FAQ

2500-Cxxx Processors: Why isn't LSP value saved with the program?

When saving or restoring a program to a CTI or Siemens Processor, Loop Setpoint (LSP) values are not saved or restored.

No Special Function variables (Loops, Alarms, SP parameters) are saved with a PLC program because these variables are created only in the controller run-time – derived from S-memory. You can verify this by viewing an offline chart and entering any of these variable types – it shows "UNDEFINED". This statement also applies to timer/counter (TCP/TCC) and Drum (DSP/DSC/DCP/DCC) variables.

NOTE: There is a feature in WorkShop to optionally save "TCP" values with PLC program, but all SF variables and DRUM variables are not saved. Even though "TCP" values can be saved with PLC program, those variables are not accessible and cannot be modified via offline program edit.

We believe Siemens/TI implemented it this way for compatibility with legacy systems when "Analog Tasks" – Loops, Alarms, SFPGMs, and SFSUBs were added to the original 500/505 Series PLC model that ran only RLL programs. All Siemens/TI and CTI CPUs operate this way.

There are 2 options for working around this issue:

1. Use "Remote SP" feature to load the LSP from a V-memory location. However, the user must change the Loop operation to use this method. He must run the Loop in "Cascade" mode (instead of "Auto" mode) because "Remote SP" works only in "Cascade" mode. To change LSP, he must then write the new value to the specified V-memory location instead of directly to LSP variable. This method will NOT work if he is currently writing a FLOAT value to LSP FLOAT variable (LSPx.) – "Remote SP" supports only integer values.

2. LSP values can be saved as part of the PLC program by writing an SFPGM (preferably called by the Loop each time it runs) to copy the current value of the LSP to a V-memory location. You must also handle the case of restoring the LSP value from the saved V-memory value. This can be done by a SFPGM that runs only once on program startup. This method has 2 advantages: the user does not need to make any operational changes in the way the LSP values are currently being written, and this method can work with both integer values (using LSPx) or FLOAT values (using LSPx.).

A table of Special Function variables is included below:

Analog Alarm SF Variables

Mnemonic	Description	Units	Real	Integer	Read
AACK	Alarm Acknowledge Flags			X	
AABD	Analog Alarm Deadband	eu	X	X	
ACFH	Alarm C Flag High Word			X	
ACFL	Alarm C Flag Low Word			X	
AERR	Alarm Error	eu	X	X	X
AHA	Alarm High Limit	eu	X	X	
AHHA	Alarm High-High Limit	eu	X	X	
ALA	Alarm Low Limit	eu	X	X	
ALLA	Alarm Low-Low Limit	eu	X	X	
AODA	Alarm Orange Deviation Limit	eu	X	X	
APV	Alarm Process Variable	eu	X	X	
APVH	Alarm PV High Limit	eu	X		
APVL	Alarm PV Low Limit	eu	X		
ARCA	Alarm Rate of Change Limit	eu/min	X		
ASP	Alarm Setpoint	eu	X	X	
ASPH	Alarm Setpoint High	eu	X	X	
ASPL	Alarm Setpoint Low	eu			
ATS	Alarm Sample Rate	sec	X		
AVF	Alarm V Flag			X	
AYDA	Alarm Yellow Deviation Limit	eu			

PID Loop SF Variables

Mnemonic	Description	Units	Real	Integer	Read
LACK	Loop Alarm Acknowledge Flags			X	
LADB	Loop Alarm Deadband	eu	X	X	
LCFH	Loop C Flag High			X	
LCFL	Loop C Flag Low			X	
LERR	Loop Error	eu	X	X	X
LHA	Loop High Alarm Limit	eu	X	X	
LHHA	Loop High-High Limit	eu	X	X	
LKC	Loop Gain		X		
LKD	Loop Rate Time	min	X		
LLA	Loop Low Alarm Limit	eu	X	X	
LLLA	Loop PV Low-Low Limit	eu	X	X	
LMN	Loop Output	%	X	X	
LMX	Loop Bias	%	X	X	
LODA	Loop Orange Deviation Limit	eu	X	X	
LPV	Loop Process Variable	eu	X	X	
LPVH	Loop PV High Limit	eu	X		
LPVL	Loop PV Low Limit	eu	X		
LRCA	Loop Rate of Change Limit	eu/min	X		
LRSF	Loop Ramp Soak Flags			X	
LRSN	Loop Ramp Soak Number			X	
LSP	Loop Setpoint	eu	X	X	
LSPH	Loop Setpoint High	eu	X	X	
LSPL	Loop Setpoint Low	eu	X	X	
LTD	Loop Rate Time	min	X		
LTI	Loop Reset Time	min	X		
LTS	Loop Sample Rate	sec	X		
LVF	Loop V Flags			X	
LYDA	Loop Yellow Deviation Limit	eu			

PLC Run-Time SF Variables

Mnemonic	Description	Units	Real	Integer	Read
P	SF Subroutine Parameters		X	X	
SFEC	SF Error Code		X	X	
APET	Alarm Peak Elapsed Time	ms		X	X
LPET	Loop Peak Elapsed Time	ms		X	X
PPET	SF Program Peak Elapsed Time (*valid*	ms		X	X
SPET	SF Subroutine Peak Elapsed Time	ms		X	X
TPET	RLL Task Peak Elapsed Time	ms		X	X

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