

EMN

RF

BROADCAST AND SAMPLING INTERVAL

REPROGRAMMING

PROCEDURE



SITUATION DESCRIPTION

The Broadcast interval is the minimal time between two data streams be sent from the sensor. By default, EMN module sends a packet every **20 seconds** (this is EMN broadcast interval value by default). As 3 packets are required to update all Modbus registers, you then get information refreshed every minute.

Now, in case of large network or network with bottleneck, if this interval time is too short, wireless network will get flooded and some data packets won't get to the gateway, especially when information from EMN must be often repeated by Mesh nodes.

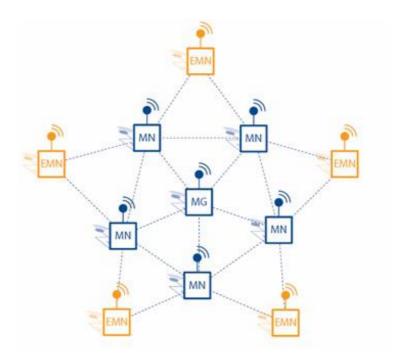
Correct broadcast interval, in seconds, can be calculated using following formula, **available in worst case situation**:

Min Interval (sec) = $2 \times MN + EN$

MN : Amount of Mesh Nodes modules EMN: Amount of End Nodes modules (EMN, Wi-Pulse, ...)

This parameter, Broadcast interval, is saved in EEPROM.

In a suitable environment, as a Star Mesh Network Topology as shown below, with MeshGate in the center, this result can be divided by two.





Examples:

1) Dense (32 EMN, 10 MN) with a single path between MG and one MeshNode (some part of the network is linear): we do have a bottleneck on the unique MeshNode in direct access to the MeshGate !

Min interval = 2x10 + 32 = 52 so we fix to 60 seconds.

2) Dense (40 EMN, 16 MN) but with best topology: Mesh Gate in the center with different Mesh nodes in direct access, no bottleneck.

 $SI = (2x16 + 40) / 2 = 36 \dots$ so we can fix to 40 seconds

The End Node sub-module from Millenial has its own interval time, called Sampling interval, which is the maximum period for heartbeat to be sent, if no data streams, in order to declare the device is still online.

This value must be higher than the Broadcast Interval.

By default, for EMN device, it is set to 30 seconds. This is the value reported in Interval row by MeshScape Network Monitor.

If this value must also be increased, take care it is written in RAM only, so needs to be written again in case of shutdown. The best solution is to have the application periodically overwriting the value, as it is also accessible through a Modbus register.

REPROGRAMMING PROCEDURE

The calculated minimum broadcast interval value, specific to each EMN is part of the internal firmware and can be modified by a Modbus register (#297): take care this is protected by password (register #298) for EMN firmware version up to V1.2. Such protection has been removed in release V1.2. The software version is written on each EMN module (front label) and can be read back in register #50.

Remind:

Available Modbus commands are:

- Write Multiple registers (function code 0x10)
- Read Holding registers (function code 0x3).

They must be sent with Modbus Slave addresses corresponding to the EMN ID.

You must modify this setting for each EMN installed in the Mesh network.

- 1) If required, set password to '0x1234' (decimal value 4660) in register #298. Wait until this value has been updated (read same register)
- 2) Set Broadcast interval time value in register #297 (0x3c = 60 sec). Wait until this value has been updated (same register).
- 3) Set Sampling Interval value in tenth of seconds (900 or 0x384 for 90s) in register #349. Read back this value in register #222.



This last parameter is also reported in Interval row by MeshScape Network Monitor and can be updated by double-clicking on it, but don't forget it is saved in RAM so no permanent in case of power down !

Altitude Web Based Configuration - Microsoft Internet Explorer MeshScape Network Monitor Monitor Edit Log Network Window Utilities Help MeshGate Device Counts Off End nodes Mesh nodes Com Port Version Total ID Channel Frequency Group 4.7.3 15 15 31 COM1 11 2.405Ghz 180.247 111.111 Last Msg Interval RX Packets Up/Dow ... Hop Count First Hop Last Hop Volt(V) ADC 0-3 Device ID Туре Status 9.38 EN online 15 s 90s 142 53 m 4 241.229 242.232 3.34 ::: 10.57 EN online 54 s 90s 190 141 m 5 241.244 241.241 3.32 ::: 9.158 EN $17 \le$ 90s 248 242.232 242.232 online 73 m 2 3.33 9,181 48 s 179 142 m 2 242,224 EN 90s 242.224 3.33 online ::: 9.194 online 90s 143 m 5 241.244 241.241 3.33 EN 24 s 183 ::: 3 10.43 EN online 37 5 90s 190 142 m 241.241 3.33 241.240 111 10.47 EN online 22 s 90s 187 140 m 5 241.244 241.241 3.34 ::: 10.72 EN online 27 s 90s 176 142 m 2 242.225 242.225 3.34 10,102 EN online 18 s 90s 260 80 m 4 241.229 242.232 3.35 ::: 2 10.134 EN online 38 s 90s 127 103 m 242.221 242.221 3.32 ::: FN online 175 141 m 2 10.137 40 s 90s 242.225 242,225 3.33 ::: 10.138 online 90s 19 m 2 242.230 242.230 3.33 EN 35 71 111 3 EN online 90s 143 m 10.147 145 462 242.222 242,232 3.32 111 10.149 EN online 10 s 90s 173 142 m 2 241.241 241.241 3.33 ::: 10.159 offline 139 m 90s 10.177 EN online 35 466 143 m 4 241.242 241.241 3.34 111 240.236 MNEN online 77 s 300s 29 141 m 2 242.225 242.225 3.27 0.01::: MNEN 29 2 241.241 241.241 240.239 online 292 s 300s 139 m 3.30 0.30:::: 241.229 online 300s 80 m 3 242.222 250.80 2.83::: MNEN 123 s 26 3.29 267 s 300s 139 m 2 241.241 241.241 241.240 **MNEN** online 29 3.29 100 241.241 **MNEN** online 254 s 300s 29 139 m 1 3.30 0.10::: online 191 s 300s 138 m 3 240.239 241.241 241.242 **MNEN** 29 3.32 0.27::: 241.244 **MNEN** online 4 s 300s 30 140 m 4 241.242 241.241 3.32 0.34::: 242.221 **MNEN** online 35 300s 56 142 m 3.30 2.85::: 1 250.80 242.222 **MNEN** online 158 s 300s 42 139 m 2 250,80 3.29 2.85::: online 125 m 242.224 MNEN 44 s 300s 44 1 3.30 2.86::: online 149 s 300s 48 139 m 3.29 2.84::: 242.225 **MNEN** 1 242.230 MNEN online 111 s 300s 47 143 m 1 3.32 2.85::: 242.224 242.224 **MNEN** online 240 s 300s 32 105 m 2 3.33 2.86:::: 242.231 242.232 **MNEN** online 209 s 300s 47 142 m 1 3.29 2.83::: 250.80 **MNEN** online 45 s 300s 30 140 m 3.27 1 111 < Applet graph started A Altitude Man... A 😂 📴 🐨 MeshScape ... Altitude 🛃 start 🍖 Altitude Mod. . 🛅 2 Windows ...