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# How to Set up Retain Variables and Data Storage?

### 1.1. Retain Variable

This paper lists the way to use "RETAIN\_VAR", "RETAIN\_ARY", "RETAIN\_FLAG\_GET", "RETAIN\_FLAG\_SET" and "RETAIN\_FLAG\_CLR" Functions. The Win-GRAF PACs are built-in the Retain memory for users to store the retain variable data that will not lose due to the PAC shutdown and can retain the last value at the next time reboot.

Note: Function "Retain\_Var()" or Retain\_Ary() can only be used in the first PAC Cycle or in the Cycle that performs the On-line Change. If use them in other Cycle, it will return "FALSE". If the Retain Variable has not assigned any initial value and the PAC calls the Function, the return value is not meaningful; users need to assign appropriate initial values to all Retain Variables at least once.

This paper provides two demo projects (i.e., demo\_retain.zip and demo\_wp5\_retain.zip). The user can run the Win-GRAF and then click File > Add Existing Project > From Zip in the menu bar to restore the "demo\_retain" project (or refer the FAQ-003).



You can click "Variables" to check/set variables in the Variables window (as the figure below), if you want to know the way of the variable declaration, refer the <u>Win-GRAF Getting Started Manual</u> (Section 2.2.2 and Section 2.3.1).

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						•				
Variables									ΗZ	X
T Name		1	Туре	Dim.	Attrib.	Syb.	Init value	User	Tag	De
	Flobal	variables	Deel			-	r o			^
BOOL	1		BOOL							
BUUL			DINT							
DINT_	2		DINT							
DINT	3		DINT							
INT_A	RY		INT	[09]						
LINT_	1		LINT							
LREA	L_1		LREAL							
on_lin	e_cha	nge_cycle	DINT							
REAL	_1		REAL	10 401						
REAL	_ARY		REAL	20						
tmn h	_aone		BOOL	12700	×	H				~
<pre></pre>	1001		BUUL						>	
NETAI	<b>\_</b>   L/-						5.			
Variable	es ne	A Type	Dim.	Attrib.	Syb.	Init valu	ue User	Tag	Descrip	<b>I</b> X
Variable	es ne RE	A Type	Dim.	Attrib.	Syb.	Init valu	ue User	Tag	Descrip	tion
Variable Variable	es ne RE <sup>1</sup> wVar	TAIN variable		Attrib.	Syb.	Init valu	ue User	Tag	Descrip	tion
Variable Variable Nam Ne	es ne RET wVar	TAIN variable		Attrib.	Syb.	Init valu	ae User	Tag	Descrip	tion
Variable Variable Nam Ne	es ne ₩Var	TAIN variable		Attrib.	Syb.	Init valu	ue User	Tag	Descrip	tion
Variable Nam Ne	es ne ∎ RE wVar	AG_CER Tu TAIN variable BOO	Dim.	Attrib.	Syb.	Init valu	ue User	Tag	Descrip	tion
Variable Variable Nam Ne	es ne RE <sup>-</sup> wVar	TAIN variable		Attrib.	Syb.	Init valu	ae User	Tag	Descrip	tion
Variable Variable Nam Ne	es ne RE <sup>T</sup> wVar	A Type TAIN variable BOO		Attrib.	Syb.	Init valu	ue User	Tag	Descrip	tion
Variable Variable Nam Ne	es ne ₩Var	AG_CER TU TAIN variable BOO		Attrib.	Syb.	Init valu	ие User	Tag	Descrip	tion
Variable Name Ne	es ne RE <sup>-</sup> wVar	TAIN variable		Attrib.	Syb.	Init valu	ue User	Tag	Descrip	tion
Variable Variable Ne	es ne wVar	AG_CER TU TAIN variable BOO		Attrib.		Init valu	ae User	Tag	Descrip	tion
Variable Nam Ne	es ne ₩Var	TAIN variable		Attrib.	Syb.	Init valu	Je User	Tag	Descrip	tion
Variable Variable Ne	es ne RE <sup>T</sup> wVar	AG_CER Tu TAIN variable BOO		Attrib.	Syb.	Init valu	ue User	Tag	Descrip	tion
Variable Nam Ne	es ne ₩Var	AG_CER TU TAIN variable BOO		Attrib.		Init valu	ae User	Tag	Descrip	tion
Variable Nam Ne	es ne RE wVar	AG_CER TU TAIN variable BOO		Attrib.	Syb.	Init valu	Je User	Tag	Descrip	tion
Variable Nam Ne	es ne ₩Var	AG_CER TU TAIN variable BOO		Attrib.	Syb.	Init valu	Je User	Tag	Descrip	tion
Variable Nam Ne	es ne ₩Var	AG_CER TU		Attrib.	Syb.	Init valu	Je User	Tag	Descrip	tion
Variable Nam Ne	es ne ∎ RE <sup>™</sup>	AG_CER TU TAIN variable BOO		Attrib.	Syb.	Init valu	Je User	Tag	Descrip	tion
Variable	es ne ₩Var	AG_CER TU TAIN variable BOO		Attrib.	Syb.	Init valu	Je User	Tag	Descrip	tion
Variable	es ne ⊋ RE <sup>™</sup>	A Type TAIN variable BOO		Attrib.		Init valu	Je User	Tag	Descrip	tion
Variable	es ne ∎ RE <sup>-</sup> wvVar	AG_CER TU TAIN variable BOO		Attrib.	Syb.	Init valu	Je User	Tag	Descrip	tion

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	2.0 2.	<b>V</b> CI CI CI CI	1.010	Dute	10012010	. uge	0 / 10
1.2. Descript	ion of the "de	emo_ret	ain" Project				
ST Program:							
This demo uses F	unction Retain_	Var() and	Retain_Ary().				
(* "on line c	hange cycle" is (	declared a	as DINT				
(nonezero	means it is in the	e cycle jus	t after doing or	n line cha	ange).		
"retain_don	e" is declared as	s BOOL an	d inited as FAL	SE.	0,		
"tmp_bool"	is declared as B	OOL.					
*)							
an line shere		at Cualada					
on_line_chang	$ge_cycle := G$	etsysinio	(_SYSINFU_CH	ANGE_C	YCLE);		
ii (retain_uui	done - TRUE ·	(* just c	la it one time *	) then			
tmn h	_uone := ntoc , nool := Retain Va	r ( DINT	$1  1 \cdot (* retain)$	/ a DINT v	variable *)		
tmp_s	ool := Retain_Va	ar ( DINT_	2 . 2) :				
tmp_b	ool := Retain_Va	ar ( REAL	1 . 3) : (* retain	a REAL	variable *)		
tmp b	ool := Retain Va	ar ( BOOL	1,4);(* retai	n a BOOL	variable *)		
tmp_b	oool := Retain_Va	ar ( BOOL_	_2 , 5) ;		,		
(* retain 1	.0 elements of a	n INT arra	y variable at re	tain addı	r starting at 6.	*)	
tmp_b	ool := Retain_Ar	y ( INT_A	RY, 6, 10)	;			
(* retain 2	0 elements of a	REAL arra	iy variable at re	tain add	r starting at 1	6. *)	
tmp_b	ool := Retain_Ar	y ( REAL_	ARY, 16, 20);				
tmp_b	ool := Retain_Va	ar ( DINT_	3 , 36) ;				
(* 64-k	oit variable can ι	ise only a	ddr from 10,00	1 to 12,0	00 *)		
tmp_b	ool := Retain_Va	ar(LINT_1	1 ,10001);	(* retain	a LINT variab	le (64-bit) *	·)
tmp_b	ool := Retain_Va	ar ( LREAL	_1 , 10002) ;	(* retain	a LREAL varia	ble (64-bit)	*)
end_if ;							

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1.3. Introduction of the Retain_xxx Functions									
1.3.1. RETAIN_VAR (Retain a Variable)									
L F	RETAIN_VA	R	Tinci						
□Na	ime	QD	Press "F1"	" kev to s	see more deta	ails.			
□Ad	ldr			-,					
Name: A variable name (DO NOT use Array variable or String). Variable type can be BOOL, SINT, USINT, BYTE, INT, UINT, WORD, DINT, UDINT, DWORD, REAL, TIME, LINT or LREAL.									
<b>Addr:</b> Data Type: DINT. The address number for retaining the variable, can be 1 to 12,000.									
<b>Q:</b> Data Type: BOOL. TRUE: Ok; FALSE: Error.									
Note:									

- One Addr can accept only one variable (or one element of the array).
   DO NOT assign the same Addr to two variables (or more), or the Retain Value will be wrong.
- 2. 64-bit data type (LINT or LREAL) can use only the Addr No. from 10,001 to 12,000.
- 3. Other data type (BOOL, SINT, USINT, BYTE, INT, UINT, WORD, DINT, UDINT, DWORD, REAL or TIME) can use the Addr No. from 1 to 12,000.

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1.3.2. RETAIN	N_ARY (Retain a ETAIN_AR me[] dr n	an Array V Y Q	ariable) <u>Tips:</u> Press '	"F1" key	to see more d	letails.	
Name[]: An ARRAY vari Variable type LINT or LREAL Addr: Data Type: DII	iable name (DO can be BOOL, SI NT. The starting	NOT use S NT, USINT address n	String). , BYTE, INT, UI	NT, WOR	D, DINT, UDIN e array variabl	NT, DWORI e; can be 1	D, REAL, TIME, 1 to 12,000.
<b>Num:</b> Data Type: Dll	NT. The amount	of elemer	nts in the Array	v variable	e to be retaine	ed.	
For example: If there are 10 than 100 that	0 elements in a is not correct.	n Array va	riable, set "Nu	m" to "1	to 100" is cor	rect, but if	set it more
If there are 5 e that is not cor	elements in an <i>i</i> rect.	Array varia	ble, set "Num'	' to "1 to	5" is correct,	but if set i	t more than 5
<b>Q:</b> Data Type: BC	OL. TRUE: Ok; F	ALSE: Errc	or.				
Note: 1. One Addr ca DO NOT ass	an accept only c ign the same Ac	one variabl ddr to two	e (or one elem variables (or n	ient of ar nore), or	ray). the Retain Va	llue will be	e wrong.

3. Other data type (BOOL, SINT, USINT, BYTE, INT, UINT, WORD, DINT, UDINT, DWORD, REAL or TIME) can use the Addr No. from 1 to 12,000.

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### 1.3.3. RETAIN\_FLAG\_SET/GET/CLR (Set/Get/Clear the Retain Flag)

### How to Use:

The "Retain Flag" is a flag (TRUE/FALSE) stored by users in the retain memory. Users can set this retain flag to indicate "All retain data has been assigned a proper value before". When a PAC starts without setting a proper value to retain variable before, the data of the retain variable read from the retain memory is not correct (it is normally a strange value). So users have to assign proper value to all retain variable at least once to let the application work well. Then after user can call the "Retain\_Flag\_Set()" to set the retain flag. It means "All retain data has been assigned a proper value". To get the state of the Retain Flag, please call "Retain\_Flag\_Get()". To clear the state of the Retain Flag, please call "Retain\_Flag\_Clr()".

### ST Program:

```
(* "on line_change_cycle" is declared as DINT
  (nonezero means it is in the cycle just after doing on line change).
   "retain done" is declared as BOOL and inited as FALSE .
   "tmp bool", "retain flag" and "to set flag" are declared as BOOL.
 *)
  on line change cycle := GetSysInfo ( SYSINFO CHANGE CYCLE);
  if (retain done = FALSE) or (on line change cycle <> 0) then
      retain done := TRUE; (* just do it one time *)
      tmp bool := Retain Var( DINT 1, 1); (* retain a DINT variable *)
      tmp bool := Retain Var( DINT 2, 2);
      tmp_bool := Retain_Var( REAL_1 , 3) ; (* retain a REAL variable *)
      tmp bool := Retain Var( BOOL 1, 4); (* retain a BOOL variable *)
      (* ... After doing all the Retain Functions ... *)
      retain flag := Retain Flag Get();
      if (retain_flag = FALSE) then
   (*If Retain variable does not set up any proper value, you can do some proper operation here. *)
         (* ... *)
      end if;
  end if;
    (* When all Retain variables are assigned proper values, remember to set the "to set flag" to
       "TRUE" for calling "Retain_Flag_Set() once, so that, when next time you use the
       "Retain Flag Get()", it can return "TRUE".
    *)
   if (to set flag = TRUE) then
       to set flag := FALSE ;
       tmp bool := Retain Flag Set();
   end if;
```



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# 1.4. Retain Variable (Using files)

You can refer the following demo project (demo\_wp5\_retain.zip) to use retain variables with files in the \System\_disk\Win-GRAF\ .

You can run the Win-GRAF and then click Execute File> Add Existing Project > From Zip in the menu bar to restore the "demo\_wp5\_retain" project (or refer the FAQ-003). This project includes an ST program (Main) and 3 ST sub-programs (load\_retain, save\_retain and Go\_retain).



# Limitation :

This project is not good at handling Retain variables which value changes frequently. For example, value changed about every second or every minute. That is because these retain values of this project are saved within files in the \System\_Disk. The file operations in it consume more CPU time, which will slow down the PAC performance if retain value changed frequently.

The "demo\_wp5\_retain" project has the following default values. Please set your own proper initial values.

MAX\_VAR\_REAL:100(Max. amount for retaining REAL variables)MAX\_VAR\_OTHER:100(Max. amount for retaining integer+Bool+Timer variables)

The <u>dim</u>ension of "**REAL\_**VAR\_now" and "**REAL\_**VAR\_old" (i.e., [0..99]) must the same with the value of "MAX\_VAR\_**REAL**" (i.e., 100).

The <u>dim</u>ension of "**OTHER\_**VAR\_now" and "**OTHER\_**VAR\_old" (i.e., [0..99]) must the same with the value of "MAX\_VAR\_**OTHER**" (i.e., 100).

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#### Note:

The bigger the value of the **MAX\_**VAR\_REAL and **MAX\_**VAR\_OTHER, the larger the PAC cycle time will be. So it is better to declare just fine value for the MAX\_VAR\_REAL and MAX\_VAR\_OTHER.

This project declares the following variables for demo purpose only. Please re-declare your own variables.

My_REAL_00	~	My_REAL_07	(Data Type: REAL)
My_DINT_00	~	My_DINT_05	(Data Type: DINT)
My_BOOL_00	~	My_BOOL_02	(Data Type: BOOL)
My_Timer_00	~	My_Timer_05	(Data Type: TIME)

You can see more variables in the "Variables" window.

Variables							₩ 12 ×
🍸 Name	Туре	Dim.	Attrib.	Syb.	Init value		Description
🖻 🚮 Global variables							
MAX_VAR_REAL	DINT		Read Only		100		Max. amount of REAL variables
MAX_VAR_OTHER	DINT		Read Only		100	The "Dim." must	Max. amount of (Integer + Bool + Timer) vai
REAL_VAR_now	REAL	[099]				he the same	Dim must = MAX_VAR_REAL
REAL_VAR_old	REAL	[099]				be the sume.	Dim must = MAX_VAR_REAL
OTHER_VAR_now	DINT	[099]					Dim must = MAX_VAR_OTHER
OTHER_VAR_old	DINT	[099]	ſ				Dim must = MAX_VAR_OTHER
File_Path1	STRING(64)				'System_	_Disk\Win-GRAF\retain_real.txt'	
File_Path2	STRING(64)				'System_	_Disk\Win-GRAF\retain_other.txt'	
My_REAL_00	REAL				200 000		
My_REAL_01	REAL						
My_REAL_02	REAL				Tł	ne directory and files for	or all Retain variables.
My_REAL_03	REAL					,	
My_REAL_04	REAL						·
<							>

"Go\_retain" sub-program is used to do the retain operation. Remember to modify this sub-program. There are 4 sections should to be modified in it. Please search "Add your REAL variables for retain here" and "Add your integer, BOOL, Timer variables for retain here", and depend on your re-declared variables to modify your "Go\_retain" sub-program.

#### (\* Add your REAL variables for retain here \*)

/* *	٤)
My_REAL_00 := REAL_VAR_now[0] ;	'
My_REAL_01 := REAL_VAR_now[1] ;	
My_REAL_02 := REAL_VAR_now[2] ;	
My_REAL_03 := REAL_VAR_now[3] ;	
My_REAL_04 := REAL_VAR_now[4] ;	
My_REAL_05 := REAL_VAR_now[5] ;	
My_REAL_06 := REAL_VAR_now[6] ;	
My_REAL_07 := REAL_VAR_now[7] ;	
(* *	•)

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	1			1	1	J -	, -
PPV *)	vour integer BC	OI Time	r variables for	rotain he	aro *)		
(*	your integer, be	JOL, TIME	*)	retain no			
My DI	NT 00 := OTHER	VAR nov	w[0];				
,_ My Di	NT 01 := OTHER	VAR nov	w[1];				
My_DI	NT_02 := OTHER	 VARnov	w[2];				
My_DI	NT_03 := OTHER	_VAR_nov	w[3] ;				
My_DI	NT_04 := OTHER	_VAR_nov	w[4] ;				
My_DI	$NT_{05} := OTHER$	_VAR_nov	w[5] ;				
IVIY_BC	$OL_00 := Any_to$		JIHER_VAR_NO	)W[6]);			
IVIY_BC	$OL_01 := Any_t$		THER VAR_NO	JW[7]);			
WIY_BC	$OL_02 = Any_0$			σνιο]),			
My Tir	ner 00 := Any to	o TIME( C	OTHER VAR no	ow[9] ) ;			
My_Tir	ner_01 := Any_t	o_TIME( C	DTHER_VAR_nc	w[10]);			
My_Tir	mer_02 := Any_t	o_TIME( C	DTHER_VAR_nc	w[11] ) ;			
My_Tir	mer_03 := Any_t	o_TIME( C	DTHER_VAR_nc	w[12] ) ;	;		
My_Tir	ner_04 := Any_t	o_TIME( C	DTHER_VAR_nc	ow[13] ) ;			
My_Tir	mer_05 := Any_t	o_TIME( C	DTHER_VAR_nc	ow[14] ) ;			
(*		•••••	*)				
(* ^ dd v	our PEAL variab	los for rot	tain horo *)				
(*			*)				
REAL \	/AR now[0] :=	My REAL	. 00 ;				
REAL \	/AR now[1] :=	My REAL	. 01;				
 REAL_\	/AR_now[2] :=	My_REAL	02;				
REAL_\	/AR_now[3] :=	My_REAL	03 ;				
REAL_\	/AR_now[4] :=	My_REAL	04 ;				
REAL_\	/AR_now[5] :=	My_REAL	05 ;				
REAL_\	/AR_now[6] :=	My_REAL	06 ;				
REAL_\	/AR_now[7] :=	My_REAL	07 ;				
(*			*)				
(* Add v	our integer BO	OI Timer	variables for r	otain hoi	ro *)		
(*	our integer, bo		*)	ctum nei	(, )		
OTHER	VAR now[0]	:= My DIN	NT 00;				
OTHER	VAR now[1]	:= My DIN	NT 01;				
OTHER		:= My_DIN	NT_02;				
OTHER	_VAR_now[3]	:= My_DIN	NT_03 ;				
OTHER	_VAR_now[4]	:= My_DIM	NT_04;				
OTHER	_VAR_now[5]	:= My_DIM	NT_05;				
		·_ ۸ + -					
OTHER		$:= Any_to$		$OL_00);$	;		
		$= AIIY_tO$	_ איז אווע 1001 ( 1019_10				
UITER	_vAN_NUW[0]	Any_to	_ אין ואוע_DU	UL_UZ ) ;	,		
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	OTHER_VAR_now[9] := Any_to_DINT( My_Timer_00 ); OTHER_VAR_now[10] := Any_to_DINT( My_Timer_01 ); OTHER_VAR_now[11] := Any_to_DINT( My_Timer_02 ); OTHER_VAR_now[12] := Any_to_DINT( My_Timer_03 ); OTHER_VAR_now[13] := Any_to_DINT( My_Timer_04 ); OTHER_VAR_now[14] := Any_to_DINT( My_Timer_05 ); (**)										
Test Pro Before t PAC (ref the PAC at the b	<b><u>oject:</u></b> testing fer the , all va egging	g, ma ≥ <u>Wi</u> alue g.	ake sure you ha <u>n-GRAF Getting</u> s in the Spy list	ive already <u>Started M</u> (refer the	y set up the PA( <u>Aanual</u> - Sectior <u>Win-GRAF Use</u>	C IP and o n 2.3.4 ar <u>r Manual</u>	compile/down nd Section 2.3 - Section 11.	nload the 3.5). Afte 3) will be	e project into the r connecting with e "0" (or "FALSE") value is changing		
r (	The "S rapidly (Becau	ave y (e. ise t	_file_counter" v g., to write seve :o write into file	will show t eral times es frequent	every second/n tly in the "\Syst	ninute.), em_disk	it is not suita " will reduce	ble for th	effectiveness.).		
r <del>iotei</del> (	rapidly (Becau	iave γ (e. Jse t	_file_counter" v g., to write seve :o write into file	will show t eral times es frequent	every second/n tly in the "\Syst	ninute.), em_disk	it is not suita " will reduce	ble for th the PAC	nis application effectiveness.).		
r <del>iotei</del> (	i he "S rapidly (Becau	ave γ (e. Jse t	_file_counter" v g., to write seve to write into file	will show t eral times es frequent S 🙆 🖻 S	every second/n tly in the "\Syst	ninute.), rem_disk	it is not suita " will reduce " ?? ## # "	ble for th	nis application effectiveness.).		
(	The "S rapidly (Becau	ave y (e. use t	_file_counter" v g., to write seve to write into file the sevents of the sevents to write into file to write into file to write into file	will show t eral times es frequent © 🏠 🖻 §	every second/n tly in the "\Syst	ninute.), em_disk	it is not suita " will reduce " <b>%                                   </b>	ble for th the PAC	nis application effectiveness.).		
(	The "S rapidly (Becau	ave γ (e. use t	_file_counter" v g., to write seve to write into file With the seve save_file_counter My_REAL_00	will show t eral times es frequent © 🙆 🖻 S Value 0 0.0	every second/n tly in the "\Syst	ninute.), rem_disk N Cycle Last= Allow Maxin Overfi	it is not suita " will reduce " <b>№</b> ## <b>₽ ■</b> time (ms): a ed =0 hum = 13 kw = 0	ble for th the PAC	nis application effectiveness.).		
(	rapidly (Becau	iave y (e. use t	_file_counter" v g., to write seve to write into file million file mil	will show t eral times es frequent © 🔏 🖻 § Value 0 0.0 0.0	ne number of t every second/n tly in the "\Syst	ninute.), rem_disk	it is not suita " will reduce " " <b>Will reduce</b> " <b>Will reduce</b> <b>Will reduce</b> <b>Will reduce</b> <b>Will reduce</b> <b>Will reduce</b> <b>Will reduce</b>	ble for th the PAC	nis application effectiveness.).		
(	i he "S rapidly (Becau	iave y (e. use t	_file_counter" v g., to write seve to write into file mile	Will show t eral times s frequent Value 0 0.0 0.0 0.0	ne number of t every second/n tly in the "\Syst	ninute.), rem_disk Cycle Last= Allow Maxin Verf Local V14-	it is not suita " will reduce " wi	ble for th the PAC	nis application effectiveness.).		
(	i he "S rapidl <sub>y</sub> (Becau	iave y (e. use t	_file_counter" v g., to write seve to write into file With the seve so write into file With the seve MewSpy1.spl Name Save_file_counter My_REAL_00 My_REAL_01 My_REAL_02 My_REAL_03 Wy_REAL_03	Will show t eral times es frequent Value 0 0.0 0.0 0.0 0.0 0.0	every second/n tly in the "\Syst	ninute.), em_disk Cycle Last= Abov Maxin Ver Local V14- CRC Target	it is not suita " will reduce " w	ble for th the PAC	nis application effectiveness.).		
(	i he "S rapidly (Becau	ave y (e. use t	_file_counter" v g., to write seve to write into file me Name Save_file_counter My_REAL_00 My_REAL_01 My_REAL_02 My_REAL_03 My_REAL_04 My_REAL_05	will show t eral times es frequent Value 0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	ne number of t every second/n tly in the "\Syst	ninute.), rem_disk Cycle Last = Allow Maxim Local VI4 - CRC Target VI4 - CRC	it is not suita it is not suita " will reduce will reduce will reduce time (ms): a ed = 0 num = 13 low = 0 01/07/2014 - 15:59:4 =16#5f76ea1c application: 01/07/2014 - 15:59:4 =16#5f76ea1c	ble for th the PAC	nis application effectiveness.).		
(	i he "S rapidly (Becau	iave y (e. use t	_file_counter" v g., to write seve to write into file mewSpy1.spl Name Save_file_counter My_REAL_00 My_REAL_01 My_REAL_02 My_REAL_03 My_REAL_05 My_REAL_05 My_REAL_05	will show t eral times es frequent Value 0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	ne number of t every second/n tly in the "\Syst	ninute.), rem_disk rem_disk V Last= Last= Vi4- CRC Target Vi4- CRC RAM	it is not suita " will reduce " will reduce" " will reduce " will reduce" " will reduce " will reduce" " will redu	ble for th the PAC	nis application effectiveness.).		
(	i he "S rapidl <sub>\</sub> (Becau	iave y (e. use t	_file_counter" v g., to write seve co write into file with magnetic seve seve_file_counter My_REAL_00 My_REAL_01 My_REAL_02 My_REAL_03 My_REAL_04 My_REAL_05 My_REAL_06 My_REAL_06 My_REAL_07	will show t eral times es frequent Value 0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	ne number of t every second/n tly in the "\Syst	ninute.), rem_disk Cycle Last= Allow Maxin Verf Local VI4- CRC Target VI4- CRC Target VI4- CRC Target	it is not suita " will reduce " w	ble for th the PAC	nis application effectiveness.).		
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(	i he "S rapidl <sub>\</sub> (Becau	ave y (e. use t	_file_counter" v g., to write seve to write into file mewspy1.spl Name Save_file_counter My_REAL_00 My_REAL_01 My_REAL_02 My_REAL_03 My_REAL_03 My_REAL_04 My_REAL_05 My_REAL_06 My_REAL_06 My_REAL_07 My_DINT_00 My_DINT_01 My_DINT_01 My_DINT_03 My_DINT_04	will show t eral times es frequent Value 0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	ne number of t every second/n tly in the "\Syst	ninute.), rem_disk Cycle Last= Allow Maxin Verf Local VI4- CRC Target VI4- CRC Target VI4- CRC RAM Elapse	it is not suita it is not suita " will reduce time (ms): application: 01/07/2014 - 15:59:4 =16#5f76ealc application: 01/07/2014 - 15:59:4 =16#5f76ealc =507864 bytes d: 1m3s	ble for th the PAC	nis application effectiveness.).		
(	i he "S rapidl <sub>\</sub> (Becau	ave y (e. use t	_file_counter" v g., to write seve to write into file mewSpy1.spl Name Save_file_counter My_REAL_00 My_REAL_01 My_REAL_02 My_REAL_03 My_REAL_03 My_REAL_04 My_REAL_05 My_REAL_06 My_REAL_06 My_REAL_07 My_DINT_00 My_DINT_00 My_DINT_02 My_DINT_03 My_DINT_04 My_DINT_05	will show t eral times es frequent value 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ne number of t every second/n tly in the "\Syst	ninute.), rem_disk Cycle Last= Allow Maxin Overf Local VI4- CRC RAM Elapse	it is not suita it is not suita " will reduce it is not suita " will reduce it is not suita " will reduce " will reduce	ble for th the PAC	nis application effectiveness.).		
(	i he "S rapidl <sub>y</sub> (Becau	ave y (e. use 1	_file_counter" v g., to write seve to write into file with the intof withe into file wi	will show t eral times es frequent value 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ne number of t every second/n tly in the "\Syst	ninute.), em_disk Cycle Last= Allow Maxin Overf Local Local Uccal V14- CRC RAM Elapse	it is not suita it is not suita will reduce it is not suita will reduce it is ad = 0 num = 13 is a = 0 is a	ble for th the PAC	nis application effectiveness.).		
(	i he "S rapidl <sub>y</sub> (Becau	ave y (e. use 1	_file_counter" v g., to write seve to write into file write into file wri	will show t         eral times         es frequent         es frequent         value         0         0.0         0 <tr< td=""><td>ne number of t every second/n tly in the "\Syst</td><td>ninute.), em_disk Cycle Last= Abov Maxin Over Local V14- CRC Target V14- CRC RAM: Elapse</td><td>it is not suita it is not suita " will reduce will reduce will reduce application: 01/07/2014 - 15:59:4 =16#5f76ealc application: 01/07/2014 - 15:59:4 =16#5f76ealc =507864 bytes d: 1m3s</td><td>ble for th the PAC</td><td>nis application effectiveness.).</td></tr<>	ne number of t every second/n tly in the "\Syst	ninute.), em_disk Cycle Last= Abov Maxin Over Local V14- CRC Target V14- CRC RAM: Elapse	it is not suita it is not suita " will reduce will reduce will reduce application: 01/07/2014 - 15:59:4 =16#5f76ealc application: 01/07/2014 - 15:59:4 =16#5f76ealc =507864 bytes d: 1m3s	ble for th the PAC	nis application effectiveness.).		
(	i he "S rapidl <sub>y</sub> (Becau	ave y (e. use 1	_file_counter" v g., to write seve to write into file me Save_file_counter My_REAL_00 My_REAL_01 My_REAL_02 My_REAL_03 My_REAL_03 My_REAL_03 My_REAL_03 My_REAL_05 My_REAL_06 My_REAL_06 My_REAL_06 My_REAL_07 My_DINT_00 My_DINT_01 My_DINT_01 My_DINT_02 My_DINT_03 My_DINT_03 My_DINT_04 My_DINT_05 My_B00L_00 My_B00L_02	will show t         eral times         es frequent         Image: strength         Image: strengt         Image: strengt	ne number of t every second/n tly in the "\Syst	ninute.), em_disk Cycle Last= Allow Wite Crcc Target VI4- CRC Target VI4- CRC RAM Elapse	it is not suita it is not suita " will reduce time (ms): application: 01/07/2014 - 15:59:4 =16#5f76ealc =507864 bytes d: 1m3s	ble for th the PAC	nis application effectiveness.).		
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(	i he "S rapidl <sub>\</sub> (Becau	ave y (e. use 1	_file_counter" v g., to write seve to write into file mewSpy1.spl Name Save_file_counter My_REAL_00 My_REAL_01 My_REAL_02 My_REAL_03 My_REAL_03 My_REAL_03 My_REAL_04 My_REAL_05 My_REAL_05 My_REAL_06 My_REAL_06 My_REAL_07 My_DINT_00 My_DINT_01 My_DINT_01 My_DINT_02 My_DINT_03 My_DINT_03 My_DINT_04 My_DINT_04 My_DINT_05 My_BOOL_02 My_ROOL_02 My_Timer_00 My_Timer_01 My_Timer_01	will show t         eral times         es frequent         Image: set of the s	ne number of t every second/n tly in the "\Syst g 😬 📷 🚰 RU Description	ninute.), rem_disk Cycle Last= Allow Vid- CRC Target Vid- CRC RAM Elapse	it is not suita it is not suita will reduce it is not suita will reduce it is not suita it is not suit is not suita it is not suita it is not suita it	ble for th the PAC	nis application effectiveness.).		
(	i he "S rapidl <sub>y</sub> (Becau	ave y (e. use 1	_file_counter" v g., to write seve to write into file MewSpy1.spl Name Save_file_counter My_REAL_00 My_REAL_01 My_REAL_02 My_REAL_03 My_REAL_03 My_REAL_03 My_REAL_04 My_REAL_05 My_REAL_06 My_REAL_06 My_REAL_06 My_REAL_07 My_DINT_00 My_DINT_00 My_DINT_01 My_DINT_02 My_DINT_03 My_DINT_03 My_DINT_04 My_DINT_05 My_B00L_00 My_B00L_01 My_B00L_02 My_Timer_00 My_Timer_01 My_Timer_02 My_Timer_02 My_Timer_02 My_Timer_02 My_Timer_02	will show t         eral times         es frequent         es frequent         value         0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0	ne number of t every second/n tly in the "\Syst	ninute.), em_disk Cycle Last= Allow Maxin Verf Local VI4- CRC Target VI4- CRC RAM Elapse	it is not suita it is not suita " will reduce it is not suita " will reduce it is not suita it is not suita " will reduce it is not suita it is not suit is not suita it is not suita	ble for th the PAC	nis application effectiveness.).		
(	i he "S rapidl <sub>y</sub> (Becau	Save y (e. use 1	_file_counter" v g., to write seve to write into file write into file	will show t         eral times         es frequent         es frequent         value         0         0.0	ne number of t every second/n tly in the "\Syst 9 C T T T T T T T T T T T T T T T T T T	ninute.), em_disk Cycle Last= Allow Maxin Over Local V14- CRC Target V14- CRC RAM: Elapse	it is not suita it is not suita " will reduce will reduce with the formation of th	ble for th the PAC	nis application effectiveness.).		

Enter some values at will. When the value has changed, it will create a text file in the PAC (\System\_disk\ Win-GRAF\retain\_real.txt and retain\_other.txt) and Write data to the files.

ICP DAS Co., Ltd. Technical Document

Author       Eva Li       Version       1.0.0       Date       Feb. 2016       Page       12 / 15         Image: Inclusion	Classification	lassification Win-GRAF English FAQ-015								
Windsond and Windsond and Windsond Windsond and Windsond and Windsond Windsond and Windsond and Windsond Windsond Windsond and Windsond and Windsond Windson	Author	Eva Li	Version	1.0.0	Date	Feb. 2016	Page	12 / 15		
檔案(E) 编辑(E) 檢視(Y) 移至(G)          御仕(D) [System_DiskWin-GRAF]         ③ sofgrafy       圖License.bin       ⑤ Quicker.dll       ⑤ QuickerNet.dll         ⑤ retain_other.txt       ⑧ retain_real.txt       ⑤ Soft-GRAF-WGF.exe       圖 t5.cod         ⑧ t5.cod1       ⑤ UserShareNet.dll        Win_GRAF_WP_8000.exe        Win_GRAF_WP_8000.ln	Win-GRAF PAC:	Name Save_fi My_REJ My_REJ My_REJ My_REJ My_REJ My_REJ My_REJ My_DIN My_DIN My_DIN My_DIN My_DIN My_DIN My_DIN My_DIN My_DIN My_DIN My_DIN My_DIN My_DIN My_DIN My_DIN My_DIN My_Tim My_Tim My_Tim	IIII       IIII       IIII       IIIII         oy1.spl       Val.         le_counter       7         AL_00       50.53         t       will increase         AL_03       0.0         AL_04       0.0         AL_05       23.5         AL_06       0.0         AL_07       0.0         AL_07       0.0         IT_03       2014         IT_03       2014         IT_05       0         OL_00       TRU         OL_01       FALS         ot=01       t#1h;         ier_02       t#0s         ier_03       t#0s         ier_05       t#0s	De 39998 117, if it w 16 16 16 16 16 16 16 16 16 16		Cycle time (ms): Last = 4 Allowed = 0 Maximum = 23 Overflow = 0 Local application V14 - 01/07/201 CRC=16#5f76e Target applicatio V14 - 01/07/201 CRC=16#5f76e RAM = 507864 ' Elapsed: 8m8s				
Image: Pertain_other.txt       Image: Pertain_real.txt       Image: Pertain_solution       Image: Pertain_solution </th <th>檔案(E) 編輯(E) ↓ ↓ ♪ ♪ 細址(D) System → sofgrafy</th> <th>檢視(⊻) 移至 く ② DiskWin-GRAF</th> <th>E(G)</th> <th></th> <th>S Quicker.dl</th> <th></th> <th>S Quicker</th> <th>Net.dll</th>	檔案(E) 編輯(E) ↓ ↓ ♪ ♪ 細址(D) System → sofgrafy	檢視(⊻) 移至 く ② DiskWin-GRAF	E(G)		S Quicker.dl		S Quicker	Net.dll		
	🖺 retain_other.txt 🔊 t5.cod1		retain_real.txt ] UserShareNet.d	Ļ	Soft-GRAF	-WGF.exe) _WP_8000.exe	🗟 t5.cod 🎇 Win_GR	AF_WP_8000.lnk		

Classification	Win-GRAF English FAQ-015						
Author	Eva Li	Version	1.0.0	Date	Feb. 2016	Page	13 / 15
1.5. Save Da	ata to EEPR	ROM					
The Win-GRAF P	AC has a bui	lt-in FFPROM I	memory for I	isers to re	ad and write (	data, whic	ch will not lose
lata when the P	AC shut dow	n. Compared 1	to the read a	nd write o	f the SRAM, E	EPROM h	as the followi
disadvantages:							
Note: Some P	AC have no E	EEPROM memo	ory (like the	NP-5238,	WP-5248). Th	ey don't s	upport
EEP_Re	ad() and EEP	_Write().					
Advantages:							
It provides ar	other way to	o save the imp	ortant data,	pesides the	e Retain Varia	ble ( <u>Secti</u>	<u>on 1.1</u> ).
Disadvantages:							
1. The opera	ation to read	/write EEPRON	տ will use mւ	ich more C	PU time (abo	ut 5 ~ 50	ms),
but chang	ging to the w	ay of "Retain v	variable", CPU	J time is m	uch less than	1 ms. The	erefore,
do not us	e the "EEP_R	Read" and "EEP		ctions too	frequently, or	r it will ind	crease
the PAC C	Cycle time.						
2. EEPROM	has a "write"	' limitation (de	epending on t	he PAC), it	t is not suitabl	le to write	e the same
<ol> <li>EEPROM data man</li> </ol>	has a "write" y times. So, I	' limitation (de <b>DO NOT</b> call "E	pending on t EP_Write" F	he PAC), it unction wi	t is not suitabl thin each PAC	le to write Cycle to	e the same do the
<ol> <li>EEPROM data man "write" o</li> </ol>	has a "write" y times. So, <b>I</b> peration.	' limitation (de DO NOT call "E	epending on t EP_Write" F	he PAC), it unction wi	t is not suitabl thin each PAC	le to write Cycle to	e the same do the
<ol> <li>EEPROM data man "write" o</li> </ol>	has a "write" y times. So, <b>I</b> peration.	' limitation (de <b>DO NOT</b> call "E	epending on t EP_Write" F	he PAC), it unction wi	t is not suitabl thin each PAC	le to write Cycle to	e the same do the
2. EEPROM data man "write" o T Program: (I	has a "write" y times. So, <b>I</b> peration. F <b>ollowing wi</b>	' limitation (de DO NOT call "E Il show the sat	pending on t EP_Write" F <b>fe and</b> dange	he PAC), it unction wi rous codir	t is not suitabl thin each PAC ng ways. <b>)</b>	le to write Cycle to	e the same do the
<ol> <li>EEPROM data man "write" o</li> <li>T Program: (I</li> </ol>	has a "write" y times. So, <b>I</b> peration. Following wi	' limitation (de DO NOT call "E Il show the sat	epending on t EEP_Write" Fi fe and dange	he PAC), it unction wi rous codir	t is not suitabl thin each PAC ng ways. <b>)</b>	le to write Cycle to	e the same do the
2. EEPROM data man "write" o 5 <b>T Program:</b> (I (* Declar	has a "write" y times. So, <b>I</b> peration. <b>Following wi</b> e "FIRST_CY(	' limitation (de DO NOT call "E Il show the sat	pending on t EP_Write" Fi fe and dange	he PAC), it unction wi rous codir nd has an	t is not suitabl thin each PAC ng ways. <b>)</b> initial value "	le to write Cycle to TRUE".	e the same do the
2. EEPROM data man "write" o 5 <b>T Program: (</b> I (* Declar Declar	has a "write" y times. So, <b>I</b> peration. <b>Following wi</b> e "FIRST_CY( e "tmp_bool	' limitation (de DO NOT call "E Il show the sat CLE" as a "BOOL" " as a "BOOL"	pending on t EP_Write" Fi fe and dange DL" variable a variable °	he PAC), it unction wi rous codir nd has an	t is not suitabl thin each PAC ng ways. <b>)</b> initial value "	le to write Cycle to TRUE".	e the same do the
2. EEPROM data man "write" o T Program: (I (* Declar Declar	has a "write" y times. So, <b>I</b> peration. Following wi e "FIRST_CYC e "tmp_bool e "New_Val"	' limitation (de DO NOT call "E Il show the sat CLE" as a "BOO " as a "BOOL" ' and "Old_Val	pending on t EP_Write" Find fe and dange DL" variable a variable ° " as "DINT" v	he PAC), it unction wi rous codir nd has an ariables. *	t is not suitabl thin each PAC ng ways. <b>)</b> initial value "	le to write Cycle to	e the same do the
2. EEPROM data man "write" o 5 <b>T Program: (</b> I (* Declar Declar Declar (* Read t	has a "write" y times. So, <b>I</b> peration. Following wi e "FIRST_CYC e "tmp_bool e "New_Val" he EEPROM	' limitation (de DO NOT call "E Il show the sat CLE" as a "BOOL" ' as a "BOOL" ' and "Old_Val' once in the firs	pending on t EP_Write" F fe and dange OL" variable a variable ° " as "DINT" v st Cycle. *)	he PAC), it unction wi rous codir nd has an ariables. *	t is not suitabl thin each PAC ng ways. <b>)</b> initial value "	le to write Cycle to TRUE".	e the same do the
2. EEPROM data man "write" o ST Program: (I (* Declar Declar Declar (* Read t if FIRS	has a "write" y times. So, <b>I</b> peration. <b>Following wi</b> e "FIRST_CYC e "tmp_bool e "New_Val" he EEPROM	' limitation (de DO NOT call "E Il show the sat CLE" as a "BOOL" ' and "Old_Val' once in the firs hen	epending on t EP_Write" Find fe and dange DL" variable a variable ° " as "DINT" v st Cycle. *)	he PAC), it unction wi rous codir nd has an ariables. *	t is not suitabl thin each PAC ng ways. <b>)</b> initial value "	le to write Cycle to TRUE".	e the same do the
2. EEPROM data man "write" o 5 <b>T Program: (I</b> (* Declar Declar Declar (* Read t if FIRS FIRS	has a "write" y times. So, I peration. Following wi e "FIRST_CYC e "tmp_bool e "New_Val" he EEPROM it_CYCLE tl it CYCLE tl	' limitation (de DO NOT call "E Il show the sat CLE" as a "BOOL" ' and "Old_Val' once in the firs hen = FALSE ; (*	pending on t EP_Write" Fi fe and dange OL" variable a variable ° " as "DINT" v st Cycle. *) *means it is r	he PAC), it unction wi rous codir nd has an ariables. * ot the firs	t is not suitabl thin each PAC g ways. <b>)</b> initial value " ) t Cycle any mo	le to write Cycle to TRUE".	e the same do the
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#### 1.5.2. EEP\_WRITE (Write a Value to the EEPROM)



#### Addr: (Data Type: "DINT")

Address, can be 1 to 1200. If the variable type of the "Value" parameter is a 64-bit data (e.g., LINT or LREAL), the "Addr" can be 1001 to 1200 only.

#### Value :

The value to write to the EEPROM.

(DO NOT use string variable. The value type can be BOOL, SINT, USINT, BYTE, INT, UINT, WORD, DINT, UDINT, DWORD, REAL, TIME, LINT, or LREAL.)

Q:

Data Type: BOOL. TRUE: Ok; FALSE: Error.