

NexBlue Modbus Documentation

Communication Channel

- **Channel type:** TCP/IP
 - **Physical interface:** RJ45 Ethernet cable connection / Wi-Fi connection
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TCP/IP Communication

2.1 Network Configuration

- **Default mode: DHCP (dynamic IP acquisition)**
 - After power-on, the device automatically requests an IP address from the DHCP server.
 - After an address is successfully obtained, the device broadcasts its information via **mDNS (Multicast DNS)**. The broadcast service name is:

```
_nexblue_modbus._tcp.local
```

This can be automatically discovered by EMS systems that support mDNS/LLMNR, such as Home Assistant and Tibber.

- **Fallback mode: Static IP (configured in the app)**
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2.2 Communication Port

- **Modbus TCP port:** 502
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2.3 Device Address (Unit ID / Device Address)

- **Default value:** 200
- **Configurable range:** 1–247

Notes:

- **Unit ID:** A logical identifier retained in TCP mode for RTU compatibility.
- **Slave Address:** The physical address used in RTU mode.
- Both share the same configuration parameter in the system.

Multi-connector structure:

- The entire chargepoint uses a single Unit ID.
- Single/dual connectors are differentiated by register address offsets:

```
base = 3000 + n × 100    (n = 0 or 1)
```

2.4 Register Definitions

2.4.1 Register Types

Register Type	Function	Function Code (Hex)	Description
Input Registers	Read input registers	0x04	Read-only registers that return measurements or status information such as voltage, current, power, temperature, cumulative energy, etc.
Holding Registers	Read holding registers	0x03	Read/write registers. The master can read current configuration, current limits, mode status, etc.
Holding Registers	Write single holding register	0x06	The master writes a single configuration parameter or command, such as max current setting or start/stop charging.
Holding Registers	Write multiple holding registers	0x10	The master writes multiple consecutive registers at once, used for batch updates to configuration or structured parameter groups.

These four are the fundamental function codes recognized by **IEC 61131-3**, **EN 61107**, and the **ISO Modbus** specification, and are supported by almost all masters/PLCs/EMS systems by default.

2.4.2 Register Address Planning (Address Map)

Principle	Description
Length	The address field in a Modbus frame is a 16-bit unsigned integer (2 bytes).
Layered partitioning	Partition by function (Identification → Station-level → Per connector). Keep the logic clear and easy to extend.
Unified starting point	All registers use "logical addresses". Logical addressing typically starts at 0. The document shows both decimal (Dec) and hexadecimal (Hex) formats.
Alignment rule	32-bit data must start at an even address (alignment boundary) to avoid crossing register boundaries.
Reserved expansion space	Each area keeps gaps so future versions can add fields without breaking compatibility.
Character encoding	Each register is 2 bytes. Strings are fixed-length and are not padded with 0x00 for unused bytes.
Byte/Word order	Single-register byte order is Big-Endian. Multi-register data uses Little-Endian word order (DCBA).
Access methods	Input uses 0x04. Holding registers are read with 0x03 and written with 0x06 (single) or 0x10 (multiple).

• Identification, Version, and Time (Input, 0x04)

Address (Dec / Hex)	Name	Type	Unit	Access	Description
0000–0007 / 0x0000–0x0007	Brand (Manufacturer)	STRING(16)	—	RO(0x04)	2 bytes per register, UTF-8/ASCII
0008–0015 / 0x0008–	Model	STRING(16)	—	RO(0x04)	

0x000F					
0016–0027 / 0x0010–0x001B	Serial Number	STRING(24)	—	RO(0x04)	
0028–0035 / 0x001C– 0x0023	Firmware Version	STRING(16)	—	RO(0x04)	For example: "04.00.19"
0036 / 0x0024	Modbus Table Version	UINT16	—	RO(0x04)	Mapping version number (for example: 0x0100)
0037 / 0x0025	Socket (ConnectorCount)	UINT16	—	RO(0x04)	Number of connectors: 1/2
0038–0039 / 0x0026– 0x0027	Date	UINT32	YYYYMMDD	RO(0x04)	32-bit even alignment (example: 20251202)
0040–0041 / 0x0028– 0x0029	Time	UINT32	HHMMSS	RO(0x04)	155630 (15:56:30)
0042 / 0x002A	Timezone	UINT16	minutes	RO(0x04)	Example: UTC+2 → +120
0044 /	HW_VERSION	STRING(16)	—	RO(0x04)	
0043–0099	Reserved	—	—	—	Reserved for future identification, certificates, manufacturing info, etc.

- **Real-time Status and Metering (Input, 0x04)**

Address (Dec / Hex)	Name	Type	Unit	Access	Description
0100 / 0x0064	Chargepoint State	UINT16	—	RO(0x04)	0: "Available", 1: "Preparing", 2: "Charging", 3: "SuspendedEVSE", 4: "SuspendedEV", 5: "Finishing", 6: "Reserved", 7: "Unavailable", 8: "Faulted"
0102–0103 / 0x0066–0x0067	Current L1	FLOAT32	A	RO(0x04)	32-bit even alignment
0104–0105 / 0x0068– 0x0069	Current L2	FLOAT32	A	RO(0x04)	
0106–0107 / 0x006A– 0x006B	Current L3	FLOAT32	A	RO(0x04)	

0108-0109 / 0x006C- 0x006D	Voltage L1-N	FLOAT32	V	RO(0x04)	
0110-0111 / 0x006E- 0x006F	Voltage L2-N	FLOAT32	V	RO(0x04)	
0112-0113 / 0x0070-0x0071	Voltage L3-N	FLOAT32	V	RO(0x04)	
0114-0115 / 0x0072-0x0073	Phase Angle L1	FLOAT32	°	RO(0x04)	Phase angle referenced to L1-N
0116-0117 / 0x0074-0x0075	Phase Angle L2	FLOAT32	°	RO(0x04)	Phase angle referenced to L1-N
0118-0119 / 0x0076-0x0077	Phase Angle L3	FLOAT32	°	RO(0x04)	Phase angle referenced to L1-N
0120-0121 / 0x0078-0x0079	Active Power L1	FLOAT32	W	RO(0x04)	
0122-0123 / 0x007A-0x007B	Active Power L2	FLOAT32	W	RO(0x04)	
0124-0125 / 0x007C- 0x007D	Active Power L3	FLOAT32	W	RO(0x04)	
0126-0127 / 0x007E-0x007F	Active Power Total	FLOAT32	W	RO(0x04)	
0128-0129 / 0x0080-0x0081	Session Energy	FLOAT32	kWh	RO(0x04)	Current session
0130-0133 / 0x0082- 0x0085	Lifetime Energy	UINT64	Wh	RO(0x04)	Cumulative energy (64-bit, 4 registers, start address aligned to a multiple of 4)
0134-0135 / 0x0086-0x0087	Fallback Current	FLOAT32	A	RO(0x04)	Fallback current set via NexBlue App or cloud. When in fallback state, this value is used with priority for charging.
0136-0137 / 0x0088- 0x0089	Max Charging Current	FLOAT32	A	RO(0x04)	Maximum charging current set via NexBlue App or cloud. Read-only.
0138 / 0x008A	Phase Charging	UINT16	—	RO(0x04)	0 = Adaptive, 1 = Force Single Phase, 2 = Force Three Phase. Read-only (a device setting that can only be changed via NexBlue App or

					cloud). If not Adaptive, the Modbus "Runtime Phase Mode" will not take effect.
0137-0399 / 0x0088-0x018F	Reserved	—	—	—	Reserved for voltage, power factor, frequency, per-phase power, etc.

• **Control and Safety (Holding, read 0x03 / write 0x06 or 0x10)**

- Notes: If the charger AC power cycles, it will automatically revert to default values and must be written again.

Address (Dec / Hex)	Name	Type	Unit	Access	Description
1000-1001 / 0x03E8-0x03E9	Current Limit	FLOAT32	A	RW (0x03/0x10)	Station-level current limit. Default 16A. Range 0-32A.
1002-1003 / 0x03EA-0x03EB	Fallback Limit	FLOAT32	A	RW (0x03/0x10)	Disconnect fallback current can only be set to 0-16. Values below 6 are treated as 0.
1004-1005 / 0x03EC-0x03ED	Fallback Timeout	UINT32	s	RW (0x03/0x10)	Heartbeat timeout threshold (ValidTime). Default 5 minutes. Minimum 30s. Maximum 30 minutes.
1006 / 0x03EE	IF_START	UINT16	—	RW (0x03/0x06)	Start/Stop control (0 = STOP, 1 = START)
1007 / 0x03EF	Runtime Phase Mode	UINT16	—	RW (0x03/0x06)	0 = Adaptive (Default), 1 = Force Single Phase, 2 = Force Three Phase. During fallback, charging uses the phase count from before disconnect. Recommended phase switching limits: • Minimum interval between

					phase switches: 10 minutes • Maximum 2 phase switches within any 1-hour period • Maximum 6 phase switches during a single charging session
1008–1999	Reserved	—	—	—	Reserved for extensions such as start/stop, mode, alarm masking, etc.

• **Alarms and Errors (Error / Warning)**

Address (Dec / Hex)	Name	Type	Unit	Access	Description
0400 / 0x0190	Error Bitset	UINT16	-	RO(0x04)	Bit0: CP voltage abnormal; Bit1: phase line leakage; Bit2: current abnormal (overcurrent); Bit3: voltage abnormal (over/undervoltage); Bit4: temperature abnormal (high/low); Bit5: relay stuck; Bit6: RCD self-test failed; Bit7: CP diode short; Bit8: PEN open; Bit9: PE leakage; Bit10: PE open; Bit11: PP abnormal; Bit12–15: reserved
0401 / 0x0191	Warning Bitset	UINT16	-	RO(0x04)	Bit0: meter chip abnormal; Bit1: inter-board communication abnormal; Bit2: RFID RF abnormal; Bit3: 868 RF abnormal; Bit4: 4G module abnormal; Bit5: cover open abnormal;

					Bit6: reserved; Bit7: TN system phase-loss abnormal; Bit8: IT neutral overcurrent; Bit9: grid abnormal; Bit10: MID mode; Bit11–15: reserved
0402 / 0x0192	Waiting Bitset	UINT16	-	RO(0x04)	Bit0: fallback due to CT offline; Bit1: fallback due to main unit offline; Bit2: paused due to low-severity error (charging profile current is 0 via OCPP); Bit3: host reduces current mid-charge; Bit4: first request sent but host has not responded; Bit5: load shedding protection active; Bit6: fallback triggered by Modbus; Bit6–15: reserved

Appendix

Function Codes

A function code in Modbus indicates **what operation the master wants to perform on the slave**.

Each frame includes a 1-byte function code. For example:

Hex	Meaning	Target
0x01	Read Coils (bit outputs)	bit
0x02	Read Discrete Inputs (bit inputs)	bit
0x03	Read Holding Registers	16-bit
0x04	Read Input Registers	16-bit
0x05	Write Single Coil	bit
0x06	Write Single Holding Register	16-bit
0x0F	Write Multiple Coils	bit
0x10	Write Multiple Holding Registers	16-bit

Summary of Common Modbus Data Types

Data Type	Registers Used	Bit Width	C Type	Meaning and Use	Typical Examples
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UINT16	1	16-bit	uint16_t	Unsigned integer	Status codes, enums, counters, connector count
INT16	1	16-bit	int16_t	Signed integer	Temperature, offsets, timezone
UINT32	2	32-bit	uint32_t	Unsigned long integer	Timestamps, energy metering, second counters
INT32	2	32-bit	int32_t	Signed long integer	Power, directional values
FLOAT32	2	32-bit	float	Single-precision float (IEEE 754)	Current, voltage, power, energy, etc.
UINT64	4	64-bit	uint64_t	Very large integer	Total energy, cumulative metering
STRING[n]	n/2	n×8-bit	char[]	Text information	Brand, model, serial number, version number