IBIS-R+

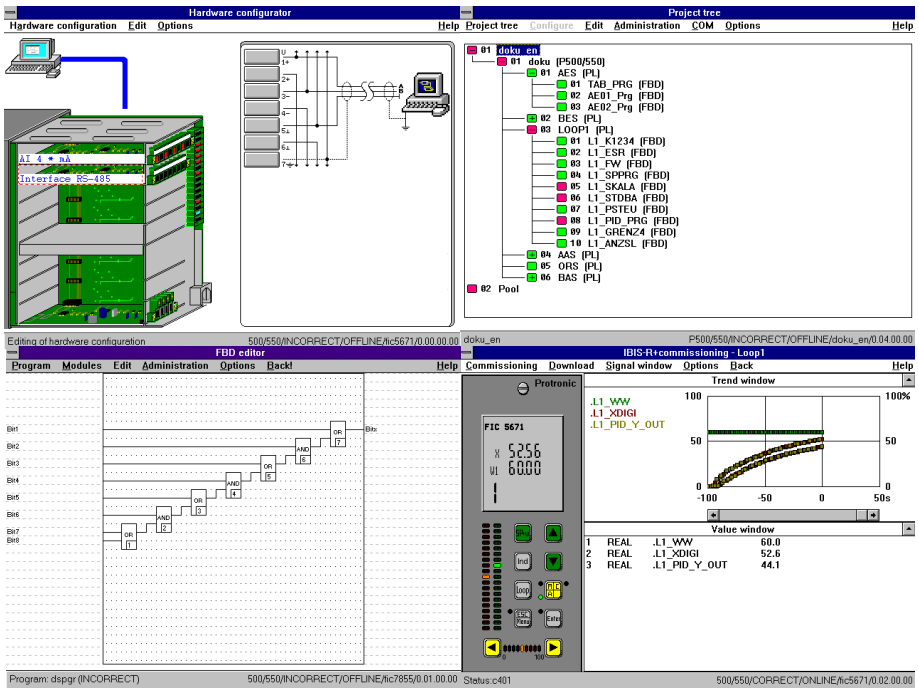
Configuration and parameter setting software for Digitric 500 and Protronic 100 / 500 / 550

since Version 1.00.0360

Supplement to manual

42/62-50030Z2 EN

Rev. 02

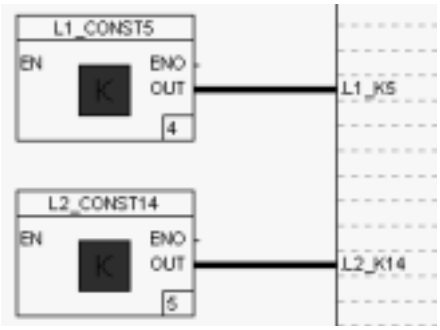


Utilization of the free online parameters K5 to K16

When using the free configuration, the operator is often asked to enter self-defined variables for online parameters. For such application, the free constants K5 to K16 have been supplemented to each control loop in library 3.6.0 for free configurable units. Access to the values of this online parameter is gained by using the constants of the functional module.

To enable this, the name of the module must contain the number of the control loop (e.g. L1_; L2_ etc.) and subsequently after the word CONST the number of the constants (e.g. L1_CONST5; L2_CONST14).

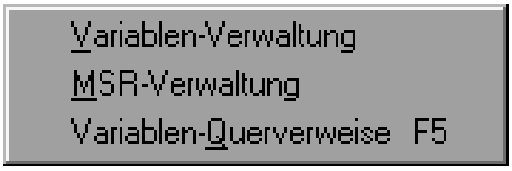
Serving as an example is the illustration of the access to constant K5 in control loop 1 and to constant K14 in control loop 2.



In addition, new predefined variables should also be generated for each control loop to enable a uniform use of the constants. Their names should give clues to their control loop number and the number of contants. All the same, any other variable of the data type REAL can be used. The value of the associated online parameters contains these variables only when the connection to the constants of the function module and the respective module name was effected, as illustrated on the left side, in free configuration.

Cross-reference to variables

In the edition of variables, possible illustration of cross-references for a variable can now also be generated directly in the FBD/AL editor. To enable this, the variable must be selected: pressing the right mouse key or the function key <F5> or *Edit→variables-cross-reference*:



leads to the display of the associated cross-references:

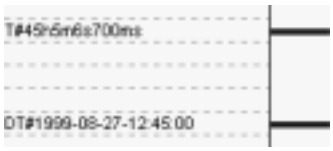
To illustrate the significance of the variable name in the 2nd line see Section on “Foreign-language support”.

This dialog contains a list of all programs, in which the selected variable can be used. The program whose output field contains the variable or which is described with a value carries the identification (:=) after the program name. As usual, every program in question can be called up directly from here.

Notice
There are some default variables which are normally described by the local operation or by the internal program segments of the controller (e.g. .AE01R). Such variables do not carry the (:=)-identification.

Input of constants

The time and date constants can be directly entered into the input field of the FBD editor (Data type DINT). It is no longer necessary to convert to seconds/milliseconds:



In contrast to the real-time module, variables with a time format can contain hours exceeding 23. These values represent relative times.

Time display format:

T#..d..h..m..s..ms

(d = days, h = hours, m = minutes, s = seconds, ms = milliseconds)

The value corresponds to many times more than milliseconds. Individual components can be left out but the sequence in the order of importance must be kept. Examples for possible entries:

T#3d / T#8h15m / T#18h10s / T#2d9h0m15s750ms

Display format for date:

DT#yyyy-mm-dd-hh:mm:ss

(yyyy = year, mm = month, dd = day, hh = hours, mm = minutes, ss = seconds)

The value corresponds to several times that of seconds. Due to the seconds exactitude, it must be borne in mind during comparison with other statements of dates that equality may be given for a duration of just one second.

With the exception of the input for seconds, all components must be stated. It is then that the seconds will be automatically set to 0. Examples for possible inputs:

DT#1999-08-27-12:45 / DT#2000-03-15-08:00:15

These input formats are also available for input into the dialog “Write variables”.

Calculations in the date format

The difference of two absolute dates can be calculated with the existing SUB function for the data type DINT.

The difference of two absolute clock times can be calculated with the SUB function provided for the data type DINT.

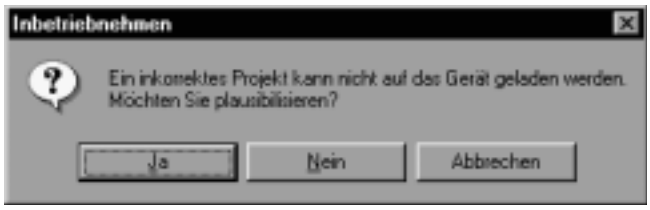
The conversion of a date into a time format, e.g. by using differential calculations, can be effected by multiplying by 1000 for the data type DINT. If necessary, the date value can be checked to see if it is smaller/greater than 2147483 and 0x20C49B respectively. The multiplication produces a result that can be displayed in the DINT format.

In order to convert clock time into a date format, the data type DINT can be divided by 1000. A precheck of the clock time variable is not necessary.

Comparisons such as equalness or the overshooting of date and time inputs can be effected with the provided comparator in the standard group. It is thus possible to obtain binary information for the generation of certain actions at a particular time or on particular days.

Begin of start-up

If start-up is begun with incorrect configuration lists, a dialog shall appear to query if the plausibility check should be called up:



[Yes] calls up the plausibility check in the list configurator

[No] initiated the start-up despite incorrect project, which can then not be downloaded onto the unit

[Abort] aborts the call-up of start-off

Trend and value windows for start-up

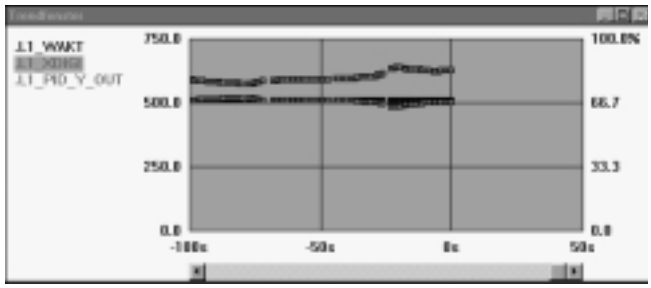
The display formats for time in the value window of DINT variables have been expanded to include “duration” and “time of day”:

Outputs of these formats appear as follows in the order *duration*, *time (HHMMSS)* and *time of day*:

```
4   DINT    .L1_D1      T#6h30m56s789ms
    DINT    .L1_D1      T#06h30m56s
    DINT    .L1_D1      DT#1970-09-29-11:46:29
```

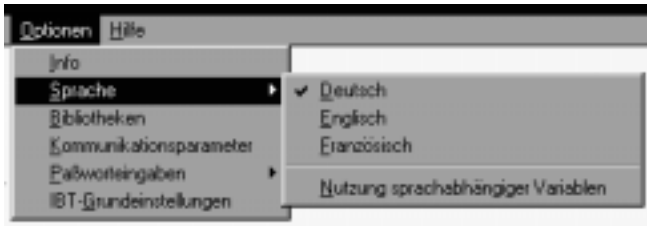
Just as in the case of constant inputs in the input field of the FBD editor, value inputs with the formats *duration* and *time (HHMMSS)* are illustrated by a leading T# and for the *time of day* format by a leading DT#.

The trend window has been expanded to include the display of the physically scaled variables. A click on the name of a variable in the trend window colours the name and duly displays the physical scaling from 0 to 100% on the left side of the time window:



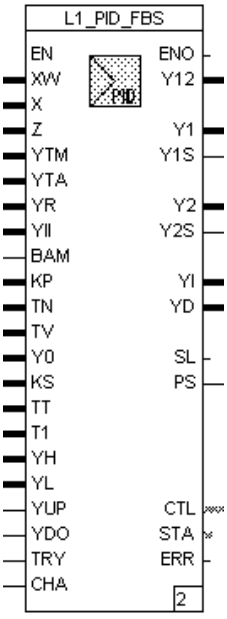
Foreign-language support

As of library 3.6.0 names of default variables can also be stated in English or French. Predefined variable names are stated in the German language. The type of language is selected with *Options →Language→use of language-defined variables* in the project editor:

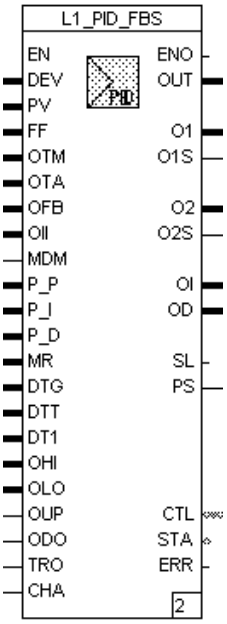


Apart from the names of default variables, pin names of the functional modules can also be changed over to the language in question:

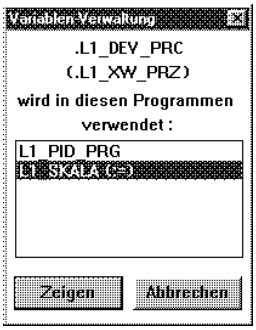
hitherto:



after changeover:



Upon selecting a cross-reference for variable, the name of the originally defined variable is displayed in the second line, if this name differs from that of the selected variable:



The changeover to a different language is enabled by this foreign language support feature only when the project is closed.

“Minimise” and “Close”

The standard operations “Minimise” and “Close” (<Alt> + <F4>) of Windows are featured.

These actions can be executed either via the standard switching field

or via the menu:

The action “Close” can also be implemented by double klicking the program symbol:

The action “Close” (following a storage query) leads to the termination of IBIS-R+ only in the program segment called “Project Management”. In all other program segments, this program part shall be terminated only upon simultaneously activating another appropriate program segment.

Higher VDU resolutions

In addition to the hitherto existing 640 × 480 pixels for screen resolution, higher resolutions are now also possible. In certain cases, display problems can occur as far as variable names in the FBD editor are concerned, especially where fonts are missing or are not installed. In such cases, it may be necessary to use the following list to modify the font adjustments

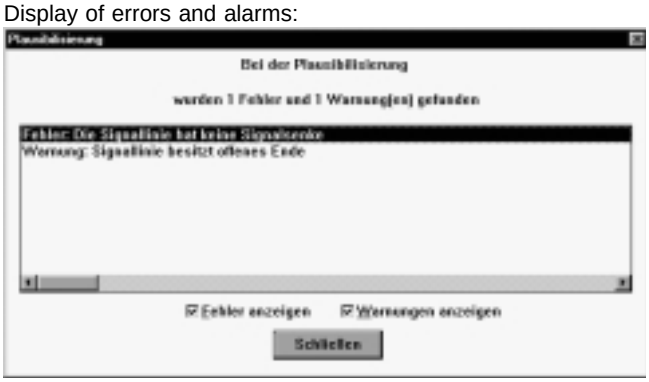
FBSFONT_1600=Courier New
FBSFONT_1280=Small Fonts
FBSFONT_1152=Small Fonts
FBSFONT_1024=Arial
FBSFONT_800=Arial
FBSFONT_640=Small Fonts

in the IBIS_RP.INI file in the Windows directory. Only the character types following the equation signs and existing in the Windows\fonts directory may be used.

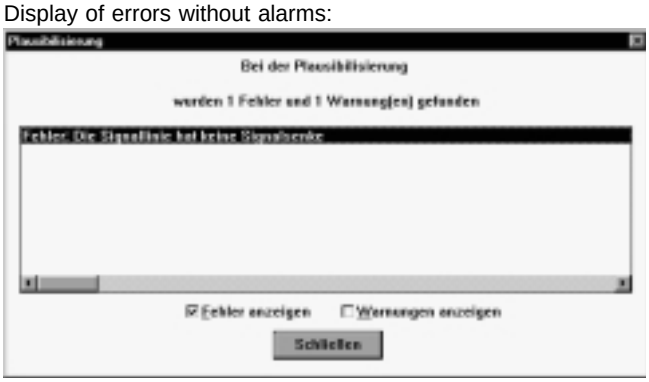
Display of plausibility check information

Plausibility check results can also be displayed in parts, i.e. as errors only or as warnings. To enable this, the corresponding fields in the output window *display errors* or *display warnings* should be selected. The selected setting is always maintained for the next plausibility check.

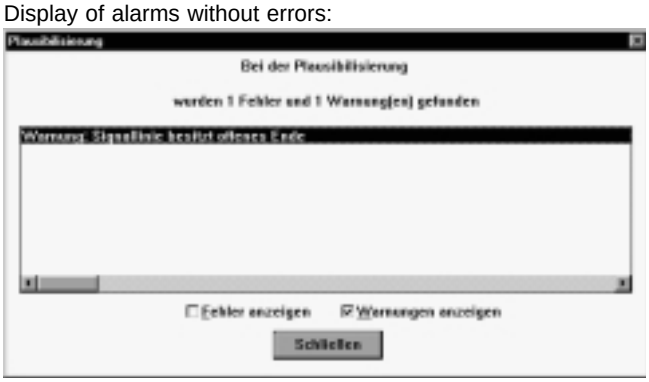
Display of errors and alarms:



Display of errors without alarms:

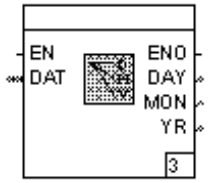


Display of alarms without errors:



D2INT: Date to INT

Icon and module



Library

as of 3.6.0

Function

Breaks down the date in its component parts of day, month, year and makes these available in the outputs.

Inputs

EN	BOOL	according to IEC 61131-3
DAT	DINT	date (in the desired date format) for breakdown

Outputs

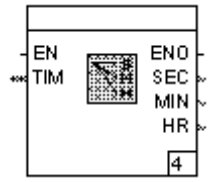
ENO	BOOL	as according to IEC 61131-3
DAY	INT	contains the day of the date of input DAT
MON	INT	contains the month of the date of input DAT
YR	INT	contains the year of the date of input DAT

Parameter definitions

none

T2INT: Time to INT

Icon and module



Library

as of 3.6.0

Function

Breaks down the time in its component parts of seconds, minutes, hours and makes these available in the outputs.

Inputs

EN	BOOL	according to IEC 61131-3
TIM	DINT	time in clock format for breakdown

Outputs

ENO	BOOL	according to IEC 61131-3
SEC	INT	contains the seconds of the clock of the input TIM
MIN	INT	contains the minutes of the clock of the input TIM
HR	INT	contains the hours of the clock of the input TIM

Parameter definitions

none

T_D: Time to Date

Function display

Function

Converts a time element from the clock format (see variable .RTC_ZEIT) into a date in the date format (see variable .RTC_DATUM).

Library

as of 3.6.0

DAY: Date

Function display

Function

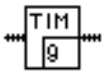
Removes the time component from the date variable at the input. This signal is interpreted as a value in the date format. The result at the output thus remains constant for 24 hours, as long as the date of the real-time clock module remains switched on.

Library

as of 3.6.0

TIM: Time

Function display



Function

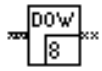
Removes the date component from the date variable set at the initial input. The result thus accepts only a value range of between T#00h00m00s and T#23h59m59s.

Library

as of 3.6.0

DOW: Day of the week

Function display



Library

as of 3.6.0

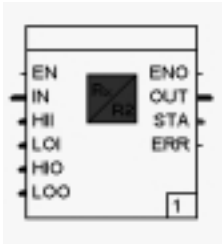
Function

States the weekday of the date variable set at the input as INT.
Codes:

1 Monday
2 Tuesday
3 Wednesday
4 Thursday
5 Friday
6 Saturday
7 Sunday

SKL: Variable range scale

Icon and module



Library

as of 3.6.0

Function

The function module displays an analog signal **IN** of the type REAL in another numerical range and provides this value as a signal at the output **OUT.** For this illustration, a pair of values must be stated for the input and output fields. Should the input value lie outside the measuring range of the input, it must be determined if this value should be kept within the limits or if it should also be effective beyond the limits. The output value would then also be beyond the parameter defined measuring range.

The conversion equation is:

$$Ausgang = \frac{Eingang - MEE}{MEE - MAE} * (MEA - MAA) + MAA$$

MAA Initial value, measuring range
MAE Final value, measuring range output
MEA Initial value, measuring range input
MEE Final value, measuring range

The value of the start of measuring range must be smaller than the end of measuring range at the input and output. Both the value of the measuring range input and measuring range out output can be stated in default as signals or constant parameters.

Inputs

EN	BOOL	according to IEC 61131-3
IN	REAL	input signal for rescaling
MEE	REAL	end of measuring range, input signal
MEA	REAL	start of measuring range, input signal
MAE	REAL	end of measuring range, of output signal
MAA	REAL	start of measuring range, output signal

Outputs

ENO	BOOL	according to IEC 61131-3
OUT	DINT	rescaled signal
STA	INT	error status 0 no error 1 the initial value violated the input measuring range 2 division by 0.0 occurs
ERR	BOOL	error FALSE, if STA = 0 TRUE, if STA <> 0

Parameter definitions

Measuring range input:

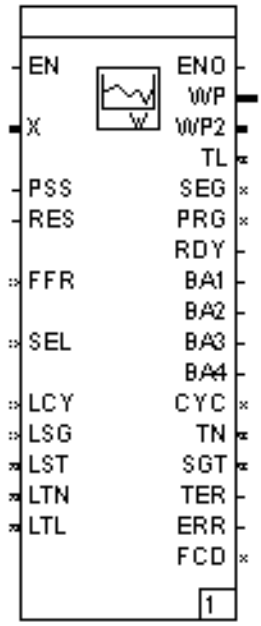
Start of measuring range	lower value of the input signal
End of measuring range	upper value of the ...
Limitation	Limitation of the input signal on the measuring range is utilized.

Measuring range output:

Start of measuring range	lower value of the output signal
End of measuring range	upper value ...

PG2: Programmer 2

Icon and component



Library

as of 3.6.0

Function

This function module provides a programmer for the supply of default set point curves (programs). Up to 10 programs can be predefined. The set point is provided at the output **WP**.

A TRUE signal of the programmer can be initiated via the input **PSS**. The input **SEL** is evaluated at the start. This input predefines the program to be utilized: 1...10. If a fixed program is defined as a parameter, it will not be possible to modify this input.

The set point curve can be reset to original position with a TRUE signal to **RES** by stopping the programmer. On stopping the programmer, it can be switched to quick run or backward run with the input **FFR**. A segment will then complete a cycle in 5 s, irrespective of the segment time defined in the parameter.

For the programmer to continue running from the point of interruption after a power breakdown, its very first run requires: information on the number of loops already completed in **LCY** during the loop cycle runs, the last executed segment in **LSG**, the already expired time in the completed segment in **LST**, the runtime already taken by the entire program without halt/tolerance times in **LTN** and the total runtime of the entire program, including the halt/tolerance times in **LTL**.

Since it is possible to stop set point ramps in accordance with their controlled variable, these ramps can be injected at the input **X**. If this function is activated, it is reported at the output with the setting **TER**.

The total runtime of the programmer is stated with the number of the selected program output **PRG** at the **TL** output in milliseconds. The program segment just used is stated at output **SEG**.

On completion of a full program cycle, the program is identified with a TRUE signal at output **RDY**. Each program segment of a set point curve can be predefined as a binary track for up to four binary signals. These binary signals are provided at outputs **BA1** to **BA4**.

For continuation after power failure, the information required for further execution is provided at the outputs **TL**, **SEG**, **CYC**, **TN** and **SGT**. These should be linked to variables which can be given fairlure-free storage.

Inputs

EN	BOOL	according to IEC 61131-3
X	REAL	controlled variable for tolerance checks
PSS	BOOL	start/stop input. TRUE for Start, FALSE for stop, when RES = FALSE
RES	BOOL	reset input to the start of a program, is only executed when PSS = FALSE
FFR	INT	quicker forward and backward run, when the programmer is stopped 0 programmer stops 1 quick forward run 2 quick backward run
SEL	INT	Number of the selected program. Count from 0 to 9 for programs 1 to 10.
LCY	INT	loop counter prior to power failure
LSG	INT	edited segment prior to power failure
LST	DINT	runtime in the edited segment prior to power failure
LTN	DINT	total runtime without halt/tolerance times prior to power failure
LTL	DINT	total runtime including halt/tolerance times prior to power failure.

Outputs

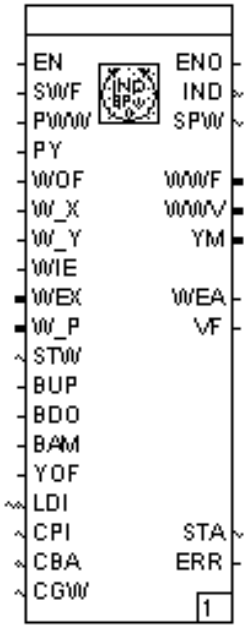
ENO	BOOL	according to IEC 61131-3
WP	REAL	current programmer set point
WP2	REAL	unused
TL	DINT	current total runtime including halt and tolerance times
SEG	INT	currently edited segment
PRG	INT	currently edited program (count from 0 to 9 for programs 1 to 10)
RDY	BOOL	End of program
BA1	BOOL	Binary track 1
BA2	BOOL	Binary track 2
BA3	BOOL	Binary track 3
BA4	BOOL	Binary track 4
CYC	INT	current number of loop editings
TN	DINT	current total runtime without halt/tolerance times
SGT	DINT	current runtime in segment without halt/tolerance times
TER	BOOL	Tolerance function is active
ERR	BOOL	unutilized
FCD	INT	unutilized

Parameter definitions

Program 1 ... Program 10	pressing one of the swithcing fields selects the desired parameter definition mask of the program
Continuation after power failure	upon selection, the programmer starts off from the last point prior to the power failure. Otherwise it starts from very first segment of the selected program.
Selected program	Statement of a set point curve which cannot be entered at the input. Values which can be entered correspond exactly to the possible answers and online parameters of the particular program.

ANZS2: Display loop 2

Icon and module



Library

as of 3.6.0

Function

The function module controls the display and operation of the controlled variable display and the IND display loop. It continues to provide the editor with either the value of the adjusted active set point source or the nominal ratios. Apart from the default elements of the IND display loop, each control loop can display and, if need be, edit 8 free variables of the data type REAL and 2 variables of the data type TIME (display version of the data type DINT).

The next valid set point source is connected via a positive flank at the input **SWF**. The position of the valid set point or controlled variable can be selected via a TRUE signal at the inputs **PWW** and **PY** respectively.

Inadvertent wrongful setting of the set point can be blocked by way of TRUE at the input **WOF**.

The inputs **W_X** and **W_Y** are used for changing over the up to 4 internal set points. If only **W_X** is utilized, the changeover will take place between **W1** and **W2**.

A TRUE signal at input **WIE** switches from the internal to the external set point. In the course of this process, the value connected via input **WEX** is used as an external set point. The use of the active set point is displayed by the function module via TRUE at the output **WEA**.

The input **W_P** is used to connect the default set point of the programmer.

The input **STW** is used for the direct selection of a configured set point source. Upon selecting this source, it is displayed by output **SPW**. If a non-configured set point source is selected, the output **SPW** does not change its value. The values used can be inferred from the output/input list.

The inputs **BUP** and **BDO** are required when making parameter definitions for the remote adjustment of set point or output variable. The speed at a constant pulse is around 100 %/min.

The MANUAL mode of the control loop is manifested to the function module with TRUE at the input **BAM**.

The controlled variable adjustment can be blocked via TRUE at the input **YOF**.

The control loop currently being displayed is connected to the input **LDI** as a figure.

To enable display and execution, this module requires information from the function modules PID universal controller, (PID), mode selector switch (REGBA) and alarms (GW4). Access is gained by connecting the CTL outputs of the modules to the inputs **CPI** (for PID), **CBA** (for REGBA) and **CGW** (for GW4).

The output **IND** shows which entry of the IND display loop shall be displayed on the front panel. The output **SPW** shows the index of the current active set point source (1 = W1, 2 = W2/Vw1, 3 = W3/Vw2, 4 = W4, Vw3, 5 = Wext, 6 = W computer, 7 = W program).

The effective set point is displayed at the output **WWF**, the effective set point ratio is displayed at the output **WWV**.

At the operation status HAND the manual correction value is output at **YM**.

Error states are stated at output **STA**.

In case of an error status unequal to 0, the output **ERR** is set.

Inputs

EN	BOOL	according to IEC 61131-3
SWF	BOOL	switches to the next configured set point source as effective set point
PWW	BOOL	selects the position of the effective set point in the display loop
PY	BOOL	selects the position of the controlled variable in the display loop
WOF	BOOL	blocks inadvertent setting of the set point displacement at TRUE

W_X BOOL switches between W1 and W2 or between W3 and W4 respectively

W_Y BOOL stipulates if W_X changeover between W1 and W2 or between W3 and W4 shall be executed. W1/W2 for FALSE, W3/W4 for TRUE

WIE BOOL switches between internal set point W1 to W4 and external set point for TRUE

WEX REAL external set point

W_P REAL Programmer set point

STW INT direct selection of set point source
- 1 W1
- 2 W2/Vw1
- 3 W3/Vw2
- 4 W4/Vw3
- 5 Wext
- 6 W-Computer
- 7 W-Program

BUP BOOL remote set point adjustment greater

BDO BOOL remote set point adjusment smaller

BAM BOOL mode of operation Manual

YOF BOOL inhibits the output variable adjustment at TRUE

LDI INT displayed loop

CPI INT connection to PID function module

CBA INT connection to the function module mode

CGW INT connection to the alarm value function mode

Outputs

ENO BOOL according to IEC 61131-3

IND INT position of the size of the displayed display loop (see description of variable .INDS_LOOP1)

SPW INT effective set point source
- 1 W1
- 2 W2/Vw1
- 3 W3/Vw2
- 4 W4/Vw3
- 5 Wext
- 6 W-Computer
- 7 W-Programm

WWF REAL effective set point

WWV REAL effective nominal set point during ratio control

YM BOOL output variable at MANUAL

VF BOOL Display of ratio control at FALSE

STA INT Error status:
- 0 no error
- 1 no valid control loop number
- 2 no new position of the IND-display loop found
- 3 access to set pointinformation not possible
- 4 set input circuit is invalid
- 5 invalid variable at the inputs CPI or CBA or CGW during initialisation
- 6 invalid variable at the inputs CPI or CBA or CGW during the cyclical execution

ERR BOOL error
FALSE, if STA = 0
TRUE, if STA <> 0

Parameter definitions

Input switching
Settings of the used input circuits.

Loop-No.
No. of the control loop in which this function module operates.

Alarm value adjustment possibilities
Each of the 4 alarm values can be defined to ensure if it can be adjusted
- during display at the operating level (IND display loop)
- only at the operating and parameter-definition levels or
- if it is not displayed at the operating level but only at the parameter-definition level, and is only there adjustable.

Dimension W
4-letter text on the right side of the value, during display of the set points on the front panel. If USER is stated there, the predefinable text for 'USER': will be reproduced. For 'USER' 4-letter text, which, as a user-defined dimension, is shown to the right of the value displayed on the front panel.

Decimal points W
The number of decimal points to be used for displaying the set points. Both fix and floating decimal point displays are optionally selectable.

Display Xw
To display a control deviation, one can select between a display in % and a display in physical units [EU].

Dimension V
Choice between no statement of dimension, dimension % and a user-defined dimension for illustrating set point and actual ratios. To illustrate the user-defined ratios, the predefinable text stored under 'USER': will be reproduced.

Decimal points V
The number of decimal points to be used to display ratios. Both fix and floating decimal point displays are optionally selectable.

Display V
When using the ratio control feature, one can differentiate between display of the set point/actual value ratio or display of set point/actual value in physical units for digital displays.

Release of the remote adjustment blocked:
No remote adjustment can take place.

only Y (in manual):
in the operation mode MANUAL the output variable can be remote adjusted via the inputs **BUP**, **BDO**.

only W (all operation modes):
in the operation mode AUTOMATIC the set point variable can be remote adjusted via the inputs **BUP**, **BDO**.

W (in Auto), Y (in Manual):
per remote adjustment, it is via the inputs **BUP**, **BDO** that the output variable is changed to MANUAL. The set point is also remotely adjusted to the AUTOMATIC mode via the same inputs.

set point alarms

W1-Min. lower set point alarm

W1-Max. upper set point alarm

V Min. lower alarm of the nominal ratio

V Max. upper alarm of nominal ratio

set point changeover with BE

AUS changeover of the internal set point via **W_X** and **W_Y** is not utilized.

W1-W2

BEx Changeover via **W_X** occurs only between W1 and W2.

W1-W4

BEy Changeover via **W_X** and **W_Y** occur only between W1, W2, W3 and W4.

W_X	**W_Y**	set point
FALSE	FALSE	W1
TRUE	FALSE	W2/Vw1
FALSE	TRUE	W3/Vw2
TRUE	TRUE	W4/Vw3

W int/ext with BE

ACTIVE The input **WIE** is only used for the changeover between the internal and external set point. **WIE** = TRUE switches to the external set point.

OFF The changeover between internal and external set point is not in function.

W-inhibition with BE

ACTIVE The input **WOF** is used to block the set point adjustor. **WOF** = FALSE means adjustor is enabled.

OFF The inhibitor of the set point adjustor is not in function.

W-Tracking

manual

OFF In the MANUAL mode, the efective set point is not traced to the controlled variable.

manual

ON In the MANUAL mode, the effective set point is traced to the controlled variable.

DDC: set point at computer breakdown

W-current the adjusted set point is used as effective set point in case of computer breakdown.

W-Comp. the last computer set point is used as effective set point in case of computer breakdown.

X-current the current controlled variable is used as effective set point in case of computer breakdown.

set point 1

W1 Parameter value of the first set point W1.

AUS set point W1 is not in function.

ON set point W1 is in function.

follows

active W set point W1 is in function and if a different set point source is used, this value will be traced to it.

Type W1

no para-

meters: The value of set point W1 is not set via the parameter variable but via the local operator only.

Parameter The set point value W1 is only set via the parameter variable.

set point 2 / Vw1

W2 Parameter value of the second set point W2 and ratio set point Vw1 respectively.

OFF W2 / Vw1 not utilized.

ON W2 / Vw1 utilized.

Parameter The value for W2 / Vw1 is set via the parameter value only.

delta

Parameter The variable is added as delta to W1 for the calculation of the new set point.

Vw1

follows

active

ratio In the case of ratio control, Vw1 is tracked to the current ratio, if a different source is used for the set point ratio.

set point 3 / Vw2

W3 Parameter value of the third point W3 and the ratio set point Vw2 respectively.

OFF W3 / Vw2 is not utilized.

ON W3 / Vw2 is utilized.

Parameter The value for W3 / Vw2 is only set via the parameter value.

delta

Parameter The value is added to W1 as delta for the calculation of the new set point.

set point 4 / Vw3

W4 Parameter value of the fourth set point W4 or of the ratio set point Vw3 respectively.

OFF W4 / Vw3 is not utilized.

ON W4 / Vw3 is utilized.

Parameter The value for W4 / Vw3 is only set via the parameter value.

delta

Parameter The value is added to W1 as delta for the calcullation of the new set point.

W-Extern

OFF No external set point is utilized.

ON An external set point is utilized.

W-Computer

OFF The set point (via interface) of a higher-level computer is not utilized.

ON The set point (via interface) of a higher-level computer is utilized.

W programmer

OFF The programmer is not used as set point source.

ON The programmer is used as set point source

Set points

Name — Default text in the display loop for respective set point source.

Diverse

ON/OFF — On/Off switching of the respective input inot the IND display loop.

Name — 3-line short text, which stands left of the value during display of the value on the front panel.

Controlled variable, Alarm values

Display

ON/OFF — On/Off switching of the respective input into the IND display loop.

Name — 3-leter short text which stands left of the value during display of the value on the front panel.

Dimension — 4-letter text which stands right of the value during display of the value on the front panel. If “USER” has been input there, the predefinable text under “User:” can be displayed.

User — 4-letter text which stands right of the value displayed as a user defined dimension during display of the value on the front panel.

K — the number of post decimal points required for the displaying the value. Statement of the figure 5 corresponds to a floating decimal point format.

Global variables in the display loop

Variables .Lx_R1 to .Lx_R8 as well as .Lx_T1 and .Lx_T2 can be included in the display loop by tick-off (x represents the number of the control loop).

Name — 3-letter short text which stands to the left of the value during display of the value on the front panel.

Dimension — 4-letter text which stands to the right of the value during display of the value on the front panel. If “USER” is stated there, the predefinable text for “User:” will be reproduced for display.

“User” — 4-letter text which stands to the right of the value during display of the value on the front panel and which is used as a user-defined dimension.

K — The number of post decimal places to be used for displaying the value. The figure 5 corresponds to a floating decimal format.

V
- [ ] Variable value is only displayed but cannot be utilized.
- [X] Variable value is displayed and can be utilized.

Global predefined variables

The following variables are new introductions to library 3.6.0:

.L1_SCAL_LO — This value (REAL) displays the contents of the parameter L1-B03-P07 “Lower control loop scaling“ of a List configuration. In the case of a free configuration, this is the parameter of the function module L1_SCALE_LO which is provided as output.

.L1_SCAL_HI — This value (REAL) displays the contents of the parameter L1-B03-P08 “Upper control loop scaling“ of a list configuration. In the case of a free configuration, this is the parameter of the function module L1_SCALE_HI which is provided as output.

.L1_ANA_LO — This value (REAL) displays the contents of the parameter L1-B03-P16 “Lower bargraph scaling“ of a list configuration. In the case of a free configuration, this is the parameter of the function module L1_ANA_LO which is provided as output.

.L1_ANA_HI — This value (REAL) displays the contents of the parameter L1-B03-P17 “Upper bargraph scaling“ of a list configuration. In the case of a free configuration, this is the parameter of the function module L1_ANA_HI which is provided as output.

.L1_SETZ_MAN — The value TRUE in the variable (BOOL) effects, if an interface module is used, a direct mode changeover to MANUAL. The value is automatically reset to FALSE. Changeover and reset are effected only when the configuration accepts this operation mode.

.L1_SETZ_AUTO — The value TRUE in the variable (BOOL) effects, if an interface module is used, a direct mode changeover to AUTOMATIC. The value is automatically reset to FALSE. Changeover and reset are effected only when the configuration accepts this operation mode.

.L1_SETZ_CASC — The value TRUE in the variable (BOOL) effects, if an interface module is used, a direct mode changeover to CASCADE. The value is automatically reset to FALSE. Changeover and reset are effected only when the configuration accepts this operation mode.

.L1_SETZ_W — The value in the variable (INT) activates the required set point source. However, this is only possible when the configuration enables it.
Codes/significance:

1 set point 1
2 set point 2 / ratio set point 1
3 set point 3 / ratio set point 2
4 set point 4 / ratio set point 3
5 external set point
6 computer set point
7 programmer set point

The value of the variables is automatically set to the value of the real activated set point. This value corresponds to the contents of the variables .WW_LOOP1.

.L1_K5 to .L1_K16 — Variables (REAL) are used for the further processing of the online parameters K5 to K16 which can be stated via the front panel during free configuration.

.RTC_DATUM — If using the real-time clock module, (DINT) contains the current date.
Date format:
contains the number of seconds since 1.1.1970.
Also included, apart from the date of day, the expired seconds of the day. The value thus changes its value every second. Leap years and leap seconds are accounted for in this variable, likewise summer/winter time.

.RTC_ZEIT — If using the real-time clock module, (DINT) contains the current time.
Time format:
contains the number of milliseconds of the day since des 0:00 o’clock.
The format is compatible with the time format of Protronic/Digitric existing hitherto.

.RTC_ERROR — The value in the variables (INT) show which problems can crop up with the real-time clock module. The codes for the respective problems are coded each in a bit of the INT variables, in such manner that several codes are possible at the same time.
Codes (decimal, hexadecimal) / significance:

1, 0x1	Replace battery.
2, 0x2	Real time clock module has reset itself due to an interruption in the power supply/battery buffer (the problem the date to be output as 1.1.1970 and the time as 0:00 o'clock).
4, 0x4	Error in the reading of the time of the real-time clock module. Date and time maintained on the module to the next power failure by separate counting with less accuracy. The module is defective and should be checked.
8, 0x8	The clock of the real-time module must be reset (the problem causes the date to be output as 1.1.1970 and the time as 0:00 o'clock).
16, 0x10	Date and time on the real-time clock module are no longer considered useful. Date and time on the module are kept till the next power failure with an extra counter of less accuracy. The module is defective and should be checked.
32, 0x20	The real-time clock module has been restarted. Time and date cannot be read off yet. This problem occurs only directly when switching on the power supply or in case the mains unit is defective.
64, 0x40	Date and time of the real-time clock module are being set. Values in the variables .RTC_DATUM and .RTC_ZEIT remain frozen until the Stellvorgang is terminated.

.RTC_STATUS — The value in the variable (INT) displays whether the real-time clock module is equipped with a battery and if summer time can be displayed. The codes for the respective information are enclosed in a bit of the INT variable in such way that multiple codes can be stated at the same time.
Code (decimal, hexadezimal) / significance:

1, 0x1	real-time clock module is equipped with a battery.
2, 0x2	summer time is displayed in the variables .RTC_DATUM and .RTC_ZEIT.

.SETZ_DATUM — The value TRUE in the (BOOL) variable sets the time of the real-time clock module to the value of the variable .NEU_DATUM.

.NEU_DATUM — In the case of the variable TRUE for .SETZ_DATUM, the value of this variable (DINT) is transferred to the clock of the real-time clock module. This time should always be stated as winter time. During summer time, the variable .RTC_DATUM automatically converts this time to summer time.

.MOD0ERR
.MOD1ERR
to
.MOD7ERR — The contents of the variables (INT) indicate an error for a value greater than 1 during the execution of the plug-in modules 1 to 7. By way of .MOD0ERR this is also displayed for the input/output levels of the basic unit.
Significance:

0	no module available.
1	module performs without error.
2	no communication to module possible. Should this error be displayed at length, a module fault can be assumed. This status is not set for the interface module RS-232/485.

.DPAKTIV — The contents of the variables (BOOL) display with the value TRUE that the cyclical Profibus DP communication is functioning without problem. The FALSE value represents a fault in the communication. Precondition is the configuration of the list configuration queries G-B30-F05 referring to Timeout and G-B30-F09 referring to the utilization of the timeout for the Profibus also.

.PG_NLAUF — Displays (DINT) the total runtime of the programmer, however reduced by halt and tolerance times. This time thus represents the pure runtime, which can be calculated from the parameters of the used program.

.PG_SEGZEIT — displays (DINT) the time which has run in the segment just executed.

.PG_ZYKLEN — Displays the completed loop cycles in the programmer during loop executions. Whenever the programmer is not in the loop execution mode, the value is 0.

The control loop-related variables .L1_... also stand as .L2_... etc. for further control loops.

Subject to technical changes.

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