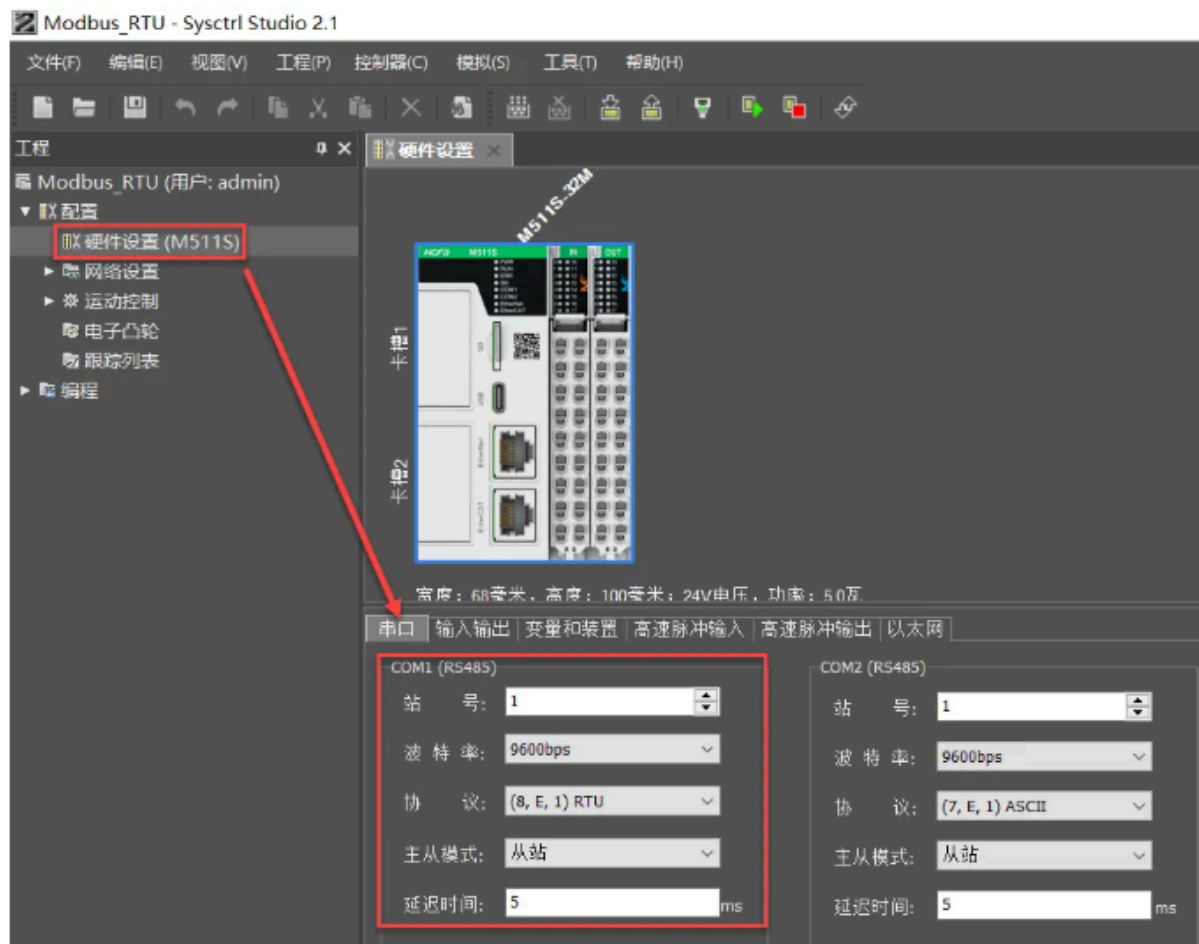


Modbus RTU

Sysctrl Studio project configuration

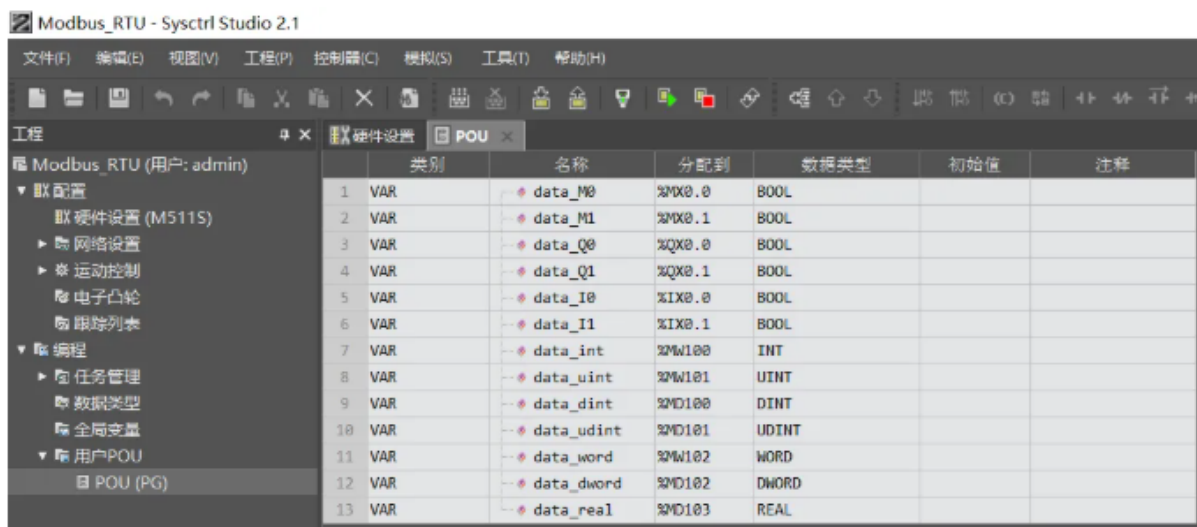
Step 1: Create a new project

Double-click to open Sysctrl Studio and create a new project. Click [Hardware Settings] and make the following settings on the serial port interface. Set the default station number to 1, the baud rate to 9600bps, the protocol to (8,E,1) RTU, and the master-slave mode to slave (with the touch screen as the master).



Step 2: Create a new variable

Open the default POU, right-click in the variable declaration area and select "Add Variable", create a new variable and assign it to the corresponding address. When assigning addresses, pay attention to the device range.



Step 3: After compilation, download the project to the controller.

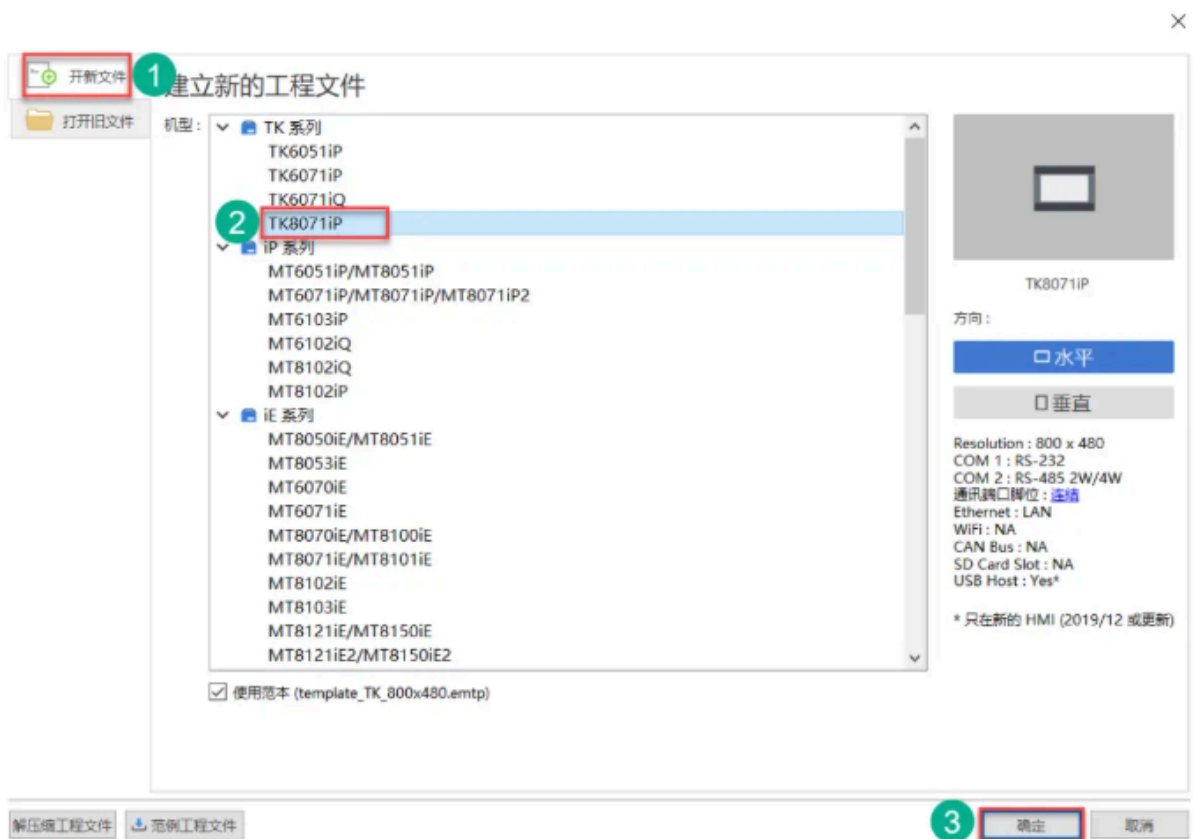
Utility Manager Project Configuration

Step 1: Create a new project

(1) Open the Utility Manager software, select [Select Model] in the upper left corner, select the model series corresponding to the touch screen, and click [EasyBuilder Pro].



(2) Click [Open New File] and select the corresponding model [TK8071iP].



Step 2: Basic Configuration

(1) In the pop-up window, select [Add device/server...]

设备 HMI 属性 一般属性 系统 远端 用户密码 扩展存储器 移动网络 打印/备份服务器 时间同步/夏令时 邮件

设备列表: [当前 PC 的 IP 信息](#)

名称	位置	设备类型	界面	通讯协议	站号
本机 触摸屏	Local HMI 本机	TK8071iP (800 x 480)	-	-	0

新增设备/服务器... 删除 设置...

* 在此页签做的设置将直接保存 (无法取消)

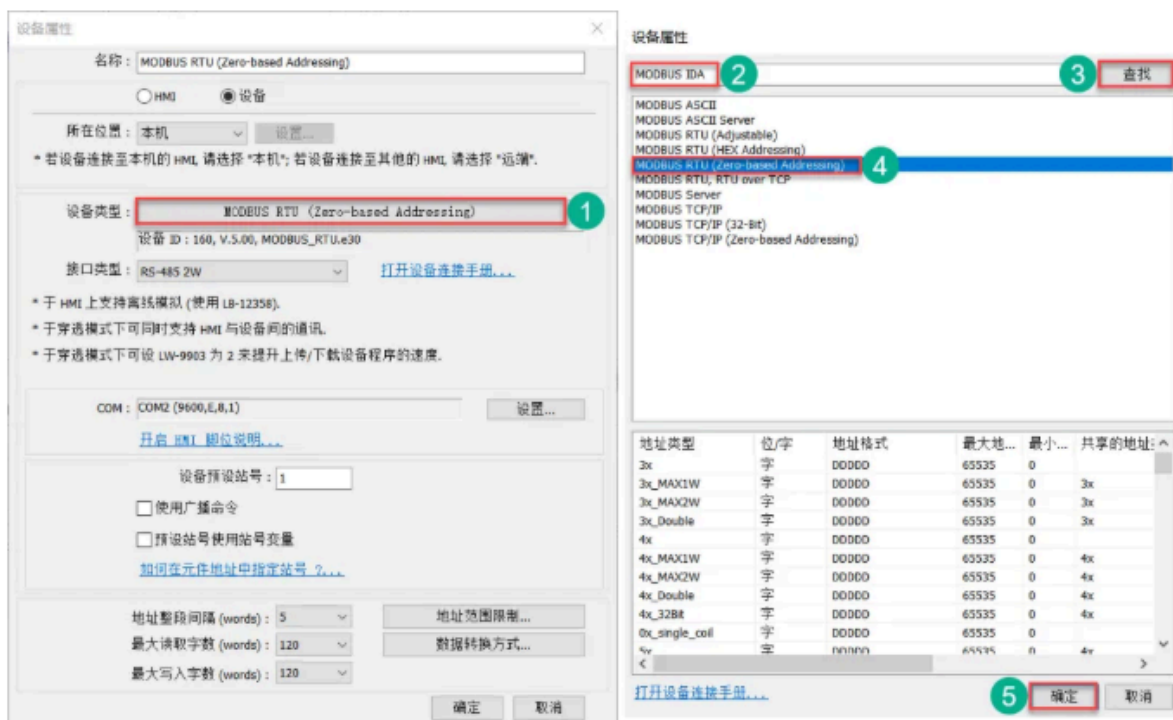
设计者备注:

SCADA 软件可以透过 MODBUS TCP/IP Server 来存取设备数据. (须先新增一个 MODBUS TCP/IP Server 并且启用 [MODBUS TCP/IP 网关])



确定 取消 帮助

(2) Select [MODBUS RTU (Zero-based Addressing)] from [Device Type].



(3) At No. 1, select the interface type corresponding to the COM port. At No. 2, the baud rate, data bits, and stop bits must be consistent with the Sysctrl project settings.

名称: MODBUS RTU (Zero-based Addressing)

☐ HMI ☒ 设备

所在位置: 本机 [设置...](#)

* 若设备连接至本机的 HMI, 请选择 "本机"; 若设备连接至其他的 HMI, 请选择 "远端".

设备类型: MODBUS RTU (Zero-based Addressing) [▶](#)

设备 ID: 160, V.5.00, MODBUS_RTU.e30

接口类型: RS-485 2W [1 打开设备连接手册...](#)

* 于 HMI 上支持离线模拟 (使用 LB-12358).

* 于穿透模式下可同时支持 HMI 与设备间的通讯.

* 于穿透模式下可设 LW-9903 为 2 来提升上传/下载设备程序的速度.

COM: COM2 (9600,E,8,1) [2](#) [设置...](#)

[开启 HMI 脚位说明...](#)

设备预设站号: 1

☐ 使用广播命令

☐ 预设站号使用站号变量

[如何在元件地址中指定站号 ?...](#)

地址整段间隔 (words): 5 [地址范围限制...](#)

最大读取字数 (words): 120 [数据转换方式...](#)

最大写入字数 (words): 120

[确定](#) [取消](#)

The Modbus addresses of the project variables and touch screen components must correspond one to one for successful communication.

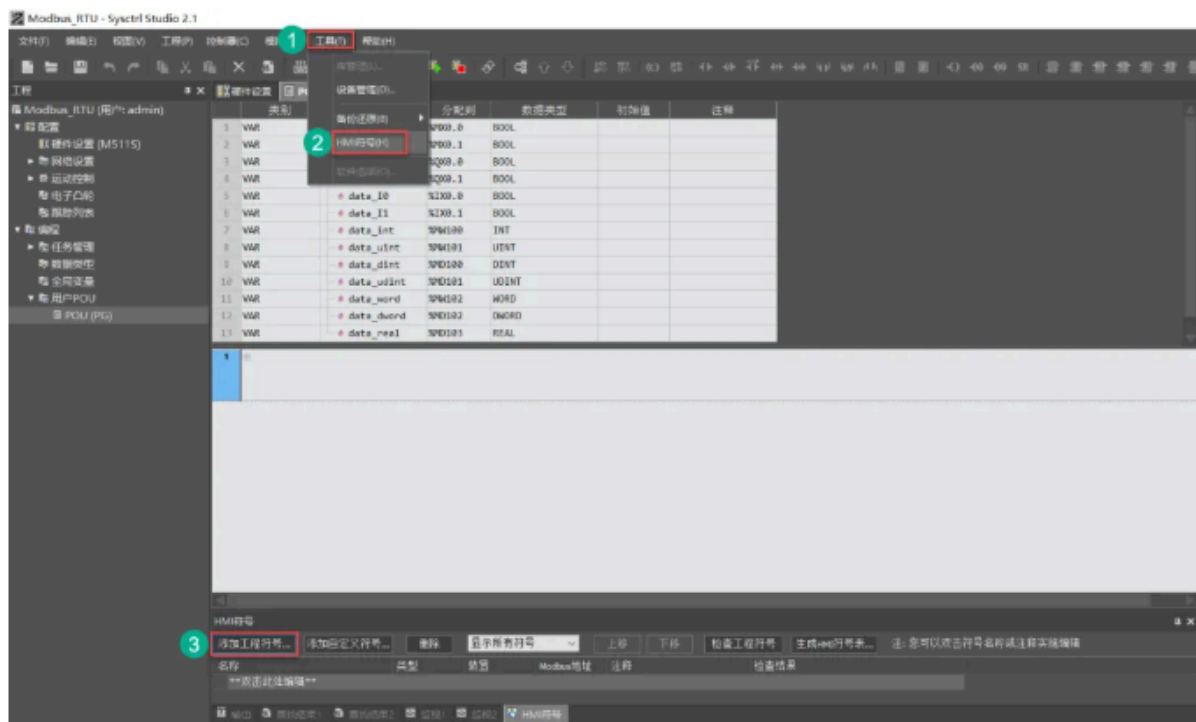
There are two ways to map addresses: **the HMI symbol table** and **the standard Modbus address calculation**.

You can choose any method to perform address mapping.

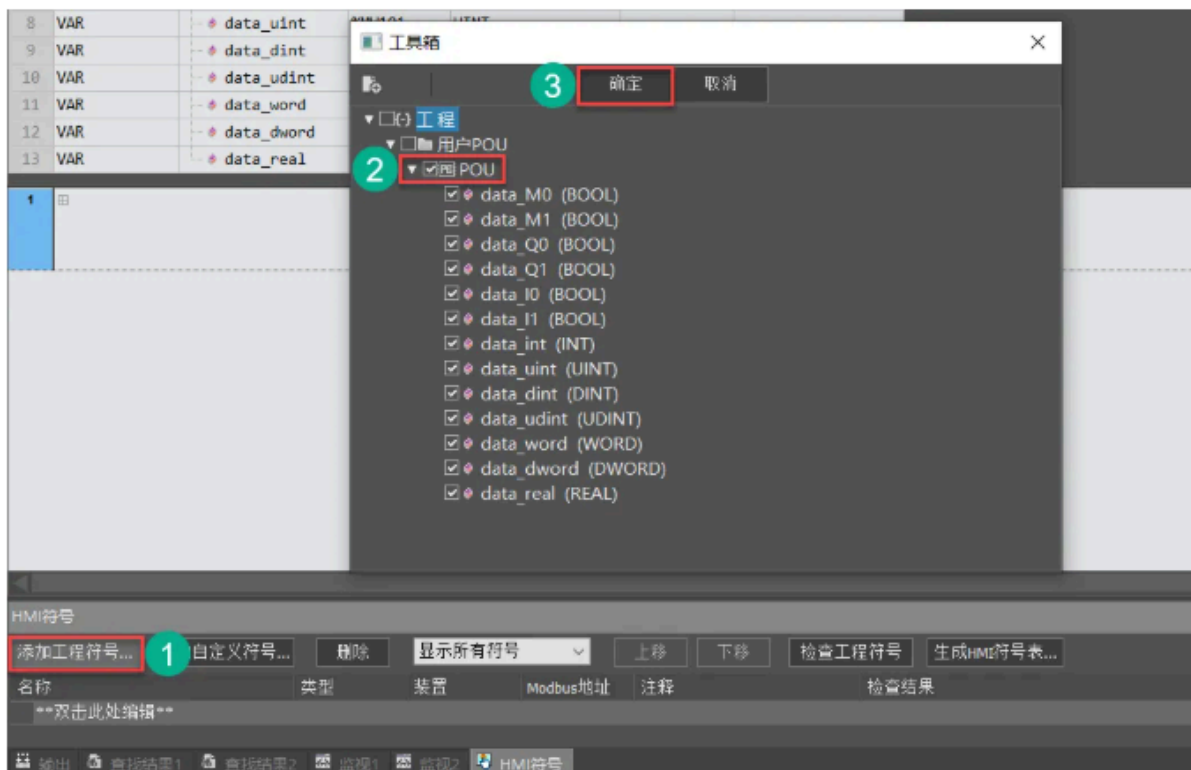
HMI symbol table

Step 1: Generate HMI symbol table (Sysctrl Studio project)

(1) Click [Tools] >> [HMI Symbols] in the upper menu bar



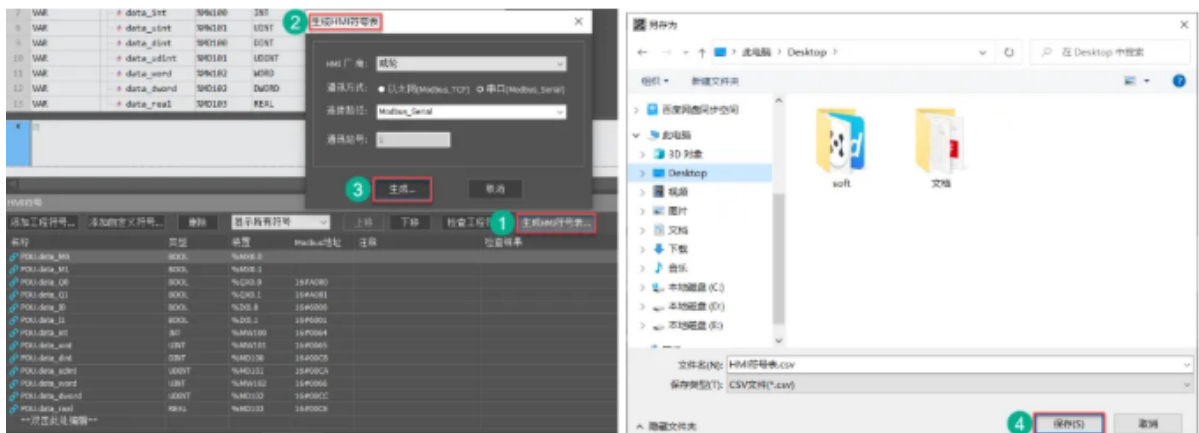
(2) The HMI symbol interface appears at the bottom. Click [Add Engineering Symbol...], select the variable to be added in the pop-up window, and click [OK].



(3) Click [Check Project Symbols] and the variables will be automatically assigned Modbus addresses.



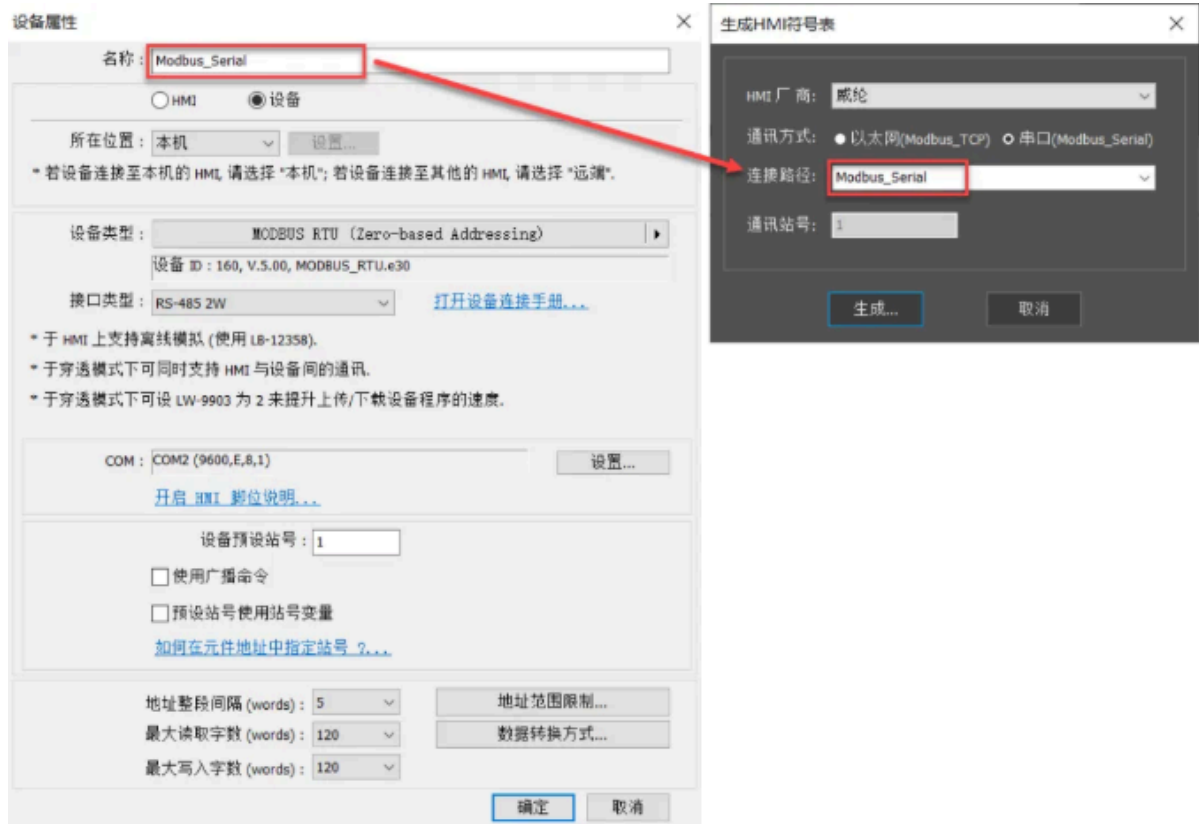
(4) Click [Generate HMI Symbol Table...]. On the [Generate HMI Symbol Table] interface, select WEINVIEW for [HMI Manufacturer], select Serial Port for [Communication Method], and select Modbus_Serial for [Connection Path]. Click [Generate...]



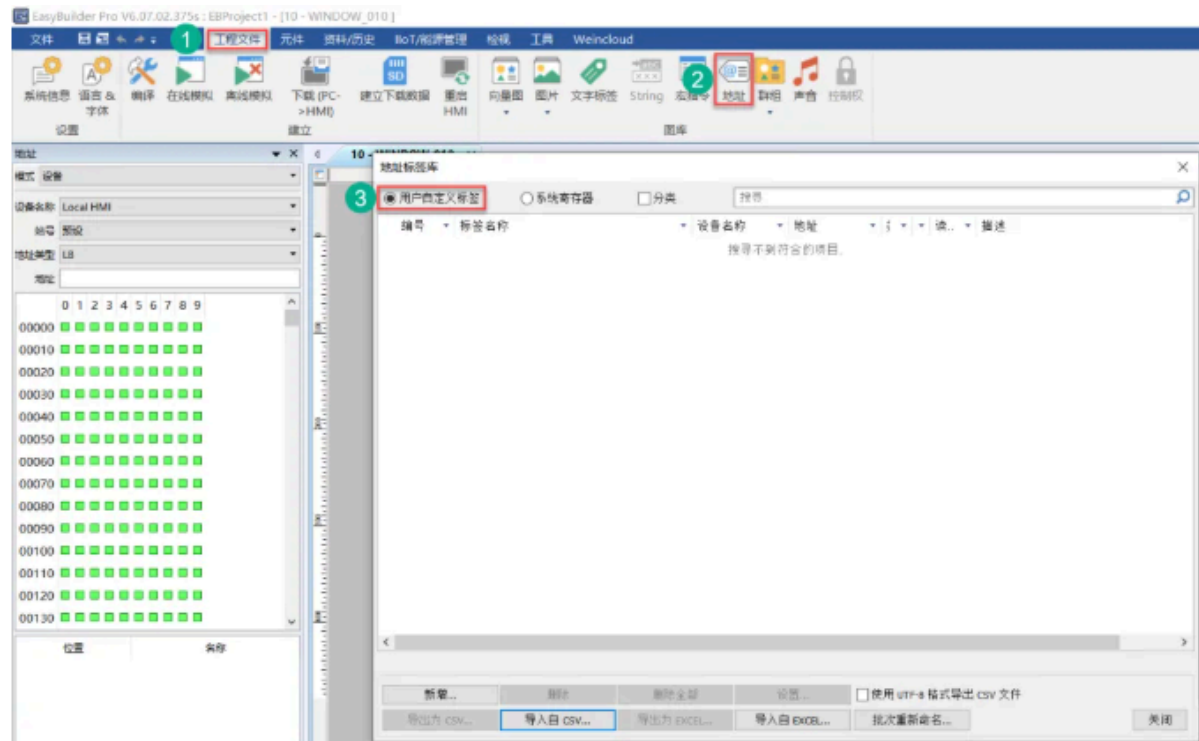
After the configuration is complete, download the project to the controller.

Step 2: Import the HMI symbol table (Utility Manager project)

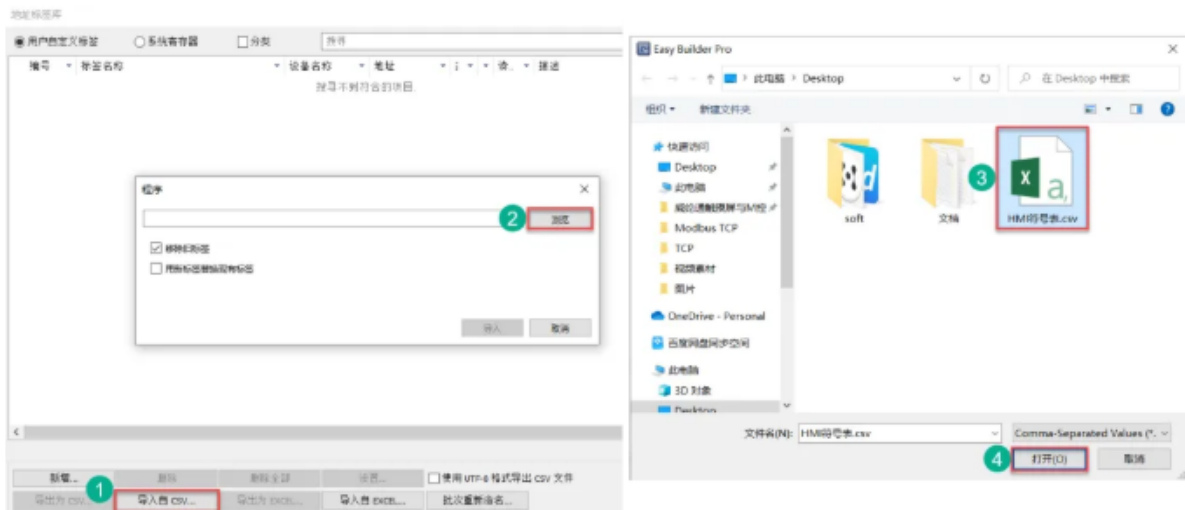
(1) The name must be consistent with the name in [Generate HMI Symbol Table] - [Connection Path]



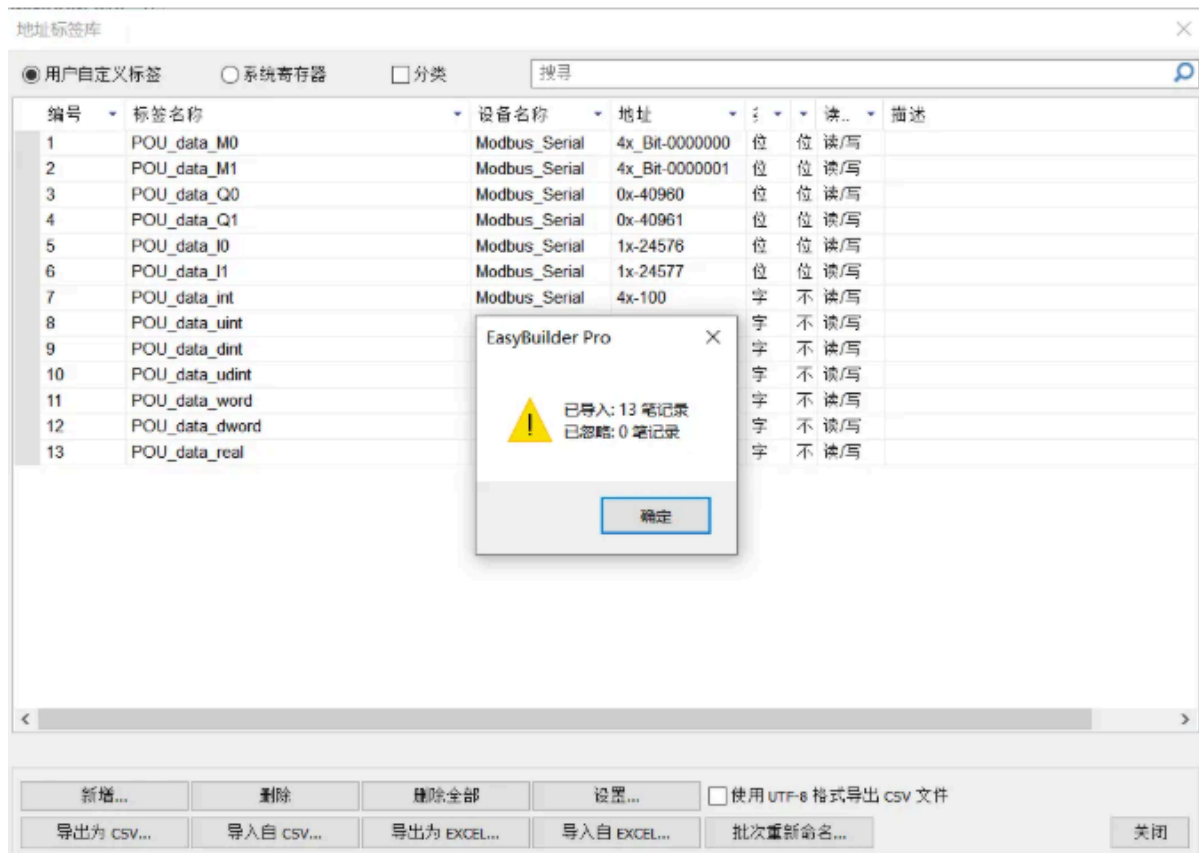
(2) Click [Project File] >> [Address] >> [User Defined Label]



(3) Import CSV file

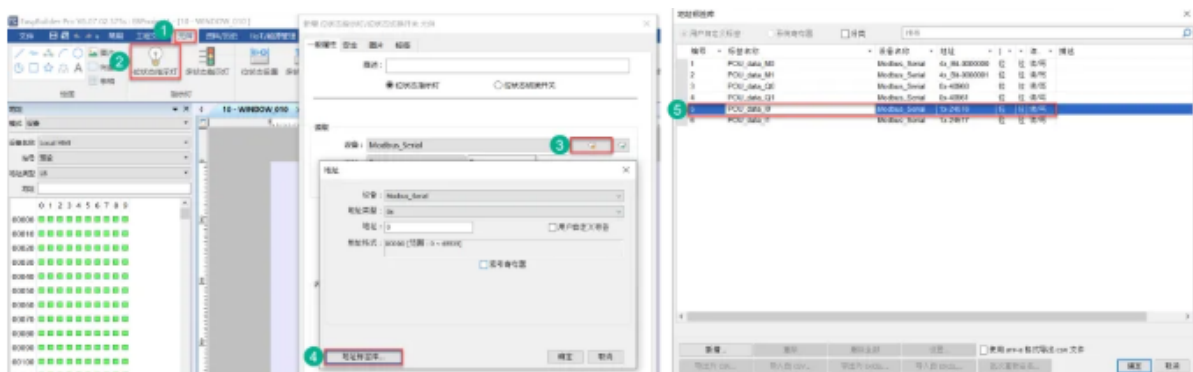


(4) A pop-up window indicates that the import was successful

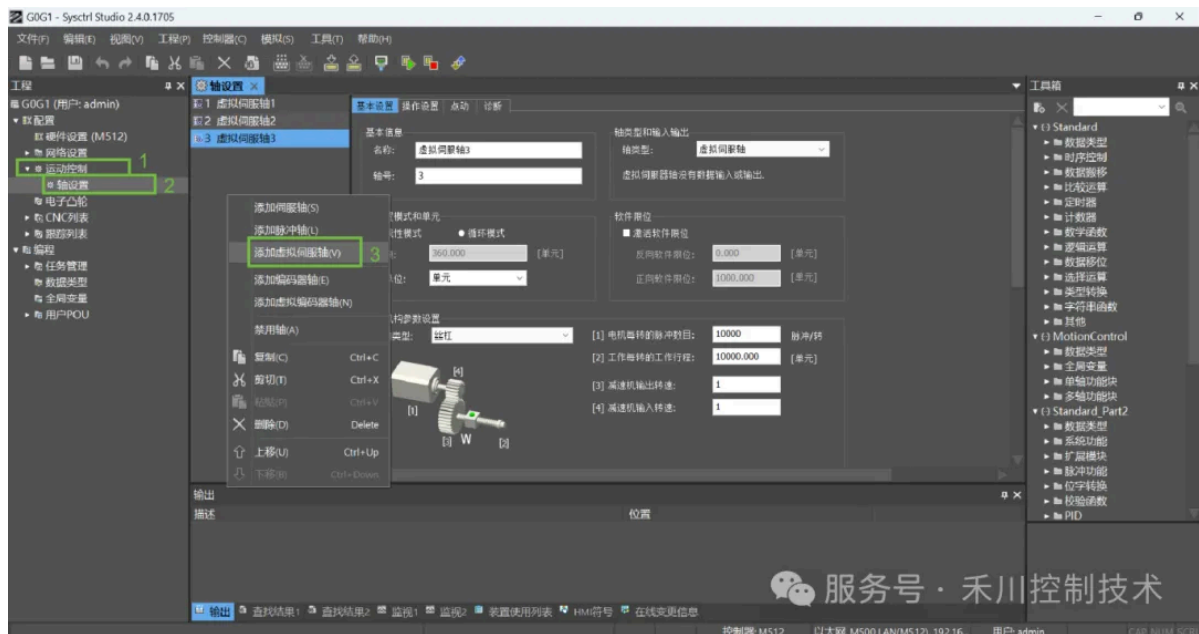


Step 3: Create a new component

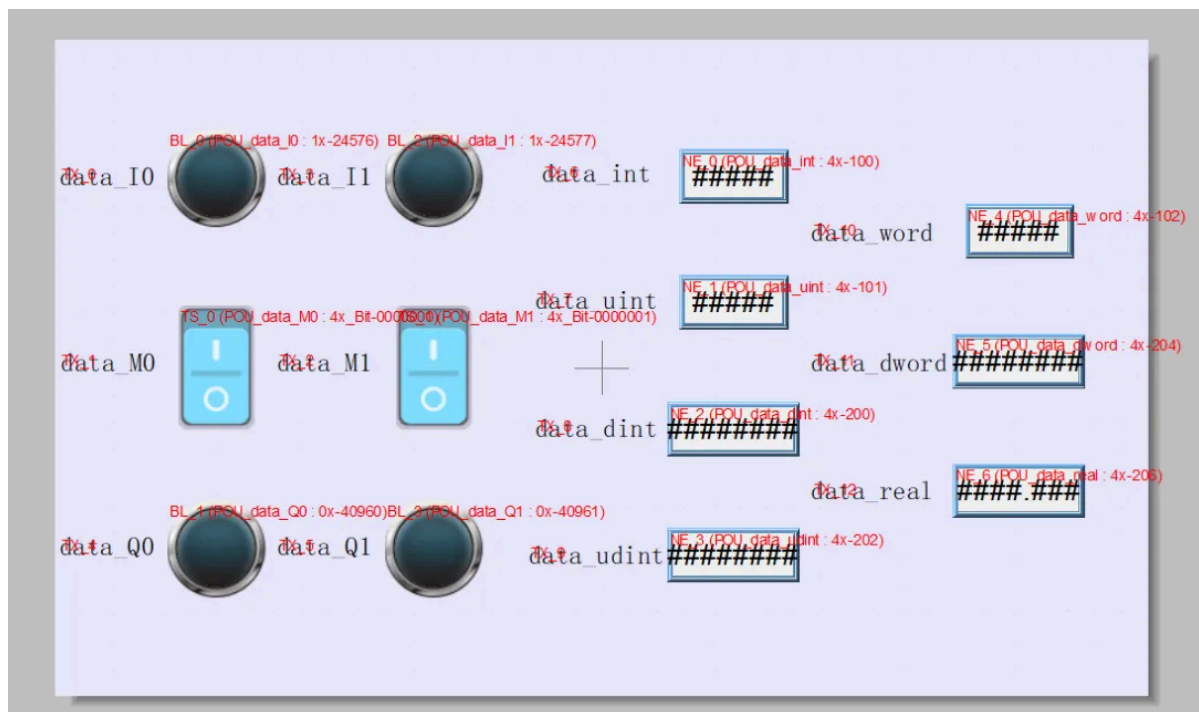
(1) Create a new indicator light component and bind it to the bool variable data_I0.



(2) Create a new bit state switching switch element and bind it to the bool variable data_M0.

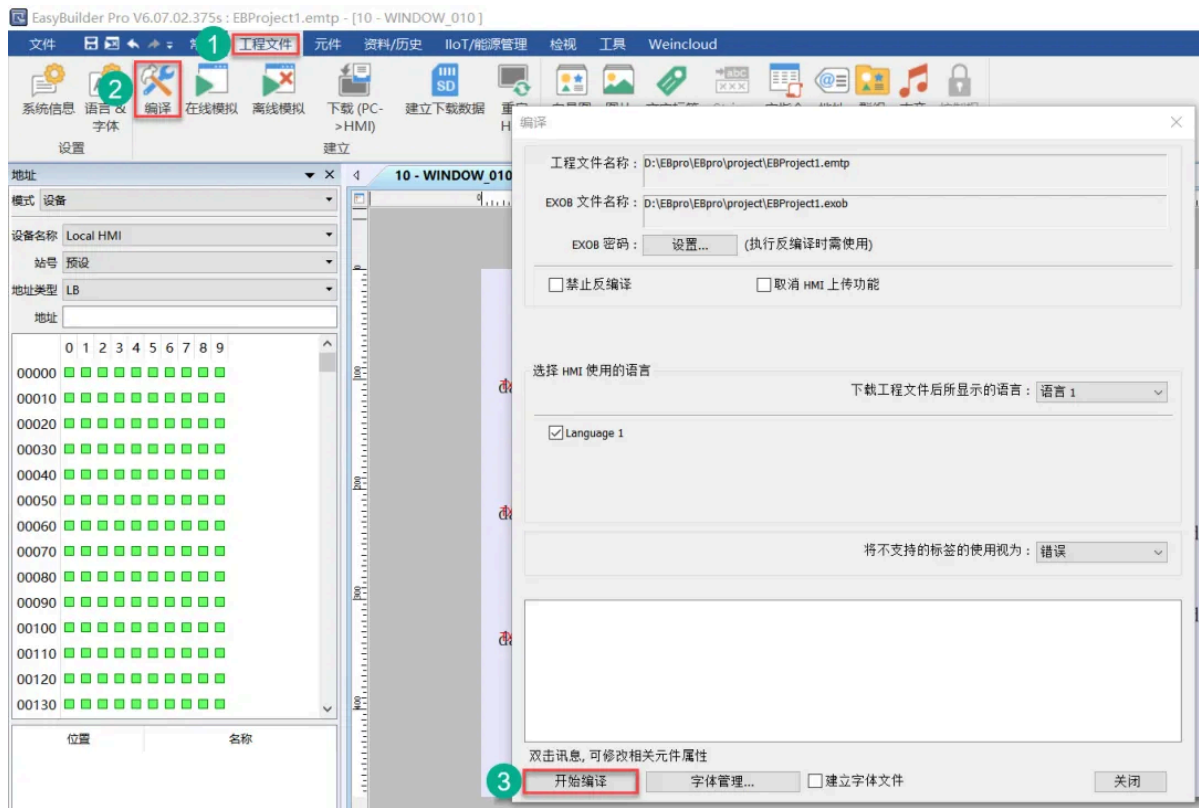


(3) Similarly, create other components and bind the corresponding variables. For easy distinction, add text here.

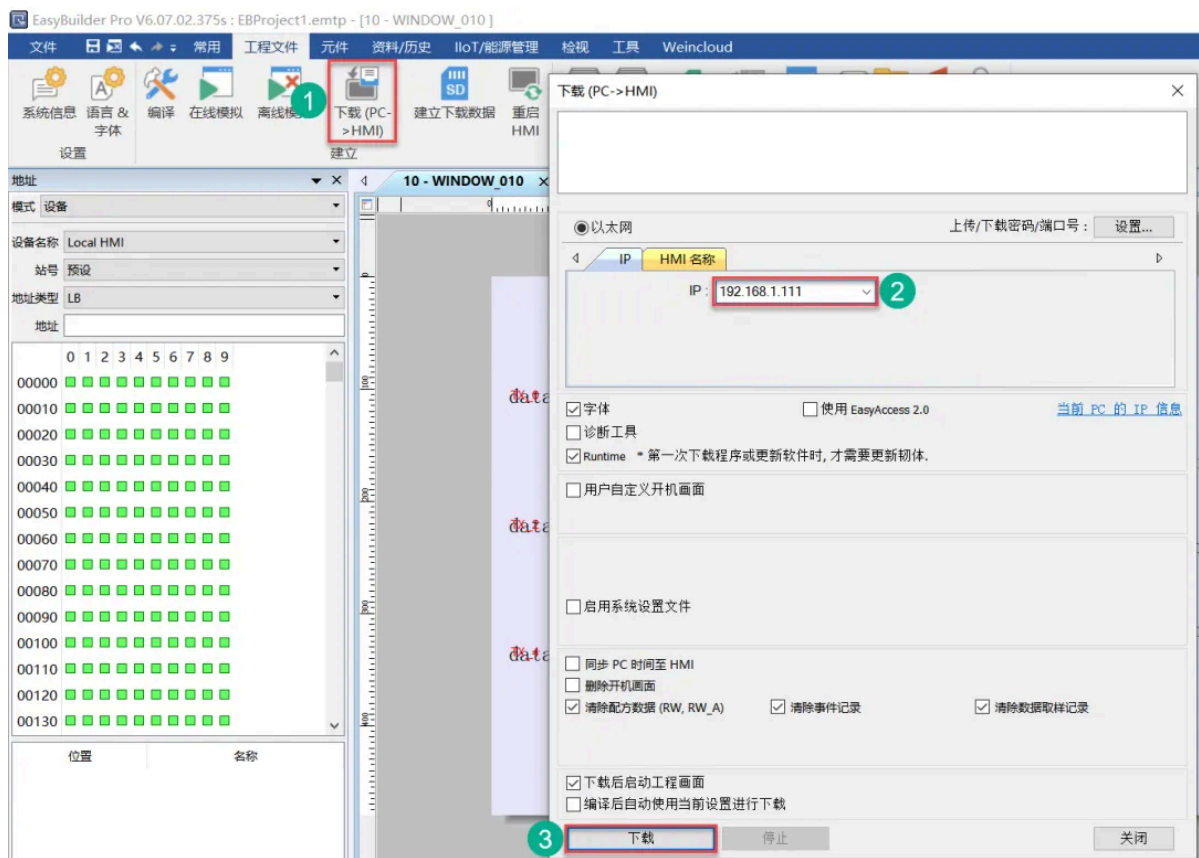


Step 4: Download the project

(1) Click [Project File] >> [Compile] >> [Start Compiling].



(2) Click [Download (PC->HMI)], enter the touch screen IP address 192.168.1.111 in the IP field, and click [Download].



(3) The window displays "All completed", indicating that the download is successful

下载 (PC->HMI)

载入字体成功
触摸屏重启 ...
启动触摸屏成功

全部完成

以太网

上传/下载密码/端口号 : 设置...

IP

HMI 名称

IP : 192.168.1.111

☒ 字体

☐ 使用 EasyAccess 2.0

[当前 PC 的 IP 信息](#)

☐ 诊断工具

☒ Runtime * 第一次下载程序或更新软件时, 才需要更新韧体.

☐ 用户自定义开机画面

☐ 启用系统设置文件

☐ 同步 PC 时间至 HMI

☐ 删除开机画面

☒ 清除配方数据 (RW, RW_A)

☒ 清除事件记录

☒ 清除数据取样记录

☒ 下载后启动工程画面

☐ 编译后自动使用当前设置进行下载

下载

停止

关闭

Standard Modbus address calculation

Address calculation relationship description

The following table applies to the Modbus address correspondence between the M series controller and the WEINVIEW HMI.

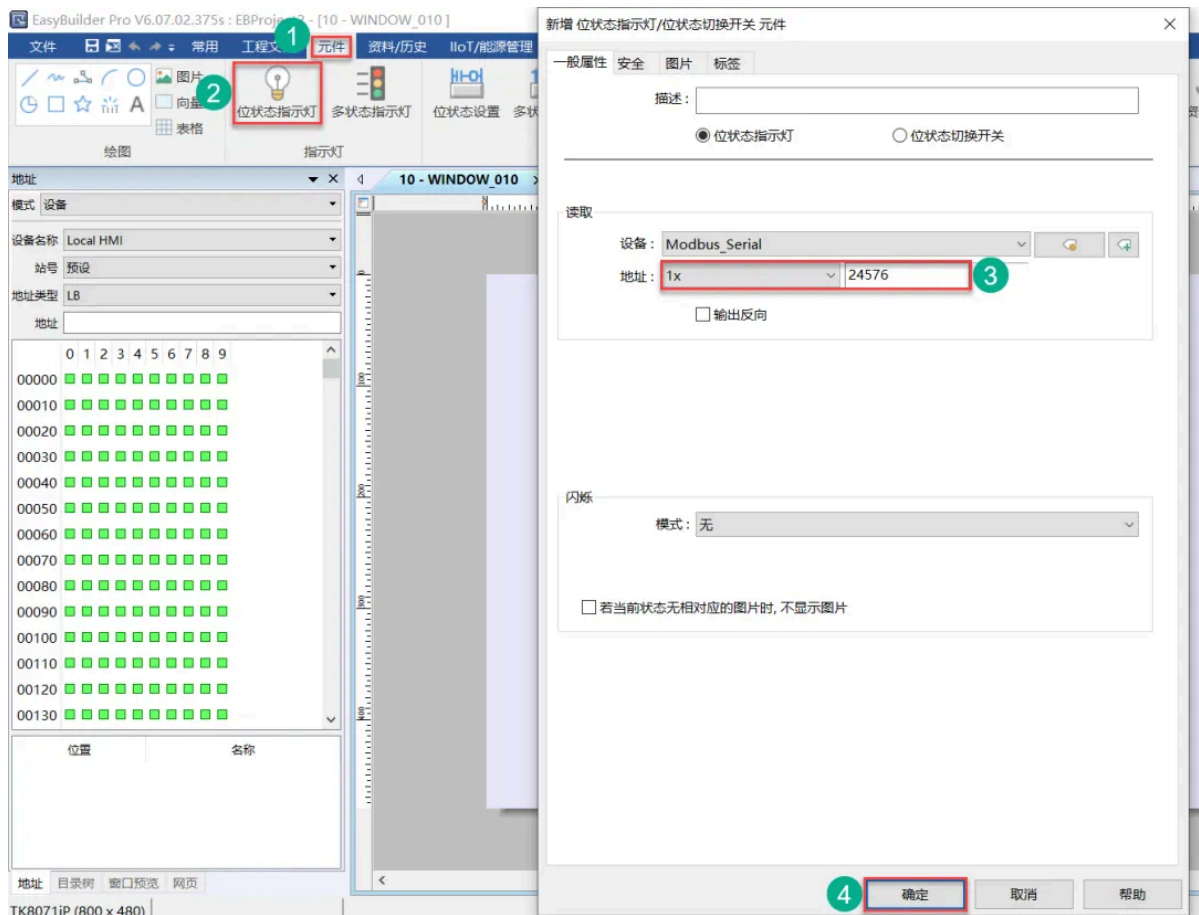
Name	Type	Number	Address	Property
I (Input device)	Bit device	%IX0.0~%IX0.7	6000 ~ 6007	Read-only
		%IX1.0~%IX1.7	6008 ~ 600F	Read-only
		.....	.....	Read-only
		%IX127.0~%IX127.7	63F8 ~ 63FF	Read-only
	Word device	%IW0~%IW63	8000 ~ 803F	Read-only
Q (Output device)	Bit device	%QX0.0~%QX0.7	A000 ~ A007	Read/Write
		%QX1.0~%QX1.7	A008 ~ A00F	Read/Write
		.....	.....	Read/Write
		%QX127.0~%QX127.7	A3F8 ~ A3FF	Read/Write
	Word device	%QW0~%QW63	A000 ~ A03F	Read/Write
M (Middle device)	Word device	%MW0~%MW32767	0000 ~ 7FFF	Read/Write

The corresponding address conversion method is as follows:

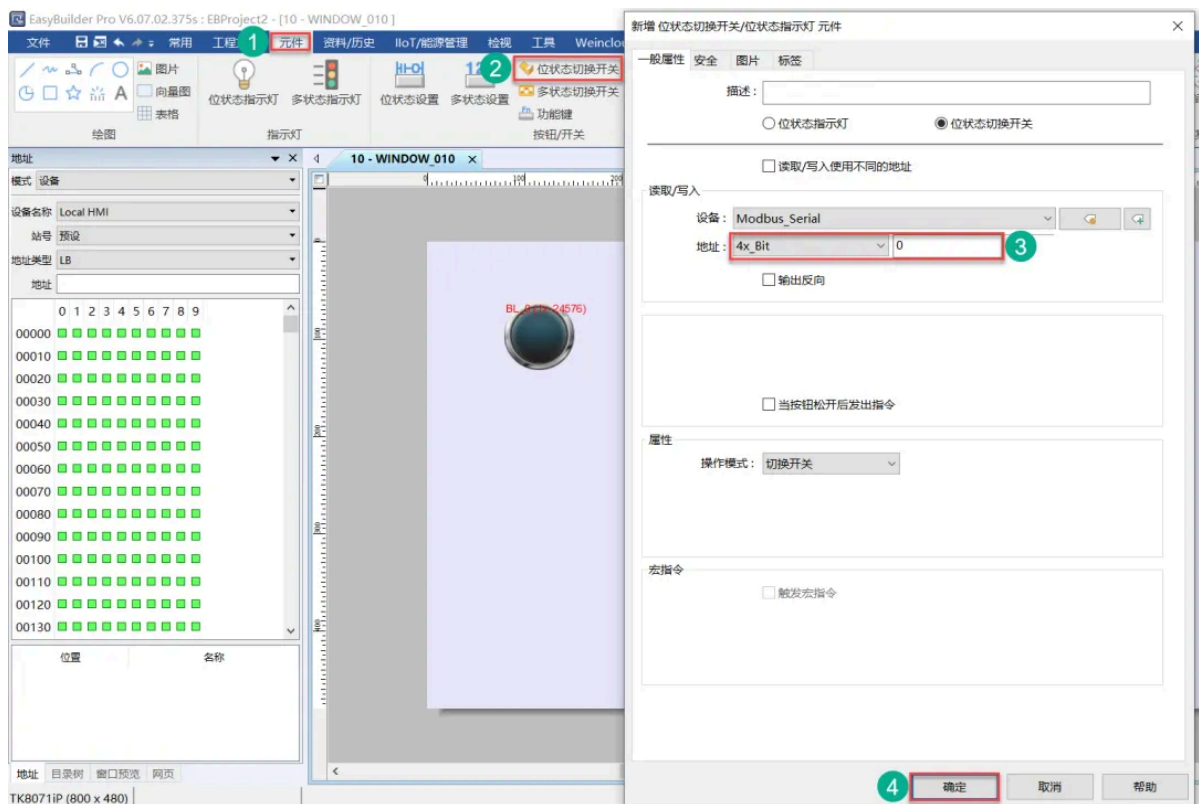
Address	Type	Algorithm	HMI Address
%IX ^A . ^B	1X	$24576 + A * 8 + B$	%IX1.1 $\rightarrow 24576 + 1 * 8 + 1 = 24585$
%IB ^A	3X_bit	$24576 + A/2$ (A/2 Divisible) $[24576 + A/2(\text{Round})].8$ (A/2 Not divisible)	%IB20 $\rightarrow 24576 + 20/2 = 24586$ %IB21 $\rightarrow [24576 + 21/2(\text{Round})].8 = 24586.8$
%IW ^A	3X	$32768 + A$	%IW10 $\rightarrow 32768 + 10 = 32778$
%QX ^A . ^B	0X	$40960 + A * 8 + B$	%QX1.1 $\rightarrow 40960 + 1 * 8 + 1 = 40969$
%QB ^A	4X_bit	$40960 + A/2$ (A/2 Divisible) $[40960 + A/2(\text{Round})].8$ (A/2 Not divisible)	%QB10 $\rightarrow 40960 + 10/2 = 40965$ %QB11 $\rightarrow [40960 + 11/2(\text{Round})].8 = 40965.8$
%QW ^A	4X	$40960 + A$	%QW10 $\rightarrow 40960 + 10 = 40970$
%MX ^A . ^B	4X_bit	$A/2.B$ (A/2 Divisible) $A/2(\text{Round}).(B+8)$ (A/2 Not divisible)	%MX500.3 $\rightarrow 500/2 = 250.3$ %MX501.3 $\rightarrow [501/2(\text{Round})].(3+8) = 250.11$
%MB ^A	4X_bit	$A/2$ (A/2 Divisible) $A/2(\text{Round}).8$ (A/2 Not divisible)	%MB100 $\rightarrow 100/2 = 50$ %MB101 $\rightarrow 101/2(\text{Round}).8 = 50.8$
%MW ^A	4X	A	%MW100 $\rightarrow 100$

Step 1: Create a new component

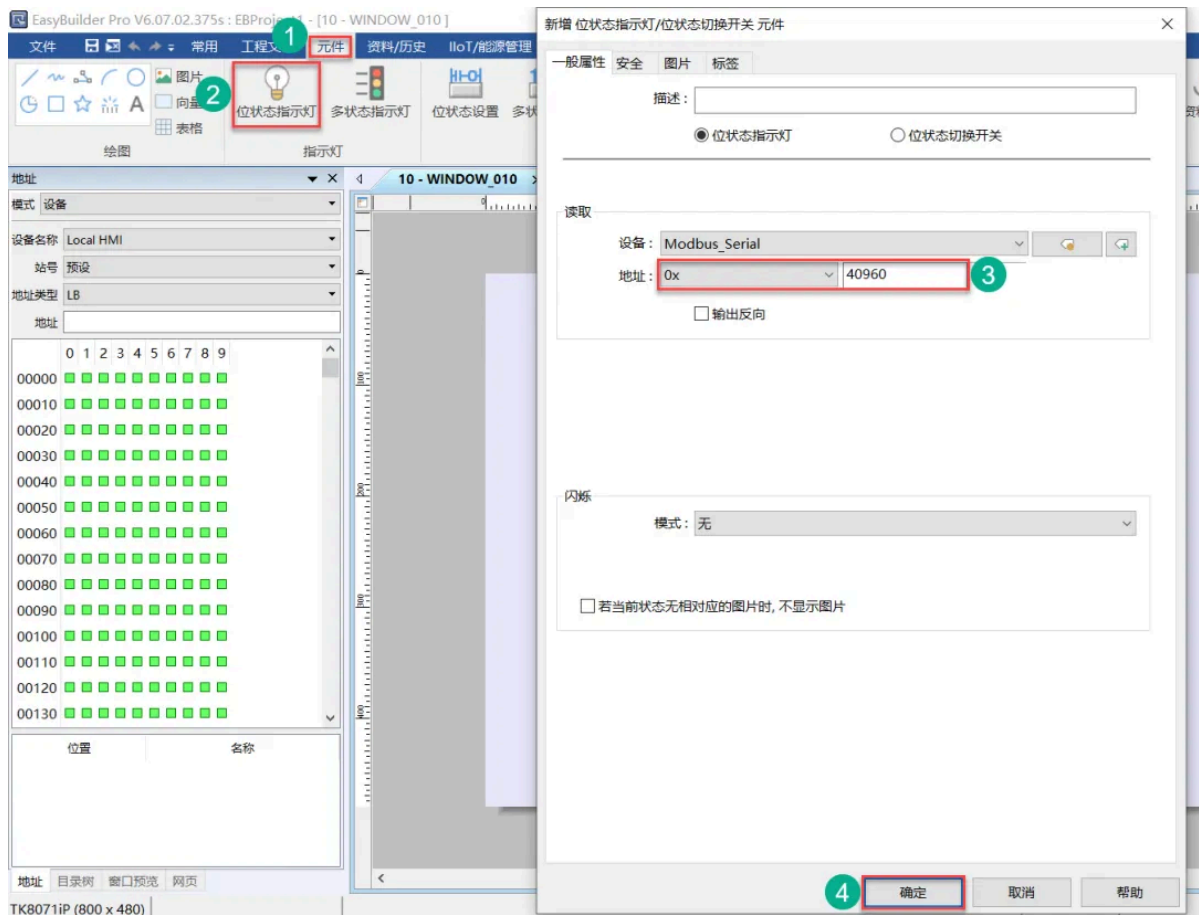
(1) Create a new indicator light component and bind the bool variable data_I0. Click [Bit Status Indicator] in the upper menu bar, select 1x for the corresponding address, and enter 24576.



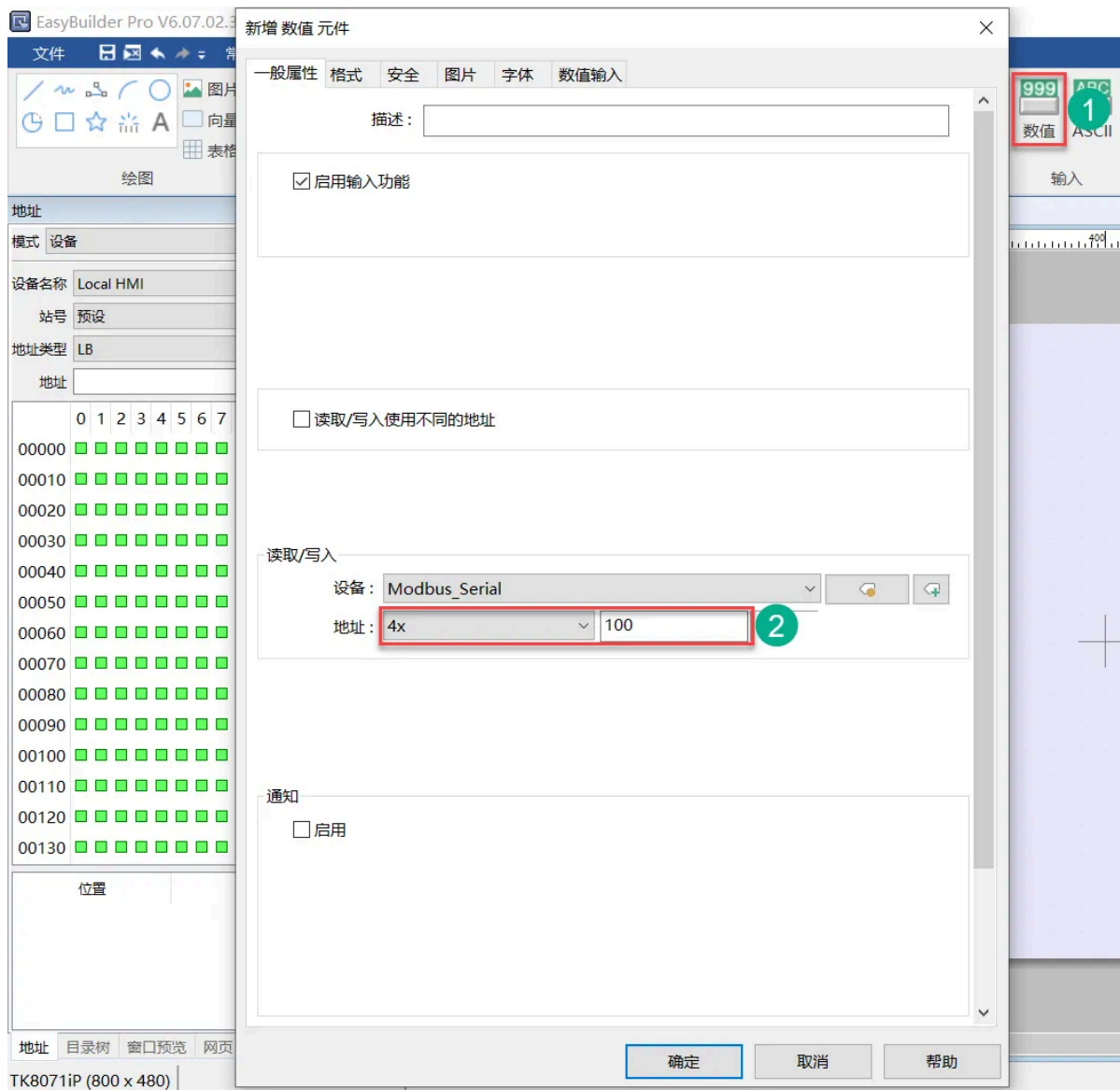
(2) Create a new Bit State Switch component and bind it to the Bool variable data_M0. Click [Bit State Switch] in the upper menu bar, select 4x_Bit for the corresponding address, and fill in 0.



(3) Create a new indicator light component and bind it to the bool variable data_Q0. Click [Bit Status Indicator] in the upper menu bar, select 0x for the corresponding address, and enter 40960.



(4) Create a new value component and bind it to the int variable data_int. Click [Value] in the upper menu bar, select 4x for the corresponding address, and enter 100.



The data type of data_int is int. Select 16-bit Signed for [Data Format]. In the [Display Format] section, enter 5 for [Number of digits above the decimal point] to indicate the number of digits that can be displayed on the touch screen.

新增 数值 元件

×

一般属性数值输入格式安全图片字体

显示格式

资料格式: 16-bit Signed 1

显示格式

类型: 预设

☐ 密码

小数点以上位数: 5 2

小数点以下位数: 0

比例转换

模式: 无

范围上下

☒ 输入常数☐ 动态限制

设备下限: 0

设备上限: 32767

输入下限: 0

输入上限: 32767

☐ 使用警示色彩

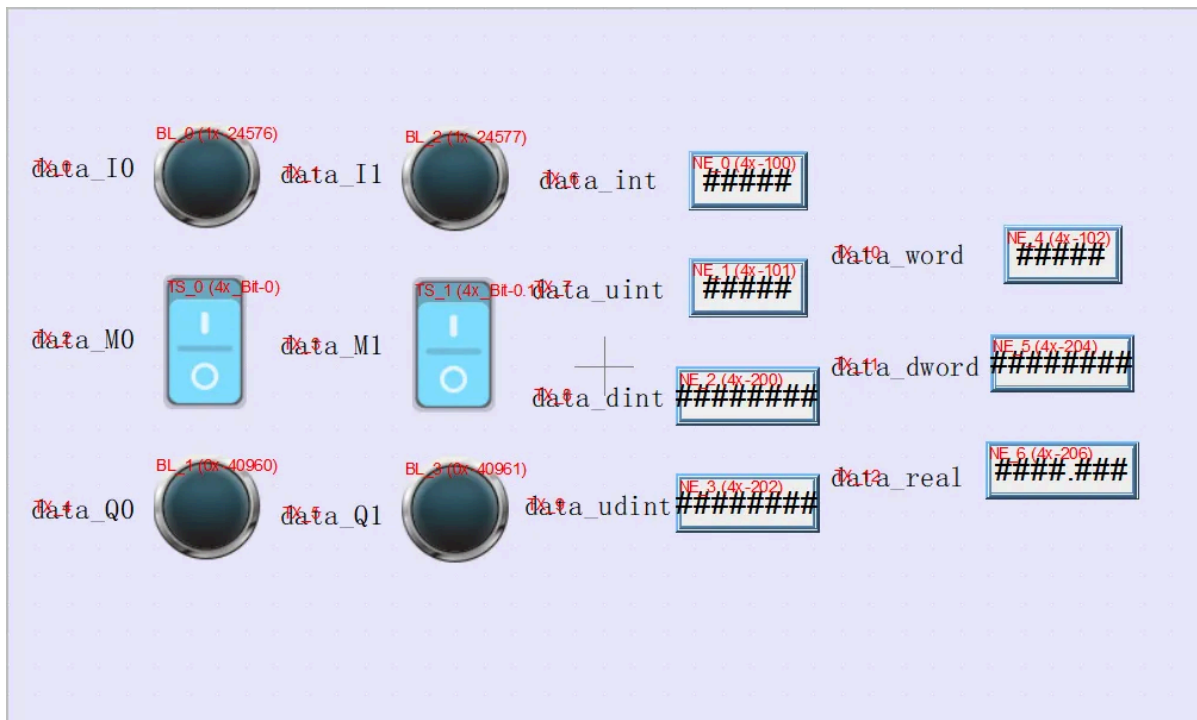
3

确定

取消

帮助

(5) Similarly, create other components and bind the corresponding variables. For easy distinction, add text here.

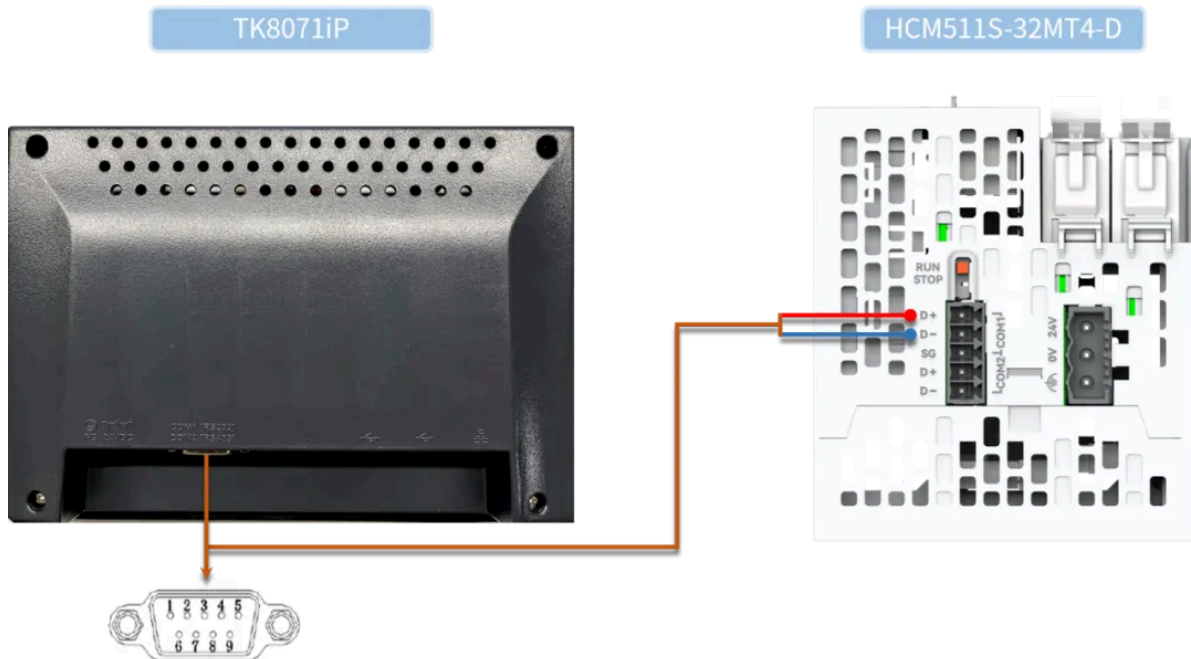


Step 2: After the component is created, download the project to the touch screen.

Communication test

Step 1: Device connection

This tutorial uses the HCM511S-32MT4-D controller and the TK8071iP touch screen. The Modbus RTU communication connection method is shown in the figure below.



The touch screen COM interface DB9 male pin definition is as follows.



接口	引脚	定义
COM2 [RS-485]2W	1	Data-
	2	Data+
COM2 [RS-485]4W	1	Rx-
	2	Rx+
	3	Tx-
	4	Tx+
COM3 [RS-485]2W	6	Data-
	9	Data+

Step 2: project Testing

The Sysctrl project enters the monitoring state and assigns values to variables.

Modbus - Sysctrl Studio 2.1

文件(F) 编辑(E) 视图(V) 工程(P) 控制器(C) 模拟(S) 工具(T) 帮助(H)

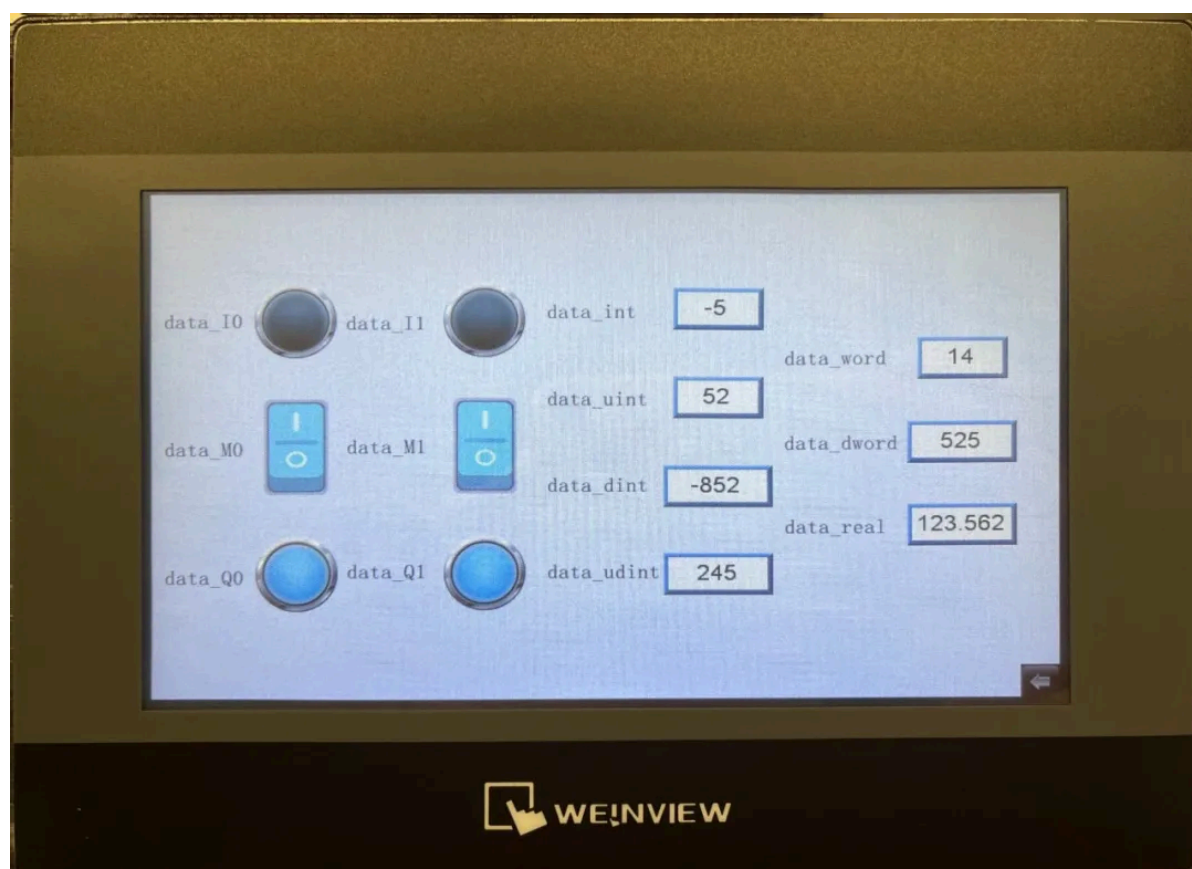
工程: POU

Modbus (用户: admin)

- 配置
 - 默认硬件设置 (M511S)
 - 网络设置
 - 运动控制
 - 电子凸轮
 - 跟踪列表
 - 编程
 - 任务管理
 - 数据类型
 - 全局变量
 - 用户POU
 - POU (PG)

	类别	名称	分配到	数据类型	在线值	准备值	注释
1	VAR	data_M0	%MX0.0	BOOL	TRUE		
2	VAR	data_M1	%MX0.1	BOOL	TRUE		
3	VAR	data_Q0	%QX0.0	BOOL	TRUE		
4	VAR	data_Q1	%QX0.1	BOOL	TRUE		
5	VAR	data_I0	%IX0.0	BOOL	FALSE		
6	VAR	data_I1	%IX0.1	BOOL	FALSE		
7	VAR	data_int	%MW100	INT	-5		
8	VAR	data_uint	%MW101	UINT	52		
9	VAR	data_dint	%MD100	DINT	-852		
10	VAR	data_udint	%MD101	UDINT	245		
11	VAR	data_word	%MW102	WORD	14		
12	VAR	data_dword	%MD102	DWORD	525		
13	VAR	data_real	%MD103	REAL	123.562		

At the same time, the touch screen component displays the corresponding value.

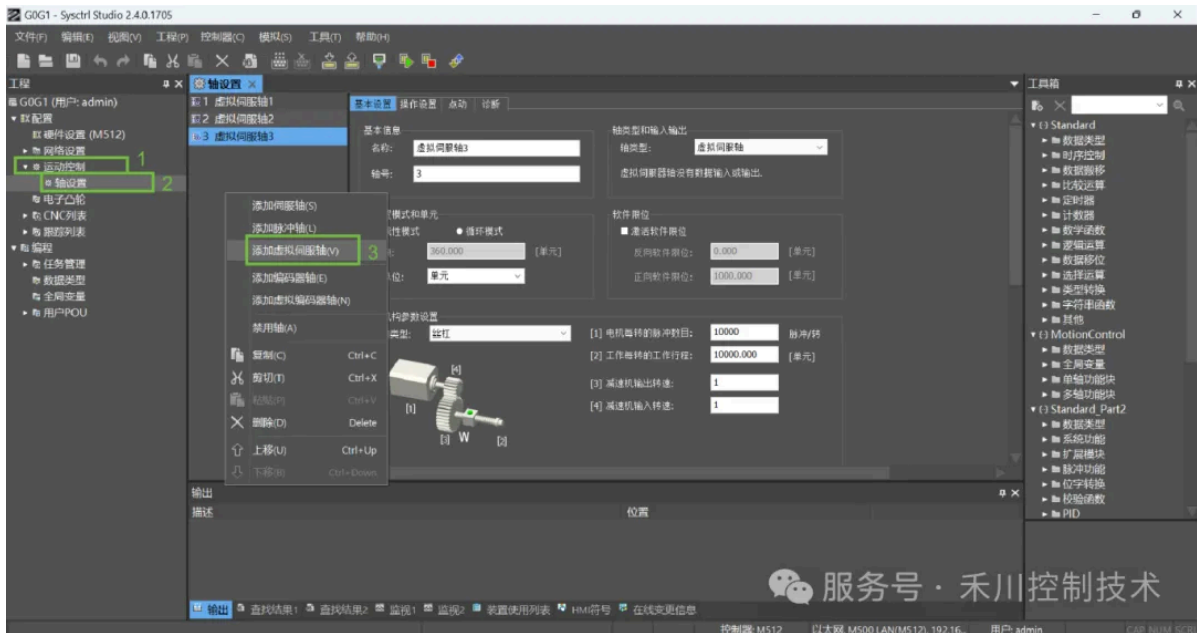


Modbus TCP

Sysctrl Studio project configuration

Step 1: Create a new project

Double-click to open the Sysctrl Studio software and create a new project. In the default POU, create new variables and assign them to corresponding addresses.

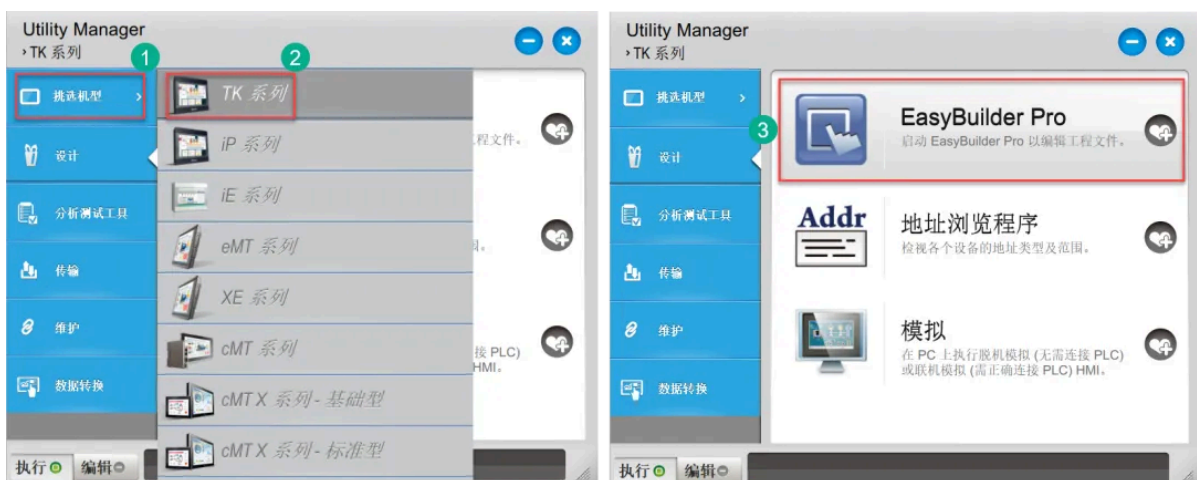


Step 2: After compilation, download the project to the controller.

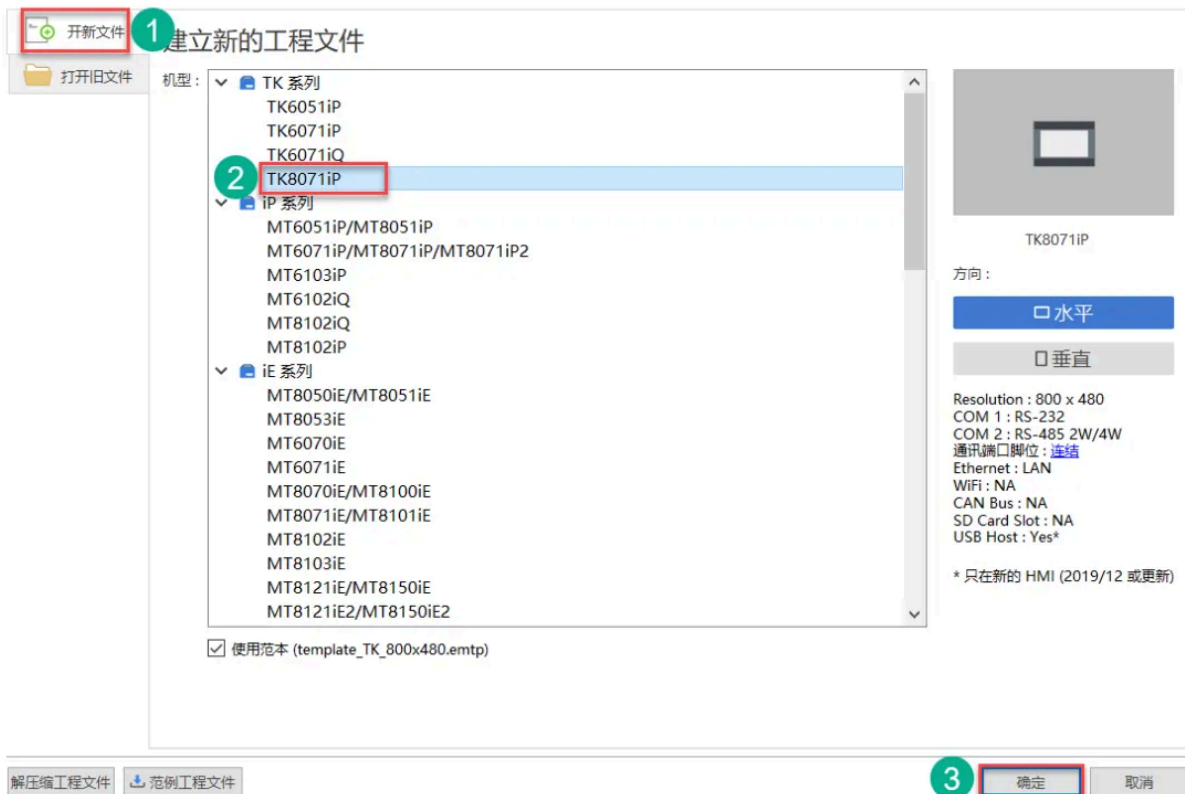
Utility Manager Project Configuration

Step 1: Create a new project

(1) Open the Utility Manager software, select [Select Model] in the upper left corner, select the model series corresponding to the touch screen, and click [EasyBuilder Pro].



(2) Click [Open New File] and select the corresponding model [TK8071iP].



Step 2: Basic Configuration

(1) In the pop-up window, select [Add device/server...]

设备 HMI 属性 一般属性 系统 远端 用户密码 扩展存储器 移动网络 打印/备份服务器 时间同步/夏令时 邮件

设备列表: [当前 PC 的 IP 信息](#)

	名称	位置	设备类型	界面	通讯协议	站号
本机 触摸屏	Local HMI	本机	TK8071iP (800 x 480)	-	-	0

新增设备/服务器... 删除 设置...

* 在此页签做的设置将直接保存 (无法取消)

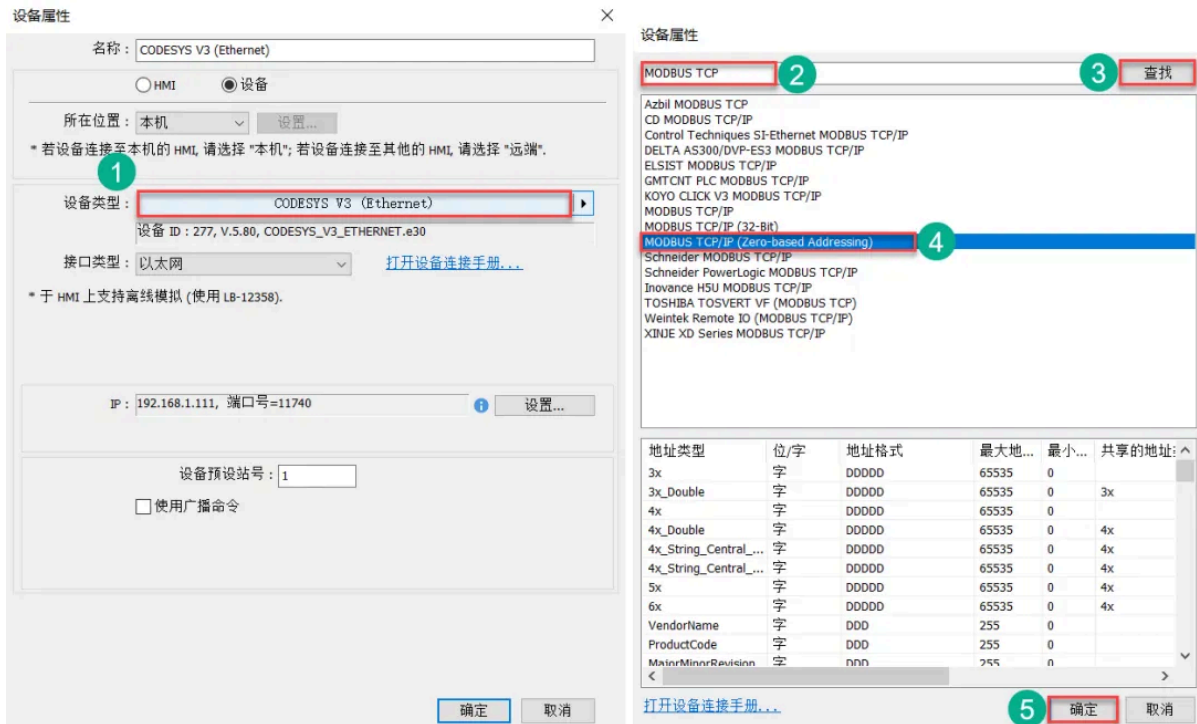
设计者备注:

SCADA 软件可以透过 MODBUS TCP/IP Server 来存取设备数据. (须先新增一个 MODBUS TCP/IP Server 并且启用 [MODBUS TCP/IP 网关])



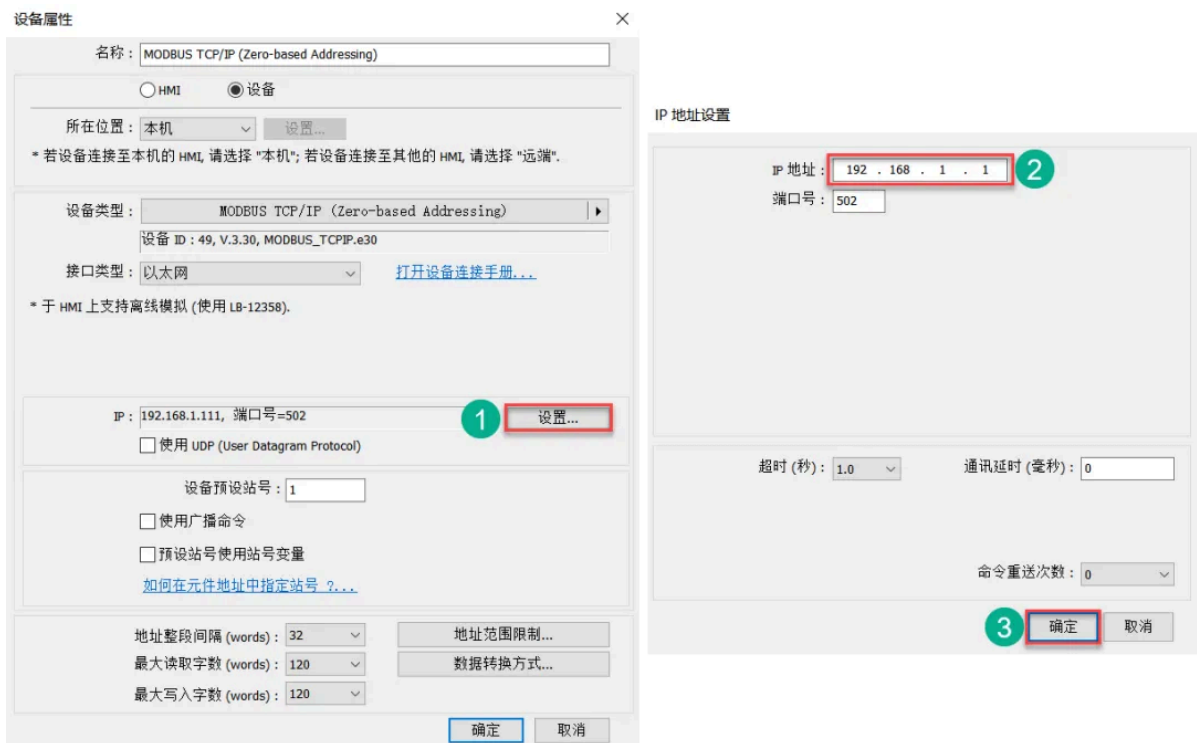
确定 取消 帮助

(2) Select [MODBUS TCP/IP (Zero-based Addressing)] from [Device Type].



(3) Click [Set...] at the IP address, and change the IP address to the controller IP address.

Note: For Modbus TCP communication, the controller IP and touch screen IP must be in the same network segment.



The Modbus addresses of the project variables and touch screen components must correspond one to one for successful communication.

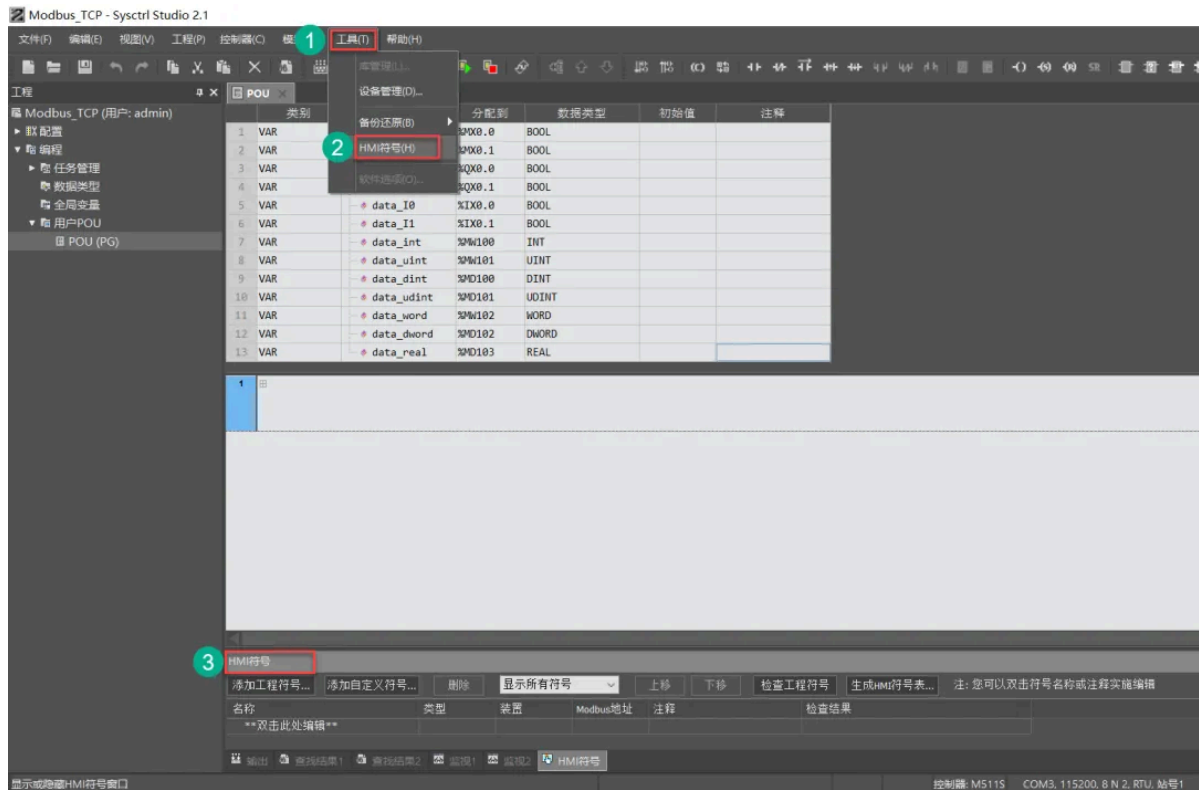
There are two ways to map addresses: **the HMI symbol table** and **the standard Modbus address calculation**.

You can choose any method to perform address mapping.

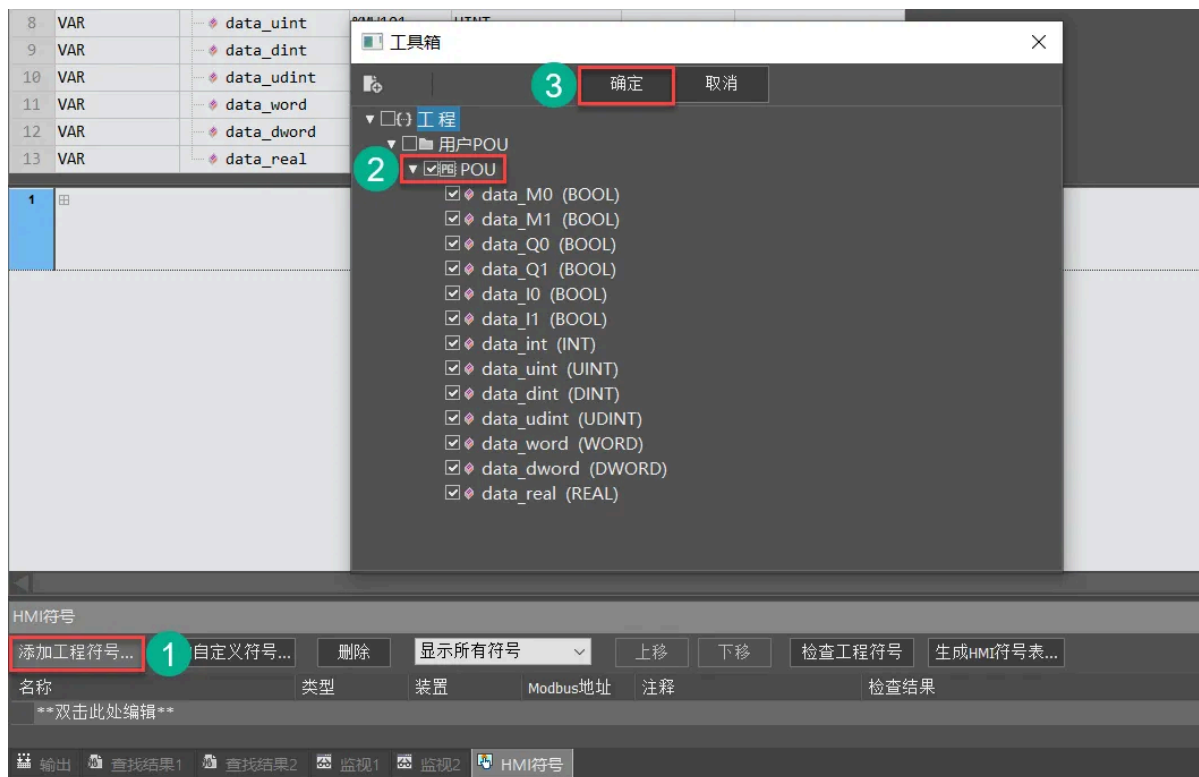
HMI symbol table

Step 1: Generate HMI symbol table (Sysctrl Studio project)

(1) Click [Tools] >> [HMI Symbols] in the upper menu bar



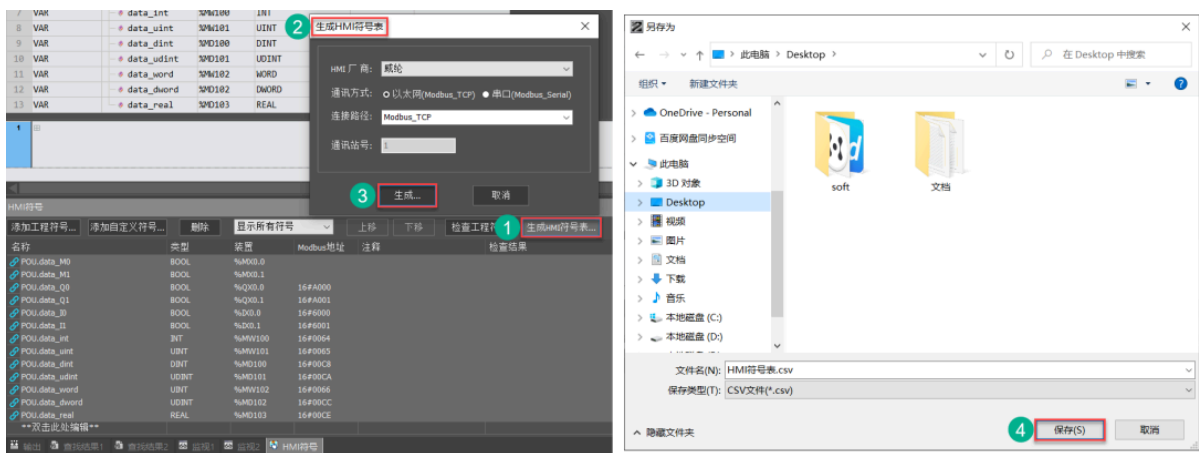
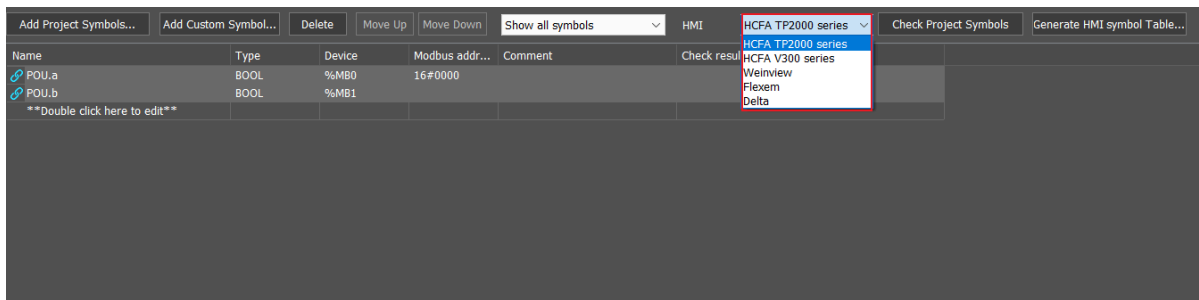
(2) The HMI symbol interface appears at the bottom. Click [Add Engineering Symbol...] and select the variable to be added in the pop-up window.



(3) Click [Check Project Symbols] and the variables will be automatically assigned Modbus addresses.



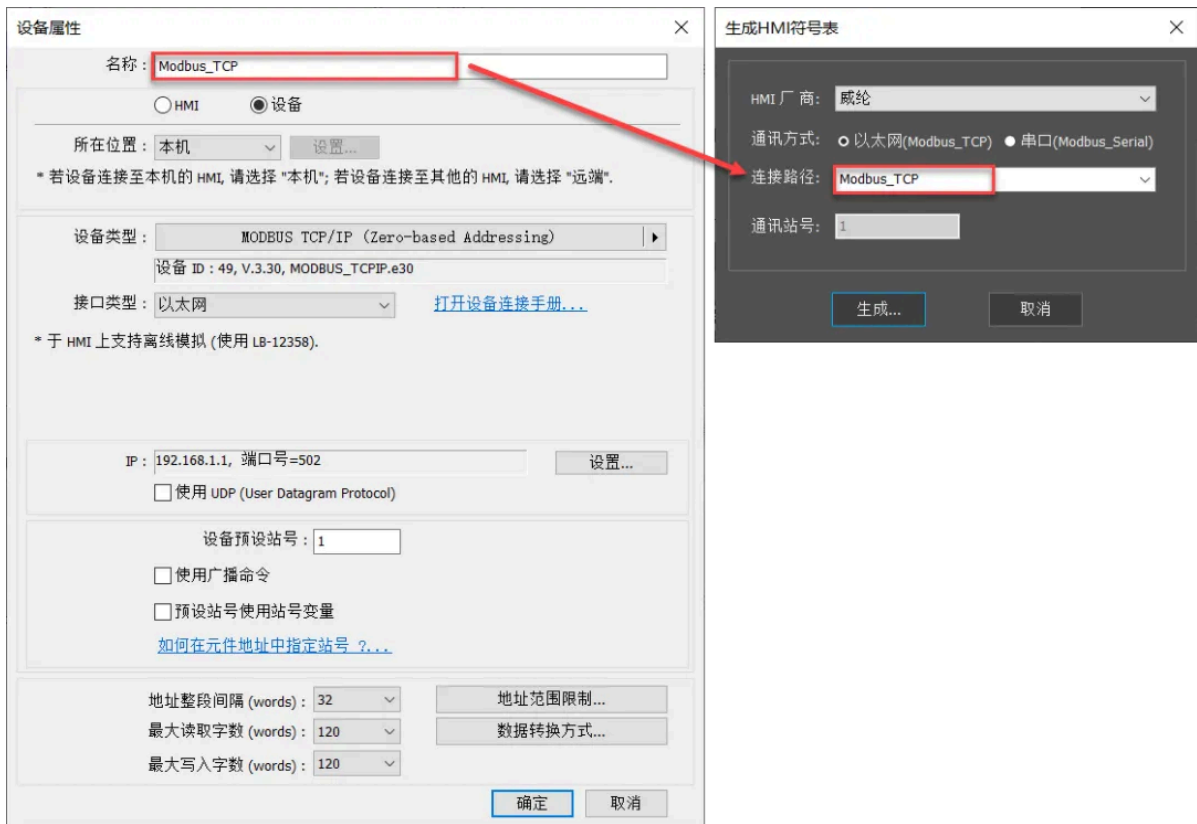
(4) Click [Generate HMI Symbol Table...]. On the [Generate HMI Symbol Table] screen, select WEINIEW for [HMI Manufacturer], Ethernet for [Communication Method], and Modbus_TCP for [Connection Path]. Click [Generate...] and save the CSV file to your computer. It will be used in subsequent touch screen projects.



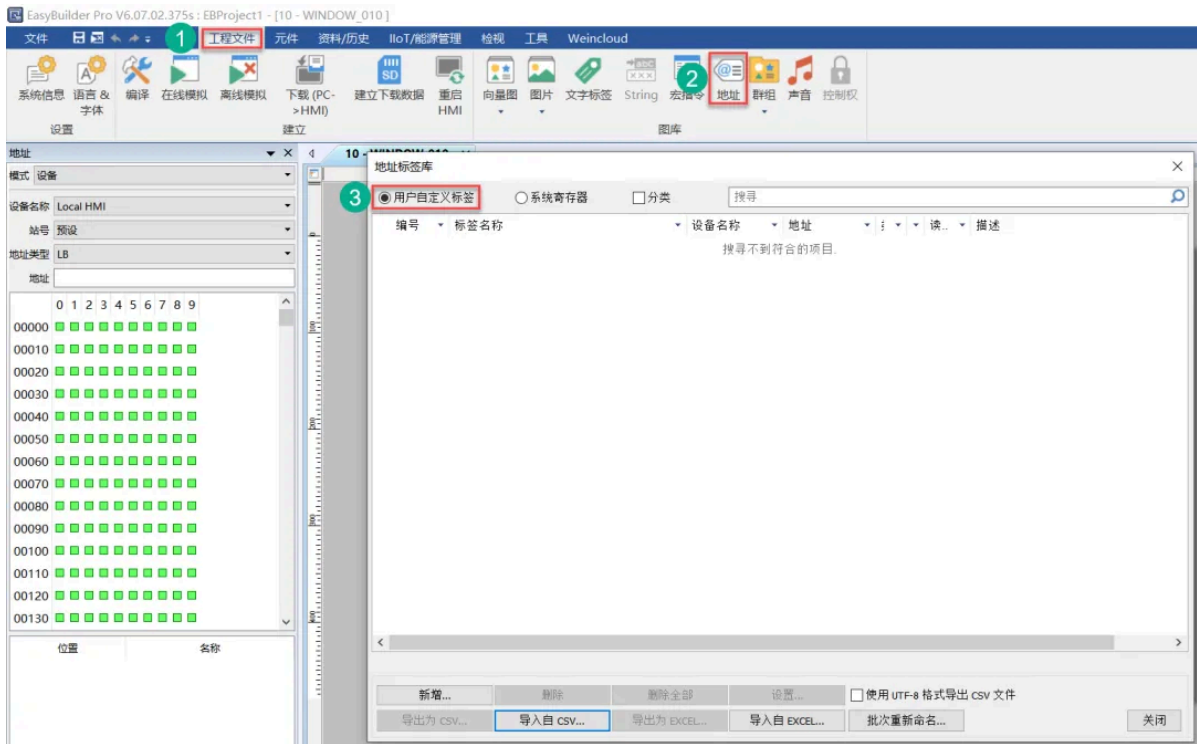
After the configuration is complete, download the project to the controller.

Step 2: Import the HMI symbol table (Utility Manager project)

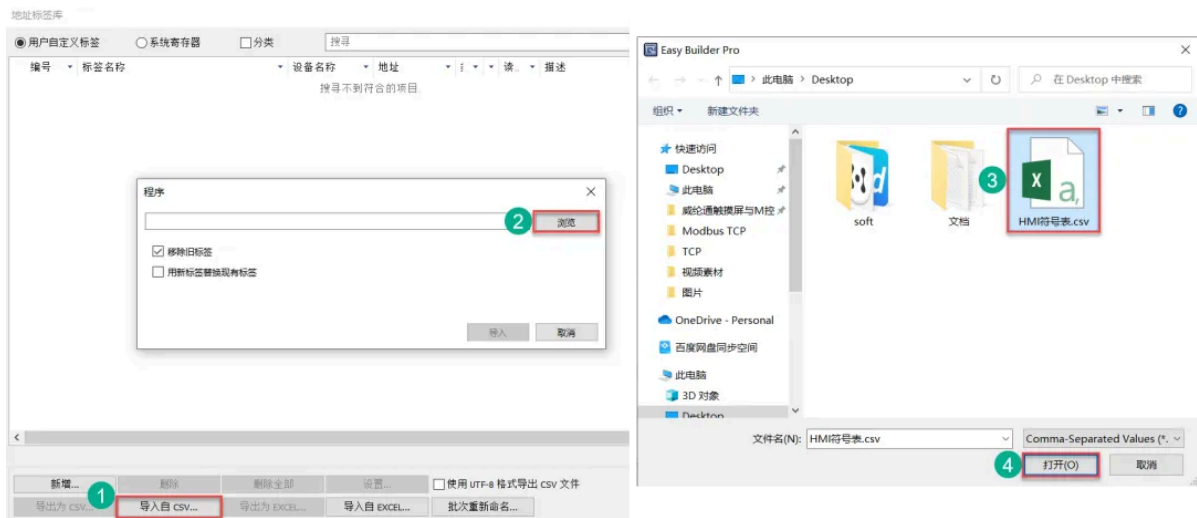
(1) The name must be consistent with the name in [Generate HMI Symbol Table] - [Connection Path].



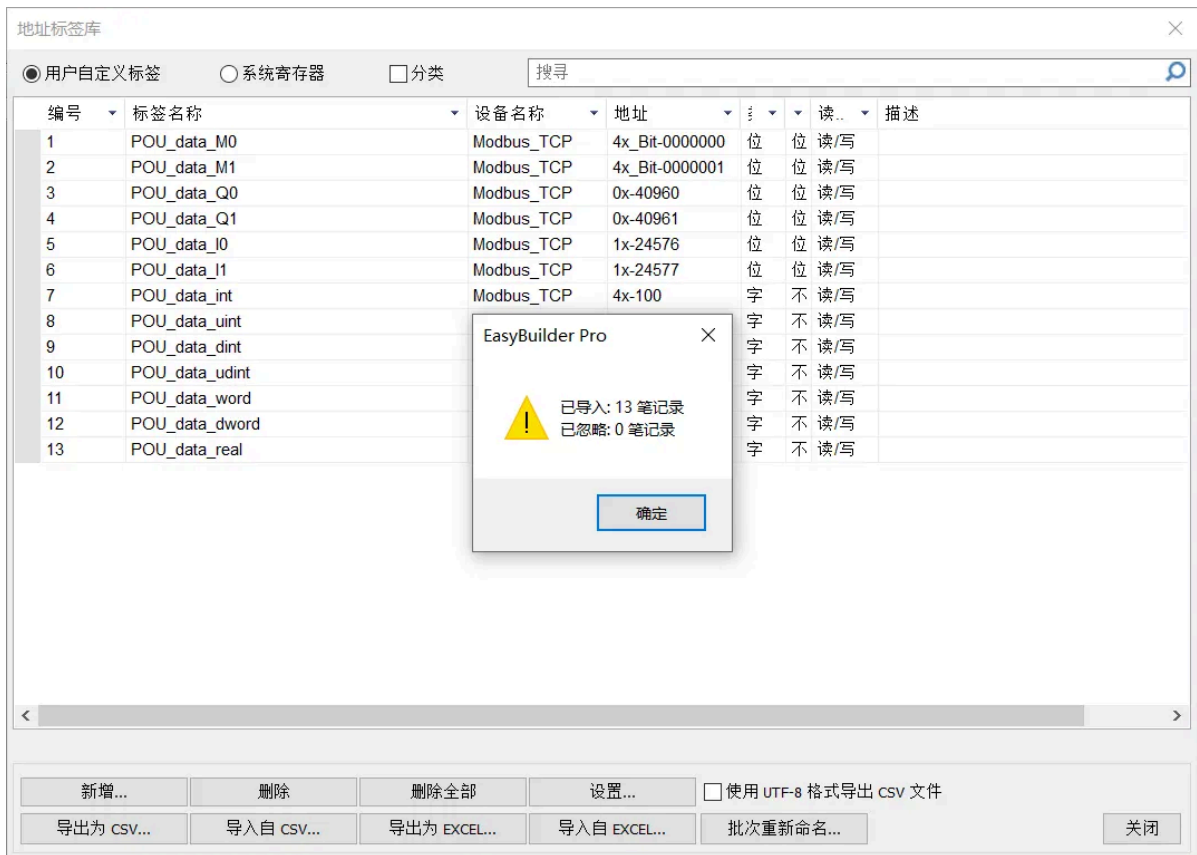
(2) Click [Project File] >> [Address] >> [User Defined Label]



(3) Import CSV file

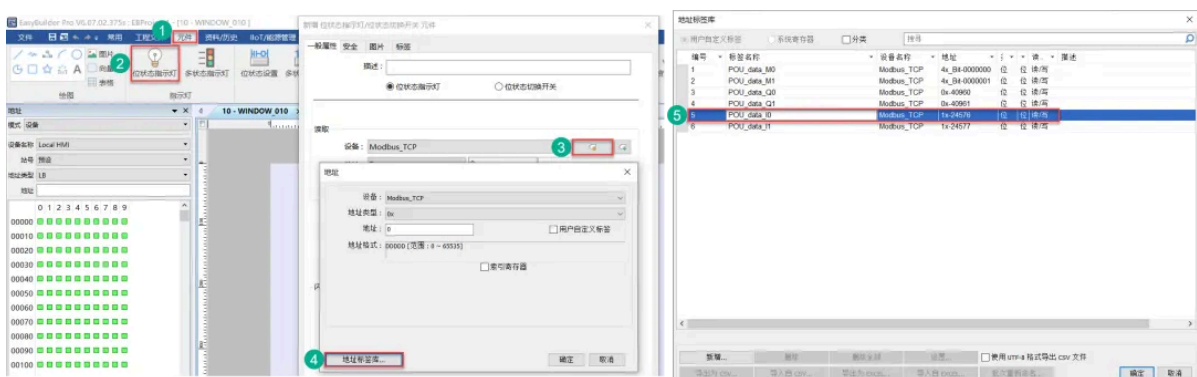


(4) A pop-up window indicates that the import was successful

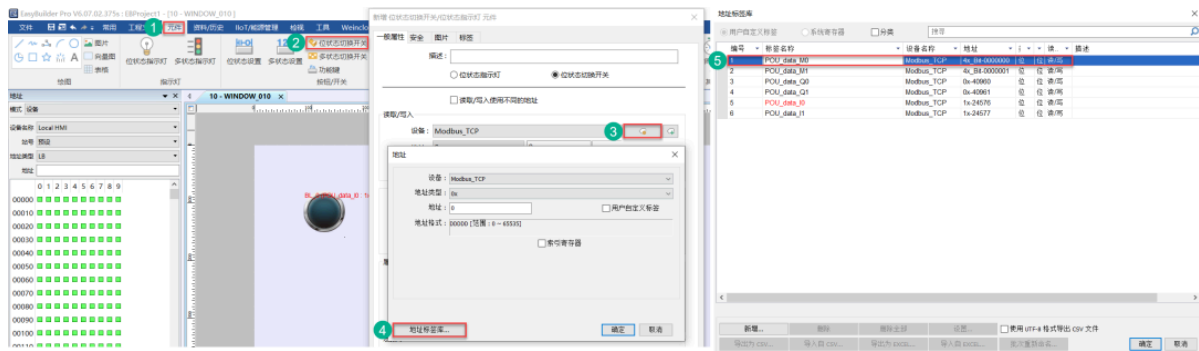


Step 3: Create a new component

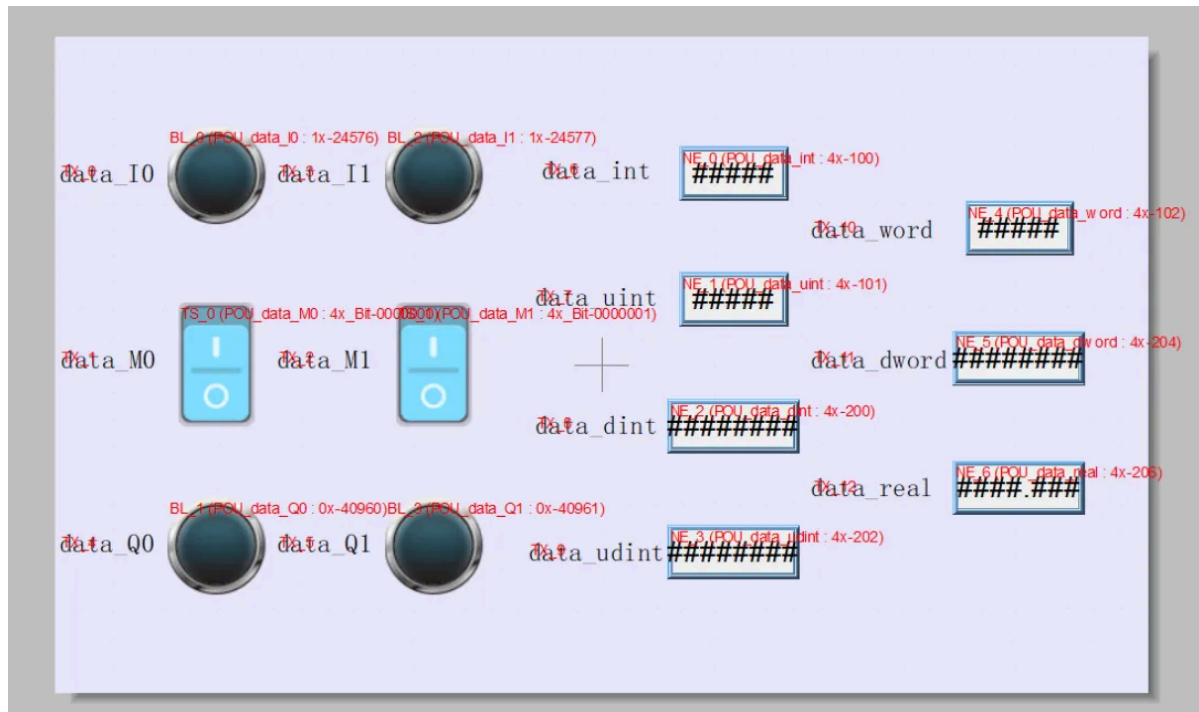
(1) Create a new indicator light component and bind it to the bool variable data_I0.



(2) Create a new bit state switching switch element and bind it to the bool variable data_M0.

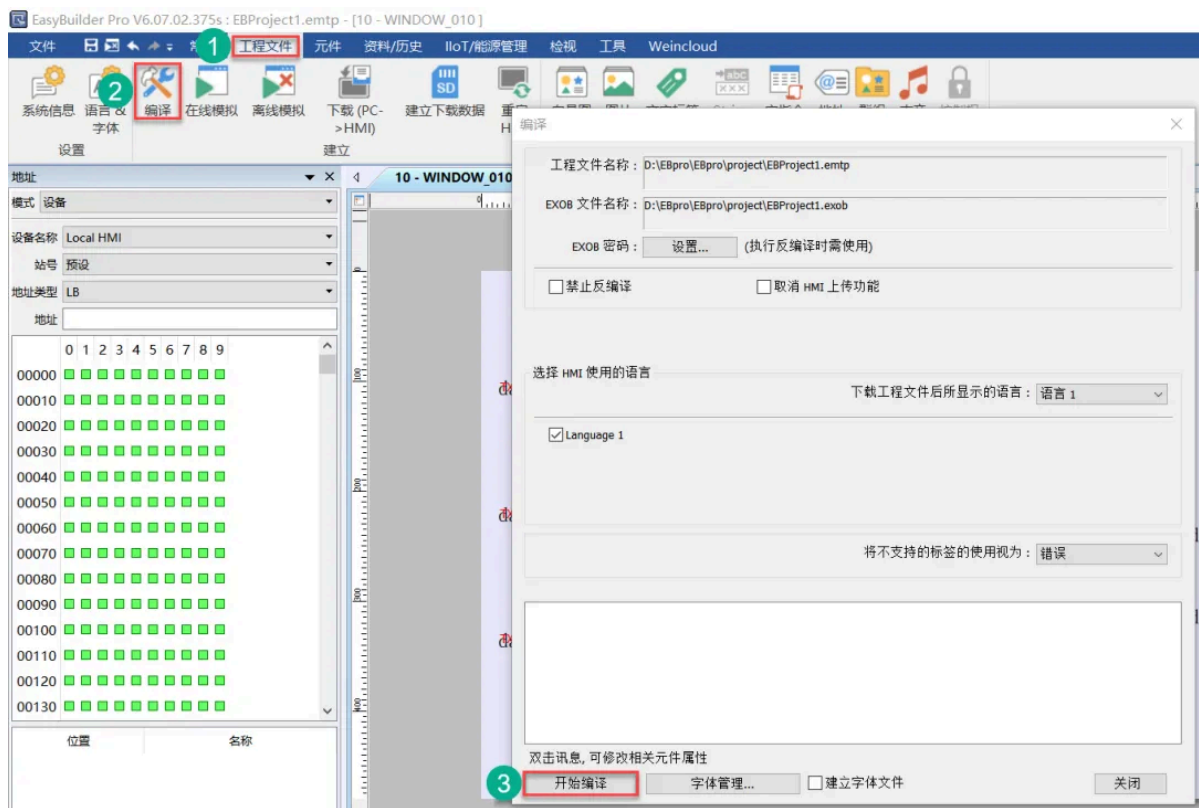


(3) Similarly, create other components and bind the corresponding variables. For easy distinction, add text here.

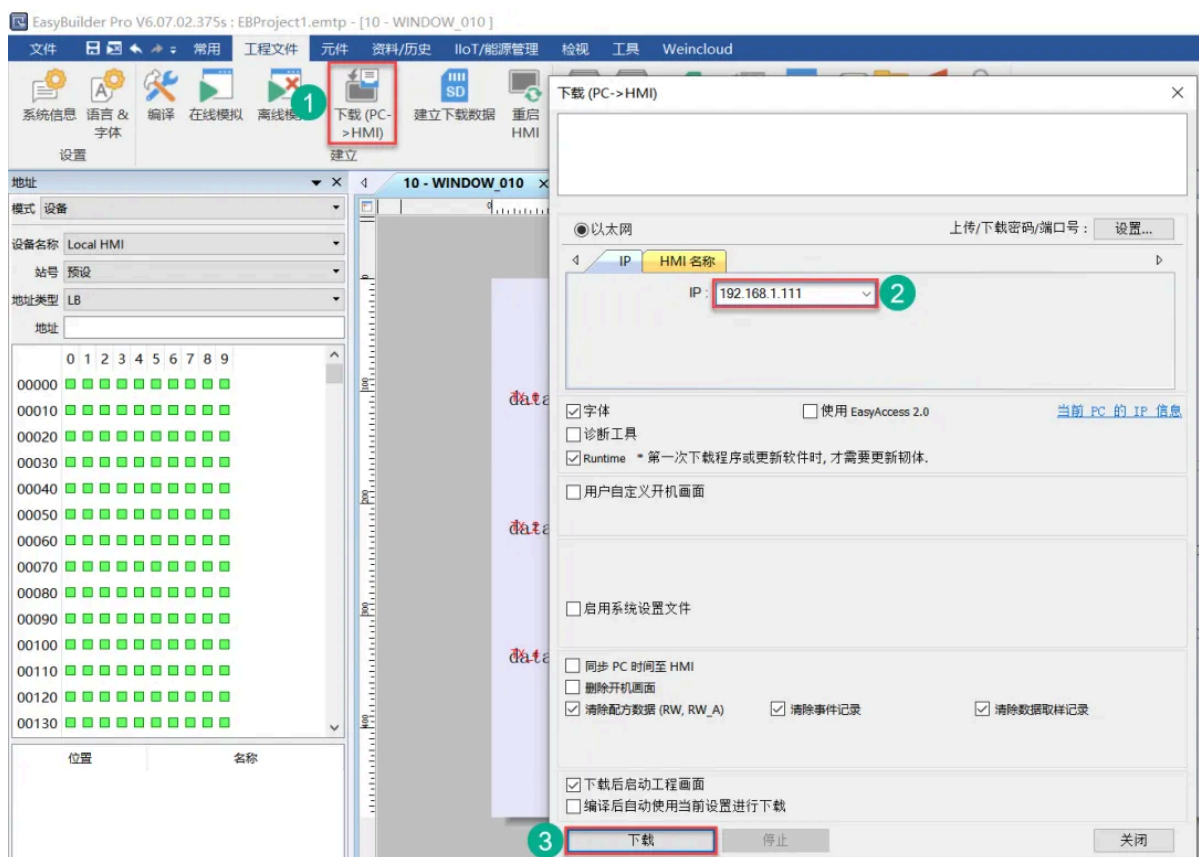


Step 4: Download the project

(1) Click [Project File] >> [Compile] >> [Start Compiling].



(2) Click [Download (PC->HMI)], enter the touch screen IP address 192.168.1.111 in the IP field, and click [Download].



(3) The window displays "All completed", indicating that the download is successful

下载 (PC->HMI)

载入字体成功
触摸屏重启 ...
启动触摸屏成功

全部完成

☒ 以太网

上传/下载密码/端口号 :

设置...

◀

IP

HMI 名称

▶

IP : 192.168.1.111 ▼

☒ 字体

☐ 使用 EasyAccess 2.0

[当前 PC 的 IP 信息](#)

☐ 诊断工具

☒ Runtime * 第一次下载程序或更新软件时, 才需要更新韧体.

☐ 用户自定义开机画面

☐ 启用系统设置文件

☐ 同步 PC 时间至 HMI

☐ 删除开机画面

☒ 清除配方数据 (RW, RW_A)

☒ 清除事件记录

☒ 清除数据取样记录

☒ 下载后启动工程画面

☐ 编译后自动使用当前设置进行下载

下载

停止

关闭

Standard Modbus address calculation

Address calculation relationship description

The following table applies to the Modbus address correspondence between the M series controller and the WEINIVIEW HMI.

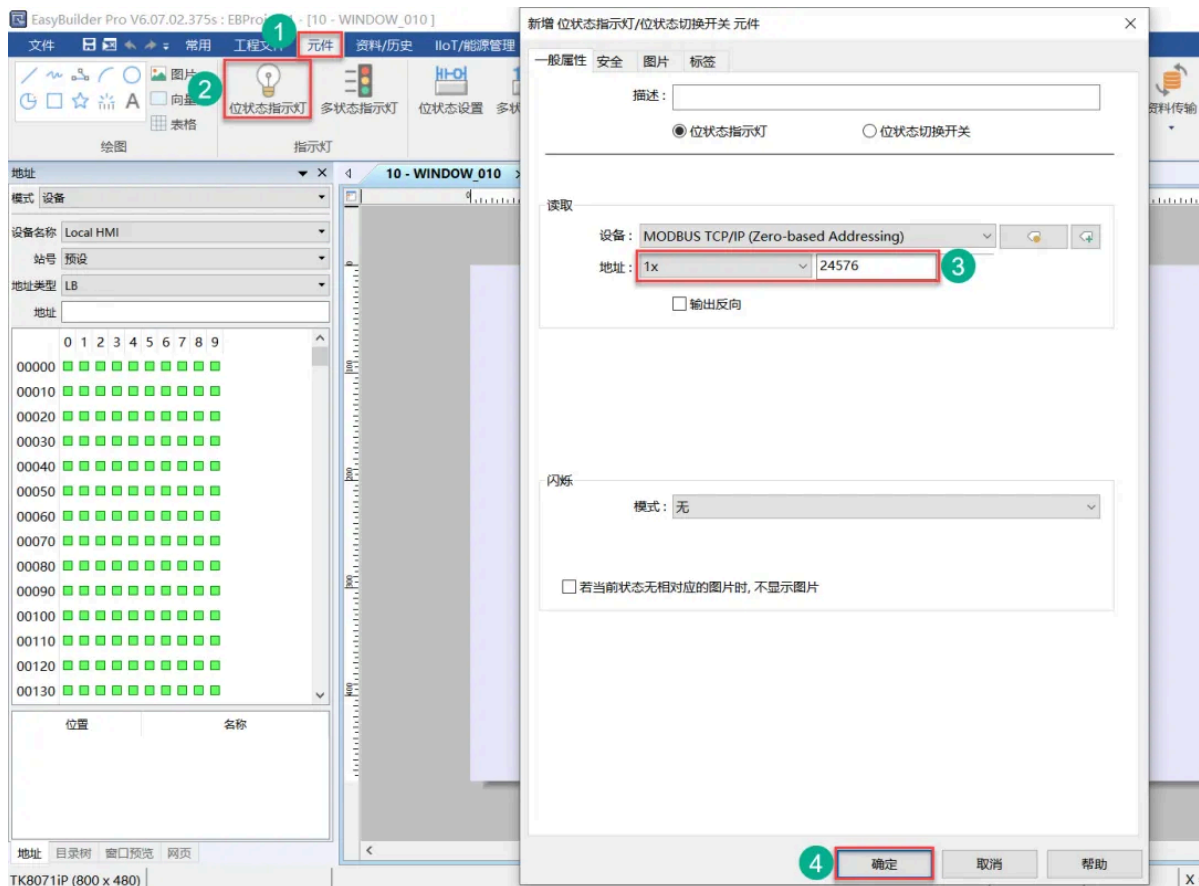
Name	Type	Number	Address	Property
I (Input device)	Bit device	%IX0.0~%IX0.7	6000 ~ 6007	Read-only
		%IX1.0~%IX1.7	6008 ~ 600F	Read-only
		.....	.....	Read-only
		%IX127.0~%IX127.7	63F8 ~ 63FF	Read-only
	Word device	%IW0~%IW63	8000 ~ 803F	Read-only
Q (Output device)	Bit device	%QX0.0~%QX0.7	A000 ~ A007	Read/Write
		%QX1.0~%QX1.7	A008 ~ A00F	Read/Write
		.....	.....	Read/Write
		%QX127.0~%QX127.7	A3F8 ~ A3FF	Read/Write
	Word device	%QW0~%QW63	A000 ~ A03F	Read/Write
M (Middle device)	Word device	%MW0~%MW32767	0000 ~ 7FFF	Read/Write

The corresponding address conversion method is as follows:

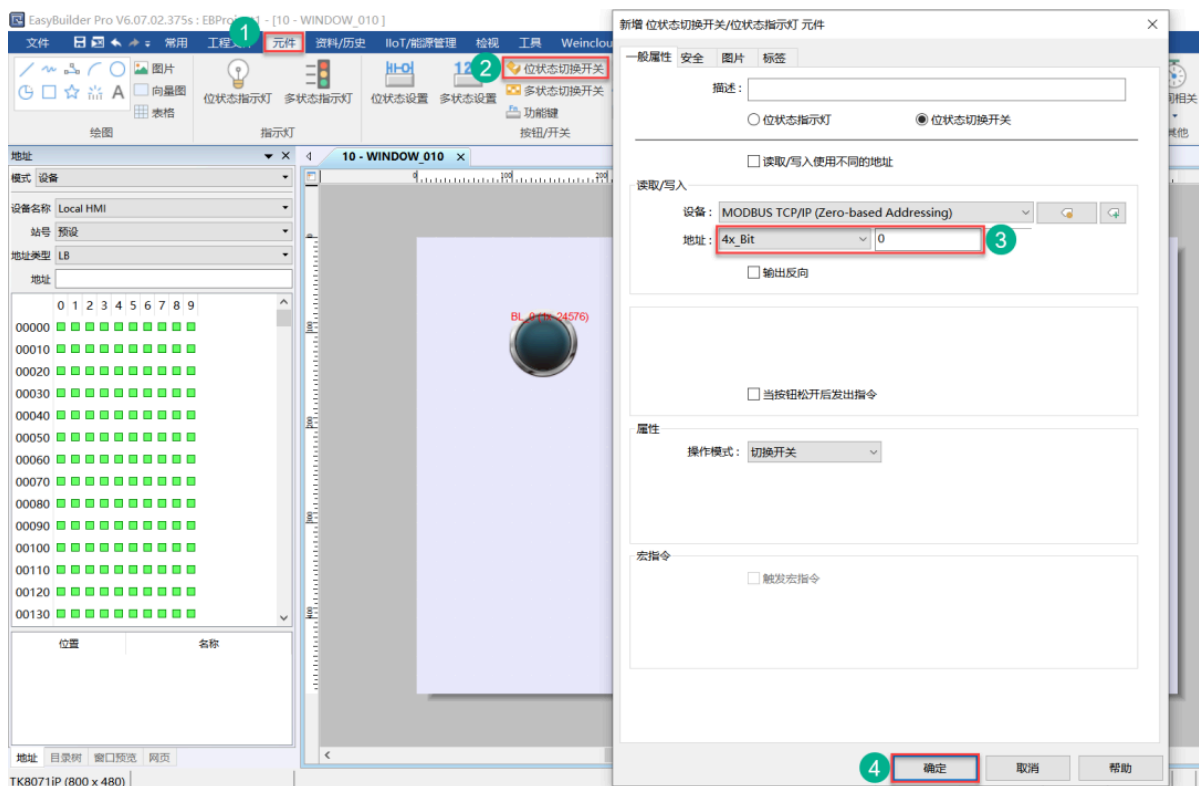
Address	Type	Algorithm	HMI Address
%IX ^A . ^B	1X	$24576 + A * 8 + B$	%IX1.1 $\rightarrow 24576 + 1 * 8 + 1 = 24585$
%IB ^A	3X_bit	$24576 + A/2$ (A/2 Divisible) $[24576 + A/2(\text{Round})].8$ (A/2 Not divisible)	%IB20 $\rightarrow 24576 + 20/2 = 24586$ %IB21 $\rightarrow [24576 + 21/2(\text{Round})].8 = 24586.8$
%IW ^A	3X	$32768 + A$	%IW10 $\rightarrow 32768 + 10 = 32778$
%QX ^A . ^B	0X	$40960 + A * 8 + B$	%QX1.1 $\rightarrow 40960 + 1 * 8 + 1 = 40969$
%QB ^A	4X_bit	$40960 + A/2$ (A/2 Divisible) $[40960 + A/2(\text{Round})].8$ (A/2 Not divisible)	%QB10 $\rightarrow 40960 + 10/2 = 40965$ %QB11 $\rightarrow [40960 + 11/2(\text{Round})].8 = 40965.8$
%QW ^A	4X	$40960 + A$	%QW10 $\rightarrow 40960 + 10 = 40970$
%MX ^A . ^B	4X_bit	$A/2.B$ (A/2 Divisible) $A/2(\text{Round}).(B+8)$ (A/2 Not divisible)	%MX500.3 $\rightarrow 500/2 = 250.3$ %MX501.3 $\rightarrow [501/2(\text{Round})].(3+8) = 250.11$
%MB ^A	4X_bit	$A/2$ (A/2 Divisible) $A/2(\text{Round}).8$ (A/2 Not divisible)	%MB100 $\rightarrow 100/2 = 50$ %MB101 $\rightarrow 101/2(\text{Round}).8 = 50.8$
%MW ^A	4X	A	%MW100 $\rightarrow 100$

Step 1: Create a new component

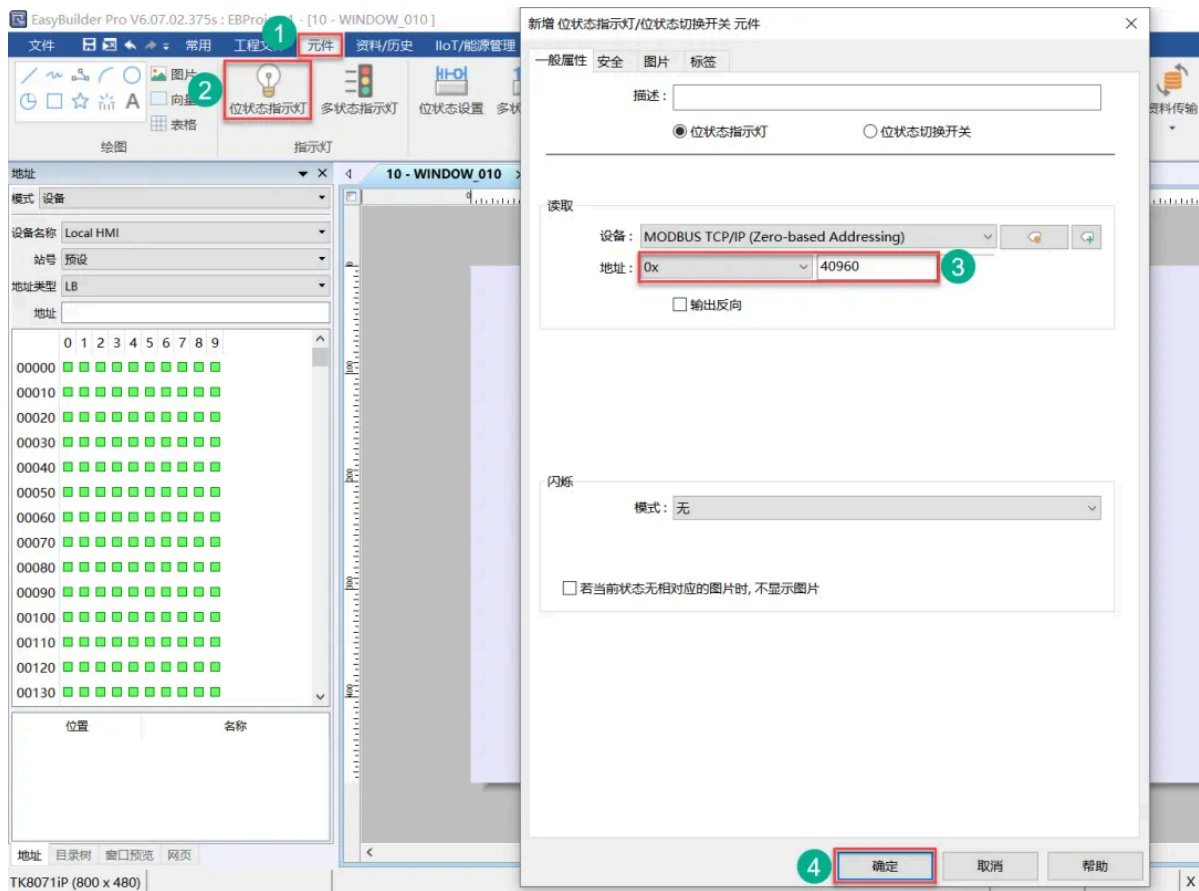
(1) Create a new indicator light component and bind the bool variable data_I0. Click [Bit Status Indicator] in the upper menu bar, select 1x for the corresponding address, and enter 24576.



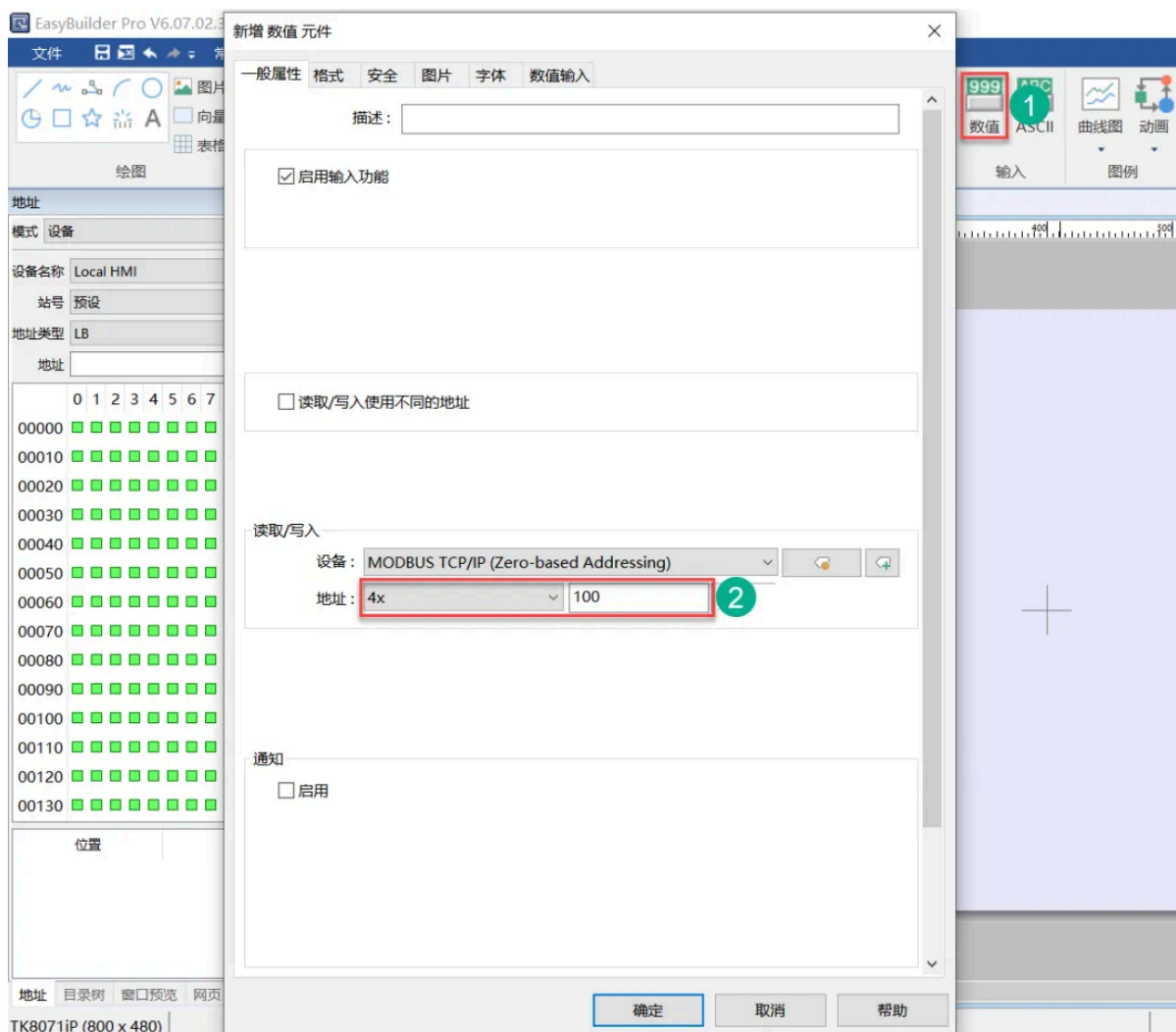
(2) Create a new Bit State Switch component and bind it to the Bool variable data_M0. Click [Bit State Switch] in the upper menu bar, select 4x_Bit for the corresponding address, and enter 0.



(3) Create a new indicator light component and bind it to the bool variable data_Q0. Click [Bit Status Indicator] in the upper menu bar, select 0x for the corresponding address, and enter 40960.



(4) Create a new value component and bind it to the int variable data_int. Click [Value] in the upper menu bar, select 4x for the corresponding address, and enter 100.



The data type of data_int is int. Select 16-bit Signed for [Data Format]. In the [Display Format] section, enter 5 for [Number of digits above the decimal point] to indicate the number of digits that can be displayed on the touch screen.

新增 数值 元件

一般属性 数值输入 格式 安全 图片 字体

显示格式

资料格式: 16-bit Signed 1

显示格式

类型: 预设 ☐ 密码

小数点以上位数: 5 2 小数点以下位数: 0

比例转换

模式: 无

范围上下

☒ 输入常数 ☐ 动态限制

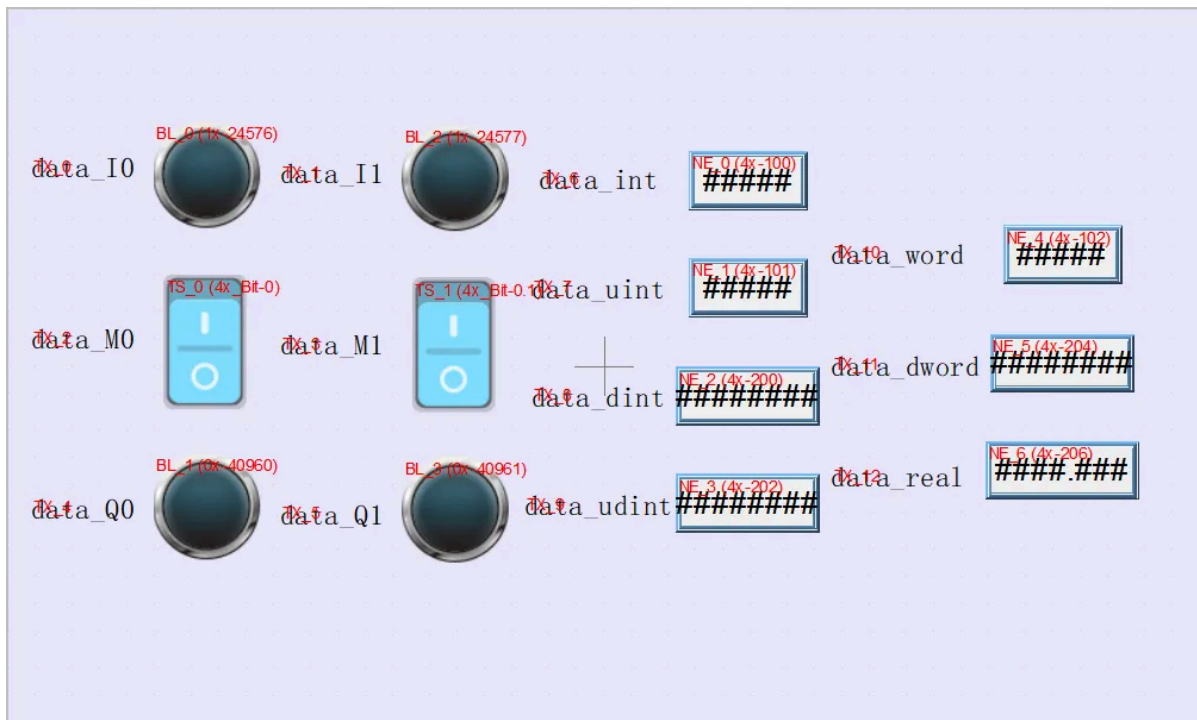
设备下限: 0 设备上限: 32767

输入下限: 0 输入上限: 32767

☐ 使用警示色彩

3 确定 取消 帮助

(5) Similarly, create other components and bind the corresponding variables. For easy distinction, add text here.

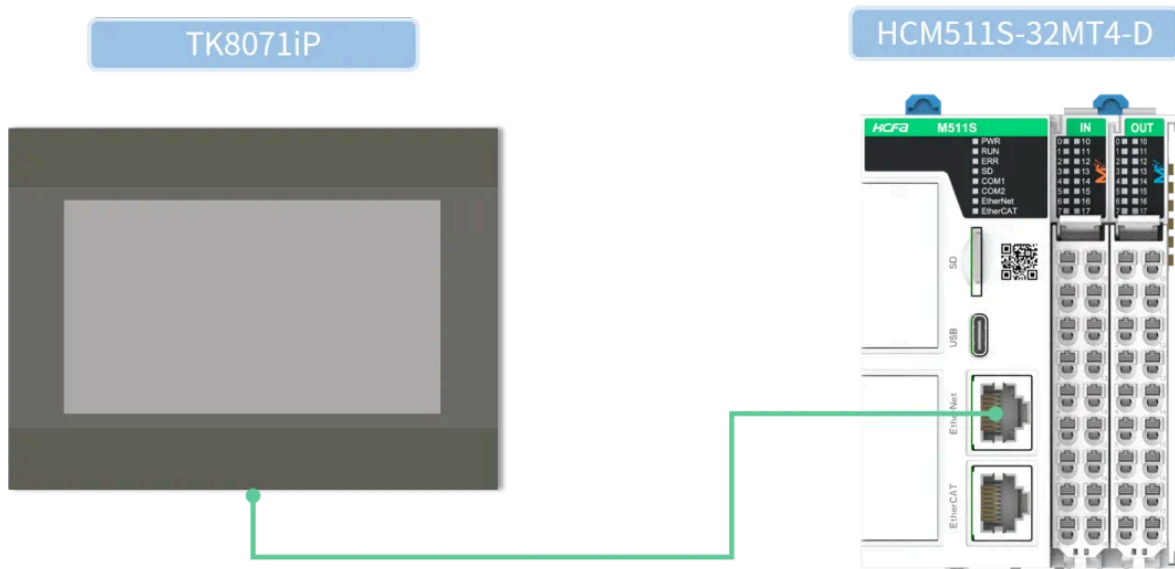


Step 2: After the component is created, download the project to the touch screen.

Communication test

Step 1: Device connection

This tutorial uses the HCM511S-32MT4-D controller and the TK8071iP touch screen. The Modbus TCP communication connection method is shown in the figure below.



Step 2: Engineering Testing

The Sysctrl project enters the monitoring state and assigns values to variables.

Modbus_TCP - Sysctrl Studio 2.1

文件(F) 编辑(E) 视图(V) 工程(P) 控制(C) 模拟(S) 工具(T) 帮助(H)

工程: Modbus_TCP (用户: admin)

POU (PG)

	类别	名称	分配到	数据类型	在线值	准备值	注释
1	VAR	data_M0	%MX0.0	BOOL	TRUE		
2	VAR	data_M1	%MX0.1	BOOL	TRUE		
3	VAR	data_Q0	%QX0.0	BOOL	TRUE		
4	VAR	data_Q1	%QX0.1	BOOL	TRUE		
5	VAR	data_I0	%IX0.0	BOOL	FALSE		
6	VAR	data_I1	%IX0.1	BOOL	FALSE		
7	VAR	data_int	%MW100	INT	-5		
8	VAR	data_uint	%MW101	UINT	52		
9	VAR	data_dint	%MD100	DINT	-852		
10	VAR	data_udint	%MD101	UDINT	245		
11	VAR	data_word	%MW102	WORD	14		
12	VAR	data_dword	%MD102	DWORD	525		
13	VAR	data_real	%MD103	REAL	123.562		

At the same time, the touch screen component displays the corresponding value.

