



## SUPPORTED PROTOCOLS OVERVIEW

### OPC UA

9+ PLC brands · Certificate security · Universal

### Modbus RTU

RS-232/485 serial · Configurable baud rate

### EtherNet/IP

Allen-Bradley / Rockwell · 4 parallel threads

### BACnet

Building automation · HVAC · Energy

### DB Direct

SQL query as live data source

### Modbus TCP

Any Modbus device · Batch read · Port 502

### Siemens S7

S7-300/400/1200/1500 · Batch 800+ tags

### MQTT

IoT broker · Subscribe/Publish · QoS 0/1/2

### HTTP/REST

Web API polling · JSON/XML data sources

### PCCC

MicroLogix / legacy Allen-Bradley

## OPC UA — STEP BY STEP

### 1 Add Driver

Menu → Drivers → OPC UA → Add New

### 2 Endpoint URL

opc.tcp://192.168.1.10:4840

### 3 Security

None (dev) or Sign&Encrypt; (production)

### 4 Certificate

Browse to server cert for encrypted mode

### 5 Test

Click Test Connection — check firewall port 4840

### 6 Browse

Click Browse Nodes — expand namespace to find variables

### 7 Import Tags

Select variables → Import as Tags → set scan rate

```
# CODESYS OPC UA Server (Zeus IPC)
Endpoint: opc.tcp://{plc-ip}:4840
Namespace: urn:CODESYS:OpcUa:Server

# Siemens S7-1500 OPC UA
Endpoint: opc.tcp://{plc-ip}:4840
# Enable OPC UA in TIA Portal first
```

## MODBUS TCP — STEP BY STEP

### 1 Add Driver

Menu → Drivers → Modbus TCP → Add New

### 2 IP & Port

Enter PLC IP · Port: 502 (default)

### 3 Unit ID

Modbus Unit ID / Slave ID (usually 1)

### 4 Add Tags

Tag Manager → Source: Modbus → enter register address

### 5 Register Type

Coil, Discrete Input, Holding Reg, Input Reg

### 6 Addressing

Example: 400001 = Holding Register 1

### 7 Batch Read

OptiZeus batches consecutive registers automatically

## MODBUS REGISTER MAP EXAMPLE

```
Holding Registers (4xxxxx):
400001 = Flow rate (Float, 2 regs)
400003 = Temperature (Float, 2 regs)
400005 = Pressure (Float, 2 regs)

Coils (0xxxxx):
000001 = Pump Start/Stop
000002 = Valve Open/Close

Discrete Inputs (1xxxxx):
100001 = Pump Running Status
```



## SIEMENS S7 — STEP BY STEP

### 1 Add Driver

Menu → Drivers → Siemens S7 → Add New

### 2 IP Address

Enter PLC IP — port 102 used automatically

### 3 PLC Type

Select S7-300, S7-400, S7-1200, or S7-1500

### 4 Rack/Slot

Default: Rack 0, Slot 2 (S7-300/400) · Slot 1 (1200/1500)

### 5 DB Access

S7-1200/1500: Enable PUT/GET in TIA Portal settings

### 6 Tag Address

Format: DB1.DBD0 (Float), DB1.DBX0.0 (Bool)

### 7 Batch Read

OptiZeus batches up to 800 tags per cycle automatically

# S7 address formats:

```

DB1.DBD0    = Float (4 bytes)
DB1.DBD4    = Float (next float)
DB1.DBW8    = Int16 (2 bytes)
DB1.DBX10.0 = Bool bit 0
DB1.DBX10.1 = Bool bit 1
M0.0        = Merker bit
MW2         = Merker word
Q0.0        = Output bit
I0.0        = Input bit

```

S7-1200/1500: You MUST enable "Permit access with PUT/GET" in TIA Portal → PLC Properties → Protection. Without this, connection will fail.

## ETHERNET/IP — ALLEN-BRADLEY

### 1 Add Driver

Menu → Drivers → EtherNet/IP → Add New

### 2 IP Address

Enter PLC IP — port 44818 used automatically

### 3 Slot Number

0 for CompactLogix / 1+ for ControlLogix chassis

### 4 Tag Address

Use Controller Tag names directly: Program:MainProgram.Flow\_PV

### 5 Array Tags

Array notation: MyArray[0], MyArray[1]...

### 6 UDT Tags

Access UDT members: MyUDT.Temp, MyUDT.Pressure

### 7 Performance

OptiZeus uses 4 parallel threads for max throughput

## MQTT — IoT & EDGE DEVICES

### 1 Add Driver

Menu → Drivers → MQTT → Add New

### 2 Broker URL

mqtt://broker-ip:1883 or mqtt://broker:8883 (TLS)

### 3 Auth

Enter username/password if broker requires auth

### 4 Subscribe

Add topics to subscribe: factory/reactor/temp

### 5 Tag Mapping

Map topic payload path to tag: \$.value or \$.data.temp

### 6 QoS

Select QoS 0 (fire-forget) or QoS 1 (at-least-once)

### 7 Publish

Optionally publish tag values to MQTT topics on change

```

# MQTT payload format (JSON):
{"value": 72.4, "unit": "°C", "ts": 1234567890}

```

```

# Tag mapping expression:
Topic: factory/reactor/temp
Value path: $.value
Timestamp path: $.ts (optional)

```





## CONNECTION TROUBLESHOOTING

### Cannot connect — timeout

Check IP address, firewall, PLC powered on. Use ping test first.

### Connected but no data

Check security mode. S7: enable PUT/GET. OPC UA: check node IDs.

### Bad quality tags

OPC UA quality = Bad: PLC program issue or address wrong.

### Intermittent disconnects

Network stability issue or PLC TCP stack overloaded — reduce scan rate.

### Modbus wrong values

Check byte order (Big/Little Endian) and register data type.

### S7 access denied

PUT/GET not enabled in TIA Portal or wrong Rack/Slot number.

### MQTT not receiving

Check broker URL, port, topic spelling, QoS level, TLS cert.

## PROTOCOL PORT REFERENCE

OPC UA	4840 (TCP)	— Default — configurable in PLC
OPC UA (TLS)	4843 (TCP)	— Secure OPC UA with certificates
Modbus TCP	502 (TCP)	— Standard — some devices use 503
Siemens S7	102 (TCP)	— ISO-TSAP — fixed port
EtherNet/IP	44818 (TCP)	— ENIP — standard Allen-Bradley
MQTT	1883 (TCP)	— Standard unencrypted
MQTT TLS	8883 (TCP)	— Encrypted MQTT
BACnet/IP	47808 (UDP)	— BACnet standard port
HTTP/REST API	80/443 (TCP)	— Standard HTTP/HTTPS
OptiZeus Server	3000 (TCP)	— Default — change in settings

## PROTOCOL SELECTION GUIDE

Choose the right protocol for your PLC:

### Zeus IPC-CM400200

OPC UA (CODESYS built-in) — preferred

### Siemens S7-1200+

OPC UA (TIA Portal built-in)

### Siemens S7-300/400

S7 ISO-TCP driver

### Allen-Bradley

EtherNet/IP (Logix) or PCCC (MicroLogix)

### Schneider

Modbus TCP (all models)

### Any Modbus device

Modbus TCP or RTU

### IoT / Edge

MQTT broker integration

### Building systems

BACnet/IP

Protocol support: [sales@optizeus.org](mailto:sales@optizeus.org) · [optizeus.org/docs](https://optizeus.org/docs) · [zeus-automation.com](https://zeus-automation.com)

All 9+ drivers included in Professional tier and above

