# Selection guide

# Nano PLCs

ppications     Smill control systems governed by non-extended/o PLC bases with maximum 2410       uppige control     Imperiation of the systems governed by non-extended/o PLC bases with maximum 2410       uppige control     Imperiation of the systems governed by non-extended/o PLC bases with maximum 2410       uppige control     Imperiation of the systems governed by non-extended/o PLC bases with maximum 2410       uppige control     Imperiation of the systems governed by non-extended/o PLC bases with maximum 2410       uppige control     Imperiation of the systems governed by non-extended/or plant       Number of outputs     Imperiation of the systems governed by non-extended/or plant       Number of outputs     Imperiation of the system outputs depending on model       Imperiation outputs     Imperiation outputs depending on model       Imperiation outputs     Imperiation outputs depending on model       Imperiation outputs     Imperiation outputs       Imperiation outputs     Imperiation outputs       Imperiation outputs     Imperiation outputs       Imperiation outputs     Imperiation outputs       Analogue context (1) MHz maximum), Hequency meder (10 Hz maximum)       Imperiation outputs     Imperiation outputs	S. S.	8	8	S.
print and by spatial generations of a set as a s	Applications	Small control systems governed by non-extend	lable PLC bases with maximum 24 I/O	AND IN COMPANY
volume       ~ 10240 V         Restrete Of Number of Voluge       ~ 10240 V         Restrete Of Number of Voluge       14 or 20 /O         Restrete Of Number of volugits       14 or 20 /O         So or 14 inputs	ppications	Small control systems governed by non-extend	lable FLC bases with maximum 24 1/0	2
upply voltage       ~ 100 240 V         iscrete VO Number of Jourgets       14 or 20 JO       10. 16 or 24 JO         iscrete VO Number of Jourgets       14 or 20 JO       10. 16 or 24 JO         iscrete VO Number of Jourgets       14 or 20 JO       10. 16 or 24 JO         iscrete VO Number of Jourgets       16 or 21 Jourts - 24 V depending on model       6 or 11 aputs - 24 V depending on model         iscrete VO Number of Jourgets       16 or 24 JO       6 or 11 aputs - 24 V depending on model         iscrete VO Number of outgets       16 or 24 JO       6 or 11 aputs - 24 V depending on model         iscrete VO Number of outgets       16 or 24 JO       6 or 11 aputs - 24 V depending on model         iscrete VO Number of outgets       16 or 24 JO       6 or 11 aputs - 24 V depending on model         iscrete VO Number of outgets       17 or 10 relay outgets depending on model       6 or 11 aputs - 24 JO, times,         incretores       Theres, upddown counters, word registers, shift bit models with 1 channel       Relations clocks (with 16 or 24 IO), times,         incretores       Theres, upddown counters, word registers, shift bit models with 1 channel       Relations clocks (with 16 or 24 IO), times,         incretores       Theres, upddown counters, word registers, shift bit models with 1 channel       Relations clocks (with 16 or 24 IO), times,         istread volters       Fast counter (110 Hzt maxinum), treque	12 <sup>-2</sup> .	NO. NO.	NO. NO.	S.
upply voltage       ~ 100240 V         iscrep I/O       14 or 20 I/O         Number of inputs       14 or 20 I/O         Number of inputs       14 or 20 I/O         Sort 21 projets :=: 24 V depending on model       6. 3 or 14 inputs :=: 24 V depending on model         Sort 21 projets :=: 24 V depending on model       6. 3 or 14 inputs :=: 24 V depending on model         Sort 21 projets :=: 24 V depending on model       6. 3 or 14 inputs :=: 24 V depending on model         Sort 21 projets :=: 24 V depending on model       6. 3 or 14 inputs :=: 24 V depending on model         Sort 12 projets :=: 24 V depending on model       6. 3 or 14 inputs :=: 24 V depending on model         Sort 12 projets :=: 24 V depending on model       6. 3 or 14 inputs :=: 24 V depending on model         Sort 12 projets :=: 24 V depending on model       6. 3 or 14 inputs :=: 24 V depending on model         Sort 12 projets :=: 24 V depending on model       6. 3 or 14 inputs :=: 24 V depending on model         Input 0:: 10 V := 1		Contraction and the second	Sector Constants	
upply voltage       ~ 100240 V         issue for VO       14 or 20 NO         Number of linputs       10, 16 or 24 NO         Number of outputs       6 or 72 linputs = 24 V depending on model         8 or 12 linputs = 24 V depending on model       6, 9 or 14 linputs = 24 V depending on model         9 otension       6 or 8 relay outputs depending on model         9 otension       9 otension         Integrate       Imput 010 V, ± 10 V.420 mA         Integrate       1 input 010 V, ± 10 V.420 mA         Integrate       Input 010 V, ± 10 V.420 mA         Integrate       Fortiging on bit stimps, word alless and indexed words         Integrate       Continuing on the IT input 010 V, ± 10 V.420 mA         Instage outputs       Fortiging on bit stimps, word alless and indexed words         Input 010 V, ± 10 V.420 mA       Input 010 V         Instage outputs       Fortiging on bit stimps, word alless and indexed words         Input 010 V, ± 10 V.420 mA       Input 010 V         Instage outputs       Fortiging on bit stimps, word alless and indexed words         Input 010 V, ± 10 V.420 mA       Input 010 V         Instage outputs       Fortiging on bit stimps, word alless and indexed words         Input 010 V, ± 10 V.420 mA       Input 010 V         Input 010 V,			10 <sup>1</sup>	and the second s
upply voltage       ~ 10240 V         iscrete U0 Number of V00       14 or 20 V0         Number of voltation       8 or 12 Inputs         8 or 12 Inputs       24 V depending on model         6, 9 or 14 Inputs       6, 9 or 14 Inputs         9 ottension       8 or 12 Inputs         10 ottension       9 ottension         10 ottension       10, 16 or 24 V0         10 ottension       6, 9 or 14 Inputs         10 ottension       6, 9 or 14 Inputs         10 ottension       1, 70 or 10 relay outputs depending on model         10 ottension       1, 70 or 10 relay outputs depending on model         10 ottension       Timers, uppdown counters, word registers, shift bit         10 ottension       1 oput 010 V, ± 10 V, 4-20 mA         10 oput 010 V, ± 10 V, 4-20 mA       1 oput 010 V         10 oput 010 V, ± 10 V, 4-20 mA       1 oput 010 V         10 oput 010 V, ± 10 V, 4-20 mA       1 oput 010 V         10 oput 010 V, ± 10 V, 4-20 mA       1 oput 010 V         10 oput 010 V, ± 10 V, 4-20 mA       1 oput 010 V         10 oput 010 V, ± 10 V, 4-20 mA       1 oput 010 V         10 oput 010 V, ± 10 V, 4-20 mA       1 oput 010 V         10 oput 010 V, ± 10 V, 4-20 mA       1 oput 010 V				
upply voltage       ~ 100240 V         issrete for VIO       14 or 20 VO         Number of inputs       8 or 12 nputs 24 V depending on model       6, 6 or 14 inputs 24 V depending on model         8 or 12 nputs 24 V depending on model       6, 9 or 14 inputs 24 V depending on model       4, 7 or 10 relay outputs depending on model         9 ottension       10, 16 or 24 I/O       6, 9 or 14 inputs 24 V depending on model       4, 7 or 10 relay outputs depending on model         9 ottension       10, 16 or 24 I/O       6, 9 or 14 inputs 24 V depending on model       4, 7 or 10 relay outputs depending on model         9 ottension       10, 16 or 24 I/O, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10				1
upply voltage       ~ 100240 V         iscrete V0 Number of V0       14 or 20 1/0       10. 16 or 24 1/0         Number of voltputs       8. or 12 Inputs = 24 V depending on model       6. 0 or 14 inputs = 24 V depending on model         Number of voltputs       8 or 12 Inputs = 24 V depending on model       6. 0 or 14 inputs = 24 V depending on model         Number of voltputs       8 or 12 Inputs = 24 V depending on model       6. 0 or 14 inputs = 24 V/depending on model         Number of voltputs       8 or 12 Inputs = 24 V depending on model       6. 0 or 14 inputs = 24 V/depending on model         Number of voltputs       8 or 12 Inputs = 24 V depending on model       6. 0 or 14 inputs = 24 V/depending on model         O extension       Input 010 V, ± 10 V.420 mA       1 or 10 relay outputs depending on model         Nodules with 1 channel       1 input 010 V, ± 10 V.420 mA       1 input 010 V         Nodules with 1 channel       Fed countor (10 KHz maximum) with 2 relea couputs       1 input 010 V         rocessing       Combinational and sequential processing Processing on bits and words       Revertible PL7 inspusse.         rogramming       F1X 17 terminal (nativection List language)       Number of undvords         rogramming       FX 171 zerware under DOS compatible with Windows 85 and Windows 87 (matruction List and Ladder language)         roporatiming       TSX 07 31 1228       TSX 07 33 122			Contraction of the	A STORAGE
apply voltage       ~100240 V         screte I/O Number of I/O       14 or 20 I/O       10, 16 or 24 I/O         a reget i/O Number of outputs       14 or 20 I/O       10, 16 or 24 I/O         a reget i/O Modules with 1 outputs       2 or 12 inputs =::24 V depending on model 6 or 8 relay outputs depending on model       6 or 14 inputs =::24 V depending on model 6 or 8 relay outputs depending on model         De extension       Immers. up/down counters, word registers, shift bit registers, step counters, drum controllers       Real-lime clocks (with 16 or 24 I/O), timers.         analoge rol Modules with 1 channel       Imput 010 V, ± 10 V, 4:20 mA       Imput 010 V         analoge rol Modules with 1 channel       East counter (10 kHz maximum), trequency meter (10 kHz maximum)         cressing       Commission module       Fast counter (10 kHz maximum) with 2 reliex outputs         cressing       Commission module       Fast counter (10 kHz maximum) with 2 reliex outputs         cressing       Commission module       Fast counter (10 kHz maximum) with 2 reliex outputs         cressing       Commission module       Fast counter (10 kHz maximum) with 2 reliex outputs         cressing       Commission down and Processing on bit strings, word tables and indexed words       Fast counter (10 kHz maximum)         cressing on pit strings, word tables and indexed words       Fast counter (10 kHz maximum)       Fast counter (10 kHz maximum)		ananananan it waal	and an and	20
upply voltage       ~ 100240 V         isorce to Voo       14 or 20 VO       10, 16 or 24 VO         isorce to Voo       8 or 12 inputs24 V depending on model       6, 9 or 14 inputs24 V depending on model         Number of inputs       8 or 12 inputs24 V depending on model       6, 9 or 14 inputs24 V depending on model         O stension       6 or 8 reley outputs depending on model       6, 9 or 14 inputs24 V depending on model         O stension       registers, step counters, word registers, shill bit       Real-time clocks (with 16 or 24 VO), timers,         nalogue VO integrate       registers, step counters, drum controllers       1 input 010 V         outling       Fast counter (10 kHz maximum), treguency meter (10 kHz maximum)       1 input 010 V         outling       Fast counter (10 kHz maximum) with 2 relex outputs       Combinational and sequential processing Processing on bits and words         onmunication       Terminal port, RS 485 ASCII link or Uhi-Telway master/slave link (depending on the model)         anguage       Reversible PL7 language, Instruction List language PL747 software under DOS compatible with Windows 85 and Windows NT (Instruction List and Ladder language)         regratming       FIX 17 terminal (Instruction List language) PL747 software under DOS compatible with Windows 85 and Windows NT (Instruction List and Ladder language)         regratming       FIX 17 12 terminal (Instruction List language) PL747 software under DOS com			N L	
upply voltage       ~ 100240 V         iscrete I/O Number of I/O       14 or 20 I/O       10, 16 or 24 I/O         Number of I/O       8 or 12 inputs24 V depending on model       6, 9 or 14 inputs24 V depending on model         Sortension       6 or 8 relay outputs depending on model       4, 7 or 10 relay outputs depending on model         Distansion       Imper of outputs       9 or 14 inputs24 V depending on model         Distansion       Impers, upidown counters, word registers, shith bit registers, step counters, dum controllers       Real-time clocks (with 16 or 24 I/O), timers.         Imper of Outputs       Imper 010 V, ± 10 V, 4-20 mA       Imput 010 V         Analogue extension modules       Est counter (10 kHz maximum), frequency meter (10 kHz maximum)         Voccessing       Combinational and sequential processing Processing on bit strings, word tables and modes Processing on bit strings, word tables and modes dwords         Inguage       Reversible PL7 language, Instruction List language with Grad-cut instructions and Ladder language         regord PLC       TSX 07 31 L428 TSX 07 31 2028       TSX 07 32 21028 TSX 07 33 2428         ages       4050/12 and 40050/13       TSX 07 33 2428			CAAAAAA GIIDAAA	
upply voltage       ~ 100240 V         iscrete I/O Number of I/DO       14 or 20 I/O       10, 16 or 24 I/O         Number of I/DO       8 or 12 inputs := 24 V depending on model       6, 9 or 14 inputs := 24 V depending on model         Number of outputs       6, 9 or 14 inputs := 24 V depending on model       6, 9 or 14 inputs := 24 V depending on model         D stension       5 or 8 relay outputs depending on model       6, 9 or 14 inputs := 24 V depending on model         D stension       10, 16 or 24 I/O       8 or 12 inputs := 24 V depending on model         D stension       10, 16 or 24 I/O       8 or 14 inputs := 24 V depending on model         D stension       10, 16 or 24 I/O       8 or 14 inputs := 24 V depending on model         D stension       10, 10 V       10, 10 V       10, 10 V         D stension       1 input 010 V, ± 10 V, 4-20 mA       1 input 010 V         Modules with 1 channel       Fast counter (10 kHz maximum), frequency meter (10 kHz maximum)       1 input 010 V         Notation       Fast counter (10 kHz maximum), frequency meter (10 kHz maximum)       1 input 010 V         Increasing on bit strings, word tables and indexed words       Instruction List language       Instruction List language         Increasing on bit strings, word tables and indexed words       Instruction List language       Instruction List language)         Proce	or i der			
iscree IO Number of Inputs Number of louputs       14 or 20 1/0       10, 15 or 24 1/0         8 or 12 inputs :=: 24 V depending on model       6, 9 or 14 inputs :=: 24 V depending on model         9 or tension       6, 9 or 14 inputs :=: 24 V depending on model         0 extension       Imper of inputs         natiogue IO Integrate Analogue extension       Imper outputs         0 extension       Imput 010 V, ± 10 V, 4:20 mA         1 input 010 V, ± 10 V, 4:20 mA       Imput 010 V         Analogue extension       Imput 010 V, ± 10 V, 4:20 mA         0 extension       Imput 010 V, ± 10 V, 4:20 mA         Analogue extension modules       Combinational and sequential processing Processing on bits and words         0 extension       Fast counter (10 kHz maximum), frequency meter (10 kHz maximum) (Uptown counter (1 kHz maximum) with 2 reflex outputs         coessing       Combinational and sequential processing Processing on bits and words         processing on bits and words       Reversible PL7 language, Instruction List language with Gratest instructions and Ladder language         regramming       FX 17 terminal (Instruction List language) PL* 07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         rps of PLC       TSX 07 31 12028       TSX 07 31 1628 TSX 07 31 1628         ages       40050/12 and 40050/13	upply voltage	$\sim$ 100240 V		
series I/O Number of I/O       14 or 20 I/O       10, 16 or 24 I/O         Number of I/DUS       8 or 12 inputs =:: 24 V depending on model       6, 9 or 14 inputs =:: 24 V depending on model         8 or 12 inputs       8 or 12 inputs =:: 24 V depending on model       6, 9 or 14 inputs =:: 24 V depending on model         9 oxtension       1, 7 or 10 relay outputs depending on model       1, 7 or 10 relay outputs depending on model         9 oxtension       1       1       10, 16 or 24 I/O         10 network       1       1       10 relay outputs depending on model         10 oxtension       1       1       10 relay outputs depending on model         11 network       1       1       10 relay outputs depending on model         11 network       1       1       10 relay outputs depending on model         11 network       1       1       10 relay outputs       10 relay outputs         11 network       1       1       1       10 relay outputs       10 relay outputs         11 network       1       1       1       1       10 relay outputs       10 relay outputs         11 network       1       1       1       1       1       1       1         11 network       1       1       1       1       1       1	and the second se			
Scree I/O       14 07 20 1/O       10, 16 07 24 1/O         Number of Inputs       8 or 12 inputs 24 V depending on model       6, 9 or 14 inputs 24 V depending on model         9 oxtension       6 or 8 relay outputs depending on model       4, 7 or 10 relay outputs depending on model         9 oxtension       Timers, up/down counters, word registers, shift bit registers, stop counters, drun controllers       Real-time clocks (with 16 or 24 1/O), timers, registers, stop counters, drun controllers         antrol system       Timers, up/down counters, word registers, shift bit registers, stop counters, drun controllers       Real-time clocks (with 16 or 24 1/O), timers, registers, stop counters, drun controllers         analogue I/O       1 input 010 V, ± 10 V, 4-20 mA       1 input 010 V         Analogue extension modules       Fast counter (10 HHz maximum), frequency meter (10 KHz maximum)         occessing       Combinational and sequential processing Processing on bits and words         processing on bits afring, word bables and indexed words       Terminal port, RS 485 ASCII link or Uni-Telway master/slave link (depending on the model)         inguage       Reversible PL7 language, Instruction List language)       TSX 07 32 1028         ptr.247 software under DOS compatible WH Windows 95 and Windows NT (Instruction List and Ladder language)       TSX 07 32 1028         ptr.247 software under DOS compatible WH Windows 95 and Windows NT (Instruction List and Ladder language)       TSX 07 32 1028 <tr< td=""><td>10</td><td></td><td></td><td></td></tr<>	10			
Number of inputs       B or 12 inputs — 24 V depending on model       E, 9 or 14 inputs — 24 V depending on model         Number of outputs       6 or 8 relay outputs depending on model       4, 7 or 10 relay outputs depending on model         O extension       Import, up/down counters, word registers, shift bit       Real-time clocks (with 16 or 24 I/O), timers,         nalogue I/O       Imput 010 V, ± 10 V, ± 20 mA       1 input 010 V         nalogue extension modules       1 input 010 V, ± 10 V, 4-20 mA       1 input 010 V         ounting       East counter (10 kHz maximum), frequency meter (10 kHz maximum)       Up/down counter (10 kHz maximum) with 2 reflex outputs         ounting       Combinational and sequential processing Processing on bits and words       Processing on bits and words         ommunication       Terminal port, RS 485 ASCII link or Uni-Telway master/slave link (depending on the model)         anguage       FX 117 terminal (Instruction List language) PL-20's stiware under DO's compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         (pe of PLC       TSX 07 31 L1428 TSX 07 33 L2028       TSX 07 33 L2028 TSX 07 33 2428         ages       40050/13	Iscrete I/O Number of I/O	14 or 20 I/O	10, 16 or 24 I/O	
Number of nutures       5 or 6 freiely outputs depending on model       0, s 0, 10 reiely outputs depending on model         6 or 6 freiely outputs depending on model       4, 7 or 10 reiely outputs depending on model         0 extension       Import of system         natiogue VO integrate       Timers, up/down counters, word registers, shift bit registers, step counters, drum controllers       Real-time clocks (with 16 or 24 I/O), timers,         natiogue VO integrate       Imput 010 V, ± 10 V, 4-20 mA       1 input 010 V         Analogue extension modules       Fast counter (10 kHz maximum), frequency meter (10 kHz maximum) Up/down counter (1 kHz maximum) with 2 reflex outputs       Combinational and sequential processing Processing on bits at myour ords         ommunication       Terminal port, RS 485 ASCII link or Uni-Telway master/slave link (depending on the model)       Reversible PL7 language, Instruction List language with Grafoet instructions and Ladder language         regramming       FIX 177 terminal (Instruction List language) PL-07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         ype of PLC       TSX 07 31 L428 TSX 07 31 L428 TSX 07 33 L428 TSX 07 33 L428       TSX 07 33 L428 TSX 07 33 L428         ages       40050/12 and 40050/13	Number of inputs	8 or 12 inputs — 24 V depending on model	6.9 or 14 inputs - 24 V dependence	ling on model
O extension       Timers, up/down counters, word registers, shift bit registers, shift bit registers, step counters, drum controllers       Real-time clocks (with 16 or 24 1/O), timers, registers, shift bit registers, shift bit registers, show counters, drum controllers         nalogue 1/O       I input 010 V, ± 10 V, 4-20 mA       I input 010 V         Analogue extension modules       Fast counter (10 H4z maximum), frequency meter (10 kHz maximum)       I input 010 V         ounting       Fast counter (10 H4z maximum), trequency meter (10 kHz maximum)       I input 010 V         rocessing       Combinational and sequential processing Processing on bits and words       Processing on bits strings, word tables and indexed words         anguage       Reversible PL7 language, Instruction List language)       Reversible PL7 language, Instruction List language)       FTX 117 terminal (Instruction List language)         ptp of PLC       TSX 07 3L 1428       TSX 07 3L 1428       TSX 07 32 1028         ages       40050/12 and 40050/13       TSX 07 33 1628	Number of outputs	6 or 8 relay outputs depending on model	4, 7 or 10 relay outputs dependi	ng on model
O extension       Immers, up/down counters, word registers, shift bit registers, step counters, drum controllers       Real-time clocks (with 16 or 24 I/O), timers,         natiogue I/O integrate       I input 010 V, ± 10 V, 4-20 mA       I input 010 V         Analogue extension modules       I input 010 V, ± 10 V, 4-20 mA       I input 010 V         ounting       Fast counter (10 kHz maximum), frequency meter (10 kHz maximum)       I input 010 V         rocessing       Combinational and sequential processing Processing on bits and words       East counter (10 kHz maximum) with 2 refex outputs         rogramming       Reversible PL7 language, Instruction List language with Grate tinstructions and Ladder language         rogramming       FIX 117 terminal (Instruction List language)         pL*07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         pL*07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         pL*07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         pL*07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         pL*07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         pL*07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         pL*07 software under DOS compatible with Windows 95 and Windows NT (In				
O extension       Timers, up/down counters, word registers, shift bit registers, shift bit registers, step counters, drum controllers       Real-time clocks (with 16 or 24 I/O), timers,         nalogue I/O Integrate With 1 channet       I input 010 V, ± 10 V, 4-20 mA       I input 010 V         Analogue extension modules       Fast counter (10 kHz maximum), frequency meter (10 kHz maximum)       I input 010 V         ounting       Fast counter (10 kHz maximum), frequency meter (10 kHz maximum)       Combinational and sequential processing Processing on bits and words         rocessing       Combinational and sequential processing Processing on bits and words       Reversible PL7 language, lnstruction List language with Grate language         rogramming       Reversible PL7 language, Instruction List language with Grate language       FX 177 terminal (Instruction List language)         rpe of PLC       TSX 07 31 L428       TSX 07 32 L428         ages       40050/12 and 40050/13				
ontrol system inctions       Timers, up/down counters, word registers, shift bit registers, step counters, drum controllers       Real-time clocks (with 16 or 24 l/O), timers,         nalogue l/O integrate Modules with 1 channel Analogue extension modules       1 input 010 V, ± 10 V, 4-20 mA       1 input 010 V         ounting       Fast counter (10 kHz maximum), frequency meter (10 kHz maximum) Up/down counter (1 kHz maximum) with 2 reflex outputs       Combinational and sequential processing Processing on bits and words Processing o	O extension			
nucleions       Timers, up/down counters, word registers, shift bit registers, shift bit registers, step counters, drum controllers       Real-time clocks (with 16 or 24 I/O), timers,         nalogue I/O       1 input 010 V, ± 10 V, 4-20 mA       1 input 010 V         Analogue extension modules       Past counter (10 kHz maximum), frequency meter (10 kHz maximum)       1 input 010 V         ounting       Past counter (10 kHz maximum), frequency meter (10 kHz maximum)       1 input 010 V         rocessing       Combinational and sequential processing Processing on bits and words Processing on bits and words       Combinational and sequential processing Processing on bits and words         anguage       Reversible PL7 language, Instruction List language with Grafetet instructions and Ladder language         regramming       FTX 117 terminal (Instruction List language)       TSX 07 32 1028         rps of PLC       TSX 07 3L 14228       TSX 07 33 1628         rps of PLC       TSX 07 3L 2028       TSX 07 33 2428	all <sup>a</sup>			
Initiality, dp/dwn boliners, drum controllers       Read-unite blocks (with 1 of 0 / 24 / 05), dmess, dmess, dmess, drum controllers         nalogue I/O       1 input 010 V, ± 10 V, 4-20 mA         Analogue extension modules       1 input 010 V         ounting       Fast counter (10 kHz maximum), frequency meter (10 kHz maximum)         up/down counter (1 kHz maximum), frequency meter (10 kHz maximum)       Combinational and sequential processing         Processing       Combinational and sequential processing         Processing on bits strings, word tables and indexed words       Processing on bit strings, word tables and indexed words         ommunication       Terminal port, RS 485 ASCII link or Uni-Telway master/slave link (depending on the model)         anguage       Reversible PL7 language, Instruction List language with Grafcet instructions and Ladder language         rogramming       FTX 117 terminal (Instruction List language)         PL-07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         ype of PLC       TSX 07 31 L428       TSX 07 32 L028         ages       40050/12 and 40050/13	antral avatam	Timora un/down counters, word registers, chiff	bit Dool time clocks (with 16 or 24 l	(O) timoro
nalogue I/O Integrate       1 input 010 V, ± 10 V, 4-20 mA         Analogue extension modules       Fast counter (10 kHz maximum), frequency meter (10 kHz maximum)         ounting       Fast counter (10 kHz maximum), frequency meter (10 kHz maximum)         rocessing       Combinational and sequential processing Processing on bits and words Processing on bit strings, word tables and indexed words         ommunication       Terminal port, RS 485 ASCII link or Uni-Telway master/slave link (depending on the model)         anguage       Reversible PL7 language, Instruction List language         FTX 117 terminal (Instruction List language) PT-07 software under DDS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         ype of PLC       TSX 07 31 L428 TSX 07 31 2028       TSX 07 32 1028 TSX 07 33 2428         ages       40050/13	inctions	registers, step counters, drum controllers		/O), umers,
naiogue VO       1 input 010 V, ± 10 V, 4-20 mA         Anaiogue extension modules       1 input 010 V, ± 10 V, 4-20 mA         iounting       Fast counter (10 kHz maximum), frequency meter (10 kHz maximum)         iounting       Combinational and sequential processing Processing on bits and words Processing on bits and words Processing on bits trings, word tables and indexed words         ommunication       Terminal port, RS 485 ASCII link or Uni-Telway master/slave link (depending on the model)         anguage       Reversible PL7 language, Instruction List language with Grafete instructions and Ladder language         rogramming       FTX 117 terminal (Instruction List language) PL7-07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         ype of PLC       TSX 07 3L 1428 TSX 07 3L 2028       TSX 07 32 1028 TSX 07 33 1628 TSX 07 33 2428         ages       40050/12 and 40050/13       TSX 07 32 21028	and the second s			
Integrate       1 input 010 V, ± 10 V, 4-20 mA         Analogue extension modules       1 input 010 V, ± 10 V, 4-20 mA         iounting       Fast counter (10 kHz maximum), frequency meter (10 kHz maximum) Up/down counter (1 kHz maximum) with 2 refiex outputs         rocessing       Combinational and sequential processing Processing on bits and words Processing on bits strings, word tables and indexed words         ommunication       Terminal port, RS 485 ASCII link or Uni-Telway master/slave link (depending on the model)         anguage       Reversible PL7 language, Instruction List language with Grafcet instructions and Ladder language         rogramming       FTX 117 terminal (Instruction List language) PL7-07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         ype of PLC       TSX 07 3L 1428 TSX 07 3L 2028       TSX 07 32 1028 TSX 07 33 1628 TSX 07 33 2428         ages       40050/12 and 40050/13	Inalogue I/O		1 input 0 10 V	
Analogue extension modules       Fast counter (10 kHz maximum), frequency meter (10 kHz maximum) Up/down counter (1 kHz maximum) with 2 reflex outputs         rocessing       Combinational and sequential processing Processing on bits and words         rocessing       Combinational and sequential processing on bits and words         rocessing on bit strings, word tables and indexed words       Image: Terminal port, RS 485 ASCII link or Uni-Telway master/slave link (depending on the model)         anguage       Reversible PL7 language, Instruction List language)       Reversible PL7 language, Instruction List language)         rogramming       FTX 117 terminal (Instruction List language)       TSX 07 32 1028         ype of PLC       TSX 07 3L 1428       TSX 07 32 1028         ages       40050/12 and 40050/13       TSX 07 32 1028	Modules with 1 channel	1 input 010 V, ± 10 V, 4-20 mA		3
ounting       Fast counter (10 kHz maximum), frequency meter (10 kHz maximum) Up/down counter (1 kHz maximum) with 2 reflex outputs         rocessing       Combinational and sequential processing Processing on bits and words Processing on bit strings, word tables and indexed words         ommunication       Terminal port, RS 485 ASCII link or Uni-Telway master/slave link (depending on the model)         anguage       Reversible PL7 language, Instruction List language with Grafcet instructions and Ladder language         rogramming       FTX 117 terminal (Instruction List language) PL7-07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         ype of PLC       TSX 07 3L 1428 TSX 07 3L 2028       TSX 07 32 1028 TSX 07 33 2428         ages       40050/12 and 40050/13	Analogue extension modules	and the second		
ounting       Fast counter (10 kHz maximum), frequency meter (10 kHz maximum) Up/down counter (1 kHz maximum) with 2 reflex outputs         rocessing       Combinational and sequential processing Processing on bits and words Processing on bits and words         ommunication       Terminal port, RS 485 ASCII link or Uni-Telway master/slave link (depending on the model)         anguage       Reversible PL7 language, Instruction List language with Grafoet instructions and Ladder language         rogramming       FTX 117 terminal (Instruction List language) PL7-07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         ype of PLC       TSX 07 3L 1428 TSX 07 3L 2028       TSX 07 32 1028 TSX 07 33 1628 TSX 07 33 2428         ages       40050/12 and 40050/13				
iounting       Fast counter (10 kHz maximum), frequency meter (10 kHz maximum) Up/down counter (1 kHz maximum) with 2 reflex outputs         rocessing       Combinational and sequential processing Processing on bits and words Processing on bit strings, word tables and indexed words         iommunication       Terminal port, RS 485 ASCII link or Uni-Telway master/slave link (depending on the model)         anguage       Reversible PL7 language, Instruction List language with Grafcet instructions and Ladder language         rogramming       FTX 117 terminal (Instruction List language) PL7-07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         ype of PLC       TSX 07 3L 1428 TSX 07 3L 2028       TSX 07 32 1028 TSX 07 33 1628 TSX 07 33 2428         ages       40050/12 and 40050/13	4			
rocessing       Combinational and sequential processing Processing on bits and words         ommunication       Terminal port, RS 485 ASCII link or Uni-Telway master/slave link (depending on the model)         anguage       Reversible PL7 language, Instruction List language with Grafcet instructions and Ladder language         rogramming       FTX 117 terminal (Instruction List language) PL7-07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         ype of PLC       TSX 07 3L 1428 TSX 07 3L 2028       TSX 07 32 1028 TSX 07 33 1628 TSX 07 33 2428         ages       40050/12 and 40050/13	counting	Fast counter (10 kHz maximum), frequency me	eter (10 kHz maximum) utputs	
rocessingCombinational and sequential processing Processing on bits and words Processing on bits and words Processing on bit strings, word tables and indexed wordsommunicationTerminal port, RS 485 ASCII link or Uni-Telway master/slave link (depending on the model)anguageReversible PL7 language, Instruction List language with Grafcet instructions and Ladder languagerogrammingFTX 117 terminal (Instruction List language) PL7-07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)ype of PLCTSX 07 3L 1428 TSX 07 3L 2028TSX 07 32 1028 TSX 07 33 1628 TSX 07 33 2428ages40050/12 and 40050/13	de la companya de la			Į.
Processing on bits and words       Processing on bits strings, word tables and indexed words         communication       Terminal port, RS 485 ASCII link or Uni-Telway master/slave link (depending on the model)         anguage       Reversible PL7 language, Instruction List language with Grafcet instructions and Ladder language         rogramming       FTX 117 terminal (Instruction List language) PL7-07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         ype of PLC       TSX 07 3L 1428 TSX 07 3L 2028       TSX 07 32 1028 TSX 07 33 1628 TSX 07 33 2428         ages       40050/12 and 40050/13	rocessing	Combinational and sequential processing		
interview       Processing on bit stinlings, word tables and indexed words         isommunication       Terminal port, RS 485 ASCII link or Uni-Telway master/slave link (depending on the model)         anguage       Reversible PL7 language, Instruction List language with Grafcet instructions and Ladder language         rogramming       FTX 117 terminal (Instruction List language) PL7-07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         ype of PLC       TSX 07 3L 1428 TSX 07 3L 2028       TSX 07 32 1028 TSX 07 33 1628 TSX 07 33 2428         ages       40050/12 and 40050/13		Processing on bits and words Processing on bit strings, word tables and inde	vod worde	
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anguage       Reversible PL7 language, Instruction List language with Grafcet instructions and Ladder language         rogramming       FTX 117 terminal (Instruction List language) PL7-07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         ype of PLC       TSX 07 3L 1428 TSX 07 3L 2028       TSX 07 32 1028 TSX 07 33 1628 TSX 07 33 2428         ages       40050/12 and 40050/13	communication	Terminal port, RS 485 ASCII link or Uni-Telway	master/slave link (depending on the model)	
anguage       Reversible PL7 language, Instruction List language with Grafcet instructions and Ladder language         rogramming       FTX 117 terminal (Instruction List language) PL7-07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         ype of PLC       TSX 07 3L 1428 TSX 07 3L 2028       TSX 07 32 1028 TSX 07 33 1628 TSX 07 33 2428         ages       40050/12 and 40050/13			, , , , , , , , , , , , , , , , , , , ,	
anguage       Reversible PL7 language, instruction List language with Grateet instructions and Ladder language         rogramming       FTX 117 terminal (Instruction List language) PL7-07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         ype of PLC       TSX 07 3L 1428 TSX 07 3L 2028       TSX 07 32 1028 TSX 07 33 1628 TSX 07 33 2428         ages       40050/12 and 40050/13	Ho.			X
rogramming       FTX 117 terminal (Instruction List language) PL7-07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         ype of PLC       TSX 07 3L 1428 TSX 07 3L 2028       TSX 07 32 1028 TSX 07 33 1628 TSX 07 33 2428         ages       40050/12 and 40050/13	anguage	Reversible PL7 language, instruction List language	ge with Gratcet instructions and Ladder languag	e
rogramming       F1X 117 terminal (Instruction List language)         PL7-07 software under DOS compatible with Windows 95 and Windows NT (Instruction List and Ladder language)         ype of PLC       TSX 07 3L 1428 TSX 07 3L 2028         ages       40050/12 and 40050/13	50°	ETV 447 to mine (Instruction List Is a support)		
ype of PLC         TSX 07 3L 1428 TSX 07 3L 2028         TSX 07 32 1028 TSX 07 33 1628 TSX 07 33 2428           ages         40050/12 and 40050/13	rogramming	PL7-07 software under DOS compatible with Win	dows 95 and Windows NT (Instruction List and	Ladder language)
TSX 07 3L 1428         TSX 07 32 1028           TSX 07 3L 2028         TSX 07 33 1628           TSX 07 33 2428         TSX 07 33 2428				and the second se
ages 40050/12 and 40050/13	ype of PLC	TSX 07 31 1428	TSX 07 32 1028	20
ages 40050/12 and 40050/13		TSX 07 3L 2028	TSX 07 33 1628	8
ages 40050/12 and 40050/13		10 Martin Carlos	TSX 07 33 2428	X
ages 40050/12 and 40050/13		8		
	ages	40050/12 and 40050/13		



### Nano PLCs Nano PLCs bases

### Presentation

Nano PLCs are very compact and offer a cost-effective replacement for traditional solutions while increasing application flexibility and ease of wiring.

Nano PLCs are available in 3 formats :

- Nano PLC bases with 10, 14, 16, 20 or 24 non-extendable I/O.
- Nano PLC bases with 10, 16 or 24 extendable I/O, which can be augmented with an I/O extension and up to 3 PLC extensions.
- Nano PLC extensions with 16 or 24 I/O which can be used to augment extendable Nano PLC bases (1 extension per base).

#### Non-extendable Nano PLC bases



Nano PLCs with 10 I/O



\*\*\*\*\*\*\*\*\*\* Nano PLCs with 14/16 I/O



\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Nano PLCs with 20/24 I/O

Non-extendable Nano PLC bases will not accept any extension. They all have a  $\sim \,$  100...240 V power supply, depending on the model :

- 10 I/O : 6 inputs + 4 outputs and 1 analogue input. 14 I/O : 8 inputs + 6 outputs.
- 14 I/O : 8 inputs + 6 outputs.
  16 I/O : 9 inputs + 7 outputs and 1 analogue input.
  20 I/O : 12 inputs + 8 outputs.
  24 I/O : 14 inputs + 10 outputs and 1 analogue input.

The following types of inputs and outputs are used :  $\bullet~$  Inputs : \_ 24 V (sensor supply is not protected).

- Outputs : relay.

These PLCs incorporate extended communication : Uni-Telway master/slave link or ASCII link for transmission/reception.

Models with 16 and 24 I/O have a real-time clock

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### Presentation (continued)

### Nano PLCs Nano PLCs bases

#### Extendable Nano PLC bases



Nano PLCs with 10 I/O



Nano PLCs with 16 I/O



Nano PLCs with 24 I/O or 16 I/O ( $\sim$  inputs)

Nano PLCs, with == 24 V or  $\sim$  100...240 V power supply, are available with three different I/O combinations :

- 10 I/O : 6 inputs + 4 outputs.
- 16 I/O : 9 inputs + 7 outputs.
- 24 I/O : 14 inputs + 10 outputs.

There are many types of I/O :

- Inputs : = 24 V,  $\sim$  115 V, analogue 0/10 V.
- Outputs: relay outputs, transistor outputs ---- 24 V/0.5 A (positive logic : load common at "-"), transistor outputs---- 24 V/0.5 A (negative logic : load common at "+").

Nano PLCs are programmed in lists of instructions using the FTX 117 programming terminal, in Ladder or Instruction list language using software on a PC compatible. Instruction list and Ladder programs are reversible on PC compatibles.

Nano PLCs are easy to set up and have numerous built in functions (EEPROM memory for storing programs, battery-backed RAM, real-time clocks for models with 16 and 24 I/O). They can be installed easily on a mounting rail or base plate, in a vertical or horizontal position.

#### Nano PLC extensions



Nano PLC extensions with 16 I/O



Nano PLC extensions with 24 I/O

Nano PLC extensions can be used to augment extendable Nano PLCs using a single extension per base.

They all have a  $\sim$  100...240 V or — 24  $\,$  V power supply and, depending on the model :

- 16 I/O : 9 inputs + 7 outputs.
- 24 I/O : 14 inputs + 10 outputs.

The following types of inputs and outputs are used :

- Inputs : --- 24 V.
- Outputs : relay outputs for models with ~ 100...240 V power supply, transistor outputs with positive logic for models with -- 24 V power supply

Each extendable Nano base PLC 1 can be augmented using an I/O extension 2, made up of one of the extendable Nano PLCs or a Nano extension.

In addition, up to three PLC extensions 3, 4 and 5 communicating via exchange words can be connected to the base PLC. Only the base PLC can receive an I/O extension.



This extension link can be used exclusively as a Modbus slave link.

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Description

### Nano PLCs Nano PLCs bases

#### Description Non-extendable Nano PLCs

The front panels of TSX 07 3L ••28 non-extendable Nano PLCs comprise :



#### **Extendable Nano PLCs**

The front panels of TSX 07 30 1000 extendable Nano PLCs with 10 I/O comprise :



- A port (1) for connecting a programming terminal (or Uni-Telway bus or serial link)
- A selector switch for coding the base/extension function
- A potentiometer
- A display of :
  - inputs 0 to 5 and outputs 0 to 3 - PLC status (RUN, ERR, COM, I/O)
- A mains power supply connection A sensor power supply (== 24 V/150 mA) on models with a  $\sim$  100...240 V supply
- An input sensor connection
- An output preactuator connection
- An extension connection (I/O extension and/or PLC
- extension) or Modbus slave connection 10 A removable cover for protecting the screw terminal

The front panels of TSX 07 31 16/24 extendable Nano PLCs with 16/24 I/O comprise :



- A port (1) for connecting a programming terminal (or
- Uni-Telway bus or serial link) A selector switch for coding the base/extension
- function
- Two potentiometers
- A display of :

blocks

- inputs 0 to 8 or 0 to 13 and outputs 0 to 6 or 0 to 9 PLC status (RUN, ERR, COM, I/O)
- A mains power supply connection
- A sensor power supply (== 24 V/150 mA) on models with a  $\sim$  100...240 V supply
- An input sensor connection
- An output preactuator connection
- An extension connection (I/O extension and/or PLC extension) or Modbus slave connection 0A removable cover for protecting the screw terminal

blocks

(1) Female 8-way mini-DIN type connector.

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### **Description** (continued)

### Nano PLCs Nano PLCs bases

#### Nano PLCs (with integrated analogue input)

The front panels of TSX 07 32/33 ••28 Nano PLCs with 10/16/24 I/O and 1 integrated analogue input comprise :



#### Nano PLC extensions

The front panels of TSX 07 EX •••• Nano PLC extensions comprise :



#### **Program loader**

The TSX PGR LDR module is designed to simplify duplicating or updating applications on Nano and Micro PLCs without the need for a programming terminal. An application (in internal RAM) can be transferred from a PLC to the TSX PGR LDR module (and saved within it), then transferred from the TSX PGR LDR module to a PLC.



The front panel of the TSX PGR LDR module comprises :

- 1 A cord for connecting to the PLC programming port
- 2 Four operation indicator lights
- A W/R button which selects the program transfer direction (PLC→ module or module → PLC).
- A GO button to start the transfer
- 5 A Write Only switch which prevents PLC→ module transfer
- 6 A Program Protect switch which protects the PLC application as read-only after the transfer

(1) Female 8-way mini-DIN type connector.

Characteristics	·
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**Functions** 

### Nano PLCs Nano PLCs bases



The RUN/STOP input will launch or stop program execution from an external order. After configuration, one of the first 6 inputs (%I0.0 to %I0.5) can be assigned to this function. One of the first 4 outputs (%Q0.0 to %Q0.3) can be configured to indicate to the user that the PLC program is not running (STOP or fault).

(1) TSX 07 30/31 PLCs can no longer receive an I/O extension or peer PLC when the integrated Modbus link is in use. TSX 07 32/33 ••28 and TSX 07 3L ••28 PLCs cannot take an I/O extension or peer PLC.

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aes 40050/12 to 40050/14

Base PLC (RUN/STOP

1 | | | C|0|1|2|3|4|5|

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### Nano PLCs Nano PLCs bases

#### Real-time based programming



### Analogue I/O



#### High-speed processing applications



Nano PLCs with 16 or 24 I/O integrate 16 user-definable real-time clocks which can be used to :

- Control the outputs directly (opening and closing electrical circuits) or act on the user program according to the time (month, day, hour and minute).
- Program time setpoints which can be modified via an operator panel or calculated by the program.
- Program event time-stamping or perform time calculations.

The Nano PLC is designed for simple process control applications (level, temperature, flow rate control, etc) with speed controller or servo-valve control.

TSX AEN/ASN modules are used with Nano PLCs to process 1 analogue input and 1 analogue output respec-tively :

- The input module, 0/10 V 10/+ 10 V or 4/20 mA is connected to the ---- 24 V input %I0.0 of the PLC and is configured in frequency meter mode.
- The output module, 0/10 V 10/+ 10 V or 4/20 mA uses the pulse width modulation transistor output %Q0.0.
   Analogue processing is also possible using three TSX 07 32/33 ●28 bases which consist of 1 analogue input 0-10 V.

On a base PLC or peer PLC, each of the first 6 inputs (%I0.0 to %I0.5) can be assigned to the latching function after configuration. This function is used to take account of input pulses with short durations, 100 µs minimum. Nano PLCs include standard functions which are easy to set up and can be used for adaptation to control systems requiring counting capacity or short response times :

- Fast counter (maximum frequency 10 kHz)
- Fast up/down counter (maximum frequency 1 kHz)
- Frequency meter (maximum frequency 10 kHz)

Sensors which are used on the up/down counter inputs (%I0.0 and %I0.3) must have solid state outputs. 2 reflex outputs (%Q0.1 and %Q0.2) are controlled directly by the fast counter (without waiting for outputs to be updated at the end of the scan) according to a matrix predefined during configuration.

**Pulse outputs** 



After configuration, the first output %Q0.0 (if it is a transistor output) of the Nano PLC can be used with :

- The PWM software function, as a pulse width modulation output at a predefined frequency of up to 4.9 kHz designed for use in applications with light or sound intensity control (dimmer function).
- The **PULSE** software function, as a pulse generator output of up to 4.9 kHz designed for use for controlling stepper motors.

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### Nano PLCs Nano PLCs bases

#### **Uni-Telway communication**



Modbus slave communication

**ASCII** communication

The Nano PLC can communicate with other Uni-Telway devices via the terminal port : speed -controllers, operator terminals, compact or modular PLCs. The ability to send and receive messages means that Nano

PLCs can be integrated in distributed architectures. In slave mode, for example, the Nano PLC can initiate communication and send updated variables to the bus master (local reflex processing).

28 Nano slave PLCs can be connected to the Uni-Telway bus over a distance of 1 km (isolated for speeds of 1.2 to 9.6 K bits/s).

Nano PLCs have an RS 485 serial link extension port, supporting the Modbus protocol (depending on the model). It is used to perform the following requests :

- Read/write bits and words
- Read PLC status (via Uni-TE request) Set to RUN or STOP mode (via Uni-TE request) .
- Initialise the PLC (via Uni-TE request)

Up to 28 Nano PLCs can be connected over a distance of 200 m for user-definable speeds of 1.2 to 19.2 K bits/s.

Bar code reade

The ability to send and receive characters enables the Nano PLC to communicate in point-to-point mode with a large number of ASCII devices, such as PCs (directly or via modem), printers, bar code readers, etc.

Frame speed and format can be configured. Connection to the Nano PLC terminal port is via an RS 232/485 converter cable powered by the PLC.

#### Modem application (Modbus or Uni-Telway protocol)



A PLC fitted with a Modbus or Uni-Telway master module Nano PLCs via the switched telephone interrogates net-work.

When connected to a Modem in RS 485 mode, the master can use the link to generate dialling sequences for remote sites

Each Nano PLC responds to requests from the master, but is also able to trigger a call by activation of a discrete input on the Modem.

Target applications (with Modbus or Uni-Telway) :

- System teleprocessing .
- Telemonitoring of remote sites .
- Water, energy, environment control .

The Uni-Telway slave link of Nano PLCs can also be used for

- Up/down loading programs
- Programming and remote diagnostics

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### Characteristics

### Nano PLCs Nano PLCs bases

Environm	ent		42 42	All Contractions	32
Conforming to	standards	8	IEC 1131-2, IEC 664, UL 508, UL 746 C, UL 94, 0	CSA 22-2 no. 142, EN 50081/class B	
Temperature Operation		o, N	0+ 60	to x Ao x	
officer	Storage	°C	- 25+ 70	. S <sup>C</sup> 0. '	
Humidity	Without condensation	%	595	ALCONT.	NIGDON
Altitude	44	m	02000	44	And a
Vibration resis	stance	~	Conforming to IEC 68-2-6 FC tests	X X	
Mechanical sh	ock resistance	e 12 <sup>8</sup>	Conforming to IEC 68-2-27 EA tests	10 <sup>.2</sup>	
Power su	pply charac	cteristics			
Type of PLC	dipoliti	<u>0</u>	TSX 07 30/31/32/33 ●●●8, TSX 07 3L ●●28, TSX 07 EX ●●28	TSX 07 31 •••2, TSX 07 EX ••12	. Bash
Supply	Nominal	v	~ 100240	24	and the second
voltage	Limit	v	85264	19.230	1
Frequency	Nominal	Hz	50/60	<u>à</u>	
A BAN	Limit	Hz	4763		
Power require	d S	5° .	≤ 30 VA	≤ 14 W	3
Sensor protec	ted power sup	oply V	24/150 mA		JS°
Primary/earth	isolation	Vrms	2000/50-60 Hz	2000/50-60 Hz	And a second
Microbreaks	Duration	ms	≤ 10	≤1	
Discrete i	nput chara	cteristics	1 All Contractions of the second s	19 <sup>.2</sup> 10 <sup>.2</sup>	
Type of input		v 🖓	<u></u> 24 (resistive)	$\sim$ 115 (capacitive)	
Nominal input	Voltage	v	<u> </u>	$\sim$ 110/120	3
values	Current	mA	7 3	10	J.S.
	Sensor supply	v v	19.230 (including ripple)	- 44	344
Limit input	At state 1 Vo	oltage V	≥ 11	≥79	
values	Cu	urrent <b>mA</b>	≥ 2.5 for 11 V	≥ 4 for 79 V	
	At state 0 Vo	ltage V	≤5	≤20	
	Cu	urrent <b>mA</b>	≤ 1.2	≤2	_3 <sup>5</sup>
Logic	an ion		Positive or negative depending on wiring		ALC'
Filter time	4		12 ms, 3 ms or 100 μs (on I0.0 to I0.7)/375 μs (on I0,8 to I0,13)	12 ms	3
Isolation	Between goup points	os of I/O Vrms	1500/50-60 Hz	1500/50-60 Hz	
	Type	Strice .	Optoelectronic module		

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Dimensions : page 40050/15

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## Characteristics (continued)

### Nano PLCs Nano PLCs bases

Discrete o	output character	istics	- 4 <sup>21</sup> - 4 <sup>21</sup>	1	
Type of outpu	t	~	Relay	Transistor, positive logic	Transistor, negative logic
Output descri	ption	Har.	1 normally open contact	Protected	Non-protected
Loads	Voltage	v	~ 24220	<u> </u>	<u> </u>
(nominal values)	Nominal current	А		0.5	0.5
	Tungsten lamp	w		≤ 10	≤ 10
loads	Voltage	v	24	19.230	19.230
Crasha?	Current	A	DC-12 : 1-24 V (0.3 x 10 <sup>6</sup> op. cycles) DC-13 : 0.4-24 V (1 x 10 <sup>6</sup> op. cycles)	0.625 (at 30 V) common to "-" loads	0.625 (at 30 V) common to "+" loads
$\sim$ loads	AC-12 resistive duty	A	1-110/220 V (0.5 x 10 <sup>6</sup> op. cycles) 0.5-110/220 V (2 x 10 <sup>6</sup> op. cycles) 1-48 V (0.5 x 10 <sup>6</sup> op. cycles) 2-24 V (0.3 x 10 <sup>6</sup> op. cycles) 1-24 V (0.5 x 10 <sup>6</sup> op. cycles)	- Manager -	O DOLL
19.64Ca.P	AC-15 inductive duty	A	0.22-220 V (1 x 10 <sup>6</sup> op. cycles) 0.5-24/48/110 V (1 x 10 <sup>6</sup> op. cycles) 1-24 V (0.2 x 10 <sup>6</sup> op. cycles)	- stat	
Response	State 0 to 1	ms	≤5	≤1 ×	≤1
time	State 1 to 0	ms	≤ 10	≤1	≤1
Leakage current	At state 0	mA	- 454543.5	<u>≤ 1</u>	≤1
Voltage drop	At state 1	V 📐	- >	≤ 2 (for I = 0.5 A)	≤ 1.5 (for I = 0.5 A)
Built-in protection	Overloads and short-circuits	3Karx	None (fit one fuse per I/O point or group of I/O points)	Yes	None (fit a fuse on the preactuator common)
	Overvoltages		None (fit RC or GMOV peak limiter circuit for $\sim$ and a freewheel diode for $=$ )	Yes	Yes
	Polarity inversions		- 44 - 44	Yes	Yes

# Polarity inversions – Integrated analogue input characteristics

Type of PLC		Jack Land	TSX 07 32/33 ••28			
Analogue	Number of points	5	1	and the second sec	and the second sec	
input	Input range	v	010	all <sup>or</sup>	JIC'	
	Input impedance	kΩ	1618	S. S		, jõ
	Max. voltage without destruction	v	± 16	144 A.	in a	14
Ś	Type of protection	a de	Against short-circuits	Ś	à.	
Conversion	Method	No.	Successive approximations			
	Resolution		8 bits	S.		
	Conversion time		PLC scan time		5	
	Precision at 25 °C	% FS	±0.8	100	200	X
	at 60 °C	% FS	±2			
	Drift		0.34 % per 10 °C	State .	St.	Ser.
	Repeatability	V	± 0.8 % of 0 to 60 °C (at full sc	ale)	St.	55
Isolation	Analogue input and processor	v	None	6	6	
Wiring	Isolated sensor	m	30 max.	and the second se	and the second se	
distance with shielded cable	Non-isolated sensor	m	10 max.	. S <sup>10</sup>	x0 <sup>170</sup>	

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Characteristics (continued)

### Nano PLCs Nano PLCs bases

Modbus characteristics		2	20		20	25	
Type of PLC	TSX 07	30/31 ••••					
Structure	Descrip	tion	Heterogeneous industria	lbus	ALO.Y		
	Physica	l interface	RS 485 non-isolated	S.	. St. 81		
	Method	of access	Master/slave type		10005	20	
Transmission	Mode	01 000000	Asynchronous in base b	and PTU/ASC		ANIO.	
		Leve -	A Q K hite (a to 40 Q K hite		on name	192	
	Bit rate		1.2 K DIts/s to 19.2 K Dits	5/S	2	<u></u>	
	Medium	۱ ی	Double shielded twisted	pair	Xe <sup>_X</sup>		
Configuration	Number	of devices	28 devices maximum, 98	link addresse	es maximum		
	Bus len	gth	200 m maximum				
<u> </u>	Drop ca	ble	15 m maximum			S. S.	
Available Modbus/Jbus slave	Code	Description		Code	Description	all a	
functions	01	Reading of n con	secutive output bits	05	Writing of 1 output bit	rd	
	02	Reading of n con	secutive input bits	15	Writing of n output bits	3	
	04	Reading of n con	secutive input words	16	Writing of n output wo	rds	
Services	Sending	g requests	Bits : 120 bits maximum per request Words : 120 words maximum per request		est		
	Safety	3°	One CRC 16 check para	meter on each	frame	S°	
	Monitor	ina	Diagnostics counters, eve	ent counters			
ASCII asynchronous ser	ial link o	haracteristics	S				
Type of PLC	8		TSX 07 30/31/32/33 •••	. TSX 07 3L	••••		
Physical laver	Termina	l port	RS 485 non-isolated Half	f-duplex (10 m	u max)		
office soffice	Flow rat	te	1.2 K bits/s to 9.6 K bits/s				
Transmission	Type		Point-to-point without flu	x control (Xon	-Xoff RTS/CTS)	S.	
	Data		7 or 8 bits				
	Stop bit	All Contractions	1 or 2 bits				
1	Parity b	it	Even, odd or no parity				
Services	120 cha	aracter messages	Transmission/reception				
<b>Uni-Telway integrated</b>	link ch	aracteristics	(general characteristics,	, see page 43	594/2)		
Type of PLC	0	S. S. S.	TSX 07 30/31/32/33 •••	, TSX 07 3L	••••		
Structure	Physica	l interface	RS 485 terminal port Hali	f-duplex non-is	solated		
	Bit rate	<u> </u>	1.2 to 9.6 K bits/s				
	Function	lis	waster/slave		. S. M.		
Configuration	Number	r of devices	Master : 3 devices maxim Slave : 28 devices maxim	num (5 link ade num (96 link ae	dresses maximum) ddresses max.)	1	
. a.S.	Bus len	gth	10 m max, 1000 m when	using the TS)	K P ACC 01 terminal port	cable connector	
Services	Uni-TE	server	Writing or reading Nano r device	master data af	iter a request is sent by a	connected client	
		AL DOUL	Reception of messages f maximum	rom all device	s on the bus (master or s	slave), 128 bytes	
	Uni-TE (master	client function)	Sending requests (128 bytes maximum) to all slave devices on the bus			the bus	
12 the state of th	Uni-TE (slave fi	client unction)	Sending messages to ever maximum	ery device on	the bus (master or slave)	, 128 bytes	

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References

### Nano PLCs Nano PLCs bases



## References (continued)

# Nano PLCs Nano PLCs bases

	Extend	able Nano P	LC bases (d	continued)		- 5
	Number of I/O	Inputs	Relay outputs	Transistor outputs 24 V/0.5 A	Reference (1)	Weight kg
	~ 100 24	0 V power supply				
	10	6124 V	40	- 3	TSX 07 30 1028	0.300
WWWWWWW			_	4 O unprotected, negative logic	TSX 07 30 1008	0.280
				No.		
A State	16	9 loc 115 V	7.0	<u>2</u>	TSX 07 31 1648	0.390
1 2021 - 1 2021		91 <u>-</u> 24 V	70		TSX 07 31 1628	0.360
			-	7 O unprotected, negative logic	TSX 07 31 1608	0.335
	24	14 I — 24 V	10.0		TSX 07 31 2428	0 410
statetetetete	C. C. C.	171	-	10 O unprotected, negative logic	TSX 07 31 2408	0.380
	Nano P	LC bases (wi	ith an integrated	analogue input) (2)	ADRILL CONTRACT	
- 14 L	Numbor	Inpute	Relay outputs	Integrated analogue input	Reference	Woight
n i i energi	of I/O	inputs	Relay outputs	integrated analogue input	(1)	kg
●●/TSX 07211648	$\sim$ 10024	0 V power supply				
	10	6 I <u>-</u> 24 V	40	1 I x 010 V	TSX 07 32 1028	0.290
	16	91 <u></u> 24V	70	1 I x 010 V	TSX 07 33 1628	0.290
L Jore	24	14 I <u>—</u> 24 V	10 O	1 I x 010 V	TSX 07 33 2428	0.290
1020 X	Nano Pl These exten Number	sions can be used to Inputs	S augment extend Relay outputs	able Nano PLC bases at minir Transistor outputs	num cost (maximum 1 ext Reference	ension per base). Weight
	Of I/O		30.	24 V/0.5 A	(1)	кд
	<u> </u>	ver supply				
	16	91 <u></u> 24 V	-	7 O protected, positive logic	TSX 07 EX 1612	0.325
and a second	24	14 I <u></u> 24 V	- 1	10 O protected, positive logic	TSX 07 EX 2412	0.370
normal (TITIT)	~ 100 24	power supply		2	Sec.	
10	16	91 <u></u> 24 V	70		TSX 07 EX 1628	0.360
600	24	14 I <u></u> 24 V	10 O		TSX 07 EX 2428	0.410
annanananan 🖉	(1) Multiling	ual quick reference	guide included a	s standard (English, French,	German, Italian and Spa	anish).
TEX Naro Elements (117717)	(2) <b>TSX 07 3</b>	<b>2/33 ●●28</b> PLCs do	not have I/O exten	sion and/or PLC extension link	s or the Modbus slave link	с. "М
<u>:</u> X 24 <b>00</b>						

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# References (continued)

### Nano PLCs Nano PLCs bases

TSX PRG LDR



Separate parts		1	/	~
Description	Use with	Length	Reference	Weight
Program loader with	Simplifies duplicating or updating	0.3 m	TSX PRG LDR	0.150
programming port	applications (program and constants			
connocang cabio				
Input simulator	Nano PLC with 10 I/O	_	TSX 07 SIM 06	0.050
$= 24/\sim$ 115 V			\$P.	0.000
	Nano PLC with 16 I/O		TSX 07 SIM 09	0.070
	Nano PLC with 24 I/O	<u>è</u> —	TSX 07 SIM 14	0.080
Connecting cables	I/O extension	0.3 m	TSX CA0 003	0.015
Delween Nano PLC Dases				
	<b>D</b> I O sutas siste	50	TOX OTO OFO	4 740
	PLC extension	50 m	TSX STC 200	1.710
		200 111		0.750
Connecting cable for	Nano PLC terminal port connection	2,5 m	TSX PCX 1130	0.240
Modem (DCE)	to the Modem device (with 25-way			
	male SUB-D connector)			
Terminal port cable	Isolation of Uni-Telway signals for	1 m	TSX P ACC 01	0.690
connector	distances > 10 m and < 1 km, line			
	termination, bus drop cable			
Description	Same and the second sec		Defenses	
Description	Composition		Reference	weight ka
Self-instruction cases	1 Nano PLC (16 I/O),		TSX SDC 07 30 117	0.950
(1)	1 Input simulator and 1 FTX 117			
	44	To.		24
	1 Nano PLC (16 I/O),		TSX SDC 07 30 DSF	0.600
	FT 210032	IT DOS IOF		
	11210002			
	1 None RI C (16 1/2)			0.000
	1 input simulator and software upde		137 30C 0/ 30 DSP	0.600
	compatible		-3 <sup>55</sup>	

(1) Multilingual quick reference guide included as standard (english, french, german, italian and spanish).

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### Dimensions, mounting

# Nano PLCs Nano PLCs bases





### Mounting

By clicking onto 35 mm - DIN rail, or by screwing onto panel using Ø M3 screws Mounting Removal



Mounting positions on vertical plane Possible mounting positions



Incorrect mounting position

Installation rules

9 а ത 1 Switchgear, enclosure or machine frame 2 Cable ducting or clips  $a \ge 20 \text{ mm}$  $b \ge 40 \text{ mm}$ Warning : Avoid placing heat generating devices (transformers, power supplies, contactors, etc) beneath the Nano PLC. ര

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### Connection of inputs

# Nano PLCs bases

### Power supply --- 24 V, 6, 9 or 14 inputs --- 24 V



### Power supply $\sim$ 100/240 V, 6, 8, 9, 12 or 14 inputs — 24 V





#### Power supply $\sim$ 100/240 V, 9 inputs $\sim$ 115 V



#### Analogue input



(1) 3 A fuse.(2) Earth connection required for non-isolated sensor.

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## Connection of relay outputs Nano PLCs

Nano PLCs bases

### Power supply <u>—</u> 24 V or $\sim$ 110...220 V (1)



TSX 07 31 1622/1628, TSX 07 33 1628, TSX 07 EX 1628





#### TSX 07 31 2422/2428, TSX 07 33 2428, TSX 07 EX 2428



#### Power supply $\sim$ 110...220 V (1)

TSX 07 31 1648



(1) Provide an inductive overload protection device at the load terminals and for each output : an RC or GMOV type peak limiter circuit for ~, a flywheel diode for \_\_\_\_\_.
(2) Fuse rated for load.

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Connection of <u>---</u> 24 V transistor outputs

### Nano PLCs Nano PLCs bases

Power supply - 24 V, positive logic transistor outputs



#### Power supply - 24 V, negative logic transistor outputs

TSX 07 31 1608



TSX 07 31 2408



(1) Fuse rated for load.

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### Connection of extensions Nano PLCs Connection to Modbus and Nano PLCs bases Uni-Telway buses

#### **Connection of extensions**



- (1) TSX CA0 003 cable (0.3 m long) or shielded twisted pair cable.
- (2) Remote location (200 m max) of Nano PLC extensions requires either :
- TSX STC 050 cable (50 m long) or TSX STC 200 (200 m long), or
- Shielded twisted pair cable with the following main characteristics :
- Mechanical characteristics : tinned copper core, 18 to 24 gauge with tinned copper shielding - Electrical characteristics : load resistance per unit length of one wire :  $\leq$  85  $\Omega$ /km, load resistance per unit length of shielding :  $\leq$  12  $\Omega$ /km

### **Connection of Modbus bus**



(1) Shielded twisted pair cable





TSX CSA ••• : bus cable, double twisted shielded pair. The shielding must be taken to earth at each device.

- TSX SCA 62 : passive 2-channel subscriber socket (see page 43594/5).
- XBT-Z908 : connecting cable between the CCX 17 operator panel and the TSX SCA 62 subscriber socket (see page 43594/5)
- TSX PCU 1030 : Uni-Telway connecting cable between the PC compatible FT 2000 terminal and the TER port of Nano PLCs or TSX P ACC 01 connectors.

T FTX CBF 020 : Uni-Telway connecting cable between the FTX 517 terminal and the TER port of Nano PLCs or TSX P ACC 01 connectors.

TSX P ACC 01 : cable connector from a Nano PLC to the Uni-Telway bus via the PLC terminal port. The connecting cable (1 m long) is integrated in the cable connector. It isolates signals (over a distance > 10 m) and adapts line termination impedance. It is also used to select the terminal port (Uni-Telway master/slave or character mode).

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### Presentation, description, characteristics

### Nano PLCs Analogue I/O extension modules

#### Presentation

TSX AMN analogue I/O extension modules have 3 analogue inputs and 1 analogue output which can be configured for voltage or current :

- TSX AMN 4000 : with $\sim$  100/240 V power supply. TSX AMN 4001 : with 24 V power supply.

It is possible to use up to 3 modules as an extension to the Nano PLC base. They communicate with the base PLC via exchange words.

### Description

The front panels of TSX AMN analogue I/O extension modules comprise :



A mains power supply connection terminal block. An analogue input connection terminal block. An analogue output connection terminal block. A PLC extension connection terminal block. A selector switch for coding the extension number.

- A display block with 4 LEDs :
- RUN : PLC status
- ERR : internal fault - COM : exchanges on the extension link
- I/O : external faults

### Characteristics

Input charact	teristics			- S		
Type of modul	e valit		TSX AMN 4000		TSX AMN 4001	
Analogue inputi	Number of channels Input range Input impedance Max. voltage without damage		3 010 V, ± 10 V, 020 mA, 4-20 mA 125 Ω in current, 100 KΩ in voltage ± 7.5 V in current, ± 30 V in voltage	A		and a second second
Power supply	Nominal voltage	v v	∼ 100240 (50/60 Hz) ∼ 85264 (50/60 Hz)	Here .	<u></u> 24 19.230	No.x
Conversion	Method Resolution channel 1 Resolution channel 2 Resolution channel 3 Precision		By successive approximation 11 bits (+ sign in $\pm$ 10 V) 11 bits (+ sign in $\pm$ 10 V) (if two char 7 bits (+ sign in $\pm$ 10 V) 0.5% of the full scale from 0 to 60°C	nnels are used),	7 bits (+ sign in ± 10 V) (if t	hree channels are used)
Isolation	Between channel and earth Between inputs	V rms	2000 Common point		2 <sup>2</sup>	44 <sup>2</sup>
	outputs	v rms	1000			

#### **Output characteristics**

Type of modu	le		TSX AMN 4000/4001	and the second se	and the second
			4		
Analogue	Number of channels		1		
output	Max. permissible	V	± 30		
	voltage	<u>_</u>	2 C		
Xe	8	20	×C.	×C°	Ke.
Conversion	According to standards		IEC 1131, UL 508, ANSI MC 96.1,	NF C 42	
	Range		010 V or ± 10 V	020 mA	4-20 mA
	Resolution		11 bits (+ sing in ± 10 V	11 bits	11 bits
	Precision		1 % of 060 °C	1.5 % of 060 °C	1.5 % of 060 °C
/	Type of protection		Permanent short circuit	Permanent open circuit	
Isolation	Between channel and earth	V rms	2000		
	Between inputs and	V rms	1000		
6	outputs	8	8	8	6

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References, dimensions, connections

### Nano PLCs Analogue I/O extension modules





Distance between module and sensors or preactuator : 50 m max. with cable ø 0.5 mm (conductor cross-section) and shielding connected on the module side. (1) 3 A fuse.

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### Description, functions, characteristics

### Nano PLCs Analogue I/O modules

TSX AEN and TSX ASN analogue I/O modules enable the use of an analogue input on Nano PLCs via high speed counter inputs and the use of an analogue output on Nano PLCs via solid state outputs respectively.

There are six types of I/O module : • TSX AEN 101 : 0/10 V input range • TSX AEN 102 : 4/20 mA input range

TSX AEN 105 : ± 10 V input range

.

- TSX ASN 101 : 0/10 V output range
  - TSX ASN 102 : 4/20 mA output range
  - TSX ASN 105 : ± 10 V output range

### Description

Analogue I/O modules are in a box format.



The front panel consists of :

- A screw terminal block for connecting the ---- 24 V power supply
- A lamp indicating the presence of the == 24 V power supply
- 3 An I/O type selector switch (positive or negative logic)
   4 A sc rew terminal for connecting the frequency input or output to the Nano PLC
- 5 Two screw terminals for connecting the sensor or analogue preactuator

### Functions

Analogue I/O modules have the following functions :

#### • For analogue inputs

- For voltage/frequency conversion, which requires connection of the TSX AEN 10e module frequency output to the I0.0 input of the Nano PLC (---- 24 V input configured as a frequency meter at 10 kHz). • For analogue outputs
- For frequency/voltage-current conversion, which requires connection of the TSX ASN 10• module frequency input to the Q0.0 output of the Nano PLC (solid state output configured for the PWM function, with time base at 0.1 ms).

### Characteristics

Type of module		2	TSX AEN 10	TSX ASN 10
76. 76.	70.	3.	<i>7</i> 6,	°6.
Analogue I/O	Number of channels	8	1 (high level)	1 (high level)
	Input impedance		6.6 MΩ (1) 250 Ω (2)	
	Load impedance			$\leq 5 \text{ K}\Omega (1) \leq 250 \Omega (2)$
	Max. permissible voltage without damage	V	±16	± 12 (1) ± 0.6 <i>(</i> 2 <i>)</i>
	1 <sup>2</sup> 1 <sup>2</sup>		A.	AV .
Conversion	Method of conversion		Voltage → frequency	Frequency   voltage
	Resolution		10 bits or 12 bits	8 bits
	Conversion time	ms	125 (10 bits), 500 (12 bits)	500
No.	Precision		± 1 % of 0…60 °C (3)	N. C.
S	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -			a
Frequency output	Nominal voltage	V	<u> </u>	
	Logic	S.	Positive or negative	
S <sup>0</sup>	Protection against short-circuits		No	
Frequency input	Naminal voltage	v	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	24
riequency input		v	-	Bositivo or pogotivo
	Logic		- 24	Fositive of negative
Power supply	Nominal voltage	v	<del></del> 24	
	Limit voltages	V	2130	~
	Power drawn	W	2.5	- 19 N
	Inrush current	A	10 max	35
	1 Contraction of the second	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
Isolation	Between power supply and earth	V rms	1500/50-60 Hz	1500/50-60 Hz
	Between the input or output and earth	V rms	1500/50-60 Hz	1500/50-60 Hz
	Between the input and frequency output	V rms	500/50-60 Hz	
14 M	Between the frequency input and the output	V rms		500/50-60 Hz

(1) TSX AeN 101 (0...10 V) and TSX AeN 105 (- 10...+ 10 V) modules. (2) TSX AeN 102 (4...20 mA) module. (3) Full scale.

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References, dimensions, mounting, connections

### Nano PLCs Analogue I/O modules

References



TSX AEN 10•



		Current	4-20 mA	TSX AEN 102	0.120
Analogue outp	out modules (3)			-70	1
Туре	Number of	Nature	Output range 📐	Reference	Weightk
	channels			(2)	g
High level	1 channel	Voltage	0-10 V	TSX ASN 101	0.120
8 bits		Ū	± 10 V	TSX ASN 105	0.120
		Current	4-20 mA	TSX ASN 102	0.120

Input range

0-10 V

± 10 V

Reference

TSX AEN 101 TSX AEN 105

(2)

TSX ASN 100

Connections TSX AEN 10• input module

Discrete inputs wired in positive logic

(1) The Nano PLC must have --- 24 V inputs.

Analogue input modules (1) Type Number of

High level

10/12 bits

channels

1 channel

(2) Installation guide included as standard (English, French, German, Italian and Spanish).
 (3) The Nano PLC must have - 24 V transistor outputs.

Nature

Voltage

#### Dimensions, mounting TSX AEN 100/ASN 100 module





Discrete inputs wired in negative logic

#### TSX ASN 10• output module Connection example with positive logic output





TSX 07 3€ ●●12 Pos. log

FG



Preactuato

Weight kg

0.120

0.120

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### Nano PLCs PL7 language

#### General

PL7 language on Nano PLCs enables the programming of simple sequential applications such as those requiring numerical processing or specific functions such as schedule blocks, fast counting, etc. This programming is in List language (Instruction List) or in Ladder language.

These two languages are reversible provided a few simple programming rules are respected : any Nano PLC program which has been written in Instruction List (on an FTX 117 terminal or using PL7-07 software) can be read and modified in Ladder language (with PL7-07 software on an FT 2100 terminal or PC compatible) or vice versa.

#### List language



#### Ladder language

PL7 Ladder language is entirely graphic and thus offers the advantage of similarity with electromagnetic relay control systems. Its basic symbols are complemented by graphic elements allowing it to carry out control system functions, numerical processing and structuring of Nano PLC programs.

Ladder language provides additional assistance when debugging applications through the real-time display of graphic symbols (for example, the highlighting of closed contacts).

#### Programming terminals

The development, transfer, debugging and archiving of programs for Nano PLCs can be carried out equally well on either of the two types of terminal :

FTX 117



Dedicated pocket terminal, for programming in List language with operation in offline or online mode.

#### FT2100 or PC compatible



Standardised design office and workshop terminal, with PL7-07 software for programming in Ladder and/or List language (Instruction List)

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### Characteristics

### Nano PLCs PL7 language

Instructions	24	Combined List instructions	24	Grafcet List instructions #	2
		<ul> <li>LD, LDN, LDR, LDF : read the state inverse, rising and falling edge)</li> <li>ST, STN, S, R : write an output (dire.</li> <li>AND, ANDN, ANDR, ANDF : logic A inverse, rising and falling edge)</li> <li>OR, ORN, ORR, ORF : logic OR with rising and falling edge)</li> <li>LD (, AND (, OR(,) : open and close levels)</li> <li>XOR, XORN, XORR, XORF : exclu</li> <li>MPS, MRD, MPP : buffer memory r divergence towards output bits</li> <li>N : negation</li> <li>List comments and title with PL7-07</li> <li>Title : 122 characters before each i LD, LDN, LDR, LDF</li> <li>Comments : 4 lines of 122 character instruction LD, LDN, LDR, LDF</li> <li>Possibility of associating a commer with each instruction</li> </ul>	e of a bit (direct, ct, inverse, set, reset) NDD with a bit (direct, n a bit (direct, inverse, brackets (8 possible sive OR with a bit nanagement for <b>r software</b> nstruction ers before each t of 122 characters	<ul> <li>-*-i: step (1 ≤ i ≤ 62)</li> <li>=*=i: initial step (1 ≤ i ≤ 62)</li> <li>#i: activate step i, after deactivation</li> <li>#: deactivate current step</li> <li>#Di: deactivate step i after another step</li> <li>#Di: deactivate step i after another step</li> <li>%Xi: bit associated with step i</li> </ul> Instructions on program <ul> <li>MCS, MCR : master relay</li> <li>END, ENDC, ENDCN : end of prograding or unconditional)</li> <li>JMP, JMPC, JMPCN : jump to a label (conditional or unconditional)</li> <li>SRn : call subroutine n (0 ≤ n ≤ 15)</li> <li>RET : end of subroutine</li> <li>NOP : non-operative instruction</li> </ul>	of current step step am (conditional el % L
		Ladder rungs 10 contacts of 7 lines with 1 output Title : 122 characters per rung Comments : 4 lines of 122 character	per line rs	Ladder language graphic symbols <ul> <li>Normally open, normally closed and c</li> <li>Direct, inverse, SET and RESET coi</li> <li>Program jump, subroutine call</li> </ul>	on edge contacts Is
		Standard function blocks		Specific function blocks	S°
		<ul> <li>32 timers :%TMi (0 ≤ i ≤ 31) 0 to 99</li> <li>16 up/down counters :%Ci (0 ≤ i ≤ 1</li> <li>4 16-bit LIFO or FIFO registers :%R</li> <li>4 drum controllers :%DRi (0 ≤ i ≤ 3</li> <li>Real-time clock :%RTCi (0 ≤ i ≤ 15</li> <li>minute, with TSX Nano 16 and 24</li> </ul>	99 (word) 5) 0 to 9999 (word) i $(0 \le i \le 3)$ ) 8 steps ) month, day, hour, /O	<ul> <li>Transmission/reception of message maximum (internal or constant) :EX(</li> <li>Exchange control : %MSG available ou</li> <li>8 shift bit registers :%SBRi (0 ≤ i ≤ 7 to the left or right (max. 16 steps).</li> <li>8 step counter blocks :%SCi (0 ≤ i ≤ forward or back one step (max. 256</li> <li>1 fast counter (max 10 KHz) forcuration.</li> </ul>	of 64 words CH tput, fault -output ), shift one step (57), move steps)
		<ul> <li>Numerical instructions</li> <li>Assignment in word, indexed word, word tables : :=</li> <li>Arithmetic : +, -, x, /, REM, SQRT</li> <li>Logic : AND, OR, XOR, NOT, INC,</li> </ul>	bit strings DEC	<ul> <li>Trast counter (max. 10 KH2), frequent 10 KHz), up/down counter (max. 1 H 2 high speed outputs</li> <li>Pulse width modulated output :%PW</li> <li>Pulse output :%PLS</li> <li>Real-time display of Grafcet steps us</li> <li>Symbol table management</li> </ul>	KHz) : %FC with
		<ul> <li>Shift operation : SHL, SHR, ROL, Frotate)</li> <li>Conversion : BTI, ITB (BCD &lt;-&gt; Bir</li> <li>Comparison :&gt;, &lt;, &lt;=, &gt;=, =, &lt;&gt;</li> </ul>	COR (logic and hary)	<ul> <li>Porting of Nano applications to Micro</li> </ul>	(List or Ladder)
Specific functions	and al. door	<ul> <li>1 input for PLC RUN/STOP comma</li> <li>1 PLC status (security) output : PLC</li> <li>6 latching inputs : 100µs minimum</li> </ul>	nd Serror	<ul> <li>Real-time display of Grafcet steps us</li> <li>Symbol table management</li> <li>Porting of Nano applications to Micro</li> </ul>	sed (List or Ladder)
Ś		S. S.		Sec. 2	
Addressable objects		Bit objects		Word objects	
		<ul> <li>% I/Qx.y : 28 inputs and 20 outputs</li> <li>% Mi : 128 internal bits</li> <li>% Si : 128 system bits</li> <li>% Xi : 62 Grafeet steps</li> <li>% •oi.j : function block bits</li> <li>% •oi:Xk : bits extracted from intern words, constant words, input and or</li> <li>Bit string and word table objects</li> </ul>	max. nal words, system utput words	<ul> <li>% MWi : 256 internal words</li> <li>% KWi: 64 constant words</li> <li>% SWi : 128 system words</li> <li>% IWi.j : 2 input words per PLC (excl inter-PLC communication)</li> <li>% QWi.j : 2 output words per PLC (e for inter-PLC communication)</li> </ul>	nange words for xchange words
		● %●i:L : bit strings (I/O, internal, sys	tem and Grafcet bits)	<ul> <li>%•Wi:L : word tables (internal, const words)</li> </ul>	ant and system

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### Nano PLCs PL7 language

#### Software structure

- There are two types of scan execution :
- Normal cyclic execution. This is the default setting.
- Periodic execution. This type of execution and the period of time are defined by the user during configuration.

#### Normal (cyclic) execution



#### Periodic execution



The execution of a scan is relaunched at the end of each period. The scan execution time must be less than that of the period defined (2 to 150 ms). If it exceeds this, it is memorised in a system bit (%S19) which should be tested and reset to 0 by the user (via the program or the terminal).

A software watchdog of 150 ms monitors the scan time. If it exceeds 150 ms, an execution fault is displayed (see normal execution).

#### PLC scan

- In both types of execution, the system carries out :
  - Internal processing
  - The system implicitly
  - monitors and controls the PLC
     processes requests from the terminal
- Reading of inputs
- The state of each preactuator connected to the inputs (%I) is memorised. It is this memorised state which is taken into account during program processing.
- Program processing
- The program is executed in the order in which the user has written it (except for program or subroutine jump instructions).
- Updating of outputs

The outputs (%Q) are activated or deactivated depending on the state (0 or 1) defined by the program.

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### Nano PLCs PL7 language

### Instruction List language

#### Program structure

A program in PL7 language comprises a list of instructions (up to 1000 instructions) from the following different families LD %10.3

- Bit instructions : for example, read input n° 3 : • Function block instructions : for example, start timer n° 0 :

00

- Word instructions : for example, an addition
- Program instructions : for example, call subroutine n° 5 :
  Grafcet instructions : for example, step n° 8 :
- Each program line has an automatically generated line number,

an instruction code and a bit or word operand.

IN %TM0 [%MW10 := %MW50 + 100] SR5

-\*-8

Example of a program line :

003 AND %M27

> operand instruction code line number





#### Application programming with Grafcet

The translation of a Ladder diagram into a	aı
nstruction List program is immediate.	

000	LD	%I0.1	Start cycle pushbutton
	AND	%10.0 🚿	Vehicle present proximity sensor
	AND	%M3	Real-time clock authorisation bit
	AND	%10.5	High roller limit switch
	AND	%10.4	Rear gantry limit switch
005	S	%M0	Memo start cycle
	LD	%M2	10 A
	AND	%10.5	
	OR	%10.2	Stop cycle pushbutton
	R	%M0	100
010	LD	%M0	
	ST	%Q0.0	Scan indicator

A Grafcet program is divided into 3 parts, each with a specific role

0	S	g	x0° x0
000	LDN	%10.6	Pre-processing
001	S	%S22	This is made up of a list of instructions
002	ST	%M0	for processing :
003	LDR	%10.6	Power returns
004	S	%S21	<ul> <li>Failures</li> </ul>
			<ul> <li>Changes in mode</li> </ul>
			Input logic
			It ends with the first =*= or -*instruction
			encountered
005	=*=	1	Sequential processing
006	LD	%I0.2	This is made up of the chart (-instructions
007	ANDN	%I0.3	representing the chart) :
008	#	2	Steps
009	LD	%10.3	Transitions
010	ANDN	%l0.2 📣	Conditions
011	#	3	It ends with execution of the =*= POS
012	<b>_*</b> -	2	instruction.
013	LD	%10.4	
014	# 📈	1	
015	-*-	03	
016	LD	%10.5	
017	#	1	
018	=*=	POST	Post-processing
019	LD	%X1	This is made up of a list of instructions
020	ST	%Q0.1	for processing :
021	LD	%X2	<ul> <li>Instructions from the sequential</li> </ul>
022	ST	%Q0.2	processing part to control the outputs
023	LD	%X3	<ul> <li>Safety interlocks specific to the</li> </ul>
024	OR (	%M1	outputs
025	ANDN	%I <b>0</b> .2	
026	AND	%10.7	
027	)		
028	ST	%Q0.3	

%I0.6 %S22 -(s) %M0 () %10.6 %S21 P (s)

	ALGER .
2	<u>).3</u> 3 3
+ %10.4	%I0.5

%X1 	%Q0.1
%X2	%Q0.2
$H \vdash$	( )
%X3	%Q0.3
%M1 %I0.2	%10.7
+  /	- 1 - Terrer 1

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### Nano PLCs PL7 language

### Ladder language



0.12						Q					_
-IE-		-11-	Ŧ	-11-	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	-(	۲
·	Ŧ	T	Ŧ	T	Ŧ	Ŧ	-	I	T	-(	7
·				-Æ-	<b>I</b>				- II	(	7
·	Ŧ	R <u>∏</u> -	- TE	Ŧ	Ŧ	Ŧ	-	Ŧ	T	-(	7
·		S ADJ:Y	<u>T</u> D		- III -					(	7
·		CU			<b>I</b> I					(	7
		CD			1	- <b>I</b> -		⊞		(	7
10		Т	est Zo	ne	- N	2011				Ч	
								Actio	n Zone		~

A program in Ladder language consists of a series of rungs Each rung is labelled and can be :

- Described by a title of 122 characters maximum.
- Completed by a comment of 4 lines of 122 characters maximum
- A rung consists of 7 lines of 11 columns with a maximum of 10 contacts and one coil per line.

- The rung is divided into two different zones :
  Test Zone for receiving graphic elements; contacts, -comparison blocks and function blocks (standard or specific).
- Action Zone for receiving coils (in column 11) and operation blocks (from column 8 onwards).

Within a rung, coils or operation blocks must be connected by at least one vertical link in order to form a single group.

### **Graphic elements**

The graphic elements which make up a rung are :

- Contacts
- +++/+HPF HNF
- Coils

%TMi

- -( )- -( / )--(s)- -(R)-
- Standard and specific function blocks

rising edge (P) and falling edge (N). These control the output bits or internal bits. 4 types are available : direct, inverse, set and reset.

These test the state of the bit associated with them. 4 types are available : normally open, normally closed,

These correspond to the control system functions. There are 10 of them (see next page). A single function block is authorised for each rung.

These enable numerical processing : assignment of words, arithmetic, logic, conversion, logic and rotate shift -operations, incrementation/decrementation. They call up the List -language numerical instructions.

These enable comparison of two words of any type (>, >=, <, <=, =, <>).

These call up subroutine n and the program jump for rung n.

These elements, called horizontal Boolean logic and -vertical Boolean logic are used to connect all the graphic elements described above.

#### Reversibility

The reversibility of List and Ladder languages enables the display of programs in whichever language is desired, regardless of the language used in their creation. For example, an application developed in the design office in Ladder language can be read, and even modified, in List language, and vice versa.

In order to be reversible, an application written in List language must respect a few rules of reversibility :

- Certain instructions such as XOR, JMPCN, etc must not be used.
- Function blocks such as BLK, OUT\_BLK and END\_BLK, etc must be used.

Each part of a non reversible program is represented in List language, the rest of the reversible program is presented in the form of rungs

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%MW0 := %MW10 + 100

**Operation blocks** 

**Comparison blocks** 



- Program structure elements
- $\rightarrow$  SRn  $\rightarrow$  %Ln
- Connecting elements

### Nano PLCs PL7 language Standard function blocks

escription	Number	Chart	Function	8	Function	
and the second sec						
mer ms minimum 199 min maximum	32	- IN Q -	E TYP	Enable input TON on-delay timer TOF off-delay timer	C %Ti,P %Ti,V	Timer output Preset value word 0 to 9999 Current value word
		ADJ:Y	тв	Time base : 1 ms (TMO & TM1), 10 ms/100 ms/1 s or 1 min	ADJ	
o/down counter	16	- R E - - S D - ADJ : Y - CU F - - CD	R P CU CD	Reset input Preset input Increment on edge input Decrement on edge input	E Ci,D F %Ci,P %Ci,V	Overflow output bit (0 to 9999) Preset done output bit Overflow output bit (9999 to 0) Preset value word 0 to 9999 Current value word Adjustment permitted (V) or prohibited (N)
FO/FIFO register	4	R %Ri R E - - I TYP : FIFO - O	R I O TYP	Reset input Storage on edge input Retrieval on edge input FIFO, stack LIFO, stack	%Ri,I %Ri,O Ri,E Ri,F	Register access word Register output word Register empty output bit Register full output bit
um controller	4	- R F - - U LEN : 0	R U LEN	Return to step zero Forward step input Number of steps	%DRi.S F Command bits	Number of current step Last bit not currently defined 16 %Qi or %Mi bits
Carlo Carlo		20		Ran Ran		Carlo Carlo
Specific function b	locks	5.	à	to.		and the second s
/idth modulated utput	1 www.cov	1 1	IN TB	Pulse input Time base 0.1 ms, 10 ms, 1 s	%PWM.P %PWM.R %Q0.0	Period preset ≤ 32767 Period ratio 0 to 100% Width modulated output
ulse output	1	-IN Q-	IN R	Pulse input Reset number of pulses to 0 input	%PLS.P %PLS.N Q	Period preset $\leq$ 32767 Pulse number $\leq$ 32767 Current pulse output bit
		ADJ : N	тв	Time base 0.1 ms, 10 ms, 1 s	D %Q0.0 AD.I	Done pulse output bit Pulse output Adjustment permitted (Y) or prohibited (N)
ast up/down counter requency meter	1 when s	- IN %FC - S TH0 - TYP:? TH1 -	IN S %FC.S0 %FC.S1	Enable input Preset input Threshold value S0 $\leq$ 65535 Threshold value S1 $\leq$ 65535	%FC.P %FC.V F %Q0.1 %Q0.2 TH0	Up/down preset value ≤ 65535 Current value Overflow output bit High-speed output 0 High-speed output 1 Current output bit value ≥ threshold TH0
essage ansmission/receptior	-	EXCH	EXCHANGE	Transmission or reception (1) via (Uni-Telway or ASCII) terminal port or	TH1 %MWi:L * %KWi:L	Current output bit value $\geq$ threshold TH1 Internal word table L $\leq$ 64 Constant word table L $\leq$ 64
xchange control	- 1920	R D.	R	Communication initialisation input	E D	Communication error output bit Available link output bit
		E_				
t shift register	8	- R <sup>%SBRi</sup> - CU	R CU CD	Reset 16 %SBRi.j bits to 0 Shift input left Shift input right	%SBRi.j	Bits 0 to 15 of register %SBRi
ep counter	8	_R %SCi _CU _CD	R CU CD	Reset %SCi.j bits to 0 Increment input one step Decrement input one step	%SCi.j	Bits 0 to 255 of step counter %SCi
chedule block eal-time clock)	16	RTC:i	Q : MTWTFSS hh:mm	Assignment of output %Mi or %Qj.k activated by schedule block Activation days of the week Hours (0 to 23) and minutes (0 to 59) of start and end of activation	DD-MMM	Validation start and end date DD : day 1 to 31 MMM : month JanDec.

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### Nano PLCs FTX 117 terminal

### Presentation

The FTX 117 dedicated terminal is the Instruction list language programming tool for Nano PLCs. It is very easy to use due to its back-lit screen with 4 lines of 16 characters and 35-key keypad for contextual entry.

The FTX 117 terminal can be powered in two different ways :

- $\bullet\,$  By a  $\sim$  100 to 120 V mains supply or  $\sim$  200 to 240 V supply via a T FTX ADC 1  $\bullet$  adaptor, in which case the terminal must be used in offline mode.
- By the Nano PLC, in which case the priority operating mode of the terminal is online mode.

### Description



#### The FTX 117 terminal front panel comprises :

- Exclusive access to connectors for connection to : T FTX ADC 10  $\sim$  / — mains adaptor
- T FTX CB1 0•0 cable for connection to the Nano PLC A back-lit screen with 4 lines of 16 alphanumeric
- characters
- An operating mode selector switch :
- FTX : offline mode operation
- TSX : online mode operation

- A 35-key keypad A slot for PCMCIA type 1 memory card Magnets fitted on the back of the terminal to keep it in a vertical position on a metal support
- A carrying strap

#### Functions

TSX: RUN APP: Exec TSX 07 2B-24 IStpD2IniD3Rtc	In order to offer rapid operation, all the necessary functions for writing, debugging, transferring and archiving programs are accessible at any time as there are 5 editors which display the menus. The 5 editors are as follows : <b>1 TSX :</b> shows the menus for : - displaying the RUN/STOP status of the PLC
000 LD %I0.1 001 AND %I0.2 2 002 ST %Q0.1 003 LD %MO	<ul> <li>running or stopping the PLC</li> <li>initialising the PLC memory</li> <li>displaying and entering the real-time clock parameters</li> <li>setting the PLC integral clock</li> <li><b>Prg</b>: program editor designed for :</li> <li>reading, writing and modifying the program using during incompart functions actors</li> </ul>
%I0.5 □■□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□	<ul> <li>partially or completely clearing the application memory</li> <li>debugging the program</li> <li>transferring and archiving applications</li> <li>program diagnostics using a consistency check</li> <li>Dat: data editor for :         <ul> <li>accessing the set of variables in real-time display</li> </ul> </li> </ul>
%C4 %C4.P: 99994	<ul> <li>modifying or forcing authorised variables</li> <li>converting word objects into hexadecimal, ASCII or decimal code</li> <li>entering and memorising data tables</li> </ul>
Adjust: p0 1App <sup>0</sup> 2Blk <sup>0</sup> 3In FTX117 - PL7-07	<ul> <li>4 Cnf : configuration editor (when default configuration is not suitable) for :         <ul> <li>entering application parameters</li> <li>entering I/O and function block parameters</li> <li>entering constant words</li> </ul> </li> </ul>
App= '5 FTX	5 FTX : terminal editor for entering terminal parameters (language, sound, keyboard, screen saver)

### Functions (continued), references, dimensions

### Nano PLCs FTX 117 terminal

 Development, debugging and adjustment tools
 The various editors offered by the FTX 117 terminal make it easy to use for all stages of application development :

 In the development phase for the configuration steps of PLC objects, real-time clocks, entering the program, diagostics and back-up (to Flash memory or to PCMCIA memory card)
 In the adjustment and debugging phase for transferring the application to the PLC, starting-up, debugging, adjusting parameters and archiving the application to PLC EEPROM memory and/or to PCMCIA memory card

 Easy touse, user-friendly tool
 The FTX 117 terminal is just as suited to use in the design office in offline mode as in the workshop connected to the TSX 07 PLC. Ease of use is mainly due to :

 A back-lit screen with 4 lines of character
 A back-lit screen with 4 lines of the configuration adjusting and magnetic back
 Its small size (185 x 95 x 30 mm) and magnetic back
 Its small size (185 x 95 x 30 mm) and magnetic back
 Its small size (185 x 95 x 30 mm) and magnetic back

 Image: the adjustment of Nano PLCs is adjusting parameters of Nano PLCs is adjusting parameters of Nano PLCs is adjusted to the program structuring instructions in supplied is upplied if Program is program structured back or program structure in struction on plcs (2) is up



T FTX 117 0000



T FTX REM 3216

Use	Manual TLX DM 07 117E	Cable for connection to Nano PLC : T FTX CB1 020	Reference (1)	Weight kg
Programming/	Not supplied	Not supplied	T FTX 117 0 🔬 🔊	0.300
adjustment of Nano PLCs (2)		Supplied	T FTX 117 071	0.400
	Supplied	Supplied	T FTX 117 071E	0.665
Separate parts				
Description	Length	Use	Reference	Weight kg
$\sim$ / $\pm$ adaptors for	-	$\sim$ 110/120 V mains adaptor	T FTX ADC 11	0.260
FTX 117 terminal		$\sim$ 200/240 V mains adaptor	T FTX ADC 12	0.260
Connecting cables	2 m	FTX 117<-> Nano PLC	T FTX CB1 020	0.100
S.	5 m	FTX 117<-> Nano PLC	T FTX CB1 050	0.190
PCMCIA type 1	-10	EEPROM 32 K words	T FTX REM 3216	0.025
memory cards		Protected RAM 32 K words	T FTX RSM 3216	0.030
21/15		Protected RAM 128 K words	T FTX RSM 12816	0.030
Battery	-	For PCMCIA RAM type memory card	TSX BAT M01	0.010

### Dimensions



(1) The letter **E** at the end of a reference indicates that the product includes documentation in English.
 (2) FTX 117 Adjust terminal, see page 43580/2

Presentation

### Nano PLCs PL7-07 software

### Presentation

PL7-07 software offers fully reversible programming in Ladder language and in Instruction list language on PC compatibles (using DOS operating system, compatible with Windows 95/Windows NT). This software, which uses a Windows type user interface, simplifies the task of the automation engineers by its optimized graphic entry, editing functions and high-performance online help.

When creating programs in Ladder language or in Instruction list language, the software displays the palettes showing the set of graphic components or of Boolean instructions, depending on the user context.

### Graphic components



### Instruction List

? LD ST AND OR KOR IN APSIELK SR _ JAP 31 :	
	Instruction list language
	The PL7-07 instruction list language is a Boo which can also process numerical operation
A marting out	This language easily translates different gr representations:
the set	Ladder diagram
A TELEVISION Course	• Grafcet

Language objects are symbolised by a maximum 32 character description. The programs are supplemented by titles (122 characters maximum) and by comments (4 lines of 122 characters maximum), which simplify debugging and maintenance.

Provided a few simple writing rules are respected, the two languages are fully reversible (apart from Grafcet instructions logic or exclusive instructions, etc). In the case of a program written in Instruction list language, when it is requested in Ladder language, non-reversible instruction sequences remain displayed in the form of an instructions list, while the rest of the reversible program is translated into Ladder language.

The transition from one language to the other is achieved by the simple touch of a button.

# Design and debugging

The following features simplify application creation: **Multilingual software**: when installing the software, it is possible to choose one of 5 languages (English, French, Spanish, German, Italian). All screens and messages as well as the online help will be displayed in the chosen language

Entry assistance: contextual graphic palettes, the structure of editors and menus, and a Windows-type user interface ensure that PL7-07 programs are easy to write and modify.

**Programming in RUN** (in Instruction list language only): changing the PL7 language object addresses in run mode allows debugging and on-site changes when controlled applications cannot be stopped. In addition, in Instruction list language, program instructions can be modified, except those instructions which modify the program structure. Debugging and adjustment: display and modification in real time of the status of bit objects and the value of word

objects, forcing of input/output, creation of data tables. Documentation: allows the user to create and update a complete application file (general information, symbol tables, configuration, program, cross-references, etc) with information sequencing and layout facilities.

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Contact

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References

### Nano PLCs PL7-07 software

### PL7-07 software packs under DOS (Windows 95 and Windows NT compatible)

Software packs designed for PC compatibles (with a 386 microprocessor minimum, 4 M bytes of RAM memory and DOS 3.3 operating system) for programming and debugging Nano PLCs in PL7 language.

Description	Support	Composition	Reference	Weight kg
<b>DOS software packs</b> Reversible instruction	Compatible PC	1 CD-Rom, 1 TSX PCU 1031 cable,	TLX CD PL7 07P 40M	0.440
List/Ladder language		1 multilingual technical documentation on CD-ROM		
	FTX 517 terminals	1 CD-Rom, 1 T FTX CB F 020 cable, 1 multilingual technical documentation on CD-ROM	TLX CD PL7 07F 40M	0.440
Update software for TLX L PL7 07• 30•	Compatible PC, FTX 517 terminal	1 CD-Rom, 1 multilingual technical documentation on CD-ROM	TLX U PL7 07 40M	0,310

TLX L PL7 07• 40M

Spare parts				
Description	Length	Use	Reference	Weight kg
Connecting cables	2.5 m	Connection between Nano PLC and FT2100/PC compatible (9-way SUB-D type connector)	TSX PCU 1031	0.140
	2 m	Connection between Nano PLC and FTX 517 (26-way SUB-D type connector)	T FTX CB F 020	0.120

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