

TIA Datatypes

List of data types used by Simatic S7. The page contains the more modern TIA variable types as well as the earlier S7-classic types.



There are four data types in: Boolean, Text, Numeric, and Date/Time. Each data type defines the format of information that can be entered into a data field and stored in your database.

Datotyp	Width (bits)	Range of values	Examples	S7-300/400	S7-1200	S7-1500
Binaries						
BOOL (x) →details	1 (S7-1500 optimized 1 Byte)	FALSE or TRUE BOOL#0 or BOOL#1 BOOL#FALSE oder BOOL#TRUE	TRUE BOOL#1 BOOL#TRUE	X	X	X
BYTE (b) →details	8	B#16#00 .. B#16#FF 0 .. 255 2#0 .. 2#11111111	15, BYTE#15, B#15	X	X	X
WORD (w) →details	16	W#16#0000 .. W#16#FFFF 0 .. 65.535 B#(0, 0) .. B#(255, 255)	55555, WORD#55555, W#555555	X	X	X
DWORD (dw) →details	32	DW#16#0000 0000 .. DW#16#FFFF FFFF 0 .. 4,294,967,295	DW#16#DEAD BEEF B#(111, 222, 255, 200)	X	X	X
LWORD (lw) →details	64	LW#16#0000 0000 0000 0000 .. LW#16#FFFF FFFF FFFF FFFF 0 .. 18.446.744.073.709.551.615	LW#16#DEAD BEEF DEAD BEEF B#(111, 222, 255, 200, 111, 222, 255, 200)	-	-	X
Integers						
SINT (si) →details	8	-128 .. 127 (hex only positive) 16#0 .. 16#7F	+42, SINT#+42 16#1A, SINT#16#2A	-	X	X
INT (i) →details	16	-32.768 .. 32.767 (hex only positive) 16#0 .. 16#7FFF	+1234, INT#+3221 16#1ABC	X	X	X
DINT (di) →details	32	-2.147.483.648 .. +2.147.483.647 (hex only positive) 16#00000000 .. 16#7FFFFFFF	123456, DINT#123.456, 16#1ABC BEEF	X	X	X
USINT (usi) →details	8	0 .. 255 16#00 .. 16#FF	42, USINT#42 16#FF	-	X	X
UINT (ui) →details	16	0 .. 65.535 16#0000 .. 16#FFFF	12.345, UINT#12345 16#BEEF	-	X	X
UDINT (udi) →details	32	0 .. 4.294.967.295 16#00000000 .. 16#FFFF FFFF	1.234.567.890, UDINT#1234567890	-	X	X
LINT (li) →details	64	-9.223.372.036.854.775.808 .. +9.223.372.036.854.775.807	+1.234.567.890.123.456.789, LINT#+1.234.567.890.123.456.789	-	-	X
ULINT (uli) →details	64	0 .. 18.446.744.073.709.551.615	123.456.789.012.345, ULINT#123.456.789.012.345	-	-	X
floating point numbers						
REAL @ →details	32	-3.402823e+38 .. -1.175 495e-38 .. +1.175 495e-38 .. +3.402823e+38	0.0, REAL#0.0 1.0e-13, REAL#1.0e-13	X	X	X
LREAL (lr) →details	64	-1.7976931348623158e+308 .. -2.2250738585072014e-308 .. +2.2250738585072014e-308 .. +1.7976931348623158e+308	0.0, LREAL#0.0	-	X	X
Times						
S5TIME (s5t) →details	16	S5T#0H_0M_0S_0MS .. S5T#2H_46M_30S_0MS	S5T#10s, S5TIME#10s	X	-	X
TIME (t) →details	32	T#-24d20h31m23s648ms .. T#+24d20h31m23s647ms	T#13d14h15m16s630ms, TIME#1d2h3m4s5ms	X	X	X
LTIME (lt) →details	64	LT#-106751d23h47m16s854ms775us808ns .. LT#+106751d23h47m16s854ms775us807ns	LT#1000d10h15m24s130ms152us15ns, LTIME#200d2h2m1s8ms652us315ns	-	-	X
Timer operations: IEC timers, TON (Generate on-delay), TOF (Generate off-delay), TP (Generate pulse), TONR (Time accumulator)						

Datotyp	Width (bits)	Range of values	Examples	S7-300/400	S7-1200	S7-1500
Counters						
CHAR →details	8	ASCII character set	'A', CHAR#'A'	X	X	X
WCHAR (wc) →details	16	Unicode character set	WCHAR#'A'	-	X	X
STRING (s) →details	n+2 (Byte)	0 .. 254 characters (n)	'Name', STRING#'lamaPLC'	X	X	X
WSTRING (ws) →details	n+2 (Word)	0 .. 16382 characters (n)	WSTRING#'lamaPLC'	-	X	X
Counter operations: CTU (count up), CTD (count down), CTUD (count up and down)						
Datotyp	Width (bits)	Range of values	Examples	S7-300/400	S7-1200	S7-1500
Date & time						
DATE (d) →details	16	D#1990-01-01 .. D#2168-12-31	D#2020-08-14, DATE#2020-08-14	X	X	X
TOD (tod) (TIME_OF_DAY) →details	32	TOD#00:00:00.000 .. TOD#23:59:59.999	TOD#11:22:33.444, TIME_OF_DAY#11:22:33.444	X	X	X
LTOD (ltod) (LTIME_OF_DAY) →details	64	LTOD#00:00:00.000000000 .. LTOD#23:59:59.999999999	LTOD#11:22:33.444_555_111, LTIME_OF_DAY#11:22:33.444_555_111	-	-	X
DT (dt) (DATE_AND_TIME) →details	64	Min.: DT#1990-01-01-0:0:0 Max.: DT#2089-12-31-23:59:59.999	DT#2020-08-14-2:44:33.111, DATE_AND_TIME#2020-08-14-11:22:33.444	X	-	X
LDT (ldt) (L_DATE_AND_TIME) →details	64	Min.: LDT#1970-01-01-0:0:0.000000000, 16#0 Max.: LDT#2262-04-11-23:47:16.854775807, 16#7FFF_FFFF_FFFF_FFFF	LDT#2020-08-14-1:2:3.4	-	-	X
DTL (dtl) →details	96	Min.: DTL#1970-01-01-00:00:00 Max.: DTL#2554-12-31-23:59:59.999999999	DTL#2020-08-14-10:12:13.23	-	X	X
Datotyp	Width (bits)	Range of values	Examples	S7-300/400	S7-1200	S7-1500
Pointers						
POINTER (p) →details	48		Symbolic: "DB"."Tag" Absolute: P#10.0 P#DB4.DBX3.2	X	-	X
ANY (any) →details	80		Symbolic: "DB".StructVariable.firstComponent Absolute: P#DB11.DBX12.0 INT 3 P#M20.0 BYTE 10	X	-	X
VARIANT (var) →details	0		Symbolic: "Data_TIA_Portal". StructVariable.firstComponent Absolute: %MW10 P#DB10.DBX10.0 INT 12	-	X	X
BLOCK_FB	0			X	-	X
BLOCK_FC	0			X	-	X
BLOCK_DB	0			X	-	-
BLOCK_SDB	0			X	-	-
VOID	0			X	X	X
PLC_DATA_TYPE	0			X	X	X

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