# BRMO 80 / MB-TCP

## User Manual

Réf : **MU-BRMO 80-MB-TCP-1.4-EN**

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## About this document

After a short presentation of the BRMO 80 family products, this document explains how to use a BRMO 80 / MB-TCP (Modbus-TCP version).

## Document History

1.0 : first draft
1.1 : add annexes
1.2 : modify mode order
1.3 : add address information
1.4 : change product reference with new Ethernet connector (4 pins D coded M12)

## Glossary

CRC : Cyclical Redundancy Check
EAS : Electronic Article Surveillance
RTU : Remote Terminal Unit

## Important User Information

Information in this document is not binding.
BALOGH Company reserves the right to modify our product in line with our policy of continuous product development.
BALOGH Company will not be responsible of possible consequences or errors due to worst use of the product. The use of this device must ensure that all the necessary steps have been taken to verify that the application meets all performance and safety requirements.



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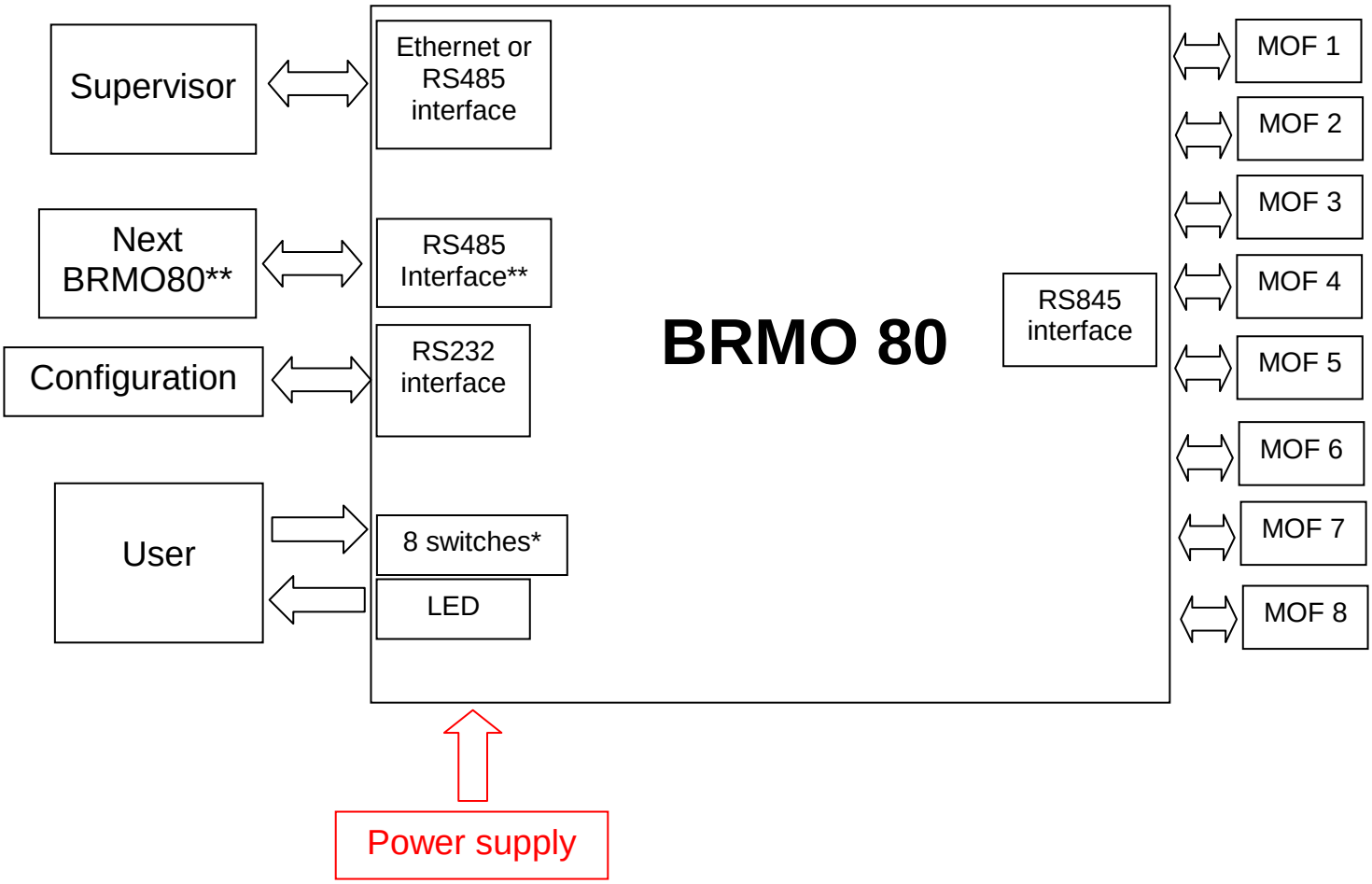
# 1 ABOUT THE BRMO 80 FAMILY

The BRMO 80 products are divided into 2 field bus applications:

1. Ethernet with Modbus-TCP and EthernetIP protocols
2. RS485 with Modbus RTU protocol

These 2 products offer high performance to dialog with multiple Balogh RFID readers (MOF).
Automatic identifications are ensured by these products.
The figure below illustrates the basic properties of the BRMO 80:




**Switches are only present on Ethernet version (IP addressing)*
***this interface to chain BRMO 80 is only available on RS485 version*

Supervisor: an automate application that sends commands and consults responses
Configuration: an RS232 host (PC with RS232) that read/change configuration and read traces
User: user that changes switches (IP address) and watch led
MOFs: RFID readers dialog with TAGs
Next BRMO 80: only in RS485 product, possibility to chain BRMO80 devices

The rest of the document gives the presentation for the Ethernet Modbus-TCP version.



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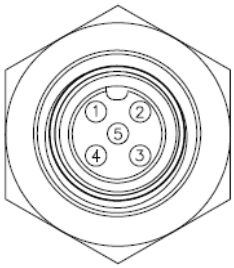
# 2 CONNECTION

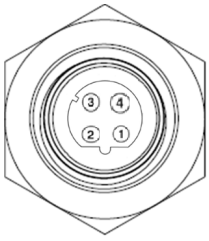
Connectors are based on M12 standard:


8 connectors M12 5 pins female for the 8 readers

| Pin | RS485 |
|---|---|
| 1 | + 24V |
| 2 | A |
| 3 | B |
| 4 et 5 | 0V |



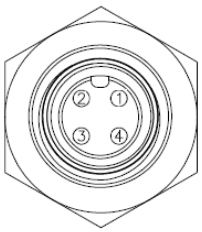
Connector M12 4 pins female **D coded** for Ethernet



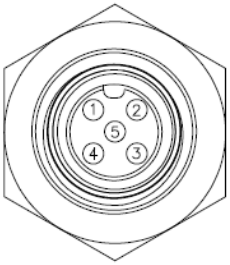
| Pin | Ethernet |
|---|---|
| 1 | TD+ |
| 2 | RD+ |
| 3 | TD- |
| 4 | RD- |

Connector M12 4 pins male for power supply

| Pin | RS232 |
|---|---|
| 1 | + 24V |
| 2 | nc |
| 3 | nc |
| 4 | 0V |



Connector M12 5 pins female for configuration



| Pin | RS232 |
|---|---|
| 1 | nc |
| 2 | Rx |
| 3 | Tx |
| 4 | 0V |
| 5 | nc |

**LED**

**8 switches (IP address)**



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# 3 INTERFACES

## 3.1 POWER SUPPLY

This interface uses a M12 4 pins male connector to power the BRMO 80.

It is required to use a regulated 24 VDC on pin 1 and the GND on pin 4.

The maximum power consumption may vary with number of readers connected.

The next table presents the typical and maximum consumption for a BRMO 80 product, a MOF932 reader and MOF100 reader:

| Consumption (mA) product | Typical | Maximal |
|---|---|---|
| **BRMO 80** | 68 | 120 |
| **MOF932** | 105 | 120 |
| **MOF100** | 93 | 100 |

A BRMO 80 can drive from 2 to 8 FRID MOF readers. The next table presents the prevision of consumption in the 4 configurations:

| Consumption (mA) Product | Typical | Maximal |
|---|---|---|
| **BRMO 80 with 2 MOF932** | 278 | 360 |
| **BRMO 80 with 8 MOF932** | 908 | 1080 |
| **BRMO 80 with 2 MOF100** | 254 | 320 |
| **BRMO 80 with 8 MOF100** | 812 | 920 |

During initialization, peaks of current occurs that's why a 1,5 A power supply is recommended.

## 3.2 ETHERNET

Ethernet uses a M12 4 pins D coded female connector to be interface with the supervisor.
A standard 10/100 Mbps link can be used.

The Ethernet IP address can be configured by switches (default address is 192.168.0.x) for the last digit (see 4.3 chapter to configure all LAN parameters).

The used protocol is **Modbus/TCP** where all requests are sent via TCP on registered **port 502**.

BRMO 80 / MB-TCP responds to all Modbus/TCP "unit identifier" (slave address) number.
Differentiation between BRMO 80 products are only done with their IP address.
Read/write multiple register Modbus/TCP commands (0x03 and 0x10) are supported, please consult chapter 5 to manage Modbus/TCP commands.



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## 3.3 CONFIGURATION

Configuration port is a M12 5 pins female connector.
The communication uses a standard RS232 link configured:

- at 9600 bauds
- with 8 bits data
- no parity
- 1 stop bit.

## 3.4 MOF READERS

MOF RFID readers are connected via a M12 5 pins female connector.
The communication uses a standard RS485 link configured:

- at 57600 bauds
- with 8 bits data
- no parity
- 1 stop bit.

As reader dialogues with Modbus RTU protocol, each MOF reader must have a unique slave number from 1 to 8 (at maximum).
If only 5 readers were configured and installed, they must take slave numbers from 1 to 5.



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# 4 CONFIGURATION OF BRMO 80 / MB-TCP

To configure the device, user must ensure that the BRMO 80 is powered (led is green) and connected to a PC with a serial port com.

The entire configuration can be done with a Terminal.

## 4.1 HYPERTERMINAL CONNECTION

Launch HyperTerminal application in: Start->Programms->Accessory->Communication
Once the right port com selected, configure the parameters like that:




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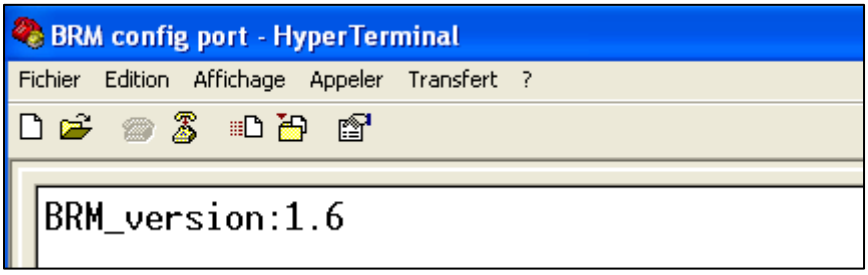
## 4.2 DIALOG COMMANDS

2 commands can be used to dialog with the product:

- send “v” to ask the firmware version




In this example the version is 1.6.

- send “r” to have the current configuration of the BRMO 80

```
BALOGH BRM080-Ethernet v1.6 configuration :
-------------------------------------------
NETWORK PARAMETERS
    IP addr on LAN : 192.168.0.4
    LAN subnet mask : 255.255.255.0
    Network gateway addr : 0.0.0.0
    Device MAC addr : 00-30-11-04-44-B6
    IP addr configured with switch : on
READER PARAMETERS
    Reader number : 2
    BRM080 mode : 1
    Auto size read : 8
    Auto high block addr read : 0x20
    Auto low block addr read  : 0x00
SERVICING PARAMETER
    Output traces : off
```

All these parameters are explained in the next chapter.



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## 4.3 CONFIGURATION PARAMETERS

Network parameters

- **IP address** : give the current IP address on the LAN Ethernet
- **Subnet mask** : give the current subnet mask
- **Gateway address** : give the current gateway address
- **Device MAC address** : give the product MAC address (cannot be changed)
- **IP addr configured with switch** : with this parameters user can enable/disable switches use to configure last digit of IP address

MOF Reader parameters

- **Reader number**: give the number of MOF RFID reader that can be used on the BRMO 80. This reader number must be between 2 and 8.
- **BRMO 80 mode** : give the current mode used by the BRMO 80 (see chapter 6 to used BRMO 80 modes). The number must be from 0 to 2.
- **Auto size read** : this size is given in byte and it is only used when BRMO 80 is configured in an auto mode. This parameter cannot be changed.
- **Auto high block addr read**
- **Auto low block addr read** : these 2 parameters cannot be dissociate and give the current address where the auto size read returns automatically data (explanations are given in chapter 6)

Servicing parameter

- **Output traces** : with this parameters user can enable/disable traces use to debug or trace activity in BRMO 80. This traces can be interpreted only with a specific Balogh tool.

To change configuration a specific text file must be sent with the Terminal to the BRMO 80.

The format of this file cannot be change, only value can be updated.
This format is:

---

IP addr on LAN : 192.168.0.144
LAN subnet mask : 255.255.255.0
Network gateway addr : 0.0.0.0
IP addr configured with switch : on
Reader number : 8
BRMO80 mode : 2
Auto high block addr read : 0xFF
Auto low block addr read : 0xFF
Output traces : off

---



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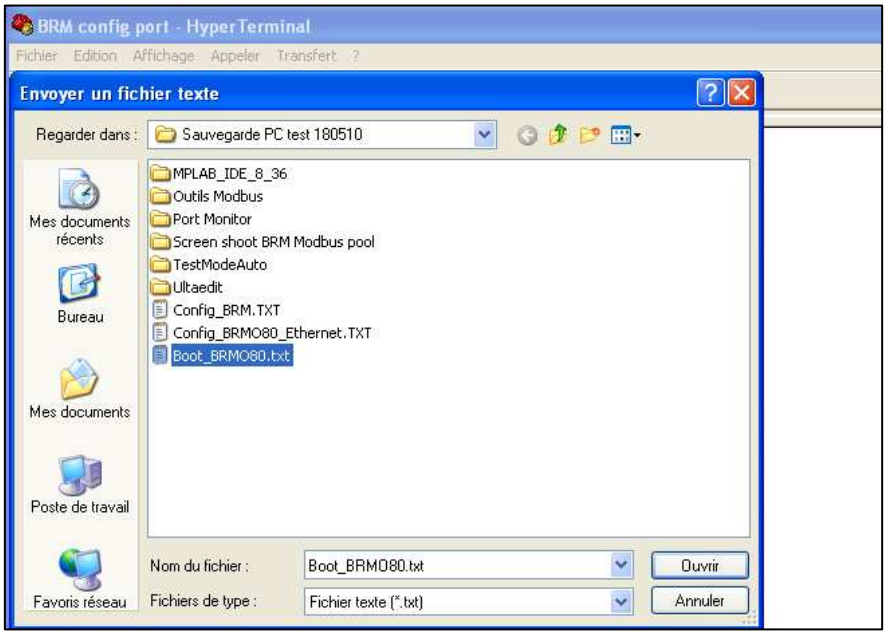
## 4.4 CHANGE CONFIGURATION

To send the configuration text file to the BRMO 80, HyperTerminal can be used.
In “Transfer->Send text file” menu choose the configuration file like in this example:




In this example the configuration is the one in the precedent chapter.

Once the file is sent the led must blind during 5 seconds in orange and the BRMO 80 restarts.
To ensure that the configuration is received, a message must be display on Terminal:

```
Correct configuration => please wait until BRM restarts !
```

A simple read command can confirm that the new configuration is taken into account:

```
BALOGH BRMO80-Ethernet v1.6 configuration :
-------------------------------------------
NETWORK PARAMETERS
    IP addr on LAN : 192.168.0.4
    LAN subnet mask : 255.255.255.0
    Network gateway addr : 0.0.0.0
    Device MAC addr : 00-30-11-04-44-B6
    IP addr configured with switch : on
READER PARAMETERS
    Reader number : 8
    BRMO80 mode : 2
    Auto size read : 8
    Auto high block addr read : 0x20
    Auto low block addr read  : 0x00
SERVICING PARAMETER
    Output traces : off
```



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Make attention with IP address because in the example in previous page, the last digit sent in IP address is 144.Here when user read the actual configuration the read IP address is 4. This is due to switch and parameter to activate switches.
In fact here the switches are activated that why the IP address set is the one by switches (see the parameters IP addr configured with switch).



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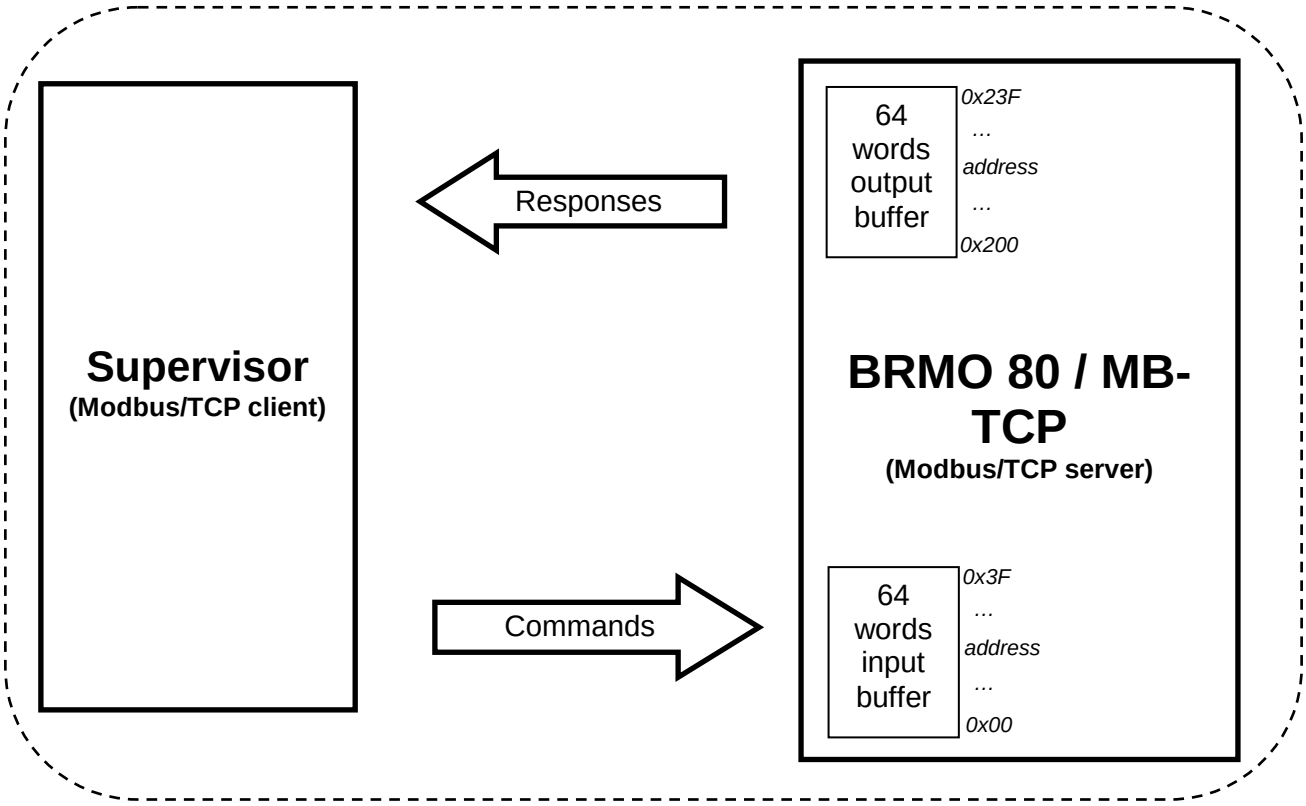
# 5 IO BUFFER ORGANISATION AND MODBUS/TCP COMMANDS

For each data direction between the supervisor and the BRMO 80 / MB-TCP, a 128 data bytes buffer length is used.

In fact each time the supervisor would send a command, this command is written into the BRMO 80 input buffer. The response will be written by the BRMO 80 in his output buffer.

As the supervisor is the client Modbus/TCP, it is his responsibility to access BRMO 80 input and output buffers.

In Modbus/TCP the protocol can exchange only word that why the IO data size in input and output are 64 words (1 word = 2 bytes).




All requests are sent via TCP on registered **port 502**.

BRMO 80 / MB-TCP responds to all Modbus/TCP “unit identifier” (slave address) number. Differentiation between BRMO 80 products are only done with their IP address.

BRMO 80 / MB-TCP **input buffer** is addressed at **[0x0 ; 0x03F]** and **output buffer** at **[0x200 ; 0x23F]** *(output buffer may be also accessible at [0;0x3F] thanks to 0x04 Modbus read function)*.

These **Modbus/TCP function codes** are used to access input and output BRMO 80 / MB-TCP buffer:

- **0x03 : read multiple registers to consult the 64 words output buffer**
- **0x10 : write multiple registers to write data into the 64 words input buffer**
- **0x0D : I/O scanning (write and read in each frame)**



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# 6 MODES

BRMO 80 has 3 different modes:

- 0 : transparent
- 1 : full master
- 2 : full master with command

Transparent mode is the only mode non automatic.
In fact in mode 1 and 2 the data are in a specific format explained in next chapter.

Transparent mode : supervisor can send read/write commands to each reader through BRMO 80

Full master mode : the BRMO 80 presents (sends) the entire automatic data table when a new activity is detected on a reader

Full master with command mode : the BRMO 80 switches between the full master mode and the transparent mode when read/write commands are initiate by the supervisor



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## 6.1 AUTO DATA MAPPING

Each of the auto mode presents all or a part of this table (each case corresponded a byte):

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Reader number 1 | 0 | Read number LSB | Read number MSB | **Status byte 0** | **Status byte 1** | Byte 0 Sector or UID | Byte 1 Sector or UID | Byte 2 Sector or UID | Byte 3 Sector or UID | Byte 4 Sector or UID | Byte 5 Sector or UID | Byte 6 Sector or UID | Byte 7 Sector or UID |
| Reader number 2 | 0 | Read number LSB | Read number MSB | **Status byte 0** | **Status byte 1** | Byte 0 Sector or UID | Byte 1 Sector or UID | Byte 2 Sector or UID | Byte 3 Sector or UID | Byte 4 Sector or UID | Byte 5 Sector or UID | Byte 6 Sector or UID | Byte 7 Sector or UID |
| Reader number 3 | 0 | Read number LSB | Read number MSB | **Status byte 0** | **Status byte 1** | Byte 0 Sector or UID | Byte 1 Sector or UID | Byte 2 Sector or UID | Byte 3 Sector or UID | Byte 4 Sector or UID | Byte 5 Sector or UID | Byte 6 Sector or UID | Byte 7 Sector or UID |
| Reader number 4 | 0 | Read number LSB | Read number MSB | **Status byte 0** | **Status byte 1** | Byte 0 Sector or UID | Byte 1 Sector or UID | Byte 2 Sector or UID | Byte 3 Sector or UID | Byte 4 Sector or UID | Byte 5 Sector or UID | Byte 6 Sector or UID | Byte 7 Sector or UID |
| Reader number 5 | 0 | Read number LSB | Read number MSB | **Status byte 0** | **Status byte 1** | Byte 0 Sector or UID | Byte 1 Sector or UID | Byte 2 Sector or UID | Byte 3 Sector or UID | Byte 4 Sector or UID | Byte 5 Sector or UID | Byte 6 Sector or UID | Byte 7 Sector or UID |
| Reader number 6 | 0 | Read number LSB | Read number MSB | **Status byte 0** | **Status byte 1** | Byte 0 Sector or UID | Byte 1 Sector or UID | Byte 2 Sector or UID | Byte 3 Sector or UID | Byte 4 Sector or UID | Byte 5 Sector or UID | Byte 6 Sector or UID | Byte 7 Sector or UID |
| Reader number 7 | 0 | Read number LSB | Read number MSB | **Status byte 0** | **Status byte 1** | Byte 0 Sector or UID | Byte 1 Sector or UID | Byte 2 Sector or UID | Byte 3 Sector or UID | Byte 4 Sector or UID | Byte 5 Sector or UID | Byte 6 Sector or UID | Byte 7 Sector or UID |
| Reader number 8 | 0 | Read number LSB | Read number MSB | **Status byte 0** | **Status byte 1** | Byte 0 Sector or UID | Byte 1 Sector or UID | Byte 2 Sector or UID | Byte 3 Sector or UID | Byte 4 Sector or UID | Byte 5 Sector or UID | Byte 6 Sector or UID | Byte 7 Sector or UID |

In fact each MOF reader has one line in this table. The size of the table depends of the reader number configured.

For each MOF reader, the information saved in this table is:

- The reader number
- A null byte use for padding
- 2 bytes that give the number of read applies in this reader
- 2 bytes that give the status of the reader (See reader technical notice)
- 8 bytes of data automatically read when a TAG is present in front of a MOF reader

The 8 data bytes automatically retrieved can be:

- 8 memory bytes in the TAG with the data base address composed with the parameters “Auto high block addr read” and “Auto low block addr read” (see configuration parameters of the BRMO 80).
- the UID(unique identifier) of the TAG. The specific address 0x2000 is interpreted by the BRMO 80 as UID automatic data read.

Each time a TAG is present in front of a MOF reader, the read number is increased and the data is read.



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## 6.2 TRANSPARENT MODE

In this mode the Supervisor can read/write directly a MOF reader.

In fact in the MOF readers network connected to BRMO 80, each reader has a unique slave number (see protocol protocol Modbus RTU and chapter 3.4).

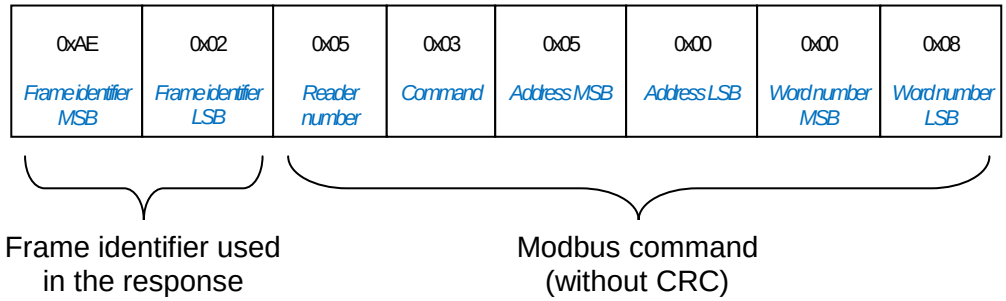
**To read/write, the supervisor must use Standard Modbus RTU (using without CRC bytes) commands. These commands are sent at the 0x0000 address into the BRMO 80 / MB-TCP input buffer.**

A frame identifier in 2 bytes is used at the beginning of the command.

The same identifier is sent into the response to differentiate frames.

For example this is 2 commands below, the first is a read:

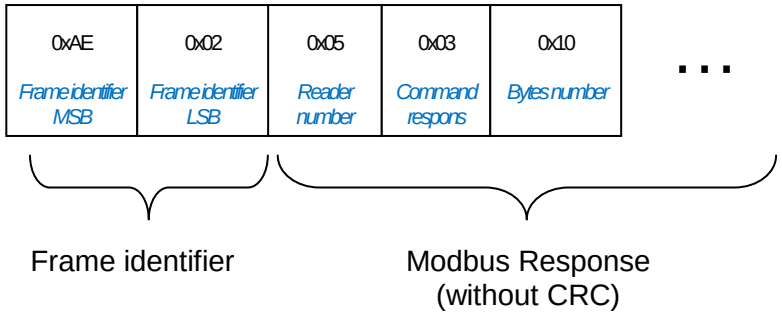
**Read**:




*This frame number 0xAE02 (44546) is a read command on the reader 5 at the address 0x500 and for 8 words long.*

For response, if a TAG is presented in front of the reader 5, a correct response (see exemple below) could be transferred, and if no TAG is presented a wrong response will be sent.

**Response**:




Here is a correct response to the read command where data are not represented.

**Request responses to read/write commands are written into the BRMO 80 / MB-TCP output buffer at the 0x200 address.**
**As BRMO 80 / MB-TCP is a Modbus/TCP server, it is the client responsibility to retrieve data.**



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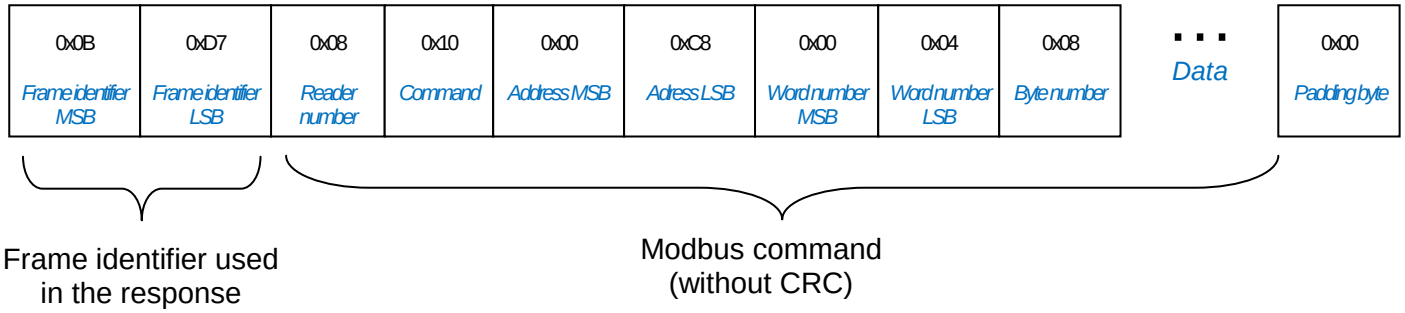
**Write example command**:

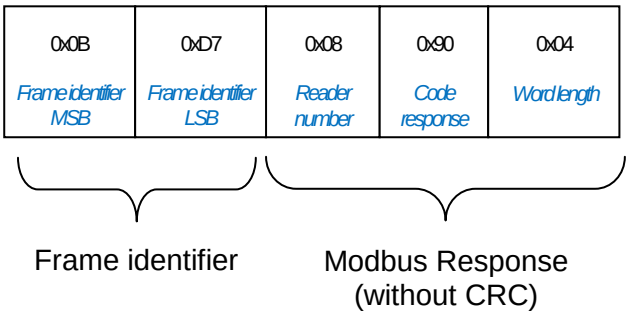



*This frame number 0xBD7 (3031) is a write command on reader number 8 at the address 0xC8 for 4 words long (here the 4 data words are not represented).*
As standard Modbus RTU command, the Modbus/TCP is based on data word long (2 bytes). That's why the last byte (null value) is a padding one. It is not interpreted in the command but it is necessary to have when an even number of bytes must be transferred.

In response to a write command the result (positive or not) will be sent into the BRMO 80 / MB-TCP output buffer at the 0x200 address.

For example, the write command response could be:

**Response** :




**In this mode, exchange data length could be 112 bytes length at maximum (56 words).**

Read and write examples with the Modbus/TCP server "Modbus Poll" are provided in annexes 2 and 3.



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## 6.3 FULL MASTER MODE

In this mode, BRMO 80 / MB-TCP writes the full automatic data table (112 bytes length) each time a new activity has been detected on a MOF reader. Each time a TAG arrives in the field of a MOF reader or every time a TAG leaves the field of a MOF reader, the full table is presented into the BRMO80 / MB-TCP output buffer at the 0x200 address.

In this case none command can be answer by the supervisor. But it only consults the BRMO 80 / MB-TCP output buffer to get the actual state of the automatic reader table.

An example is given in annex 4.

## 6.4 FULL MASTER MODE WITH COMMAND

This is the default mode when BRMO 80 / MB-TCP first starts after production.

This mode presents the entire automatic reader table each time a new activity is detected in front of a reader. This behavior is similar to “full master” mode, but in this mode supervisor can send read/write command like in “transparent” mode.

To differentiate automatic reader table and result of read/write commands, a frame identifier is added at the beginning of the automatic reader table, these 2 bytes (1 word) are 0xFF and 0xFF.
See annex 5 to have an example.

By default in this mode, the “full master” functioning is applied (automatic reader data table presented).

When a new read/write command is sent by the supervisor (see chapter 6.2 for command format) to the BRMO 80, the transparent mode is the active mode. In this case the automatic reader table is not presented to the BRMO output buffer.

To retrieve again automatic reader table (full master mode), the supervisor must send a specific read command (to leave “transparent” mode).
This specific command is a read command sent to the reader 1 in 0xFFFF address where the length is not taken into account.

In response BRMO 80 / MB-TCP returns the automatic reader table and leave “transparent” mode.

For example this read command can be:

| 0xF0 | 0x52 | 0x01 | 0x03 | 0xFF | 0xFF | 0x00 | 0x02 |
|---|---|---|---|---|---|---|---|
| *Frame identifier MSB* | *Frame identifier LSB* | *Reader number* | *Command* | *Address MSB* | *Address LSB* | *Word number MSB* | *Word number LSB* |



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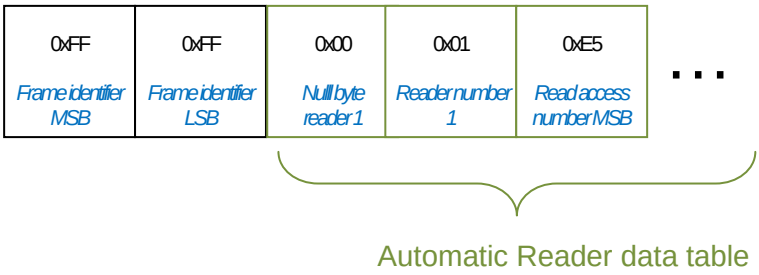
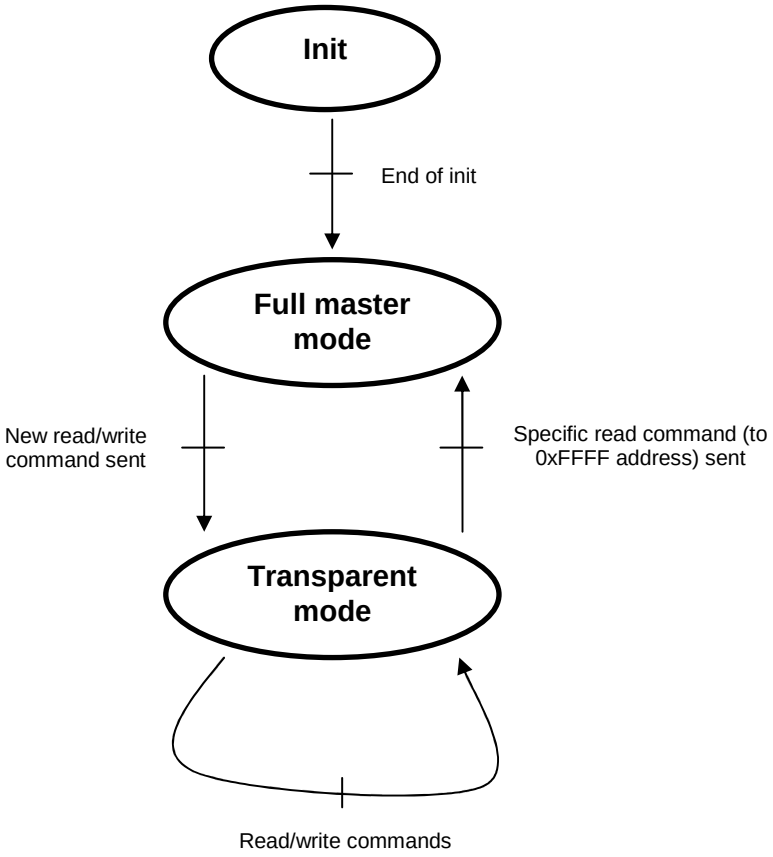
The answer is provided in BRMO 80 output buffer at address 0x200:




An example of this specific read command sent with Modbus Poll is given in annex 6.

This state machine presents the management of the 2 modes mixed:



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# 7 ANNEXE

## 7.1 ANNEX 1: ASCII TABLE

| décimal | octal | hexadécimal | caractère | décimal | octal | hexadécimal | caractère |
|---|---|---|---|---|---|---|---|
| 0 | 00 | 0 | NUL | 64 | 100 | 40 | @ |
| 1 | 001 | 01 | SOH | 65 | 101 | 41 | A |
| 2 | 002 | 02 | STX | 66 | 102 | 42 | B |
| 3 | 003 | 03 | ETX | 67 | 103 | 43 | C |
| 4 | 004 | 04 | EOT | 68 | 104 | 44 | D |
| 5 | 005 | 05 | ENQ | 69 | 105 | 45 | E |
| 6 | 006 | 06 | ACK | 70 | 106 | 46 | F |
| 7 | 007 | 07 | BEL | 71 | 107 | 47 | G |
| 8 | 010 | 08 | BS | 72 | 110 | 48 | H |
| 9 | 011 | 09 | HT | 73 | 111 | 49 | I |
| 10 | 012 | 0A | LF | 74 | 112 | 4A | J |
| 11 | 013 | 0B | VT | 75 | 113 | 4B | K |
| 12 | 014 | 0C | FF | 76 | 114 | 4C | L |
| 13 | 015 | 0D | CR | 77 | 115 | 4D | M |
| 14 | 016 | 0E | SOH | 78 | 116 | 4E | N |
| 15 | 017 | 0F | SI | 79 | 117 | 4F | O |
| 16 | 020 | 10 | DLE | 80 | 120 | 50 | P |
| 17 | 021 | 11 | DC1 | 81 | 121 | 51 | Q |
| 18 | 022 | 12 | DC2 | 82 | 122 | 52 | R |
| 19 | 023 | 13 | DC3 | 83 | 123 | 53 | S |
| 20 | 024 | 14 | DC4 | 84 | 124 | 54 | T |
| 21 | 025 | 15 | NAK | 85 | 125 | 55 | U |
| 22 | 026 | 16 | SYN | 86 | 126 | 56 | V |
| 23 | 027 | 17 | ETB | 87 | 127 | 57 | W |
| 24 | 030 | 18 | CAN | 88 | 130 | 58 | X |
| 25 | 031 | 19 | EM | 89 | 131 | 59 | Y |
| 26 | 032 | 1A | SUB | 90 | 132 | 5A | Z |
| 27 | 033 | 1B | ESC | 91 | 133 | 5B | [ |
| 28 | 034 | 1C | FS | 92 | 134 | 5C | \ |
| 29 | 035 | 1D | GS | 93 | 135 | 5D | ] |
| 30 | 036 | 1E | RS | 94 | 136 | 5E | ^ |
| 31 | 037 | 1F | US | 95 | 137 | 5F | _ |
| 32 | 040 | 20 | SP | 96 | 140 | 60 | ` |
| 33 | 041 | 21 | ! | 97 | 141 | 61 | a |
| 34 | 042 | 22 | " | 98 | 142 | 62 | b |
| 35 | 043 | 23 | # | 99 | 143 | 63 | c |
| 36 | 044 | 24 | $ | 100 | 144 | 64 | d |
| 37 | 045 | 25 | % | 101 | 145 | 65 | e |
| 38 | 046 | 26 | & | 102 | 146 | 66 | f |
| 39 | 047 | 27 |  | 103 | 147 | 67 | g |
| 40 | 050 | 28 | ( | 104 | 150 | 68 | h |
| 41 | 051 | 29 | ) | 105 | 151 | 69 | i |
| 42 | 052 | 2A | * | 106 | 152 | 6A | j |
| 43 | 053 | 2B | + | 107 | 153 | 6B | k |
| 44 | 054 | 2C | , | 108 | 154 | 6C | l |
| 45 | 055 | 2D | - | 109 | 155 | 6D | m |
| 46 | 056 | 2E | . | 110 | 156 | 6E | n |
| 47 | 057 | 2F | / | 111 | 157 | 6F | o |
| 48 | 060 | 30 | 0 | 112 | 160 | 70 | p |
| 49 | 061 | 31 | 1 | 113 | 161 | 71 | q |
| 50 | 062 | 32 | 2 | 114 | 162 | 72 | r |
| 51 | 063 | 33 | 3 | 115 | 163 | 73 | s |
| 52 | 064 | 34 | 4 | 116 | 164 | 74 | t |
| 53 | 065 | 35 | 5 | 117 | 165 | 75 | u |
| 54 | 066 | 36 | 6 | 118 | 166 | 76 | v |
| 55 | 067 | 37 | 7 | 119 | 167 | 77 | w |
| 56 | 070 | 38 | 8 | 120 | 170 | 78 | x |
| 57 | 071 | 39 | 9 | 121 | 171 | 79 | y |
| 58 | 072 | 3A | : | 122 | 172 | 7A | z |
| 59 | 073 | 3B | ; | 123 | 173 | 7B | { |
| 60 | 074 | 3C | < | 124 | 174 | 7C | \| |
| 61 | 075 | 3D | = | 125 | 175 | 7D | } |
| 62 | 076 | 3E | > | 126 | 176 | 7E | ~ |
| 63 | 077 | 3F | ? | 127 | 177 | 7F | DEL |



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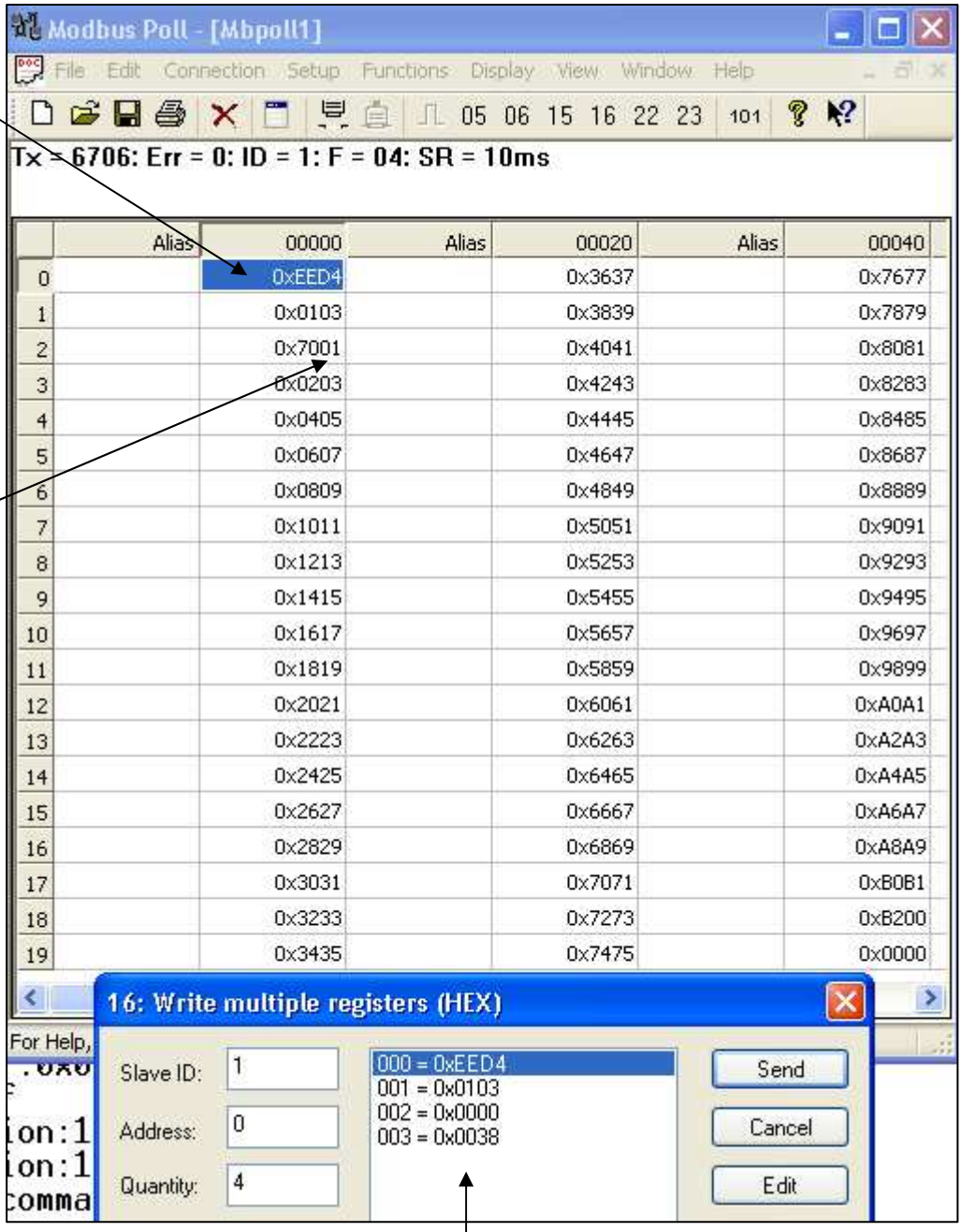
## 7.2 ANNEX 2: 112 BYTES READ COMMAND WITH MODBUS POLL

Read request (identifier 0xEED4) in 0x0000 on the reader number 1 has responded (the beginning data is at address 0x02) in BRMO 80 / MB-TCP transparent mode.

*Response frame identifier*

*Correct response from reader 1, read response (0x03) of 112 bytes (0x70). Data bytes are 0x01, 0x02, 0x03 …*




*Read request number 0xEED4 on reader number 1 for 56 data words long (0x38)*



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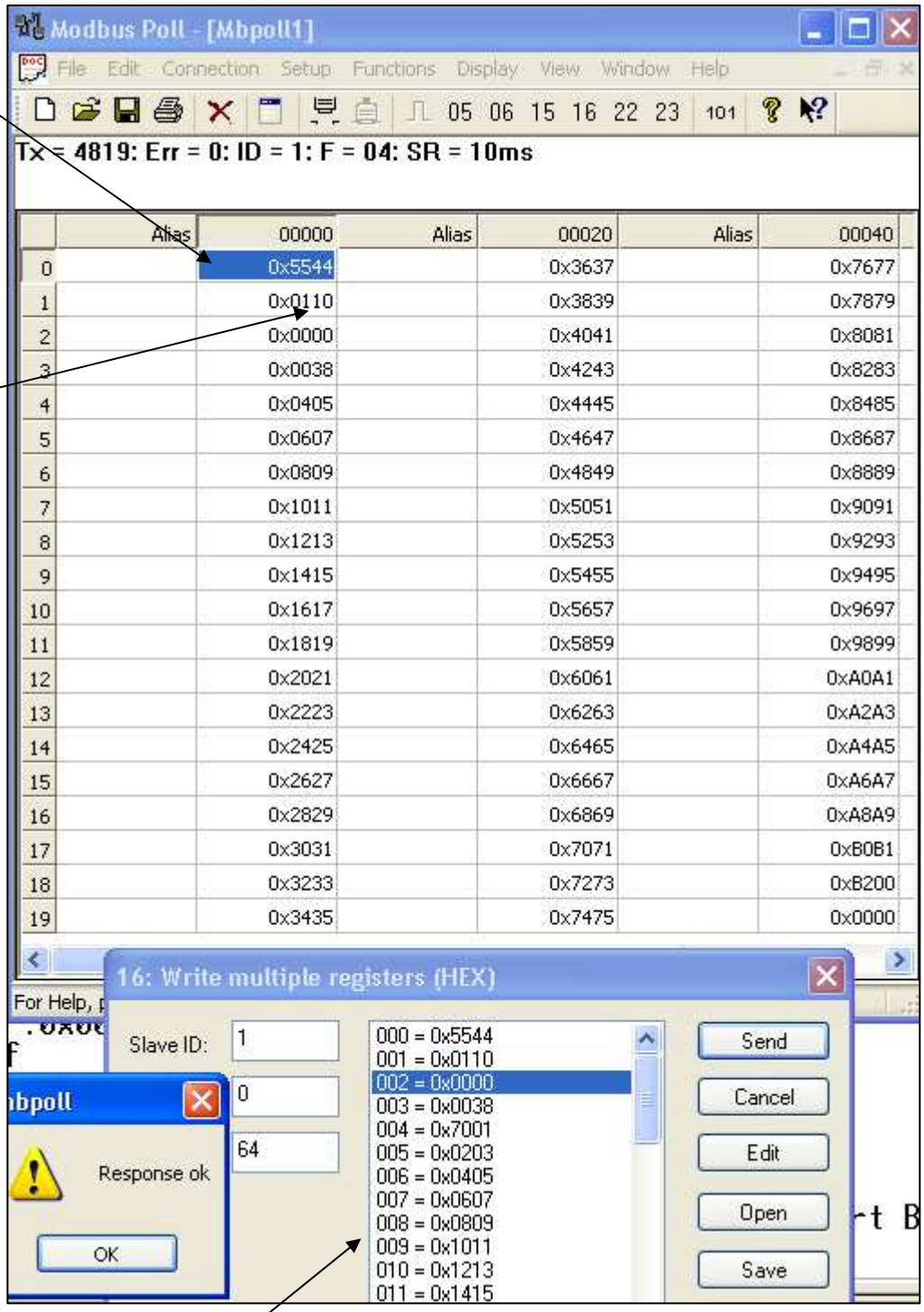
## 7.3 ANNEX 3: 112 BYTES WRITE COMMAND WITH MODBUS POLL

Write request (identifier 0x5544) in 0x0000 on the reader number 1 has responded in BRMO 80 / MB-TCP transparent mode.

*Response frame identifier*

*Correct response on reader 1, write command response (0x10) of 56 words (0x38)*




*Write request number 0x5544 on reader 1 of 56 data words long (0x38) with data 0x01, 0x02 …*



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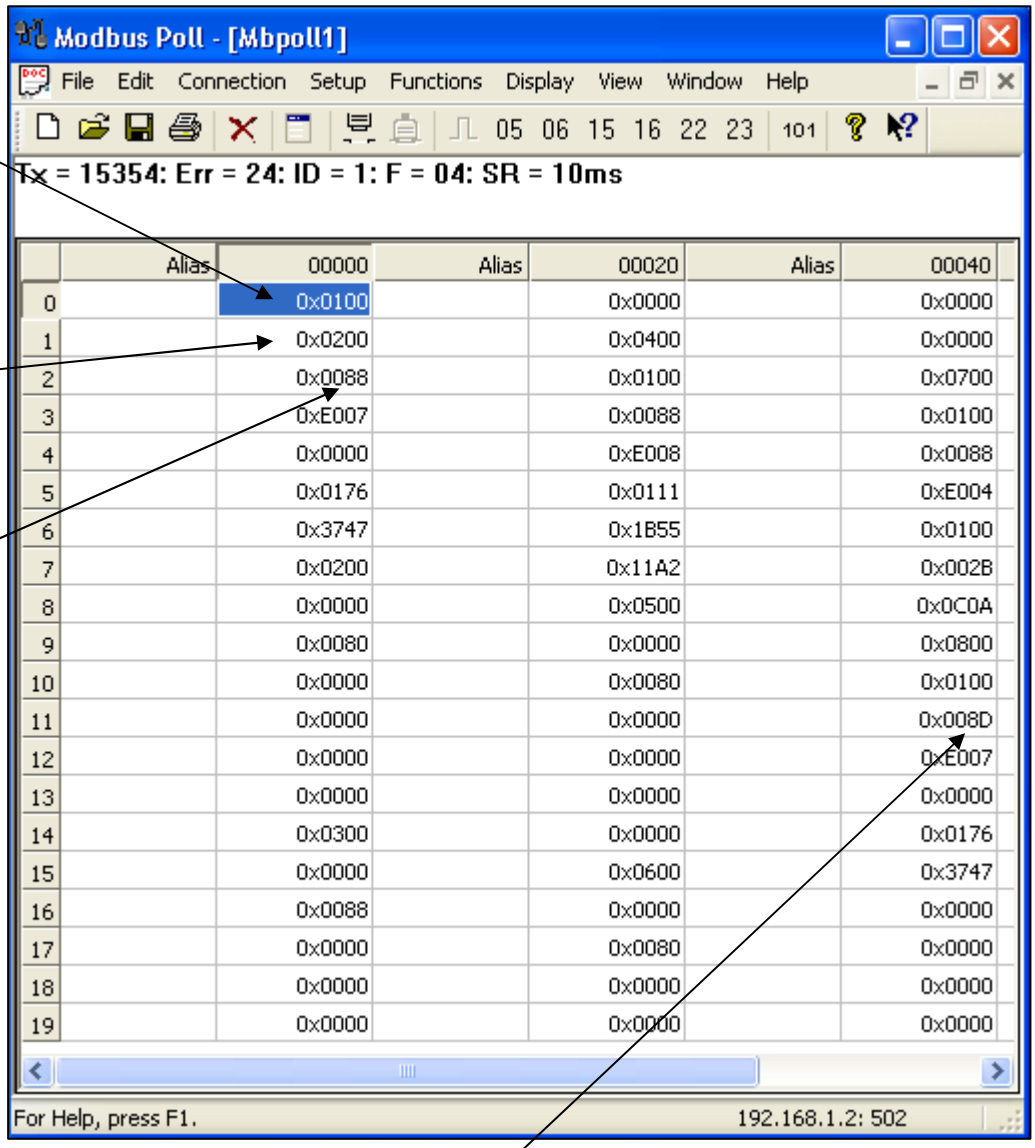
## 7.4 ANNEX 4: READER TABLE ACCESS IN FULL MASTER MODE WITH MODBUS POLL

Full table access in full master mode.

*Directly automatic data bytes without identifier because none command are needed.*

*On this reader 1 there were 2 TAG reads*

*The status 0x88 signifies that there is no TAG present in front of the reader 1. Follow the 8 UID bytes of the last TAG accessed.*




| | Alias | 00000 | Alias | 00020 | Alias | 00040 |
|---|---|---|---|---|---|---|
| 0 | | 0x0100 | | 0x0000 | | 0x0000 |
| 1 | | 0x0200 | | 0x0400 | | 0x0000 |
| 2 | | 0x0088 | | 0x0100 | | 0x0700 |
| 3 | | 0xE007 | | 0x0088 | | 0x0100 |
| 4 | | 0x0000 | | 0xE008 | | 0x0088 |
| 5 | | 0x0176 | | 0x0111 | | 0xE004 |
| 6 | | 0x3747 | | 0x1B55 | | 0x0100 |
| 7 | | 0x0200 | | 0x11A2 | | 0x002B |
| 8 | | 0x0000 | | 0x0500 | | 0x0C0A |
| 9 | | 0x0080 | | 0x0000 | | 0x0800 |
| 10 | | 0x0000 | | 0x0080 | | 0x0100 |
| 11 | | 0x0000 | | 0x0000 | | 0x008D |
| 12 | | 0x0000 | | 0x0000 | | 0xE007 |
| 13 | | 0x0000 | | 0x0000 | | 0x0000 |
| 14 | | 0x0300 | | 0x0000 | | 0x0176 |
| 15 | | 0x0000 | | 0x0600 | | 0x3747 |
| 16 | | 0x0088 | | 0x0000 | | 0x0000 |
| 17 | | 0x0000 | | 0x0080 | | 0x0000 |
| 18 | | 0x0000 | | 0x0000 | | 0x0000 |
| 19 | | 0x0000 | | 0x0000 | | 0x0000 |

*The status 0x8D signifies that there is a TAG present in front of the reader 8. Follow the 8 UID bytes of the actual TAG.*

Note that no command is needed to have automatic reader table.



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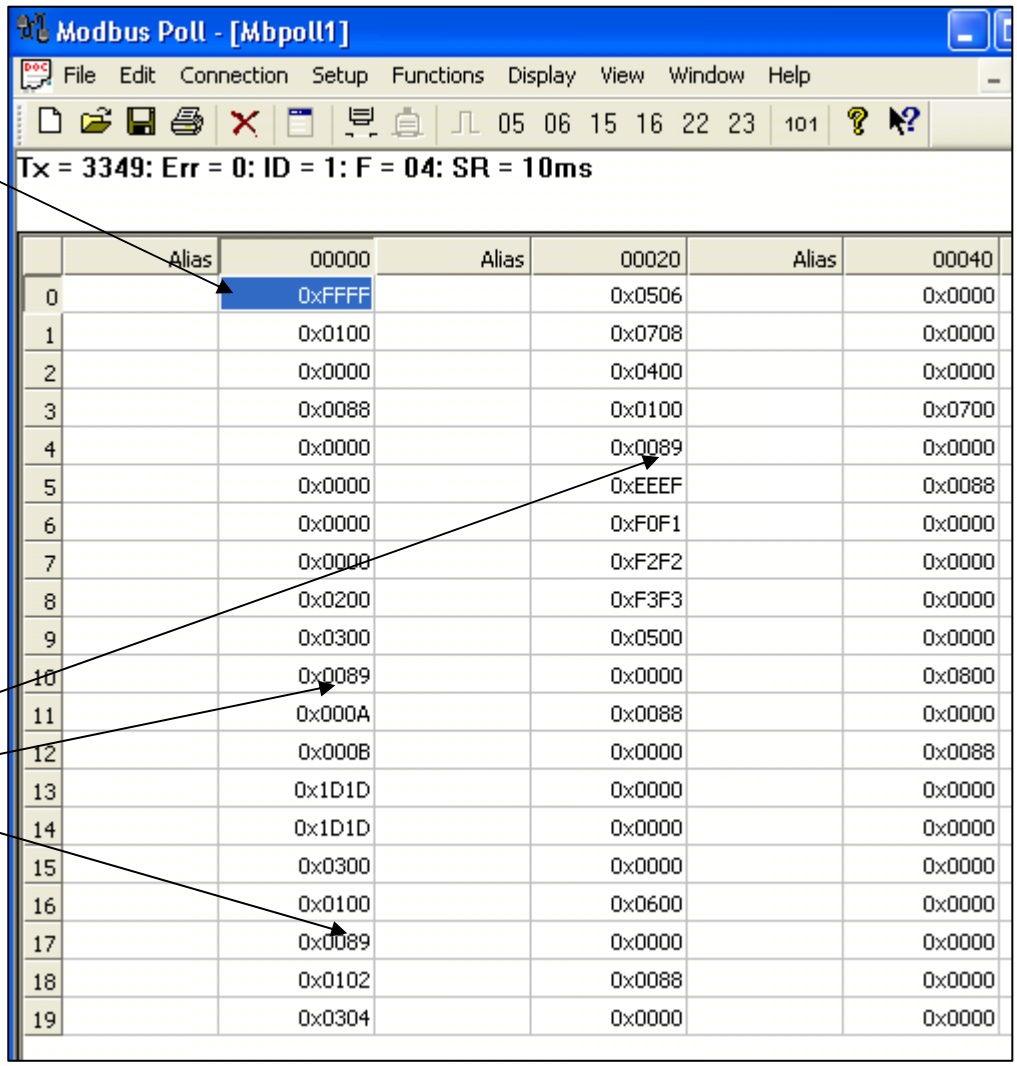
## 7.5 ANNEX 5: AUTOMATIC READER TABLE IN FULL MASTER MODE WITH COMMAND (WITH MODBUS POLL)

All automatic reader information in the table:

*Specific frame identifier in this mode for the automatic reader data table*

*With the status 0x89, supervisor has the information that TAGs are presented in front of readers 2, 3 and 4*




| | Alias | 00000 | Alias | 00020 | Alias | 00040 |
|---|---|---|---|---|---|---|
| 0 | | 0xFFFF | | 0x0506 | | 0x0000 |
| 1 | | 0x0100 | | 0x0708 | | 0x0000 |
| 2 | | 0x0000 | | 0x0400 | | 0x0000 |
| 3 | | 0x0088 | | 0x0100 | | 0x0700 |
| 4 | | 0x0000 | | 0x0089 | | 0x0000 |
| 5 | | 0x0000 | | 0xEEEF | | 0x0088 |
| 6 | | 0x0000 | | 0xF0F1 | | 0x0000 |
| 7 | | 0x0000 | | 0xF2F2 | | 0x0000 |
| 8 | | 0x0200 | | 0xF3F3 | | 0x0000 |
| 9 | | 0x0300 | | 0x0500 | | 0x0000 |
| 10 | | 0x0089 | | 0x0000 | | 0x0800 |
| 11 | | 0x000A | | 0x0088 | | 0x0000 |
| 12 | | 0x000B | | 0x0000 | | 0x0088 |
| 13 | | 0x1D1D | | 0x0000 | | 0x0000 |
| 14 | | 0x1D1D | | 0x0000 | | 0x0000 |
| 15 | | 0x0300 | | 0x0000 | | 0x0000 |
| 16 | | 0x0100 | | 0x0600 | | 0x0000 |
| 17 | | 0x0089 | | 0x0000 | | 0x0000 |
| 18 | | 0x0102 | | 0x0088 | | 0x0000 |
| 19 | | 0x0304 | | 0x0000 | | 0x0000 |



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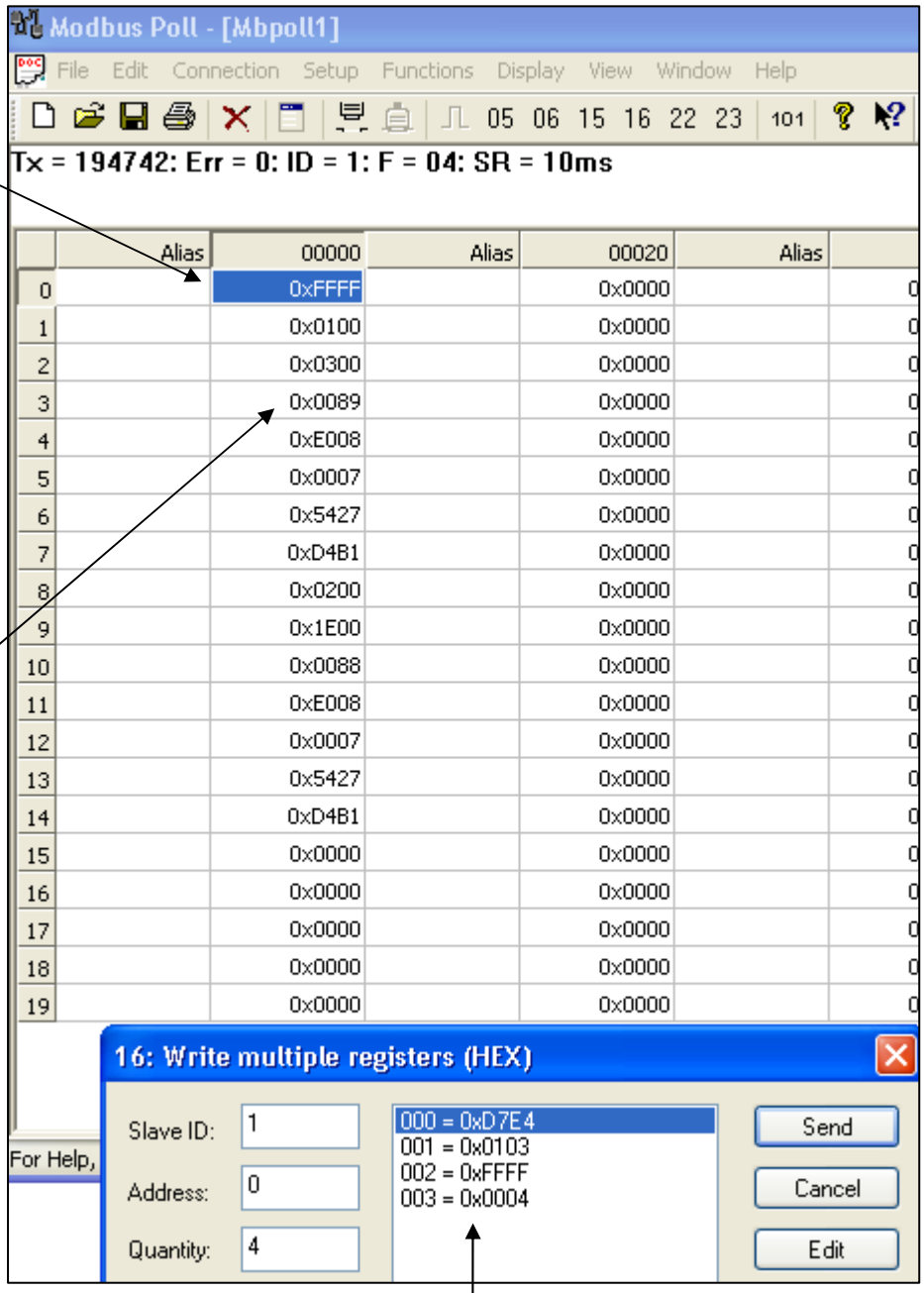
## 7.6 ANNEX 6: SPECIFIC READ COMMAND IN FULL MASTER MODE WITH COMMAND (WITH MODBUS POLL)

To leave the “transparent” behavior in this mode, the specific read command must be sent:

*0xFFFF is the frame identifier in the response.*

*With the status 0x89, supervisor has the information that a TAG is presented in front of reader 1*




*Read command number 0xD7E4 on reader number 1 of 4 words to the 0xFFFF.*
***The important parameters are the reader number at 1 and the address accessed 0xFFFF.***



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