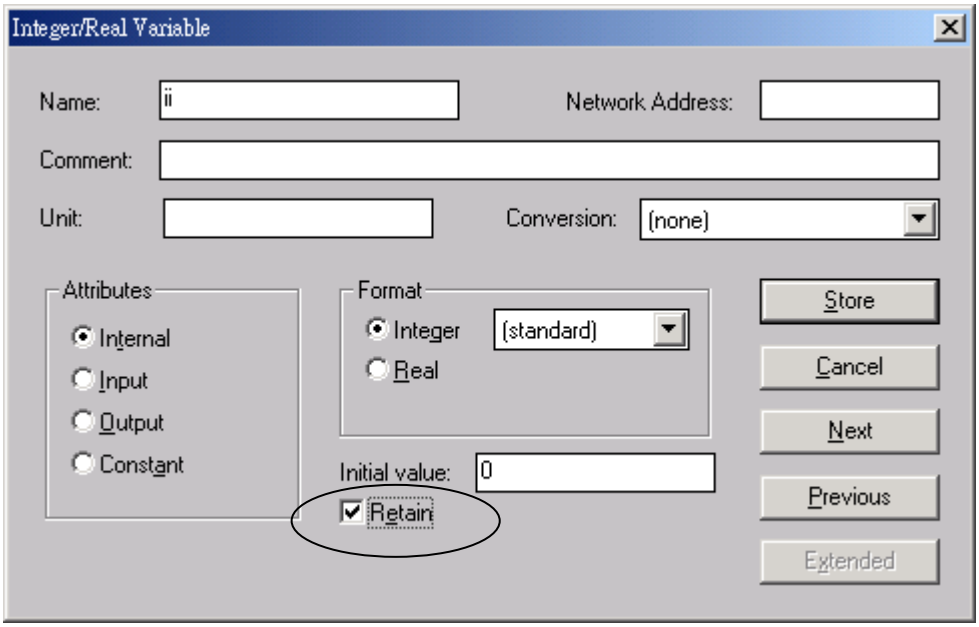
New ISaGRAF retained variable is better than old one?

I-7188EG + X607 or X608: driver ver. 2.05 or later
I-7188XG + X607 or X608: driver ver. 2.04 or later
I-8xx7+ S256 or S512 : driver ver. 3.07 or later
W-8x37+ S256 or S512 : driver ver. 3.17 or later with new Wincon backplane
WB-831 (For 3-slot): Rev 2.6
WB-871 (For 7-slot): Rev 2.8

The old method to use retain variable is to check “Retain” in the ISaGRAF dictionary as below. The retain value keep when power is off. However it has a big disadvantage. The retained value will be lost when download a modified project to the controller.



New retain variable is supported by below functions.

Target 1 : I-7188EG/XG+X607/608, I-8417/8817/8437/8837+S256/512
Target 2 : W-8037/8337/8737+S256/512 with new Wincon backplane

Retain_B : retain Boolean variable.	Target 1: up to 256 variables,	Target 2: up to 1024.
Retain_N : retain Integer variable.	Target 1: up to 1024 variables,	Target 2: up to 4096.
Retain_F : retain Real variable.	Target 1: up to 1024 variables,	Target 2: up to 4096.
Retain_T : retain Timer variable.	Target 1: up to 256 variables,	Target 2: up to 1024.

Retain_X : retain variable by using its Network address

The retain value will keep always whatever power is off, or modifying , re-compiling & download a new ISaGRAF project.

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Example1: (* Set by variable name *)

```
(* To_Retain is declared as an internal boolean variable with initial value as TRUE *)
(* Tmp is declared as an internal boolean variable *)
(* B1 , B2 is declared as internal Boolean variable, Do not check "Retain" *)
(* N1 , N2 is declared as internal Integer variable, Do not check "Retain" *)
(* F1 , F2 is declared as internal Real variable, Do not check "Retain" *)
(* T1 , T2 is declared as internal Timer variable, Do not check "Retain" *)
(* is_fault & fault_type are declared as internal integer *)

(* PC / HMI can request controller fault state & type by Modbus protocol at No.=9999 & 9998 *)

(* to get controller state *)
is_fault    :=    R_MB_ADR(1,9999);          (* 0: Ok , 1: controller fault happens *)

(* controller fault type
    101 : Global fault : project stop running, only HMI/PC can request it by Modbus No. 9999 & 9998
      --- other value is Local fault ---
    102: S_R_R error, invalid REAL value
    103: R_MB_REL error, invalid REAL value
    104: INT_REAL error, invalid REAL value
    105: RETAIN_F error, invalid REAL value
    106: RETAIN_X error, invalid REAL value
    107: Real value divided by 0
    108: Integer value divided by 0
    109: F_READ_F error, invalid REAL value (For Wincon-8x37/8x36 only)
    110: I-87K IO board in slot 0 to 7 not found. *)

fault_type    :=    R_MB_ADR(1,9998);

(* Do action here when    "Local Fault" happens *)
if    is_fault=1    then

   (* Do action here when    "Local Fault" happens *)
   (*      …      *)

   (* Only for Wincon-8x37: Stop program running & reset all output in slot 0 to 7 *)
   (*    tmp := Stop_APL( );    *)
   (* To clear the value in Network address 9999 & 9998 when Local fault happens *)
        tmp :=    W_MB_ADR(1, 9999, 0);
        tmp :=    W_MB_ADR(1, 9998, 0);
end_if;
```


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```
(* To set retained variables when controller is start running *)
  if   To_Retain   then
         To_Retain   :=   False ;     (* Only do it once *)
         Tmp   :=   Retain_B( B1 , 1 ) ;
         Tmp   :=   Retain_B( B2 , 2 ) ;
         Tmp   :=   Retain_N( N1 , 1 ) ;
         Tmp   :=   Retain_N( N2 , 2 ) ;
         Tmp   :=   Retain_F( F1 , 1 ) ;
         Tmp   :=   Retain_F( F2 , 2 ) ;
         Tmp   :=   Retain_T( T1 , 1 ) ;
         Tmp   :=   Retain_T( T2 , 2 ) ;
  end_if ;
  (* After then B1, B2, N1, N2, F1, F2, T1, T2 will be automatically retained in the program *)
```

Example2: (* Set by variable's network address No. *)

```
(* To_Retain is declared as an internal boolean variable with initial value as TRUE *)
(* Tmp is declared as internal boolean variable *)
(* ii is declared as an internal integer *)
(* N01 ~ N10 is declared as internal Integer variable with network address No.
   = 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, Do not check "Retain" *)
(* F01 ~ F10 is declared as internal Real variable with network address No.
   = 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, Do not check "Retain" *)
(* is_fault & fault_type are declared as internal integer *)
(* PC / HMI can request controller fault state & type by Modbus protocol at No.=9999 & 9998 *)

(* to get controller state *)
is_fault : R_MB_ADR(1,9999);        (* 0: Ok ,   1: controller fault happens *)

(* controller fault type
   101 : Global fault : project stop running, only HMI/PC can request it by Modbus No. 9999 & 9998
     --- other value is Local fault ---
   102: S_R_R error, invalid REAL value
   103: R_MB_REL error, invalid REAL value
   104: INT_REAL error, invalid REAL value
   105: RETAIN_F error, invalid REAL value
   106: RETAIN_X error, invalid REAL value
   107: Real value divided by 0
   108: Integer value divided by 0
   109: F_READ_F error, invalid REAL value (For Wincon-8x37/8x36 only)
   110: I-87K IO board in slot 0 to 7 not found.      *)
```


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```
fault_type    :=    R_MB_ADR(1,9998);

(* Do action here when "Local Fault" happens *)
if    is_fault=1    then
   (* Do action here when "Local Fault" happens *)
   (*    …    *)

   (* Only for Wincon-8x37: Stop program running & reset all output in slot 0 to 7 *)
   (*    tmp := Stop_APL( );    *)

   (* To clear the value in Network address 9999 & 9998 when Local fault happens *)
   tmp :=    W_MB_ADR(1, 9999, 0);
   tmp :=    W_MB_ADR(1, 9998, 0);

end_if;

(* To set retained variables when controller is start running *)
if    To_Retain    then
     To_Retain    :=    False ;      (* Only do it once *)
     for    ii    :=    1    to    10    do
          Tmp    :=    Retain_X( 'N' , 2*ii-1 , ii ) ;       (* retained N01 to N10 *)
          Tmp    :=    Retain_X( 'F' , 2*ii+19 , ii ) ;      (* retained F01 to F10 *)
     end_for ;
end_if ;
(* After then N01 to N10 & F01 to F10 will be automatically retained in the program *)
```

Click the link for more ISaGRAF FAQ:
http://www.icpdas.com/en/faq/index.php?kind=280#751

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