

PLC Simulator: Register Map

The built-in water plant workbooks. The Store demo (port 502) runs one of them; your own simulator starts on the water tank. Every value is a 16-bit register or a single bit. The last page has the Understanding Modbus book, the course and the simulator.

Host	sim.learnscada.com	Protocol	Modbus TCP, any unit ID (1 is fine)
Store demo	port 502: read-only (writes get exception 01), open to everyone	Your own sim	your port (on your account page): read/write
Addressing	zero-based: holding register address 0 = reference 400001	Scaled values	register = value × scale: level 50.0% with scale ×10 reads 500

Water tank

Built-in workbook tank-sample.xlsx: Tank with inlet valve, drain valve and transfer pump; auto mode holds the level setpoint. Scan 500 ms. 19 tags.

Reference	Address	Table	Tag	Type	Scale	Units	Initial	Access	Description
000001	0	Coil	pump_cmd	bool			OFF	calculated*	Pump run command (auto drives it; manual = whatever the client writes)
000002	1	Coil	inlet_cmd	bool			OFF	calculated*	Inlet valve open command
000003	2	Coil	drain_cmd	bool			OFF	read/write	Drain valve open command
000004	3	Coil	alarm_reset	bool			OFF	calculated*	Write 1 to reset alarms; clears itself after one scan
100001	0	Discrete input	pump_running	bool			OFF	read	Pump running (won't run dry)
100002	1	Discrete input	inlet_open	bool			OFF	read	Inlet valve open feedback
100003	2	Discrete input	drain_open	bool			OFF	read	Drain valve open feedback
100004	3	Discrete input	hi_alarm	bool			OFF	read	High level alarm (latched)
100005	4	Discrete input	lo_alarm	bool			OFF	read	Low level alarm (latched)
300001	0	Input register	level	uint16	×10	%	50	read	Tank level (1000 gal tank)
300002	1	Input register	flow_in	uint16	×10	gpm	0	read	Inlet flow
300003	2	Input register	flow_out	uint16	×10	gpm	0	read	Outlet flow
300004	3	Input register	temperature	uint16	×10	°F	68	read	Water temperature
300005	4	Input register	motor_amps	uint16	×10	A	0	read	Pump motor current
300006	5	Input register	heartbeat	uint16			0	read	Counts up every scan
400001	0	Holding register	mode	uint16			1	read/write	0 = manual, 1 = auto
400002	1	Holding register	level_sp	uint16	×10	%	50	read/write	Auto level setpoint

Reference	Address	Table	Tag	Type	Scale	Units	Initial	Access	Description
400003	2	Holding register	hi_limit	uint16	×10	%	90	read/write	High level alarm limit
400004	3	Holding register	lo_limit	uint16	×10	%	10	read/write	Low level alarm limit

Water tank: fill, hold, feed

Built-in workbook tank-fill-dump.xlsx: Auto cycles: fill to fill_to, hold hold_s seconds, feed (pump out) down to dump_to, repeat. tank_gal sets the speed. Scan 500 ms. 25 tags.

Reference	Address	Table	Tag	Type	Scale	Units	Initial	Access	Description
000001	0	Coil	pump_cmd	bool			OFF	calculated*	Pump run command (auto: on while feeding; manual = whatever the client writes)
000002	1	Coil	inlet_cmd	bool			OFF	calculated*	Inlet valve open command (auto: open while filling)
000003	2	Coil	drain_cmd	bool			OFF	read/write	Drain valve open command
000004	3	Coil	alarm_reset	bool			OFF	calculated*	Write 1 to reset alarms; clears itself after one scan
100001	0	Discrete input	pump_running	bool			OFF	read	Pump running (won't run dry)
100002	1	Discrete input	inlet_open	bool			OFF	read	Inlet valve open feedback
100003	2	Discrete input	drain_open	bool			OFF	read	Drain valve open feedback
100004	3	Discrete input	hi_alarm	bool			OFF	read	High level alarm (latched)
100005	4	Discrete input	lo_alarm	bool			OFF	read	Low level alarm (latched)
300001	0	Input register	level	uint16	×10	%	20	read	Tank level
300002	1	Input register	flow_in	uint16	×10	gpm	0	read	Inlet flow
300003	2	Input register	flow_out	uint16	×10	gpm	0	read	Outlet flow
300004	3	Input register	temperature	uint16	×10	°F	68	read	Water temperature
300005	4	Input register	motor_amps	uint16	×10	A	0	read	Pump motor current
300006	5	Input register	heartbeat	uint16			0	read	Counts up every scan
300007	6	Input register	phase	uint16			0	read	Auto step: 0 = fill, 1 = hold, 2 = feed (pump out to distribution)
300008	7	Input register	hold_t	uint16		s	0	read	Seconds held at the top so far (whole seconds)
300009	8	Input register	hold_left	uint16		s	0	read	Hold countdown: seconds left while holding (0 otherwise)
400001	0	Holding register	mode	uint16			1	read/write	0 = manual, 1 = auto (fill, hold, feed cycle)
400002	1	Holding register	fill_to	uint16	×10	%	80	read/write	Auto: fill up to this level
400003	2	Holding register	hi_limit	uint16	×10	%	90	read/write	High level alarm limit

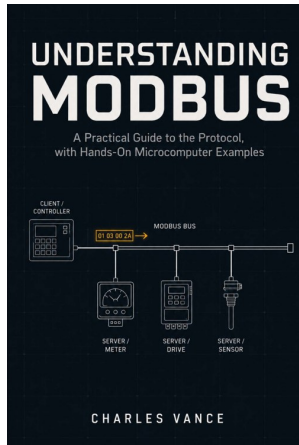


Reference	Address	Table	Tag	Type	Scale	Units	Initial	Access	Description
400004	3	Holding register	lo_limit	uint16	×10	%	10	read/write	Low level alarm limit
400005	4	Holding register	dump_to	uint16	×10	%	20	read/write	Auto: feed (pump out) down to this level (2% or more: the pump won't run dry)
400006	5	Holding register	hold_s	uint16		s	5	read/write	Auto: seconds to hold when full before feeding (0-999)
400007	6	Holding register	tank_gal	uint16		gal	300	read/write	Tank size. Smaller fills and dumps faster

Access: *read/write* = you can write it (on your own sim; the Store demo is read-only). *calculated** = the simulator sets it each scan, as its description says: the pump and inlet commands follow the auto logic and take your writes in manual (mode = 0); a `alarm_reset` takes a 1 for one scan. Coils and discrete inputs are on/off bits.

Learn Modbus: read it, take the course, practice live

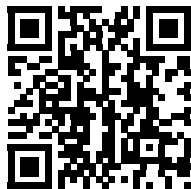
This register map comes from the LearnSCADA PLC Simulator. Here's the rest of the set, all at learnskada.com.



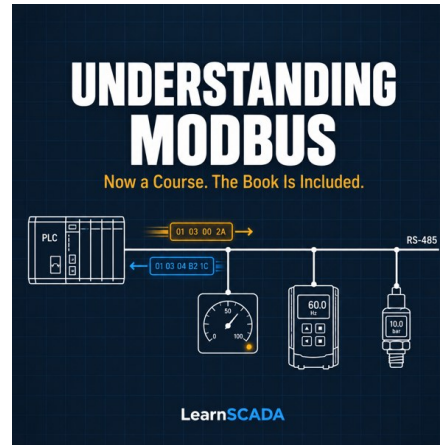
Understanding Modbus

The book, by Charles Vance

A practical guide to the protocol, with hands-on microcomputer examples: the data model, RTU, ASCII and TCP frames, addressing, data types, troubleshooting, and a pump-station project in Python.



Scan or visit
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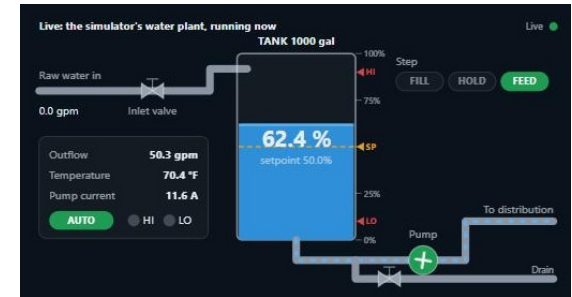
Understanding Modbus course

The book comes with it

The book chapter by chapter, all 19, with interactive figures and tools and a short check at the end of each chapter. The complete book PDF is included. Part I is free to preview.



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PLC Simulator

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Try it right now: point any Modbus TCP client at sim.learnskada.com port 502. That's the live plant on the store's simulator page, read-only and open to everyone.