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将设备的 TransSECS 用在基于 Modbus PLC 的 SECS / GEM 界面

使用设备的 TransSECS 创建 SECS /
GEM 工具界面，并与 Modbus PLC
进行数据连接



简介

本指南将向您展示如何使用 TransSECS 编辑器将 Modbus 寄存器链接到 SECS / GEM 并部署您的 Modbus-SECS / GEM 解决方案。

在这里简单介绍了 TransSECS 编辑器界面。如果您对于 SECS / GEM 有些研究，您应该不会对这些概念感到陌生。

之后，您将学习如何将 Modbus 寄存器链接到 SECS / GEM 以及如何部署您的界面。

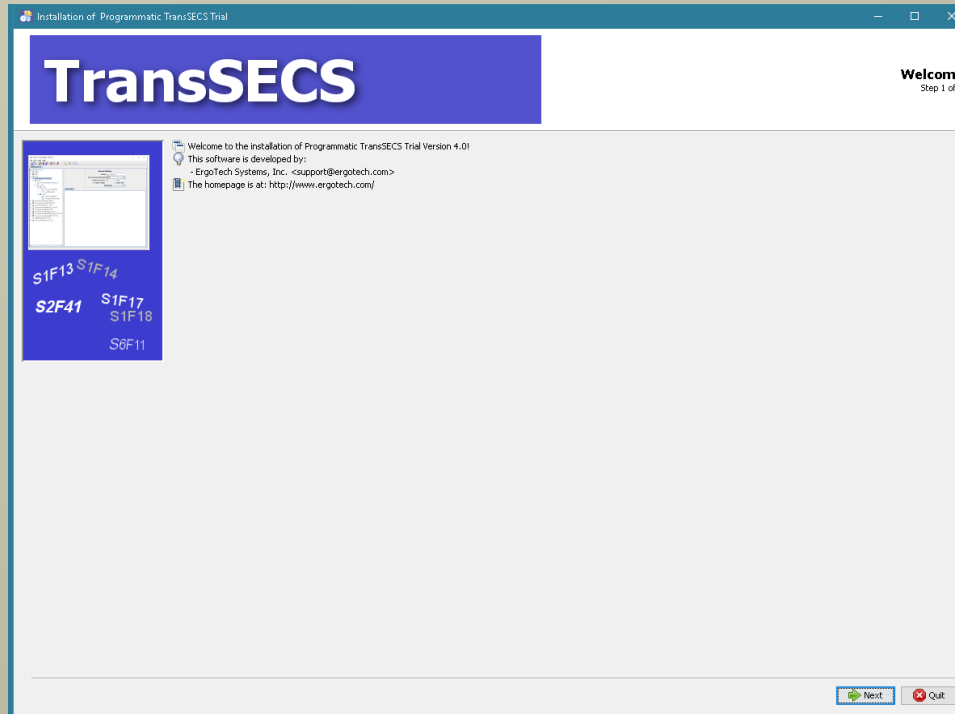
最后，将让您了解如何使用 TransSECS 测试主机测试您的界面。



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安装 TransSECS



双击安装程序，然后在出现提示时点击下一步。安装完成后，启动 TransSECS 设备构建器应用程序 (MIStudioSuite/TransSECS/Builder/TransSECSDevices.exe)



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当您启动 TransSECS 设备构建器时，系统将加载如以下示例一样的 PLCTool。然后，我们将加载 ModbusPLCTool 示例。

TransSECS Build:12371 - PLCTool

File Edit Tools Help

PLCTool

PLCTool

- CEIDs
- ALIDs
- VIDs
- Devices
- HostCommandSTART: S2F41 W
- HostCommandSTOP: S2F41 W
- HostCommandRejectedBadParam: S2F42
- HostCommandReply: S2F42

Tool Attributes

Tool Name: PLCTool Host Equip.

Uses GEM

Device ID: 1 Port: 5010 Baud Rate: 9600

T1: 0.5 T2: 10.0 T3: 45.0 T4: 45.0 T6: 5.0 T7: 10.0

Description

A GEM Tool with a minimal subset of SECS/GEM. Use the GEMHost project as a test host or use the SECS Tester.

PLCTool 示例项目将模拟数据源用于 VIDs、ALIDs 和 CEIDs。此项目拥有专门的文档，可以单独研究参考。

Modbus 项目示例相当类似于 PLCTool，但是现在我们将会先连接到 Modbus PLC。



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使用文件菜单中的“打开项目”来加载示例 ModbusPLCTool 项目。浏览名称为“ ModbusPLCTool”的绿色项目文件夹，然后双击它。

The screenshot shows the TransSecs Build:12371 - PLCTool application. The 'File' menu is open, and 'Open Project' is selected. An 'Open' dialog box is open, showing a file tree with 'ModbusPLCTool' and 'PLCTool' folders highlighted. The main window displays 'Tool Attributes' and a 'Description' section.

Tool Attributes

Tool Name	PLCTool	Host	<input type="radio"/>	Equip.	<input checked="" type="radio"/>
Device ID	1	Port	5010	Baud Rate	9600
T1	0.5	T2	10.0	T3	45.0
T4	45.0	T6	5.0	T7	10.0

Description

A GEM Tool with a minimal subset of SECS/GEM. Use the GEMHost project as a test host or use the SECS Tester.



以下是 TransSECS 中已加载的 ModbusPLCTool 示例

工具界面默认为在端口 5010 (HSMS) 上运行

与设备 ID 1

Tool Attributes

Tool Name: ModbusPLCTool Host: Equip.:

Uses GEM:

Device ID1: Port: Baud Rate:

T1: T2: T3: T4: T6: T7:

Description

A GEM Tool with a minimal subset of SECS/GEM Use the GEMHost project as a test host or use the SECS Tester.



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以下是 TransSECS 中已加载的 ModbusPLCTool 示例

在此处配置左侧面板中所选项目的数据和其他详细信息

TransSecs Build:12371 - ModbusPLCTool

File Edit Tools Help

ModbusPLCTool

ModbusPLCTool

- ALIDs
- CEIDs
- VIDs
- HostCommandRejectedBadParam: S2F42
- HostCommandReply: S2F42
- HostCommandSTART: S2F41 W
- HostCommandSTOP: S2F41 W
- Test: S2F17 W
- Devices

Tool Attributes

Tool Name: ModbusPLCTool Host: Equip.:

Uses GEM:

Device ID1: Port: 5010 Baud Rate: 9600

T1: 0.5 T2: 10.0 T3: 45.0 T4: 45.0 T6: 5.0 T7: 10.0

Description

A GEM Tool with a minimal subset of SECS/GEM. Use the GEMHost project as a test host or use the SECS Tester.

在开发界面时，可在此处输入所选项目的注释和描述。



以下是 TransSECS 中已加载的 ModbusPLCTool 示例

该工具已经定义了一些 VIDs , ALIDs 和 CEIDs 。

该工具拥有一些定义为示例的主机命令信息。

Tool Name: ModbusPLCTool Host Equip.
Uses GEM
Device ID: 1 Port: 5010 Baud Rate: 9600
T1: 0.5 T2: 10.0 T3: 45.0 T4: 45.0 T6: 5.0 T7: 10.0

Description
A GEM Tool with a minimal subset of SECS/GEM. Use the GEMHost project as a test host or use the SECS Tester.



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您可以将脚本添加到任何信息或数据项目中。例如，在此项目中，我们已将脚本添加到“主机命令开始”的信息中，以进行数据分析并向主机发送正确的回复信息。

The screenshot displays the ModbusPLCTool application window. The title bar reads "TransSecs Build:12371 - ModbusPLCTool". The menu bar includes "File", "Edit", "Tools", and "Help". The toolbar contains various icons for file operations and editing. The left sidebar shows a tree view of the project structure, with "HostCommandSTART: S2F41 W" selected. The main area is divided into two panes. The top pane, titled "Message Attributes", shows the configuration for the selected message: Name is "HostCommandSTART", Auto Response Message is "<none>", Stream & Function is "S2" and "F41", and Message Direction is "In Message". The bottom pane, titled "Script", contains a Java script for handling the message. The script includes comments and code for parsing the message, finding the controller, and sending a response.

```
4 print("Host Command START");
5 //1. START has been requested. Parse parameter(s) in the message to get the PPID.
6 //2. Store PPID in RecipeName device register
7 //3. Set STARTFlag in PLC to 99
8 //4. Wait up to 2000 ms for PLC to signal OK or error in register STARTFlag
9 // 0 or 4(OK), 2 (cannot perform now), 5 (already in that state)
10 //5. Send reply to host
11
12
13 var TransSecsController = Java.type("com.ergotech.transsecs.secs.TransSecsController");
14 try {
15
16 secsInterface=TransSecsController.findController("ModbusPLCTool");
17 hostcommand=secsInterface.getMessageBean("HostCommandSTART");
18
19 //recipe name is the second element of the first parameter array
20 //Note:if CPName Validation is not used, you need to manually check that there is a
21 //single CPName which is "PPID". This example assumes this host message matched HostComm
22 recipeName = hostcommand.getCommandParams().elementAt(0).elementAt(1);
23
24 /Devices/DemoServers_Servers/RecipeName->setStringValue(recipeName);
25
```



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以下是 TransSECS 中已加载的 ModbusPLCTool 示例

TransSecs Build:12371 - ModbusPLCTool

File Edit Tools Help

ModbusPLCTool

ALIDs
CEIDs
VIDs
HostCommandRejectedBadParam: S2F42
HostCommandReply: S2F42
HostCommandSTART: S2F41 W
HostCommandSTOP: S2F41 W
Devices

Tool Attributes

Tool Name: ModbusPLCTool Host Equip.

Uses GEM

Device ID: 1 Port: 5010 Baud Rate: 9600

T1:0.5 T2:10.0 T3:45.0 T4:45.0 T6:5.0 T7:10.0

Description

A GEM Tool with a minimal subset of SECS/GEM. Use the GEMHost project as a test host or use the SECS Tester.

这是将 PLC 服务器和寄存器添加到项目中的“设备”节点



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选择 Modbus TCP 设备节点

此处可对 Modbus TCP 设备服务器的连接参数和配置进行设置。

The screenshot shows the ModbusPLCTool software interface. The left sidebar displays a tree view of the project structure, with the 'ModbusTCP' folder under 'Devices' selected. The main window is divided into two tabs: 'Basic' and 'Expert'. The 'Basic' tab is active, showing a table of configuration parameters for the 'Modbus TCP Device Server'. The parameters are as follows:

Property	Value
Name	ModbusTCP
Response Timeout	250
Simulating ?	False
Hostname	192.168.5.98
Maximum Socket Connections	5

Below the configuration table is a 'Description' section with the text: 'Modbus PLC Connection. Check the Hostname property to enter the IP address of the controller.'



展开 Modbus TCP 设备节点

TransSecs Build:12371 - ModbusPLCTool

File Edit Tools Help

ModbusPLCTool

- ModbusPLCTool
 - ALIDs
 - CEIDs
 - VIDs
 - HostCommandRejectedBadParam: S2F42
 - HostCommandReply: S2F42
 - HostCommandSTART: S2F41 W
 - HostCommandSTOP: S2F41 W
 - Devices
 - ModbusTCP
 - TriggerMsg
 - OnlineOfflineSwitch
 - LocalRemoteSwitch
 - Event
 - Alarm
 - PPID
 - ECID
 - DemoServers

Description

Devices are data sources for VIDs, ALIDs, and CEIDs.

我们已经设置了一些设备寄存器来读取或将数据写入 PLC。我们将添加另一个寄存器来读取 VID 1512 的过程温度。



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添加 Modbus 浮点以更精准地读取过程温度

TransSecs Build:12371 - ModbusPLCTool

File Edit Tools Help

ModbusPLCTool

ModbusPLCTool

- ALIDs
 - GasFlowProblem
 - TemperatureProblem
- CEIDs
- VIDs
- HostCommandRejectedBadParam: S2F42
- HostCommandReply: S2F42
- HostCommandSTART: S2F41 W
- HostCommandSTOP: S2F41 W
- Devices
 - Modbus TCP
 - Delete
 - Modbus Word
 - Modbus Double Word
 - Modbus Float
 - Modbus String
 - Modbus Array
 - Modbus String Array
 - Modbus 0x Reg
 - Modbus 1x Reg
 - Modbus Preset Word

Basic Expert

Modbus TCP Device Server: ModbusTCP

Block Reads: True

Modbus Port: 502

Use Transaction IDs?: True

Link Timeout: 0.0

Screen Local?: False

Timebase: 1 n

Description

Modbus PLC Connection. Check the Hostname property to enter the IP address of the controller.

右键单击 ModbusTCP 设备并添加 Modbus 浮点



添加 Modbus 浮点以更精准地读取过程温度

The screenshot shows the ModbusPLCTool software interface. The left pane displays a tree view of the Modbus configuration, with the 'TemperatureReading' register selected under the 'ModbusTCP' device. The right pane shows the configuration details for this register.

Basic	
Modbus 4x Float	TemperatureReading
Name	TemperatureReading
Reg. Address	120
Register Type	4X Register
Script	Not Set
Swap Style	Word Swap
Slave Node Address	0
Timebase	1.0

Description

将 Modbus 浮点重新命名为“温度读取”，并将寄存器地址设置为 120。



将温度读取 Modbus 浮点分配给过程温度 VID (VID 1512)

选择 VID 节点并找到过程温度 VID

The screenshot shows the ModbusPLCTool software interface. On the left, a tree view under 'VIDs' has 'ProcessTemperature' selected. The main area shows the configuration for this VID. The 'Name' is 'ProcessTemperature', 'VID' is '1512', 'Data Type' is 'Float-4', and 'VID Type' is 'SVID'. The 'Device Name' is set to 'ModbusTCP'. A dropdown menu for 'Tag Name' is open, showing a list of options with 'TemperatureReading' selected. The 'Description' field contains the text: 'An SVID with the process temperature value'.

将设备名称更改为 ModbusTCP

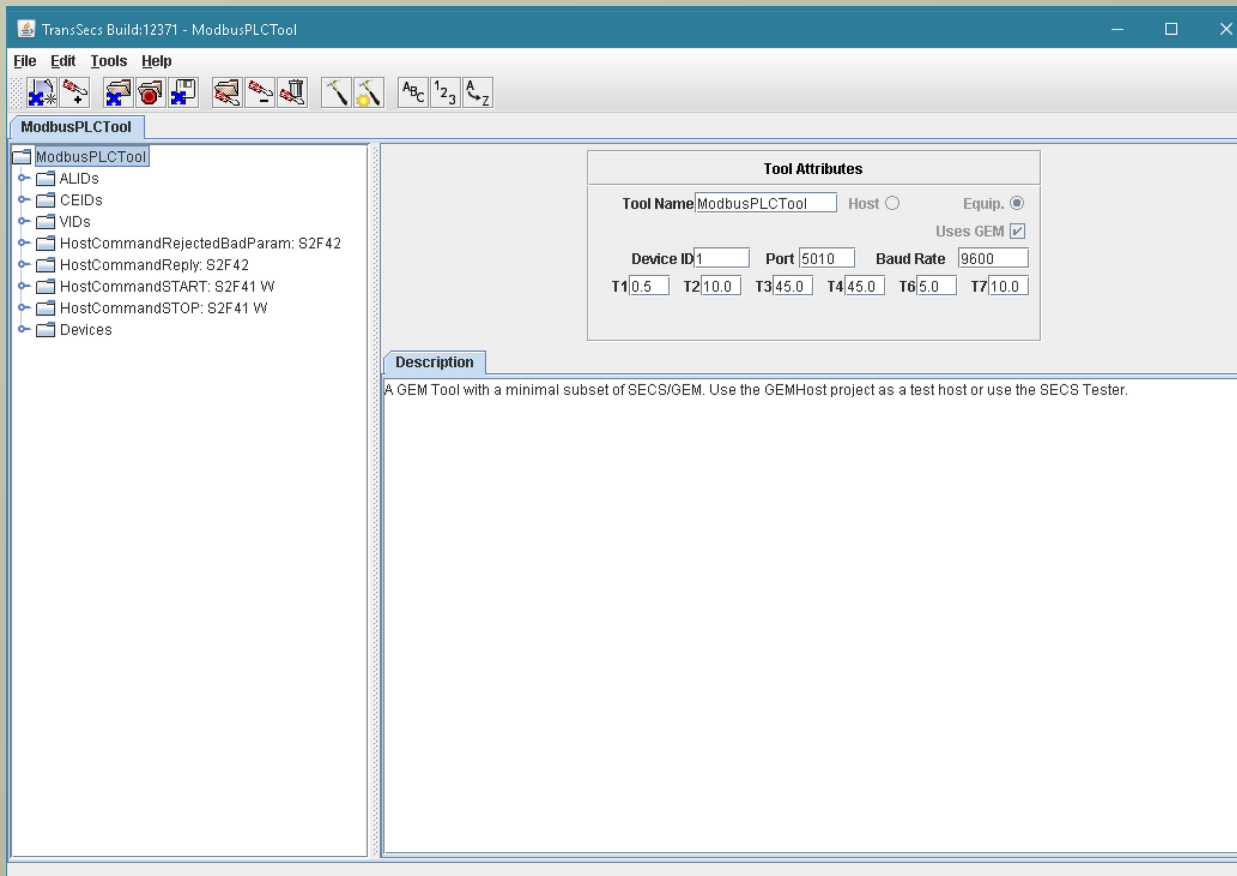
从标签名称列表中选择“温度读取”



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现在让我们测试项目的更改。我们将构建项目，然后运行它并使用主机应用程序对其进行测试

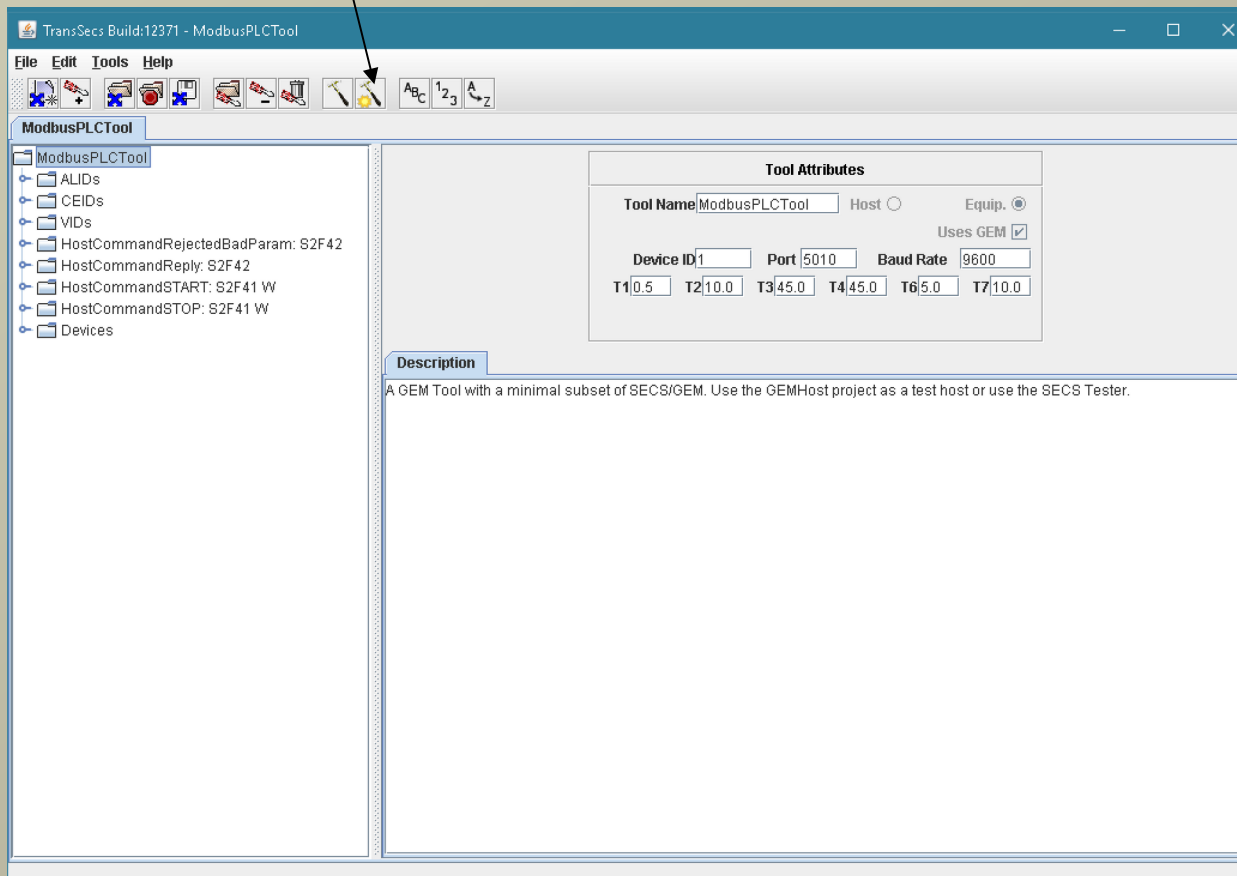




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按下锤子 / 星星按钮以构建项目

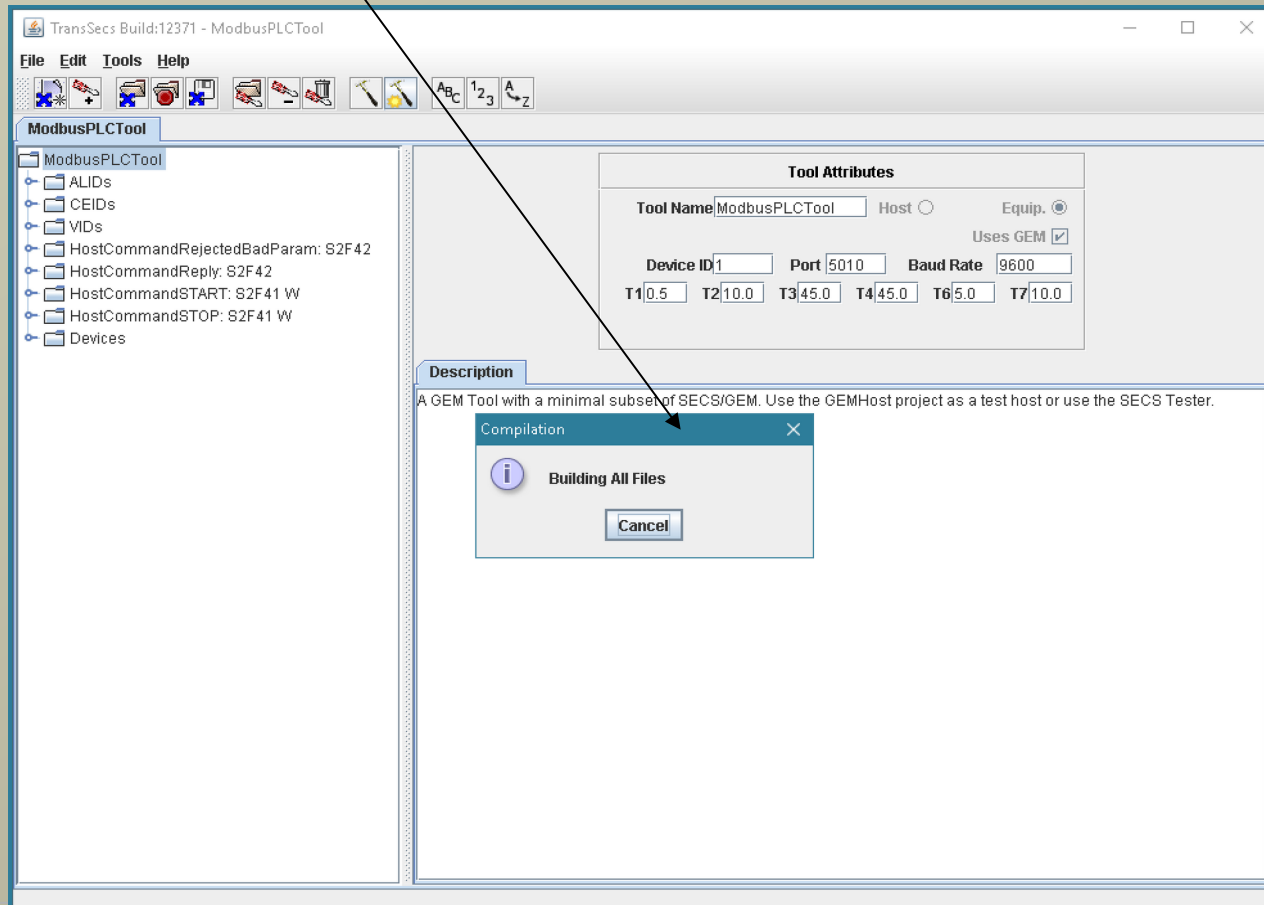




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当“编译”弹出窗口关闭时，表示构建已完成。这可能需要大约一分钟时间左右。

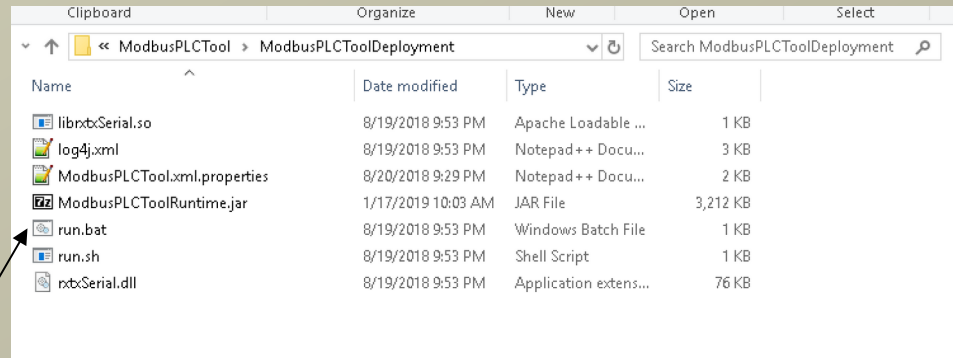




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代码生成后，工具的代码将被储存于项目的 ModbusPLCTool/
ModbusPLCToolDeployment 目录中。



双击 Windows 的 run.bat 以运行该工具。

对于 Linux 系统，例如 Raspberry Pi，请使用 run.sh

此文件夹中包含运行 SECS / GEM 界面所需要的所有内容。对于已部署的应用程序，您不需要使用编辑器。



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运行 SECS / GEM 界面

使用部署目录中的 run.bat 文件。
如果您曾移动过文件位置，则可能需要额外编辑 jre 的路径。

```
F:\TransSECSProjects\Devices\ModbusPLCTool\ModbusPLCToolDeployment>rem Ensure there is a jre on the path. Copy the  
jre provided or install a jvm  
  
F:\TransSECSProjects\Devices\ModbusPLCTool\ModbusPLCToolDeployment>set classpath=././ModbusPLCToolRuntime.jar  
  
F:\TransSECSProjects\Devices\ModbusPLCTool\ModbusPLCToolDeployment>java deploy.ModbusPLCTool.EquipmentController  
user.dir F:\TransSECSProjects\Devices\ModbusPLCTool\ModbusPLCToolDeployment  
ECID SetPoint (2000) value changed  
Started tool ModbusPLCTool on port 5010 device id 1  
-
```

当您运行所生成的 run.bat 时，该工具的 SECS / GEM 将在端口 5010 和设备 ID 1 上运行



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测试

在上一张幻灯片中，您部署了完整的 SECS / GEM 兼容解决方案，其中包含 Modbus PLC 或其他支持 Modbus 设备的链接。

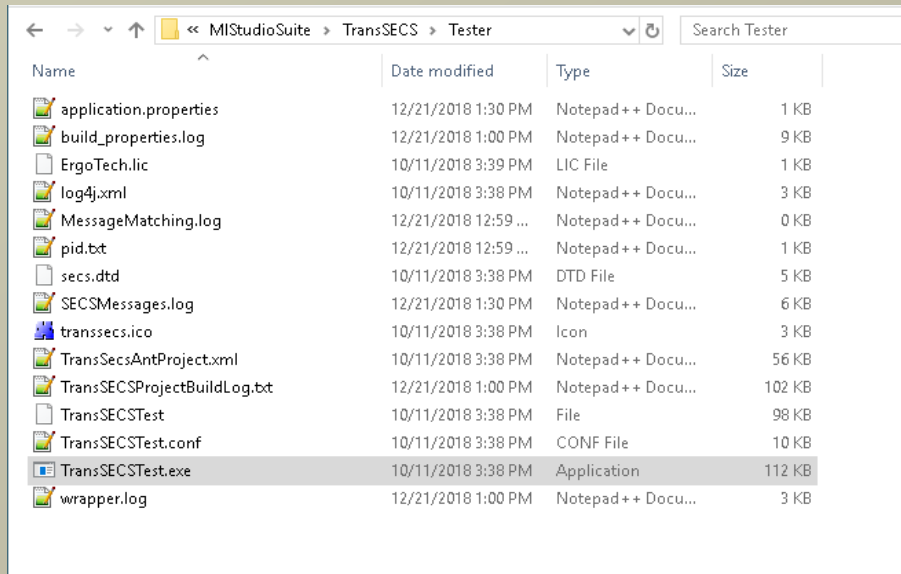
下一节将提供有关测试此界面（或任何其他 SECS / GEM 界面）的说明。



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使用 TransSECSTest.exe 与 TransSECS GEMHost 测试 SECS / GEM 界面



这将以 GEMHost 项目启动 TransSECS ，项目将作为主机运行以测试工具界面。



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作为测试主机运行 TransSECS

在构建 GEM 主机项目之前设置为 LIVE 模式

Tool Attributes

Tool Name: GEMHost Host Equip.

Tool IP Addr.: localhost Uses GEM

Device ID 1: Port: 5010 Baud Rate: 19200

T1: 0.5 T2: 10.0 T3: 45.0 T4: 45.0 T6: 5.0 T7: 10.0

Deployment Type: Test Host Only

Description

Sample Host for TransSECS. Use with the GEMTool project.

使用锤子 / 星星按钮构建

构建主机后，它将运行并自动连接到 GEMTool，然后开始设置事件报告与启用警报

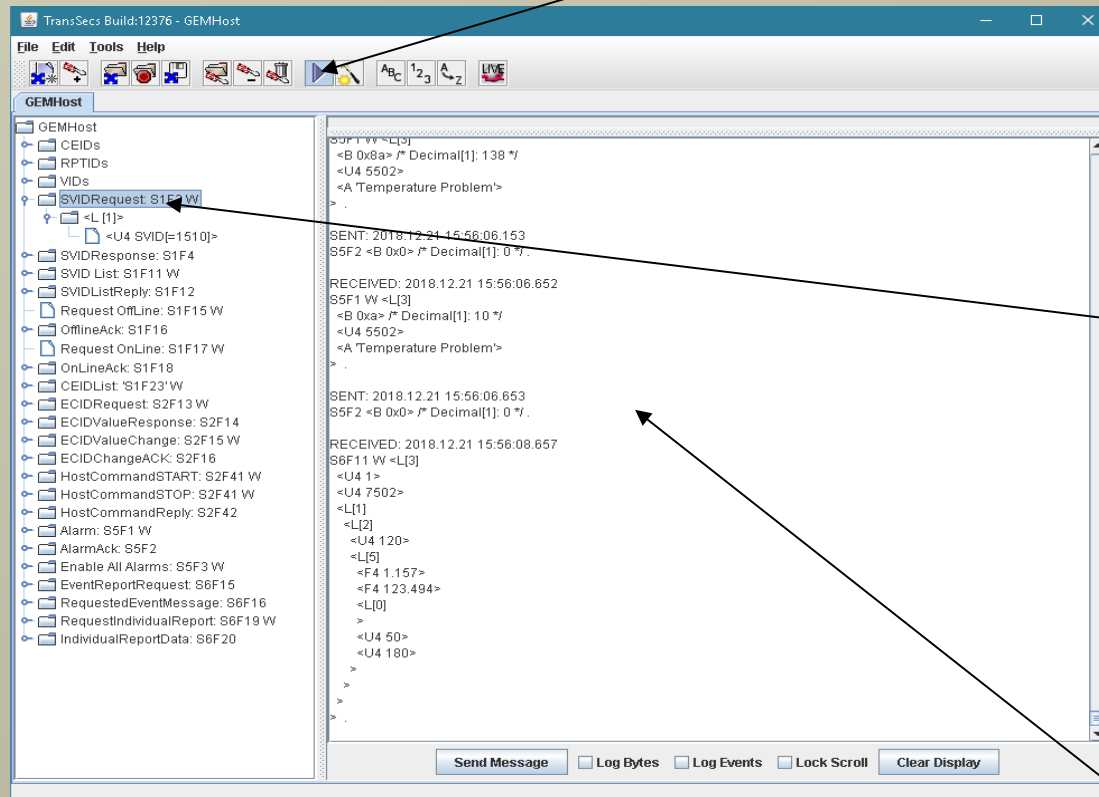


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作为主机运行 TransSECS 测试

此箭头表示主机正在运行



选择一个主要（外发）信息，然后按“发送信息”按钮进行发送

已发送和接收的信息将显示在“信息”面板中（选择信息时）



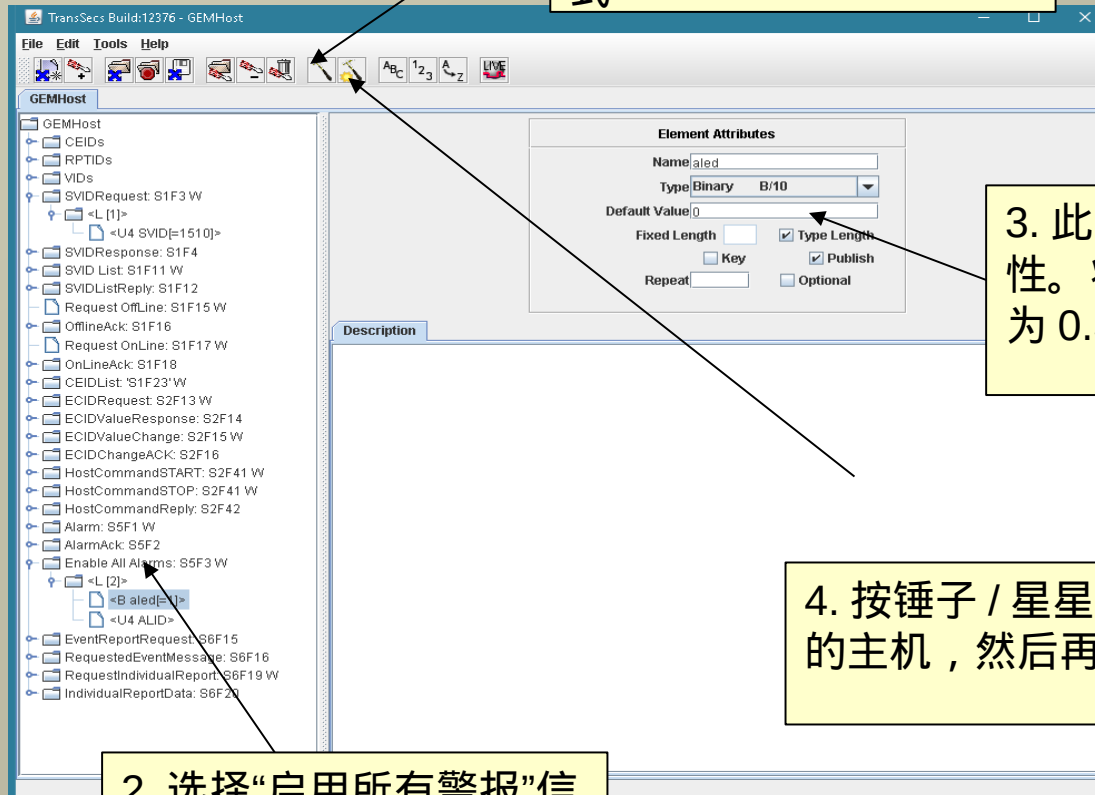
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您可以在 TransSECS 主机中更改信息并发送已更改的信息

暂时停用警报

1. 按下运行按钮以让 TransSECS 退出运行模式



3. 此处显示信息字段属性。将 aled 值从 1 更改为 0.3。

4. 按锤子 / 星星按钮构建带有此更改的主机，然后再次运行它

2. 选择“启用所有警报”信息，将其展开，然后选择 aled 字段

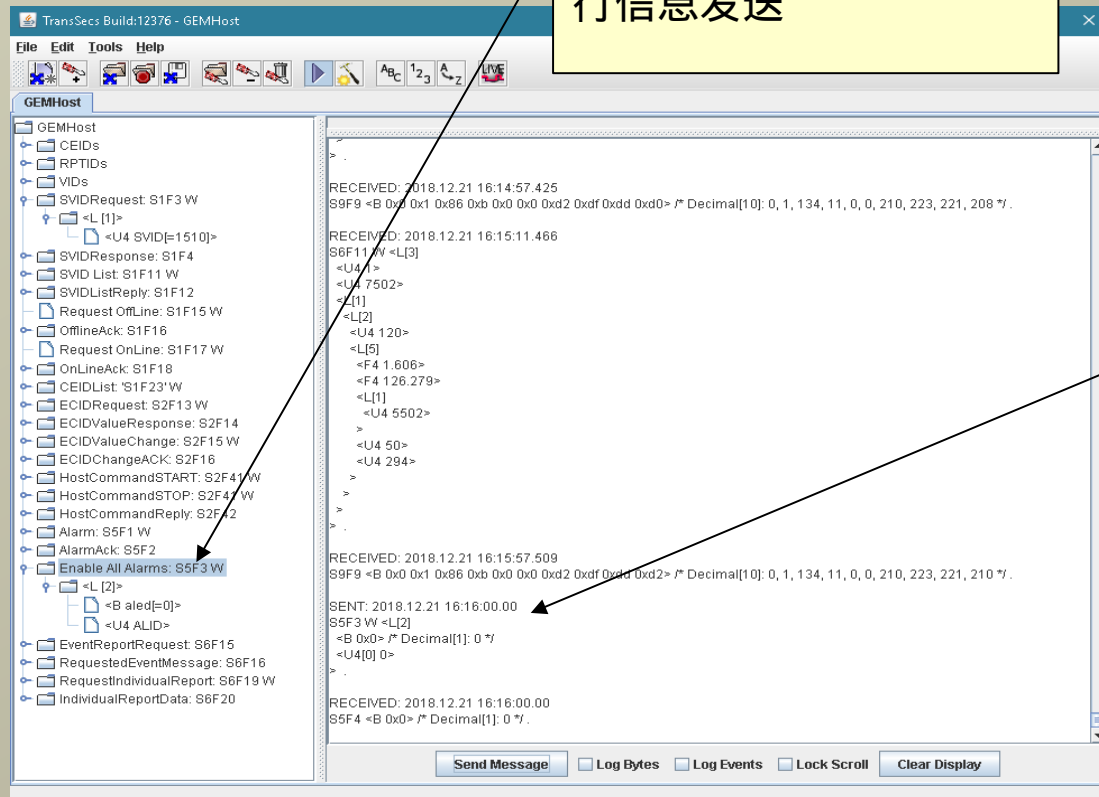


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暂时停用警报

选择启用所有警报，然后使用发送信息按钮进行信息发送



该工具的信息和确认答复将显示在此处



当您正在进行测试时，如果停用了警报信息，则会较容易观察事件和主机信息



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发送主机信息

选择启用所有警报，然后使用发送信息按钮进行信息发送

The screenshot shows the 'GEMHost' software interface. On the left, a tree view lists various components under 'GEMHost', including 'SVIDRequest: S1F3 W', 'SVIDResponse: S1F4', 'Request OffLine: S1F15 W', and 'Enable All Alarms: S5F3 W' (which is highlighted). On the right, a log window displays several messages, including 'RECEIVED: 2018.12.21 16:14:57.425' and 'SENT: 2018.12.21 16:16:00.00'. At the bottom of the window, there is a 'Send Message' button and several checkboxes for 'Log Bytes', 'Log Events', 'Lock Scroll', and 'Clear Display'.

该工具的信息和确认答复将显示在此处



当您正在进行测试时，如果停用了警报信息，则会比较容易观察事件和主机信息

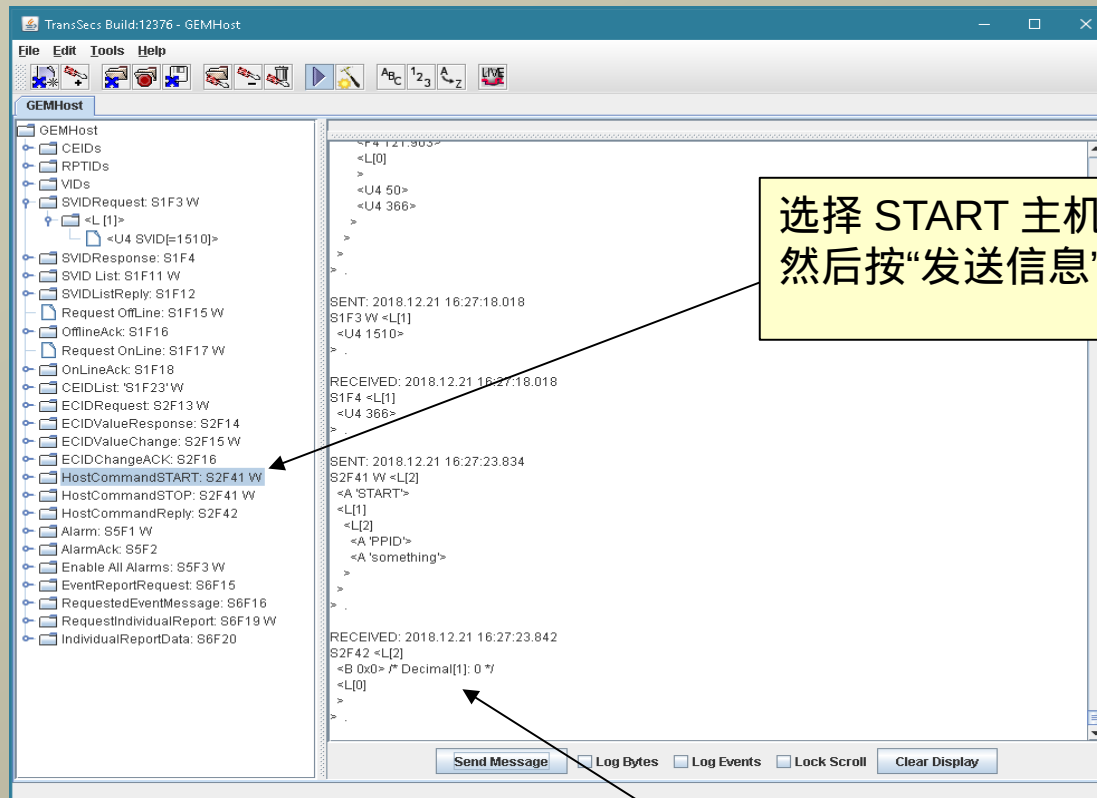


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向工具发送主机信息

设置 GEMTool 以处理主机命令“START”



选择 START 主机命令，然后按“发送信息”按钮

工具已正确处理该信息，并且已将答复发送给主机



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检查过程温度 VID

使用 VID 1512 将 S1F3 发送到工具以检查从 PLC 读取的当前温度

TransSecs Build:12371 - ExtendedTestHost

File Edit Tools Help

ExtendedHost

- AreYouThereResponseFromHost: S1F2
- SVIDRequest: S1F3 W
- SVIDResponse: S1F4
- SVID List: S1F11 W
- SVIDListReply: S1F12
- EstablishCommunications: S1F13 W
- EstablishCommunicationsResponse: S1F14
- Request OffLine: S1F15 W
- OfflineAck: S1F16
- Request OnLine: S1F17 W
- OnlineAck: S1F18
- CEIDList: 'S1F23'W
- CEIDListReply: 'S1F24'
- DateTimeRequest: S2F17 W
- DateTimeReply: S2F18
- ECID List: S2F29 W
- ECIDListReply: S2F30
- SetDateTime: S2F31 W
- SetDateTimeReply: S2F32
- DefineReport: S2F33 W
- DeleteAllReports: S2F33 W
- CreateReportsResponse: S2F34
- LinkReport: S2F35 W
- UnLinkReports: S2F35 W
- LinkReportsResponse: S2F36
- DisableAllReports: S2F37 W
- EnableAllReports: S2F37 W
- EnableReportsResponse: S2F38
- HostCommandSTART: S2F41 W
- HostCommandSTOP: S2F41 W

SVID 1510

```
S2F4Z <L[2]
<B 0x0> /* Decimal[1]: 0 */
<L[0]
>
>
SENT: 2019.01.17 10:29:38.447
S1F3 W <L[1]
<U4 1512>
>
RECEIVED: 2019.01.17 10:29:38.449
S1F4 <L[1]
<F4 233.2>
>
SENT: 2019.01.17 10:29:52.618
S1F3 W <L[1]
<U4 1512>
>
RECEIVED: 2019.01.17 10:29:52.619
S1F4 <L[1]
<F4 230.7>
>
```

Send Message Log Bytes Log Events Lock Scroll

这是来自 PLC 的两个当前温度值



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仅此而已

这个简单的 ModbusPLCTool 界面示例想必应该为您提供了一些想法并解决了您心里的一些困惑。您需要添加连接到 PLC 中寄存器的 VIDs、ALIDs 和 CEIDs。此外，更多的主机命令信息处理也可以进行添加，并且还设有用于手动处理配方信息的选项，又或者您可以自己设置简单的自动配方处理。