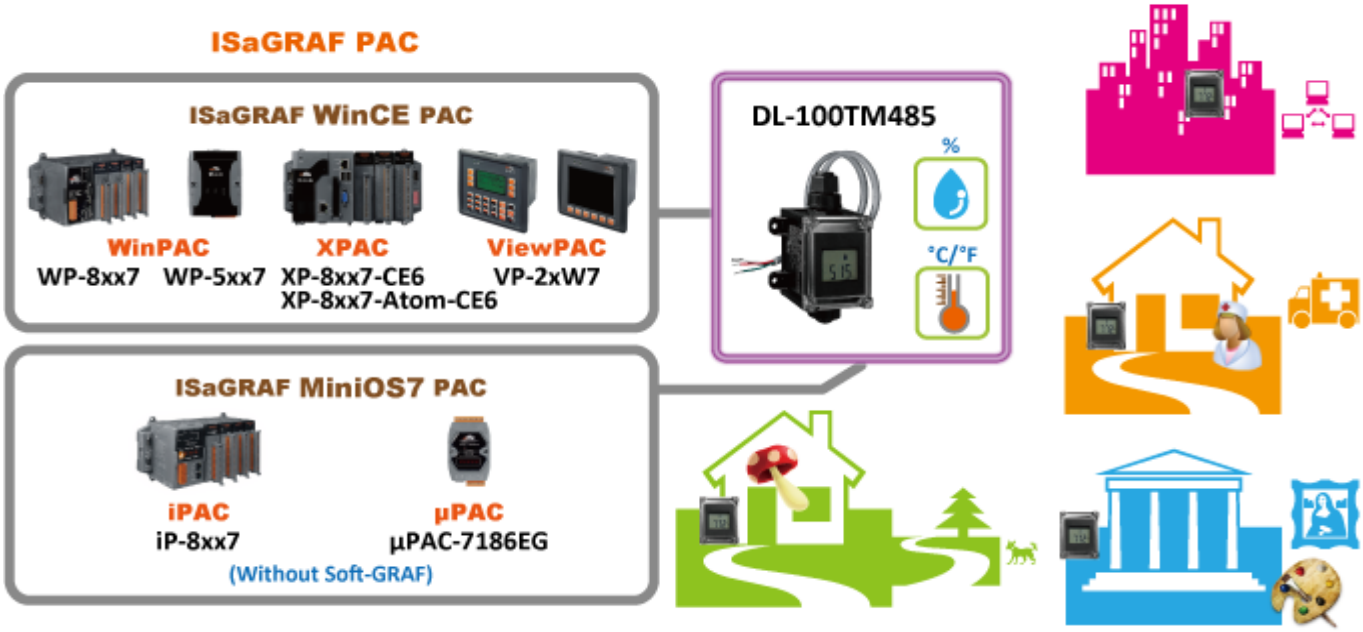
Application: ISaGRAF PAC connects a DL-100TM485 to measure humidity and temperature values



ICP DAS ISaGRAF PAC support Modbus RTU protocol to read humidity and temperature values from the DL-100TM485. The DL-100TM485 is a temperature and humidity data logger module. It can apply in smart building, hospital, museums, greenhouse, etc.
For more information about the DL-100TM485, please refer to the website:
http://www.icpdas.com/en/product/guide+IIoT+IO_Sensor+Industrial__Sensor#996 DL Series

1.1. Download Demo Programs and Documents

The following driver versions of ISaGRAF WinCE PAC support the Soft-GRAF HMI. They can run the Soft-GRAF demo program included in this FAQ-156. For other PAC (e.g. the µPAC-7186EG, iP-8xx7), they can run only the ISaGRAF program (they don't support the Soft-GRAF HMI).

ISaGRAF PAC	ISaGRAF Driver Version
WinCE PAC:	
XP-8xx7-CE6	1.31 or later version
XP-8xx7-Atom-CE6	1.01 or later version
WP-8xx7	1.51 or later version
WP-5147	1.02 or later version
VP-25W7/23W7	1.43 or later version

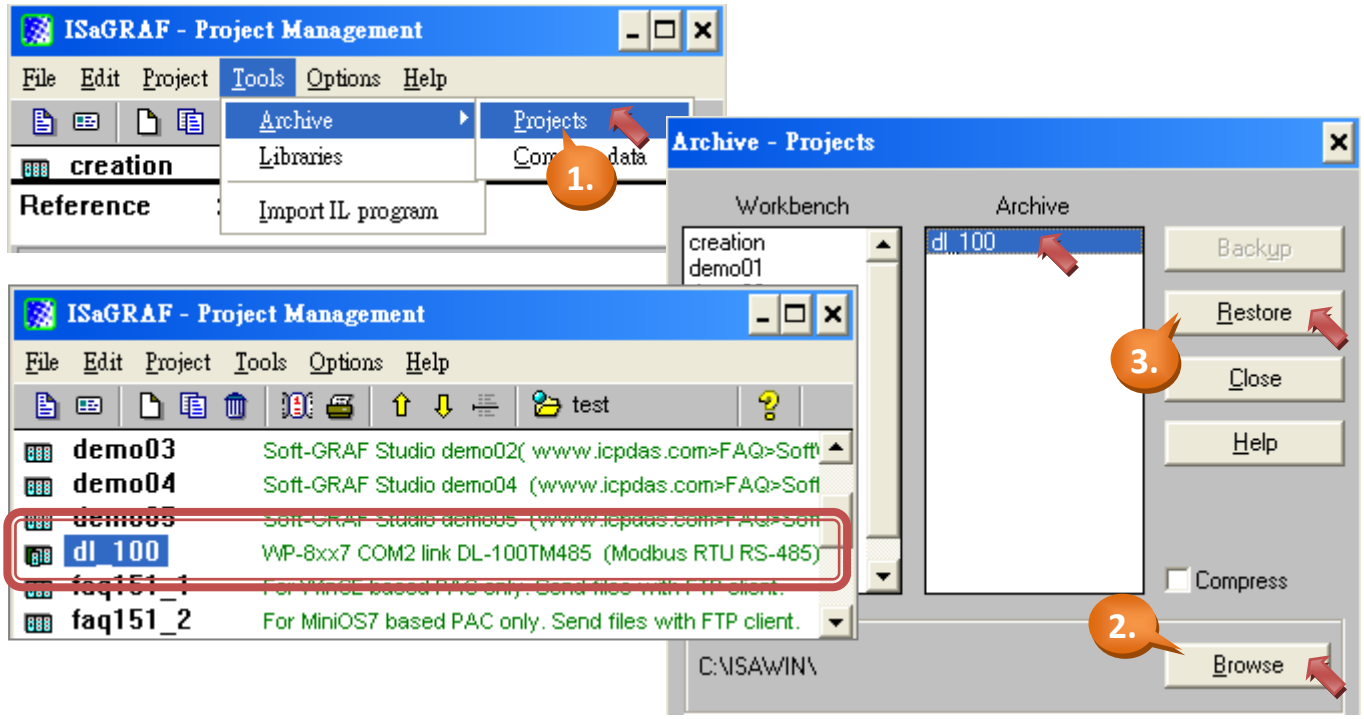
Download the ISaGRAF Driver:
If your driver version is the earlier one, you may download the new ISaGRAF Driver from
http://www.icpdas.com/en/download/show.php?num=368&nation=US&kind1=&model=&kw=isagraf
and then follow the attached document to update it to your ISaGRAF PAC.

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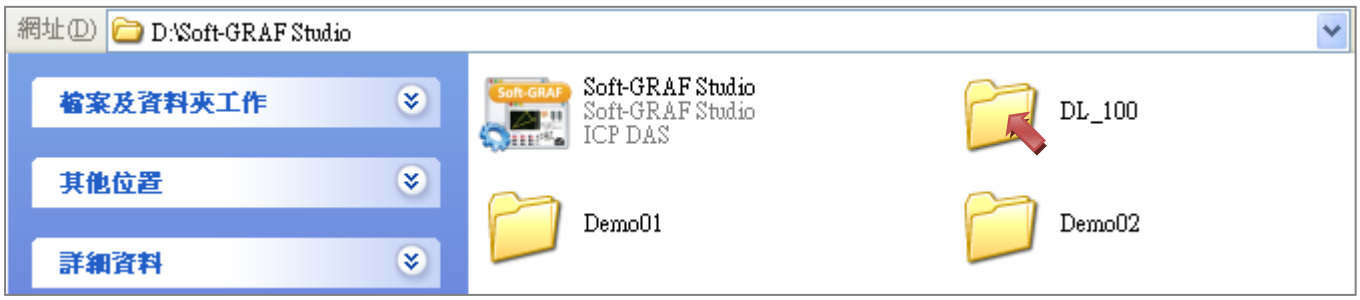
Download the ISaGRAF Demo Project:
This paper is the ISaGRAF FAQ-156. User can download the document, ISaGRAF demo (dl_100.pia) and Soft-GRAF (DL_100) demo programs from https://www.icpdas.com/en/faq/index.php?kind=280#751 > **156**

1.2. Restore Demo Program

Restore the ISaGRAF Demo Program:
After downloading the ISaGRAF demo program (dl_100.pia), user need to restore it to the PC/ISaGRAF. Please follow the instructions as below:



Restore the Soft-GRAF Demo Program:
Please copy the "DL_100" folder to the installation path of the "Soft-GRAF Studio" (ex, D:\Soft-GRAF Studio\). If you have not yet installed the "Soft-GRAF Studio", please refer to the website to download the related files. https://www.icpdas.com/en/faq/index.php?kind=280#751 > 146.

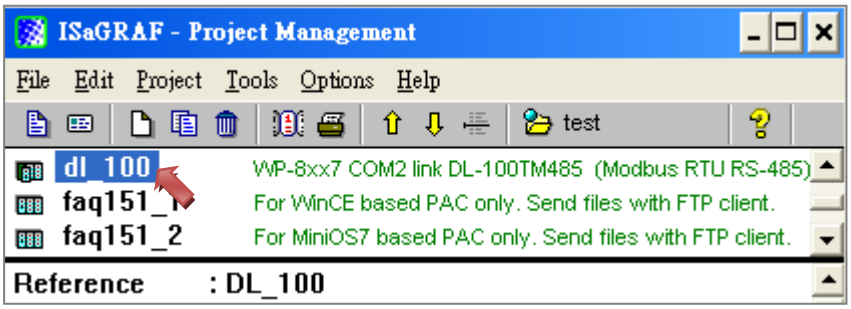


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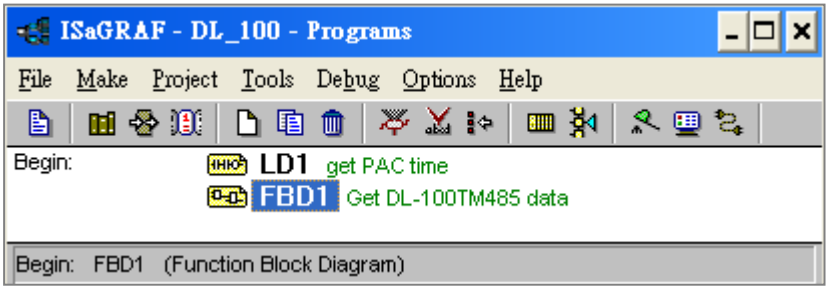
1.3. Description of ISaGRAF Program

This program is used to make ISaGRAF PAC to read the humidity and temperature values from the DL-100TM485 (Net-ID = 1) via COM2 (RS-485), If the PAC's COM2 is not a RS-485 port, please modify the ISaGRAF program to use other RS-485 port. For example, the COM3 of XP-8xx7-CE6 is RS-485 port. This demo program uses the Modbus Function Code 4 to read three words per second from address 0.

1. Mouse double-click on "dl_100" to open the demo program.

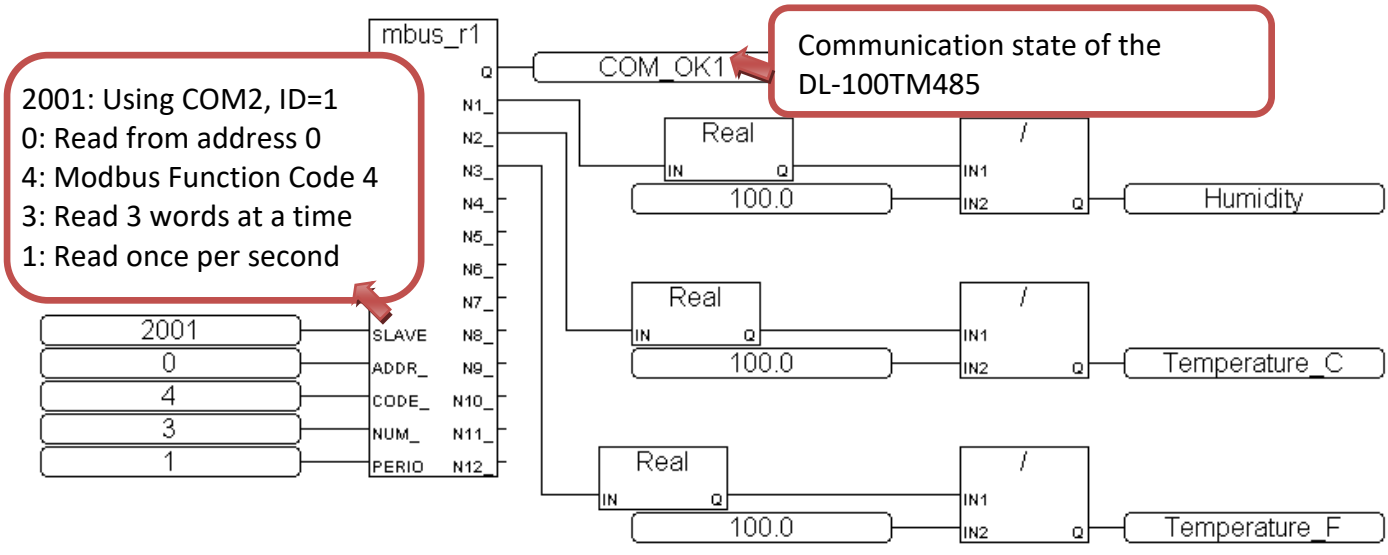


2. This program includes one LD and one FBD program (LD1, FBD1).



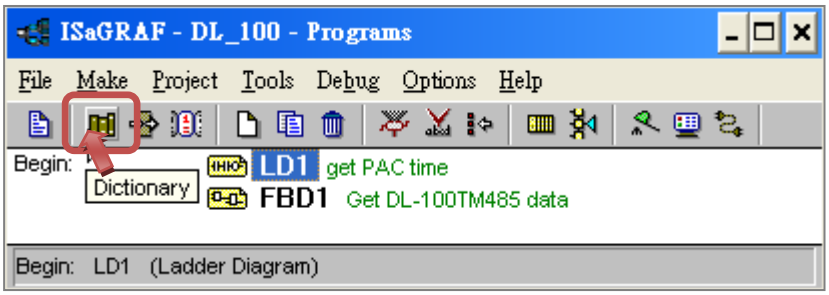
LD1: to read the system date/time. (Using "SYSDAT_R" and "SYSTIM_R" function block)

FBD1: to read the humidity and temperature (℃/℉) values of the DL-100TM485.



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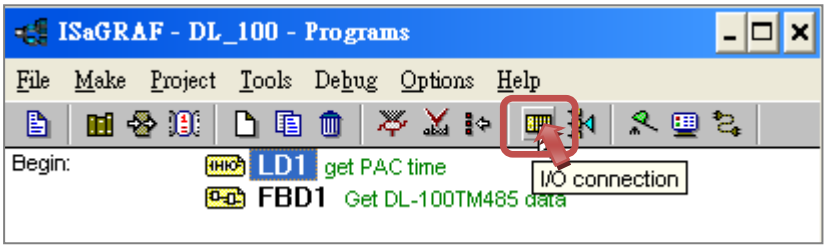
3. Click “Dictionary” to to see the variables.



ISaGRAF Variables:

Name	Type	Description
COM_OK1	Boolean	The communication state of the DL-100TM485. (Addr.=7, True: normal, False: fail)
Year1	Integer	System date, year (Addr.=1)
Month1	Integer	System date, month (Addr.=2)
Day1	Integer	System date, day (Addr.=3)
Hour1	Integer	System time, hour (Addr.=4)
Minute1	Integer	System time, minute (Addr.=5)
Second1	Integer	System time, second (Addr.=6)
Humidity	Real	Humidity value (Addr.=21, Unit = %, Init = 0)
Temperature_C	Real	Celsius value (Addr.=23, Unit =℃, Init = 0)
Temperature_F	Real	Fahrenheit value (Addr.=25, Unit =℉, Init = 0)

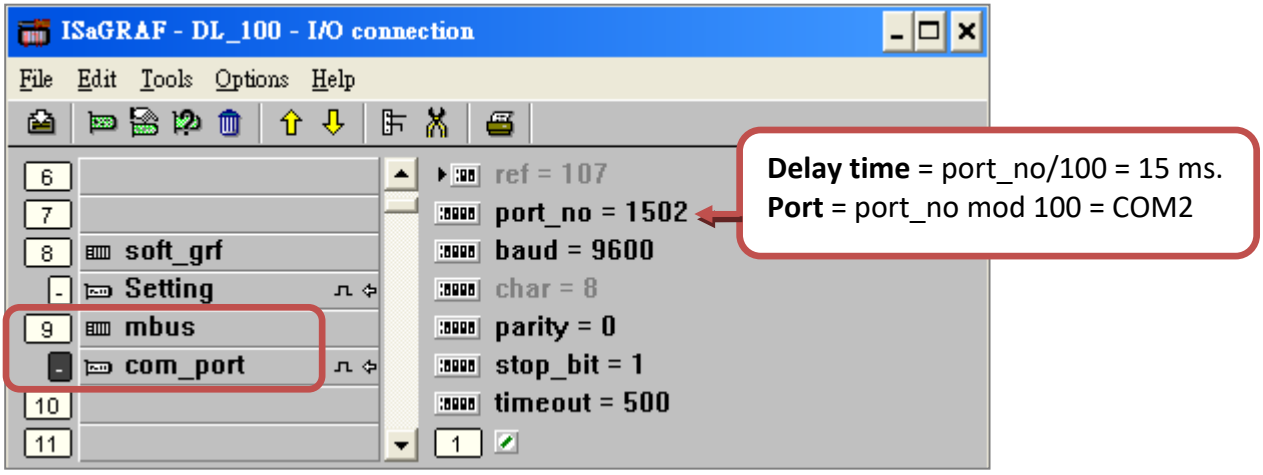
4. Click “ I/0 Connection” to see the I/O features.



Note: The “soft-graf” is only for the ISaGRAF WinCE PAC to enable the Soft-GRAF HMI. It is not for other PACs. For example, if your PAC is µPAC-7186EG (or iP-8xx7), please remove the “soft-graf”.

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Using the “mbus” feature to enable the Modbus Master Port. In this example, the ISaGRAF PAC uses COM2, the delay time is 15 ms and the baud rate is 9600.



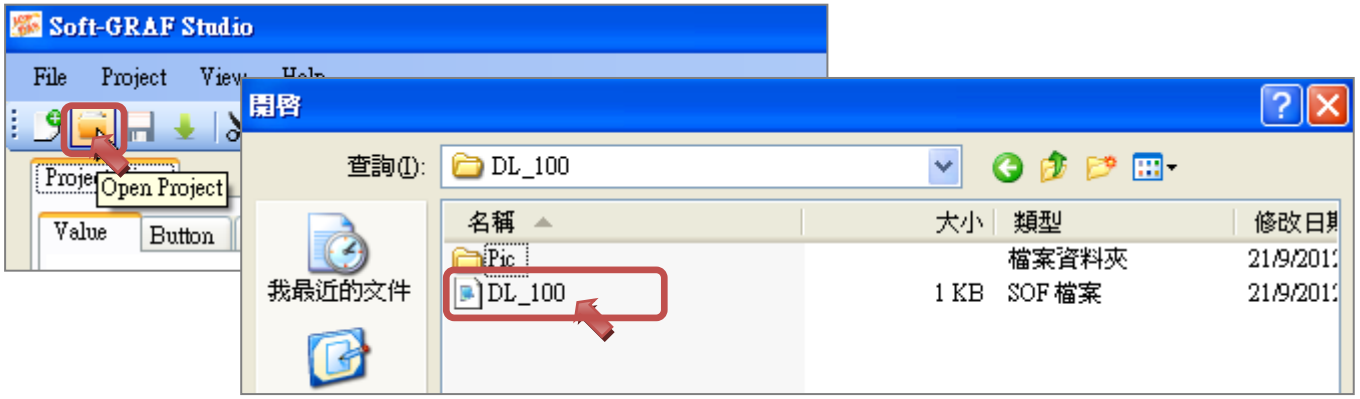
Note: If the “port_no” is less than 100 (for example, port_no = 2), the delay time will set as the default value 100 ms.

1.4. Description of Soft-GRAF Program

1. In the installation path of "Soft-GRAF Studio" (for example, D:\Soft-GRAF Studio), mouse double click on the "Soft-GRAF Studio.exe" to open the program.

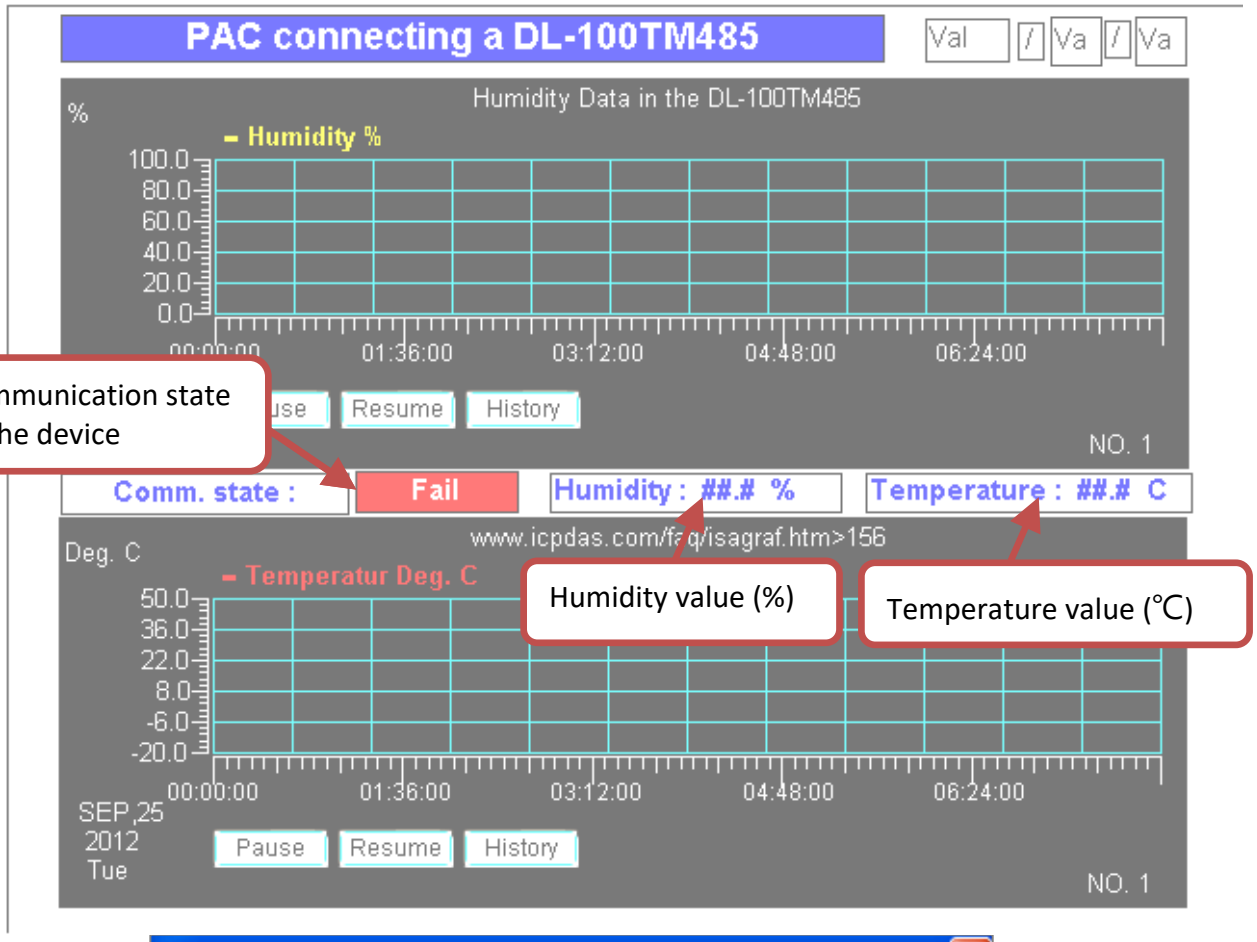
2. Click “Open Project” to open the “DL_100.sof” program.

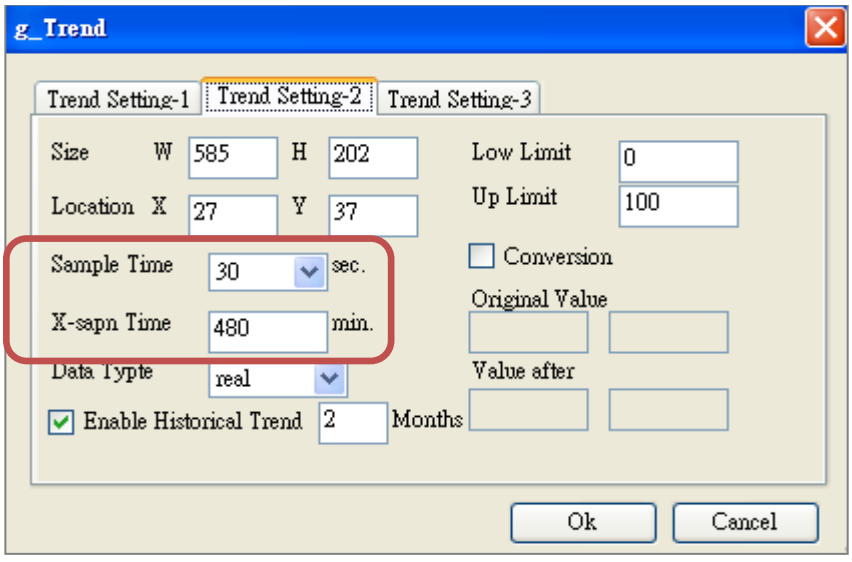




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3. As the figure below, this program can show the communication state of the DL-100TM485 and real-time humidity and temperature values. There are also two trends to record the humidity and temperature values. The recording rate is once per 30 seconds. The length of time period displayed on the x-axis of the trend is 480 min (8 hours).





If you are not familiar with the operation of Soft-GRAF, please refer to https://www.icpdas.com/en/faq/index.php?kind=280#751 – 146 for more details.

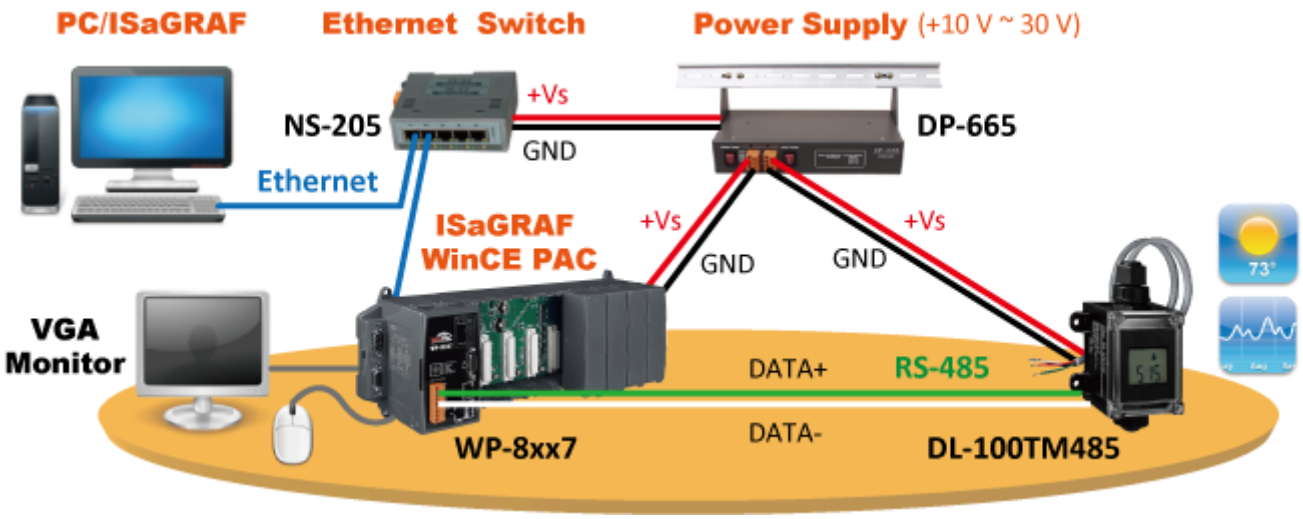
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1.5. Test the Demo Program?

Before testing, you need to download the ISaGRAF and Soft-GRAF programs to the ISaGRAF WinCE PAC. First, please make sure all the devices are connected well and then check if the DL-100TM485's ID is 1, the baud rate is 9.6 k (i.e. 9600) and the communication parameter is "n, 8, 1" which are displayed on the DL-100TM485. If not, please modify the ISaGRAF program to fit the setting of the DL-100TM485 (or refer to DL-100TM485's user manual to change its communication setting).

1.5.1. Install the Hareware

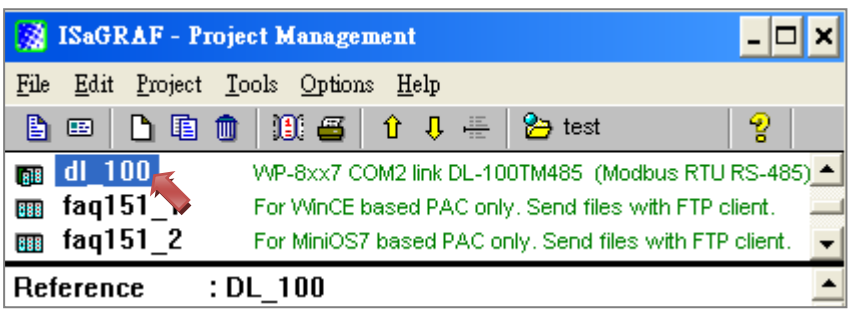
As the figure, the testing environment is used for this example. You can connect the device according to the actual situation.



The DL-100TM485 is a remote temperature and humidity data logger module which supports Modbus RTU protocol (RS-485), please refer to the website for more informaiotn:
http://www.icpdas.com/en/product/DL-100T485

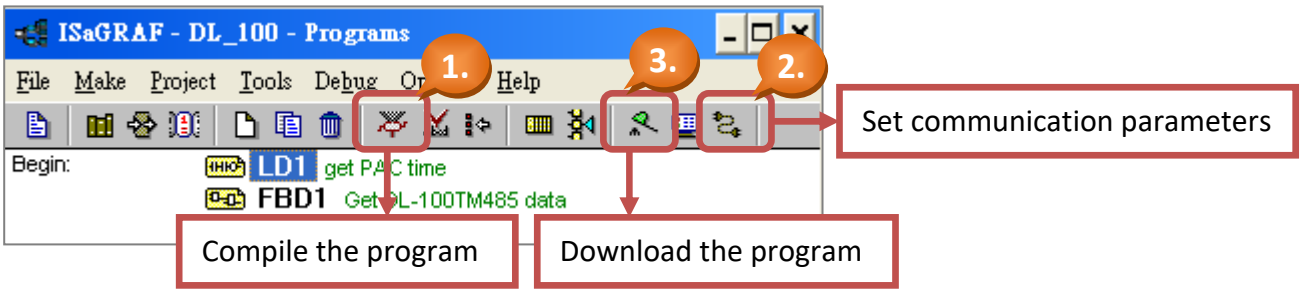
1.5.2. Download the ISaGRAF Program to the ISaGRAF PAC

1. Mouse double-clicks on "dl_100" to open the program.

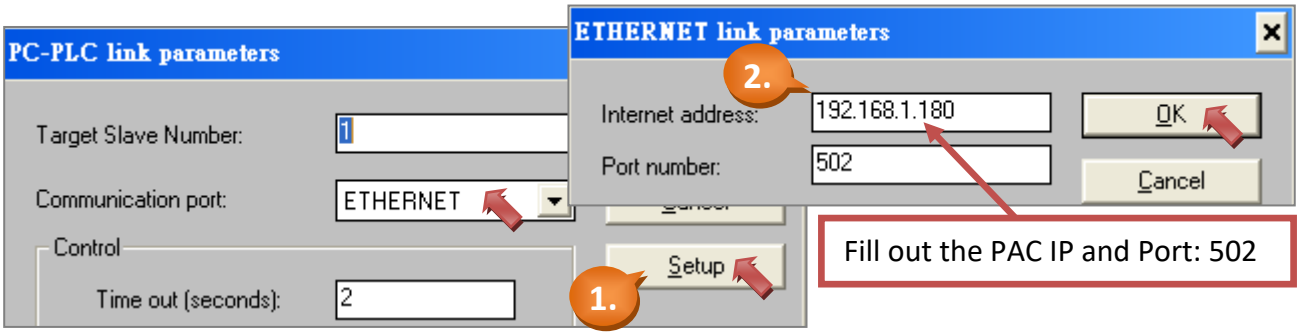


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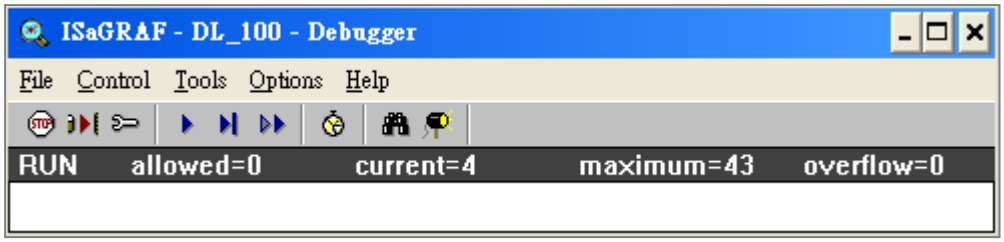
2. Click “Make Application Code” (icon 1) to compile the program.



3. As step 2, click “Link Setup” (icon 2) to set the communication parameters.

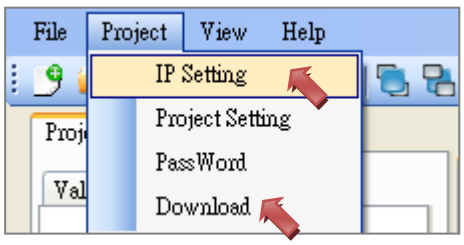


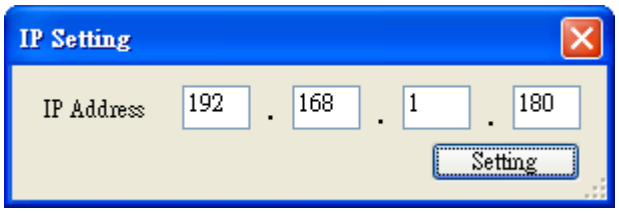
4. As step 2, click “Debug” (icon 3) to download the program to the PAC. After successfully downloading, you will see this screen.



1.5.3. Download the Soft-GRAF Program to the ISaGRAF PAC

1. After opening the program (DL_100.sof, refer to Section 1.4), click “Project > IP Setting” and fill out the target PAC IP, then click “Project > Download” to download the program.

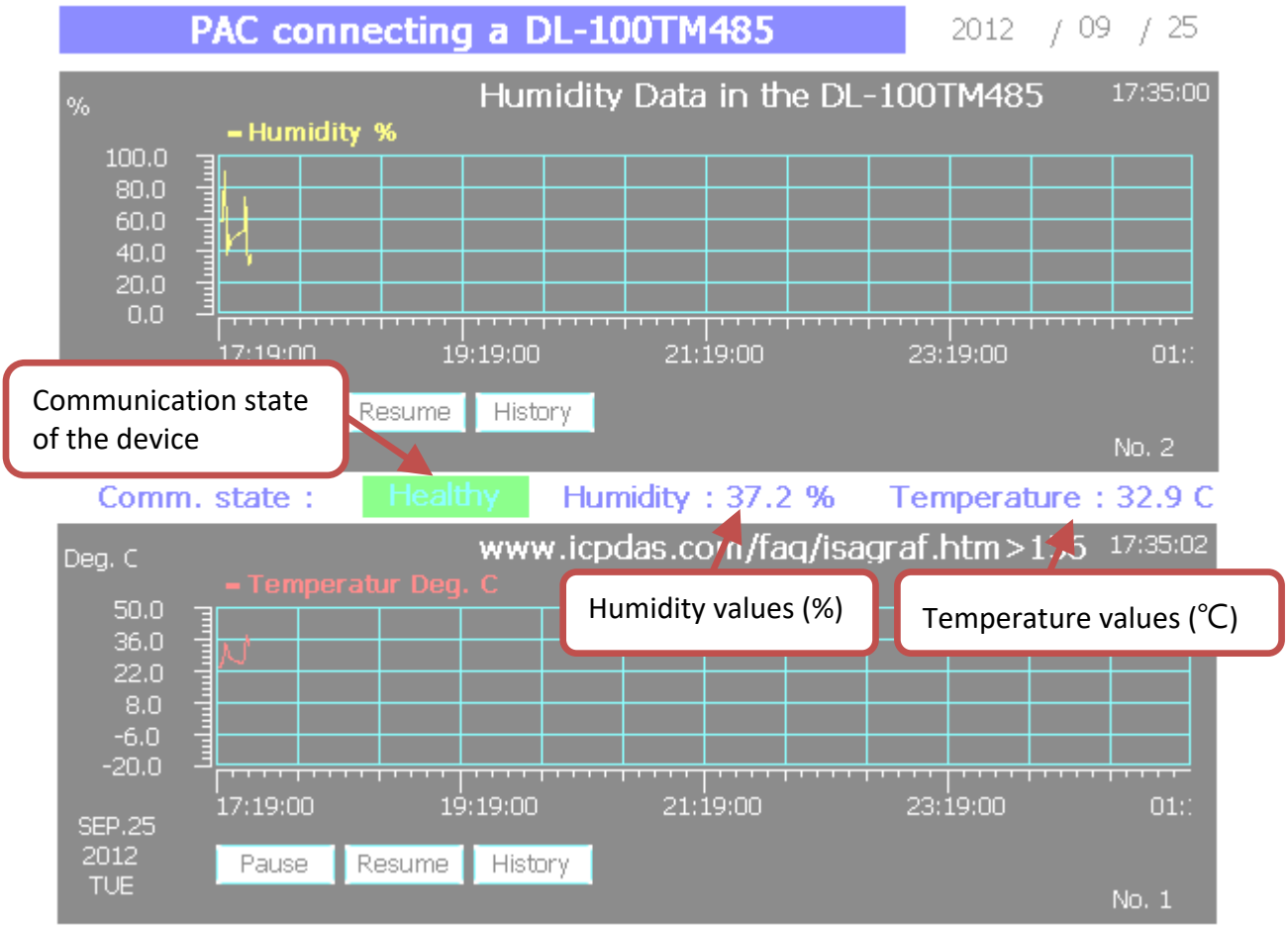




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1.5.4. Test the Demo Program

In the ISaGRAF WinCE PAC, you can see the HMI page as below:



A. Communication Test:

You can remove the COM2 cable to see if the communication state is changed to “Fail” and blinking.



B. Humidity/Temperature Test:

You can put your hand on the detector, and see the change of the humidity and temperature values.

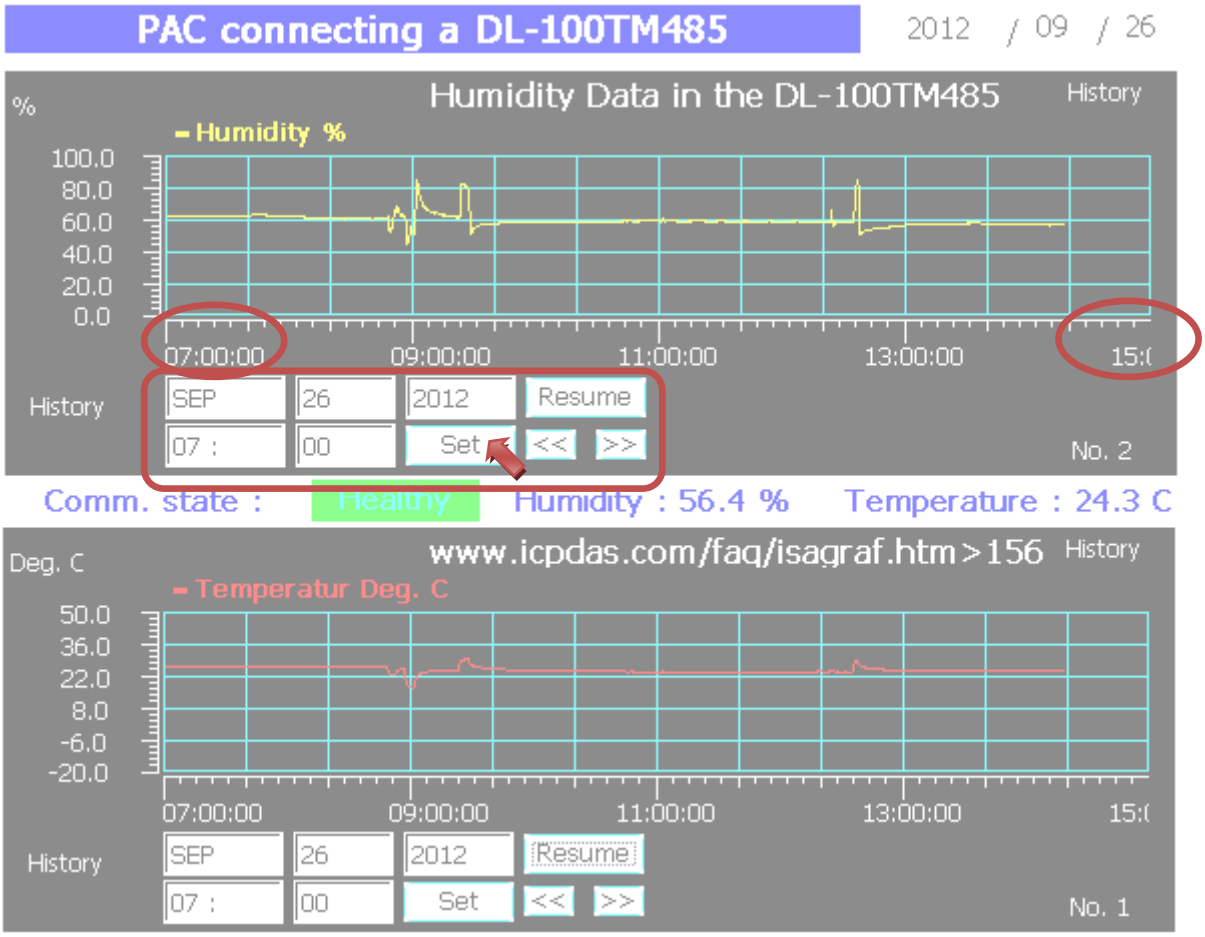


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C. Historical Humidity/Temperature Querying:

In this example, the trend is set to draw once per 30 seconds. The time period of the x-axis is 480 min (8 hours).

Please click “History” button and set the start date/time (e.g. SEP. 26 2012 7:00), then click “Set” for querying. As the figure below, it shows the historical record values from 7:00 to 15:00 (8 hours).



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