

FUN 214 P
FLN

FLOATING POINT NAPIERIAN LOGARITHM, $\log_e x$ or $\ln(x)$

FUN 214 P
FLN

Operation Control EN

F214P.FLN

S :

D :

S : Source data or register to be calculated Napierian logarithm value

D : Register for storing the result

S, D may combine with V, Z, P0~P9 to serve indirect address application

Range	HR	ROR	DR	K	XR
Ope- rand	R0 R3839	R5000 R8071	D0 D3999	Floating number	V · Z P0~P9
	S				
D		*			

Description

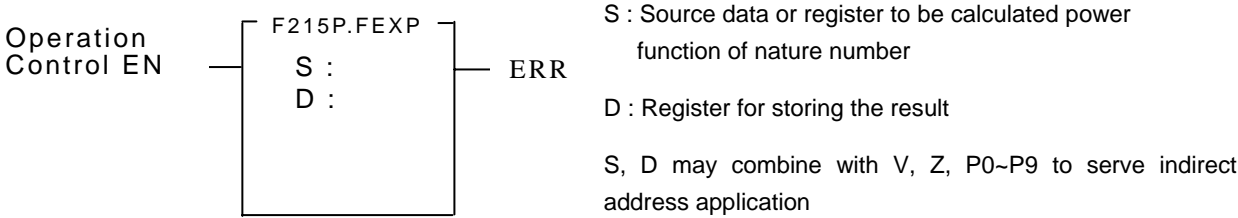
- The format of floating point number of Fatek-PLC follows the IEEE-754 standard of 32-bit.
- When operation control "EN" = 1 or "EN ↑" (**P** instruction) from 0 to 1, take the Napierian logarithm of the data specified by the S value or S~S+1 register, and store the result into the register specified by D~D+1.
- If the value of S is negative or equal to 0 、 invalid indirect addressing 、 or over range of the result , the error flag "ERR" will be set to 1, and not update the value of D~D+1.
- All floating point instructions can't be executed in interrupt service routine.

Example

- When M214=1, calculate the Napierian logarithm value, it is DD246 = $\ln(DD46)$

Floating point instructions

FUN 215 P FEXP	FLOATING POINT NATURE POWER FUNCTION, e^x	FUN 215 P FEXP
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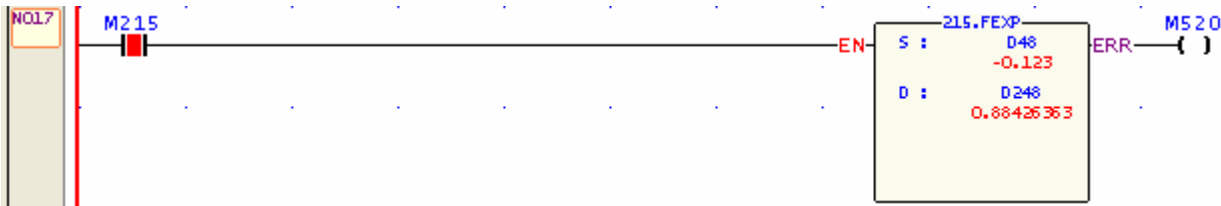


Range	HR	ROR	DR	K	XR
Ope- rand	R0 R3839	R5000 R8071	D0 D3999	Floating number	V · Z P0~P9
S	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>		<input type="radio"/>

Description

- The format of floating point number of Fatek-PLC follows the IEEE-754 standard of 32-bit.
- When operation control "EN" = 1 or "EN ↑" (**P** instruction) from 0 to 1, calculate the nature power function of the data specified by the S value or S~S+1 register, and store the result into the register specified by D~D+1.
- If the value of S is out of range、invalid indirect addressing、or over range of the result , the error flag "ERR" will be set to 1, and not update the value of D~D+1.
- All floating point instructions can't be executed in interrupt service routine.

Example



- When M215=1, calculate the nature power function, it is $DD248 = e^{DD48}$

Ref. No.	Status	Data	Ref. No.	Status	Data	F
DD48	Floating	-0.123				
DD248	Floating	0.88426363				
M215	Enable	ON				

StatusPage2 / StatusPage1

FUN 216 P FLOG	FLOATING POINT LOGARITHM, $\log_{10}x$ or $\log(x)$	FUN 216 P FLOG
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Operation Control EN

F216P.FLOG

S :
D :

ERR

S : Source data or register to be calculated logarithm value

D : Register for storing the result

S, D may combine with V, Z, P0~P9 to serve indirect address application

	HR	ROR	DR	K	XR
Range Ope- rand	R0 R3839	R5000 R8071	D0 D3999	Floating number	V · Z P0~P9
	S	D	O*	O	O

Description

- The format of floating point number of Fatek-PLC follows the IEEE-754 standard of 32-bit.
- When operation control "EN" = 1 or "EN ↑" (P instruction) from 0 to 1, calculate the logarithm value of the data specified by the S value or S~S+1 register, and store the result into the register specified by D~D+1.
- If the value of S is negative or equal to 0 、 invalid indirect addressing 、 or over range of the result , the error flag "ERR" will be set to 1, and not update the value of D~D+1.
- All floating point instructions can't be executed in interrupt service routine.

Example

N019

M216

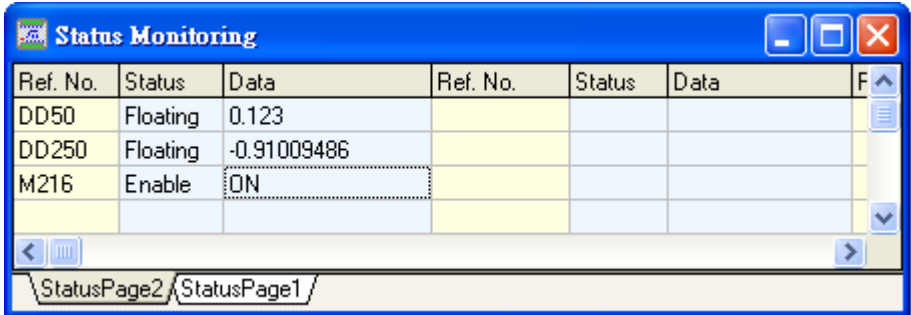
216.FLOG

S : 050
0.123

D : D250
-0.91009486

ERR → M521

- When M216=1, calculate the logarithm value, it is DD250 = log (DD50)



The screenshot shows a 'Status Monitoring' window with a table containing the following data:

Ref. No.	Status	Data	Ref. No.	Status	Data
DD50	Floating	0.123			
DD250	Floating	-0.91009486			
M216	Enable	ON			

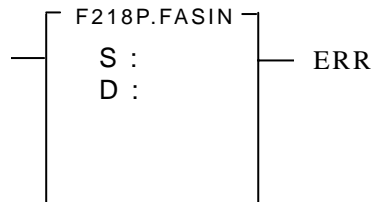
At the bottom of the window, there are tabs labeled 'StatusPage2' and 'StatusPage1'.

Floating point instructions

FUN 217 P FPOW	FLOATING POINT POWER FUNCTION, x^y	FUN 217 P FPOW																																			
<div> <div>Operation Control EN</div> <div> <div>F217P.FPOW</div> <div> <div>Sy :</div> <div>Sx :</div> <div>D :</div> </div> </div> <div>ERR</div> </div> <div> <div>Sy: Source data or register of exponential</div> <div>SX: Source data or register of base °</div> <div>D : Register for storing the result</div> <div>Sy, Sx, D may combine with V, Z, P0~P9 to serve indirect address application</div> </div>																																					
	<table> <tr> <th>Range</th><th>HR</th><th>ROR</th><th>DR</th><th>K</th><th>XR</th></tr> <tr> <th>Op- erand</th><th>R0 R3839</th><th>R5000 R8071</th><th>D0 D3999</th><th>Floating number</th><th>V · Z P0~P9</th></tr> <tr> <td>Sy</td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td></tr> <tr> <td>Sx</td><td><input type="radio"/></td><td><input checked="" type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td></tr> <tr> <td>D</td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td></tr> </table>	Range	HR	ROR	DR	K	XR	Op- erand	R0 R3839	R5000 R8071	D0 D3999	Floating number	V · Z P0~P9	Sy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sx	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
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D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																																
Description	<ul style="list-style-type: none"> The format of floating point number of Fatek-PLC follows the IEEE-754 standard of 32-bit. When operation control "EN" = 1 or "EN ↑" (P instruction) from 0 to 1, calculate the power function of the exponential data specified by the Sy · base data specified by the Sx, and store the result into the register specified by D~D+1. If it exists invalid indirect addressing · or over range of the result , the error flag "ERR" will be set to 1, and not update the value of D~D+1. All floating point instructions can't be executed in interrupt service routine. 																																				
Example	<div> <ul style="list-style-type: none"> When M217=1, calculate the power function, it is $DD252 = DD54^{DD52}$ </div>																																				
	<div>Status Monitoring</div> <table> <tr> <th>Ref. No.</th><th>Status</th><th>Data</th><th>Ref. No.</th><th>Status</th><th>Data</th><th>F</th></tr> <tr> <td>DD52</td><td>Floating</td><td>12.34</td><td></td><td></td><td></td><td></td></tr> <tr> <td>DD54</td><td>Floating</td><td>99.900002</td><td></td><td></td><td></td><td></td></tr> <tr> <td>DD252</td><td>Floating</td><td>4.7276013e+24</td><td></td><td></td><td></td><td></td></tr> <tr> <td>M217</td><td>Enable</td><td>ON</td><td></td><td></td><td></td><td></td></tr> </table>	Ref. No.	Status	Data	Ref. No.	Status	Data	F	DD52	Floating	12.34					DD54	Floating	99.900002					DD252	Floating	4.7276013e+24					M217	Enable	ON					
Ref. No.	Status	Data	Ref. No.	Status	Data	F																															
DD52	Floating	12.34																																			
DD54	Floating	99.900002																																			
DD252	Floating	4.7276013e+24																																			
M217	Enable	ON																																			

FUN 218 P FASIN	FLOATING POINT ARC SINE FUNCTION, \sin^{-1}	FUN 218 P FASIN
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Operation
Control EN



S : Source data or register to be calculated the arc sine value

D : Register for storing the result

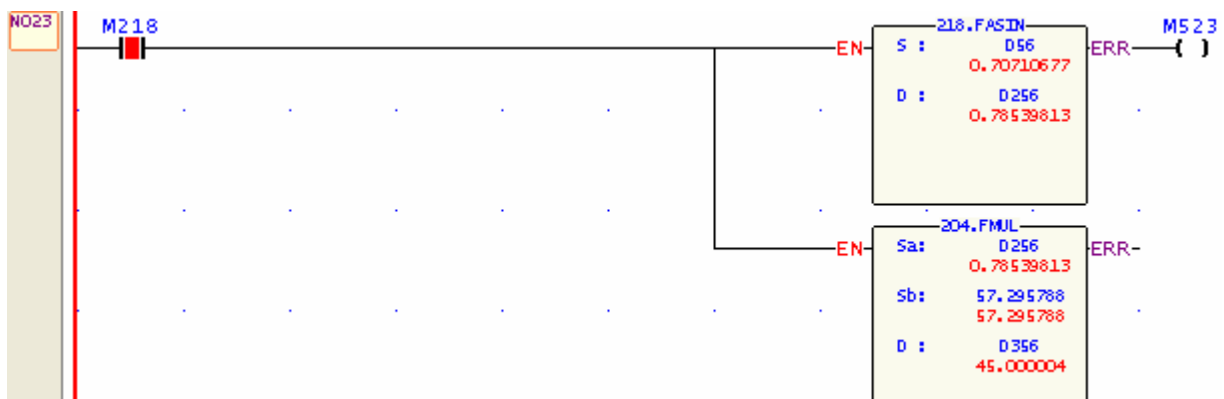
S, D may combine with V, Z, P0~P9 to serve indirect address application

Range	HR	ROR	DR	K	XR
Ope- rand	R0 R3839	R5000 R8071	D0 D3999	Floating number	V · Z P0~P9
S	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Description

- The format of floating point number of Fatek-PLC follows the IEEE-754 standard of 32-bit.
- When operation control "EN" = 1 or "EN ↑" (**P** instruction) from 0 to 1, calculate the arc sine value of the data specified by the S value or S~S+1 register, and store the result into the register specified by D~D+1.
- Range of S data : -1~ +1 ; range of D value : $-\pi/2 \sim \pi/2$ (Unit in radian)
- If the value of S is out of range or invalid indirect addressing, the error flag "ERR" will be set to 1, and not update the value of D~D+1.
- All floating point instructions can't be executed in interrupt service routine.

Example



- When M218=1, calculate the arc sine value, it is DD256 = \sin^{-1} DD56;
DD256(Unit in radian) $\times 57.295788(180/\pi)$ to acquire the degree value

Status Monitoring					
Ref. No.	Status	Data	Ref. No.	Status	Data
DD56	Floating	0.70710677			
DD256	Floating	0.78539813			
M218	Enable	ON			
DD356	Floating	45.000004			

Floating point instructions

FUN 219 P FACOS	FLOATING POINT ARC COSINE FUNCTION, \cos^{-1}	FUN 219 P FACOS
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Operation Control EN

F219P.FACOS
S :
D :

ERR

S : Source data or register to be calculated the arc cosine value

D : Register for storing the result

S, D may combine with V, Z, P0~P9 to serve indirect address application

Range	HR	ROR	DR	K	XR
Ope- rand	R0 R3839	R5000 R8071	D0 D3999	Floating number	V ~ Z P0~P9
S	○	○	○	○	○
D	○	○*	○		○

Description

- The format of floating point number of Fatek-PLC follows the IEEE-754 standard of 32-bit.
- When operation control "EN" = 1 or "EN ↑" (P instruction) from 0 to 1, calculate the arc cosine value of the data specified by the S value or S~S+1 register, and store the result into the register specified by D~D+1.
- Range of S data : -1~ +1 ; range of D value : 0 ~ π (Unit in radian)
- If the value of S is out of range \ or invalid indirect addressing, the error flag "ERR" will be set to 1, and not update the value of D~D+1.
- All floating point instructions can't be executed in interrupt service routine.

Example

- When M219=1, calculate the arc cosine value, it is DD258 = \cos^{-1} DD58;
DD258(Unit in radian) \times 57.295788($180/\pi$) to acquire the degree value

Status Monitoring					
Ref. No.	Status	Data	Ref. No.	Status	Data
DD58	Floating	0.5			
DD258	Floating	1.0471976			
M219	Enable	ON			
DD358	Floating	60.000008			

FUN 220 **P**
FATAN

FLOATING POINT ARC TANGENT FUNCTION, \tan^{-1}

FUN 220 **P**
FATAN

Operation
Control EN

S : Source data or register to be calculated the arc tangent value

D : Register for storing the result

S, D may combine with V, Z, P0~P9 to serve indirect address application

Range	HR	ROR	DR	K	XR
	R0 R3839	R5000 R8071	D0 D3999	Floating number	V · Z P0~P9
S	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Description

- The format of floating point number of Fatek-PLC follows the IEEE-754 standard of 32-bit.
- When operation control "EN" = 1 or "EN ↑" (**P** instruction) from 0 to 1, calculate the arc tangent value of the data specified by the S value or S~S+1 register, and store the result into the register specified by D~D+1.
- S data is any number ; range of D value : $-\pi/2 \sim \pi/2$ (Unit in radian)
- If it exists invalid indirect addressing, the error flag "ERR" will be set to 1, and not update the value of D~D+1.
- All floating point instructions can't be executed in interrupt service routine.

Example

- When M220=1, calculate the arc tangent value, it is $DD260 = \tan^{-1} DD60$;
 $DD260(\text{Unit in radian}) \times 57.295788(180/\pi)$ to acquire the degree value

Status Monitoring						
Ref. No.	Status	Data	Ref. No.	Status	Data	F
DD60	Floating	1.23				
DD260	Floating	0.88817382				
M220	Enable	ON				
DD360	Floating	50.888618				