Metal Work EB80Up
MANUALE D'USO

Metal Work EB80Up
USER MANUAL

IT   EN

L'App "Metal Work EB80Up" consente il collegamento via Bluetooth, da smartphone Android® e iOS®, alle isole di valvole Metal Work della serie EB 80, dotati di interfaccia wireless.

Tramite "Metal Work EB80Up" è possibile visualizzare tutti i dati diagnostici ed impostare i parametri di connessione ad una rete Wi-Fi.

Scarica qui la versione per iOS

Scarica qui la versione per Android

1. INSTALLAZIONE

1.1 DISPOSITIVI ANDROID
Scaricare l'App da Play Store ed installarla sullo smartphone.
La versione minima supportata è Android 6.0 Marshmallow.
Per la comunicazione con EB 80 wireless, il dispositivo necessita di Bluetooth LE.

1.2 DISPOSITIVI IOS
Scaricare l'app da Apple Store ed installarla sullo smartphone.
La versione minima supportata è IOS 11.
Per la comunicazione con EB 80 wireless, il dispositivo necessita di Bluetooth LE.

2. APPLICAZIONE

### 2.1 INTRODUZIONE
L'App permette di:
- scansionare i dispositivi EB 80 nelle vicinanze;
- connettersi e visualizzare i dati diagnostici del dispositivo;
- azzerare il numero di cicli valvole;
- azzerare il numero di cicli degli attuatori virtuali.
- impostare i parametri della rete Wireless.

2.2 UTILIZZO

Avviare l'App, al primo avvio effettuare la scansione dei dispositivi, successivamente ad ogni avvio l'App tenterà di ricollegarsi all'ultimo dispositivo connesso.
Se il dispositivo è disponibile, in caso di errore, è necessario premere il pulsante **Riprova** per riprovare a collegarsi.
Per effettuare una nuova scansione, aprire il menù in alto a sinistra e selezionare **Dispositivi**, verranno visualizzati tutti i dispositivi che sono stati precedentemente associati.
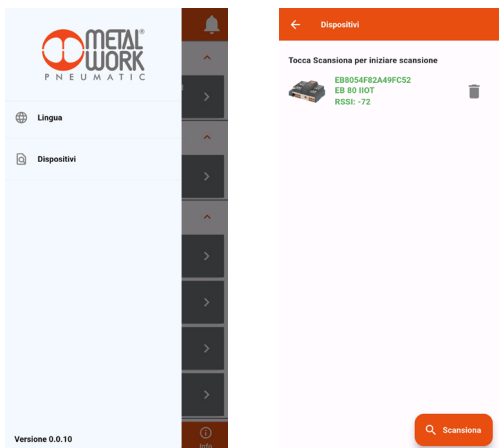
Premere sul pulsante **Scansione** per avviare la ricerca di nuovi dispositivi.
I dispositivi rilevati saranno visualizzati in verde.
Il valore RSSI indica l'intensità del segnale.

RSSI	Qualità segnale
Fino a -67	Ottimo
Tra -67 a -70	Buono
Tra -70 a -75	Debole
Oltre a -75	Molto debole

Premere sul dispositivo per effettuare la connessione.
Per rimuovere dall'elenco i dispositivi non collegati premere sull'icona **Cestino**.

2.3 DASHBOARD

Nella pagina **Impianto** vengono visualizzati tutti i moduli che compongono l'isola, tutti i parametri configurati e gli eventuali allarmi presenti.

La barra superiore visualizza il nome del dispositivo a cui si è collegati.
La barra inferiore visualizza il menu delle funzioni.

2.4 STATS

Mostra tutti i dati diagnostici delle valvole installate.
La scheda "Attuale" mostra i dati diagnostici relativi alla valvola selezionata in uso.
La scheda "Storico" mostra i dati diagnostici di ogni posizione, accumulati ad ogni reset effettuato quando si sostituisce la valvola.

2.5 ATTUATORI

Visualizza i tempi di attivazione e attuazione del circuito pneumatico controllato, composto da valvola, attuatore e sensori.
La funzione deve essere attivata e parametrizzata nella configurazione PLC.

Descrizione	Valore
Ritardo attivazione (ms)	95
Durata corsa andata (ms)	434
Ritardo ripristino (ms)	189
Durata corsa ritorno (ms)	704
Contatore corse	249
Id Pilota 1	3
Id Pilota 2	4
Id input fine corsa 1	3
Id input fine corsa 2	4
Ritardo attivazione max (ms)	100
Tolleranza ritardo attivazione (%)	30
Ritardo ripristino max (ms)	100
Tolleranza ripristino (%)	30
Durata corsa andata max (ms)	500
Tolleranza tempo attuazione (%)	20
Tempo ritorno max (ms)	500
Tolleranza tempo ritorno (%)	20

Attuatore #1

EB 80 IIOT

Impianto Stats Attuatori Setup Info

2.6 SETUP

Nella pagina **Setup** è possibile effettuare il reset dei dati diagnostici di ogni singola valvola e di ogni Cilindro virtuale.
Impostare i parametri per la connessione Wireless.
Impostare la password di accesso.

Per attivare le modifiche è necessario salvarle prima di uscire dalla pagina.

Nel caso di smarrimento della password contattare Metal Work, per ottenere un codice di sblocco.
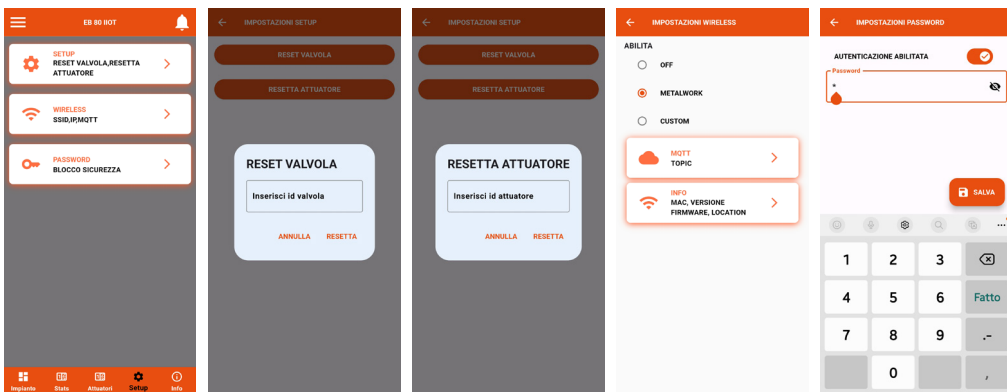
2.6.1 PASSWORD

La pagina Password consente di impostare un codice di sblocco a tre cifre.
Quando l'autenticazione è abilitata, il codice di sblocco è necessario per accedere al menù Setup.
Nel caso di smarrimento della password contattare Metal Work, per ottenere un codice di sblocco.
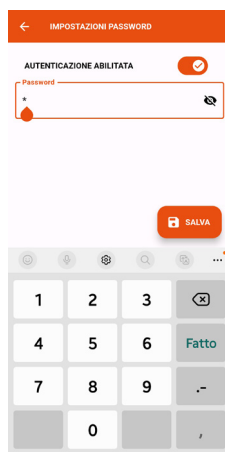
2.6.2 WIRELESS
Consente di impostare i parametri di connessione alla rete wireless:
- Abilita con selezione del server.
  Per il server METALWORK i parametri sono già impostati.
  Per il server Custom è necessaria l'impostazione dei seguenti parametri: SSID
  IP address
  MQTT
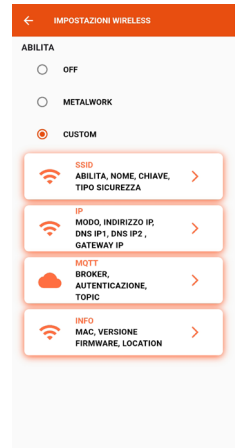
2.6.2.1 SSID
- Nome: inserire il nome della rete alla quale collegarsi
- Cliccando sull'icona a destra del campo Name si visualizzano le reti disponibili.
- Tipo di sicurezza: selezionare se la rete è protetta oppure aperta
- Chiave: impostare la password di rete
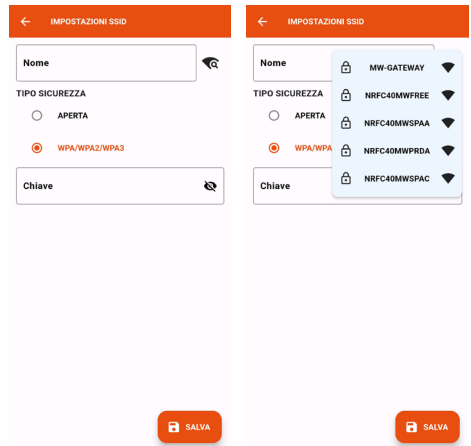
2.6.4.2 IP
- **DHCP**: l'indirizzo IP viene assegnato dal server DHCP
- **STATICO**: l'indirizzo IP viene assegnato permanentemente

Indirizzo IP, impostare l'indirizzo IP del dispositivo nella stessa classe di rete del Gateway di collegamento.

Indirizzo, impostare la maschera in funzione dell'intervallo di indirizzi IP all'interno della sottorete.

IP DNS 1 e 2, impostare l'indirizzo del server DNS, visibile nelle proprietà della rete Wi-Fi in uso.
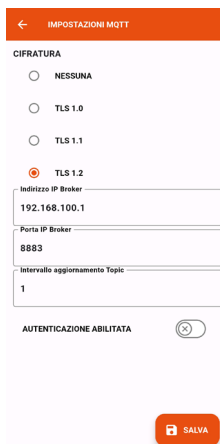
2.6.4.3 MQTT
Consente di impostare i parametri per il collegamento ad un Broker MQTT
- Tipo di crittografia utilizzata
- Indirizzo IP del Broker
- Porta Utilizzata dal Broker – 8883
- Intervallo di aggiornamento
- Abilitazione dell'autenticazione

2.6.4.4 INFO (pagina Setup)
- **MAC WIR**: MAC address per il protocollo Wireless
- **MAC BLU**: MAC address per la connessione via EB80Up
- **SW VER**: versione software del software di comunicazione radio
- **Locazione**: impostare il nome del dispositivo, sono consentiti 11 caratteri.

2.7 INFO
La pagina Info visualizza le informazioni del dispositivo:
- lo stato della rete;
- i parametri della rete: Location, SSID, RSSI, MAC, Maschera indirizzo IP, GATEWAY, DNS1, DNS2;
- la versione del firmware;
- il numero seriale;
- il numero di accensioni dell'isola;
- il numero di allarmi.

Inoltre, in caso di presenza di più unità, è possibile Identificare l'isola EB 80 connessa usando il pulsante **Identifica**: in questo modo Wireless effettuerà un lampeggio del led verde PWR per 5 secondi.

Il modulo Wireless di EB 80 consente la connessione ad una rete Wi-Fi, tramite un Access point oppure un Gateway, per monitorare i dati diagnostici del sistema.

STRUTTURA DEL COLLEGAMENTO CON GATEWAY METAL WORK

Il Gateway Metal Work si occupa della raccolta dati, della formattazione e dell'analisi, presentandoli in una pagina Web visualizzabile tramite browser. I dati sono residenti e archiviati nel Gateway, quindi sempre visualizzabili da qualsiasi utente accreditato.

MQTT   **WEB APP**

GATEWAY
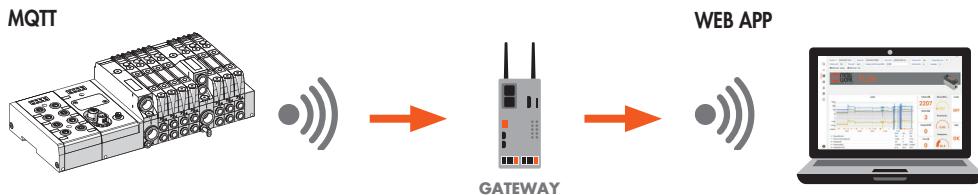
STRUTTURA DEL COLLEGAMENTO TRAMITE UN ACCESS POINT AD UN BROKER MQTT

MQTT   **Broker MQTT**

In entrambi i casi la raccolta dei dati dal campo consente di effettuare una diagnosi predittiva dell'impianto; mantenendo sempre sotto controllo i parametri operativi ottimizzando il funzionamento delle macchine e dell'impianto pneumatico.

Il software può essere implementato con funzioni di analisi che consentono il controllo dell'efficienza macchine.

CARATTERISTICHE DELLA CONNESSIONE WIRELESS

Gateway
SSID_SECURITY nessuna o WPA/WPA2/WPA3
SSID_NAME max 31 caratteri
SSID_KEY max 62 caratteri
IP statico / dhcp

Broker MQTT
ENCRYPTION nessuna, TLS 1.0, 1.1, 1.2 (require_certificate = false)
BROKER IP ADDRESS
BROKER IP PORT 1883,8883
Autenticazione utente (opzionale):
AUTH_NAME max 8 caratteri
AUTH_KEY max 8 caratteri

Struttura dei dati in formato MQTT (struttura pacchetti dati JSON)
TOPIC: MW-EB80/MAC_ADDRESS/DATA

Si utilizza il formato big endian (MSB first).
Ad es., per un campo numerico su 2 byte, si ha:
• 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: comunication 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: comunication 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: comunication 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: comunication 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: comunication 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: comunication 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: comunication 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 lenght: 58

1.8 Alarms master (a3)
bt: board type (1)
bn: board number (1)
c: comunication 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 lenght: 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 lenght: 81

1.10 Alarms of web module (a0)
bt: board type (14)
bn: board number (1)
c: comunication 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 31

IT

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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 141

Note:
- **ie/oe** sono una percentuale, dove il Fondo Scala 100% = 30.000.000 cicli per modulo pneumatico e 100% = 60.000.000 cicli per valvola proporzionale;
- **ic/oc/ia/io/pc/fs/bs** possono anche superare i 99.999.999, ma su MQTT vanno limitati a tale valore;
- **wt** può anche superare i 99.999, ma su MQTT va limitato a tale valore.

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 lenght: 66

5.   Info WEB (i)

i: object of type info
sn: serial number
sv: sw version
wv: wireless version
l : location

Example: {"i":{"sn":99999,"sv":"01.00","wv":"4.0.0-006","l":"---"}}

Maximum lenght: 8

Questo dispositivo contiene:
FCC ID: **XPYNINAW106**
IC: **8595A-NINAW106**

Il modulo serie NINA-W15 è certificato nei seguenti Paesi/regioni:
• Europe (RED)
• USA (FCC)
• Canada (IC)
• Japan (MIC)
• Taiwan (NCC)
• South Korea (KCC)
• Brazil (ANATEL)
• Australia and New Zeeland (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	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	ICASA TA-2021/3334 APPROVED
Bluetooth Declaration ID D062365	®

Marchi commerciali:
• Bluetooth® è un marchio commerciale registrato in tutto il mondo di Bluetooth SIG, Inc.
• Wi-Fi® é un marchio commerciale registrato di Wi-Fi Alliance.
• Tutti gli altri marchi e copyright sono proprietà dei rispettivi proprietari.

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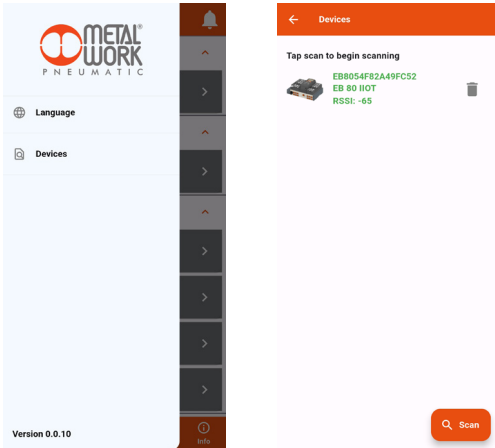
Press the **Scan** button to start searching for new devices.
The devices recognised will be displayed in green.
The RSSI value indicates the signal strength.

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.

Screen 1 – EB 80 IIOT

Master		^
1.1	02282E0PN - EB 80 Profinet I/O Ver: 03.46 NETX90	>
Valve bases		^
2.1	02282B4_8 - Base for valves 8 controls Ver: 10.03	>
Digital Inputs		^
3.1	02282S01 - 8 M8 Digital Inputs Ver: 05.01	>
3.2	02282S06- 16 Digital terminal block Inputs Ver: 04.01	>
3.3	02282S01 - 8 M8 Digital Inputs Ver: 05.01	>
3.4	02282S01 - 8 M8 Digital Inputs Ver: 05.02	>

Plant   Stats   Actuators   Setup   Info

Screen 2 – DETAILS BOARD

1.1 02282E0CC- EB 80 CC-Link IE Field Basic

Errors   Parameters

Description	Value
Fail safe output	Outputs reset
System start with	Stored Parameter
Visualization of analogue input	INTEL(LSB - MSB)
Analog input data format	Sign+15bit
I4.0 enabling	Disabled
Valves data refresh time(ms)	1000
Actuators data refresh time(ms)	100

Screen 3 – EB 80 IIOT

	Ver: 04.03	
Analog Input		^
5.1	02282S04 - 4 M8 Analog Inputs Ver: 04.04	>
5.2	02282S04 - 4 M8 Analog Inputs Ver: 04.04	>
Analog Output		^
6.1	02282S05 - 4 M8 Analog Outputs Ver: 04.00	>
Pressure Regulator		^
8.1	02282S09 - Pressure regulator Ver: 02.07	>
Wireless		^
14.1	Wireless module Ver: 00.07	>

Plant   Stats   Actuators   Setup   Info

Screen 4 – DETAILS BOARD

2.1 02282B4_8 - Base for valves 8 controls

Errors   Parameters

Code(hex)	Description
20	Valve faulty: P2 (12) open circuit

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.

Screen 5 – EB 80 IIOT

Actual   Historical

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	
Valve #2		v
Valve #3		v
Valve #4		v
Valve #5		v

Plant   Stats   Actuators   Setup   Info

Screen 6 – EB 80 IIOT

Actual   Historical

Valve #1		^
Description	**Value**	
P1 (14) SC alarms	1	
P1 (14) OC alarms	0	
P1 (14) Number of Cycles	1633297	
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	
Valve #2		v
Valve #3		v
Valve #4		v
Valve #5		v

Plant   Stats   Actuators   Setup   Info

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.

| 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

2.6 SETUP

On the **Setup** page, resetting the diagnostic data of each individual valve and virtual cylinder is possible.
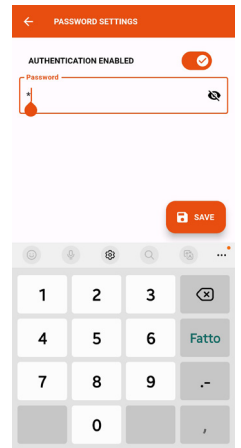Set the parameters for the Wireless connection.
Set the login password.

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.
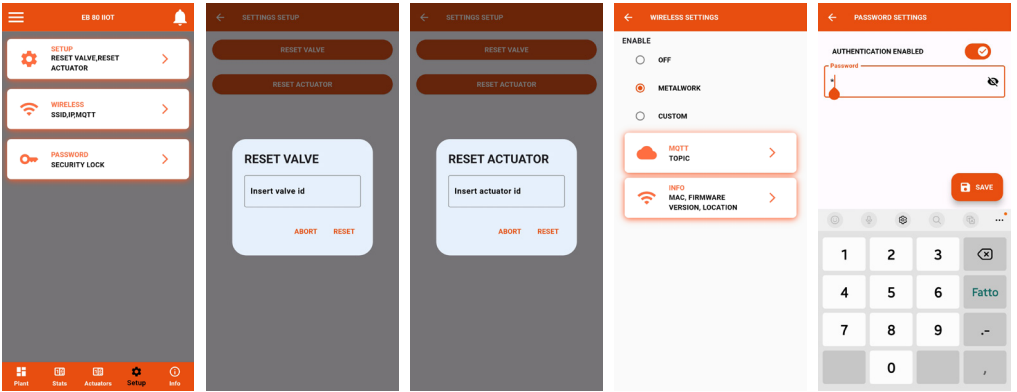
2.6.1 PASSWORD

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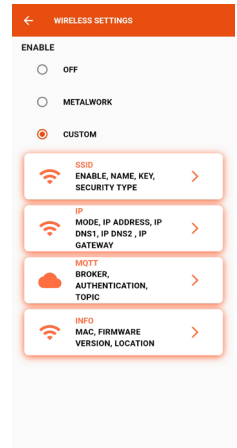If you forget the password, contact Metal Work to obtain a password reset code.

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
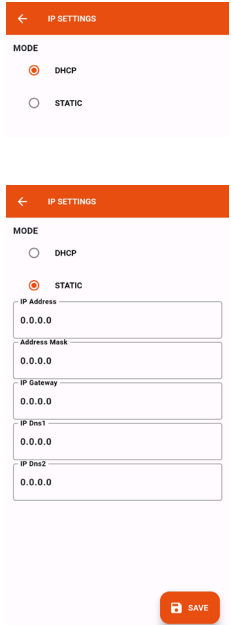IP address
MQTT

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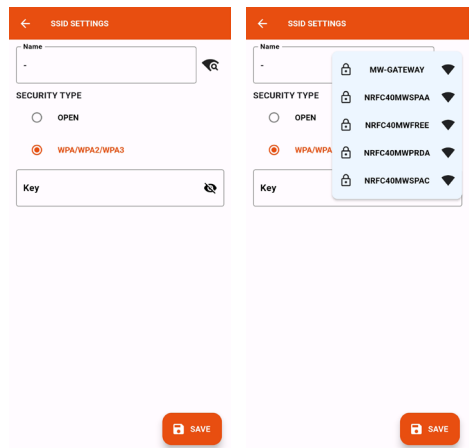
2.6.4.2 IP
- **DHCP**: the IP address is assigned by the DHCP server
- **STATIC**: the IP address is assigned permanently

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.

2.7 INFO
The info page displays device information:
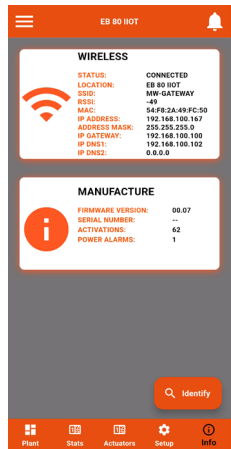- network status, network;
- network parameters: Location, SSID, RSSI, MAC, Mask, IP, GATEWAY, DNS1, DNS2;
- firmware version;
- serial number;
- system startup counter;
- supply alert counter.

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.

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.

MQTT   **WEB APP**

GATEWAY
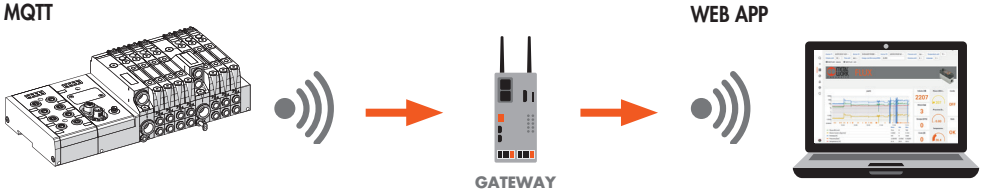
CONNECTION TO A MQTT BROKER VIA AN ACCESS POINT

MQTT   **Broker MQTT**

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: comunication 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: comunication 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: comunication 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: comunication 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: comunication 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: comunication 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: comunication 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 lenght: 58

1.8 Alarms master (a3)
bt: board type (1)
bn: board number (1)
c: comunication 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 lenght: 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 lenght: 81

1.10 Alarms of web module (a0)
bt: board type (14)
bn: board number (1)
c: comunication 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 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 lenght: 66

5. Info WEB (i)

i: object of type info
sn: serial number
sv: sw version
wv: wireless version
l : location

Example: {"i":{"sn":99999,"sv":"01.00","wv":"4.0.0-006","l":"---"}}

Maximum lenght: 8

![Metal Work Pneumatic logo]

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 Zeeland (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 内含發射器模組:: **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	**I·C·A·S·A** TA-2021/3334 APPROVED
Bluetooth Declaration ID D062365	(Bluetooth logo)

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