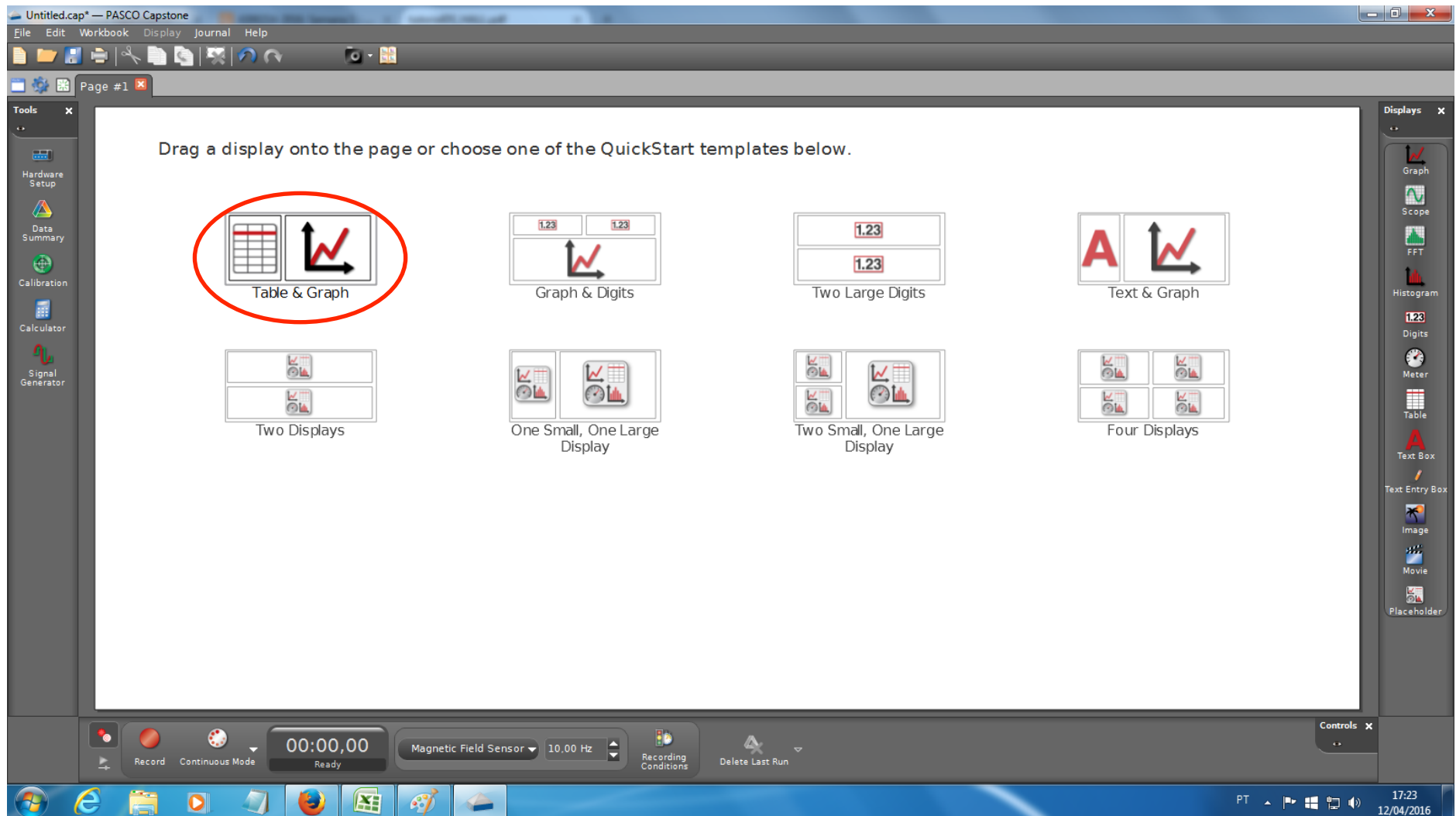
Clique na porta que o sensor está inserido (normalmente A) e selecione “Magnetic Field Sensor”



Clique em “properties” e a janela abaixo será mostrada. Ajuste o ganho (gain) de acordo com selecionado no sensor. Clique em OK.



Na janela principal, escolha “Table & Graph”



Clique em <Select Measurement> -> Create New -> User-Entered Data

The screenshot displays the PASCO Capstone software interface. The main window is titled "Untitled.cap* - PASCO Capstone" and contains a table and a graph. The table, titled "[Table title here]", has a red circle around the "<Select Measurement>" button in the first row. A context menu is open over this button, with "Create New" selected, and a sub-menu is open over "Create New", with "User-Entered Data" selected. The graph, titled "[Graph title here]", is empty with axes labeled from -10 to 10. The software interface includes a menu bar (File, Edit, Workbook, Display, Journal, Help), a toolbar, and a sidebar with various tools like Hardware Setup, Data Summary, Calibration, Calculator, and Signal Generator. The bottom status bar shows recording controls, a timer at 00:00:00, and the selected sensor "Magnetic Field Sensor" at 10.00 Hz. The Windows taskbar at the bottom shows the date 12/04/2016 and time 17:23.

Clique em <Select Measurement> e escolha o ganho apropriado

The screenshot displays the PASCO Capstone software interface. On the left, there is a 'Tools' panel with icons for Hardware Setup, Data Summary, Calibration, Calculator, and Signal Generator. The main workspace is divided into two sections: a data table and a graph.

The data table, titled '[Table title here]', has a header row with a 'Set' button and '<No Data Selected>'. Below the header, there are 21 rows. The first row is labeled 'User Data 1 (units)'. A dropdown menu labeled '<Select Measurement>' is open over the table, listing the following options: 'Create New', 'Rename', 'Magnetic Field Sensor', 'Magnetic Field Strength (1X) (T)', 'Magnetic Field Strength (10X) (T)', 'Magnetic Field Strength (100X) (T)', 'User Entered Data', 'User Data 1 (units)', 'Equations/Constants', 'Constants', 'Time', 'Time (s)', 'Index', and 'Index'. A red circle highlights the 'Magnetic Field Strength (10X) (T)' option.

The graph, titled '[Graph title here]', is a blank coordinate system with a vertical axis ranging from -10 to 5 and a horizontal axis ranging from 0 to 10. A dropdown menu labeled '<Select Measurement>' is positioned below the graph.

At the bottom of the interface, there is a 'Controls' panel with a 'Record' button, a 'Continuous Mode' indicator, a timer showing '00:00,00' in 'Ready' status, a sensor selection dropdown set to 'Magnetic Field Sensor', a frequency selector set to '10.00 Hz', and a 'Recording Conditions' button. A 'Delete Last Run' button is also present.

The Windows taskbar at the bottom shows the system clock as 17:24 on 12/04/2016.

Selecione a unidade desejada

The screenshot displays the PASCO Capstone software interface. On the left, a table is shown with a header row containing 'Set', 'User Data 1 (units)', and '<No Data Selected>'. Below this, the text 'Magnetic Field Strength (10X)' is followed by a dropdown menu. A red circle highlights this dropdown menu, which currently shows three options: 'gauss', 'mT', and 'T'. To the right of the table is a graph with a grid. The y-axis ranges from -10 to 5, and the x-axis ranges from 0 to 10. A '<Select Measurement>' button is located below the x-axis. The bottom of the interface features a control panel with a 'Record' button, a timer set to '00:00,00', a 'Magnetic Field Sensor' dropdown, and a frequency set to '10.00 Hz'. The Windows taskbar at the bottom shows the system time as 17:24 on 12/04/2016.

	Set	<No Data Selected>
	User Data 1 (units)	Magnetic Field Strength (10X)
1		(T) gauss
2		mT
3		T
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		

No gráfico, escolha os eixos (Magnetic field no y e a distância em x)

The screenshot shows the PASCO Capstone software interface. On the left is a data table with 21 rows and 2 columns. The first column is labeled 'User Data 1 (units)' and the second is 'Magnetic Field Strength (10X) (T)'. The table is currently empty. To the right of the table is a graph area. The y-axis is labeled 'Magnetic Field Strength (10X) (T)' and the x-axis is labeled 'Time (s)'. A red circle highlights the y-axis label, and a context menu is open over it, showing options like 'Add Similar Measurement', 'Quick Calc', 'Magnetic Field Sensor', 'Magnetic Field Strength (1X) (T)', 'Magnetic Field Strength (10X) (T)', 'Magnetic Field Strength (100X) (T)', 'User Entered Data', 'User Data 1 (units)', 'Equations/Constants', 'Constants', 'Time', 'Time (s)', 'Index', and 'Index'. The software interface includes a menu bar (File, Edit, Workbook, Display, Journal, Help), a toolbar, and a status bar at the bottom showing 'Record Continuous Mode', '00:00,00 Ready', 'Magnetic Field Sensor 10.00 Hz', and 'Recording Conditions Delete Last Run'. The Windows taskbar at the bottom shows the date and time as 17:25 on 12/04/2016.

	▲ Set	<No Data Selected>
	User Data 1 (units)	Magnetic Field Strength (10X) (T)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		

Selecione a opção Keep Mode. Você pode escolher a taxa de amostragem (sampling) logo ao lado

The screenshot displays the PASCO Capstone software interface. On the left, a table is shown with the following structure:

	▲ Set User Data 1 (units)	<No Data Selected> Magnetic Field Strength (10X) (T)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		

To the right of the table is a graph with the following axes:

- Y-axis: Magnetic Field Strength (10X) (T), ranging from -0.8 to 0.8.
- X-axis: User Data 1 (units), ranging from 0 to 10.

The graph area is currently empty, with a small box labeled 'B' in the top right corner. The bottom control panel features a 'Record' button, a 'Continuous Mode' dropdown menu, a timer showing '00:00,00', a 'Magnetic Field Sensor' dropdown menu, and a '10,00 Hz' sampling rate control. The 'Keep Mode' option is highlighted with a red circle.

Para iniciar a medida, clique em “preview”. O botão vai se tornar “stop”

The screenshot displays the PASCO Capstone software interface. The main window is titled "Untitled.cap* — PASCO Capstone" and contains a menu bar (File, Edit, Workbook, Display, Journal, Help) and a toolbar. The interface is divided into several sections:

- Tools Panel (Left):** Contains icons for Hardware Setup, Data Summary, Calibration, Calculator, and Signal Generator.
- Table:** A data table with the title "[Table title here]". It has two columns: "User Data 1 (units)" and "Magnetic Field Strength (10X) (T)". The first row contains the value "-8E-4". The table is currently in "Run #1" mode, indicated by a green diamond icon.
- Graph:** A graph with the title "[Graph title here]". The y-axis is labeled "Magnetic Field Strength (10X) (T)" and ranges from -0.8 to 0.8. The x-axis is labeled "User Data 1 (units)" and ranges from 0 to 10. The graph is currently empty.
- Displays Panel (Right):** Contains icons for Graph, Scope, FFT, Histogram, Digits, Meter, Table, Text Box, Text Entry Box, Image, Movie, and Placeholder.
- Controls Panel (Bottom):** Contains a "Stop" button (highlighted with a red circle), "Keep Sample", "Keep Mode", a timer showing "00:02,91", "Recording", "Magnetic Field Sensor", "10.00 Hz", "Recording Conditions", and "Delete Last Run".

Para manter a medida clique em “Keep Sample”
e digite a distância do trilho na tabela

The screenshot displays the PASCO Capstone software interface. On the left, a data table is visible with the following structure:

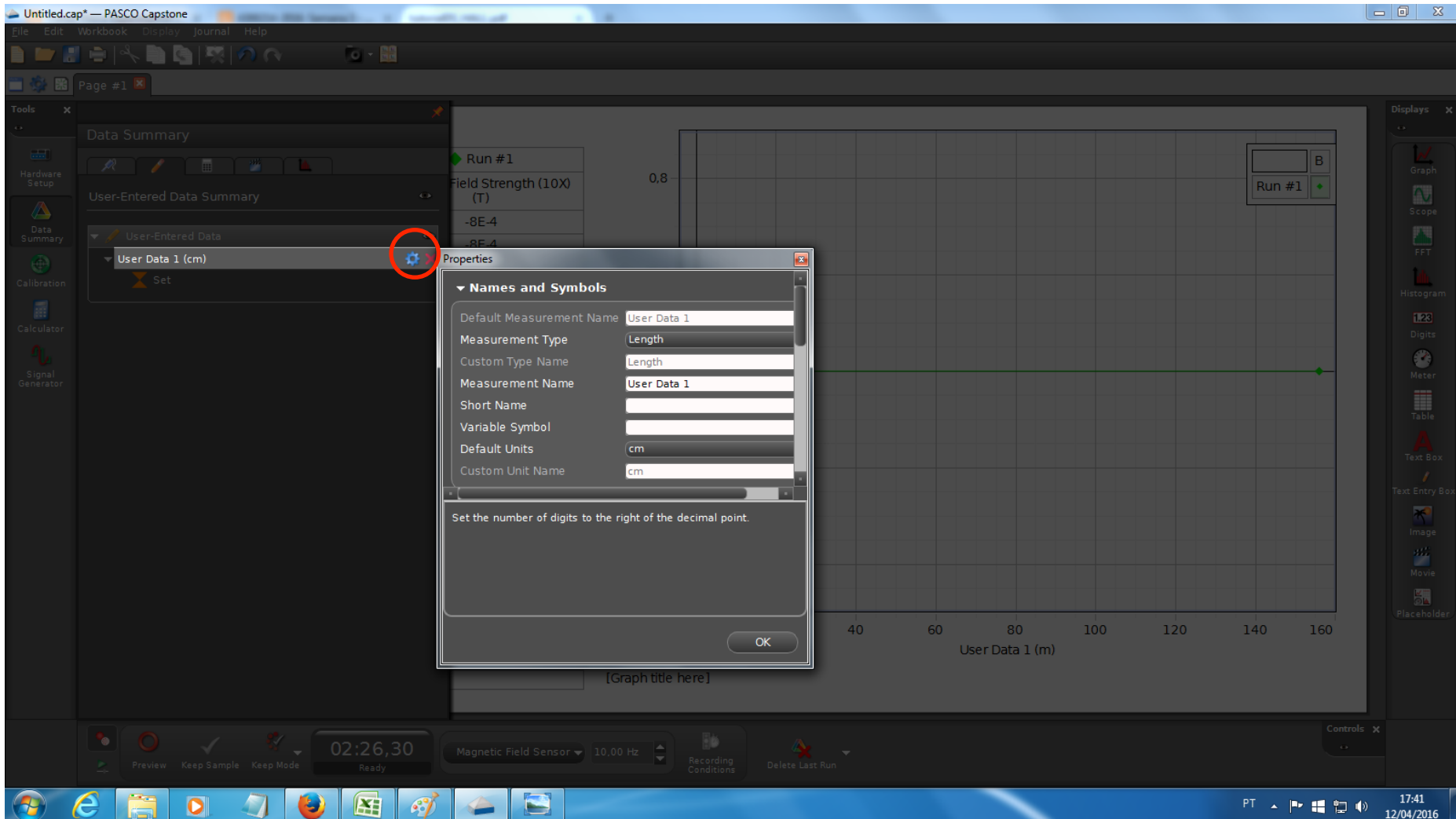
	Set	Run #1
	User Data 1 (units)	Magnetic Field Strength (10X) (T)
1	0	-8E-4
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		

To the right of the table is a graph with the y-axis labeled "Magnetic Field Strength (10X) (T)" ranging from -0.8 to 0.8 and the x-axis labeled "User Data 1 (units)" ranging from 0 to 10. The graph area is currently empty. The bottom control bar includes a "Keep Sample" button with a red checkmark icon, which is circled in red. Other controls include "Stop", "Keep Mode", a timer showing "01:21,11", "Magnetic Field Sensor" with a frequency of "10.00 Hz", "Recording Conditions", and "Delete Last Run". A status bar at the bottom indicates "Record most recent measurement from each connected sensor".

Antes de exportar, em data summary escolha no botão olho apenas os dados que deseja exportar

The screenshot displays the PASCO Capstone software interface. The main window is titled "Untitled.cap* — PASCO Capstone" and contains a menu bar (File, Edit, Workbook, Display, Journal, Help) and a toolbar. The "Page #1" tab is active. On the left, the "Tools" panel is open, showing the "Data Summary" section. Under "Sensor Data Summary", the "Magnetic Field Sensor" is expanded, and "Magnetic Field Strength (100X) (T)" is selected. A red circle highlights the eye icon next to this sensor name. A context menu is open over the eye icon, listing options: "Voltage", "Magnetic Field Strength (1X)", "Magnetic Field Strength (10X)", "Magnetic Field Strength (100X)" (which is checked), and "Magnetic Field Strength". The main workspace shows a graph with the y-axis labeled "Magnetic Field Strength (T)" ranging from -0.8 to 0.8 and the x-axis labeled "User Data 1 (units)" ranging from 0 to 160. A single green data point is plotted at approximately (158, 0.0). The "Displays" panel on the right shows various visualization options like Graph, Scope, FFT, Histogram, etc. The bottom status bar shows "Ready", "Magnetic Field Sensor", "10.00 Hz", and "Recording Conditions". The Windows taskbar at the bottom shows the time as 17:36 on 12/04/2016.

No botão engrenagem para cada conjunto de dados é possível configurar a unidade e número de casas decimais a serem exportadas.



Finalmente exporte os dados para um arquivo texto.

The screenshot displays the PASCO Capstone software interface. The main window is titled "Untitled.cap* — PASCO Capstone" and features a menu bar with "File", "Edit", "Workbook", "Display", "Journal", and "Help". The "File" menu is open, showing options such as "New Experiment", "Open Experiment...", "Save Experiment", "Save Experiment As...", "Preferences", "Import Data...", "Export Data...", "Recent Experiments", "Print Page Setup", "Print Preview...", "Print...", and "Exit".

In the center, a graph titled "[Graph title here]" plots "Magnetic Field Strength (10X) (T)" on the y-axis (ranging from -0.8 to 0.8) against "User Data 1 (units)" on the x-axis (ranging from 0 to 160). A single green data point is visible at approximately (160, 0.0). A legend in the top right corner of the graph area shows a green diamond next to "Run #1".

To the left of the graph, a data table is visible, showing the following data for "Run #1":

Field Strength (10X) (T)
-8E-4
-8E-4

The bottom of the interface contains a control panel with buttons for "Preview", "Keep Sample", "Keep Mode", a timer showing "02:26,30", a dropdown menu for "Magnetic Field Sensor" set to "10.00 Hz", and a "Delete Last Run" button. The Windows taskbar at the very bottom shows the system tray with the time "17:36" and date "12/04/2016".