

实训项目 3 创建激光切割曲线

- 1、在 ROBOTSTUDIO 中进行机器人及周边设备的合理布局。
- 2、ROBOTSTUDIO 的软件中捕捉工具的使用
- 3、机器人自动轨迹轨迹的创建
- 4、仿真的调试。

机器人工作站的布局

所有的部件已包含在打包文件中。双击打开打包文件后，请按照以下的图 1 中所示进行布局。

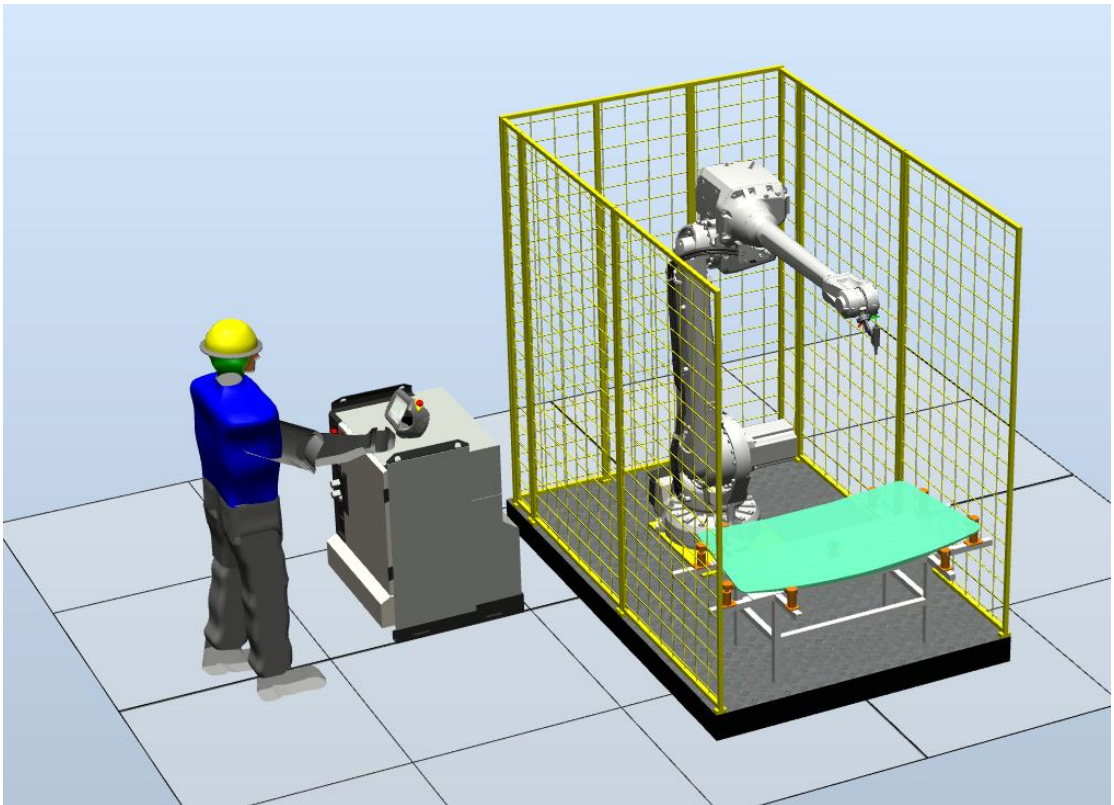
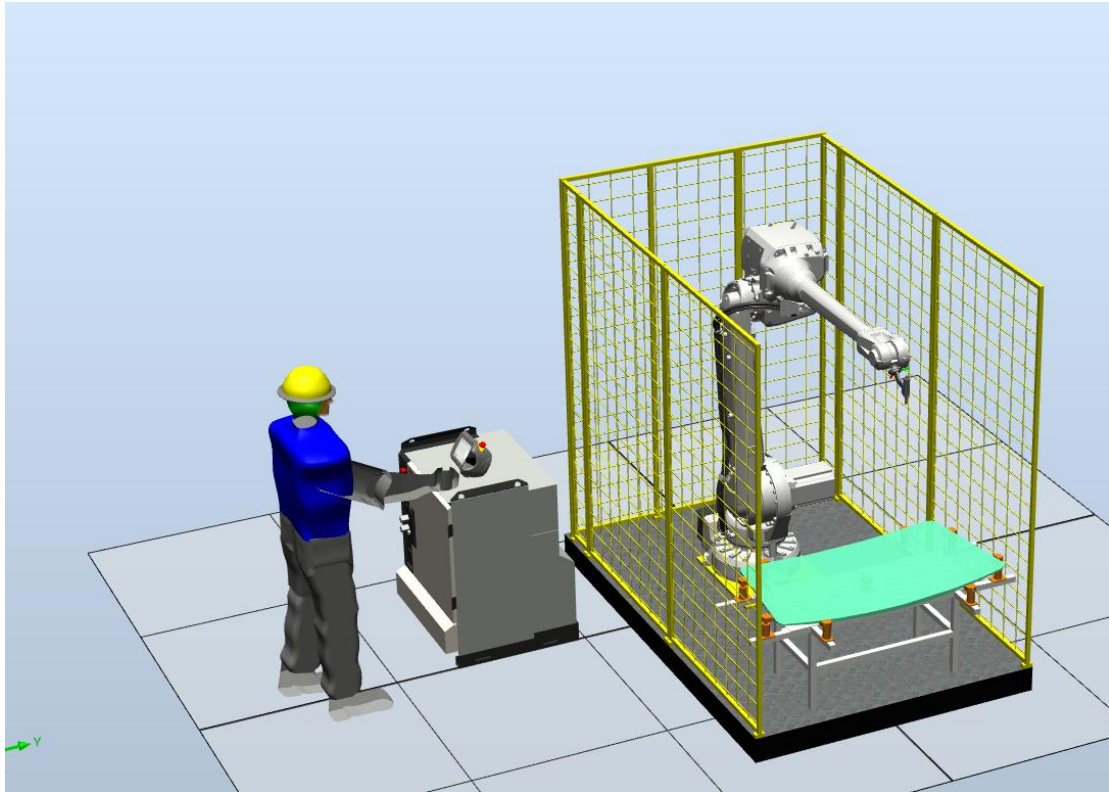


图 1 机器人工作站的布局示意

要注意的问题：

- 1、机器人与周边的部件的位置要合理，周边部件应在机器人的工作范围的中间位置为佳。
- 2、可以对机器人的操作，以确认机器人喷枪可以到达最远端是可以顺利到达的，否则以后再调整就会很麻烦了。

ROBOTSTUDIO 的软件中捕捉工具的使用



详情说明书。

机器人轨迹的创建

机器人的动作是从左侧的码垛盘存放处搬运到右边的的方形的码垛盘处。

具体的操作方法如下：

1、设置正确的工件坐标与工具，如下图所示：



2、根据具体的情况，设定正确的机器人运动指令的参数，如下图所示：



3、根据动作的要求通过示教指令的方法，创建对应的轨迹程序，程序样板如下图所示：

MODULE Module1

CONST robtarget

phone:=[[206.469896202,711.958903415,1165.773085887],[0.005867891,0,-0.9999
82784,0],[0,-1,0,0],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

pp1:=[[98.661188458,102.052283579,315.694866416],[0.005511338,0.022947832,0.
998215526,-0.054852398],[-1,-2,0,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_10:=[[98.660801969,102.052557915,140.055500578],[0.009401294,0.093936433,0.994050698,-0.054321015],[-1,-1,0,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_20:=[[105.361350134,101.599728901,140.162732903],[0.009405627,0.09393639,0.994048138,-0.054367163],[-1,-1,0,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_30:=[[114.970782726,102.53191278,140.14182916],[0.009396677,0.093936477,0.994053424,-0.054271823],[-1,-1,0,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_40:=[[124.482591031,105.402692924,139.907149195],[0.009369139,0.093936718,0.994069632,-0.05397851],[-1,-1,0,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_50:=[[133.234892743,110.094770125,139.469271238],[0.009324138,0.093937026,0.994095934,-0.053499242],[-1,-1,0,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_60:=[[143.72414839,119.535868826,138.541273238],[0.009233596,0.093937322,0.994148169,-0.052535112],[-1,-1,0,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_70:=[[151.764242037,186.488513498,131.924474268],[0.00859144,0.093927062,0.994492395,-0.04570306],[-1,-1,0,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_80:=[[167.867510963,357.351038048,119.196744011],[0.006952933,0.093803059,0.995164307,-0.028295681],[-1,0,-1,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_90:=[[177.838432,532.647837928,112.311926182],[0.005275943,0.093530503,0.995547442,-0.01046423],[-1,0,-1,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_100:=[[181.049414008,671.513281886,111.277944616],[0.003953431,0.093210517,0.995631872,0.003653161],[-1,0,-1,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_110:=[[181.050932759,747.916391675,112.373690913],[0.004017779,0.023319503,0.99965761,0.011167853],[0,0,-1,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_120:=[[177.816088269,887.465644123,117.428302191],[0.003685779,0.023243032,0.9993998,0.025420796],[0,0,-1,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_130:=[[167.82310573,1062.489832721,129.364538556],[0.003269162,0.023113498,0.998788505,0.043319748],[0,0,-1,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_140:=[[151.6983421,1232.912377794,147.013175482],[0.002864328,0.022951172,0.997882687,0.060788015],[0,0,-1,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_150:=[[146.554506907,1275.38438469,152.343094479],[0.002763698,0.0229

Target_300:=[[-469.12249816,1196.098988266,137.339989964],[0.002952993,0.022969553,0.998105472,0.057001282],[0,0,-1,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_310:=[[-469.010536609,1034.377114437,121.554313337],[0.003340195,0.0230309897,0.998911005,0.040432792],[0,0,-1,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_320:=[[-468.944603654,872.220507459,111.143018367],[0.003726447,0.023078417,0.99944211,0.023853061],[0,0,-1,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_330:=[[-468.9247719,709.807733726,106.117569942],[0.004110371,0.023085133,0.999698643,0.007266623],[0,0,-1,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_340:=[[-468.951063187,547.317641723,106.483502073],[0.004490599,0.023060141,0.999680532,-0.009321982],[-1,-1,0,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_350:=[[-469.023448562,384.929165077,112.240411795],[0.004865769,0.023003603,0.999387774,-0.025908216],[-1,-1,0,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_360:=[[-469.141848315,222.821125515,123.381959616],[0.005234526,0.022915757,0.998820443,-0.042487539],[-1,-1,0,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_370:=[[-469.141848315,222.821125515,123.381959616],[0.005234526,0.022915757,0.998820443,-0.042487539],[-1,-1,0,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_380:=[[-468.215968459,213.186777504,124.222492758],[0.005256649,0.022918962,0.998777812,-0.043473796],[-1,-1,0,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_390:=[[-465.346445778,203.644358154,125.090580624],[0.005278555,0.022922028,0.998734624,-0.04445074],[-1,-1,0,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_400:=[[-460.643229677,194.857497375,125.924176327],[0.005298721,0.022924756,0.998694007,-0.045350415],[-1,-1,0,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_410:=[[-454.491681872,187.376430427,126.664811128],[0.005315886,0.022927006,0.998658784,-0.046116447],[-1,-1,0,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_420:=[[-447.053269139,181.249550734,127.300499516],[0.00532994,0.0229288,0.998629498,-0.046743842],[-1,-1,0,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_430:=[[-438.306918477,176.552589201,127.819080027],[0.005340712,0.022930144,0.998606781,-0.047224806],[-1,-1,0,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_440:=[[-425.890216628,173.19612577,128.245113167],[0.005348406,0.022931089,0.998590408,-0.047568435],[-1,-1,0,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

CONST robtarget

Target_450:=[[98.660801969,102.052557915,140.055500578],[0.005511225,0.022947954,0.998215525,-0.054852378],[-1,-1,0,1],[9E9,9E9,9E9,9E9,9E9,9E9]];

PROC Path_10()

MoveJ phome,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveJ pp1,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_10,v1000,fine,tGlueGun\WObj:=Workobject_1;
MoveL Target_20,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_30,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_40,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_50,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_60,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_70,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_80,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_90,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_100,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_110,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_120,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_130,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_140,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_150,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_160,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_170,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_180,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_190,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_200,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_210,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_220,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_230,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_240,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_250,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_260,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_270,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_280,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_290,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_300,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_310,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_320,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_330,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_340,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_350,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_360,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_370,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_380,v1000,z100,tGlueGun\WObj:=Workobject_1;

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MoveL Target_390,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_400,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_410,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_420,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_430,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_440,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_450,v1000,fine,tGlueGun\WObj:=Workobject_1;
MoveL pp1,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveJ phone,v1000,z100,tGlueGun\WObj:=Workobject_1;

```

ENDPROC

PROC Path_20()

```

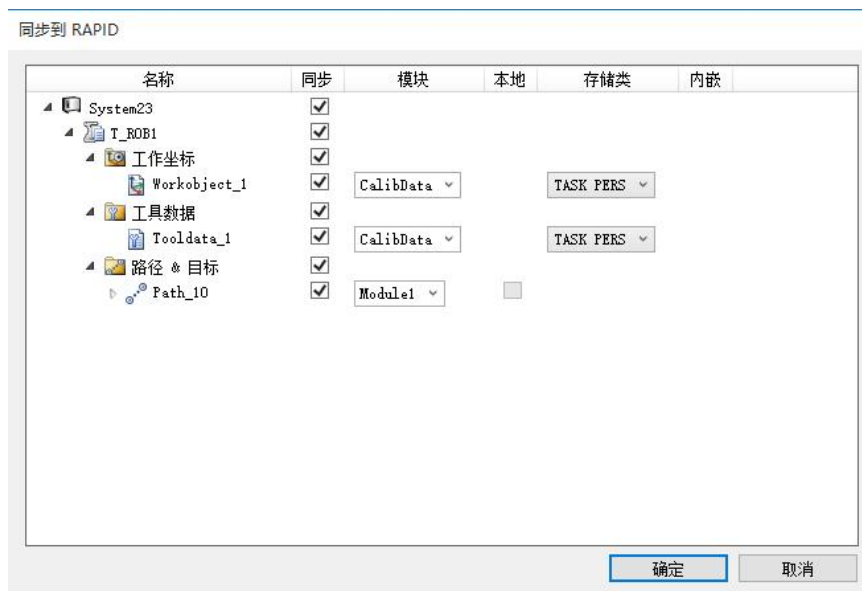
MoveL Target_370,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_380,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_390,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_400,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_410,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_420,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_430,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_440,v1000,z100,tGlueGun\WObj:=Workobject_1;
MoveL Target_450,v1000,z100,tGlueGun\WObj:=Workobject_1;

```

ENDPROC

ENDMODULE

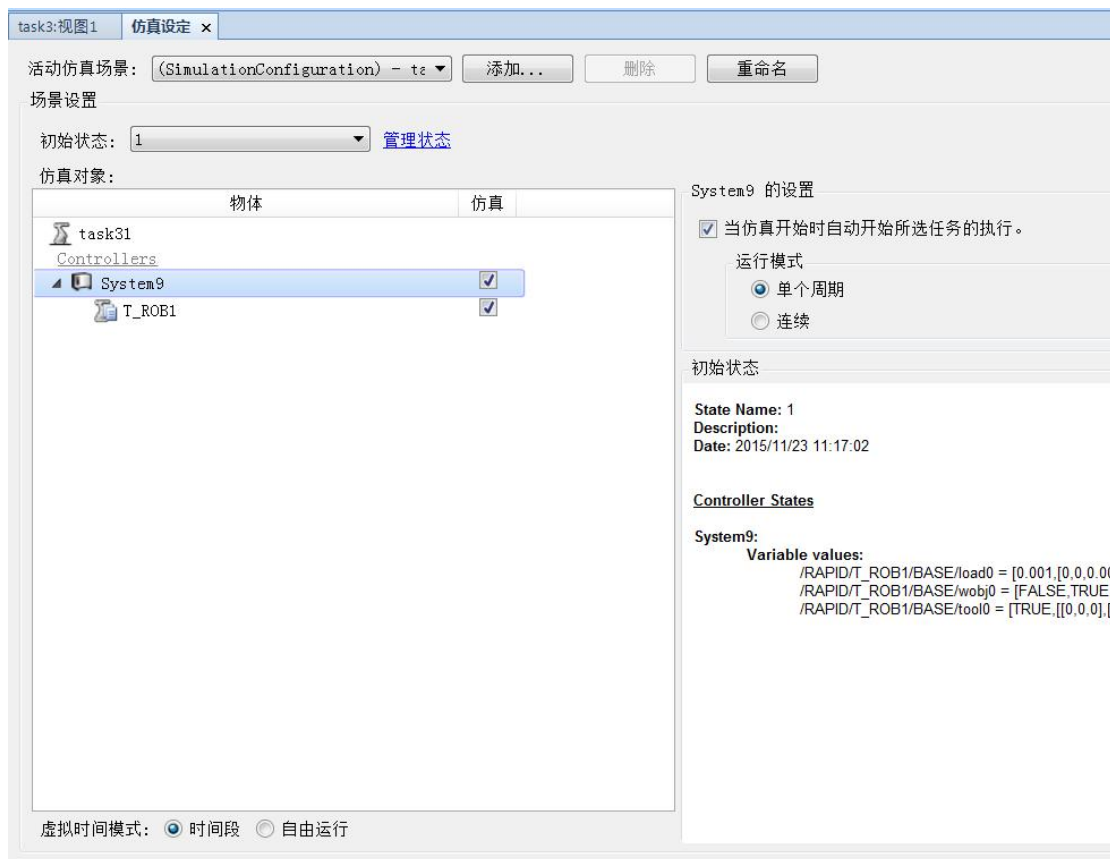
将写好的程序同步到RAPID，菜单操作：基本---同步---同步到RAPID，如下图所示：



仿真的调试

在完成了设置与编程以后，先保存初始状态，接着下来就是要验证一下仿真动画的结果了，具体的操作如下：

- 1、设定要运行的 RAPID 子程序，在本项目中是 PATH10，菜单操作如下：仿真---仿真设定---指定 PATH10，如下图所示：



2、点击仿真菜单中的“播放”就可以看到动画效果了。动画结束后，点击“重置”，恢复到原来的状态。