

ION8 EB · ETH BRIDGE AND ETH2BLE MODES

Installation and Commissioning

Mounting, wiring, mode selection, PLC connection (S7 · Modbus · EtherNet/IP · OPC UA · RS485), pairing, connection profile, firmware update and troubleshooting. To be used together with the separate **Commissioning Form**.



1 · Connect

supply, Ethernet, RS485

2 · Select mode

ETH Bridge or ETH2BLE

3 · Pair

RIOs or the remote EB

4 · Verify

read / write from the PLC

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1 Safety and intended use



WARNING

Indicates actions that carry a risk of injury, equipment damage or loss of machine control.



INFORMATION

Indicates explanations needed for correct installation and verification.

- Installation and wiring must be carried out only by authorized, trained personnel.
- Switch off the supply and verify by measurement that it is de-energized before removing the terminal block or connecting wires.
- The device is protected against reverse polarity, overcurrent and overtemperature; these protections do not replace correct wiring and installation protection.
- For commands carried over the wireless link, ensure machine safety in the PLC program (safe state on loss of communication, timeout supervision).

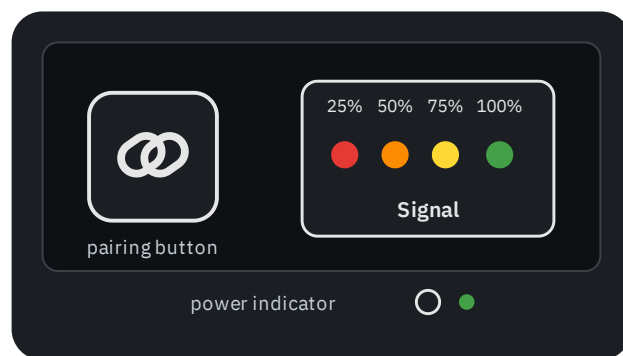
Intended use

Data transfer between a PLC/SCADA and remote ION8 I/O stations and RS485 devices (ETH Bridge), or point-to-point wireless extension of two Ethernet/RS485 ends (ETH2BLE). Intended for low and medium density automation traffic.

Reasonably foreseeable misuse

Using it as an emergency stop or safety circuit; expecting a deterministic 1–4 ms cycle such as PROFINET RT/IRT; carrying video or continuous high bandwidth; publishing OPC UA without security on an open network.

2 Getting to know the device



Front panel: pairing button, 4 signal LEDs, power indicator

Connection side: 8-pole removable terminal and RJ45 Ethernet

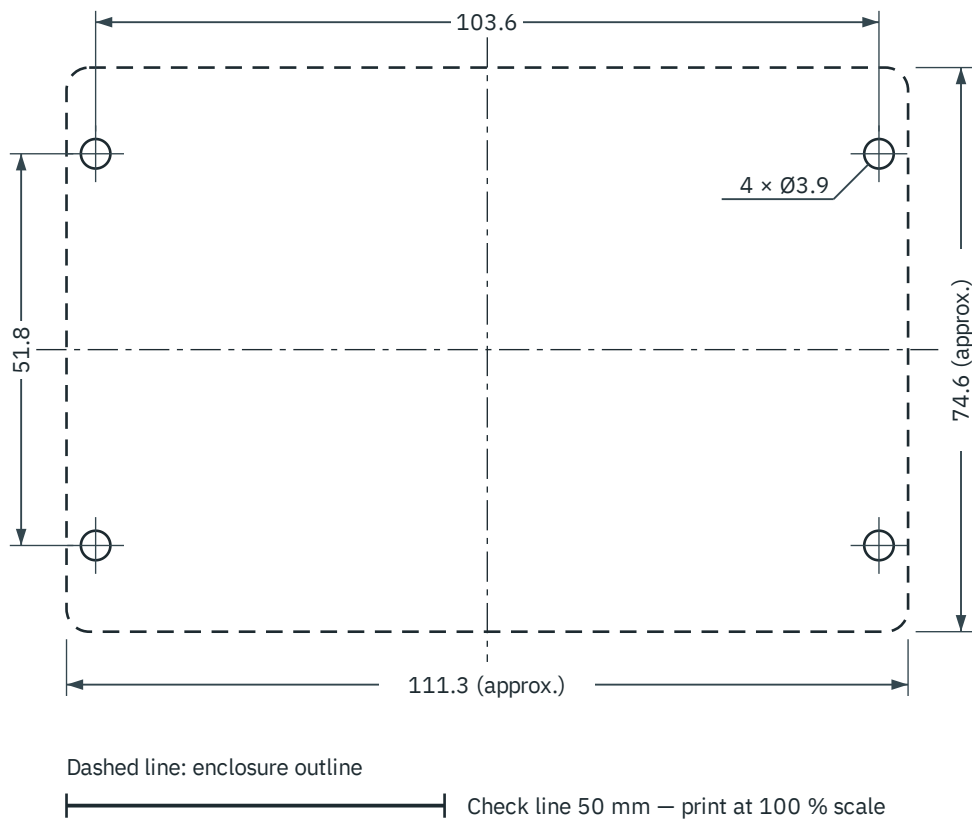
Interface	Description
Supply	10–30 VDC, terminal 1 (+) and 2 (0 V)
Ethernet	RJ45, 10/100 Mbit/s — PLC, switch or laptop
RS485	Terminal 5 (A), 6 (B), 7 (termination), 8 (reference) — half duplex, 2-wire
Bluetooth LE 5	Communication with ION8 RIOs in ETH Bridge, with the remote EB in ETH2BLE
Wi-Fi management access point	For configuration and monitoring only; does not carry field data
Pairing button	Pairing in ETH2BLE mode and factory reset at power-up
4 signal LEDs	Link quality 25% / 50% / 75% / 100%; in ETH Bridge shows the best RIO connection

3 Mounting and antenna

- 1 Place the device on a dry surface away from direct heat sources. The maximum ambient temperature is 70 °C.
- 2 Use the four screw mounting points on the enclosure (4 × Ø3.9 mm, centre to centre 103.6 × 51.8 mm; dimensioned template below). The device is not designed for DIN rail mounting.
- 3 **With the internal-antenna model**, do not bury the device deep inside a metal cabinet; if the cover or enclosure is metal, prefer the external-antenna model.
- 4 **With the external-antenna model**, place the antenna outside the cabinet at a high point that gives the clearest possible line of sight between the two ends. Do not bend the antenna cable sharply or put tensile load on the connector.
- 5 Secure the cables so they are free of strain and vibration, and leave access to the terminal and RJ45 for service.

Mounting hole template (1:1)

Mounting hole template — scale 1:1, dimensions in mm



Print the page without scaling (100 %) and verify the 50 mm check line with a ruler; then fix the template to the mounting surface and mark the hole centres. Dimensions in mm.



Range tip

Links of up to 500 metres in line of sight are possible with an external antenna. Metal enclosures, machine movement, antenna height and 2.4 GHz congestion affect the range; during commissioning check the signal LEDs and the dBm value in the web interface.

4 Electrical connection and RS485 wiring

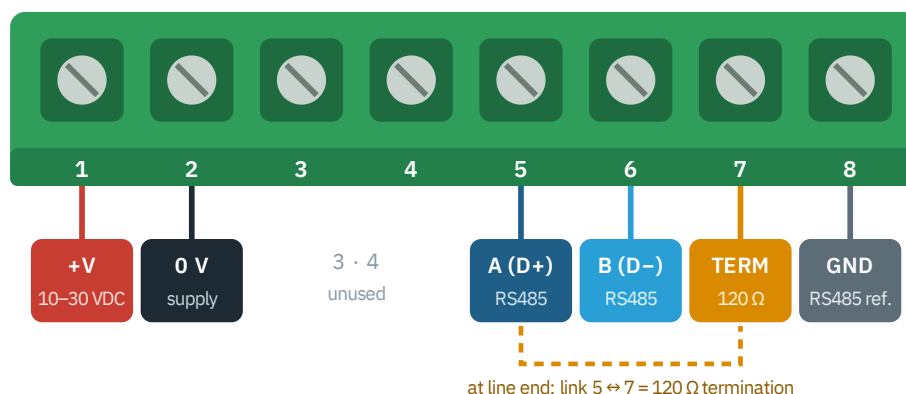


Figure 1. 8-pole terminal layout. For the physical connection, rely on the numbering on the device.

Terminal	Function	Connection
1	Supply +	+10...30 VDC (typ. 24 VDC)
2	Supply 0 V	Power supply 0 V
3-4	—	Not used, leave empty
5	RS485 A (D+)	A / D+ / Data+ terminal of the remote device
6	RS485 B (D-)	B / D- / Data- terminal of the remote device
7	Termination	If the EB is at the end of the line, link it to 5 (120 Ω is enabled); if it is in the middle, leave it empty
8	RS485 reference	GND / reference terminal of the remote device (not the cable shield)

Supply

- 1 Switch off the power; pull the terminal block off the device.
- 2 Connect +V to terminal 1 and 0 V to terminal 2. Make no connection to 3-4.
- 3 Measure the polarity, seat the terminal block fully and power up.
- 4 At power-up, see the four LEDs light in sequence and then together.

RS485 wiring rules

- Use shielded twisted-pair cable; connect A-A and B-B.
- Run the line as a daisy chain; no star topology and no long stubs.
- Use termination only at the two physical ends of the line.
- Connect the reference terminal (8) to limit the common-mode voltage; ground the shield at a single point.
- There must be only one master on a line.



A/B naming

Some manufacturers name A and B the other way round. If there is no communication and the error counters are increasing, try swapping A and B.

Ethernet

Connect the RJ45 port to the PLC, a switch or a laptop with a standard Cat5e/Cat6 cable. The port must detect 10/100 Mbit/s and speed/duplex automatically. In ETH2BLE mode, the port of each EB is connected to the device on its own side.

5 First access: the web interface

All settings are made from a browser; no software installation is needed. Field data is always carried over Bluetooth LE; the Wi-Fi management access point opens only for configuration, for an adjustable **service window** after power-up.

	ETH Bridge mode	ETH2BLE mode
Wi-Fi network name	ion8eb_XXXXXX	ethble_XXXXXX
Default password	12345678 — change it at first login (8–63 characters)	
Address	http://192.168.4.1 · over Ethernet http://ion8eb.local or the device IP	http://192.168.4.1
Wi-Fi stays on	Adjustable (0–1440 min, default 2 min; 0 = always on): it closes if nobody connects within the time; it stays on while a client is connected, and the time restarts when the last client leaves	Adjustable 2–60 min, default 5 min; when the time expires Wi-Fi closes and the bridge keeps working

XXXXXX is a 6-digit code unique to the device. To regain access after Wi-Fi has closed, restart the device (in ETH Bridge mode, access over Ethernet is always available).

i

Live connection indicator

The status badge in the page header shows real-time communication with the device. If the device does not respond, the ETH Bridge interface covers the whole page with a "No connection to device" ("Cihazla bağlantı yok") warning, so you never mistake on-screen values for current ones. The header also shows the firmware build signature (in YYYY.MM.DD.HH:MM.SS format) — write it on the commissioning form and the service record.

6 Selecting the operating mode

The same device does two different jobs; only one mode runs at a time.

- 1 In the web interface, open the **Device Mode** ("Cihaz Modu") card. *Running mode* ("Çalışan mod") shows the current role.
- 2 From the *Next boot mode* ("Sonraki açılış modu") list select *ION8 ETH Bridge* or *ETH2BLE* and press **Save Mode Selection** ("Mod Seçimini Kaydet").
- 3 The device does not restart by itself. Cycle the power at a suitable moment.
- 4 Reconnect and confirm the new mode in the *Running mode* field.



Before changing the mode

Put the machine in a safe state. When the mode changes, the data exchange with the PLC is re-established according to the new mode.

The **Firmware Update Mode** ("Firmware Güncelleme Modu") button under the same card is for firmware updates only (Section 16).

Cihaz Modu

Çalışan mod

ETH_BRIDGE

Sonraki açılış modu

ION8 ETH Bridge

ION8 ETH Bridge, saha cihazlarını ION8 ekosistemine bağlar. ETH2BLE, PLC'ler arasında transparan Ethernet iletişimi sağlar.

Mod Seçimini Kaydet

Firmware güncellemesi factory recovery ile yapılır; eşleştirme ve ayarlar korunur.

Firmware Güncelleme Modu

Mod değişikliği bekleniyor.

The **Device Mode** card

7 ETH Bridge: network and RIO pairing

7.1 Ethernet settings

Network mode	When
DHCP (default)	Office/workshop network, IP obtained automatically
Workshop fixed	Direct connection; the device becomes 192.168.0.3
Field static	PLC network; you enter the IP, mask and gateway

Apply with **Save and Restart** ("Kaydet ve Yeniden Başlat").
Whichever mode is selected, access via <http://ion8eb.local> and, over Wi-Fi, 192.168.4.1 is retained.

Ethernet Settings



For S7 and EtherNet/IP

The EB connects to the PLC by itself; the EB's IP address must be in the same subnet as the PLC.

7.2 Pairing remote I/O stations (RIO)

SLOT	DURUM	MODEL	FW	KAP.	MAC	RSSI	KAYIP	KOPMA	DESC	İŞLEM
0	Bağlı	1324 (RIO)	#101	6	00:CF:13:34:00:A0	-58 dBm İYİ	0	0	v3	Bul + Sil
1	Bağlı	1324 (RIO)	#101	1	00:CF:13:34:01:A1	-71 dBm ZAYIF	0	1	v3	Bul + Sil
2						— boş —				
3						— boş —				
4						— boş —				
5						— boş —				
6						— boş —				
7						— boş —				

Pairing and Slot Status: connected RIOs, signal, loss and disconnect counters

- 1 Power up the RIOs. Press **Pairing Mode** ("Eşleştirme Modu"); for safety, the mode closes automatically after 5 minutes.
- 2 In the *Scanned Devices* ("Taranan Cihazlar") list the RIOs appear with model, firmware version, capacity and signal strength.
- 3 For the RIO you want, use **Assign to Slot** ("Slota Ata") and choose a free slot from 0–7. The slot number determines the PLC addresses (see Section 8).

- 4 To see which physical RIO is in which slot, press **Find** ("Bul"); the RIO's LEDs blink.
- 5 To remove a pairing, use **Delete** ("Sil"). Pairings are persistent; they are not lost when power is cut.

The pairing list recognizes all models of the ION8 RIO family: 1010, 1020, 1030, 1111, 1324, 1325, 2020, 2040, 2222, 3030, 3040, 3333, 4040, 4444, 5050 and 5555.

7.3 Wireless connection profile (Speed / Range)

In the **Wireless Connection Profile** ("Kablosuz Bağlantı Profili") card you choose how the BLE link with the RIOs operates. The choice is persistent; it is kept across restarts and applied to all connected RIOs within a few seconds.

Profile	When
Speed	Shortest response time. When the RIOs are in the same cabinet or room as the EB, or nearby. Metal covers, walls and distance weaken the signal; with a weak signal the connection can drop.
Range (default)	Longer range and a more robust link in noisy environments. When the RIOs are in different cabinets, behind walls or far away. Response time is longer.



The **Wireless Connection Profile** card

- 1 Select the profile in the card and press **Save and apply** ("Kaydet ve uygula").
- 2 The table shows mode, connection interval and signal strength for each slot. If a slot's signal is weak in the Speed profile, the card gives a warning; if disconnects occur, go back to **Range**.



Automatic timing

The connection timing is set automatically according to the number of connected RIOs; as the number of devices increases, the response time gets longer. The card shows the estimated time for the selected profile and your device count.

8

ETH Bridge: tag selection and address map

The inputs and outputs of each RIO (digital mask, counter, encoder position/speed, analog value, load cell, PWM frequency...) are reported to the EB as a **tag catalogue**. You choose which tags are carried to the PLC; the selected tags are placed in the 48-word window of each slot.

Canlı Tag'ler

Canlı

1s

Hepsi Giriş Çıkış Tüm slotlar

7 tag + Tag Ekle

SLOT	TAG	YÖN	TİP	CANLI DEĞER	MODBUS	
0	DI_mask	Giriş	u16	37	2000	-
0	Enc0_pos	Giriş	i32 ABCD	48213	2002-2003	-
0	Enc0_hiz	Giriş	f32 ABCD	1.251e+3	2004-2005	-
0	AI0	Giriş	u16	1234	2006	-
0	DO_mask	Çıkış	u16	5	3000	-
0	PWM0_frekans	Çıkış	u32 ABCD	1000	3008-3009	-
1	LC_net	Giriş	u16	812	2051	-

Bu tablo yalnız senkron seçili tag'leri gösterir (katalog değil). Değerler UI açikken canlı güncellenir. + ekle - satırdaki - çıkar (RIO'ya yazılır).

Live Tags: slot, direction, data type, byte order, live value and Modbus address

- 1 With **+ Add Tag** (" + Tag Ekle") select the slot; tick the tags in the *Input (read)* and *Output (write)* tabs and press **Write to RIO** ("RIO'ya Yaz").
- 2 The table shows only the selected tags; values refresh once per second while the interface is open. Remove a tag with **-**.
- 3 For 32-bit tags (U32, I32, FLOAT32) the byte order can be selected for Modbus TCP and OPC UA; new tags start with ABCD. The S7 side always uses Siemens order.
- 4 If a RIO's firmware is updated and its catalogue changes, the list refreshes automatically; you do not need to reload the page.

A maximum of 40 tag routes and a 48-word window can be used per slot.



Changes sent instantly

A change in RIO inputs and a change in outputs coming from the PLC are sent without waiting for the next cycle. When nothing changes, only a sparse heartbeat is transmitted; this keeps the data both fast and light on the link.

Address map

1000–1255

RS485 node data

8 nodes × 32 words · read/write

2000–2383

RIO → PLC (inputs)

8 slots × 48 words · read-only

3000–3383

PLC → RIO (outputs)

8 slots × 48 words · writable

4000–4063

Diagnostics

8 slots × 8 words · read-only

Address formulas (zero-based Modbus address — not the 40001 notation)

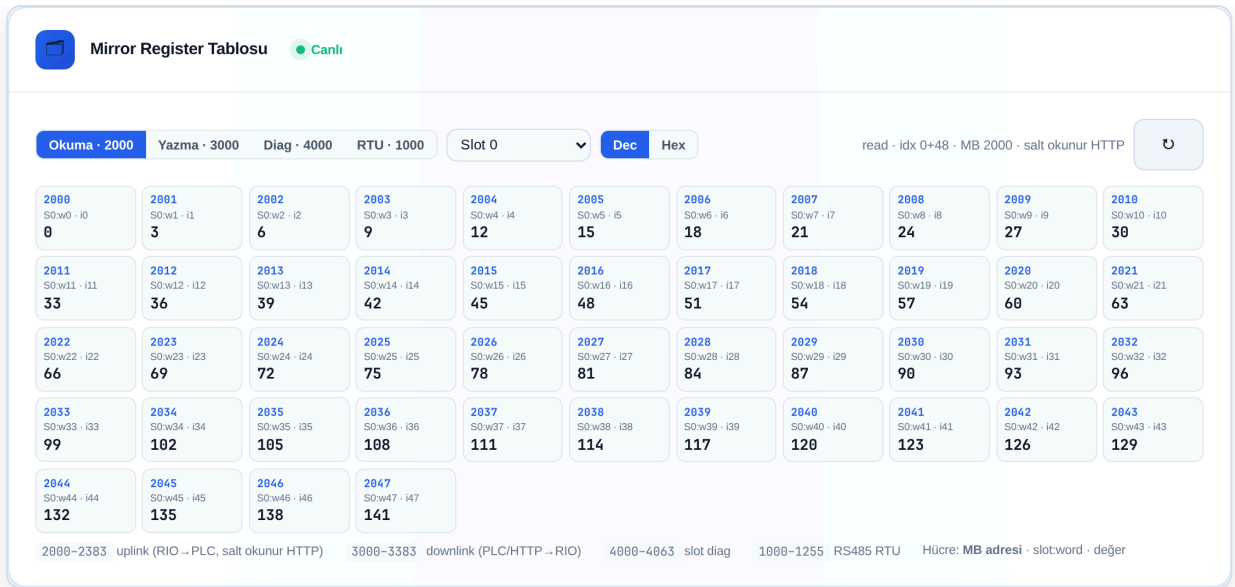
Input: $2000 + 48 \times \text{slot} + \text{word}$

Output: $3000 + 48 \times \text{slot} + \text{word}$

Diag.: $4000 + 8 \times \text{slot} + i$

RS485 node n: $1000 + 32 \times (n - 1) \rightarrow \text{read} + 0...7 \cdot \text{write} + 8...15 \cdot \text{status} + 16...30 \cdot \text{trigger} + 31$

Example: slot 2, word 5 input $\rightarrow 2000 + 96 + 5 = 2101$ · same word as output $\rightarrow 3101$ · node 3 read data $\rightarrow 1064...1071$



Mirror Register Table (in the *Diagnostics / Expert* section at the bottom of the page; opened with the **Show Diagnostics / Expert section** ("Tanı / Uzman bölümünü göster") button): the raw word values of the four areas are monitored live; in the Write area a value can be entered and sent to the RIO with **Write** ("Yaz")

Dagnostic word	Content (per slot, $4000 + 8 \times \text{slot} + i$)
i = 0	Status — bit 0: connected, bit 1: RIO has gone to the safe state (failsafe)
i = 1 / 2	Signal strength on the EB side / on the RIO side (dBm, signed)
i = 3	Number of wireless channels in use (out of 37)
i = 4 / 5	Lost packet count / connection disconnect count
i = 6	Tag configuration (descriptor) version — for commissioning checks



Recommended supervision in the PLC program

For each slot, monitor bit 0 of the status word and the disconnect counter; when the connection drops, put the related machine function in a safe state.

9 ETH Bridge: Siemens S7 PUT/GET

The EB communicates with S7-1200 / S7-1500 (and other S7 CPUs that support PUT/GET) through two data blocks. The EB is the client: it connects to the PLC by itself; you do not need to program an additional communication block in the PLC.

PUT DB — EB → PLC

RIO inputs (the selected input tags in the 2000... area) are written to this DB in the PLC. They are sent immediately on change (at intervals of at least "PUT Min Interval") and also once per "PUT Heartbeat" period (default 5000 ms).

GET DB — PLC → EB

The output commands the PLC writes to this DB (into the 3000... area) are read and forwarded to the RIOS. The read period is "GET Period" (default 100 ms).

9.1 Preparing the CPU in TIA Portal

- 1 CPU properties → *Protection & Security* → *Connection mechanisms* → tick **Permit access with PUT/GET communication from remote partner**.
- 2 Check the CPU's IP address and that the EB is in the same subnet. For S7-1200/1500, **rack 0, slot 1** is used.

9.2 S7 settings on the EB and transferring the DB structure to TIA

- 1 First, in Section 8, select the tags to be carried to the PLC.
- 2 In the **S7comm PUT/GET** card tick *S7comm Enabled* ("S7comm Aktif"); enter PLC IP, rack, slot, GET DB no. and PUT DB no.
- 3 Leave **Auto** ("Oto") ticked for the GET and PUT sizes: the size is calculated from the selected tags (maximum 768 bytes). If you enter a small size manually, the tags that will not fit are listed before saving.
- 4 Press **Save** ("Kaydet").
- 5 Under *TIA Portal DB structure* choose the format and press **Copy PUT DB structure** ("PUT DB yapısını kopyala"):
 - **SCL source**: save the text as an **.scl** file → in *TIA External source files* → *Add new external file* → right-click *Generate blocks from source*.
 - **Table**: create a new global DB in TIA, disable *Optimized block access*, click the first *Name* cell and paste with Ctrl+V.
- 6 Give the resulting DB the same number as the PUT DB no. you entered on the EB. Repeat the same procedure for the **GET DB**.
- 7 Download to the PLC. The badge in the card header must read **CONNECTED**.

GET DB No: 10 GET Boyut (byte): 12 ☒ Oto

PUT DB No: 11 PUT Boyut (byte): 104 ☒ Oto

GET: 12 byte otomatik (katalog · 2 tag).
PUT: 104 byte otomatik (katalog · 5 tag).
32-bit değerler PLC'ye her zaman Siemens sırasıyla gider (Real / DInt / UDIInt doğrudan okunur).
PDU 240 byte → istek başına en çok 222 byte; büyük DB otomatik parçalanır.

Automatic DB size

TIA Portal DB yapısı

SCL kaynak — External source → Generate blocks

☒ PUT DB yapısını kopyala ☒ GET DB yapısını kopyala

▼ Önizleme

```
// ION8 EB · S7 PUT DB (EB → PLC · giriş tag'leri) · 27.09.2026 12:44:44
// DB numarası: 11 · boyut: 104 byte · 5 tag
// TIA: .scl olarak kaydedin → External source files → Add new external
// sağ tık "Generate blocks from source" → oluşan DB'nin numarası
// "Optimized block access" KAPALI kalmalı (mutlak adres). CPU'da PUT/
DATA_BLOCK "ION8EB_PUT_DB11"
{ S7_Optimized_Access := 'FALSE' }
VERSION : 0.1
NON_RETAIN
VAR
    SCL_DT_mack : Word; // DB11.DBW0 · SlotA.wirA · Modbus
```

Yapı, katalogda seçili tag'lerin gerçek byte offsetleriyle üretilir; aradaki boş alanlar Rsv_... dizileriyle doldurulur. DB'de **Optimized block access kapalı** olmalı, CPU'da **PUT/GET izni açık** olmalı.

TIA Portal DB structure — real byte offsets, gaps filled with **Rsv_** arrays



32-bit values

On the S7 side, 32-bit values are always transferred in Siemens byte order (big-endian); use the **Real**, **DInt**, **UDInt** fields in the DB directly, without swapping bytes. The request size is split automatically according to the PLC's PDU (222 bytes per request on S7-1200).



Outputs on PLC loss

If the S7 connection drops, or no output data (GET) can be received from the PLC for about 1.5 seconds, the EB zeroes the output window sent to the RIOs; RIO outputs go to a safe (zero) state. When the connection returns, the PLC's values are applied again. This behaviour applies to S7 only; with Modbus TCP, OPC UA and EtherNet/IP the EB keeps the last values — for these protocols, set up timeout and heartbeat supervision in the PLC/SCADA program.

9.3 S7 diagnostic messages

If the PLC rejects a request, the EB does not drop the connection; a guiding message and the error detail appear under the card.

Message / state	What to do
Cannot connect	Check the PLC IP, cable, subnet and rack/slot values.
Access denied	Enable PUT/GET permission in the CPU (9.1) and download.
DB missing / address out of range	Check the DB number, that <i>Optimized block access</i> is disabled and that the DB has been downloaded to the PLC.
DB shorter than expected	The EB keeps transferring the part that fits and retries the full length every 30 seconds. Copy the DB structure again and update the PLC.

10 ETH Bridge: Modbus TCP, OPC UA, EtherNet/IP

Modbus TCP server

- Port 502, adjustable Unit ID
- FC03 read (≤ 125), FC06 / FC16 write (≤ 123)
- Read: 2000..., 4000...; write: 3000..., 1000...
- Writing to a read-only area returns "illegal address" (02)
- A single client at a time is recommended

OPC UA server

- `opc.tcp://<EB-IP>:4840`
- *MirrorRead* nodes are read-only (RIO inputs)
- *MirrorWrite* nodes are writable; the written value is forwarded to the RIO
- Maximum 2 sessions
- No authentication or encryption — only in an isolated control network

EtherNet/IP client

- Disabled by default; enabled from its card
- Logix PLC IP and **CPU Slot** (CompactLogix: 0; Micro800: "Direct")
- **Read Tag** (`INT[]`) → RIO outputs (3000...)
- **Write Tag** (`INT[]`) ← RIO inputs (2000...)
- Elements ≤ 128 , period 10–10000 ms · Class 3 explicit



HMI/SCADA addressing

EB addresses are zero-based. In software that uses "4xxxx" notation, address 2000 is entered as **42001** and address 3000 as **43001**.

11 ETH Bridge: RS485 Modbus RTU

The RS485 port operates in three ways. Settings are saved and applied **when the device is restarted**.

Off

The port is not used (default).

Master

The EB periodically reads/writes up to 8 Modbus RTU devices; the data is exposed to the PLC in the 1000–1255 area.

Slave

The EB becomes a Modbus RTU slave: an HMI/PLC on the serial line accesses the 2000... (RIO inputs), 3000... (RIO outputs) and 4000... (diagnostics) areas.

RS485 Modbus RTU

Master: 8 kablolü cihaz için bağımsız okuma/yazma. Slave: BLE read 2000–2383, write 3000–3383, tanımlama 4000–4063. Adresler sıfır tabanlı Modbus adresidir; 40001 gösterimi değildir. Kaydetme kalıcı belleğe'ye yapılır, ayarlar yeniden başlatınca uygulanır. Veri 8 bit. Bir 32-bit değer iki register kullanır. Komut ACK' fiziksel hareket kanıtı değildir.

Mod

Master

Baud

19200

Slave ID

1

Parity

None

Stop bits

2

Write owner

Network

Slave modunda yazma yetkisi: Network = yalnız Ethernet/Web, Serial = yalnız RS485, Both = her iki kaynak (son kabul edilen komut geçerlidir).

▼ Node 1 - Master map 1000–1031

☒ Node etkin

Cihaz slave adresi: 1 Okuma fonksiyonu: FC03 Holding Cihaz okuma başlangıcı: 0 Okuma word adedi (0=kapalı): 4

Okuma veri tipi: U16 Cihaz okuma sırası: ABCD / normal Cihaz yazma başlangıcı: 100 Yazma word adedi (0=kapalı): 2 Yazma veri tipi: U16

Cihaz yazma sırası: ABCD / normal Okuma periyodu (ms): 200 Yanıt timeout (ms): 300 Hata sonrası bekleme (ms): 1000 Komut ömrü / TTL (ms): 2000

☒ Yazma tekrar güvencesi (dempotent)

Read 1000–1007 · Write 1008–1015 · Status 1016–1030 · Tetik 1031. Veri alanına yazmak komut göndermez; tetik ayrıca gerekir. 1 word FC06, birden çok word FC16.

RS485 settings and Node 1 configuration

General settings

Baud 300–230400 · parity None/Even/Odd · stop 1/2 · data 8 bits · Slave ID (in slave mode).

Write owner (slave mode): *Network* = outputs are written only by Ethernet/Web, *Serial* = only by the RS485 master, *Both* = by both (the last command received applies).

Node settings (master)

Device slave address 1–247

Read function FC03 Holding / FC04 Input

Read / write start address, 0–8 words (0 = off)

Data type U16, I16, U32, I32, FLOAT32 + byte order

Timing read period, response timeout, wait after error, command lifetime (TTL)

Safe write retry if ticked, a write can be retried on timeout

Node address block (each node 32 words: 1000 + 32 × (n – 1) + ...)

Offset	Node 1 example	Meaning
+0 ... +7	1000–1007	Data read (values coming from the device)
+8 ... +15	1008–1015	Data to be written (the PLC writes here)
+16 ... +30	1016–1030	Status: data quality, age, error codes, exception, command counters
+31	1031	Trigger — write to the trigger word to send the write data to the device



Writing takes two steps

Writing to the data area (+8...+15) alone does not send a command; then write to the trigger word (+31). One word is sent with FC06, several words with FC16. An "ACK" reply shows that the device received the command; it is not proof of physical movement.

Çalışan: Master · 19200 / 8N2 · UART hazır

RX 3040 · TX 3040 · CRC 0 · Timeout 0 · UART 0 · Taşma 0 · Parity 0 · Frame 0 · Kuyruk dolu 0 · Süresi geçen 0

NODE / ID	MB READ / YAŞ	DEĞER / NORMALİZE WORD	MB WRITE	HATA / EXCEPTION	KOMUT / TAMAMLANAN
1 / 1	VALID / 140 ms	1200, 0, 57, 1 1200, 0, 57, 1	ACK	R: Yok / 0 W: Yok / 0	12 / 12
2 / 2	VALID / 170 ms	1201, 0, 57, 1 1201, 0, 57, 1	ACK	R: Yok / 0 W: Yok / 0	12 / 12
3 / 3	Kapalı / —		IDLE	R: Yok / 0 W: Yok / 0	0 / 0
4 / 4	Kapalı / —		IDLE	R: Yok / 0 W: Yok / 0	0 / 0
5 / 5	Kapalı / —		IDLE	R: Yok / 0 W: Yok / 0	0 / 0
6 / 6	Kapalı / —		IDLE	R: Yok / 0 W: Yok / 0	0 / 0
7 / 7	Kapalı / —		IDLE	R: Yok / 0 W: Yok / 0	0 / 0
8 / 8	Kapalı / —		IDLE	R: Yok / 0 W: Yok / 0	0 / 0

► Manuel Master yazma (açık tetik)

RS485 live status: per-node quality (VALID / STALE), value, write status, errors and command counters

12 ETH2BLE: pairing and LEDs

ETH2BLE requires **two EBs**; both must be in ETH2BLE mode (Section 6). In a standard installation the web interface is not needed: pair, plug in the cables, and it works.

- 1 Power up both devices.
- 2 On both devices press the pairing button **continuously for at least 3 seconds**; release when all four LEDs start blinking together.
- 3 During the search, a single LED moves from left to right and back.
- 4 When pairing is complete, the four LEDs blink together for **5 seconds**; then the display returns to the signal indicator.
- 5 Plug in the Ethernet cables; in TIA Portal see the PLC on the other side with *Accessible devices*.

Good to know

- The role (A/B) is determined automatically; no setting is needed.
- At the first successful pairing the two devices **lock** to each other; no foreign device can interfere.
- On re-pairing, the old peer is kept until the new connection is established.
- After a power interruption the devices find each other again automatically.

LED behaviour	Meaning
At power-up lights in sequence, then together	LED check
Outer two LEDs ↔ inner two LEDs alternating (approx. 400 ms)	Not paired, waiting for pairing
Single LED left to right and back	Pairing in progress
Four LEDs blink together for 5 s	Pairing successful
25% / 50% / 75% / 100% lit	Signal level (thresholds ≈ -74 / -68 / -60 / -59 dBm and above)
All off	No wireless connection

Factory reset

- 1 Switch off the power, hold the pairing button pressed and apply power without releasing it.
- 2 At **7 seconds** the LEDs give a warning — release now if you want to cancel.
- 3 If you hold for a total of **10 seconds**, all settings including the pairing are erased; the device restarts and returns to waiting for pairing.

Holding the button for a long time during normal operation does not cause a reset.

13 ETH2BLE: web interface settings

The web interface is for advanced settings and monitoring only. The **Guide** ("Kılavuz") button at the top right starts a guided tour; **Find Me** ("Beni Bul") blinks the device's LEDs to show which physical device you are connected to.

TÜNEL DURUMU

BLE Tünel **bağlı**
Ethernet Link **up**
Yerel veri yolu **hazır**
Ethernet hızı **100 Mbps / full duplex**
Başlangıç hatası **0**

Tunnel Status ("Tünel Durumu"): wireless tunnel, Ethernet link, speed/duplex

13.1 RS485 serial tunnel

- Tick *Enabled* separately at both ends; baud (300–230400), data bits (5–8), parity and stop bits are set according to the device connected at that end. Default **19200 8N2**.
- The setting is saved and applied **after a restart**; it is not sent to the other end automatically.
- The byte stream is carried as is — Modbus RTU is not decoded and the CRC is not changed. Increase the response timeout on the master side according to the wireless latency (e.g. ≥ 300 ms).
- Ethernet and RS485 share the same wireless capacity; under heavy traffic, monitor the "lost" and "overflow" values in the counters.

RS485 SERİ TÜNEL

☒ Etkin Baud **19200** Data **8** Parity **None** Stop **2** **Kaydet (yeniden başlatma gerekir)**

Kayıtlı ayar yüklendi; çalışan ayar durumdan izlenir.

Çalışan: **19200 8N2** · hazır

Sayaçlar RX/TX bayt: **90412 / 88710** · parça: **3120 / 3118** · hata/kayıp: **0 / 0**

Kuyruk RX/TX: **0 / 0** · tepe: **2 / 1** · dolu/taşma/zaman aşımı/eski veri: **0 / 0 / 0 / 0**

Her uç kendi seri ayarını kullanır. Ethernet ve RS485 aynı BLE kapasitesini paylaşır; aşırı yükte kayıp sayaçlarını kontrol edin.

The **RS485 Serial Tunnel** card — running settings, byte/fragment counters, queue state

13.2 MAC filter (optional)

PROFINET MAC EŞLEŞTİRME ?

Her satıra **bu cihazın karşı tarafında** bulunan bir hedef MAC (AA:BB:CC:DD:EE:FF) girilir. **Boş = tam transparan**. Doldurulursa yalnız listedeki unicast hedefler ile ARP/PROFINET, DHCP ve IPv6 komşu keşfi trafiği BLE'ye aktarılır. mDNS ve LLDP için tam transparan mod gerekir. Aşağıdaki keşif tablosunda **BU TARAF** bu cihazın Ethernet portunu, **KARŞI TARAF** BLE'nin öbür ucunu ifade eder. IP, ARP/IPv4 trafiğinden öğrenilir; henüz görülmediyse — gösterilir. Öğrenilen liste geçicidir; filtre kendiliğinden değişmez.

Yeni kullanıcı için öneri: Önce boş/tam transparan çalıştırın. TIA ve PLC haberleşmesi doğruysa filtre şart değildir. Trafiği azaltmak istediğinizde **MAC'leri Listele** → **Karşı Tarafı Filtre Alanına Aktar** → listeyi kontrol et → **Eşleştirmeyi Kaydet** sırasını izleyin. ARP ve PROFINET DCP keşif broadcast'leri filtre açıkken de geçer.

AA:BB:CC:DD:EE:FF

Eşleştirmeyi Kaydet

MAC'leri Listele

Karşı Tarafı Filtre Alanına Aktar

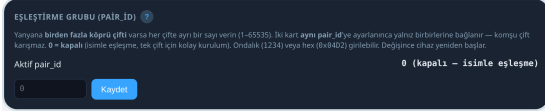
Bulundu: 2 bu taraf, 1 karşı taraf. Sayaç için tekrar listeleyin.

MAC	IP	KONUM	FRAME	SON GÖRÜLME	İŞLEM
28:63:36:A1:0C:22	192.168.0.1	KARŞI TARAF	5210	şimdi	Filtreye ekle
00:1B:1B:7C:44:10	192.168.0.10	BU TARAF	4987	şimdi	—
3C:52:82:10:9A:01	192.168.0.100	BU TARAF	811	4 sn önce	—

PROFINET MAC Pairing: learned devices, side information and one-click addition to the filter

- 1 On first installation leave the list **empty**: fully transparent operation. If TIA and PLC communication is correct, no filter is needed.
- 2 If you want to reduce traffic: **List MACs** ("MAC'leri Listele") → **Transfer Peer to Filter Field** ("Karşı Tarafı Filtre Alanına Aktar") → check the list → **Save Pairing** ("Eşleştirmeyi Kaydet").
- 3 A maximum of 8 remote-side addresses can be entered at each end. ARP, PROFINET DCP, DHCP and IPv6 neighbour discovery pass even with the filter on; mDNS/LLDP requires transparent mode.

13.3 Multiple lines side by side: pairing group



Pairing Group

If there is more than one ETH2BLE pair in the same area, give each pair a separate group number between 1 and 65535; two devices with the same number connect only to each other. **0** = off (easiest setup for a single pair). When it changes, the device restarts.

Device lock: If you have replaced a device, press **Reset Lock** ("Kilidi Sıfırla") on the remaining device; the next device that pairs becomes the new peer.

13.4 Wi-Fi time, password and settings backup

- **Wi-Fi AP (service window):** stays on for the set time after power-up and after the last client leaves (ETH Bridge default 2 min; ETH2BLE 2–60 min, default 5 min). When the time expires, Wi-Fi switches off completely and the Ethernet/RS485 bridge keeps working; restart to regain access.
- **Password:** update with *Change Password* ("Parolayı Değiştir"); the device restarts.
- **ETH Bridge network name and time:** from the *Wi-Fi AP* card you set the network name (SSID, 1–32 characters, no Turkish characters) and the AP on-time (0–1440 min, 0 = always on). When the network name changes, the device restarts.


Wi-Fi AP

Ağ adı (SSID)

1–32 karakter, Türkçe karakter kullanmayın. Boş bırakırsanız varsayılan ada döner.

AP açık kalma süresi (dk)

Açılışta ve son istemci ayrıldıktan sonra bu kadar açık kalır; sonra Wi-Fi tamamen kapanır ve cihaz BLE ile çalışır. 0 = sürekli açık.

 **AP Ayarlarını Kaydet**

Ağ adı değişirse cihaz yeniden başlar; yeni adla bağlanın.

Yeni WPA2 parolası

Yeni parolayı doğrulayın

Kaydedince cihaz yeniden başlar. Mevcut parola güvenlik için gösterilmez.

 **Parolayı Kaydet ve Yeniden Başlat**

Wi-Fi AP: network name, AP on-time and password

- **Settings Backup and Sharing** ("Ayar Yedekleme ve Paylaşım"): pairing group, MAC filter, AP time and next boot mode are exported to a JSON file; it is loaded onto another device with *Import JSON* ("JSON İçer Aktar"). Passwords are added to the file only if explicitly selected. The device lock is not copied.

Diagnostic counters (Tunnel Status and BLE Health)

Ethernet → BLE: frames received from the line, sent to the tunnel, filtered, queue full, dropped while there was no tunnel.

BLE → Ethernet: frames received from the tunnel, sent to the line, send-wait and error counts.

BLE Health ("BLE Sağlık"): signal strength (dBm), disconnect count, data channel setup errors.

System: uptime, boot count, last reset reason (abnormal reasons are shown in red).

14 Troubleshooting

Symptom	Check
Device does not power up	Measure +10...30 VDC at terminal 1, 0 V at terminal 2, and the polarity.
Wi-Fi network not visible	The management time may have expired; restart the device and connect within the time (ETH Bridge 2 min, ETH2BLE 5 min). In ETH Bridge, try <code>ion8eb.local</code> over Ethernet.
Mode did not change	The selection is applied only at the next power-up; cycle the power and check <i>Running mode</i> .

Symptom	Check
RIO slot not "connected"	Check the RIO power, distance and antenna; look at the signal and disconnect counter in the diagnostic words; if needed confirm the right device with Find .
RIO drops in the Speed profile	Check the signal strength (table in Section 7.3); if weak, improve the antenna/placement or switch to the Range profile.
Outputs reset on PLC loss	This is the expected behaviour on S7 (Section 9). Check the PLC connection, rack/slot and DB settings.
S7 badge not connected	According to the message in Section 9.3, check the IP, rack/slot, PUT/GET permission, DB number and optimized access setting.
32-bit value meaningless in the PLC	On S7 the DB field must be <code>Real/DInt</code> . On Modbus/OPC UA, match the tag's byte order with that of the HMI.
EtherNet/IP does not connect	Check the PLC IP and the CPU Slot value (CompactLogix 0, ControlLogix the CPU's slot, Micro800 "Direct"); verify that the tags are <code>INT[]</code> and of sufficient size.
No response / CRC error on RS485	Check A/B, the reference terminal, baud/parity/stop, the slave address and line terminations; restart after changing settings.
ETH2BLE does not pair	Make sure you held and released the button for 3 s on both devices, and that both are in ETH2BLE mode and in the same pairing group. If locked, Reset Lock .
No Ethernet traffic passes in ETH2BLE	Check the RJ45 link and the MAC filter; try temporarily emptying the filter.

15 Maintenance, service and disposal

- **Periodic check:** signal level, lost packet and disconnect counters, RS485 error counters, boot count and last reset reason. An unexpected rise in the boot count may point to a supply problem.
- **Firmware update:** only with the signed package supplied by IONIA, over Wi-Fi and without using USB (Section 16). Pairings and settings are preserved. Do not install unapproved firmware.
- **Do not open the enclosure.** In case of a fault, contact IONIA with the product code, build signature, LED behaviour and wiring diagram.
- **Disposal:** the product is electronic waste; do not dispose of it with household waste, hand it in to the local electronic waste collection system.

16 Field firmware update

The update is done with the signed `.ota` package supplied by IONIA. There is no need to open the device or connect USB; pairings and settings are preserved. The method is the same in both operating modes (ETH Bridge and ETH2BLE).

- 1 **Preparation:** put the machine in a safe state; during the update the device's wireless and PLC data is interrupted. Write the current build signature from the web interface header on the commissioning form.
- 2 Connect the computer to the device's Wi-Fi management access point (Section 5). If the service window has closed, restart the device.

- 3 In the **Device Mode** card press **Firmware Update Mode** and confirm the warning. The device switches to update mode and broadcasts a Wi-Fi network specific to update mode (the network name is shown in the card and on the update page).
- 4 Connect the computer to this update network and, on the update page that opens, select and upload the package supplied by IONIA. The package must match the device model and operating mode; a package whose signature cannot be verified is not accepted.
- 5 When the upload finishes, the device restarts and boots with the uploaded firmware. Do not cut the power during this time.
- 6 **Verification:** reconnect to the normal Wi-Fi network; check that the build signature in the page header matches the new version, that *Running mode* is correct and that the pairings are in place. Write the new signature on the commissioning form.



Caution

Do not restart the device or interrupt the connection until the update is complete. After the update, re-verify the PLC connections (S7 badge, Modbus, RS485) and signal levels with the functional checks on the commissioning form.



www.ionia-automation.com · Related documents: ION8 EB Commissioning Form, Product Brochure, Datasheet

IONIA Automation Technologies

Screenshots were prepared with sample data; minor differences may occur depending on the firmware version. This revision (RevD - 26.10.2026) was prepared for the field release of the ION8 EB firmware.