

Metal Work EB80Up
BEDIENUNGSANLEITUNG

Metal Work EB80Up
USER MANUAL



Die App „Metal Work EB80Up“ ermöglicht die Verbindung per Bluetooth von Android®- und iOS®-Smartphones zu den Ventilseln der Serie EB 80 von Metal Work, die mit einer Wireless-Schnittstelle ausgestattet sind.

Über „Metal Work EB80Up“ können alle Diagnosedaten angezeigt und die Verbindungsparameter zu einem Wi-Fi-Netzwerk eingestellt werden.

Hier die Version
für iOS herunterladen



Hier die Version
für Android herunterladen



1. INSTALLATION

1.1 ANDROID-GERÄTE

Die App aus dem Play Store herunterladen und auf dem Smartphone installieren.

Die minimal unterstützte Version ist Android 6.0 Marshmallow.

Für die Kommunikation mit EB 80 Wireless benötigt das Gerät Bluetooth LE.

1.2 IOS-GERÄTE

Die App aus dem Apple Store herunterladen und auf dem Smartphone installieren.

Die minimal unterstützte Version ist iOS 11.

Für die Kommunikation mit EB 80 Wireless benötigt das Gerät Bluetooth LE.

2. ANWENDUNG

2.1 EINFÜHRUNG

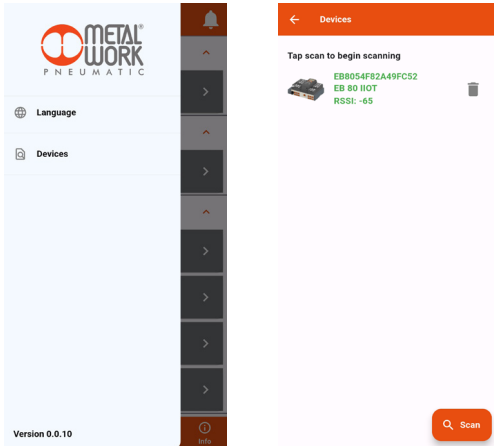
Die App ermöglicht es:

- EB 80 Geräte in der Nähe zu scannen;
- eine Verbindung herzustellen und die Diagnosedaten des Geräts anzuzeigen;
- die Zyklenzahl der Ventile zurückzusetzen;
- die Zyklenzahl der virtuellen Aktuatoren zurückzusetzen;
- die Parameter des Wireless-Netzwerks einzustellen.

2.2 VERWENDUNG

Die App starten; beim ersten Start eine Gerätesuche durchführen, anschließend versucht die App bei jedem Start, sich mit dem zuletzt verbundenen Gerät erneut zu verbinden.

Wenn das Gerät verfügbar ist, jedoch ein Fehler auftritt, muss die Taste „**Erneut versuchen**“ gedrückt werden, um die Verbindung erneut aufzubauen. Um eine neue Suche durchzuführen, das Menü oben links öffnen und „**Geräte**“ auswählen; es werden alle zuvor gekoppelten Geräte angezeigt.



Auf die Taste „**Scannen**“ drücken, um die Suche nach neuen Geräten zu starten.

Die erkannten Geräte werden in Grün angezeigt.

Der RSSI-Wert gibt die Signalstärke an.

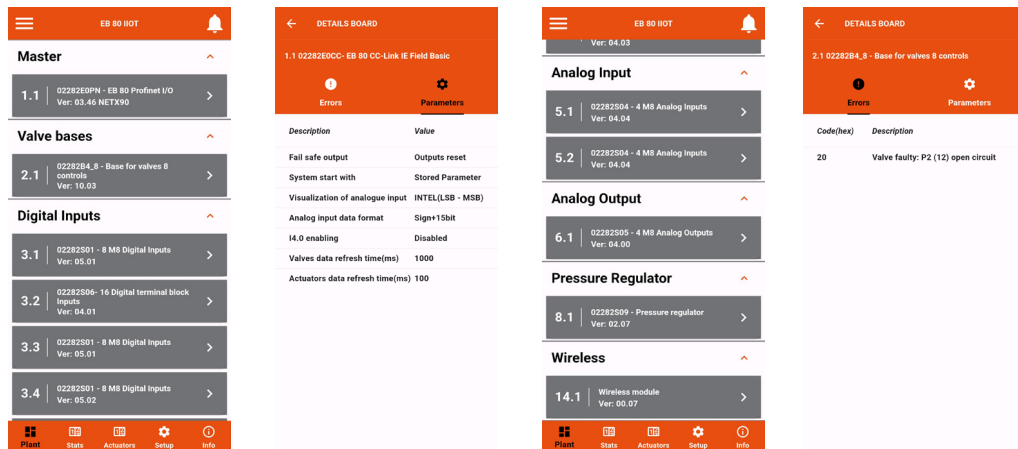
RSSI	Signalqualität
Bis -67	Hervorragend
Zwischen -67 und -70	Gut
Zwischen -70 und -75	Schwach
Unter -75	Sehr schwach

Auf das Gerät tippen, um die Verbindung herzustellen.

Um nicht verbundene Geräte aus der Liste zu entfernen, auf das **Papierkorb**-Symbol drücken.

2.3 DASHBOARD

Auf der Seite „Anlage“ werden alle Module der Ventilinsel, alle konfigurierten Parameter sowie eventuelle vorhandene Alarmer angezeigt.



The dashboard interface consists of several panels. The top panel shows the device name 'EB 80 HOT' and a notification bell. Below this, the 'Master' panel displays the device ID '0228250PM - EB 80 Profinet I/O' and version 'Ver: 03.46.NETX90'. The 'Valve bases' panel shows a list of valves, including '02282504_8 - Base for valves 8 controls' and '02282501 - 8 MB Digital Inputs'. The 'Digital Inputs' panel shows a list of inputs, including '02282501 - 8 MB Digital Inputs' and '02282505 - 16 Digital terminal block Inputs'. The 'Details Board' panel shows the device ID '1.1 0228250CC-EB 80 CC-Link IE Field Basic' and a table of parameters. The 'Analog Input' panel shows a list of inputs, including '02282504 - 4 MS Analog Inputs' and '02282504 - 4 MS Analog Inputs'. The 'Analog Output' panel shows a list of outputs, including '02282505 - 4 MS Analog Outputs'. The 'Pressure Regulator' panel shows a list of regulators, including '02282509 - Pressure regulator'. The 'Wireless' panel shows a list of wireless modules, including 'Wireless module'. The bottom panel shows a navigation menu with icons for Plant, Stats, Actuators, Setup, and Info.

Die obere Leiste zeigt den Namen des Geräts an, mit dem die Verbindung hergestellt wurde.
Die untere Leiste zeigt das Funktionsmenü an.

2.4 STATS

Zeigt alle Diagnosedaten der installierten Ventile an.

Die Registerkarte „Aktuell“ zeigt die Diagnosedaten des ausgewählten Ventils im Betrieb.

Die Registerkarte „Historie“ zeigt die Diagnosedaten jeder Position an, die bei jedem Reset nach einem Ventiltausch gespeichert wurden.



The Stats interface shows two tabs: 'Aktuell' (Actual) and 'Historie' (History). The 'Aktuell' tab displays the current status of the selected valve, while the 'Historie' tab displays the historical data. The interface shows a list of valves, including 'Valve #1', 'Valve #2', 'Valve #3', 'Valve #4', and 'Valve #5'. The bottom panel shows a navigation menu with icons for Plant, Stats, Actuators, Setup, and Info.

2.5 AKTUATOREN

Zeigt die Einschalt- und Betätigungszeiten des gesteuerten Pneumatikkreises an, bestehend aus Ventil, Aktuator und Sensoren. Die Funktion muss in der SPS-Konfiguration aktiviert und parametrisiert werden.



ER RO HOT



Actuator #1

Description	Value
Forward activation delay (ms)	95
Movement time (ms)	434
Backward activation delay (ms)	189
Return Time (ms)	704
Number of Cycles	249
Id Coil 1	3
Id Coil 2	4
Id Input End point 1	3
Id Input End point 2	4
Forward activation delay max (ms)	100
Forward activation tolerance (%)	30
Backward activation delay max (ms)	100
Backward activation tolerance (%)	30
Movement time max (ms)	500
Movement time tolerance (%)	20
Movement return time max (ms)	500
Movement return time tolerance (%)	20









Plant
Stats
Actuators
Setup
Info

2.6 SETUP

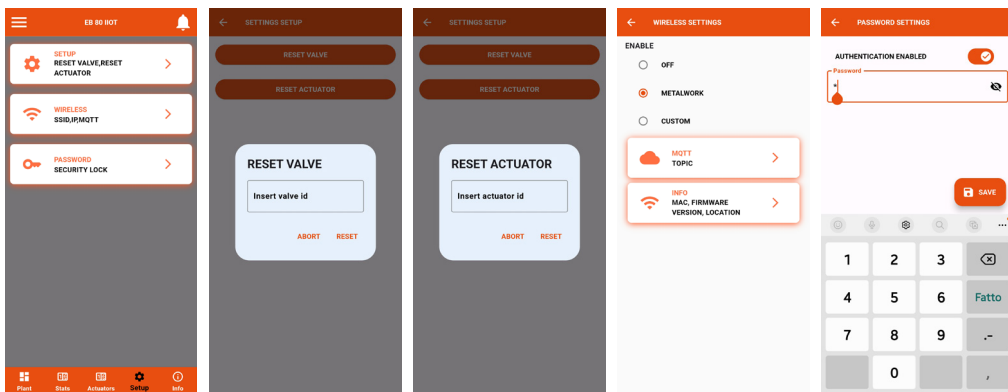
Auf der Seite „**Setup**“ ist es möglich, die Diagnosedaten jedes einzelnen Ventils und jedes virtuellen Zylinders zurückzusetzen.

Die Parameter für die Wireless-Verbindung einstellen.

Das Zugangspasswort festlegen.

Um die Änderungen zu aktivieren, müssen diese vor dem Verlassen der Seite gespeichert werden.

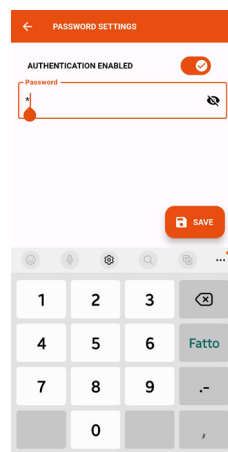
Im Falle eines Passwortverlusts Metal Work kontaktieren, um einen Entsperrcode zu erhalten.



2.6.1 PASSWORD

Die Seite „**Password**“ ermöglicht es, einen dreistelligen Entsperrcode festzulegen.

Wenn die Authentifizierung aktiviert ist, wird der Entsperrcode benötigt, um auf das Setup-Menü zuzugreifen. Im Falle eines Passwortverlusts Metal Work kontaktieren, um einen Entsperrcode zu erhalten.



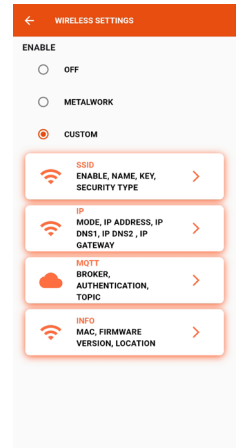
2.6.2 WIRELESS

Ermöglicht das Einstellen der Verbindungsparameter zum Wireless-Netzwerk:
Aktivieren durch Auswahl des Servers.

Für den Metal Work Server sind die Parameter bereits voreingestellt.

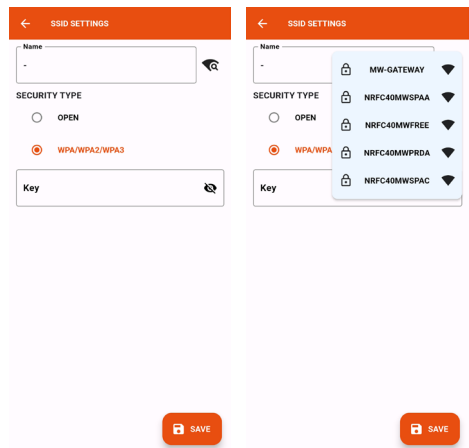
Für den Custom-Server ist die Einstellung der folgenden Parameter erforderlich:

SSID
IP address
MQTT



2.6.2.1 SSID

- Name: den Namen des Netzwerks eingeben, mit dem die Verbindung hergestellt werden soll
- Durch Klicken auf das Symbol rechts im Feld „Name“ werden die verfügbaren Netzwerke angezeigt.
- Sicherheitsart: auswählen, ob das Netzwerk geschützt oder offen ist
- Schlüssel: das Netzwerkpasswort eingeben



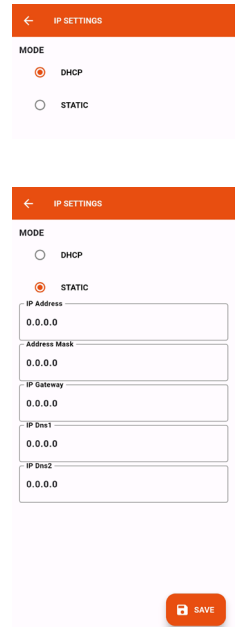
2.6.4.2 IP

- **DHCP:** die IP-Adresse wird vom DHCP-Server zugewiesen
- **STATISCH:** die IP-Adresse wird dauerhaft vergeben

IP-Adresse: die IP-Adresse des Geräts in derselben Netzwerkkategorie wie das Gateway einstellen.

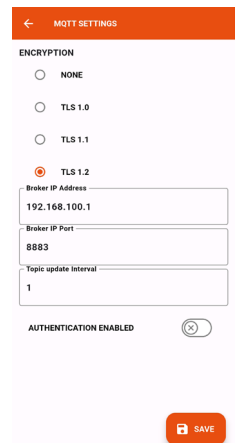
Netzmaske: die Maske entsprechend dem Bereich der IP-Adressen innerhalb des Subnetzes einstellen.

IP DNS 1 und 2, die Adresse des DNS-Servers einstellen, sichtbar in den Eigenschaften des verwendeten Wi-Fi-Netzwerks.



2.6.4.3 MQTT

- Ermöglicht das Einstellen der Parameter für die Verbindung zu einem MQTT-Broker
- Art der verwendeten Verschlüsselung
- IP-Adresse des Brokers
- Vom Broker verwendeter Port – 8883
- Aktualisierungsintervall
- Aktivierung der Authentifizierung



2.6.4.4 INFO (SETUP-SEITE)

- **MAC WIR:** MAC-Adresse für das Wireless-Protokoll
- **MAC BLU:** MAC-Adresse für die Verbindung über EB80Up
- **SW VER:** Softwareversion der Funkkommunikations-Software
- **Location:** Gerätenamen einstellen, es sind bis zu 11 Zeichen zulässig.

←
INFO

MAC WIR : 54:F8:2A:49:FC:50

MAC BLU : 54:F8:2A:49:FC:52

SW VER : 4.0.0-006

Location
 EB 80 IIOT

2.7 INFO

Die Seite „Info“ zeigt die Informationen des Geräts an:

- den Status des Netzwerks;
- die Netzparameter: Standort, SSID, RSSI, MAC, IP-Adressmaske, GATEWAY, DNS1, DNS2;
- die Firmware-Version;
- die Seriennummer;
- die Anzahl der Einschaltungen der Insel;
- die Anzahl der Alarme.

Außerdem ist es bei Vorhandensein mehrerer Einheiten möglich, die verbundene EB 80 Insel mit der Taste „**Identifizieren**“ zu erkennen: dabei wird die grüne PWR-LED für 5 Sekunden blinken.

☰
EB 80 IIOT
🔔

WIRELESS

STATUS: CONNECTED

LOCATION: EB 80 IIOT

SSID: MW-GATEWAY

BSSID: -49

MAC: 54:F8:2A:49:FC:50

IP ADDRESS: 192.168.100.167

ADDRESS MASK: 255.255.255.0

IP GATEWAY: 192.168.100.100

IP DNS1: 192.168.100.102

IP DNS2: 0.0.0.0

CONNECTED

EB 80 IIOT

MW-GATEWAY

-49

54:F8:2A:49:FC:50

192.168.100.167

255.255.255.0

192.168.100.100

192.168.100.102

0.0.0.0

MANUFACTURE

FIRMWARE VERSION: 00.07

SERIAL NUMBER: --

ACTIVATIONS: 62

POWER ALARMS: 1

00.07

--

62

1

🔍 Identify

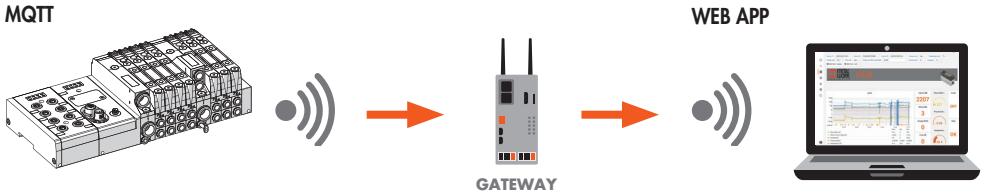
Plant
Stats
Actuators
Setup
Info

3. WIRELESS-VERBINDUNG

Das Wireless-Modul von EB 80 ermöglicht die Verbindung zu einem Wi-Fi-Netzwerk über einen Access Point oder ein Gateway, um die Diagnosedaten des Systems zu überwachen.

STRUKTUR DER VERBINDUNG MIT DEM METAL WORK GATEWAY

Das Metal Work Gateway übernimmt die Datenerfassung, die Formatierung und die Analyse und stellt diese auf einer Webseite dar, die über einen Browser angezeigt werden kann. Die Daten sind im Gateway gespeichert und archiviert und können daher jederzeit von jedem berechtigten Benutzer eingesehen werden.



STRUKTUR DER VERBINDUNG ÜBER EINEN ACCESS POINT ZU EINEM MQTT-BROKER



In beiden Fällen ermöglicht die Datenerfassung aus dem Feld eine prädiktive Diagnose der Anlage; die Betriebsparameter werden stets überwacht, wodurch der Betrieb der Maschinen und der pneumatischen Anlage optimiert wird.

Die Software kann mit Analysefunktionen erweitert werden, die eine Kontrolle der Maschineneffizienz ermöglichen.

EIGENSCHAFTEN DER WIRELESS-VERBINDUNG

Gateway

SSID_SECURITY keine oder WPA/WPA2/WPA3

SSID_NAME max. 31 Zeichen

SSID_KEY max. 62 Zeichen

IP statisch / dhcp

Broker MQTT

ENCRYPTION keine, TLS 1.0, 1.1, 1.2 (require_certificate = false)

BROKER IP ADDRESS

BROKER IP PORT 1883,8883

Benutzerauthentifizierung (optional):

AUTH_NAME max. 8 Zeichen

AUTH_KEY max. 8 Zeichen

Datenstruktur im MQTT-Format (JSON-Paketstruktur)

TOPIC: MW-EB80/MAC_ADDRESS/DATA

Es wird das Big-Endian-Format (MSB first) verwendet. Beispiel: bei einem numerischen Feld über 2 Byte gilt:

- byte P(n) = MSB
- byte P(n+1) = LSB

1. Alarms (ax)

1.1 Alarms of base for valves (a2)

bt: board type (2)

bn: board number (0 ÷ 43)

c: communication flag (0 = ok, 1 =error)

s: status flag (0=ok / 1=alarm)

p0: board alarms (0 ÷ 255)

p1: solenoids short circuit (0 ÷ 255)

p2: solenoids open circuit (0 ÷ 255)

Example: {"a2":{"bt":2,"bn":43,"c":1,"s":1,"p0":255,"p1":255,"p2":255}}

Maximum lenght: 62

1.2 Alarms of digital inputs (a2)

bt: board type (3)

bn: board number (0 ÷ 16)

c: communication flag (0 = ok, 1 =error)

s: status flag (0=ok / 1=alarm)

p0: board alarms (0 ÷ 255)

p1: inputs 1÷8 power fail (0 ÷ 255)

p2: inputs 9÷16 power fail (0 ÷ 255)

Example: {"a2":{"bt":3,"bn":16,"c":1,"s":1,"p0":255,"p1":255,"p2":255}}

Maximum lenght: 62

1.3 Alarms of digital outputs (a2)

bt: board type (4)
 bn: board number (0 ÷ 22)
 c: communication flag (0 = ok, 1 =error)
 s: status flag (0=ok / 1=alarm)
 p0: board alarms (0 ÷ 255)
 p1: outputs 1÷8 fault (0 ÷ 255)
 p2: outputs 9÷16 fault (0 ÷ 255)

Example: {"a2":{"bt":4,"bn":22,"c":1,"s":1,"p0":255,"p1":255,"p2":255}}

Maximum lenght: 62

1.4 Alarms of analog inputs (a2)

bt: board type (5)
 bn: board number (0 ÷ 4)
 c: communication flag (0 = ok, 1 =error)
 s: status flag (0=ok / 1=alarm)
 p0: board alarms (0 ÷ 255)
 p1: inputs under/overflow (0 ÷ 15)
 p2: inputs out of range (0 ÷ 15)

Example: {"a2":{"bt":5,"bn":4,"c":1,"s":1,"p0":255,"p1":15,"p2":15}}

Maximum lenght: 59

1.5 Alarms of analog outputs (a4)

bt: board type (6)
 bn: board number (0 ÷ 4)
 c: communication flag (0 = ok, 1 =error)
 s: status flag (0=ok / 1=alarm)
 p0: board alarms (0 ÷ 255)
 p1: outputs power fail (0 ÷ 15)
 p2: outputs current fault (0 ÷ 15)
 p3: outputs DC-DC fault (0 ÷ 15)
 p4: outputs wrong command (0 ÷ 15)

Example: {"a4":{"bt":6,"bn":4,"c":1,"s":1,"p0":255,"p1":15,"p2":15,"p3":15,"p4":15}}

Maximum lenght: 75

1.6 Alarms of thermal inputs (a6)

bt: board type (7)
 bn: board number (0 ÷ 4)
 c: communication flag (0 = ok, 1 =error)
 s: status flag (0=ok / 1=alarm)
 p0: board alarms (0 ÷ 255)
 p1: inputs under/overflow (0 ÷ 15)
 p2: inputs out of range (0 ÷ 15)
 p3: inputs short circuit (0 ÷ 15)
 p4: inputs open circuit (0 ÷ 15)
 p5: inputs internal calibration (0 ÷ 15)
 p6: inputs OV-UV-Ext-ref (0 ÷ 15)

Example: {"a6":{"bt":7,"bn":4,"c":1,"s":1,"p0":255,"p1":15,"p2":15,"p3":15,"p4":15,"p5":15,"p6":15}}

Maximum lenght: 91

1.7 Alarms of pressure regulator (a2)

bt: board type (8)
 bn: board number (0 ÷ 16)
 c: communication flag (0 = ok, 1 = error)
 s: status flag (0 = ok / 1 = alarm)
 p0: board alarms (0 ÷ 255)
 p1: solenoids short circuit (0 ÷ 2)
 p2: solenoids open circuit (0 ÷ 2)

Example: {"a2":{"bt":8,"bn":16,"c":1,"s":1,"p0":255,"p1":2,"p2":2}}

Maximum length: 58

1.8 Alarms master (a3)

bt: board type (1)
 bn: board number (1)
 c: communication flag (0 = ok, 1 = error)
 s: status flag (0 = ok / 1 = alarm)
 p0: byte 1 (0 ÷ 255)
 p1: byte 2 (0 ÷ 255)
 p2: byte 3 (0 ÷ 255)
 p3: byte 4 (0 ÷ 255)

Example: {"a3":{"bt":1,"bn":1,"c":1,"s":1,"p0":255,"p1":255,"p2":255,"p3":255}}

Maximum length: 70

1.9 Master alarm detail (a5)

bt: board type (1)
 bn: board number (1)
 s: status flag (0 = ok / 1 = alarm)
 p0: Bit allarme (0 ÷ 31)
 p1: Code (0 ÷ 255)
 p2: Detail 1 (0 ÷ 255)
 p3: Detail 2 (0 ÷ 255)
 p4: Detail 3 (0 ÷ 255)
 p5: Detail 4 (0 ÷ 255)

Example: {"a5":{"bt":1,"bn":1,"s":1,"p0":31,"p1":255,"p2":255,"p4":255,"p3":255,"p5":255}}

Maximum length: 81

1.10 Alarms of web module (a0)

bt: board type (14)
 bn: board number (1)
 c: communication flag (0 = ok, 1 = error)
 s: status flag (0 = ok / 1 = alarm)
 p0: board alarms (0 ÷ 255)

Example: {"a0":{"bt":14,"bn":1,"c":1,"s":1,"p0":255}}

Maximum length: 44

2. I4.0 diagnostics (dx)

2.1 I4.0 diagnostics of monostable valve (dm)

vn: valve id (1 ÷ 144)
 pr: pressure regulator flag (0)
 ie: P1(14) percentage usage (0 ÷ 100)
 is: P1(14) short circuit alarm counter (0 ÷ 15)
 io: P1(14) open circuit alarm counter (0 ÷ 15)
 ic: P1(14) cycle counter (0 ÷ 99.999.999)
 ia: P1(14) total activation time [seconds] (0 ÷ 99.999.999)

Example:{"dm":{"vn":144,"pr":0,"ie":100,"is":15,"io":15,"ic":99999999,"ia":99999999}}

Maximum length: 77

2.2 I4.0 diagnostics of bistable valve (db)

vn: valve id (1 ÷ 144)
 pr: pressure regulator flag (0)
 ie: P1(14) percentage usage (0 ÷ 100)
 is: P1(14) short circuit alarm counter (0 ÷ 15)
 io: P1(14) open circuit alarm counter (0 ÷ 15)
 ic: P1(14) cycle counter (0 ÷ 99.999.999)
 ia: P1(14) total activation time [seconds] (0 ÷ 99.999.999)
 oe: P2(12) percentage usage (0 ÷ 100)
 os: P2(12) short circuit alarm counter (0 ÷ 15)
 oo: P2(12) open circuit alarm counter (0 ÷ 15)
 oc: P2(12) cycle counter (0 ÷ 99.999.999)
 oa: P2(12) total activation time [seconds] (0 ÷ 99.999.999)

Example:{"db":{"vn":144,"pr":0,"ie":100,"is":15,"io":15,"ic":99999999,"ia":99999999,"oe":100,"os":15,"oo":15,"oc":99999999,"oa":99999999}}

Maximum length: 130

2.3 I4.0 diagnostics for proportional valve (dp)

vn: valve id (1 ÷ 144)
 pr: pressure regulator flag (1)
 wt: total working time [hours] (0 ÷ 99.999)
 ie: P1(14) percentage usage (0 ÷ 100)
 is: P1(14) short circuit alarm counter (0 ÷ 15)
 io: P1(14) open circuit alarm counter (0 ÷ 15)
 ic: P1(14) cycle counter (0 ÷ 99.999.999)
 oe: P2(12) percentage usage (0 ÷ 100)
 os: P2(12) short circuit alarm counter (0 ÷ 15)
 oo: P2(12) open circuit alarm counter (0 ÷ 15)
 oc: P2(12) cycle counter (0 ÷ 99.999.999)

Example:{"dp":{"vn":144,"pr":1,"wt":99999,"ie":100,"is":15,"io":15,"ic":99999999,"oe":100,"os":15,"oo":15,"oc":99999999}}

Maximum length: 113

2.4 I4.0 master diagnostics (dt)

pc: Power on Counter (0 ÷ 99999999)
 aa: Power alarm counter

Example: {"dt":{"pc":99999999,"aa":255}}

Maximum length: 31

2.5 I4.0 diagnostics for actuator (da)

an: actuator id (1 ÷ 10)
 st: status bitmap (255)
 fa: Forward activation delay (ms) (0 ÷ 65535)
 fs: Forward stroke time (ms) (0 ÷ 99999999)
 ba: Backward activation delay (ms) (0 ÷ 65535)
 bs: Backward stroke time (ms) (0 ÷ 99999999)
 cs: Counter stroke (0 ÷ 99999999)

Example: {"da":{"an":10,"st":255,"fa":65535,"fs":99999999,"ba":65535,"bs":99999999,"cs":99999999}}

Maximum length: 90

2.6 I4.0 history diagnostics of monostable valve (hdm)

vn: valve id (1 ÷ 144)
 pr: pressure regulator flag (0)
 hd: disponible (0)
 ie: P1(14) percentage usage (0 ÷ 100)
 is: P1(14) short circuit alarm counter (0 ÷ 15)
 io: P1(14) open circuit alarm counter (0 ÷ 15)
 ic: P1(14) cycle counter (0 ÷ 99.999.999)
 ia: P1(14) total activation time [seconds] (0 ÷ 99.999.999)

Example: {"hdm":{"vn":144,"pr":0,"hd":0,"ie":100,"is":15,"io":15,"ic":99999999,"ia":99999999}}

Maximum length: 85

2.7 I4.0 diagnostics of bistable valve (hdb)

vn: valve id (1 ÷ 144)
 pr: pressure regulator flag (0)
 hd: disponible (0)
 ie: P1(14) percentage usage (0 ÷ 100)
 is: P1(14) short circuit alarm counter (0 ÷ 15)
 io: P1(14) open circuit alarm counter (0 ÷ 15)
 ic: P1(14) cycle counter (0 ÷ 99.999.999)
 ia: P1(14) total activation time [seconds] (0 ÷ 99.999.999)
 oe: P2(12) percentage usage (0 ÷ 100)
 os: P2(12) short circuit alarm counter (0 ÷ 15)
 oo: P2(12) open circuit alarm counter (0 ÷ 15)
 oc: P2(12) cycle counter (0 ÷ 99.999.999)
 oa: P2(12) total activation time [seconds] (0 ÷ 99.999.999)

Example: {"hdb":{"vn":144,"pr":0,"hd":0,"ie":100,"is":15,"io":15,"ic":99999999,"ia":99999999,"oe":100,"os":15,"oo":15,"oc":99999999,"oa":99999999}}

Maximum length: 138

3. Parameter configuration (cx)

3.1 Parameter for valves (c1)

bt: board type (2)

bn: board number (1 ÷ 43)

p1: fail safe (0 ÷ 65535)

Example: {"c1":{"bt":2,"bn":43,"p1":65535}}

Maximum length: 34

3.2 Parameter for digital inputs (c8)

bt: board type (3)

bn: board number (1 ÷ 16)

st: subtype (0)

mc: map inputs available (0 ÷ 65535) : MAP_DI8 = 0x00FF, MAP_DI16 = 0xFFFF

p1: polarity 1..8 (0 ÷ 255)

p2: Activation state 1..8 (0 ÷ 255)

p3: Input debounce time 1..8 (0 ÷ 65535)

p4: Signal extension time 1..8 (0 ÷ 65535)

p5: polarity 9..16 (0 ÷ 255)

p6: Activation state 9..16 (0 ÷ 255)

p7: Input debounce time 9..16 (0 ÷ 65535)

p8: Signal extension time 9..16 (0 ÷ 65535)

Example: {"c8":{"bt":3,"bn":16,"st":0,"mc":65535,"p1":255,"p2":255,"p3":65535,"p4":65535,"p5":255,"p6":255,"p7":65535,"p8":65535}}

Maximum length: 121

3.3 Parameter for encoder (c8)

bt: board type (3)

bn: board number (1 ÷ 16)

st: subtype (1)

mc: map inputs available (0 ÷ 255) : MAP_ENC_DI4 = 0x3C

me: map encoders available (0 ÷ 255)

p1: polarity 1..8 (0 ÷ 255)

p2: Activation state 1..8 (0 ÷ 255)

p3: Input debounce time 1..8 (0 ÷ 65535)

p4: Signal extension time 1..8 (0 ÷ 65535)

p5: Encoder 1 Count inversion (0 ÷ 1)

p6: Encoder 1 Count reset mode (0 ÷ 8)

p7: Encoder 2 Count inversion (0 ÷ 1)

p8: Encoder 2 Count reset mode (0 ÷ 8)

Example: {"c8":{"bt":3,"bn":16,"st":1,"mc":255,"me":255,"p1":255,"p2":255,"p3":65535,"p4":65535,"p5":1,"p6":8,"p7":1,"p8":8}}

Maximum length: 116

3.4 Parameter for digital outputs (c6)

bt: board type (4)
 bn: board number (1 ÷ 22)
 mc: map output available (0 ÷ 65535) : MAP_DO6 = 0x003F, MAP_DO8 = 0x00FF, MAP_DO16 = 0xFFFF
 p1: polarity 1..8 (0 ÷ 255)
 p2: Activation state 1..8 (0 ÷ 255)
 p3: fail safe 1..8 (0 ÷ 65535)
 p4: polarity 9..16 (0 ÷ 255)
 p5: Activation state 9..16 (0 ÷ 255)
 p6: fail safe 9..16 (0 ÷ 65535)

Example: {"c6":{"bt":4,"bn":22,"mc":65535,"p1":255,"p2":255,"p3":65535,"p4":255,"p5":255,"p6":65535}}

Maximum length: 92

3.5 Parameter for analog inputs (c13)

bt: board type (5)
 bn: board number (1 ÷ 4)
 p1: Data format
 p2: ICH01:Signal range (0 ÷ 8)
 p3: ICH01:Filter measured value(0 ÷ 6)
 p4: ICH01:User full scale (1 ÷ 32767)
 p5: ICH02:Signal range (0 ÷ 8)
 p6: ICH02:Filter measured value(0 ÷ 6)
 p7: ICH02:User full scale (1 ÷ 32767)
 p8: ICH03:Signal range (0 ÷ 8)
 p9: ICH03:Filter measured value(0 ÷ 6)
 p10: ICH03:User full scale (1 ÷ 32767)
 p11: ICH04:Signal range (0 ÷ 8)
 p12: ICH04:Filter measured value(0 ÷ 6)
 p13: ICH04:User full scale (1 ÷ 32767)

Example: {"c13":{"bt":5,"bn":4,"p1":1,"p2":8,"p3":6,"p4":32767,"p5":8,"p6":6,"p7":32767,"p8":8,"p9":6,"p10":32767,"p11":8,"p12":6,"p13":32767}}

Maximum length: 134

3.6 Parameter for analog outputs (c8)

bt: board type (6)
 bn: board number (1 ÷ 4)
 cn: channel n (1 ÷ 4)
 p1: Signal range (0 ÷ 8)
 p2: Monitor lowest value (0 ÷ 1)
 p3: Monitor highest value (0 ÷ 1)
 p4: Fail safe output (0 ÷ 1)
 p5: User full scale (1 ÷ 32767)
 p6: Lowest value (-32767 ÷ 32767)
 p7: Highest value (-32767 ÷ 32767)
 p8: Fault mode value (-32767 ÷ 32767)

Example: c8":{"bt":6,"bn":4,"cn":4,"p1":8,"p2":1,"p3":1,"p4":1,"p5":32767,"p6":-32767,"p7":-32767,"p8":-32768}}

Maximum length: 104

3.7 Parameter for thermal inputs (c2)

bt: board type (7)

bn: board number (1 ÷ 4)

cn: channel n (0)

p1: Temperature scale (0 ÷ 1)

p2: Noise rejection (0 ÷ 7)

Example: {"c2": {"bt": 7, "bn": 4, "cn": 0, "p1": 1, "p2": 7}}

Maximum length: 44

Parameter for thermal inputs (c12)

bt: board type (7)

bn: board number (1 ÷ 4)

cn: channel n (1 ÷ 4)

p1: Sensor adjustment (0 ÷ 20)

p2: Connection technology (only for RTD) (0 ÷ 1)

p3: Cold junction compensation (0 ÷ 1)

p4: Temperature range (0 ÷ 1)

p5: Monitor wire break (0 ÷ 1)

p6: Monitor short circuit (0 ÷ 1)

p7: Monitor lowest circuit (0 ÷ 1)

p8: Monitor highest circuit (0 ÷ 1)

p9: Filter measured value (0 ÷ 6)

p10: Lowest value (-32767 ÷ 32767)

p11: Highest value (-32767 ÷ 32767)

p12: Acquisition filter (0 ÷ 1)

Example: {"c12": {"bt": 7, "bn": 4, "cn": 4, "p1": 20, "p2": 1, "p3": 1, "p4": 1, "p5": 1, "p6": 1, "p7": 1, "p8": 1, "p9": 6, "p10": -32767, "p11": 32767, "p12": 1}}

Maximum length: 128

3.8 Parameter for proportional valve (c13)

bt: board type (8)

bn: board number (1 ÷ 16)

p1: Regulator type (0 ÷ 10)

p2: Control type (6= da can, 3 = by keyboard)

p3: Measure unit (0 ÷ 3)

p4: Dead band (10 ÷ 1000)

p5: User full scale (0 ÷ 10000)

p6: Lowest value (0 ÷ 10000)

p7: Output Digital (0 ÷ 1)

p8: P On/ P+ (0 ÷ 10000)

p9: P Off/ P(0 ÷ 10000)

p10: Speed adjust (1 ÷ 10)

p11: Fail safe output (0 ÷ 1)

p12: Fault mode value (0 ÷ 10000)

p13: LCD language (0 ÷ 4)

Example: {"c13": {"bt": 8, "bn": 16, "p1": 10, "p2": 6, "p3": 3, "p4": 1000, "p5": 10000, "p6": 10000, "p7": 1, "p8": 10000, "p9": 10000, "p10": 10, "p11": 1, "p12": 10000, "p13": 4}}

Maximum length: 144

3.9 Parameter master (c7)

bt: board type (1)

bn: board number (1)

p1: netXFailSafe (0 ÷ 2)

p2: systemStart (0 ÷ 1)
 p3: analogEndianness (0 ÷ 1)
 p4: analogFormat (0 ÷ 1)
 p5: I40Enable (0 ÷ 1)
 p6: I40CounterRefreshPeriod (0 ÷ 65535)
 p7: I40CylinderRefreshPeriod (0 ÷ 65535)
 Example: {"c13":{"bt":1,"bn":1,"p1":2,"p2":1,"p3":1,"p4":1,"p5":1,"p6":65535,"p7":65535}}
 Maximum length: 80

3.10 Actuator parameters (ca)

id: actuator id (1 : 10)
 p1: Id Coil 1 (1 : 128)
 p2: Id Input End point 1 (1 : 128)
 p3: Id Coil 2 (1 : 128)
 p4: Id Input End point 2 (1 : 128)
 p5: Forward activation delay (ms) (1 ÷ 65535)
 p6: Forward activation tolerance(1: 100%)
 p7: Backward activation delay (ms) (1 ÷ 65535)
 p8: Backward activation tolerance(1: 100%)
 p9: Actuator movement time(ms)(1 ÷ 99.999.999)
 p10: Actuator movement time tolerance(1: 100%)
 p11: Actuator return time(ms)(1 ÷ 99.999.999)
 p12: Actuator return time tolerance(1: 100%)
 Example: {"ca":{"id":10,"p1":128,"p2":128,"p3":128,"p4":128,"p5":65535,"p6":100,"p7":65535,"p8":100,"p9":99999999,"p10":100,"p11":99999999,"p12":100}}
 Maximum length: 141

Hinweis:

- **ie/oe** sind Prozentangaben, wobei der Endwert 100 % = 30.000.000 Zyklen pro Pneumatikmodul und 100 % = 60.000.000 Zyklen pro Proportionalventil entspricht.-
- **ic/oc/ia/io/pc/fs/bs** können auch den Wert 99.999.999 überschreiten, müssen jedoch im MQTT auf diesen Wert begrenzt werden.
- **wt** kann ebenfalls den Wert 99.999 überschreiten, muss jedoch im MQTT auf diesen Wert begrenzt werden.

4. Info slave (i3)

bt: board type (1 ÷ 14)
 bn: board number (1 ÷ 43)
 st: subtype (0 ÷ 1)
 p1: versione H (0 ÷ 255)
 p2: versione L (0 ÷ 255)
 p3: name char [10]
 Example: {"i3":{"bt":14,"bn":43,"st":1,"p1":255,"p2":255,"p3":"123456789"}}
 Maximum length: 66

5. Info WEB (i)

i: object of type info
 sn: serial number
 sv: sw version
 ww: wireless version
 l: location
 Example: {"i":{"sn":99999,"sv":"01.00","ww":"4.0.0-006","l":"---"}}
 Maximum length: 8

4. ZERTIFIKATE

Dieses Gerät enthält:
FCC ID: **XPYNINAW106**
IC: **8595A-NINAW106**

Das Modul der Serie NINA-W15 ist in den folgenden Ländern/Regionen zertifiziert:

- Europe (RED)
- USA (FCC)
- Canada (IC)
- Japan (MIC)
- Taiwan (NCC)
- South Korea (KCC)
- Brazil (ANATEL)
- Australia and New Zealand (ACMA)
- South Africa (ICASA)

European Union regulatory compliance	Radio Equipment Directive (RED) 2014/53/EU NINA-W15 series modules comply with the essential requirements and other relevant provisions of Radio Equipment Directive (RED) 2014/53/EU.
USA – Canada FCC/IC compliance	This device complies with Part 15 of the FCC Rules and with Industry Canada license-exempt RSS standard(s).
Japan radio equipment compliance Giteki mark, R and the NINA-W156 MIC certification number	 R 203-JN1166
NCC Taiwan compliance	Contains Transmitter Module 內含發射器模組:  CCAI21Y1009AT3
KCC South Korea compliance	 R-C-ULX-NINA-W106
Brazil compliance	 ANATEL 05099-21-01056 "Este equipamento opera em caráter secundário, isto é, não tem direito a proteção contra interferência prejudicial, mesmo de estações do mesmo tipo, e não pode causar interferência a sistemas operando em caráter primário."
Australia and New Zealand regulatory compliance	 NINA-W151, NINA-W152 and NINA-W156 modules are compliant with the standards made by the Australian Communications and Media Authority (ACMA).
South Africa regulatory compliance	 TA-2021/3334 APPROVED
Bluetooth Declaration ID D062365	

Handelsmarken:

- Bluetooth® ist ein weltweit eingetragenes Warenzeichen der Bluetooth SIG, Inc.
- Wi-Fi® ist ein eingetragenes Warenzeichen der Wi-Fi Alliance.
- Alle anderen Marken und Urheberrechte sind Eigentum der jeweiligen Inhaber.



“Metal Work EB80Up” can be connected via Bluetooth to Metal Work EB 80 wireless interface, from Android® smartphone and iOS®.

The “Metal Work EB80Up” App lets you view all diagnostic data and set wireless parameters.

Download the version here
for iOS



Download the version here
for Android



1. INSTALLATION

1.1 ANDROID DEVICES

Download the App from the Play Store and install it on your smartphone.

The minimum supported version is Android 6.0 Marshmallow for communication with the EB 80 wireless, the device requires Bluetooth LE.

1.2 iOS DEVICES

Download the app from the Apple Store and install it on your smartphone.

The minimum supported version is iOS 11 for communication with the EB 80 wireless - the device requires Bluetooth LE.

2. APPLICATION

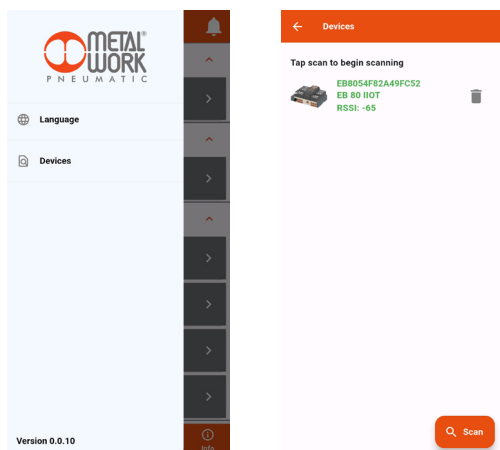
2.1 INTRODUCTION

This App allows you to:

- scan nearby EB 80 wireless devices;
- connect and view device diagnostic information;
- valve data resetting;
- virtual Cylinder data resetting;
- set wireless network parameters.

2.2 OPERATION

Run the App and scan the devices the first time it is started. Afterwards, each time it is started, the App will attempt to reconnect to the last connected device. If the device is available, in case of an error, press the **Retry** button to connect again. To rescan, open the top left menu and select '**Devices**', All previously associated devices will be displayed.



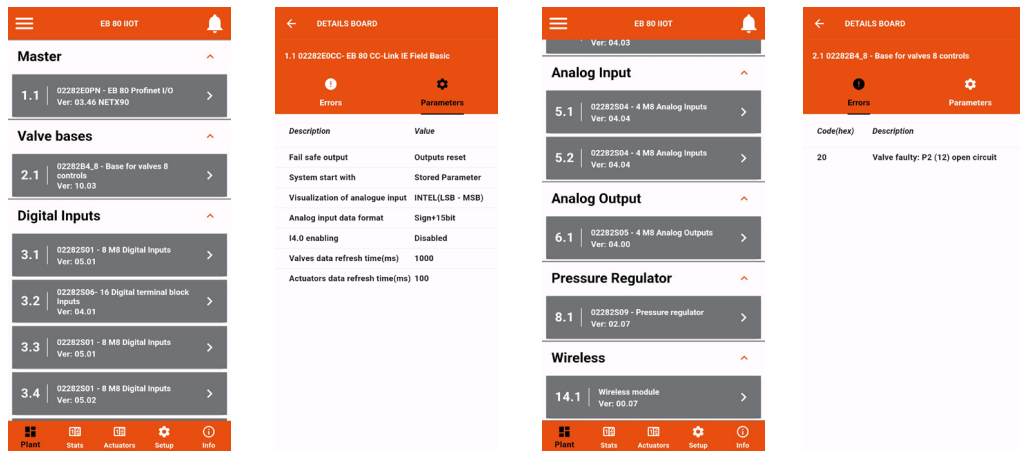
Press the **Scan** button to start searching for new devices.
The devices recognised will be displayed in green.
The RSSI value indicates the signal strength.

RSSI	Signal quality
Up to -67	Excellent
From -67 to -70	Good
From -70 to -75	Weak
Over -75	Very weak

Press on the device to make the connection.
To remove non-connected devices from the list, press the **Bin** icon.

2.3 DASHBOARD

The **Dashboard** page displays all the modules that make up the island, all the configured parameters and any alarms present.



The dashboard interface consists of four main sections:

- Master:** Displays the device name (EB 80 HOT) and a list of modules (1.1 to 1.4) with their respective versions and descriptions.
- Details Board:** Shows the configuration for a specific module (1.1 02282E0CC-EB 80 CC-Link IE Field Basic). It includes a table of parameters and their values.
- Analog Input:** Displays the configuration for analog input modules (5.1 to 5.2) with their versions and descriptions.
- Analog Output:** Displays the configuration for analog output modules (6.1 to 6.2) with their versions and descriptions.
- Pressure Regulator:** Displays the configuration for pressure regulator modules (8.1 to 8.2) with their versions and descriptions.
- Wireless:** Displays the configuration for wireless modules (14.1 to 14.2) with their versions and descriptions.

The top bar displays the name of the device being connected.
The bottom bar displays the function menu.

2.4 STATS

Displays the data of all the configured valves.

The "Actual" tab displays the diagnostic data relating to the selected valve in use.

The "History" tab displays the diagnostic data for each position, accumulated at each reset performed when the valve is replaced.



The Stats interface displays diagnostic data for all configured valves. It includes two tabs: "Actual" and "Historical".

Actual Tab (Valve #1):

Description	Value
P1 (14) SC alarms	0
P1 (14) OC alarms	0
P1 (14) Number of Cycles	2
P1 (14) Total activation time (s)	94
P2 (12) SC alarms	0
P2 (12) OC alarms	2
P2 (12) Number of Cycles	0
P2 (12) Total activation time (s)	0

Historical Tab (Valve #1):

Description	Value
P1 (14) SC alarms	1
P1 (14) OC alarms	0
P1 (14) Number of Cycles	1632297
P1 (14) Total activation time (s)	183537
P2 (12) SC alarms	15
P2 (12) OC alarms	3
P2 (12) Number of Cycles	816373
P2 (12) Total activation time (s)	166419

2.5 ACTUATORS

Displays the activation and actuation times of the controlled pneumatic circuit, composed of valve, actuator and sensors. The function must be activated and parameterized in the PLC configuration.

ER RO HOT

Actuator #1

Description	Value
Forward activation delay (ms)	95
Movement time (ms)	434
Backward activation delay (ms)	189
Return Time (ms)	704
Number of Cycles	249
Id Coil 1	3
Id Coil 2	4
Id Input End point 1	3
Id Input End point 2	4
Forward activation delay max (ms)	100
Forward activation tolerance (%)	30
Backward activation delay max (ms)	100
Backward activation tolerance (%)	30
Movement time max (ms)	500
Movement time tolerance (%)	20
Movement return time max (ms)	500
Movement return time tolerance (%)	20

Plant

Stats

Actuators

Setup

Info

2.6 SETUP

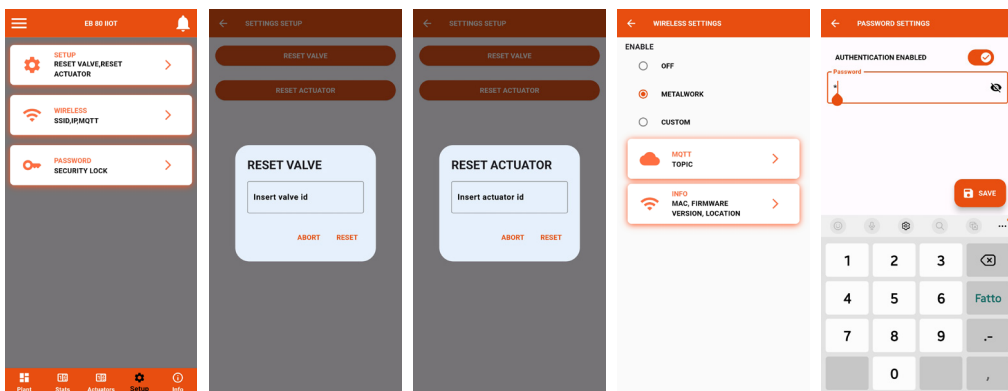
On the **Setup** page, resetting the diagnostic data of each individual valve and virtual cylinder is possible.

Set the parameters for the Wireless connection.

Set the login password.

To enable the changes made, you need to save them before exiting the page.

If you forget the password, contact Metal Work to obtain a password reset code.

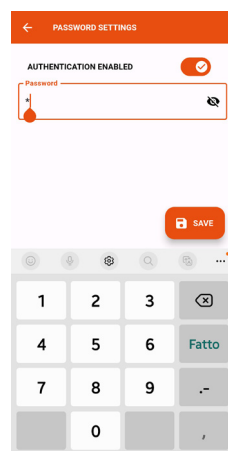


2.6.1 PASSWORD

The Password page allows you to set a three-digit unlock code.

When authentication is enabled, the unlock code is required to log in to the setup menu.

If you forget the password, contact Metal Work to obtain a password reset code.



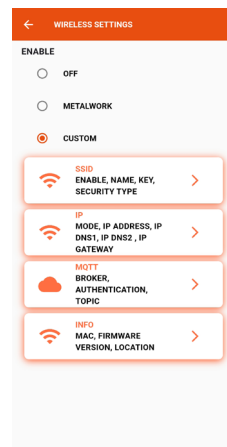
2.6.2 WIRELESS

Can be used to set wireless network connection parameters:

- Enable via server selection

For the METALWORK server, the parameters are already set.

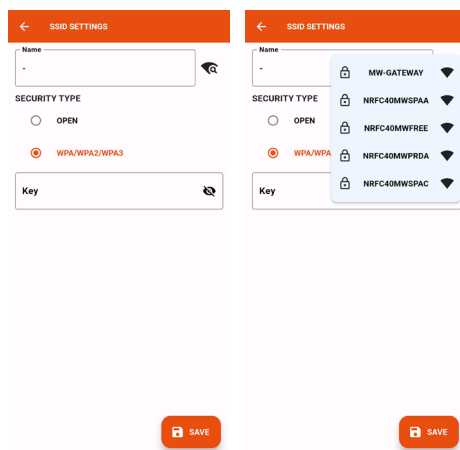
For the Custom server, the following parameters must be set: SSID
IP address
MQTT



The 'WIRELESS SETTINGS' screen has an orange header with a back arrow. Below the header, there is an 'ENABLE' section with three radio buttons: 'OFF', 'METALWORK', and 'CUSTOM' (which is selected). Below this are four expandable sections, each with a Wi-Fi icon and a right-pointing arrow: 'SSID' (ENABLE, NAME, KEY, SECURITY TYPE), 'IP' (MODE, IP ADDRESS, IP DNS1, IP DNS2, IP GATEWAY), 'MQTT' (BROKER, AUTHENTICATION, TOPIC), and 'INFO' (MAC, FIRMWARE VERSION, LOCATION).

2.6.2.1 SSID

- Name: enter the name of the network you wish to connect to
- By clicking on the icon to the right of the Name field, the available networks are displayed
- Security type: select whether the network is protected or open
- Key: select whether the network password is to be protected or open



The 'SSID SETTINGS' screen has an orange header with a back arrow. It contains four input fields: 'Name' (with a network selection icon to its right), 'SECURITY TYPE' (with radio buttons for 'OPEN' and 'WPA/WPA2/WPA3', where 'WPA/WPA2/WPA3' is selected), and 'Key' (with a visibility icon to its right). At the bottom right is a red 'SAVE' button. A second, slightly offset version of the screen is shown to the right, displaying a list of available networks: 'MW-GATEWAY', 'NRFC40MWSPAA', 'NRFC40MWFREE', 'NRFC40MWPRDA', and 'NRFC40MWSPAC', each with a lock icon and a Wi-Fi signal strength indicator.

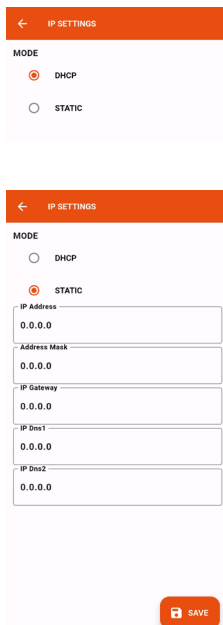
2.6.4.2 IP

- **DHCP**: the IP address is assigned by the DHCP server
- **STATIC**: the IP address is assigned permanently

IP address, set the IP address of the device in the same network class as the link Gateway.

Address mask, Set the mask according to the IP address range in the given subnetwork.

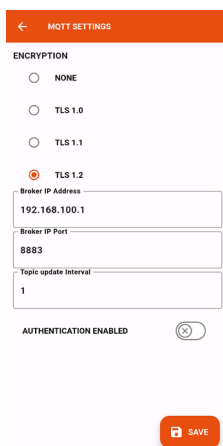
IP DNS 1 and 2, Set the DNS server address, visible in the properties of the Wi-Fi network in use.



2.6.4.3 MQTT

Can be used to set the parameters for connection to an MQTT Broker

- Type of encryption used
- Broker IP Address
- Port Used by the Broker – 8883
- Update interval
- Enabling activation



2.6.4.4 INFO (Set up page)

- **MAC WIR**: MAC address for the Wireless protocol
- **MAC BLU**: MAC address for connection via the EB80Up
- **SW VER**: software version of the radio communication software
- **Location**: can be used to set the device name, 11 characters are allowed.

← INFO

MAC WIR : 54:F8:2A:49:FC:50
MAC BLU : 54:F8:2A:49:FC:52
SW VER : 4.0.0-006
Location
EB 80 IIOT

2.7 INFO

The info page displays device information:

- network status, network;
- network parameters: Location, SSID, RSSI, MAC, Mask, IP, GATEWAY, DNS1, DNS2;
- firmware version;
- serial number;
- system startup counter;
- supply alert counter.

Moreover, if more than one unit is present, it is possible to identify the connected EB 80 using the **Identify** button: the wireless module PWR green LED will then flash for 5 seconds.

☰ EB 80 IIOT 🔔

WIRELESS


STATUS:	CONNECTED
LOCATION:	EB 80 IIOT
SSID:	MW-GATEWAY
BSSID:	54:F8:2A:49:FC:50
MAC:	-49
IP ADDRESS:	192.168.100.167
ADDRESS MASK:	255.255.255.0
IP GATEWAY:	192.168.100.100
IP DNS1:	192.168.100.102
IP DNS2:	0.0.0.0

MANUFACTURE


FIRMWARE VERSION:	00.07
SERIAL NUMBER:	--
ACTIVATIONS:	62
POWER ALARMS:	1

🔍 Identify

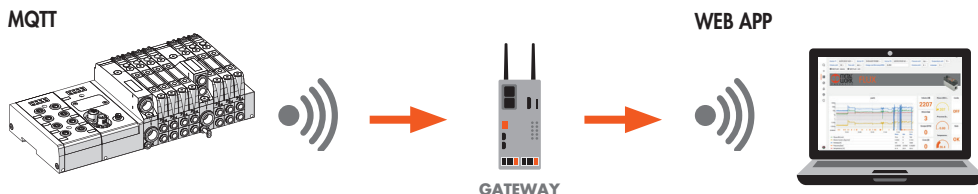
Plant Stats Actuators Setup Info

3. WIRELESS CONNECTION

The EB 80 Wireless module allows connection to a Wi-Fi network, via an Access point or a Gateway, to monitor the system's diagnostic data.

LINK STRUCTURE WITH THE METAL WORK GATEWAY

The Metal Work Gateway handles the collection, formatting and analysis of data, displaying them in a browser-viewable web page. The data is resident and stored in the Gateway, thus always viewable by any authorised user.



CONNECTION TO A MQTT BROKER VIA AN ACCESS POINT



Gathering data from the field makes it possible to carry out a predictive diagnosis of the system; monitor the operating parameters at all times and optimize the operation of the machines and the pneumatic system. The software can be implemented with analysis functions that provide machine efficiency monitoring.

WIRELESS CONNECTION FEATURES

Gateway

SSID_SECURITY none or WPA/WPA2/WPA3

SSID_NAME max. 31 characters

SSID_KEY max. 62 characters

IP static / dhcp

Broker MQTT

ENCRYPTION none, TLS 1.0, 1.1, 1.2 (require_certificate = false)

BROKER IP ADDRESS

BROKER IP PORT 1883,8883

User authentication (optional):

AUTH_NAME max. 8 characters

AUTH_KEY max. 8 characters

Data structure in MQTT format (JSON data packet structure)

TOPIC: MW-EB80/MAC_ADDRESS/DATA

The format is the big endian (MSB first).

For example a numeric field of 2 bytes:

- byte P(n) = MSB
- byte P(n+1) = LSB

1. Alarms (ax)

1.1 Alarms of base for valves (a2)

bt: board type (2)

bn: board number (0 ÷ 43)

c: communication flag (0 = ok, 1 =error)

s: status flag (0=ok / 1=alarm)

p0: board alarms (0 ÷ 255)

p1: solenoids short circuit (0 ÷ 255)

p2: solenoids open circuit (0 ÷ 255)

Example: {"a2":{"bt":2,"bn":43,"c":1,"s":1,"p0":255,"p1":255,"p2":255}}

Maximum length: 62

1.2 Alarms of digital inputs (a2)

bt: board type (3)

bn: board number (0 ÷ 16)

c: communication flag (0 = ok, 1 =error)

s: status flag (0=ok / 1=alarm)

p0: board alarms (0 ÷ 255)

p1: inputs 1÷8 power fail (0 ÷ 255)

p2: inputs 9÷16 power fail (0 ÷ 255)

Example: {"a2":{"bt":3,"bn":16,"c":1,"s":1,"p0":255,"p1":255,"p2":255}}

Maximum length: 62

1.3 Alarms of digital outputs (a2)

bt: board type (4)
 bn: board number (0 ÷ 22)
 c: communication flag (0 = ok, 1 = error)
 s: status flag (0 = ok / 1 = alarm)
 p0: board alarms (0 ÷ 255)
 p1: outputs 1 ÷ 8 fault (0 ÷ 255)
 p2: outputs 9 ÷ 16 fault (0 ÷ 255)

Example: {"a2":{"bt":4,"bn":22,"c":1,"s":1,"p0":255,"p1":255,"p2":255}}

Maximum length: 62

1.4 Alarms of analog inputs (a2)

bt: board type (5)
 bn: board number (0 ÷ 4)
 c: communication flag (0 = ok, 1 = error)
 s: status flag (0 = ok / 1 = alarm)
 p0: board alarms (0 ÷ 255)
 p1: inputs under/overflow (0 ÷ 15)
 p2: inputs out of range (0 ÷ 15)

Example: {"a2":{"bt":5,"bn":4,"c":1,"s":1,"p0":255,"p1":15,"p2":15}}

Maximum length: 59

1.5 Alarms of analog outputs (a4)

bt: board type (6)
 bn: board number (0 ÷ 4)
 c: communication flag (0 = ok, 1 = error)
 s: status flag (0 = ok / 1 = alarm)
 p0: board alarms (0 ÷ 255)
 p1: outputs power fail (0 ÷ 15)
 p2: outputs current fault (0 ÷ 15)
 p3: outputs DC-DC fault (0 ÷ 15)
 p4: outputs wrong command (0 ÷ 15)

Example: {"a4":{"bt":6,"bn":4,"c":1,"s":1,"p0":255,"p1":15,"p2":15,"p3":15,"p4":15}}

Maximum length: 75

1.6 Alarms of thermal inputs (a6)

bt: board type (7)
 bn: board number (0 ÷ 4)
 c: communication flag (0 = ok, 1 = error)
 s: status flag (0 = ok / 1 = alarm)
 p0: board alarms (0 ÷ 255)
 p1: inputs under/overflow (0 ÷ 15)
 p2: inputs out of range (0 ÷ 15)
 p3: inputs short circuit (0 ÷ 15)
 p4: inputs open circuit (0 ÷ 15)
 p5: inputs internal calibration (0 ÷ 15)
 p6: inputs OV-UV-Ext-ref (0 ÷ 15)

Example: {"a6":{"bt":7,"bn":4,"c":1,"s":1,"p0":255,"p1":15,"p2":15,"p3":15,"p4":15,"p5":15,"p6":15}}

Maximum length: 91

1.7 Alarms of pressure regulator (a2)

bt: board type (8)
 bn: board number (0 ÷ 16)
 c: communication flag (0 = ok, 1 = error)
 s: status flag (0 = ok / 1 = alarm)
 p0: board alarms (0 ÷ 255)
 p1: solenoids short circuit (0 ÷ 2)
 p2: solenoids open circuit (0 ÷ 2)

Example: {"a2":{"bt":8,"bn":16,"c":1,"s":1,"p0":255,"p1":2,"p2":2}}

Maximum length: 58

1.8 Alarms master (a3)

bt: board type (1)
 bn: board number (1)
 c: communication flag (0 = ok, 1 = error)
 s: status flag (0 = ok / 1 = alarm)
 p0: byte 1 (0 ÷ 255)
 p1: byte 2 (0 ÷ 255)
 p2: byte 3 (0 ÷ 255)
 p3: byte 4 (0 ÷ 255)

Example: {"a3":{"bt":1,"bn":1,"c":1,"s":1,"p0":255,"p1":255,"p2":255,"p3":255}}

Maximum length: 70

1.9 Master alarm detail (a5)

bt: board type (1)
 bn: board number (1)
 s: status flag (0 = ok / 1 = alarm)
 p0: Bit allarme (0 ÷ 31)
 p1: Code (0 ÷ 255)
 p2: Detail 1 (0 ÷ 255)
 p3: Detail 2 (0 ÷ 255)
 p4: Detail 3 (0 ÷ 255)
 p5: Detail 4 (0 ÷ 255)

Example: {"a5":{"bt":1,"bn":1,"s":1,"p0":31,"p1":255,"p2":255,"p4":255,"p3":255,"p5":255}}

Maximum length: 81

1.10 Alarms of web module (a0)

bt: board type (14)
 bn: board number (1)
 c: communication flag (0 = ok, 1 = error)
 s: status flag (0 = ok / 1 = alarm)
 p0: board alarms (0 ÷ 255)

Example: {"a0":{"bt":14,"bn":1,"c":1,"s":1,"p0":255}}

Maximum length: 44

2. I4.0 diagnostics (dx)

2.1 I4.0 diagnostics of monostable valve (dm)

vn: valve id (1 ÷ 144)
 pr: pressure regulator flag (0)
 ie: P1(14) percentage usage (0 ÷ 100)
 is: P1(14) short circuit alarm counter (0 ÷ 15)
 io: P1(14) open circuit alarm counter (0 ÷ 15)
 ic: P1(14) cycle counter (0 ÷ 99.999.999)
 ia: P1(14) total activation time [seconds] (0 ÷ 99.999.999)

Example:{"dm":{"vn":144,"pr":0,"ie":100,"is":15,"io":15,"ic":99999999,"ia":99999999}}

Maximum length: 77

2.2 I4.0 diagnostics of bistable valve (db)

vn: valve id (1 ÷ 144)
 pr: pressure regulator flag (0)
 ie: P1(14) percentage usage (0 ÷ 100)
 is: P1(14) short circuit alarm counter (0 ÷ 15)
 io: P1(14) open circuit alarm counter (0 ÷ 15)
 ic: P1(14) cycle counter (0 ÷ 99.999.999)
 ia: P1(14) total activation time [seconds] (0 ÷ 99.999.999)
 oe: P2(12) percentage usage (0 ÷ 100)
 os: P2(12) short circuit alarm counter (0 ÷ 15)
 oo: P2(12) open circuit alarm counter (0 ÷ 15)
 oc: P2(12) cycle counter (0 ÷ 99.999.999)
 oa: P2(12) total activation time [seconds] (0 ÷ 99.999.999)

Example:{"db":{"vn":144,"pr":0,"ie":100,"is":15,"io":15,"ic":99999999,"ia":99999999,
 "oe":100,"os":15,"oo":15,"oc":99999999,"oa":99999999}}

Maximum length: 130

2.3 I4.0 diagnostics for proportional valve (dp)

vn: valve id (1 ÷ 144)
 pr: pressure regulator flag (1)
 wt: total working time [hours] (0 ÷ 99.999)
 ie: P1(14) percentage usage (0 ÷ 100)
 is: P1(14) short circuit alarm counter (0 ÷ 15)
 io: P1(14) open circuit alarm counter (0 ÷ 15)
 ic: P1(14) cycle counter (0 ÷ 99.999.999)
 oe: P2(12) percentage usage (0 ÷ 100)
 os: P2(12) short circuit alarm counter (0 ÷ 15)
 oo: P2(12) open circuit alarm counter (0 ÷ 15)
 oc: P2(12) cycle counter (0 ÷ 99.999.999)

Example:{"dp":{"vn":144,"pr":1,"wt":99999,"ie":100,"is":15,"io":15,"ic":99999999,"oe":100,"os":15,
 "oo":15,"oc":99999999}}

Maximum length: 113

2.4 I4.0 master diagnostics (dt)

pc: Power on Counter (0 ÷ 99999999)
 aa: Power alarm counter

Example: {"dt":{"pc":99999999,"aa":255}}

Maximum length: 31

2.5 I4.0 diagnostics for actuator (da)

an: actuator id (1 ÷ 10)
 st: status bitmap (255)
 fa: Forward activation delay (ms) (0 ÷ 65535)
 fs: Forward stroke time (ms) (0 ÷ 99999999)
 ba: Backward activation delay (ms) (0 ÷ 65535)
 bs: Backward stroke time (ms) (0 ÷ 99999999)
 cs: Counter stroke (0 ÷ 99999999)

Example: {"da":{"an":10,"st":255,"fa":65535,"fs":99999999,"ba":65535,"bs":99999999,"cs":99999999}}

Maximum length: 90

2.6 I4.0 history diagnostics of monostable valve (hdm)

vn: valve id (1 ÷ 144)
 pr: pressure regulator flag (0)
 hd: disponible (0)
 ie: P1(14) percentage usage (0 ÷ 100)
 is: P1(14) short circuit alarm counter (0 ÷ 15)
 io: P1(14) open circuit alarm counter (0 ÷ 15)
 ic: P1(14) cycle counter (0 ÷ 99.999.999)
 ia: P1(14) total activation time [seconds] (0 ÷ 99.999.999)

Example: {"hdm":{"vn":144,"pr":0,"hd":0,"ie":100,"is":15,"io":15,"ic":99999999,"ia":99999999}}

Maximum length: 85

2.7 I4.0 diagnostics of bistable valve (hdb)

vn: valve id (1 ÷ 144)
 pr: pressure regulator flag (0)
 hd: disponible (0)
 ie: P1(14) percentage usage (0 ÷ 100)
 is: P1(14) short circuit alarm counter (0 ÷ 15)
 io: P1(14) open circuit alarm counter (0 ÷ 15)
 ic: P1(14) cycle counter (0 ÷ 99.999.999)
 ia: P1(14) total activation time [seconds] (0 ÷ 99.999.999)
 oe: P2(12) percentage usage (0 ÷ 100)
 os: P2(12) short circuit alarm counter (0 ÷ 15)
 oo: P2(12) open circuit alarm counter (0 ÷ 15)
 oc: P2(12) cycle counter (0 ÷ 99.999.999)
 oa: P2(12) total activation time [seconds] (0 ÷ 99.999.999)

Example: {"hdb":{"vn":144,"pr":0,"hd":0,"ie":100,"is":15,"io":15,"ic":99999999,"ia":99999999,"oe":100,"os":15,"oo":15,"oc":99999999,"oa":99999999}}

Maximum length: 138

3. Parameter configuration (cx)

3.1 Parameter for valves (c1)

bt: board type (2)

bn: board number (1 ÷ 43)

p1: fail safe (0 ÷ 65535)

Example: {"c1":{"bt":2,"bn":43,"p1":65535}}

Maximum length: 34

3.2 Parameter for digital inputs (c8)

bt: board type (3)

bn: board number (1 ÷ 16)

st: subtype (0)

mc: map inputs available (0 ÷ 65535) : MAP_DI8 = 0x00FF, MAP_DI16 = 0xFFFF

p1: polarity 1..8 (0 ÷ 255)

p2: Activation state 1..8 (0 ÷ 255)

p3: Input debounce time 1..8 (0 ÷ 65535)

p4: Signal extension time 1..8 (0 ÷ 65535)

p5: polarity 9..16 (0 ÷ 255)

p6: Activation state 9..16 (0 ÷ 255)

p7: Input debounce time 9..16 (0 ÷ 65535)

p8: Signal extension time 9..16 (0 ÷ 65535)

Example: {"c8":{"bt":3,"bn":16,"st":0,"mc":65535,"p1":255,"p2":255,"p3":65535,"p4":65535,"p5":255,"p6":255,"p7":65535,"p8":65535}}

Maximum length: 121

3.3 Parameter for encoder (c8)

bt: board type (3)

bn: board number (1 ÷ 16)

st: subtype (1)

mc: map inputs available (0 ÷ 255) : MAP_ENC_DI4 = 0x3C

me: map encoders available (0 ÷ 255)

p1: polarity 1..8 (0 ÷ 255)

p2: Activation state 1..8 (0 ÷ 255)

p3: Input debounce time 1..8 (0 ÷ 65535)

p4: Signal extension time 1..8 (0 ÷ 65535)

p5: Encoder 1 Count inversion (0 ÷ 1)

p6: Encoder 1 Count reset mode (0 ÷ 8)

p7: Encoder 2 Count inversion (0 ÷ 1)

p8: Encoder 2 Count reset mode (0 ÷ 8)

Example: {"c8":{"bt":3,"bn":16,"st":1,"mc":255,"me":255,"p1":255,"p2":255,"p3":65535,"p4":65535,"p5":1,"p6":8,"p7":1,"p8":8}}

Maximum length: 116

3.4 Parameter for digital outputs (c6)

bt: board type (4)
 bn: board number (1 ÷ 22)
 mc: map output available (0 ÷ 65535) : MAP_DO6 = 0x003F, MAP_DO8 = 0x00FF, MAP_DO16 = 0xFFFF
 p1: polarity 1..8 (0 ÷ 255)
 p2: Activation state 1..8 (0 ÷ 255)
 p3: fail safe 1..8 (0 ÷ 65535)
 p4: polarity 9..16 (0 ÷ 255)
 p5: Activation state 9..16 (0 ÷ 255)
 p6: fail safe 9..16 (0 ÷ 65535)

Example: {"c6":{"bt":4,"bn":22,"mc":65535,"p1":255,"p2":255,"p3":65535,"p4":255,"p5":255,"p6":65535}}

Maximum length: 92

3.5 Parameter for analog inputs (c13)

bt: board type (5)
 bn: board number (1 ÷ 4)
 p1: Data format
 p2: ICH01:Signal range (0 ÷ 8)
 p3: ICH01:Filter measured value(0 ÷ 6)
 p4: ICH01:User full scale (1 ÷ 32767)
 p5: ICH02:Signal range (0 ÷ 8)
 p6: ICH02:Filter measured value(0 ÷ 6)
 p7: ICH02:User full scale (1 ÷ 32767)
 p8: ICH03:Signal range (0 ÷ 8)
 p9: ICH03:Filter measured value(0 ÷ 6)
 p10: ICH03:User full scale (1 ÷ 32767)
 p11: ICH04:Signal range (0 ÷ 8)
 p12: ICH04:Filter measured value(0 ÷ 6)
 p13: ICH04:User full scale (1 ÷ 32767)

Example: {"c13":{"bt":5,"bn":4,"p1":1,"p2":8,"p3":6,"p4":32767,"p5":8,"p6":6,"p7":32767,"p8":8,"p9":6,"p10":32767,"p11":8,"p12":6,"p13":32767}}

Maximum length: 134

3.6 Parameter for analog outputs (c8)

bt: board type (6)
 bn: board number (1 ÷ 4)
 cn: channel n (1 ÷ 4)
 p1: Signal range (0 ÷ 8)
 p2: Monitor lowest value (0 ÷ 1)
 p3: Monitor highest value (0 ÷ 1)
 p4: Fail safe output (0 ÷ 1)
 p5: User full scale (1 ÷ 32767)
 p6: Lowest value (-32767 ÷ 32767)
 p7: Highest value (-32767 ÷ 32767)
 p8: Fault mode value (-32767 ÷ 32767)

Example: c8":{"bt":6,"bn":4,"cn":4,"p1":8,"p2":1,"p3":1,"p4":1,"p5":32767,"p6":-32767,"p7":-32767,"p8":-32768}}

Maximum length: 104

3.7 Parameter for thermal inputs (c2)

bt: board type (7)

bn: board number (1 ÷ 4)

cn: channel n (0)

p1: Temperature scale (0 ÷ 1)

p2: Noise rejection (0 ÷ 7)

Example: {"c2":{"bt":7,"bn":4,"cn":0,"p1":1,"p2":7}}

Maximum length: 44

Parameter for thermal inputs (c12)

bt: board type (7)

bn: board number (1 ÷ 4)

cn: channel n (1 ÷ 4)

p1: Sensor adjustment (0 ÷ 20)

p2: Connection technology (only for RTD) (0 ÷ 1)

p3: Cold junction compensation (0 ÷ 1)

p4: Temperature range (0 ÷ 1)

p5: Monitor wire break (0 ÷ 1)

p6: Monitor short circuit (0 ÷ 1)

p7: Monitor lowest circuit (0 ÷ 1)

p8: Monitor highest circuit (0 ÷ 1)

p9: Filter measured value (0 ÷ 6)

p10: Lowest value (-32767 ÷ 32767)

p11: Highest value (-32767 ÷ 32767)

p12: Acquisition filter (0 ÷ 1)

Example: {"c12":{"bt":7,"bn":4,"cn":4,"p1":20,"p2":1,"p3":1,"p4":1,"p5":1,"p6":1,"p7":1,"p8":1,"p9":6,"p10":-32767,"p11":32767,"p12":1}}

Maximum length: 128

3.8 Parameter for proportional valve (c13)

bt: board type (8)

bn: board number (1 ÷ 16)

p1: Regulator type (0 ÷ 10)

p2: Control type (6= da can, 3 = by keyboard)

p3: Measure unit (0 ÷ 3)

p4: Dead band (10 ÷ 1000)

p5: User full scale (0 ÷ 10000)

p6: Lowest value (0 ÷ 10000)

p7: Output Digital (0 ÷ 1)

p8: P On/ P+ (0 ÷ 10000)

p9: P Off/ P(0 ÷ 10000)

p10: Speed adjust (1 ÷ 10)

p11: Fail safe output (0 ÷ 1)

p12: Fault mode value (0 ÷ 10000)

p13: LCD language (0 ÷ 4)

Example: {"c13":{"bt":8,"bn":16,"p1":10,"p2":6,"p3":3,"p4":1000,"p5":10000,"p6":10000,"p7":1,"p8":10000,"p9":10000,"p10":10,"p11":1,"p12":10000,"p13":4}}

Maximum length: 144

3.9 Parameter master (c7)

bt: board type (1)

bn: board number (1)

p1: netXFailSafe (0 ÷ 2)

p2: systemStart (0 ÷ 1)
 p3: analogEndianness (0 ÷ 1)
 p4: analogFormat (0 ÷ 1)
 p5: I40Enable (0 ÷ 1)
 p6: I40CounterRefreshPeriod (0 ÷ 65535)
 p7: I40CylinderRefreshPeriod (0 ÷ 65535)
 Example: {"c13":{"bt":1,"bn":1,"p1":2,"p2":1,"p3":1,"p4":1,"p5":1,"p6":65535,"p7":65535}}
 Maximum length: 80

3.10 Actuator parameters (ca)

id: actuator id (1 : 10)
 p1: Id Coil 1 (1 : 128)
 p2: Id Input End point 1 (1 : 128)
 p3: Id Coil 2 (1 : 128)
 p4: Id Input End point 2 (1 : 128)
 p5: Forward activation delay (ms) (1 ÷ 65535)
 p6: Forward activation tolerance(1: 100%)
 p7: Backward activation delay (ms) (1 ÷ 65535)
 p8: Backward activation tolerance(1: 100%)
 p9: Actuator movement time(ms)(1 ÷ 99.999.999)
 p10: Actuator movement time tolerance(1: 100%)
 p11: Actuator return time(ms)(1 ÷ 99.999.999)
 p12: Actuator return time tolerance(1: 100%)
 Example: {"ca":{"id":10,"p1":128,"p2":128,"p3":128,"p4":128,"p5":65535,"p6":100,"p7":65535,"p8":100,"p9":99999999,"p10":100,"p11":99999999,"p12":100}}
 Maximum length: 141

Notes:

- **ie/oe** are a percentage, where the Full Scale 100% = 30.000.000 cycles for the pneumatic module and 100% = 60.000.000 cycles for the pressure regulator;
- **ic/oc/ia/io/pc/fs/bs** they can exceed 99,999,999, but on MQTT they must be limited to this value;
- **wt** can exceed 99.999, but on MQTT they must be limited to this value.

4. Info slave (i3)

bt: board type (1 ÷ 14)
 bn: board number (1 ÷ 43)
 st: subtype (0 ÷ 1)
 p1: versione H (0 ÷ 255)
 p2: versione L (0 ÷ 255)
 p3: name char [10]
 Example: {"i3":{"bt":14,"bn":43,"st":1,"p1":255,"p2":255,"p3":123456789}}
 Maximum length: 66

5. Info WEB (i)

i: object of type info
 sn: serial number
 sv: sw version
 ww: wireless version
 l: location
 Example: {"i":{"sn":99999,"sv":01.00,"ww":4.0.0-006,"l":---}}
 Maximum length: 8

4. QUALIFICATION AND APPROVALS

This device contains
FCC ID: **XPYNINAW106**
IC: **8595A-NINAW106**

The NINA-W15 module series is certified for use in the following countries/regions:

- Europe (RED)
- USA (FCC)
- Canada (IC)
- Japan (MIC)
- Taiwan (NCC)
- South Korea (KCC)
- Brazil (ANATEL)
- Australia and New Zealand (ACMA)
- South Africa (ICASA)

European Union regulatory compliance	Radio Equipment Directive (RED) 2014/53/EU NINA-W15 series modules comply with the essential requirements and other relevant provisions of Radio Equipment Directive (RED) 2014/53/EU.
USA – Canada FCC/IC compliance	This device complies with Part 15 of the FCC Rules and with Industry Canada license-exempt RSS standard(s).
Japan radio equipment compliance Giteki mark, R and the NINA-W156 MIC certification number	 R 203-JN1166
NCC Taiwan compliance	Contains Transmitter Module 內含發射器模組:  CCAI21Y1009AT3
KCC South Korea compliance	 R-C-ULX-NINA-W106
Brazil compliance	 05099-21-01056 "Este equipamento opera em caráter secundário, isto é, não tem direito a proteção contra interferência prejudicial, mesmo de estações do mesmo tipo, e não pode causar interferência a sistemas operando em caráter primário."
Australia and New Zealand regulatory compliance	 NINA-W151, NINA-W152 and NINA-W156 modules are compliant with the standards made by the Australian Communications and Media Authority (ACMA).
South Africa regulatory compliance	 TA-2021/3334 APPROVED
Bluetooth Declaration ID D062365	

Trademarks:

- Bluetooth® is a registered trademark of Bluetooth SIG, Inc. worldwide.
- Wi-Fi® is a registered trademark of the Wi-Fi Alliance.
- All other trademarks and copyrights are the property of their respective owners.

NOTES

NOTES

NOTES

NOTES