

SoftPLC MATH Module

I. INTRODUCTION

MATH.TLM contains four (4) TOPDOC Loadable Instructions (TLI's) to compare values, obtain absolute values and obtain the remainders of division calculations. The four (4) ladder instructions are MIN, MAX, ABS, and MOD.

II. INSTALLATION

If the SoftPLC kernel version is 3.x, the MATH.TLM should be transferred to the "C:\SOFTPLC\TLM" directory on the SoftPLC system using an FTP client like WSFTP_PRO. If the installed SoftPLC version is 2.x, TLM should be transferred to the \SPLCZIODVR directory on the SOFTPLC system.

The next step is to copy the two (2) property files (MATH.DEF and MATH.2X) to your development computer's "\SOFTPLC\PLC" directory. NexGen will use these files to determine the location of the MATH.TLM. After this step is completed, and the MATH.TLM is selected in to be "Used" and Sent to the PLC via TOPDOC NexGen's Module Editor, the instructions will be available online for editing and to be run by SoftPLC.

For offline programming and execution using SoftPLC version 2.x, the TLM file should be installed in the "\TDZ" directory on your development computer. To cause TOPDOC version 4.x to load the math TLM, a single entry in the MODULE.LST file is required as shown below.

MODULE=MATH.TLM

III. TLI INSTRUCTIONS

The **MIN** instruction takes three (3) parameters. The first and second parameters are values that will be compared to determine which is less. The third parameter is an address to store the smaller of the two.

The **MAX** instruction takes three (3) parameters. The first and second parameters are values that will be compared to determine which is greater. The third parameter is an address to store the larger of the two.

The **ABS** instruction takes two (2) parameters. The first parameter is an address of a negative or positive value of which to determine the absolute value. The second parameter is an address to store the result.

The **MOD** (modulus) instruction takes three (3) parameters. The first will be divided by the second parameter and the numerical remainder will be stored in the third parameter.

IV. EXAMPLE LADDER PROGRAM

On the following page is an example SoftPLC ladder program using the four (4) **math** TLM instructions:

```

P2/0 +-----+
!                                     +- TLI -----+
!                                     + ABSOLUTE VALUE +
! Function: ABS                       !
! Source:  N007: 000                   !
!                                     - 7654 !
! Dest:    N010: 000                   !
!                                     7654 !
!                                     +-----+
!                                     +- TLI -----+
P2/1 +-----+
!                                     + Minimum      +
! Function: MIN                       !
! SourceA: N007: 003                   !
!                                     888 !
! SourceB: N007: 004                   !
!                                     555 !
! Result:  N010: 001                   !
!                                     555 !
!                                     +-----+
!                                     +- TLI -----+
P2/2 +-----+
!                                     + Maximum      +
! Function: MAX                       !
! SourceA: N007: 003                   !
!                                     888 !
! SourceB: N007: 004                   !
!                                     555 !
! Result:  N010: 002                   !
!                                     888 !
!                                     +-----+
!                                     +- TLI -----+
P2/3 +-----+
!                                     + MODULUS (REMAINDER) OF X/Y +
! Function: MDD                       !
! X:      N007: 005                     !
!                                     50 !
! Y:      N007: 006                     !
!                                     8 !
! Dest:   N010: 003                     !
!                                     2 !
!                                     +-----+

```