DOCUMENT
Ladder instruction reference
LADV-IR-LD

PROJECT
Wartens LADV virtual PLCs
Rev 1.0

Ladder instruction reference

The 23 ladder instructions of the LADX ladder editor, which the LADV controllers execute.

Document	Ladder instruction reference
Code	LADV-IR-LD
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Firmware	V1.0.0
Issued by	Wartens, makers of LADX

How a rung is solved

A rung is solved left to right. Conditions on one branch are in series, so all must pass; branches are in parallel, so any one passes. The result, the rung's power, drives every output on the right in order. Rungs are solved top to bottom once per scan, and a JSR runs another routine where it stands before the next rung. Timers and counters keep their state in their own tag, with .DN, .TT and .EN bits and accumulated and preset values. Edges are per instruction: a CTU counts once when its rung goes true, however many scans it stays true.

Bit

Mnemonic	Name	Where	Behaviour
XIC	Examine On	Condition	Passes power when the bit is 1. A normally-open contact.
XIO	Examine Off	Condition	Passes power when the bit is 0. A normally-closed contact.
ONS	One Shot	Condition	Passes power for a single scan on the rising edge.
OTE	Coil	Output	Follows the rung: 1 while powered, 0 when not.
OTL	Latch	Output	Sets the bit to 1 and leaves it there.
OTU	Unlatch	Output	Resets the bit to 0.

Timer/Counter

Mnemonic	Name	Where	Behaviour
TON	Timer On	Output	Times while powered. DN goes true at the preset.
TOF	Timer Off	Output	DN is true while powered, and stays true for the preset after power is lost.
CTU	Count Up	Output	Counts one on each rising edge. DN at the preset.
CTD	Count Down	Output	Counts down one on each rising edge.
RES	Reset	Output	Clears a timer or counter's accumulator.

Compare

Mnemonic	Name	Where	Behaviour
EQU	Equal	Condition	Passes power when the two values are equal.
NEQ	Not Equal	Condition	Passes power when the two values differ.
GRT	Greater	Condition	Passes power when the first value is greater.
LES	Less	Condition	Passes power when the first value is less.
GEQ	Greater or Equal	Condition	Passes power when the first is greater or equal.
LEQ	Less or Equal	Condition	Passes power when the first is less or equal.

Program

Mnemonic	Name	Where	Behaviour
JSR	Call routine	Output	Runs another routine and comes back. The tag is the routine's name.

Move/Math

Mnemonic	Name	Where	Behaviour
MOV	Move	Output	Copies a value into another tag.
ADD	Add	Output	Adds two values into a destination.
SUB	Subtract	Output	Subtracts the second value from the first.
MUL	Multiply	Output	Multiplies the two values into a destination.
DIV	Divide	Output	Divides the first value by the second. Dividing by zero is reported rather than written.