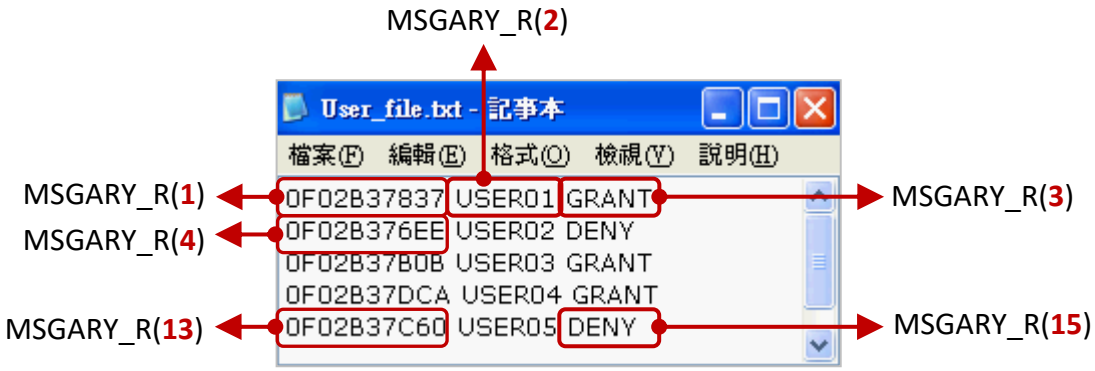
How to use ISaGRAF functions to read multiple strings from a file?

This FAQ-172 provides an ISaGRAF demo program to show the way to use the “MSGARY_R(addr)” and the “MSGARY_W(addr,msg)” functions to read multiple strings from a file. For instance, the “User_file.txt” file has five rows and three columns for a total of fifteen strings. Then, user can use MSGARY_R(1) in the ISaGRAF program to get the first string “0F02B37837”, using MSGARY_R(2) to get the 2nd string “USER01”, using MSGARY_R(3) to get the 3rd string “GRANT” and using MSGARY_R(15) to get the 15th string “DENY”, and so on.



1.1. Download / Upgrade the ISaGRAF Driver

The following ISaGRAF WinCE PACs support the MSGARY_R(addr) and the MSGARY_W(addr,msg) functions, and the new ISaGRAF driver versions are shown as below.

ISaGRAF WinCE PAC	ISaGRAF Driver Version
XP-8xx7-CE6	Ver. 1.46 or later
XP-8xx7-Atom-CE6	Ver. 1.03 or later
WP-8x47/8x37	Ver. 1.66 or later
WP-5147	Ver. 1.12 or later
VP-25W7/23W7/4137	Ver. 1.59 or later

Download the ISaGRAF Driver:
If your ISaGRAF does not support these functions, go to the website to download the new ISaGRAF driver.
http://www.icpdas.com/en/download/show.php?num=368&nation=US&kind1=&model=&kw=isagraf

Upgrade:
Refer to the PDF included in the downloaded ZIP file (e.g., “vp-2xw7-1.59.zip”) to upgrade the ISaGRAF driver.

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1.2. Download / Restore the ISaGRAF Project

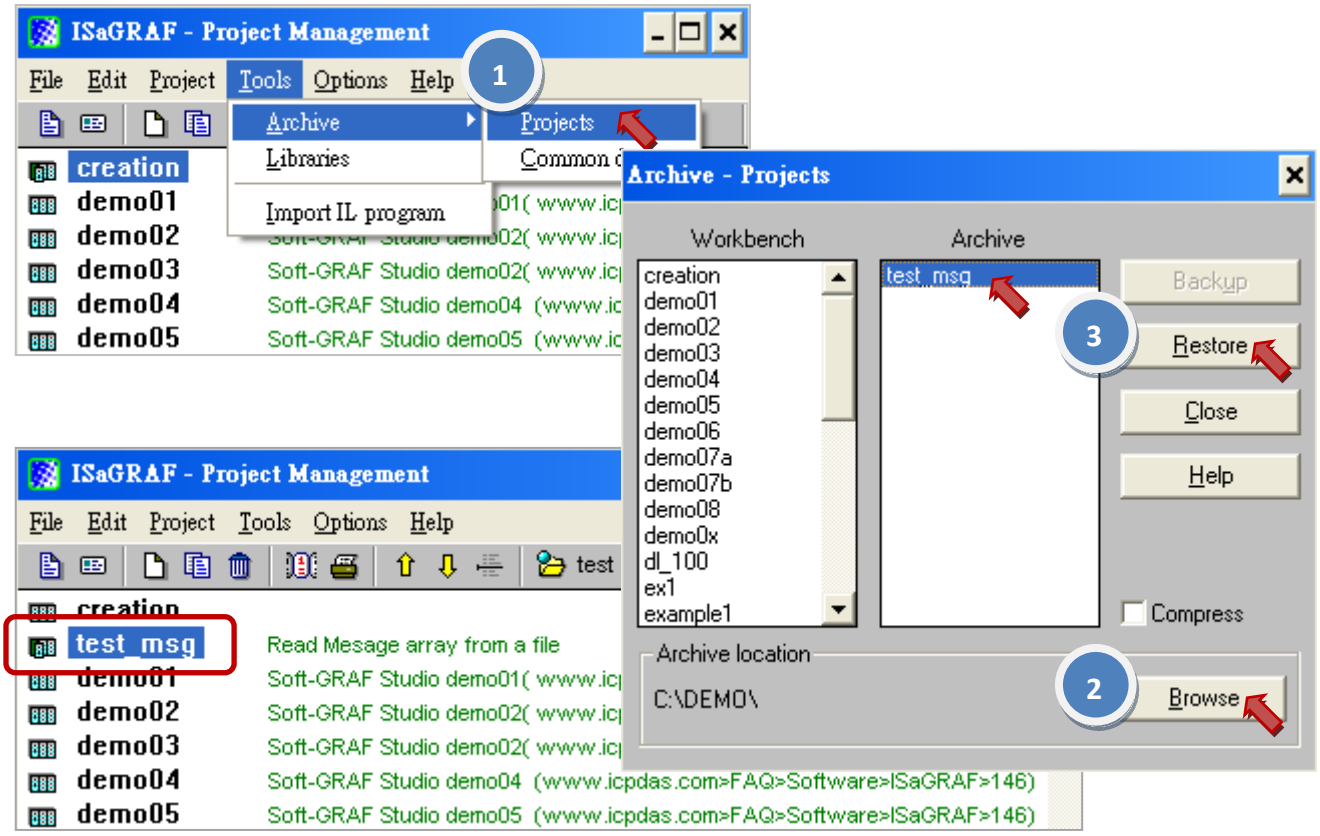
Download the demo program:

https://www.icpdas.com/en/faq/index.php?kind=280#751 > FAQ-172 to download the "faq172_demo_chinese.zip" file. This file includes this document, the ISaGRAF demo program ("test_msg.pia") and the data file ("User_file.txt").

Restore the demo program:

Unzip the file and then restore the ISaGRAF demo program ("test_msg.pia") to the PC/ISaGRAF.

1. Click "Tools → Archive → Projects" to open the "Archive – Projects" window.
2. Restore the "test_msg.pia" project to the ISaGRAF Workbench from an assigned folder (e.g., "C:\DEMO").



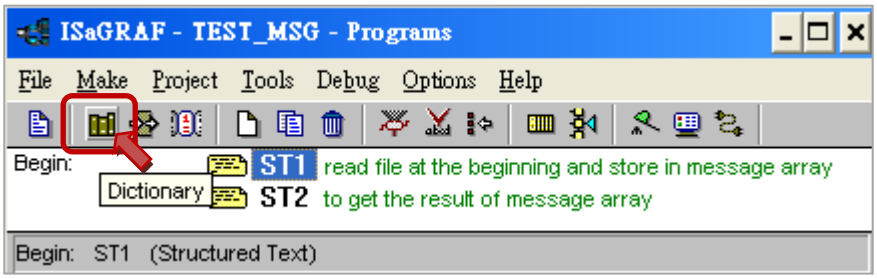
3. Then, copy the "User_file.txt" data file to the **"\Micro_SD\"** folder of the ISaGRAF PAC by using the FTP or USB Disk. (In this example, the "\Micro_SD\" is the default file location for this ISaGRAF project to read strings).

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1.3. Introduction of the demo program

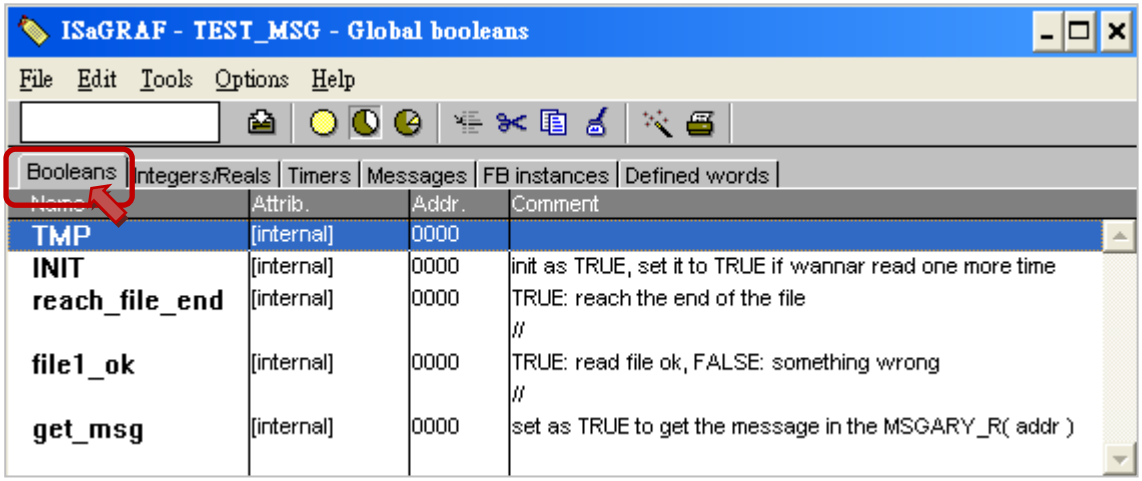
Project Architecture:

There are two ST programs in this project. Click the “Dictionary” button to see the variables that used in these programs.



ISaGRAF Variables Table:

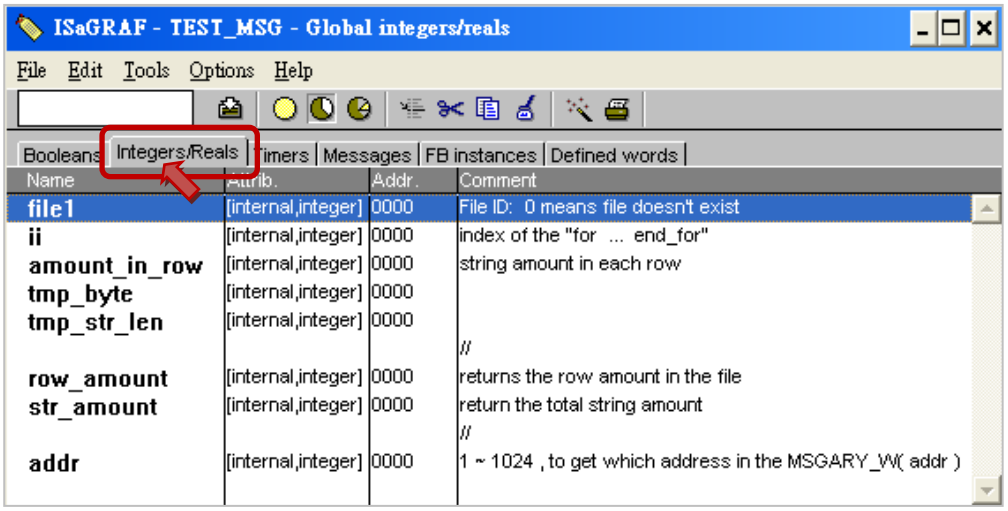
“Booleans” variables:

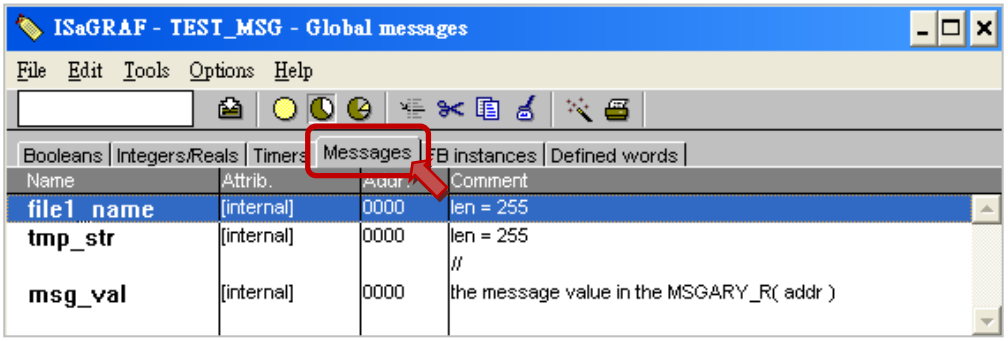


Name	Type	Attribute	Description
TMP	Boolean	Internal	For temporary usage.
INIT			Set this "True" to read the data file again. To declare its initial value as "True".
reach_file_end			When the status is "True", it means reach the end of the file.
file_ok			When the status is "True", it means read file OK. When the status is "False", it means read file error.
get_msg			Set this "True" to get message by using the “MSGARY_R(addr)” function.

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"Integers/Reals" , "Messages" variables:





Name	Type	Attribute	Description
file1	Integer	Internal	File ID: 0 means file doesn't exist.
ii			For the use of "For" loop in this program.
amount_in_row			It stands for the string amount in each row. (In this example, the value is 3)
tmp_byte			For temporary usage.
tmp_str_len			It stands for string length. (For temporary usage)
row_amount			It stands for the total amount of rows. (In this example, the value is 5)
str_amount			It stands for the total amount of strings. (In this example, the value is 15)
addr			The string address wish to get by the "MSGARY_R(addr)" function. (Address Range: 1 ~ 1024)
file_name	Message		It stands for the file location. (In this example, the file is located at '\Micro_SD\User_file.txt')
tmp_str			For the temporary usage in the "MSGARY_W()".
msg_val			For the temporary usage in the "MSGARY_R(addr)".

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ST1 Program:

```
(* Read string array in a file and store them by "MSGARY_W(addr, string)" .
     File format : each row end with <CR><LF>, each row has 3 strings
          0F02B37837 USER01 GRANT
          0F02B376EE USER02 DENY
          0F02B37B0B USER03 GRANT
          0F02B37DCA USER04 GRANT
          0F02B37C60 USER05 DENY
     Then MSGARY_R(1) will return '0F02B37837'.
          MSGARY_R(2) will return 'USER01'.
          MSGARY_R(3) will return 'GRANT'.
          MSGARY_R(4) will return '0F02B376EE'.
          MSGARY_R(5) will return 'USER02'.
          MSGARY_R(6) will return 'DENY'.
          ...
          MSGARY_R(13) will return    '0F02B37C60'.
          MSGARY_R(14) will return    'USER05'.
          MSGARY_R(15) will return    'DENY'.
     The addr parameter can be 1 to 1024 in the MSGARY_R(addr) and MSGARY_W(addr,msg) .
*)

(* INIT is declared with initial value TRUE *)
if    INIT    then
     INIT := FALSE ;
     file1_name := '\Micro_SD\User_file.txt' ;
     file1_ok := FALSE ;    (* Init as "not ok" *)
     reach_file_end := FALSE ;    (* Init as no reach the end of file yet *)
     amount_in_row := 3 ;    (* This example has 3 strings in each row *)
     row_amount := 0 ;    (* Init total row amount as 0 *)
     str_amount := 0 ;    (* Init total string amount as 0 *)

     file1 := f_ropen(file1_name) ;    (* Try to open file1 *)
     if    file1 = 0    then
          (* File doesn't exist *)
     else
```


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```
        (* File does exist, open it and read and then close it at the end *)
        while   (reach_file_end = FALSE)   and   ( row_amount < 1024/amount_in_row )   do
            for   ii := 1 to amount_in_row   do      (* Each row has 3 strings in this example *)
                if   reach_file_end   then
                    exit ;   (* Reach file end, exit "for" loop *)
                end_if ;
                tmp_str := '' ;
                tmp_str_len := 0   ;   (* Init string length as 0 *)
                while   tmp_str_len < 255   do     (* Max string length is 255 in ISaGRAF *)
                    TMP := f_eof(file1) ;
                    if   TMP   then
                        (* Reach the end of the file *)
                        reach_file_end := TRUE ;
                        if   tmp_str_len > 0   then
                       (* The current read message is complete , store this string by MSGARY_W() *)
                            str_amount := str_amount + 1 ;
                            TMP := MSGARY_W(str_amount , tmp_str) ;
                            if   ii = amount_in_row   then
                                row_amount := row_amount + 1 ;
                            end_if ;
                        end_if ;
                        if   (row_amount > 0) and ( MOD(str_amount , amount_in_row) = 0 ) then
                            file1_ok := TRUE ;     (* File read successfully *)
                        end_if ;
                        exit ;     (* Exit "while" loop *)
                    end_if ;
                    (* It hasn't reach file end *)
                    tmp_byte := f_read_b(file1) ;   (* Read 1 bytye *)
                    if      (tmp_byte = 0)        (* Wrong string character or f_read_b() fail *)
                        or (tmp_byte = 32)       (* CHAR(32) = ' ' , space *)
                        or (tmp_byte = 9)        (* CHAR(9) = HT , Horizontal Tab *)
                        or (tmp_byte = 44)       (* CHAR(44) = ',' , Comma *)
                        or (tmp_byte = 13)       (* CHAR(13) = CR *)
                        or (tmp_byte = 10)       (* CHAR(10) = LF *)
                    then
                        if   tmp_str_len > 0   then
```


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```
                    (* The current read message is complete , store this string by MSGARY_W() *)
                        str_amount := str_amount + 1 ;
                        TMP := MSGARY_W(str_amount , tmp_str) ;
                        if    ii = amount_in_row    then
                            row_amount := row_amount + 1 ;
                        end_if ;
                        exit ;      (* Exit "while" loop *)
                    end_if ;
                else
                    (* Other character , add it into the tmp_str *)
                    tmp_str := tmp_str + CHAR(tmp_byte) ;
                    tmp_str_len := tmp_str_len + 1;
                end_if ;
            end_while ;
        end_for ;
    end_while ;
    TMP := f_close(file1) ;
  end_if ;

(* If the final result is    file1_ok = TRUE, then the "row_amount" is the total row amount in this
file *)

end_if ;
```

ST2 Program: To get the result of message array.

```
(* Read one message in the MSGARY( addr ) *)
if    get_msg    then
    get_msg := FALSE ;
    msg_val := MSGARY_R( addr ) ;
end_if ;
```

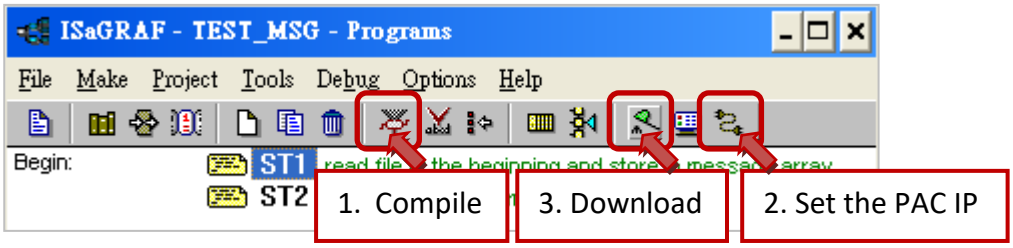

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1.4. Test the demo program

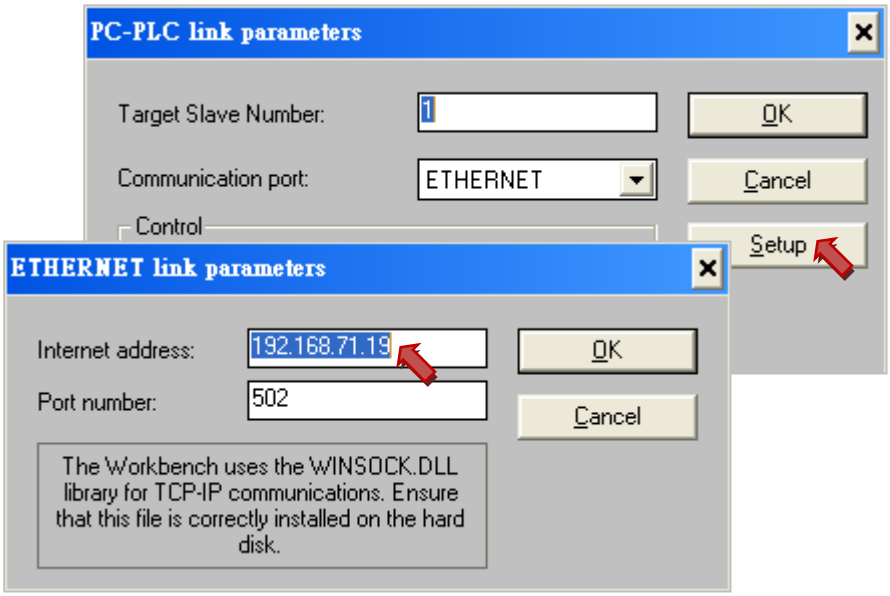
Users must download the ISaGRAF project ("TEST_MSG") to the PAC before test it.

Download the ISaGRAF project:

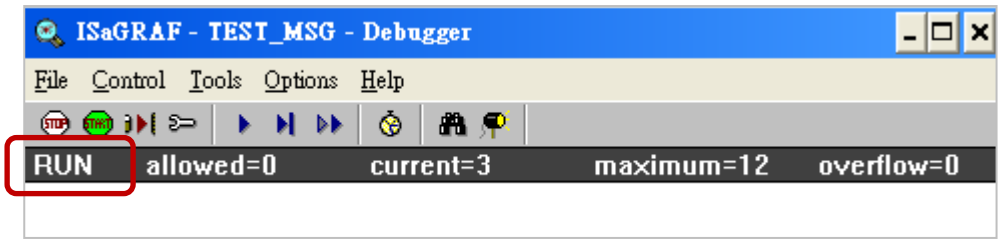
1. Click the menu bar "Make → Make application" or the tool button to re-compile the ISaGRAF project.



2. Click the menu bar "Debug → Link setup" or the tool button to set the download IP (i.e., PAC IP).



3. Click the menu bar "Debug → Debug" or the tool button to download the "TEST_MSG" project. If the process is successful, the "Debugger" window will show as below.



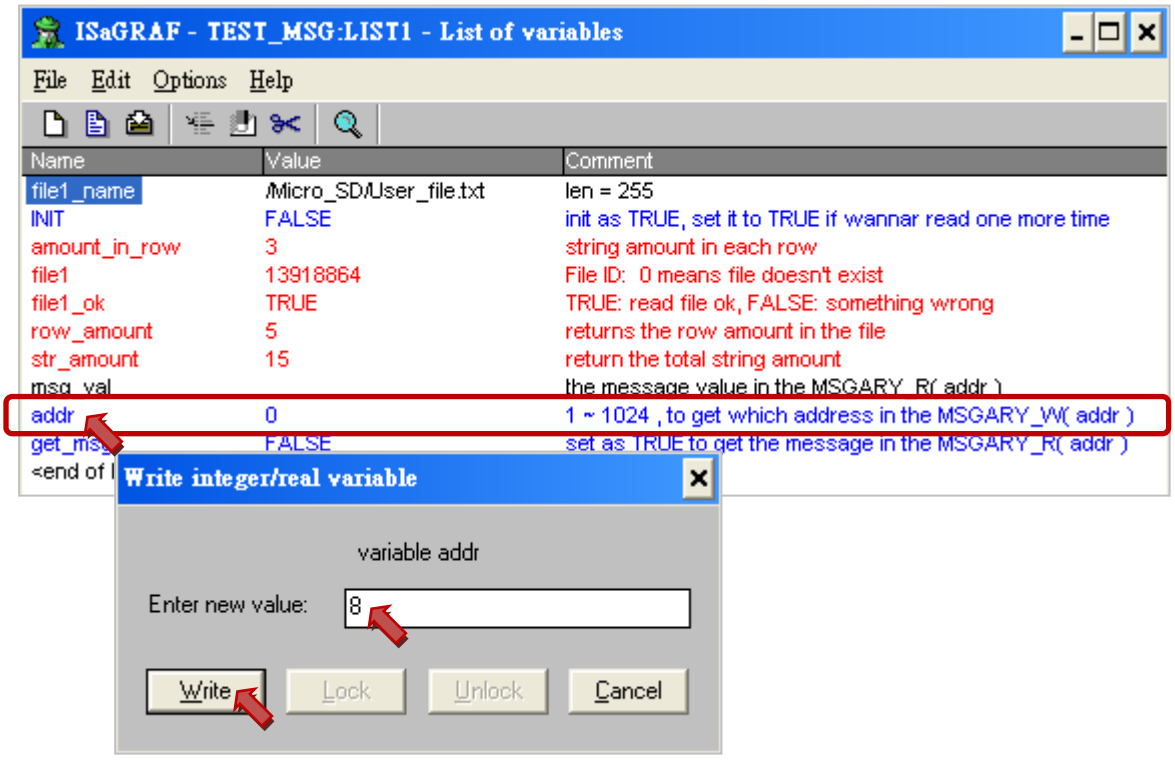
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Test Way:

Users will see the “Spy lists” after downloading the ISaGRAF project (or click “Tools → Spy lists” in the “Debugger” window).

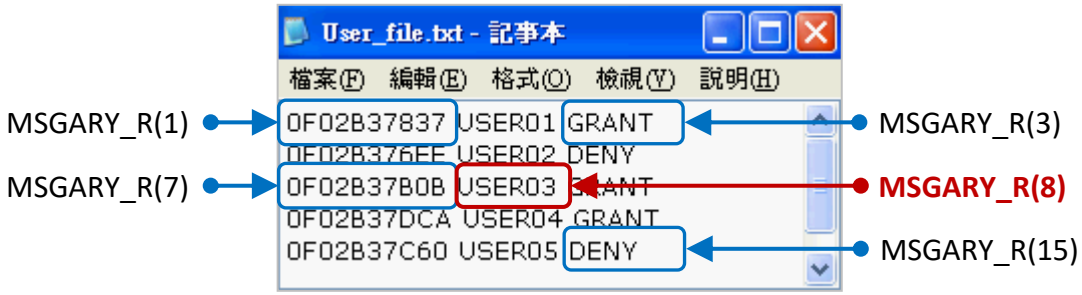
Notice: This project will try to read the data file once while running on a PAC. In this “Spy lists”, If the “file_ok” shows “FALSE” that means error reading from file, verify that the file exists in the specified location (e.g., “\Micro_SD\User_file.txt”) and the file format is correct (e.g., If the “amount_in_row” is specified as 3 that means there are three strings in each row. So, if there are only two strings in a row, it will cause a read error.) After the confirmation, set the "INIT” to “TRUE” to read the file again.

1. Double click the “addr” variable and assign a value (e.g., 8) to read the Nth string in the data file.



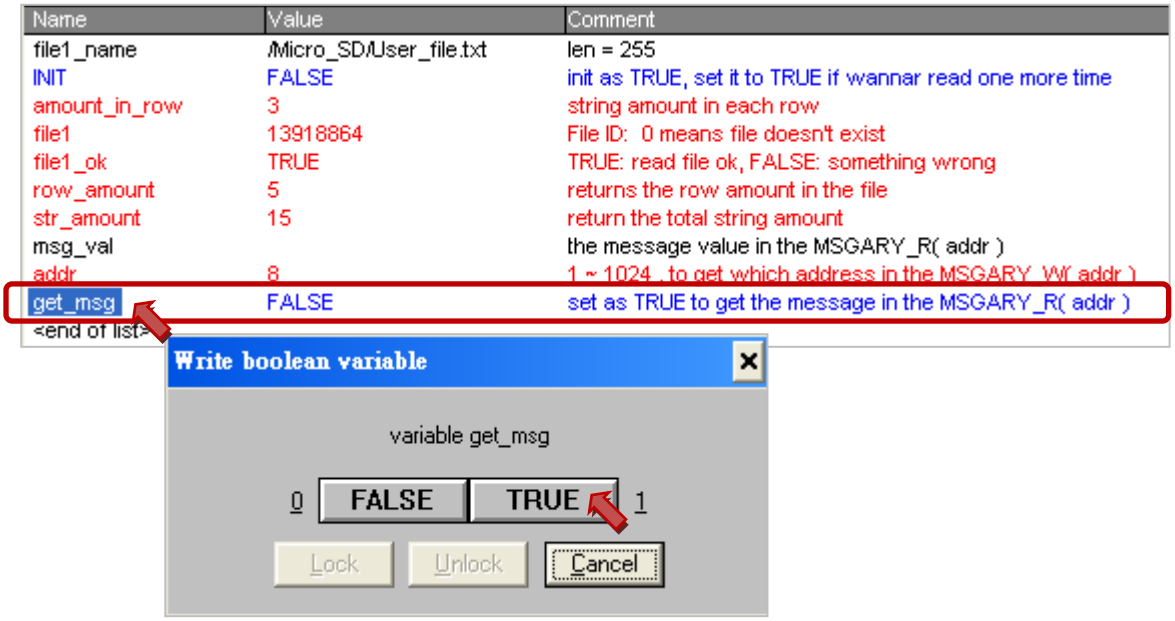
In this “Spy lists”, the value of the “row _amount” is 5 and the value of the “str _amount” is 15 that means there are total five rows and fifteen strings in this data file.

The corresponding sequence of these strings:

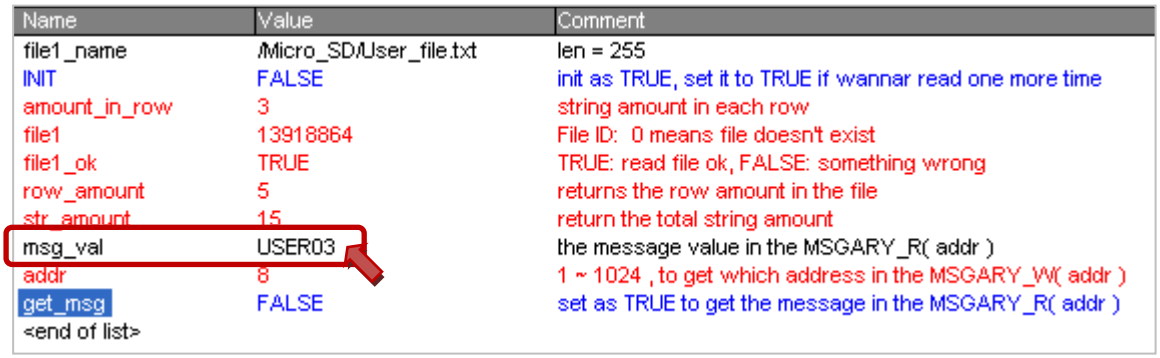


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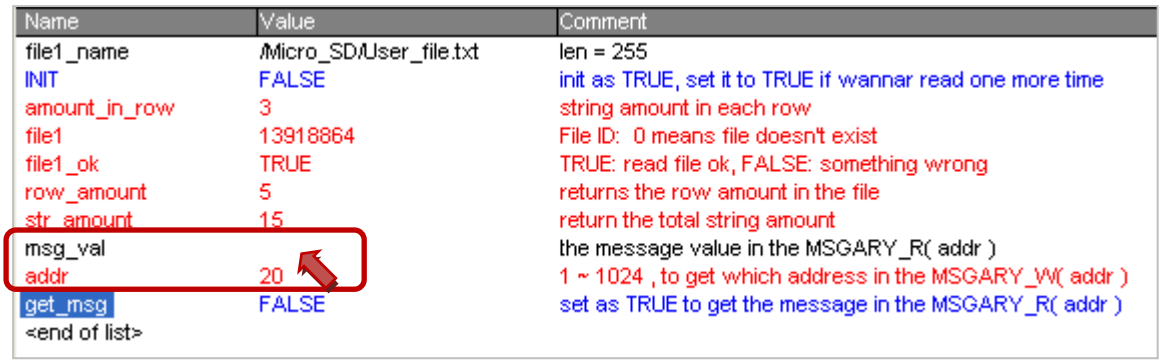
2. Double click the “get_msg” variable to set it as “TRUE” to get the string.
   (Note: It will auto reset to “FALSE”)



3. Now, the return value of the “msg_val” variable is shown as below (e.g., “USER03”)



Note: If the value of the "addr" variable exceeds the total amount of strings (e.g., 20 > 15), It will show null string.



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