RoboWare Designer 手册

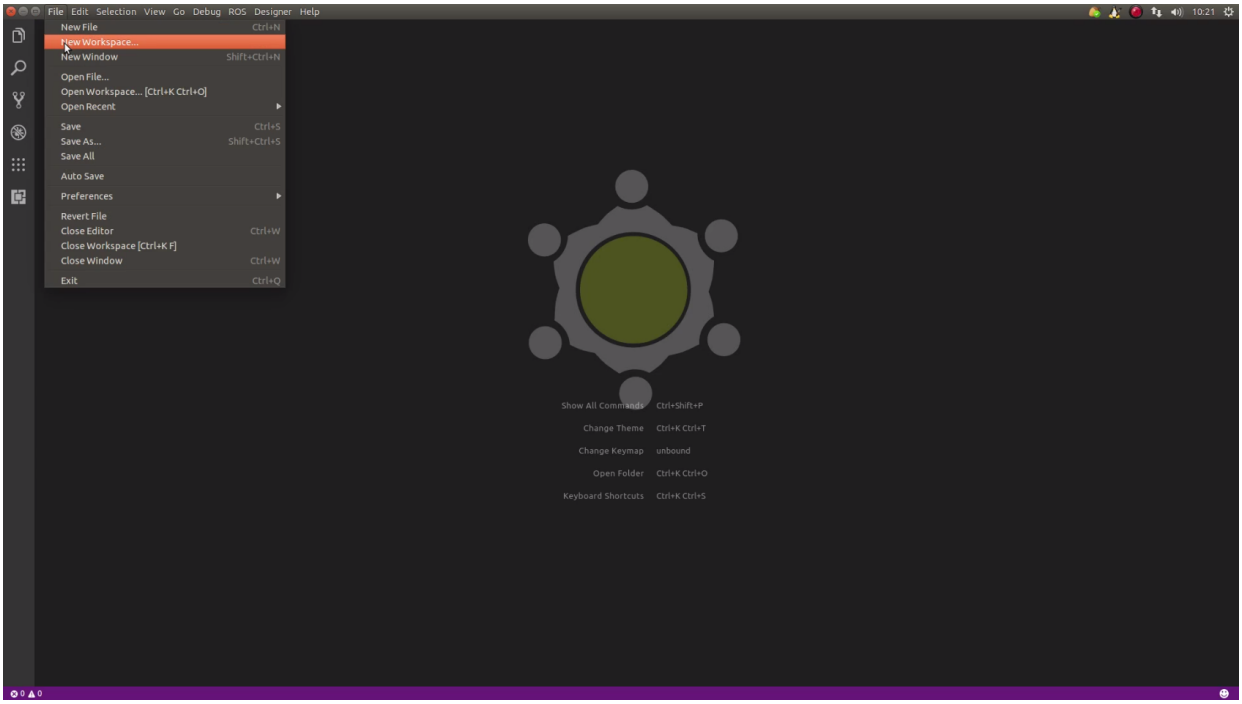
RoboWare Designer 是 RoboWare Studio 推出的 ROS 图形化开发工具。在 RoboWare Designer 中，基于 ROS 的硬件和这些硬件的软件以可视化的方式表示，并且允许你拖动它们、配置它们、编辑它们，使用图表示它们的联系。当你完成这个“游戏”过程，RoboWare Designer 会为你生成一个完全的 ROS workspace — ROS 工程文件树。

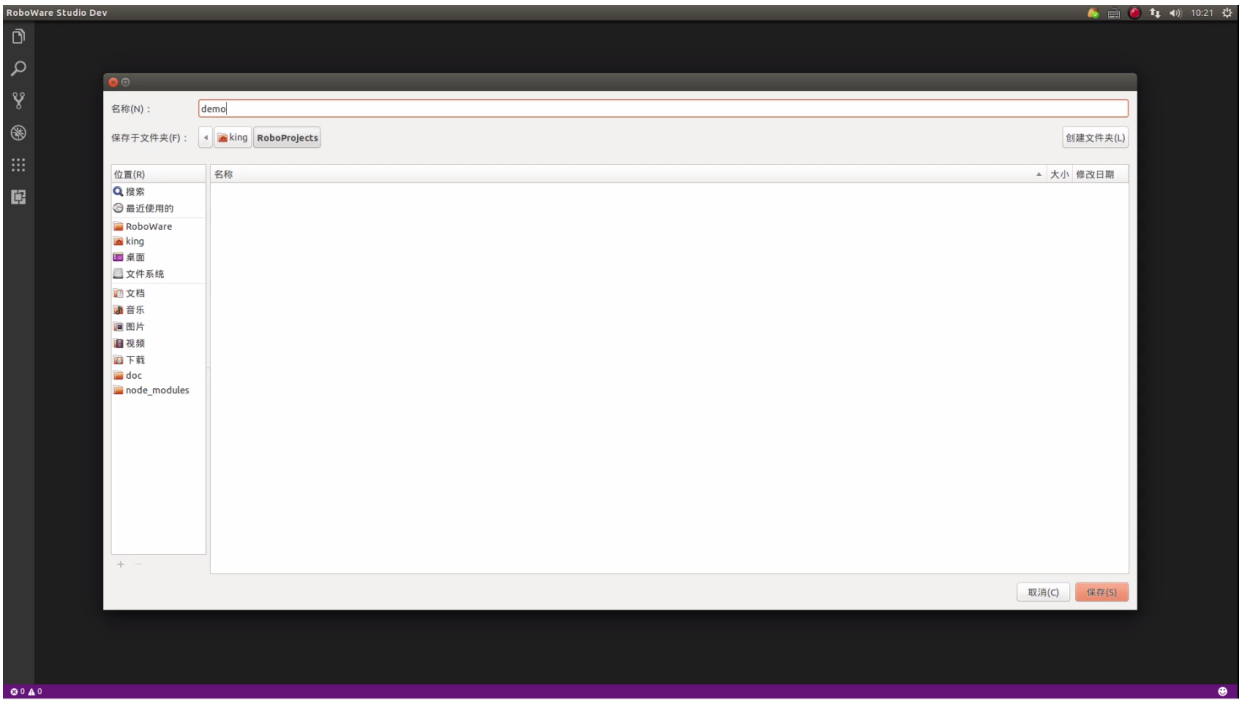
RoboWare Designer 使你在开发的初期，以可视化的角度来考虑整个 ROS 工程，并且准备你需要的各个硬件和软件资源，当你一些考虑就绪之后，RoboWare Designer 为你准备好你预定的各项 ROS 资源设施。

本章主要介绍 RoboWare Designer 的组成和使用指南。

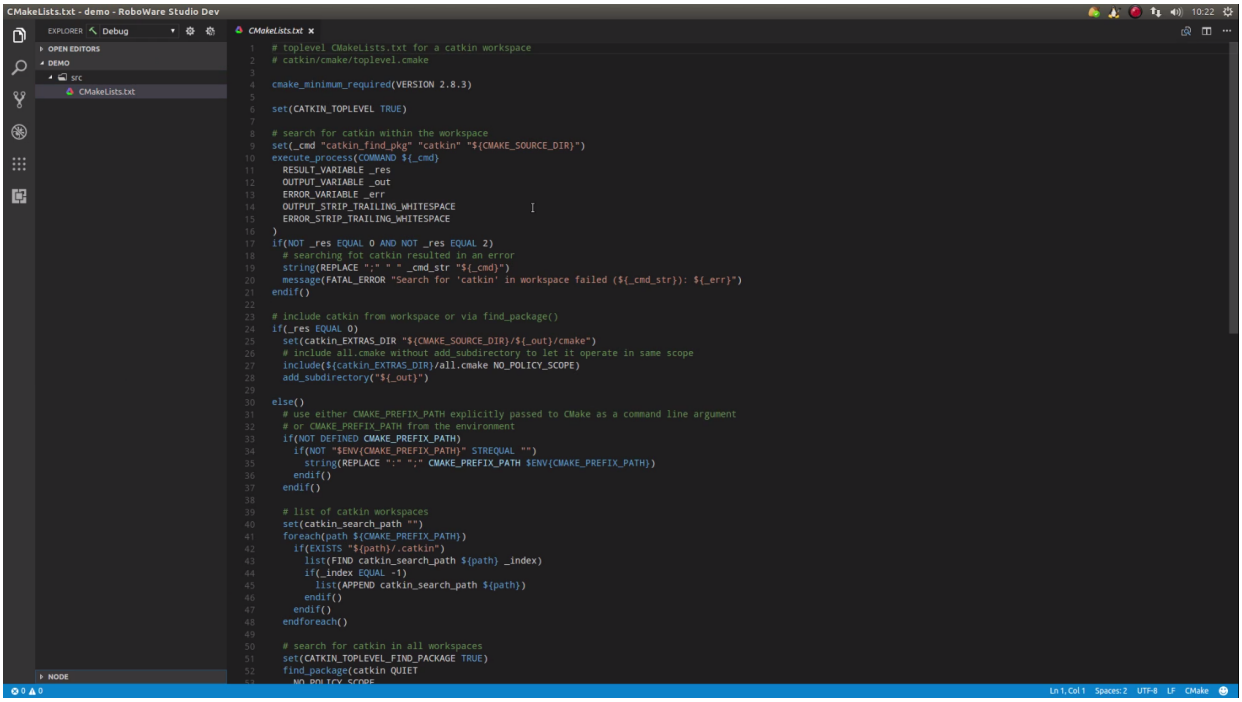
1. 创建一个新的工作区

打开 RoboWare Studio，点击 **File** 菜单 –> **New Workspace...**，输入工作区的名字，创建一个新的工作区。我们在这里给工作区命名为 **demo**，你可以按照自己的需要为工作区命名：



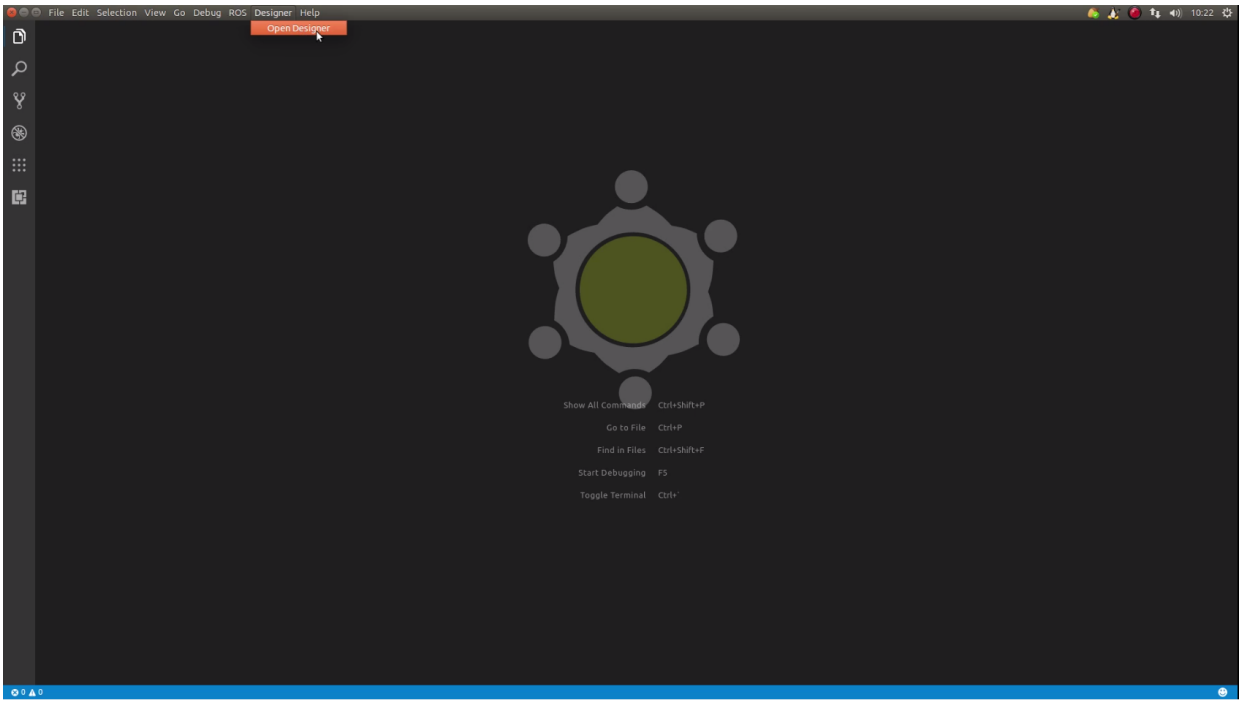


新的工作区只有一个 **src** 目录，里面有一个 **CMakeLists.txt** 文件。这样的工作区，我们称之为“纯净的”，能够成为 Designer 的生成目标。接下来，我们通过 Designer 为这个工作区创建需要的 ROS 工程包，以建造我们的 ROS 基础设施：



2. 打开 RoboWare Designer

点击 **Designer** 菜单栏 –> **Open Designer** 打开 Designer：



Designer 由 4 部分组成：

- **工具箱**

  位于左侧，里面存放着各种部件的原型

- **画布**

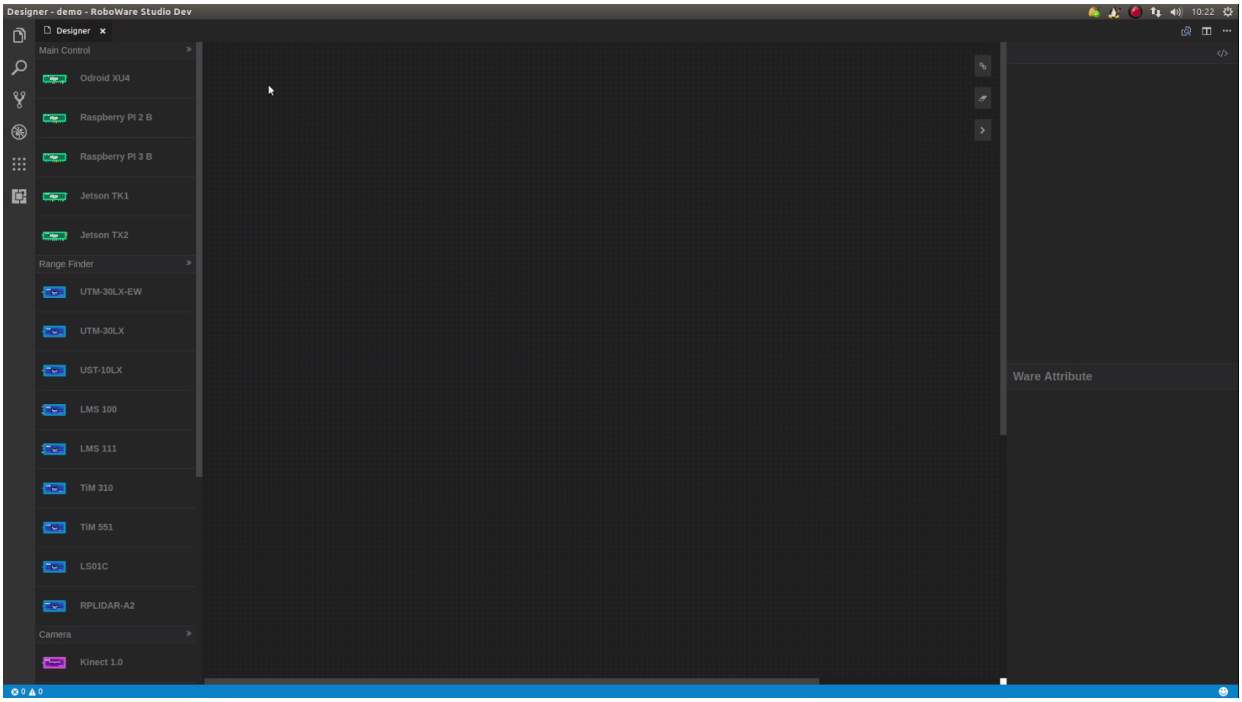
  位于中间，用来放置你需要的部件，可以连接部件之间的端口、删除连线、删除部件、查看部件信息

- **注册栏**

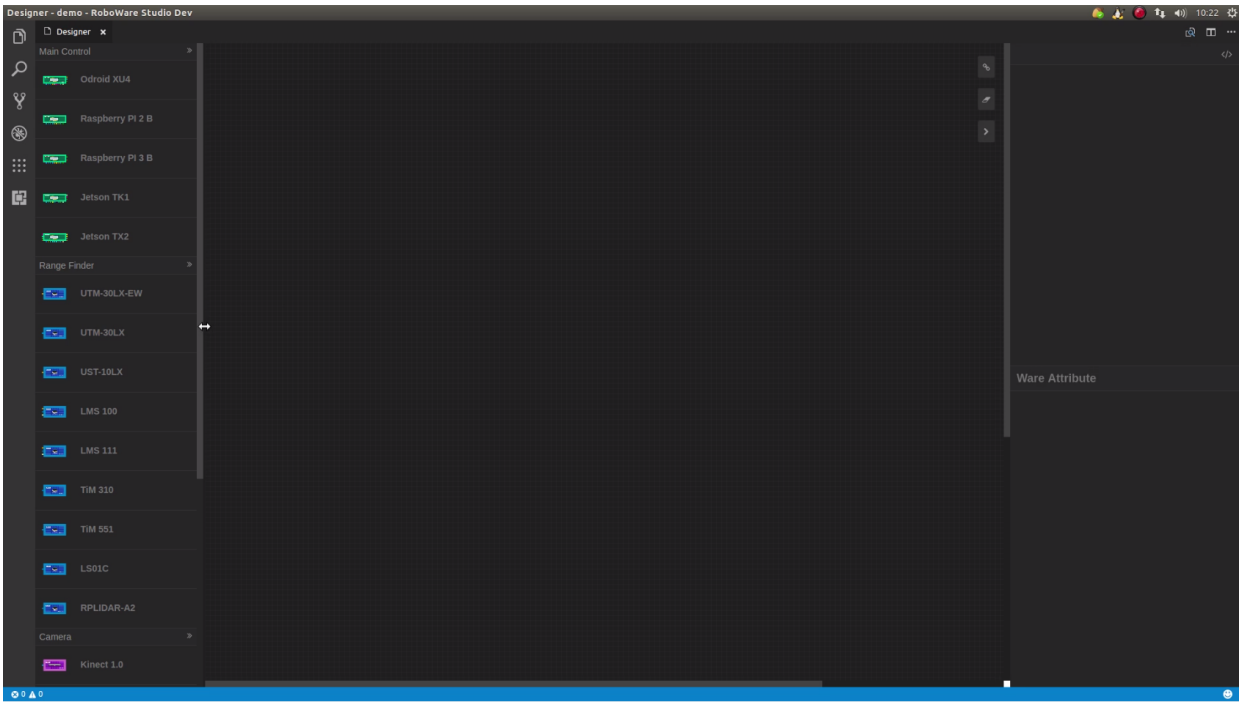
  位于右上角，用来索引**画布**中各个部件，便于查看部件

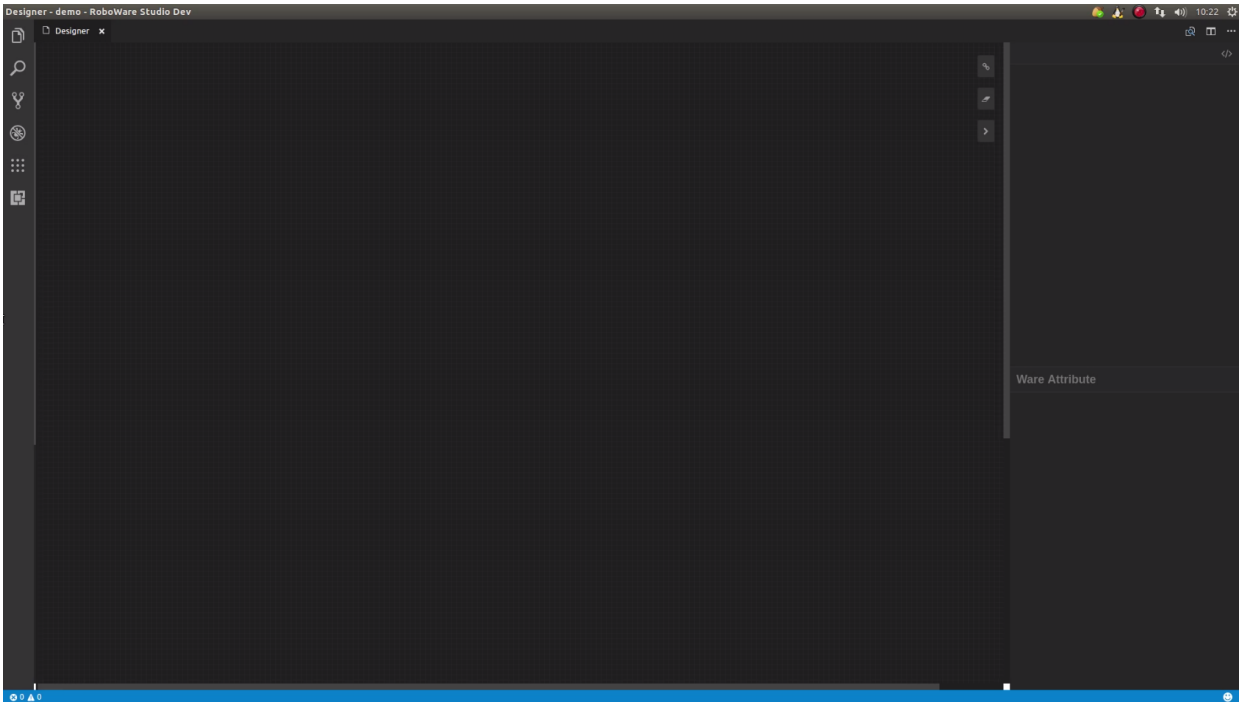
- **属性栏**

  位于右下角称为，在这里可以查看**画布**中各个部件的属性信息

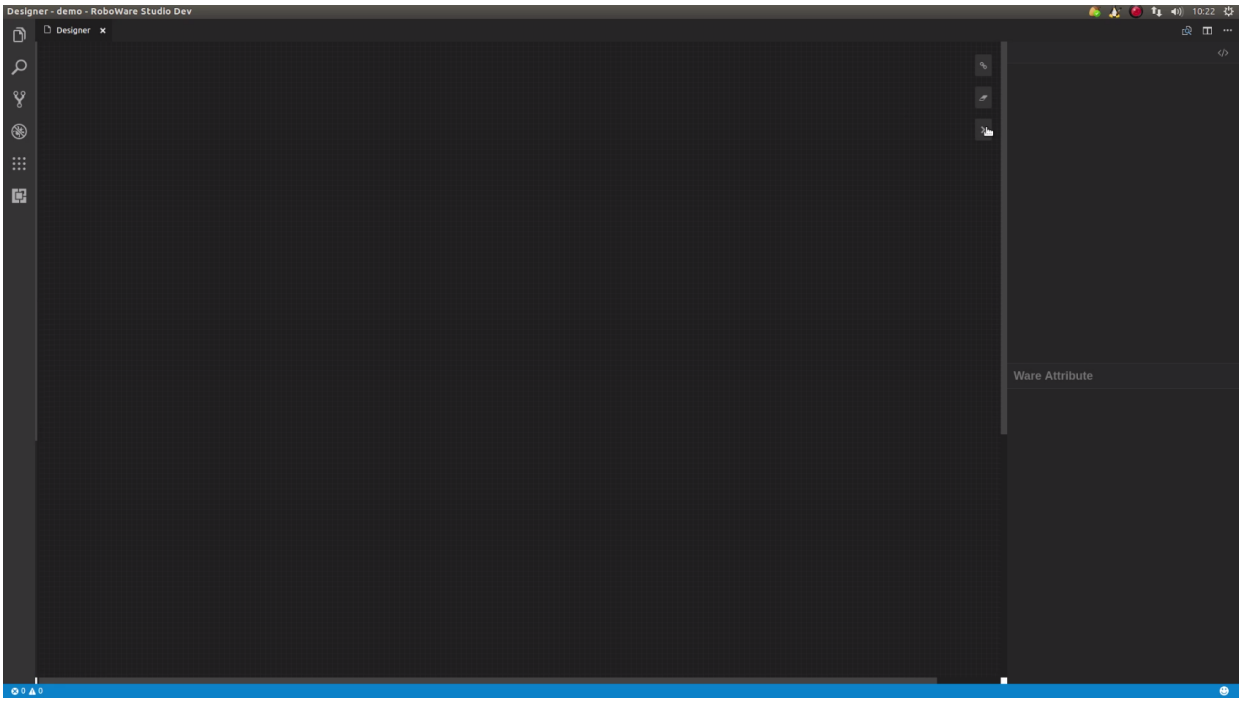


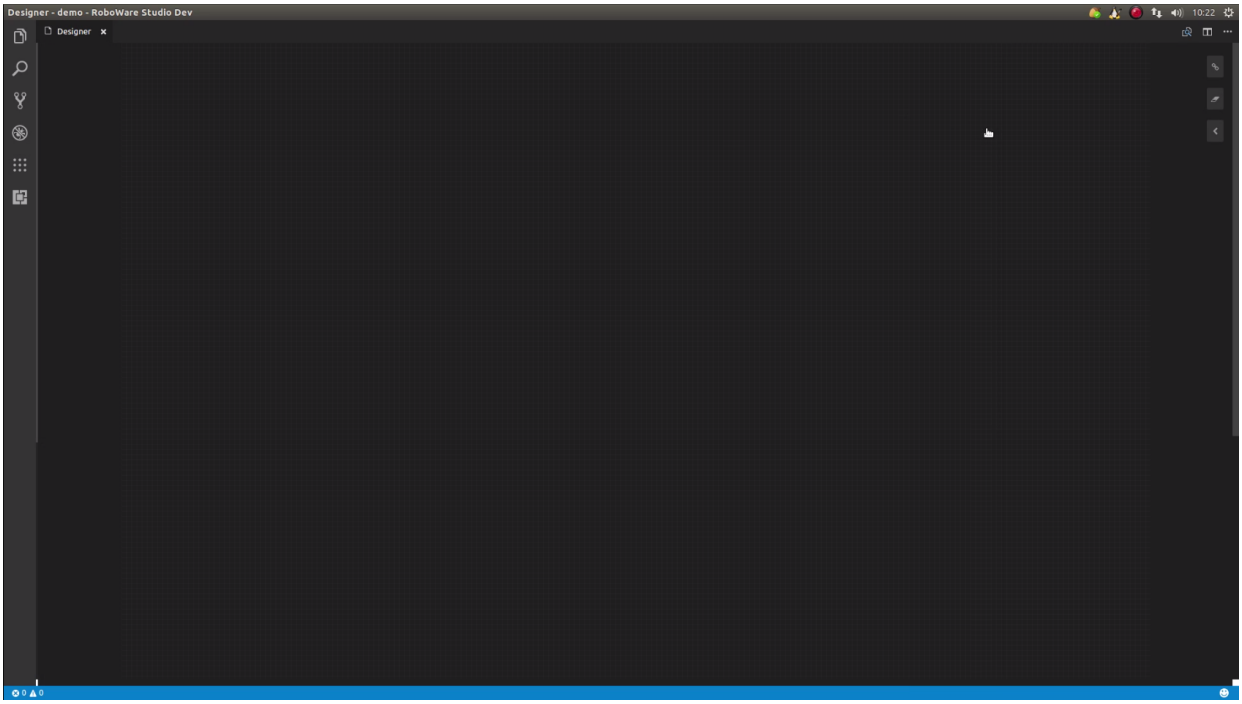
工具箱可以收缩到左边，为**画布**提供更大的视野：





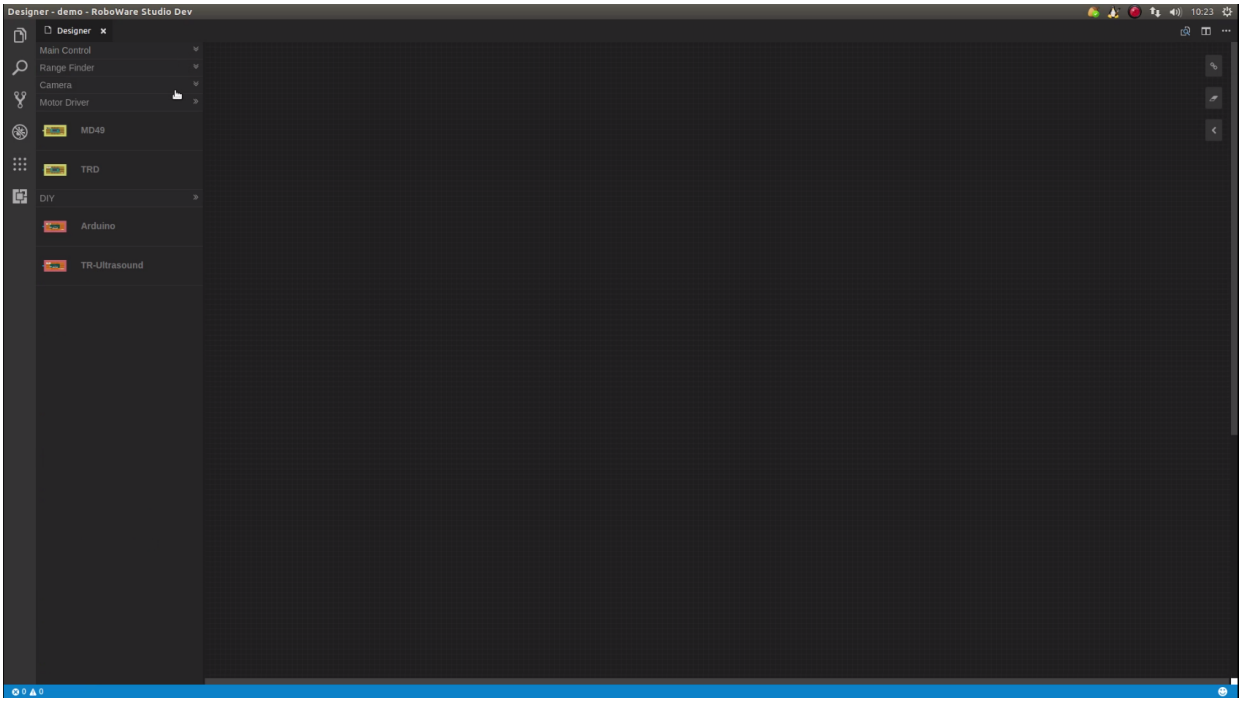
画布右上角有三个按钮，点击第 3 个按钮可以把**注册栏**和**属性栏**收起来，为**画布**提供更大的视野：

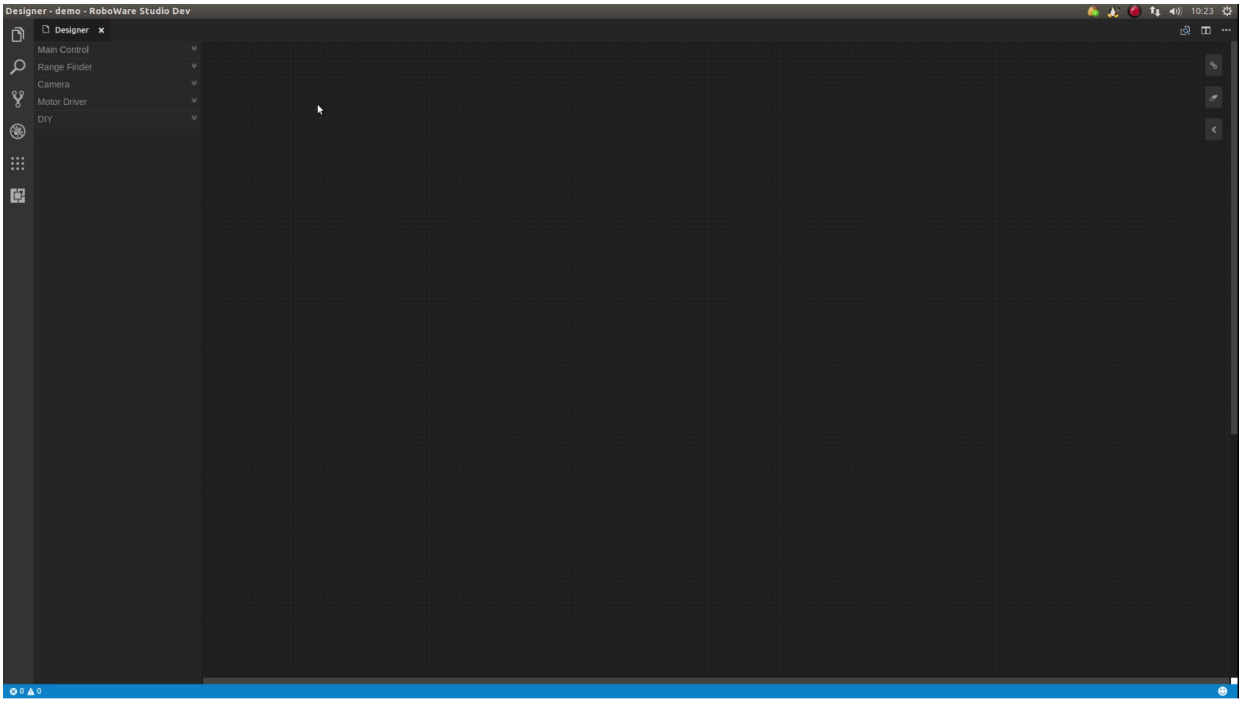




工具箱有 4 种部件：分别是 **Main Control (主控板卡)**、**Range Finder (激光测控仪)**、**Camera (照相机)**、**DIY**。

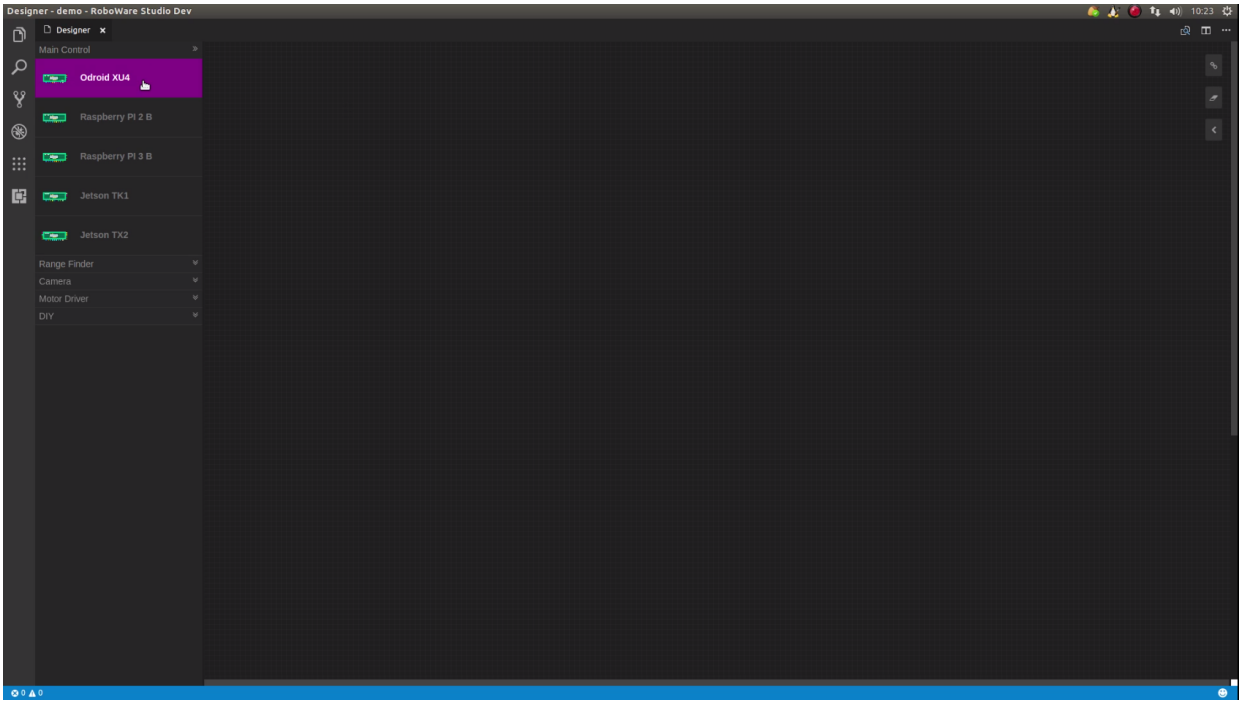
这些不同分类的部件可以折叠，以方便的选择部件：

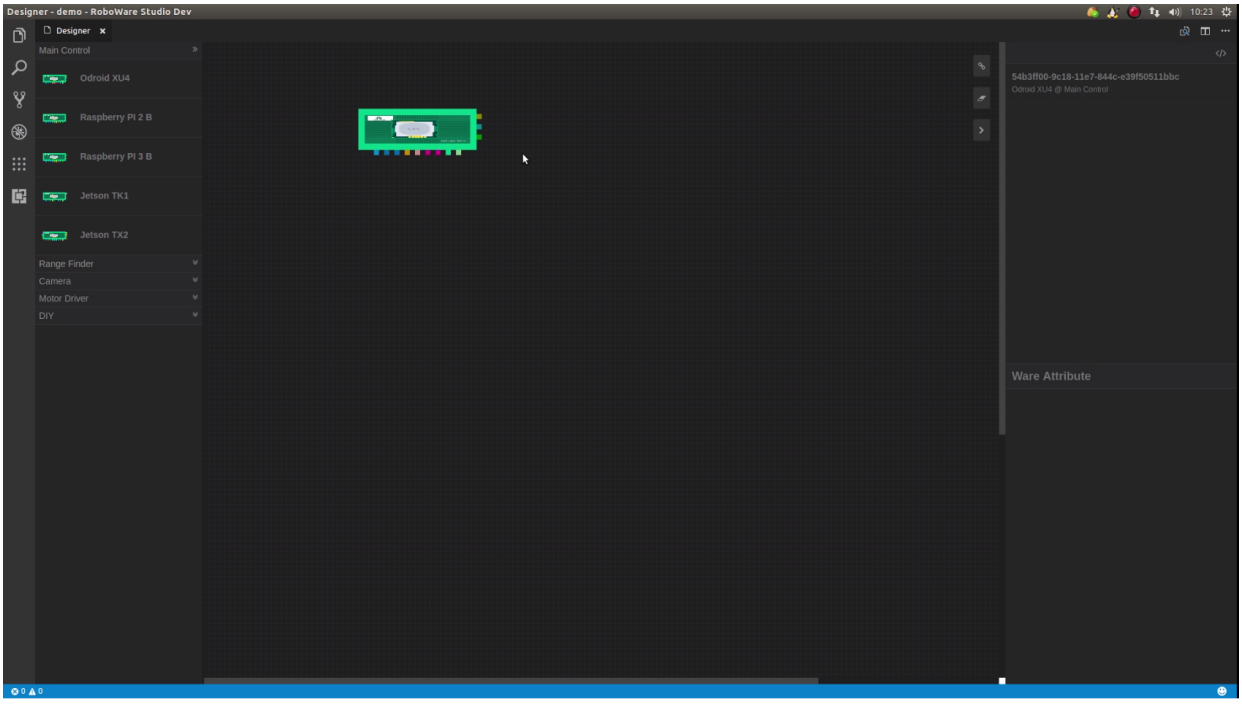




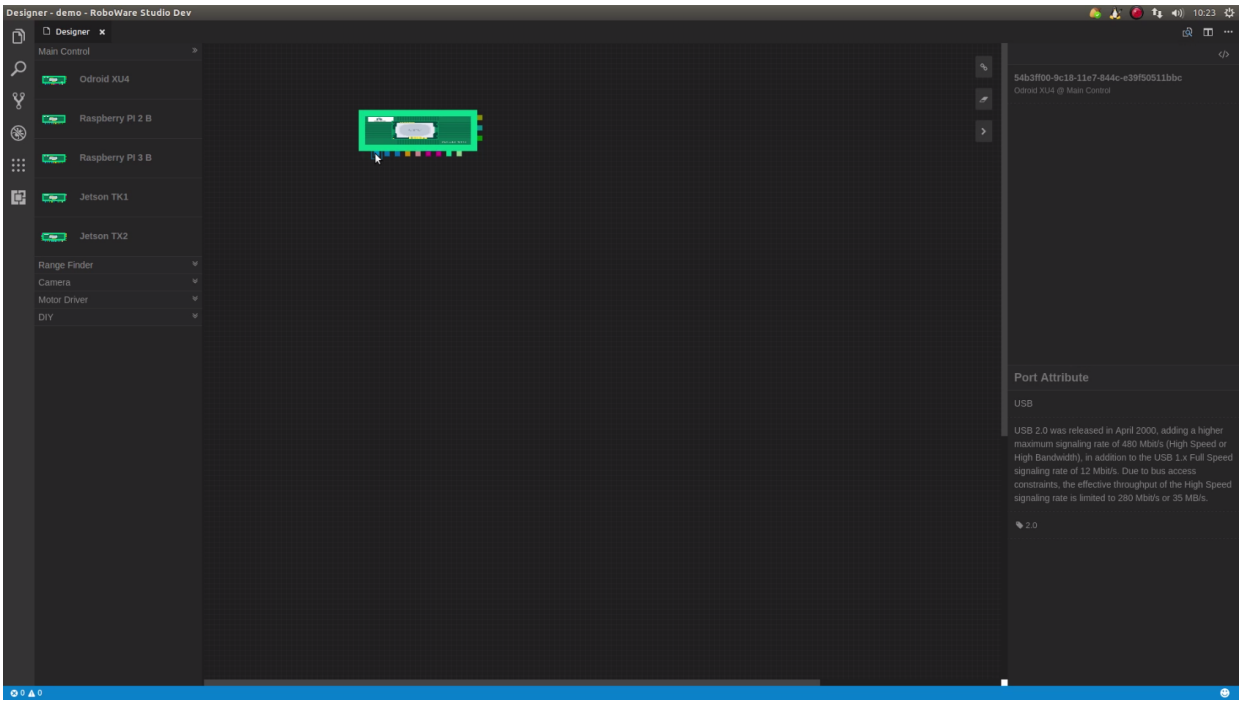
3. 创建部件和查看部件属性

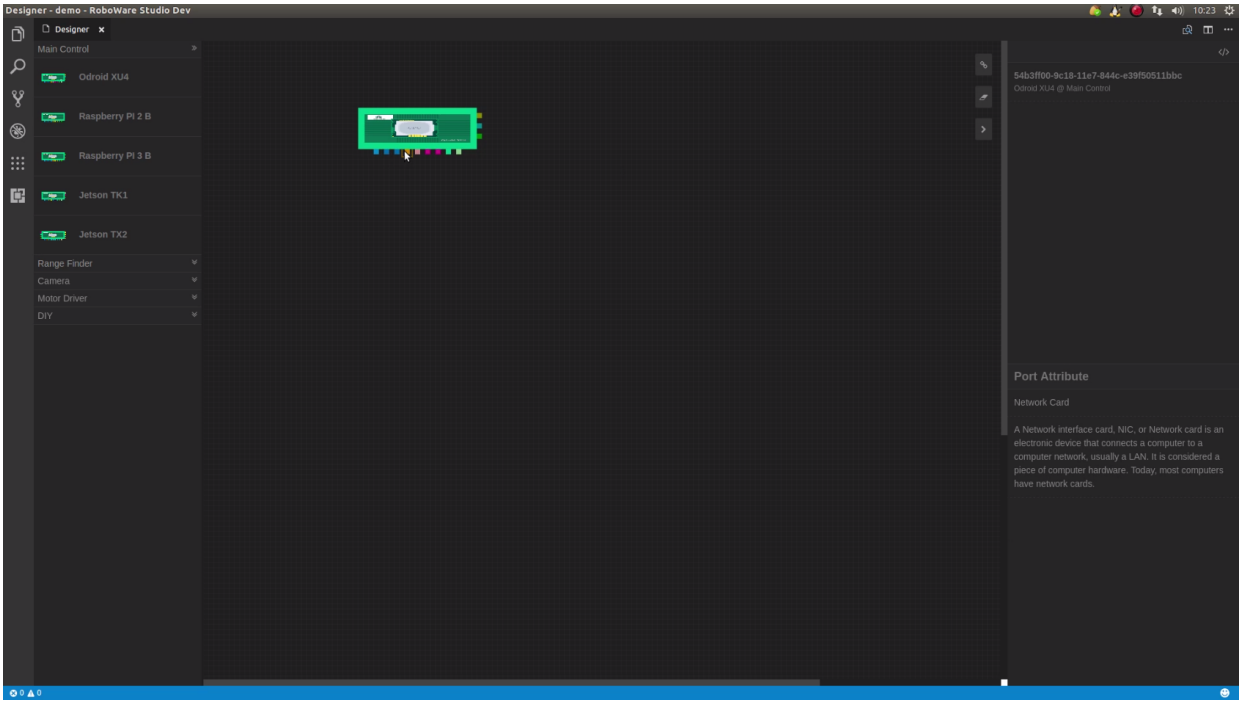
点击**工具箱**上的部件，然后在**画布**上点击，一个新的部件就会添加到**画布**上，同时**注册栏**会登记这个部件：



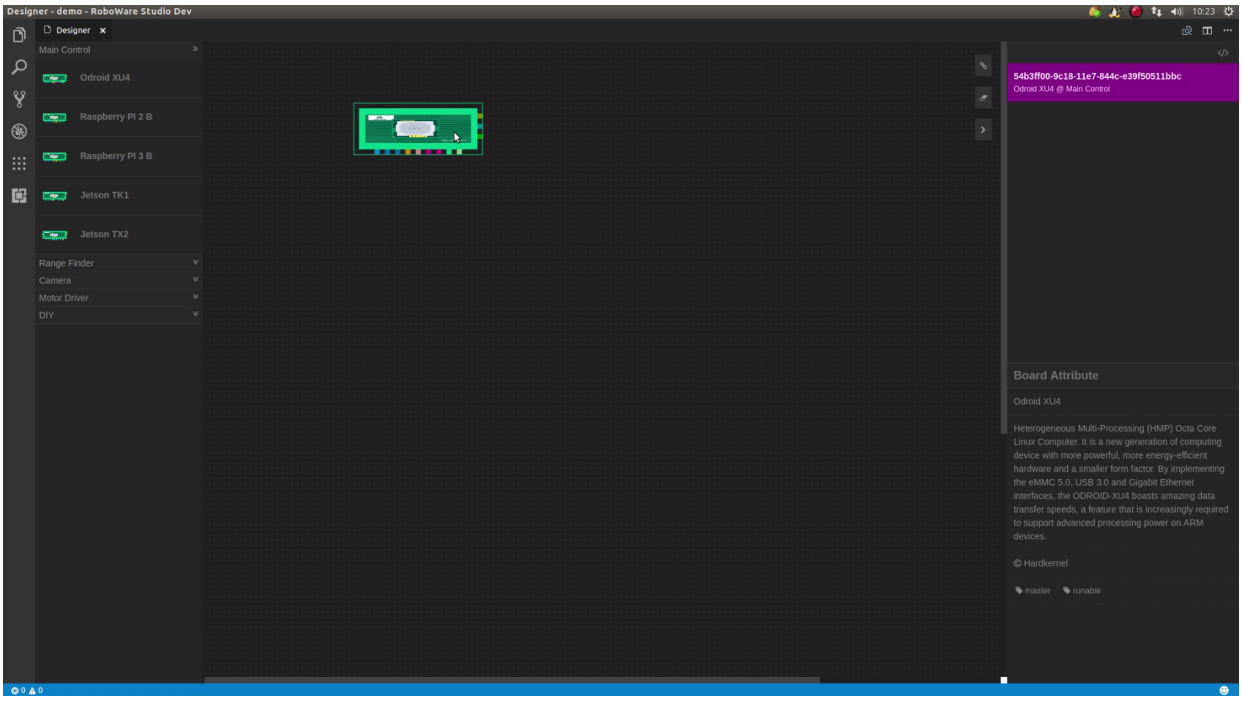


点击部件本身和部件上的端口，可以在**属性栏**看到它们的属性：





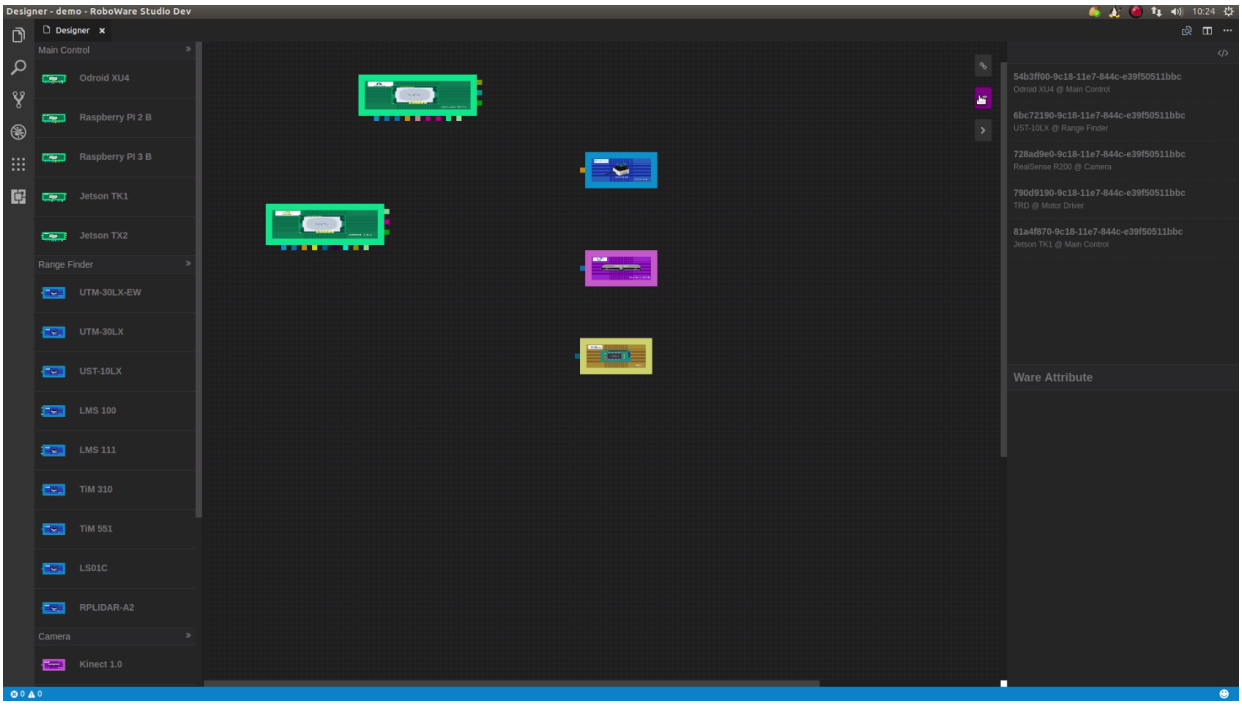
部件目前有 5 个属性：名字、描述信息、开发厂商、ROS 驱动包、标签：



你可以不停地从**工具箱**拖动部件到画布上，每个部件都附带着其依赖的 ROS 软件包（ROS Node），Designer 会为你自动下载并且配置这些软件包：

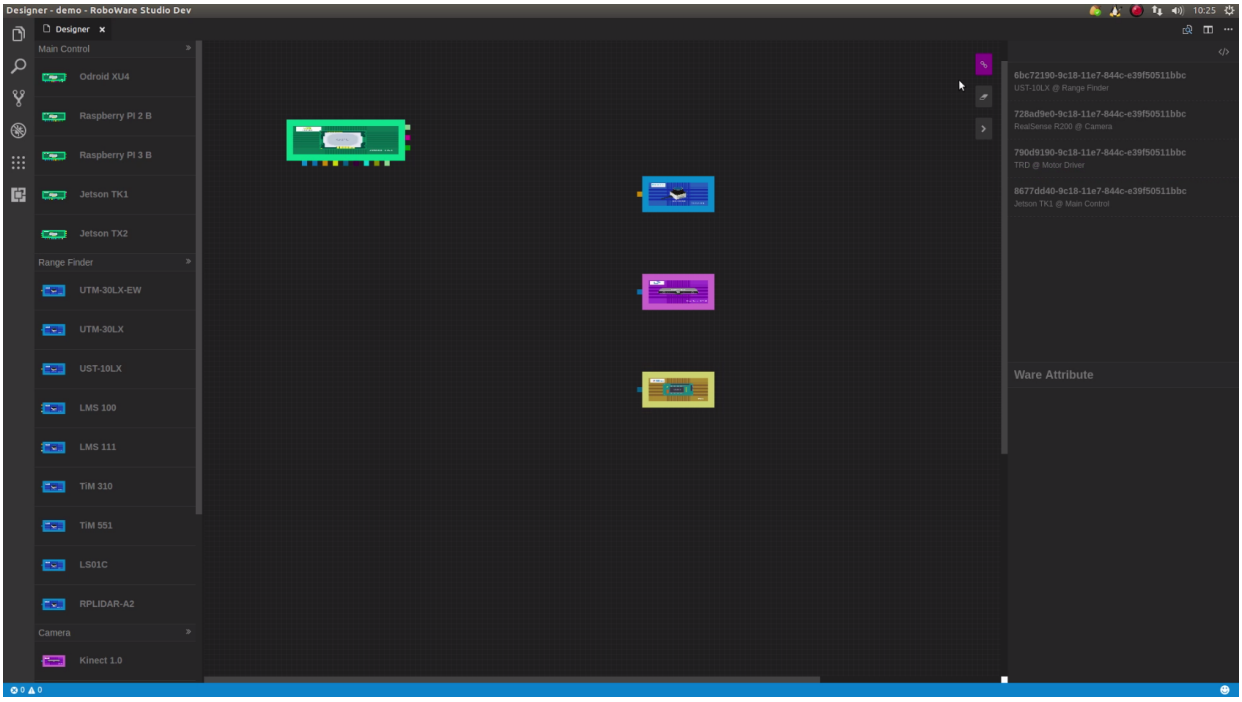
4. 删除部件和端口连接线

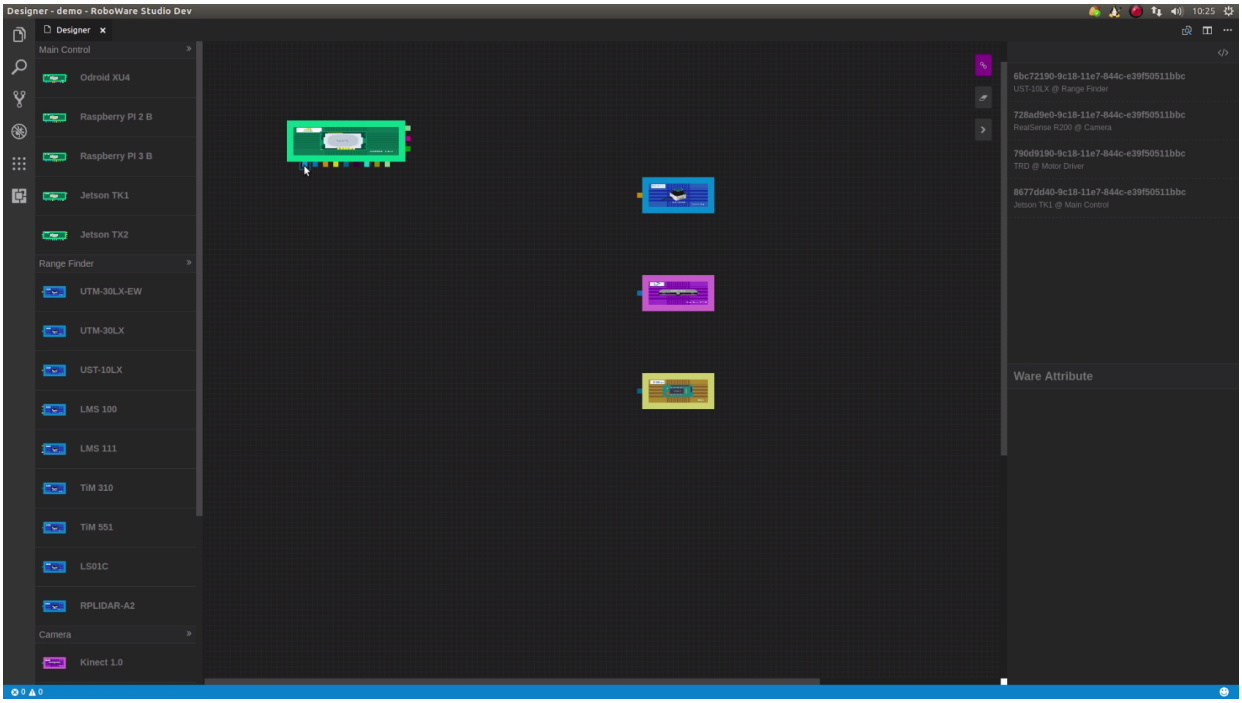
点击**画布**右上角的第二个菜单按钮，这时候就打开了**删除**的功能。当鼠标捕捉到部件的时候，点击鼠标就会删除这个部件，部件上端口的连线也会全部删除。当鼠标捕捉到部件的端口时，只删除该端口上的连接线：

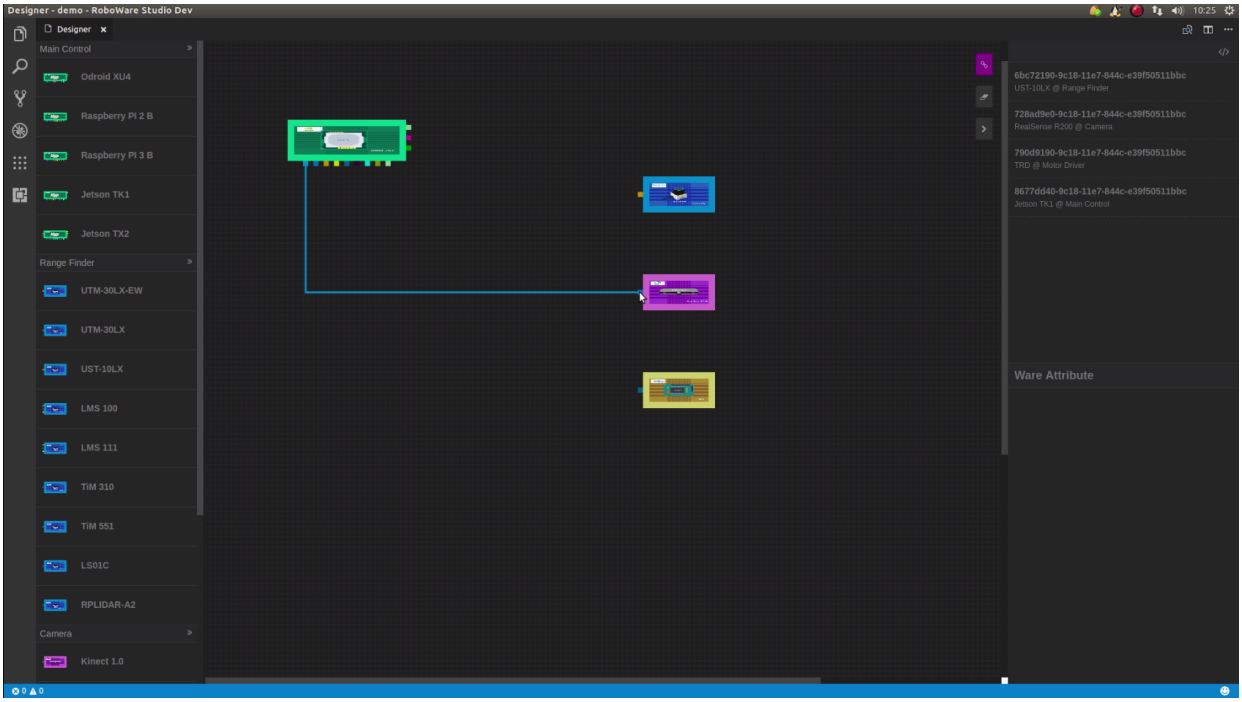


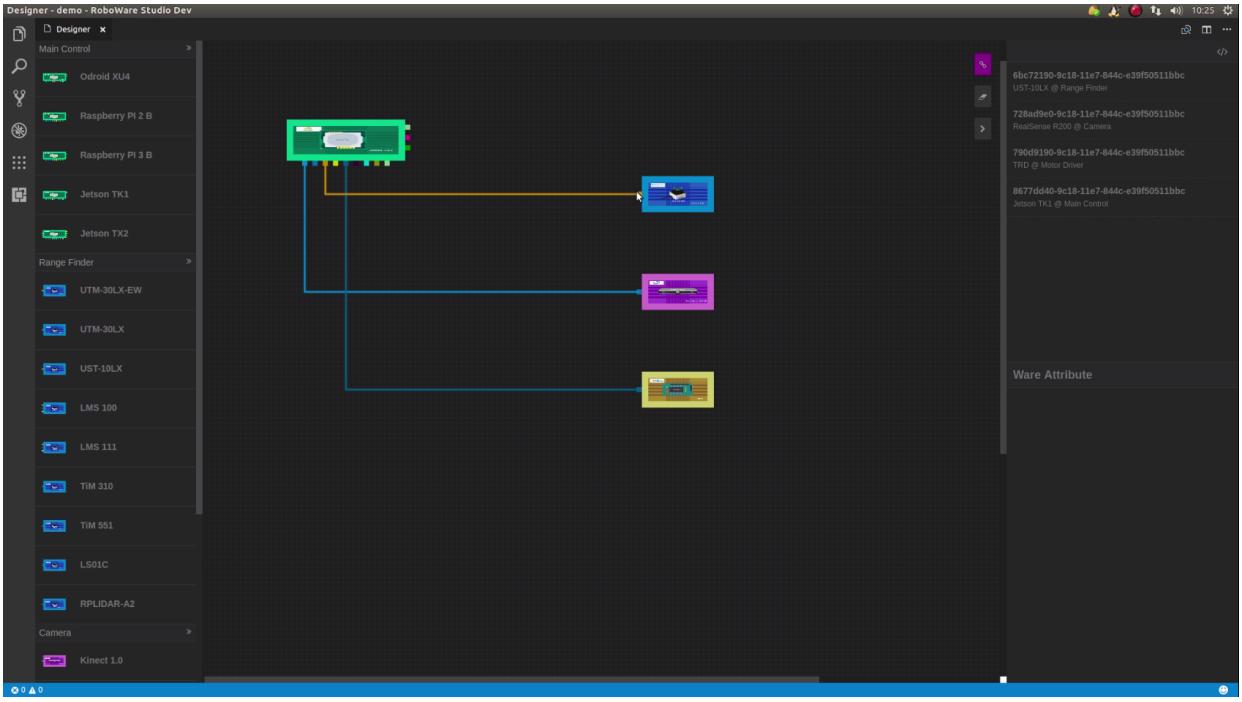
5. 连接端口

点击**画布**右上角的第二个菜单按钮，这时候就打开了**连接**的功能。点击一个部件的端口，再点击另一个部件相同的端口，这两个端口就可以连接在一起：

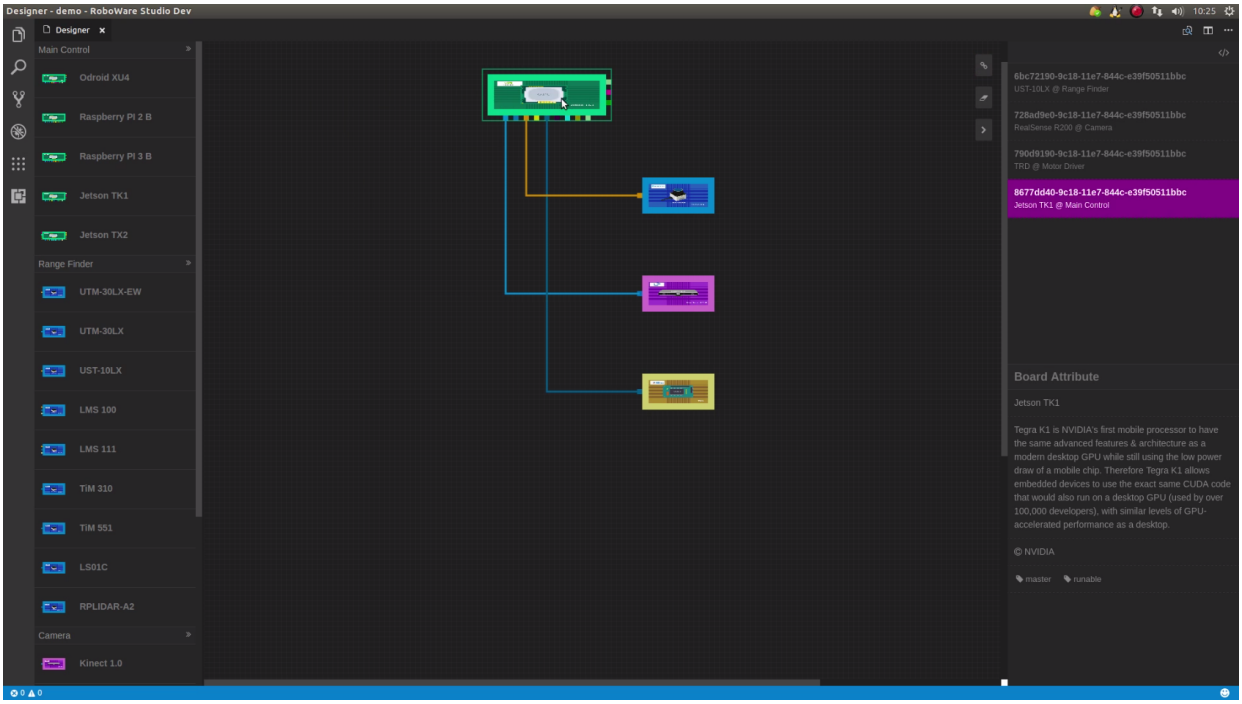


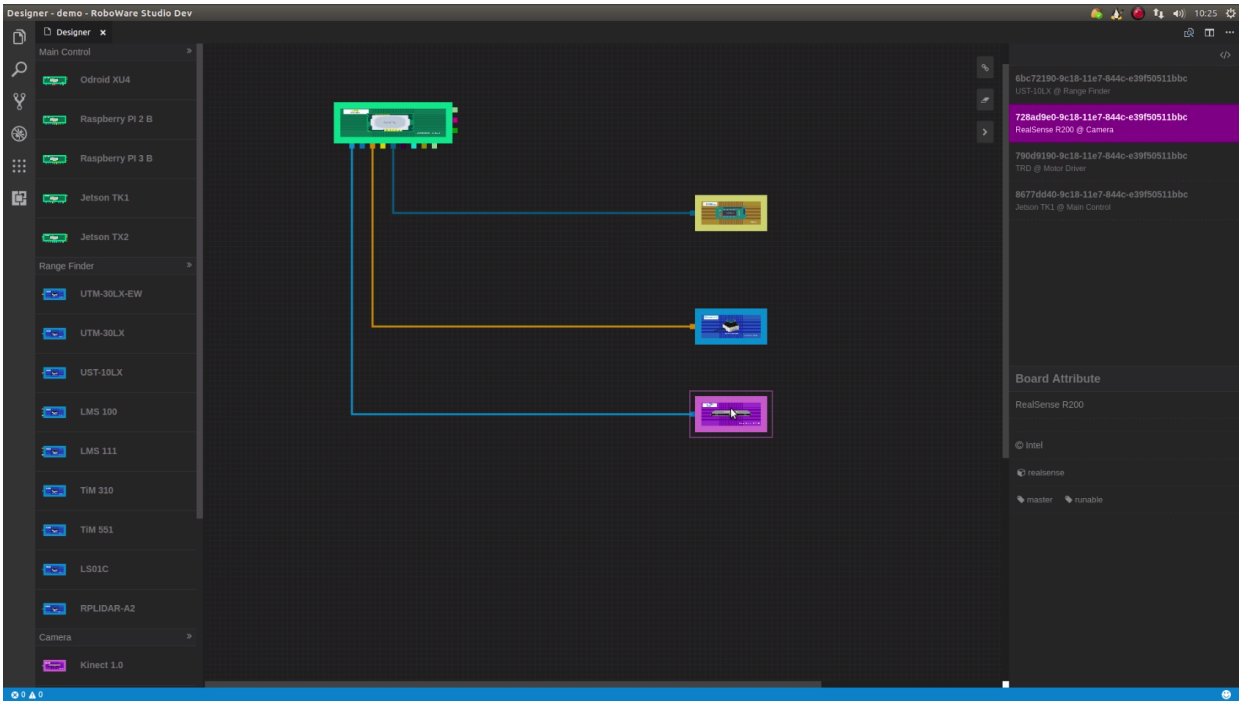

Designer - demo - RoboWare Studio Dev
10:25
Designer
Main Control
Odroid XU4
Raspberry PI 2 B
Raspberry PI 3 B
Jetson TK1
Jetson TX2
Range Finder
UTM-30LX-EW
UTM-30LX
UST-10LX
LMS 100
LMS 111
TiM 310
TiM 551
LS01C
RPLIDAR-A2
Camera
Kinect 1.0
6bc72190-9c18-11e7-844c-e39f50511bbc
UST-10LX @ Range Finder
728ad9e0-9c18-11e7-844c-e39f50511bbc
RealSense R200 @ Camera
790d9190-9c18-11e7-844c-e39f50511bbc
TRD @ Motor Driver
8677dd40-9c18-11e7-844c-e39f50511bbc
Jetson TK1 @ Main Control
Ware Attribute


Designer - demo - RoboWare Studio Dev
10:25
Designer
Main Control
Odroid XU4
Raspberry PI 2 B
Raspberry PI 3 B
Jetson TK1
Jetson TX2
Range Finder
UTM-30LX-EW
UTM-30LX
UST-10LX
LMS 100
LMS 111
TiM 310
TiM 551
LS01C
RPLIDAR-A2
Camera
Kinect 1.0
6bc72190-9c18-11e7-844c-e39f50511bbc
UST-10LX @ Range Finder
728ad9e0-9c18-11e7-844c-e39f50511bbc
RealSense R200 @ Camera
790d9190-9c18-11e7-844c-e39f50511bbc
TRD @ Motor Driver
8677dd40-9c18-11e7-844c-e39f50511bbc
Jetson TK1 @ Main Control
Ware Attribute



部件之间的连接线是动态的，当你移动部件的时候，这些连接线可以聪明的自动调整：



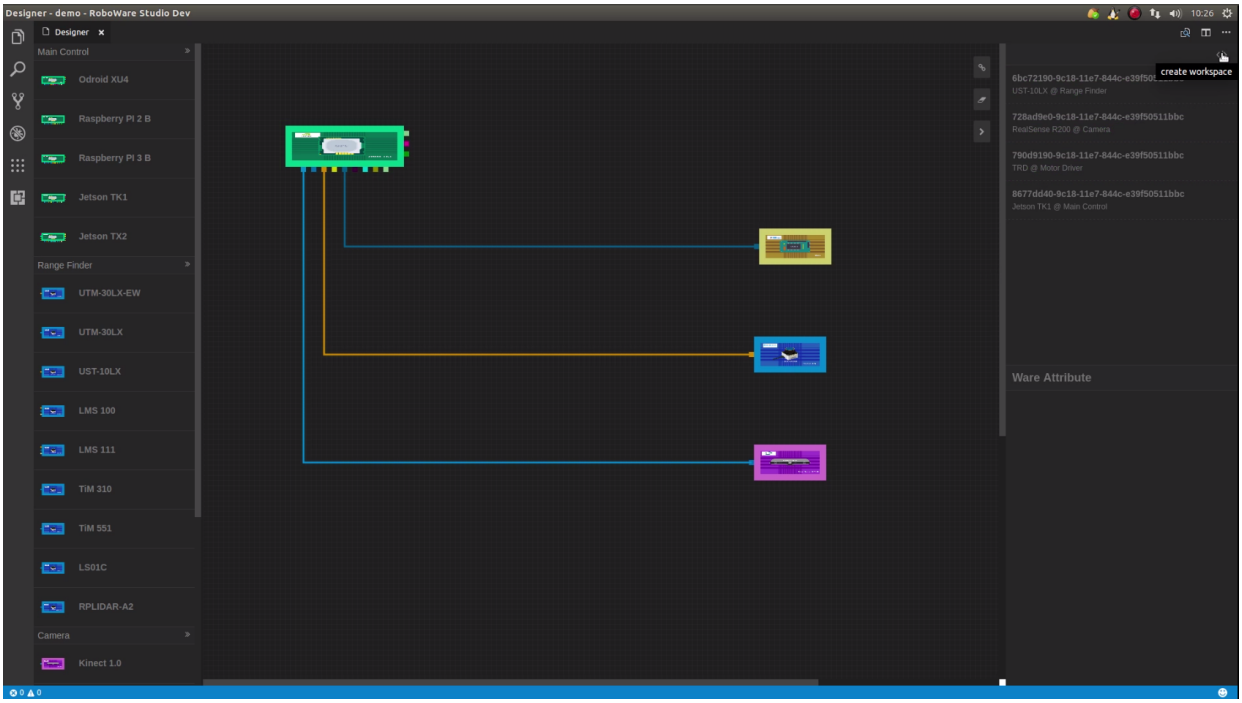


6. 为工作区创建 ROS 软件包

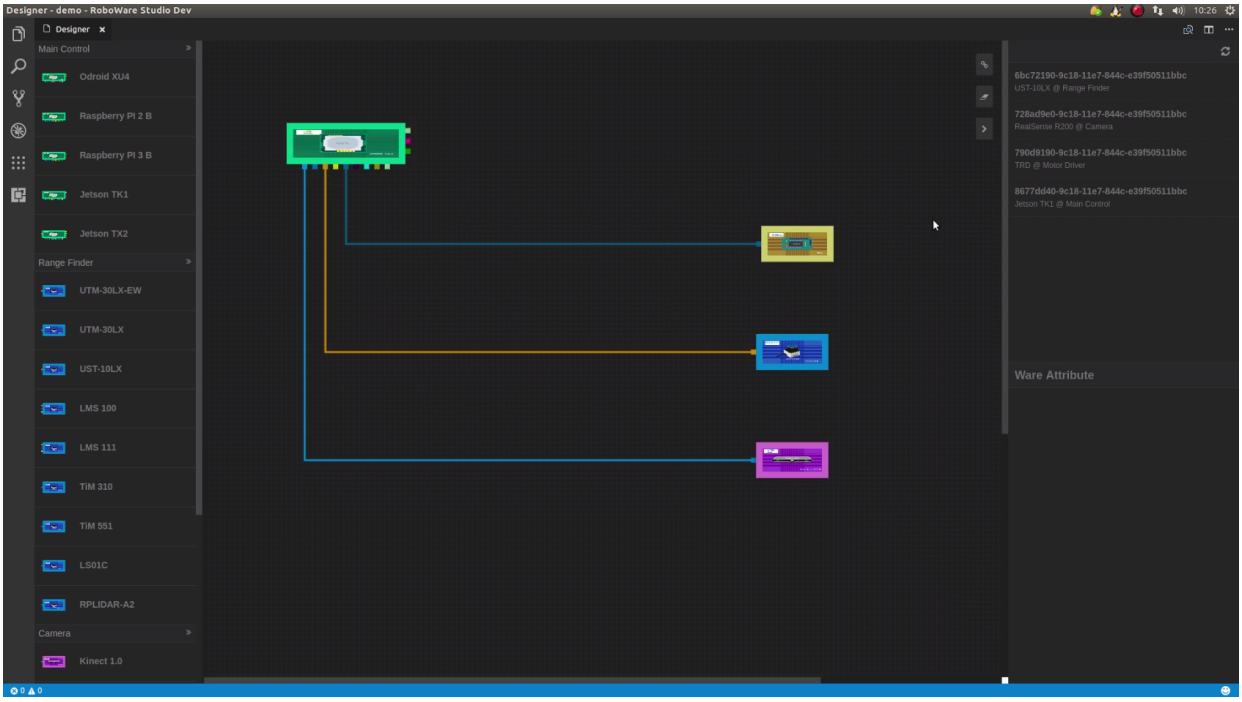
当你在**画布**放置完成自己的部件后，就可以开始为工作区创建 ROS 软件包了。我们在这里拖动了 4 个部件，分别是：

分类	名字	开发厂商	依赖 ROS 软件包
主控板卡	Jetson TK1	NVIDIA	
相机	RealSense R200	Intel	realsense
激光扫描仪	UST-10LX	Hokuyo	urg_node
电机驱动	TRD	Tony Robotics	

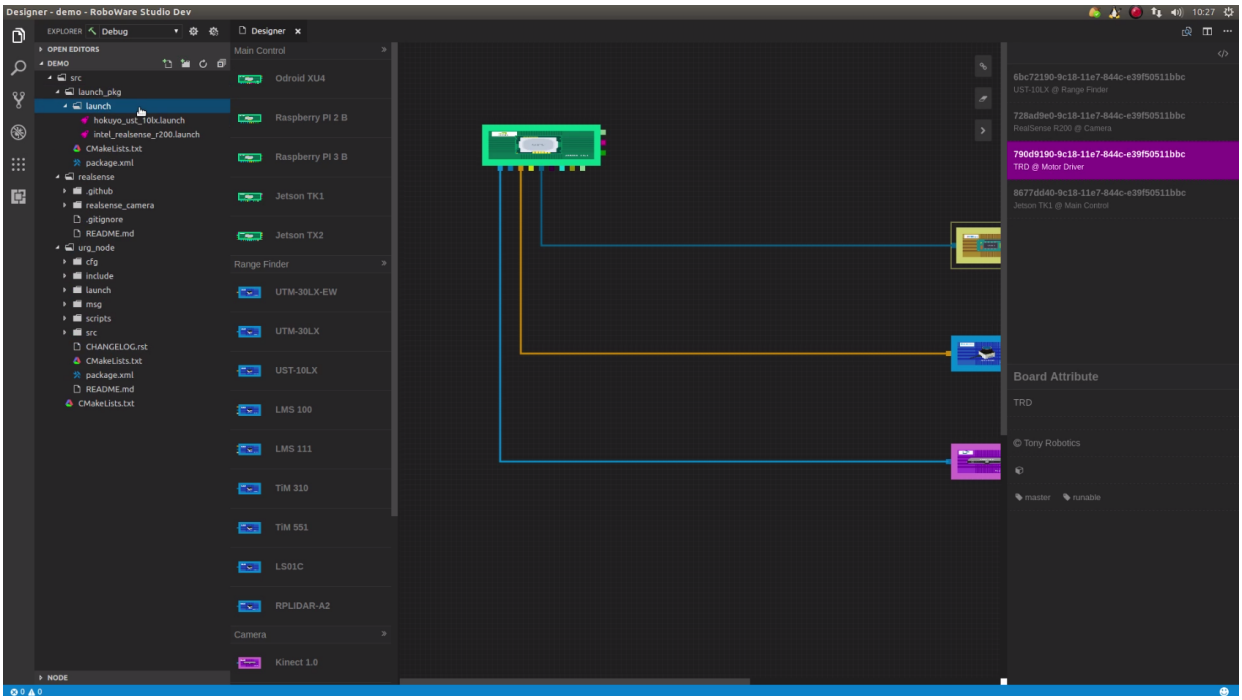
点击**注册栏**上面的**create workspace**按钮:

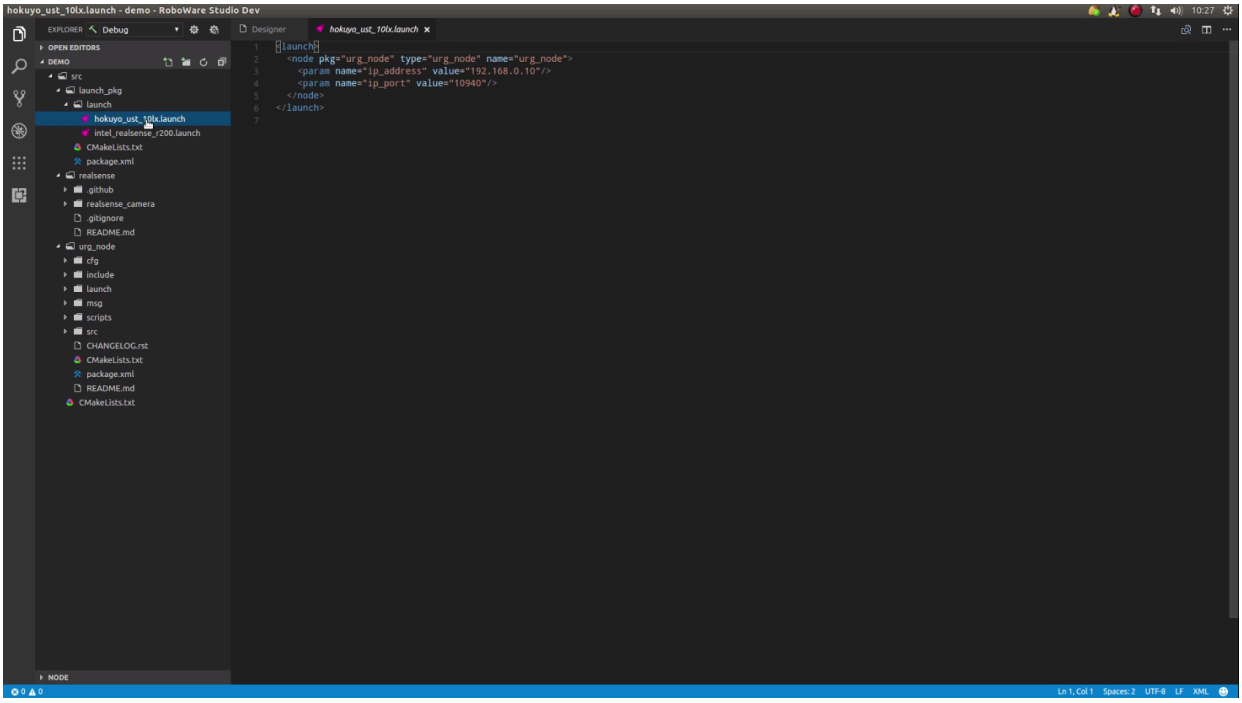


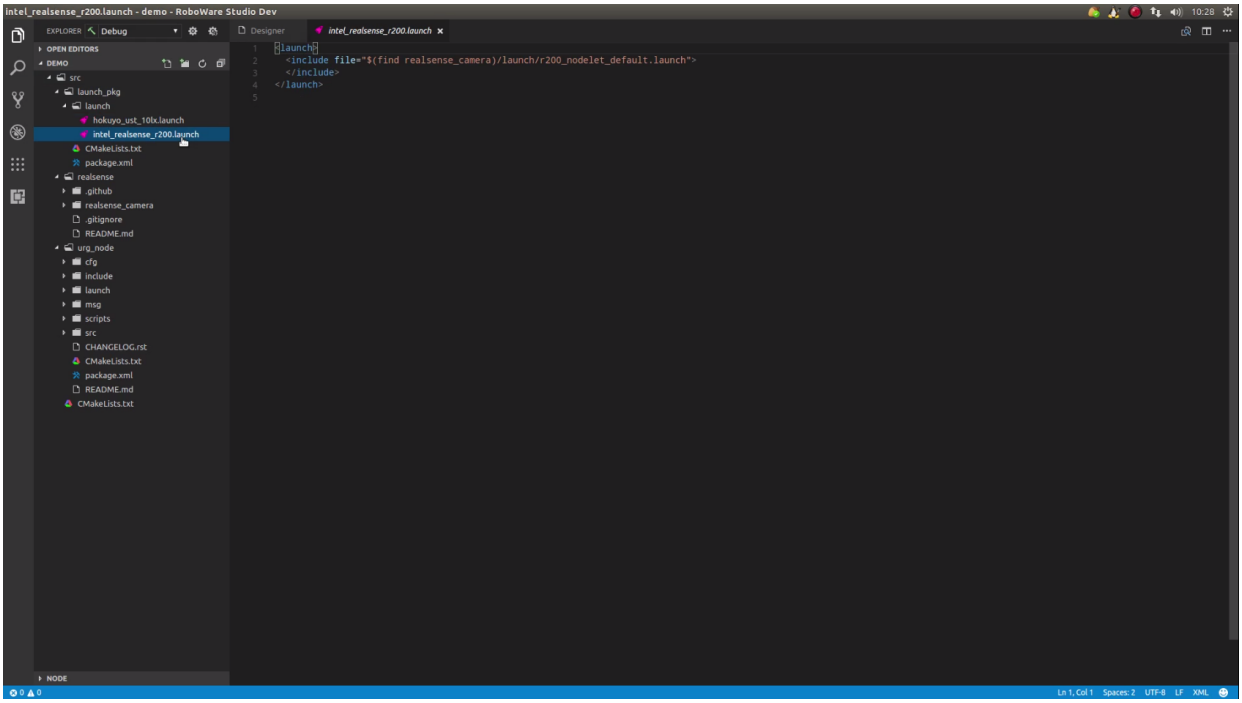
Designer 会提取**画布**上所有部件的 ROS 依赖软件的信息，执行软件包的自动下载和 launch 配置任务：

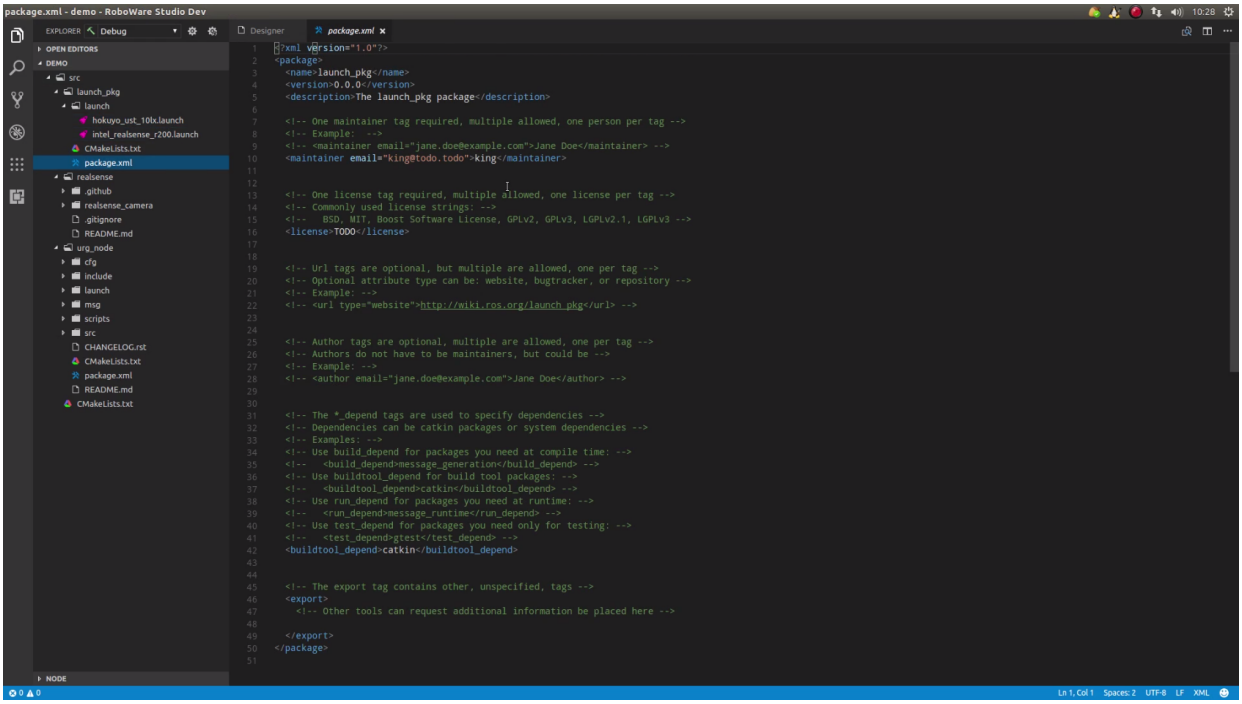


当 Designer 完成任务后，你能在工作区看到下载的 ROS 软件包和配置完成的 launch 文件:









7. 开始工作

至此，Designer 完成了 ROS 设备的布局和依赖软件包的安装和配置，基础设施构建完毕。接下来，就是真正开始运行和开发 ROS 工作的时候了。