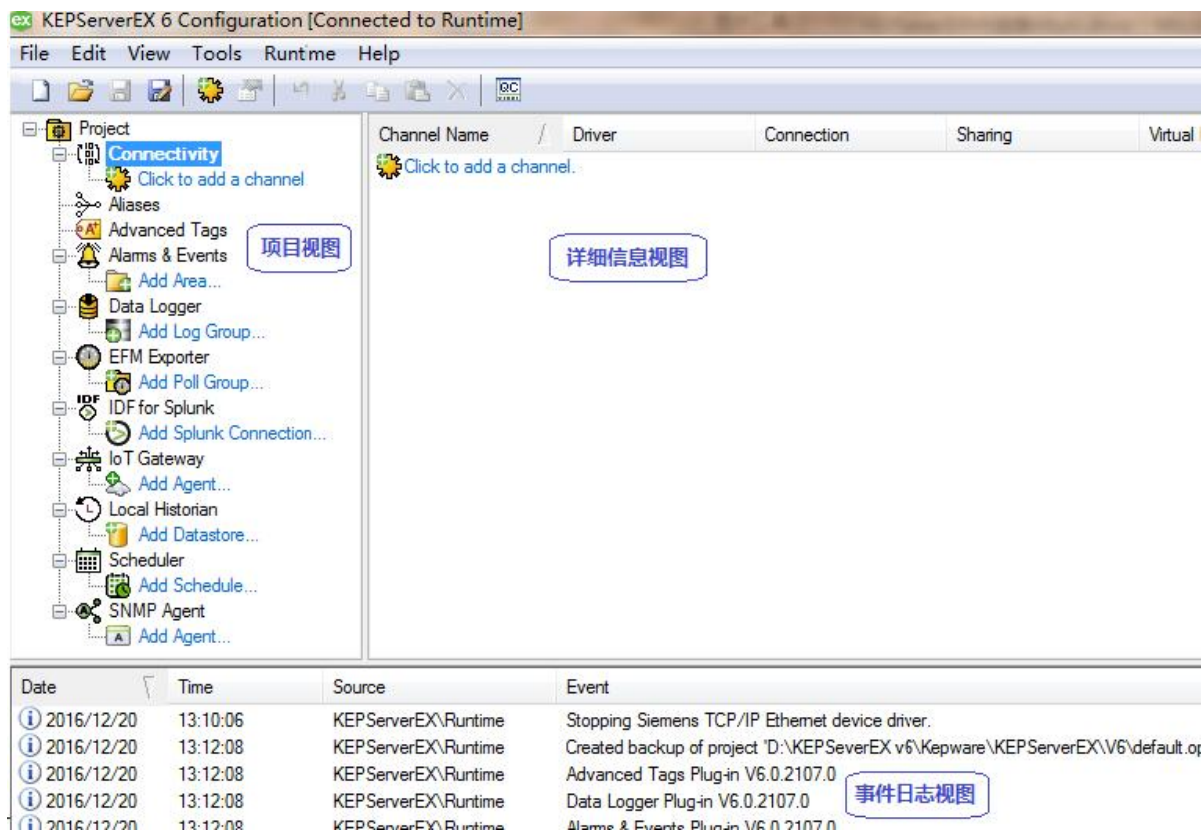# KEPServerEX 连接 IEC60870-5-104 演示

2022-06

KEPServerEX 连接 IEC60870-5-104 演示

本实例是通过 KEPServerEX V6 建立 IEC104 设备连接并实现通信的案例。

◆ 设置 KEPServerEX V6

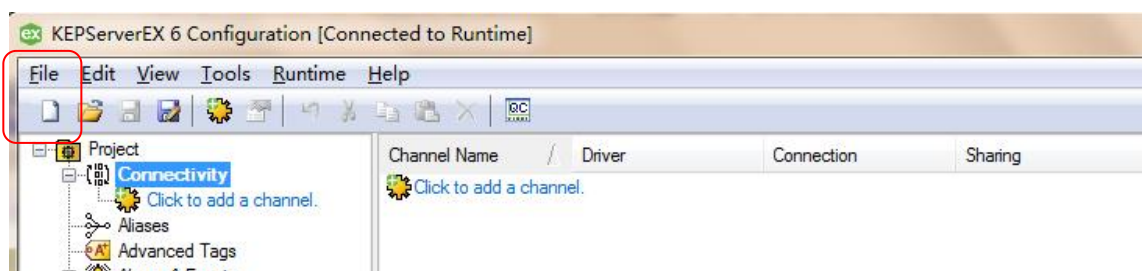建立 KEPServerEX 的工程主要分为以下几项：新建通道：New Channel；新建设备：New Device；
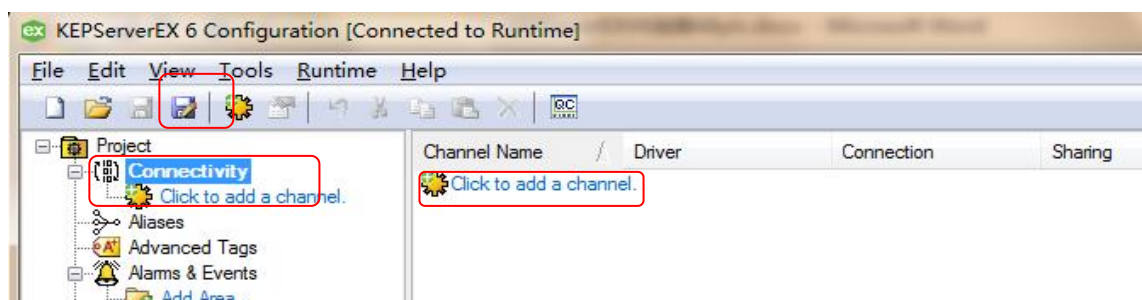
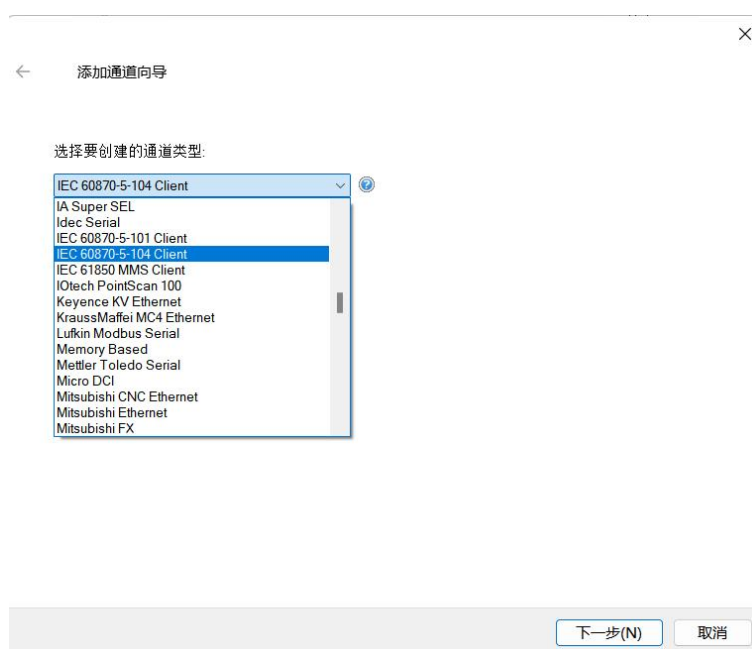新建标签组：New Tag Group（可选）；新建标签：New Tag。

➢ 新建通道：New Channel

1. 打开"KEPServerEX V6"软件，点击"File"->"New"，或者工具栏上的"New Project"，建立一个新的工程。

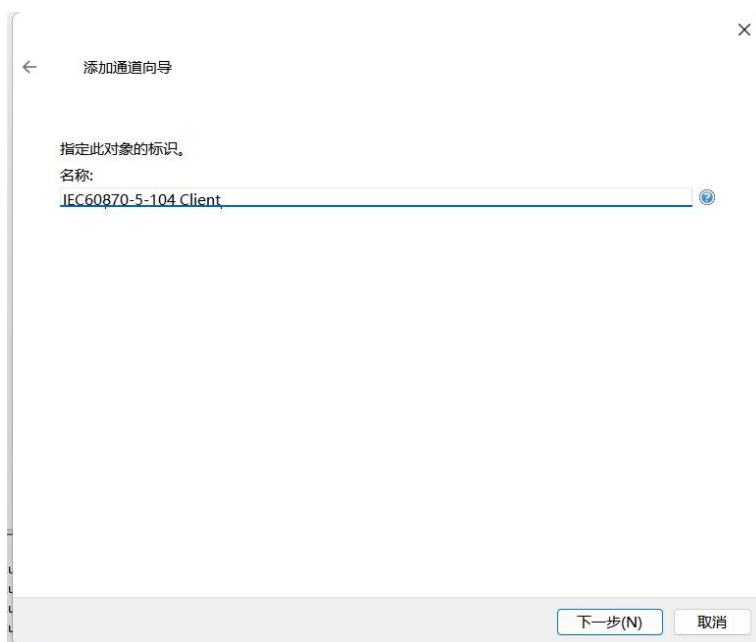2. 单击"Click to add a channel"或者工具栏上的"New channel"，建立一个新通道。

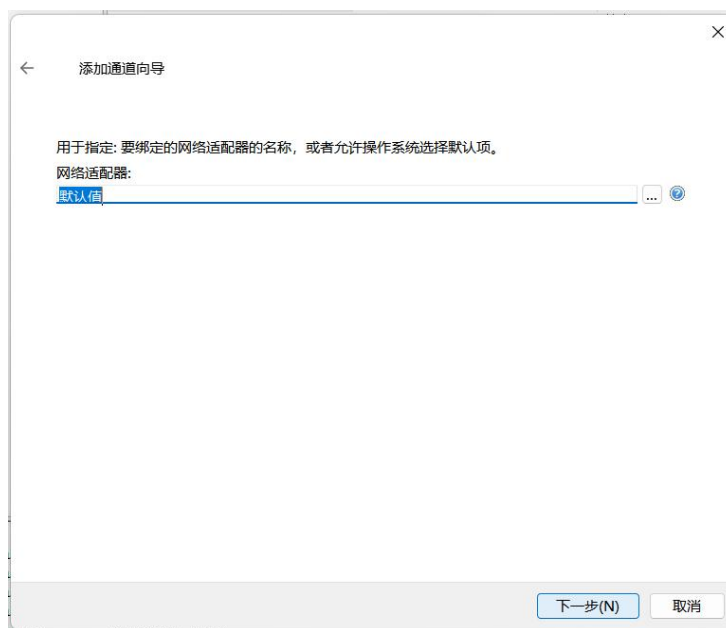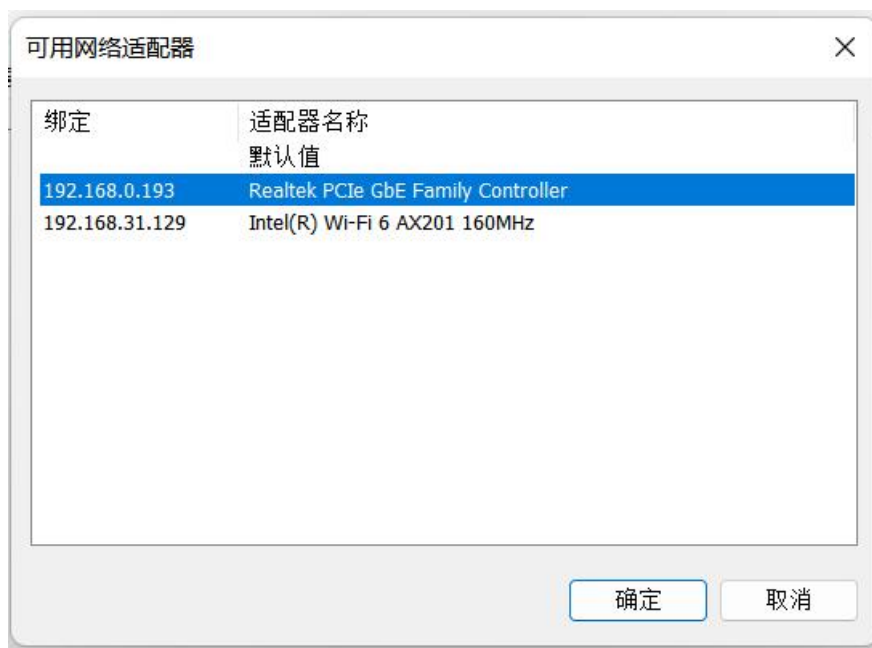3. 选择需要分配给本通道的设备驱动"Device driver", 在下拉选项中选择"IEC60870-5-104 Client", 单击"下一步"。

　　注意：如果用户使用过程中在下拉选项中没有找到想要的驱动，可能安装的时候没有完全安装，此时需要对KEPServerEX V6 进行修改安装，在安装时安装所需要的驱动。

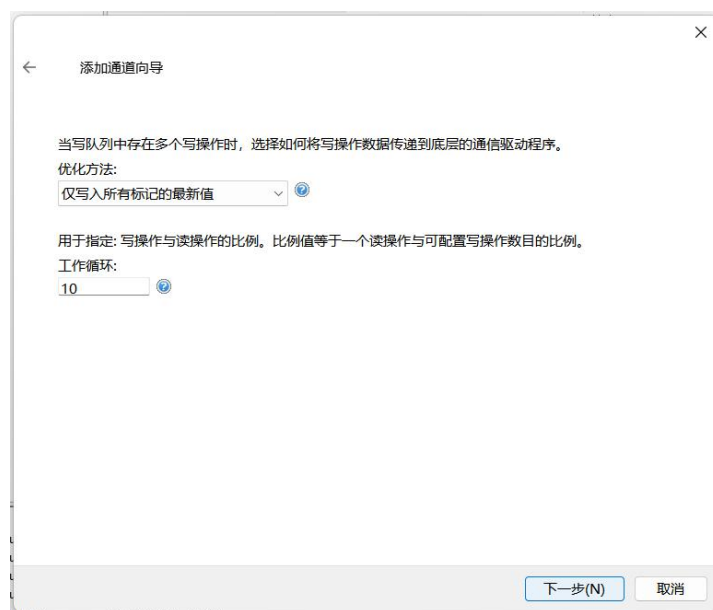4. 修改通道名称"Channel name", 修改为想要的名称，可不做修改。如下修改为"IEC60870-5-104 Client", 单击"下一步"。

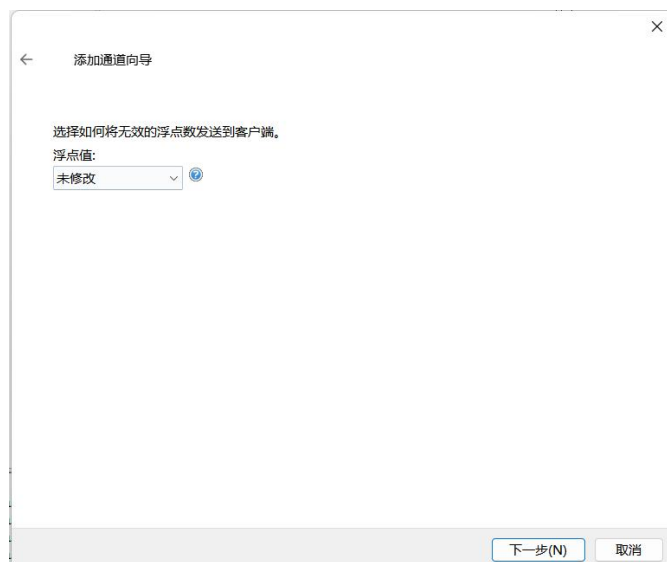5. 选择设备所用的网络适配器"Network Adapter"。这里选择实际需要使用的网络适配器，点击"…"弹出选择窗口，选择所用网络适配器，点击"OK"之后单击"下一步"。

6. 对通道进行优化设置"优化方法"，这里保持默认，单击"下一步"。

7. 设置浮点型标准"Floating-Point Values"，保持默认值不变，单击"下一步"。

8. 设置 IEC104 设备的地址和端口号
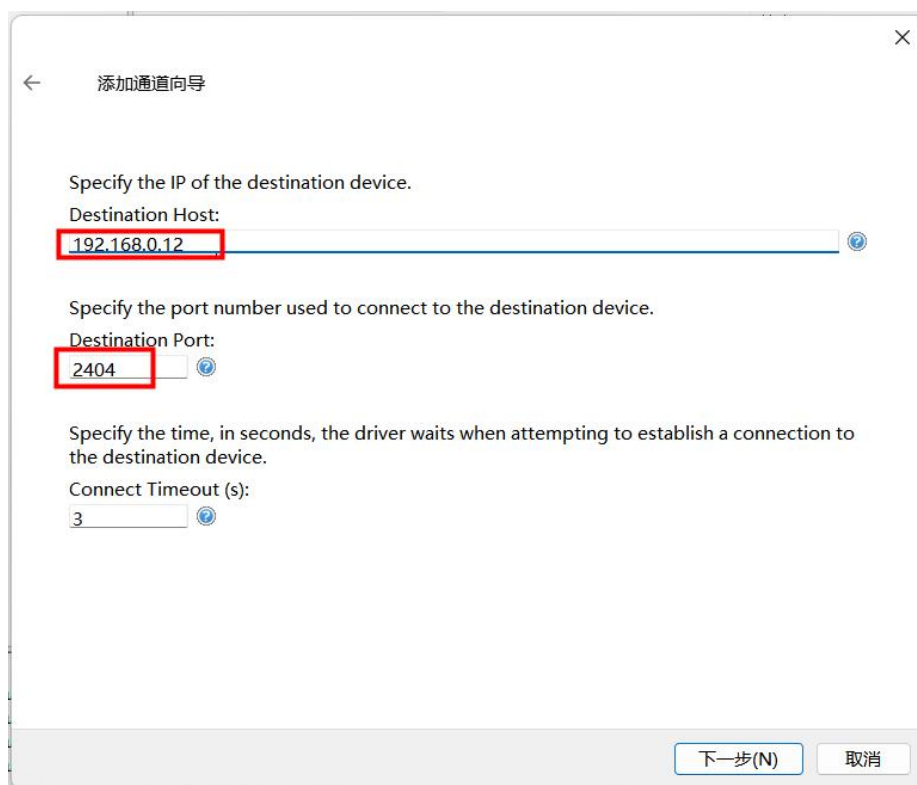
9. 设置 COT 传送原因和 Originator Address，这里要和 104 设备端保持一致即可

10. 设置总结，单击"完成"，在这里可以对以上所做的设置重新进行修改。

通过右键点击通道名选择"Properties"，或者双击通道名称修改通道参数。
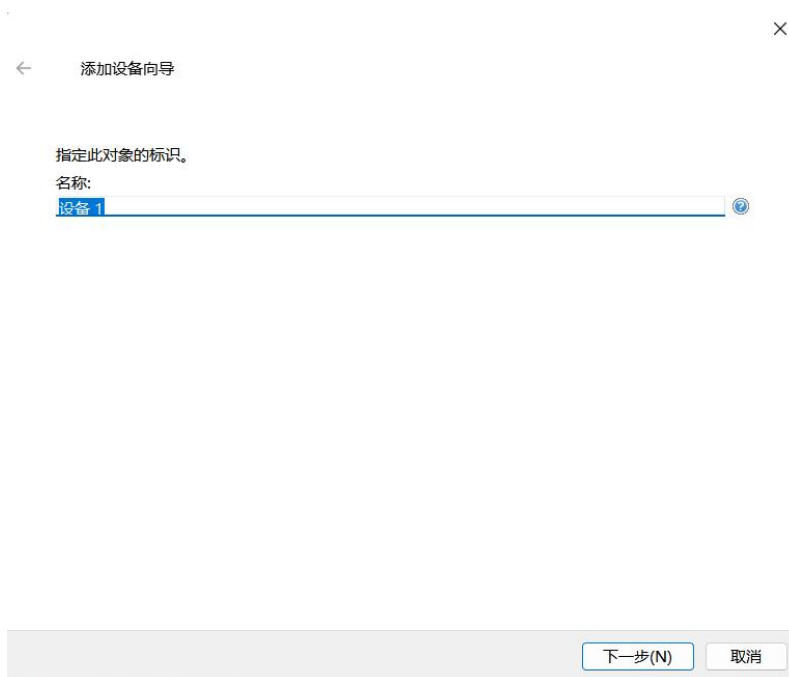
➢ 新建设备：**New Device**

1. 单击软件界面中的"单击添加设备"或者工具栏上的"新建设备"，进行设备设置。
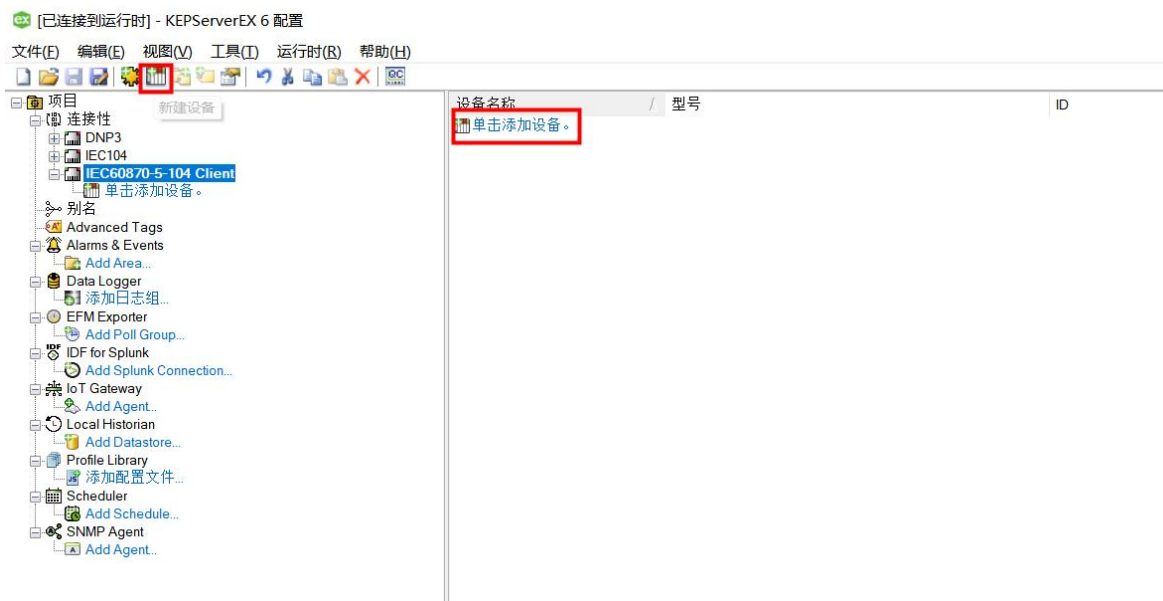
2. 修改设备名称"Name"，修改为需要的名称，这里我们改为"设备 1"，然后单击"下一步"。

3. 选择扫描方式"Scan Mode"，保持默认，单击"下一步"。

4. 设置失败降级"故障降级"，保持默认设置不变，单击"下一步"。
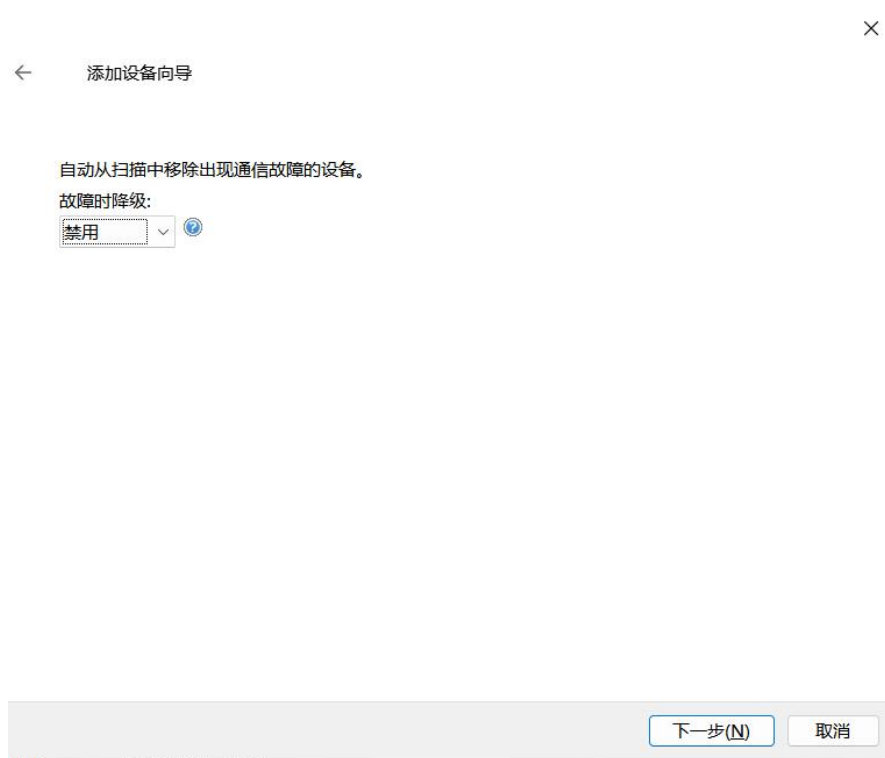
5. 设置时区参数，保持默认，下一步
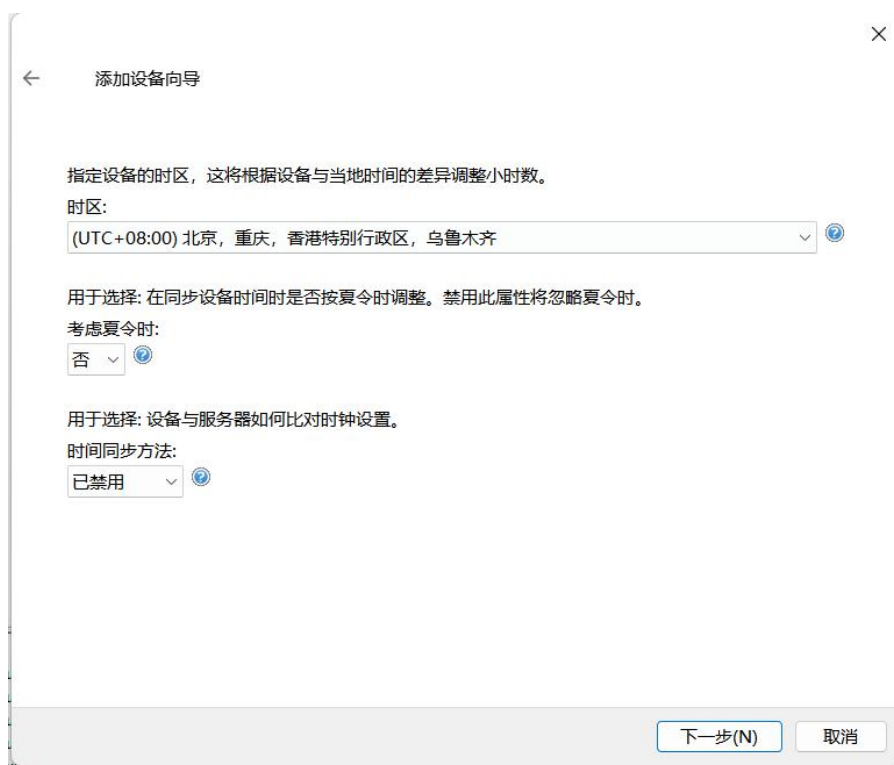
6. 设备 Common Address，，单击"下一步"。

设置时钟同步、总召、计数器召唤的初始化方式，默认即可

设置总召和计数器召唤的触发周期时间，一般遥脉信号默认把计数器召唤时间改成 1 分钟即可。

7. 设置是否启用 Test Procedure 和 Playback Events，视设备参数设置成一致即可，点击下一步。

8. 设置总结，单击"完成"。在这里可以对之前的设置进行修改。

　　用户可以右键单击设备名称选择"Properties"或者双击设备名称来修改设备参数。

> ## 新建标签：New Tag

1. 单击软件界面中的"Click to add a static tag"，或者工具栏中的"New Tag"新增标签。

如果有需要建立标签组，也可以在新建标签之前先建立 New Tag Group，单击工具栏"New Tag Group"。

2. 设置 Tag 属性，这里我们输入一个 tag 的名称，地址为 M_ME_FV.3.VALUE，即遥测地址，其他保持默认不变，

单击"OK"。

M_ME_FV.X.VALUE，代表遥测

M_SP.X.VALUE，代表遥信

M_IT.X.VALUE，代表遥脉

X 代表 IOA 地址序号

Monitor ASDUs

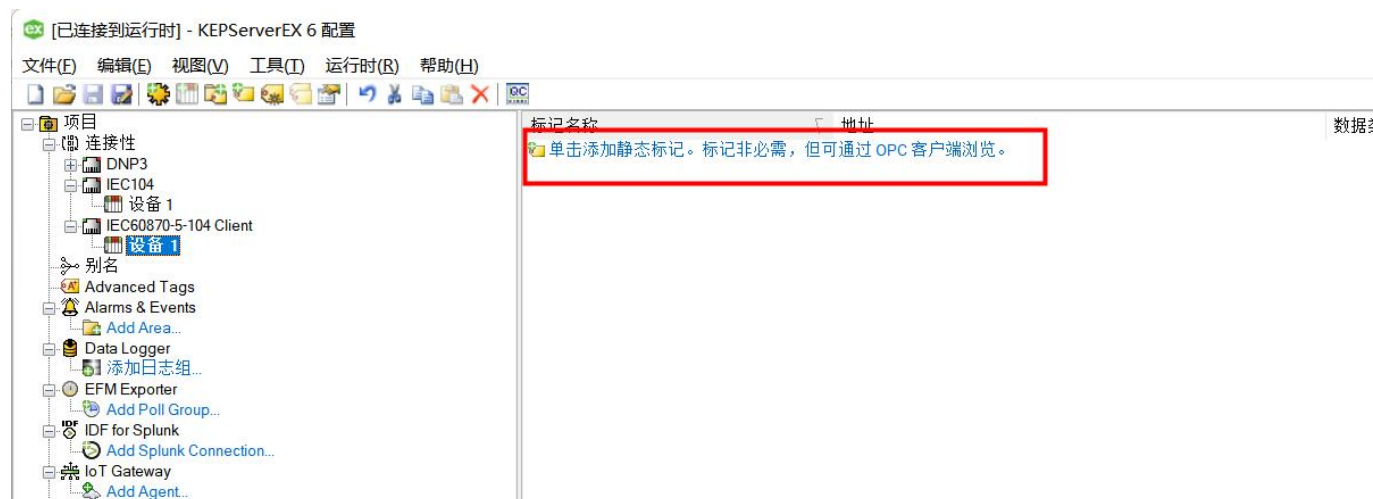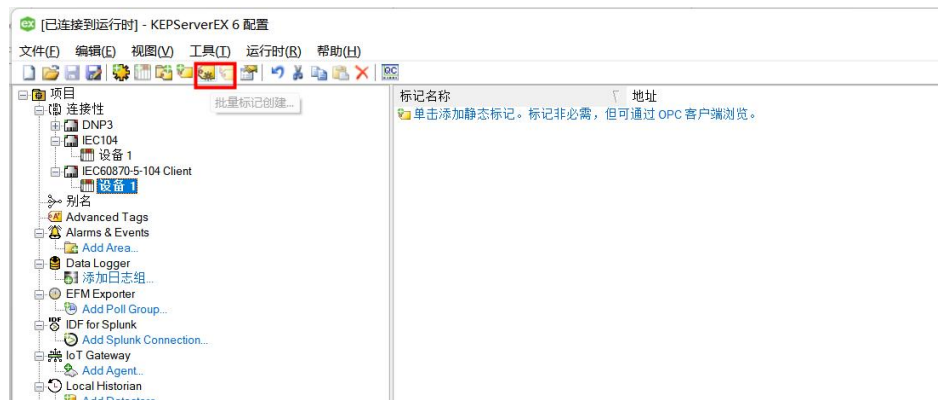| Monitor TYPEID	Data Type	ASDU	Description
M_SP	Boolean	1, 30	Single-Point Information
M_DP	Char	3, 31	Double-Point Information: Possible values are 0, 1, 2, and 3. 0: Indeterminate or Intermediate State 1: Determined State OFF 2: Determined State ON 3: Indeterminate State
M_ST	Char	5, 32	Step Position Information: Possible values are -64 to +63. Supports the Transient sub-type.
M_BO	DWord	7, 33	Bit string of 32 bit. Support bit indexing into the following sub-types: Value and CurrentValue.
M_ME_NV	Float	9, 21, 34	Measured Value, Normalized Value: This represents a value between -1 and 0.99996482421875. Devices transmit this value and the driver converts this into its appropriate floating-point value.
M_ME_SV	Short	11, 35	Measured Value, Scaled Value. Possible values are -32768 to +32767.
M_ME_FV	Float	13, 36	Measured Value, Short Floating Point Number.
M_IT	Long	15, 37	Integrated Totals. Supports the SQ sub-type. Does not support unbuffered "Current" sub-types.

SUB-TYPE
The SUB-TYPEs that are available are determined by the TYPEID. Monitor TYPEIDs can only use monitor SUB-TYPEs. For more information, refer to the table below.

SUB-TYPE	Data Type	Description
Value	See TYPEID	The Event Playback value. Values received during General Interrogation (GI) and event acquisition are played back with this tag. If the quality descriptor IV (invalid) bit is set, this tag shows bad quality. When used with M_BO, this supports bit indexing. For example, to access bit 0 in the value tag, use the sub-type Value with .0 appended: Value.0.
CurrentValue*	See TYPEID	This reports all unbuffered data; which includes cyclic, background scan, and polled reads. If the quality descriptor IV (invalid) bit is set, this tag shows bad quality. When used with M_BO, this supports bit indexing. For example, to access bit 0 in the value tag, use the sub-type CurrentValue with .0 appended: CurrentValue.0. Not supported for M_IT. Polled reads are performed with the read command: C_RD Type ID 102. Although the standard considers this a control operation, the physical reads are performed with the monitor TYPEIDs.
Timestamp	Date	The Event Playback timestamp. Timestamps received during GI, event acquisition, cyclic updates, and background scans are played back with this tag. If the device provides data without a timestamp, the Timestamp tag value is set to 1899-12-30T00:00:00.000 and it is set to bad quality.
CurrentTimestamp*	Date	Same as Timestamp, but with unbuffered data.
QualityDesc	Byte	The Event Playback quality description field. Quality descriptions received during GI, event acquisition, cyclic updates, and background scans will be played back with this tag.
CurrentQualityDesc*	Byte	Same as QualityDesc, but with unbuffered data.
COT	Word	The Event Playback Cause of Transmission (COT) field. For COT values as specified in 60870-5-104, section 7.2.3, refer to the table below.
CurrentCOT*	Word	Same as COT, but with unbuffered data.
Transient	Boolean	The Event Playback Transient bit associated with M_ST ASDU type. 0: Equipment is not in transient state. 1: Equipment is in transient state.
CurrentTransient*	Boolean	The same as the Transient, but with unbuffered data.
SQ	Char	The event playback sequence field associated with the M_IT ASDU type. A number between 0 and 31 represents the sequence notation.

如 C_SC.1.DIRECTVALUE，代表遥控

Control ASDUs

These Control ASDUs are write only.

Control TYPEID	Data Type	ASDU	Description
C_SC	Boolean	45, 58	Single Command
C_DC	Char	46, 59	Double Command. Possible values are 1 and 2. 0: Not Permitted 1: Determined State OFF 2: Determined State ON 3: Not Permitted
C_RC	Char	47, 60	Regulating Step Command. Possible values are 1 and 2. 0: Not Permitted 1: Next Step LOWER 2: Next Step HIGHER 3: Not Permitted
C_SE_NV	Float	48, 61	Measured Value, Normalized Value: This represents a value between -1 and 0.999969482421875. Values outside the range fail and report bad quality.
C_SE_SV	Short	49, 62	Set point command, scaled value.
C_SE_FV	Float	50, 63	Set point command, Short Floating Point Number.
C_BO	DWord	51, 64	Bit string of 32 bits. Does not support bit indexing.

SUB-TYPE

The SUB-TYPEs that are available are determined by the TYPEID. Control TYPEIDs can only use control SUB-TYPEs. For more information, refer to the table below.

SUB-TYPE	Data Type	Description
SelectExecuteValue	See TYPEID	The two-step write value. Writing to this causes the associated command ASDU to write to a device using select-and-execute. In this mode, writes occur with a dual command/response from the device.
DirectValue	See TYPEID	The single-step write value. Writing to this causes the associated command ASDU to write to a device using direct execute. In this mode, writes occur with a single command/response with the device.
Select	See TYPEID	The first step of a two-step write value process, also known as Select Before Operate (SBO). Writing to this causes the device to select the associated command ASDU. For points that require an SBO command, the process can be completed using the DirectValue write (assuming the select timeout has not expired).
Deselect	See TYPEID	The opposite of a Select operation; writing to this causes the device to deselect the associated command ASDU.

OPTIONAL

The below properties can be included with select Control TYPEIDs, but are not required. These allow access to additional Control SUB-TYPE options. Optional addressing can be used in any order.

| OPTION	Applicable TypeIDs	Description
Timestamp	All Control ASDUs	Control ASDU includes the IEC 60870 client system time in the transmitted command. If not included, timestamp is not transmitted. These are effected by the configured time zone settings.
ShortPulse	C_SC C_DC C_RC	Control ASDU includes ShortPulse QoC. Only one of ShortPulse, LongPulse, or Persistent may be used at a time. Not specifying allows the device to use its default setting.
LongPulse	C_SC C_DC C_RC	Control ASDU includes LongPulse QoC. Only one of ShortPulse, LongPulse, or Persistent may be used at a time. Not specifying allows the device to use its default setting.
Persistent	C_SC C_DC C_RC	Control ASDU includes Persistent QoC. Only one of ShortPulse, LongPulse, or Persistent may be used at a time. Not specifying allows the device to use its default setting.

"No additional definition" (value of 0) is used for command tags that support the Qualifier of Command (QoC) syntax, but have no QoC option is specified.

Control ASDUs Examples

If an OPC client must control single-point data monitored with IOA 100, it can be accomplished with control ASDUs. In 60870-5-104, monitor IOAs are read-only (used to transfer data from the IEC 60870 server to the IEC 60870 client) and cannot be written. The IEC 60870 server; however, may be configured to expose a single control IOA at point 2100 such that it correlates to the monitor IOA 100 (for the same point). When the IEC 60870 client changes the value of IOA 2100, the change is reflected in the monitored single-point IOA 100. The following tags can be used to send control ASDUs to the IEC 60870 server for single-point 2100.

```
C_SC.2100.SELECTEXECUTEVALUE
C_SC.2100.DIRECTVALUE
C_SC.2100.SELECT
C_SC.2100.DESELECT
```

COMMAND.GI 代表总召
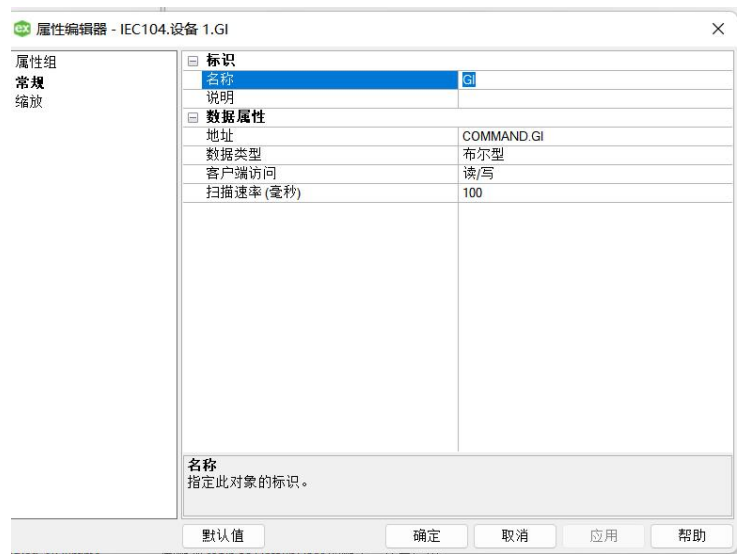
如需帮助，可以点击 tag 地址后面的地址描述信息。
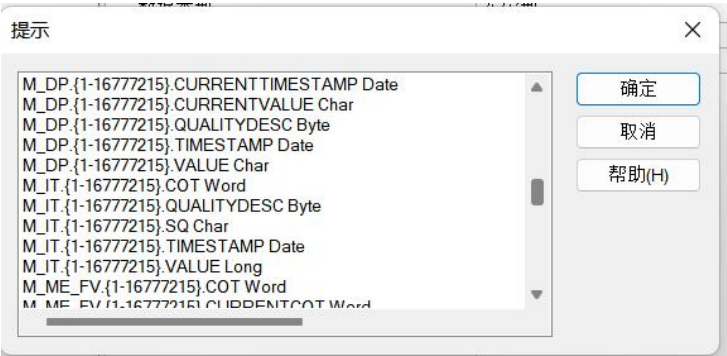
注意：填写 Address（地址）时，必须确保填写的内容是硬件设备内部允许访问的地址。

3. 等待 tag 创建完毕之后，可以点击 QC 查看数据