

# MBD-62

## Ethernet Protocol Specifications

Rev 1.0 - July, 14th - 2024

### 1 - Overview

This document describes the Ethernet communication protocol used by MBD-62 for data exchange between the equipment and other devices over a network.

### 2 - Protocol Specifications

#### 2.1 - Connector

The MBD-62 uses a female RJ45 connector for Ethernet interface (highlighted in red):

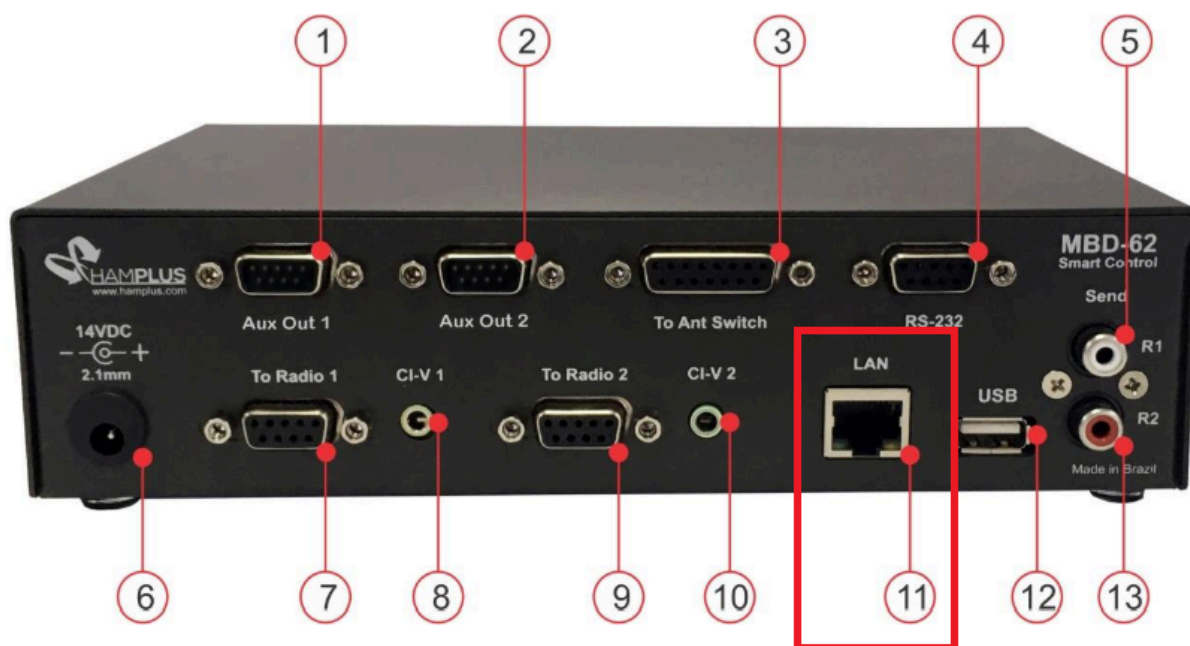


Figure 1: MBD-62 - Connectors (Ethernet RJ45 highlighted in red)

## 2.2 - Network Interface

The MBD-62 uses an Ethernet interface with the following specifications:

IP Address: by DHCP (default)  
Default Gateway: by DHCP (default)  
UDP Port: 11000 (default)<sup>1</sup>  
Host Name: mbd62 (default)

## 2.3 - Data Transmission

The MBD-62 communicates using the UDP (User Datagram Protocol). UDP is a connectionless protocol that does not require a connection to be established before data is transmitted.

## 2.4 - Packet Structure

Each packet sent to or from the MBD-62 follows this structure:

**Header:** Includes source and destination IP addresses, source and destination ports, and other relevant information.

**Payload:** Contains the actual data being transmitted. The structure and format of the payload depend on the specific commands and responses used by the equipment.

In the example of a packet captured in the Wireshark<sup>2</sup> program shown in figure 1 below, the source address is 192.168.68.108 (PC) and the destination address of mbd62 is 192.168.68.101.

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<sup>1</sup> UDP Port can change related to the hostname set on equipment:

11000 to mbd62;  
11001 to mbd62a;  
11002 to mbd62b;  
11003 to mbd62c;  
11004 to mbd62d;  
11005 to mbd62e.

<sup>2</sup> [www.wireshark.org](http://www.wireshark.org) for more information.

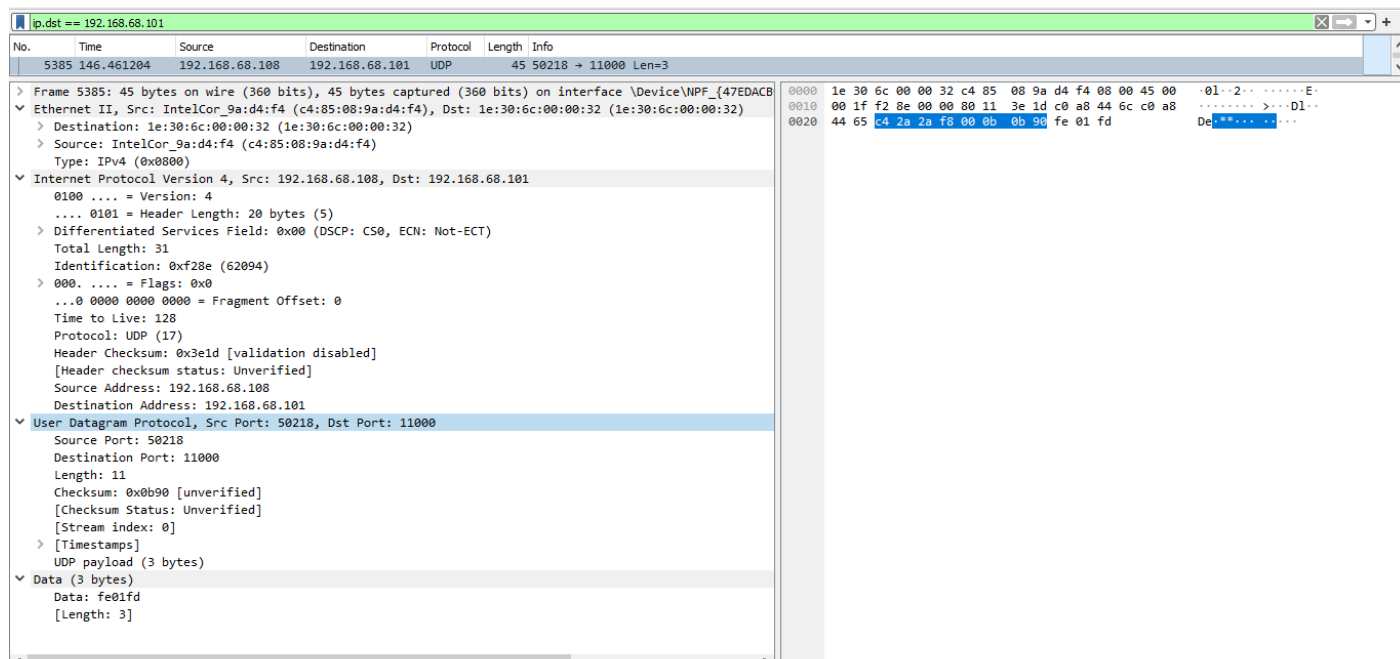


Figure 2: UDP Packet Structure

## 2.5 - List of Commands

Commands are sent as byte sequences in the last Block of UDP Packet (Data). A control command is composed of a start with 1 byte, a command byte, various parameters, and the terminator byte that signals the end of the control command.

Start	Description	Byte in Hex
STX	Start Byte	0xfe

Table 1: Start Byte

Command	Description	Byte in Hex
CMD_WR_POSITION_1	Command to set the Antenna Selection of Radio 1	0x02
CMD_WR_POSITION_2	Command to set the Antenna Selection of Radio 2	0x03
CMD_ENABLE_SPLIT_1	To set the MBD-62 Antenna Split of Radio 1	0x04
CMD_ENABLE_SPLIT_2	To set the MBD-62 Antenna Split of Radio 2	0x05
CMD_READ_STATUS	Command to get the full status of MBD-62	0x01

Table 2: Commands

Command	Description	Byte in Hex
EOM	End of Message Byte	0xfd

Table 3: Terminator Byte

### 3 - Communication - Commands and Responses

#### 3.1 - To set the MBD-62 Antenna Selection of Radio 1: CMD\_WR\_POSITION\_1

The host computer sends the UDP Packet:

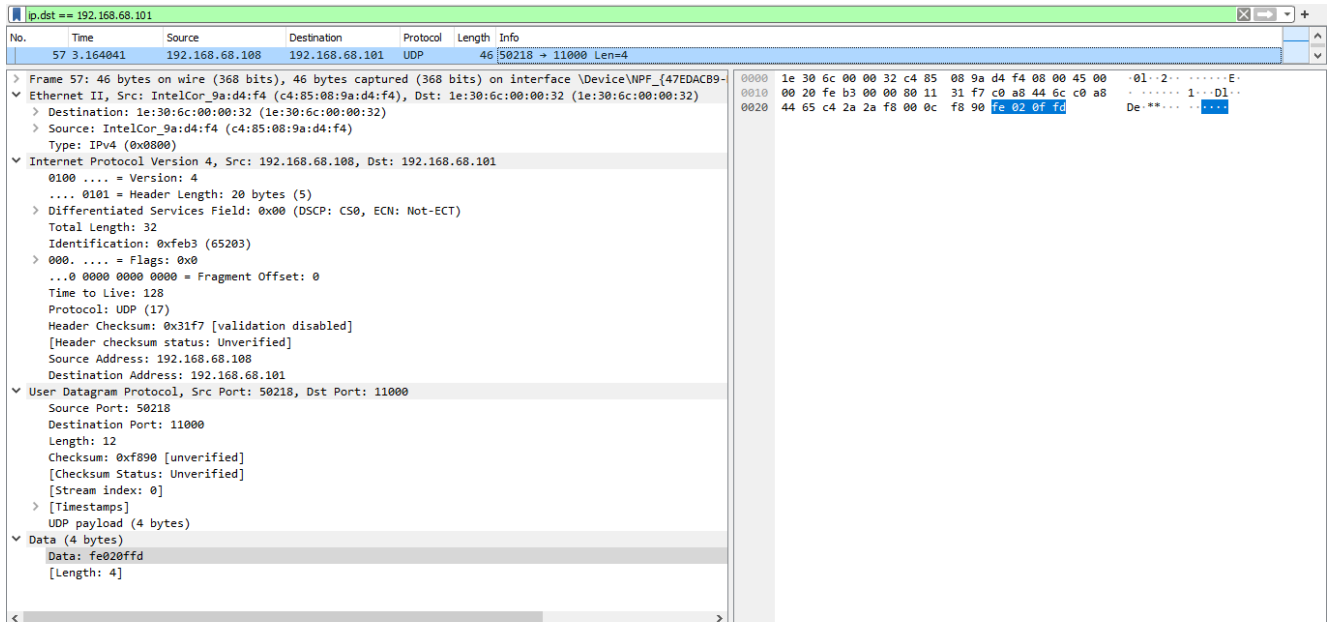


Figure 3: MBD-62 - Packet Structure at Set Antenna for Radio 1

The last 4 bytes (Data) includes the switch command:

1st byte	2nd byte	3rd byte	4th byte
0xfe	0x02	0x00: to Ant 1; 0x01: to Ant 2; 0x02: to Ant 3; 0x03: to Ant 4; 0x04: to Ant 5; 0x05: to Ant 6; 0x0f: to Release all Antennas;	0xfd

Table 4: Data Packet for Antenna Selection of Radio 1

The MBD-62 does not send confirmation data (UDP) and confirmation must be performed with the read status command.

### 3.2 - To set the MBD-62 Antenna Selection of Radio 2: CMD\_WR\_POSITION\_2

The host computer sends the UDP Packet:

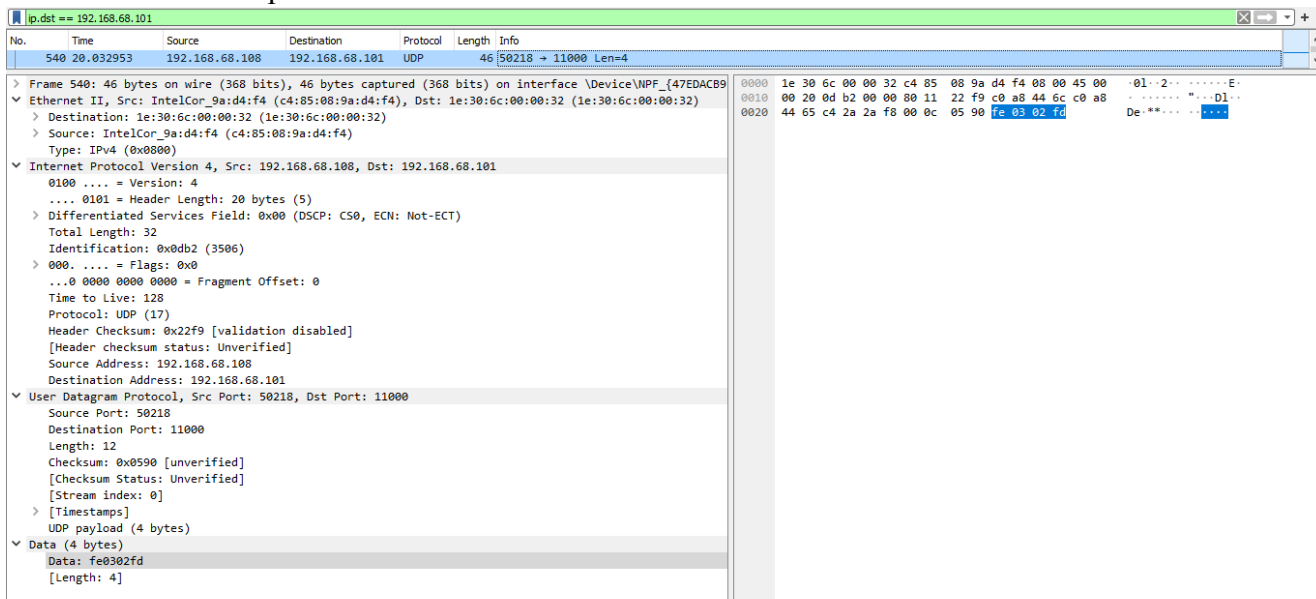


Figure 4: MBD-62 - Packet Structure at Set Antenna for Radio 2

The last 4 bytes (Data) includes the switch command:

1st byte	2nd byte	3rd byte	4th byte
0xfe	0x03	0x00: to Ant 1; 0x01: to Ant 2; 0x02: to Ant 3; 0x03: to Ant 4; 0x04: to Ant 5; 0x05: to Ant 6; 0x0f: to Release all Antennas;	0xfd

Table 5: Data Packet for Antenna Selection of Radio 2

The MBD-62 does not send confirmation data (UDP) and confirmation must be performed with the read status command.

### 3.3 - To set the MBD-62 Antenna Split of Radio 1: CMD\_ENABLE\_SPLIT\_1

The host computer sends the UDP Packet:

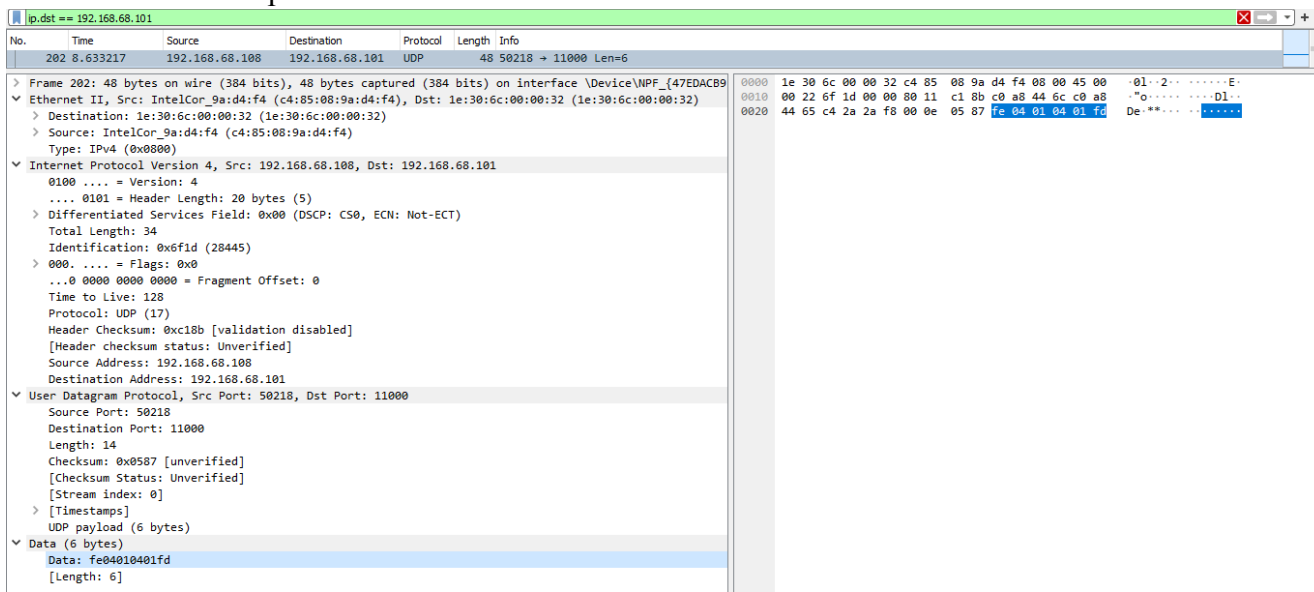


Figure 5: MBD-62 - UDP Packet to Set Split for Radio 1

The last 6 bytes (Data) includes the Split command:

1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte
0xfe	0x04	0x01	Antenna to Split from 0x00 to 0x05 (Ant 1 to Ant 6);	Antenna Active Position from 0x00 to 0x05 (Ant 1 to Ant 6);	0xfd

Table 6: Data Packet to enable Antenna Split of Radio 1

To disable the split at radio 1 the data needs to be set at:

1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte
0xfe	0x04	0x00	0x00	0x00	0xfd

Table 7: Data Packet to disable Antenna Split of Radio 1

The MBD-62 does not send confirmation data (UDP) and confirmation must be performed with the read status command.

### 3.4 - To set the MBD-62 Antenna Split of Radio 2: CMD\_ENABLE\_SPLIT\_2

The host computer sends the UDP Packet:

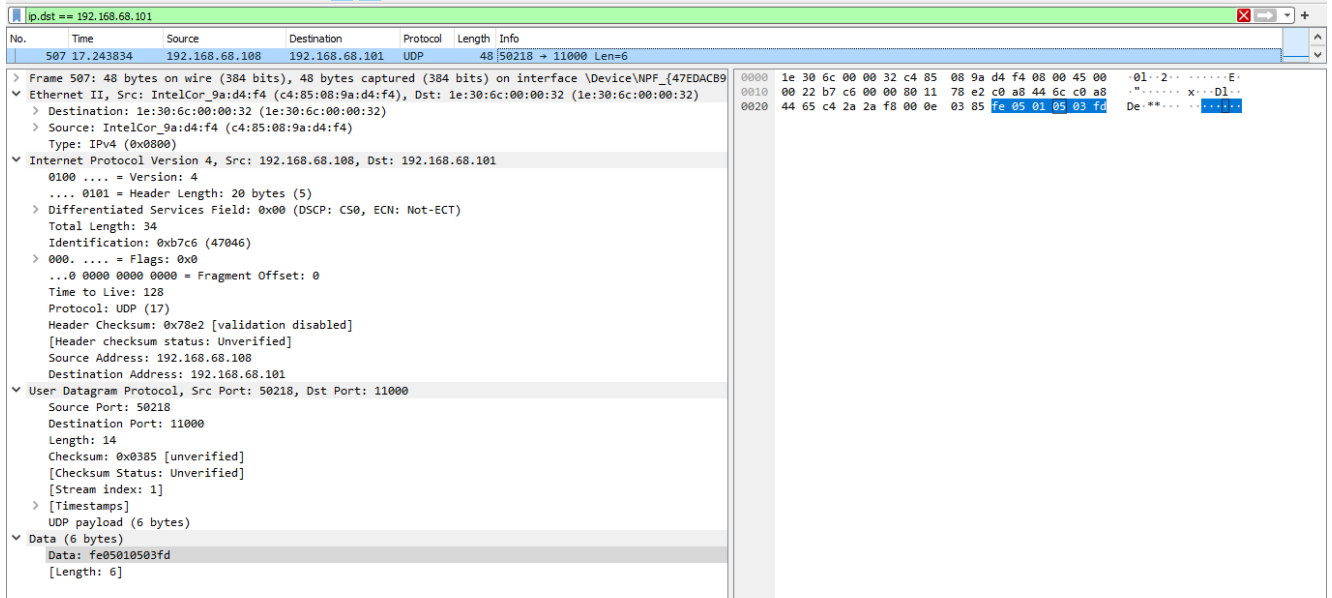


Figure 6: MBD-62 - UDP Packet to Set Split for Radio 2

The last 6 bytes (Data) includes the Split command:

1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte
0xfe	0x05	0x01	Antenna to Split from 0x00 to 0x05 (Ant 1 to Ant 6);	Antenna Active Position from 0x00 to 0x05 (Ant 1 to Ant 6);	0xfd

Table 8: Data Packet to enable Antenna Split of Radio 2

To disable the split at radio 1 the data needs to be set at:

1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte
0xfe	0x05	0x00	0x00	0x00	0xfd

Table 9: Data Packet to disable Antenna Split of Radio 2

The MBD-62 does not send confirmation data (UDP) and confirmation must be performed with the read status command.

### 3.5 - To get the MBD-62 Status: CMD\_READ\_STATUS

The host computer sends the UDP Packet:

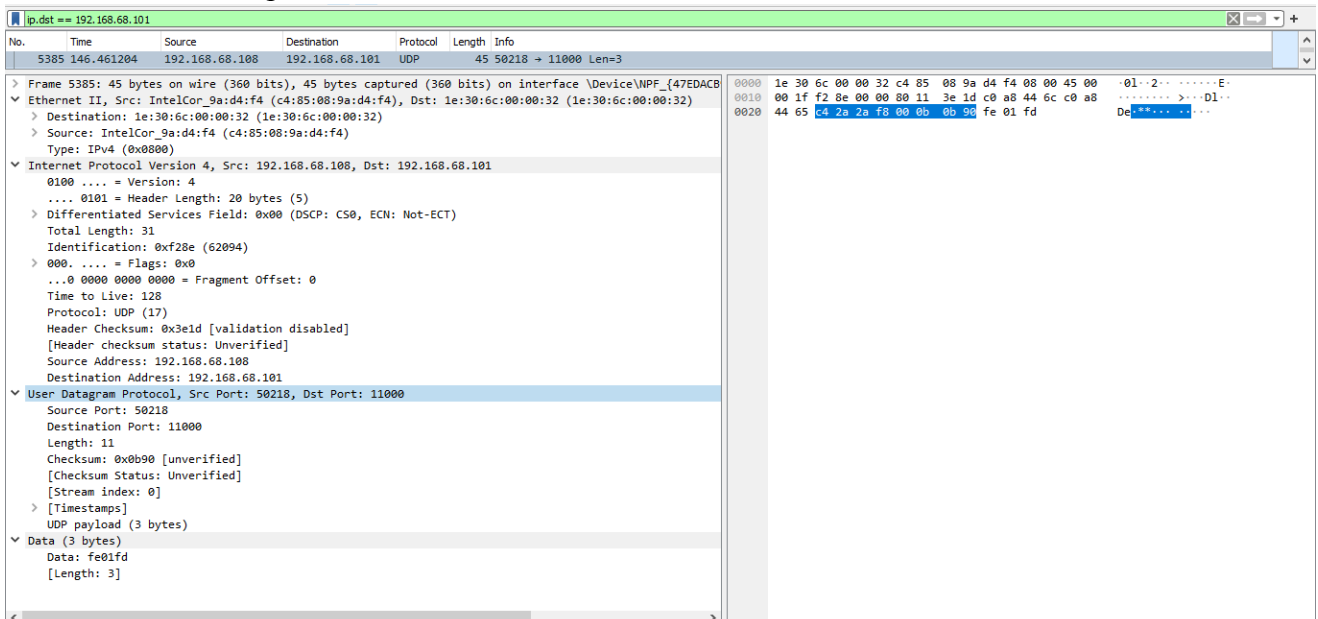


Figure 7: MBD-62 - Send UDP Packet to get the status

The last 3 bytes (Data) includes the read Status command:

1st byte	2rd byte	3th byte
0xfe	0x01	0xfd

Table 10: Data Packet to get MBD-62 Status



The MBD-62 sends a new packet to the host computer including all status in the last 22 bytes:

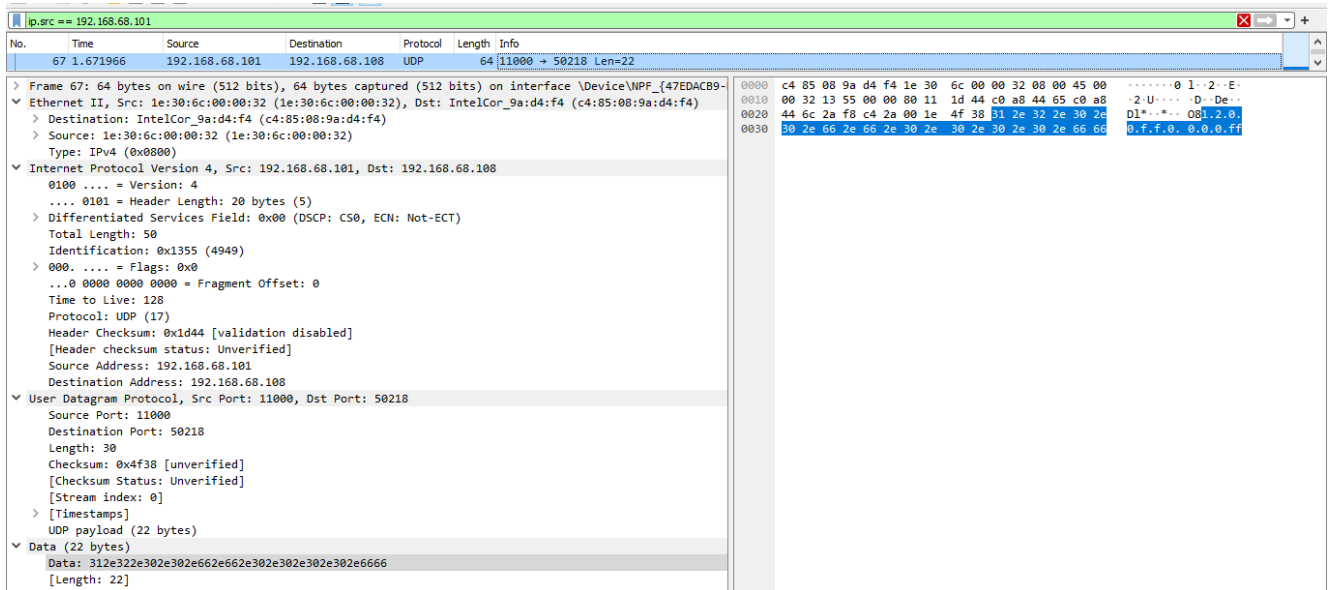


Figure 8: MBD-62 - Return UDP Packet including status information

The status information comes in ASCII character encoding:

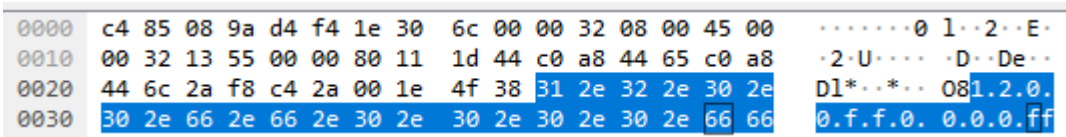


Figure 9: MBD-62 - Status Data Information

So the status information is on the string "1.2.0.0.f.f.0.0.0.ff" and in this example Radio 1 is on Antenna 2 and Radio 2 is on Antenna 3.

1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
Antenna Position 1	0x2e = "."	Antenna Position 2	0x2e = "."	Split mode 1 ("0": disabled "1": Enabled)	0x2e = "."	Split mode 2 ("0": disabled "1": Enabled)	0x2e = "."

9th byte	10th byte	11th byte	12th byte	13th byte	14th byte	15th byte	16th byte
Antenna Split 1	0x2e = "."	Antenna Split 2	0x2e = "."	Send Active 1	0x2e = "."	Send Active 2	0x2e = "."

17th byte	18th byte	19th byte	20th byte	21th byte	22th byte
BP 1	0x2e = "."	BP 2	0x2e = "."	0x66 = "f"	0x66 = "f"

Table 11: Data Packet of MBD-62 Status

Another example of read status can be seen below. The MBD-62 is configured to:

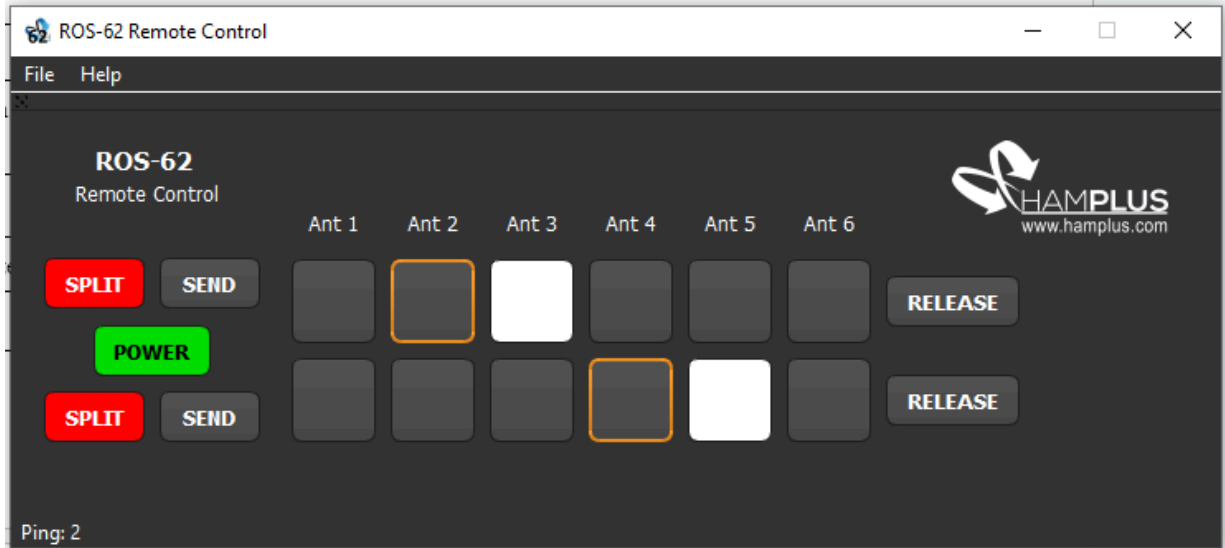


Figure 10: MBD-62

The status information comes in ASCII character encoding (22 Bytes):

0000	c4 85 08 9a d4 f4 1e 30 6c 00 00 32 08 00 45 00	.....0 1..2..E.
0010	00 32 2f 1a 00 00 80 11 01 7f c0 a8 44 65 c0 a8	..2/.....De..
0020	44 6c 2a f8 c4 2a 00 1e b2 38 31 2e 33 2e 31 2e	D1*...*...81.3.1.
0030	31 2e 32 2e 34 2e 30 2e 30 2e 30 2e 30 2e 66 66	1.2.4.0. 0.0.0.ff

Figure 11: MBD-62 - Status data Information at UDP Packet

So the status information is on the string "1.3.1.1.2.4.0.0.0.0.ff" and in this example Radio 1 and Radio 2 are on Split Mode (5th and 7th Byte "1"). Radio 1 is on antenna 2 with split on antenna 3 and Radio 2 is on antenna 4 with split on antenna 5.



## **4 - Final Considerations**

This document provides an overview of the Ethernet protocol used by the MBD-62. For more detailed information about the equipment refer to Hamplus MBD-62 Official Page:  
<http://hamplus.com/mbd62.htm>