



MPR Series HF & UHF RFID Devices
CANopen read UID/EPC

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1 Introduction

1.1 MPR Series · Devices

RFID	Housing	Antenna(s)	Host Interface	Order Code	Communication Protocol
HF	Small Housing	Internal	CANopen	R-MP-HF-IA-CAN	CANopen read UID
UHF	Small Housing	Internal	CANopen	R-MP-UHF-IA-CAN	CANopen read UID
UHF	Large Housing	Internal	CANopen	R-MP-UHF-IA-CAN	CANopen read EPC
UHF	Large Housing	2 × external	CANopen	R-MP-UHF-2CH-CAN	CANopen read EPC

1.2 Intended Use

These devices can communicate with RFID data tags for the purpose of data transfer. To achieve this these devices intentionally emit radio frequencies as part of their normal function.

1.3 Safety Notes

The device may only be used for the intended purpose designed by the manufacturer. The operation manual should be always kept available for each user.

The liability-prescriptions of the manufacturer in the issue valid at the time of purchase are valid for the device. The manufacturer shall not be held legally responsible for inaccuracies, errors, or omissions in the manual or automatically set parameters for a device or for an incorrect application of a device.

Repairs may be executed by the manufacturer only.

The device is intended for storage and operation in office conditions.

1.4 Hardware Settings

There are no hardware settings to be done. All configuration is done using configuration software or via binary commands.

2 CANopen Communication

2.1 General

The devices use telegrams at 250 kbs. They use notify messages without data and telegrams with extended frame format. As the RFID data can be longer than 8 Bytes, the ISO transfer protocol is used.

When the UID of an HF tag is detected, the RFID device notifies with two telegrams with 0x600 as identifier. After this the first frame telegram with the first 3 Bytes of the UID is sent. This needs to be answered with a flow control telegram.

For the EPC of UHF tags, you need to send an explicit read command.

>> Telegram is sent from a PC/PLC to the RFID device.

<< Telegram is replied from the RFID device to a PC/PLC.

2.2 Read the UID of an ISO 14443A Type Tag

The screenshot shows the IXXAT canAnalyser3 Mini software interface. The left sidebar displays the hardware configuration for a USB-to-CAN V2 compact CAN-1 interface, including statistics (Receive Counter: 10, Error Counter: 0) and hardware details (Controller: Bosch C_CAN, Clock Rate: 1 MHz, Serial Number: HW611253, Revision: 1.5, Driver Version: 4.1.212.0). The main window is divided into 'Receive' and 'Transmit' sections. The 'Receive' section shows a list of received telegrams with columns for No, Time (abs), State, ID (hex), DLC, Data (hex), and ASCII. The 'Transmit' section shows a list of telegrams to be sent, with columns for Tx, ID (hex), Description, Ext., RTR, Data (hex), and Cycle options (Count, Time (ms), Inc Mode, Byte).

No	Time (abs)	State	ID (hex)	DLC	Data (hex)	ASCII
1	00:00:13.311		600	0		
2	00:00:13.338		600	0		
3	00:00:13.743	E	1BC1B001	8	10 07 62 60 22 AE 99 CA	..b™...
4	00:00:14.215	SE	1BC00836	3	30 00 0A	0..
5	00:00:14.226	E	1BC1B001	8	21 DA 00 00 00 00 00 00	!.....

Tx	ID (hex)	Description	Ext.	RTR	Data (hex)	Count	Time (ms)	Inc Mode	Byte
	1BC00836	FC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	30 00 0A	0	10.00	Identifier	
			<input checked="" type="checkbox"/>	<input type="checkbox"/>		0	10.00	None	
			<input checked="" type="checkbox"/>	<input type="checkbox"/>		0	10.00	None	
			<input checked="" type="checkbox"/>	<input type="checkbox"/>		0	10.00	None	
			<input checked="" type="checkbox"/>	<input type="checkbox"/>		0	10.00	None	

Direction	Frame ID	Data	Description
<<	0x0600	—	Wake-up, notify of following telegram
<<	0x0600	—	Wake-up, notify of following telegram
<<	0x1BC1B001	10 07 62 60 22 AE 99 CA	First Frame telegram with command codes, status und 3 Bytes of the UID. The UID is sent LSB.
>>	0x1BC00836	30 00 0A	Flow Control telegram
<<	0x1BC1B001	21 DA 00 00 00 00 00 00	Consecutive Frame with the remaining Byte(s) of the UID

2.3 Read the UID of an ISO 15693 Type Tag

The screenshot shows the IXXAT canAnalyser3 Mini software interface. The left sidebar displays the controller 'USB-to-CAN V2 compact HW611253' and 'CAN-1'. The main window is divided into 'Receive' and 'Transmit' sections.

Receive Section:

No	Time (abs)	State	ID (hex)	DLC	Data (hex)	ASCII
1	00:00:03.855		600	0		
2	00:00:03.882		600	0		
3	00:00:04.287	E	1BC1B001	8	10 0B 62 60 22 82 58 03	..b".X.
4	00:00:09.270	SE	1BC00836	3	30 00 0A	0..
5	00:00:09.281	E	1BC1B001	8	21 3B 62 80 07 E0 00 00	!;b.....

Transmit Section:

Tx	ID (hex)	Description	Ext.	RTR	Data (hex)	Cycle options			
						Count	Time (ms)	Inc Mode	Byte
	1BC00836	FC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	30 00 0A	0	10.00	Identifier	
			<input checked="" type="checkbox"/>	<input type="checkbox"/>		0	10.00	None	
			<input checked="" type="checkbox"/>	<input type="checkbox"/>		0	10.00	None	
			<input checked="" type="checkbox"/>	<input type="checkbox"/>		0	10.00	None	
			<input checked="" type="checkbox"/>	<input type="checkbox"/>		0	10.00	None	

Statistics: Receive Counter: 10, Error Counter: 0.

Hardware: Controller: Bosch C_CAN, Clock Rate: 1 MHz, Serial Number: HW611253, Revision: 1.5, Driver Version: 4.1.212.0.

Features: standard and extended remote-frames, error-frames reception, send-list, passive mode, delayed transmission, single shot transmission, high priority messages, automatic bitrate detection, FD Frames, fast timing, ISO conform frame (ISO 11898-1:2...), 64-bit time stamp counter.

Direction	Frame ID	Data	Description
<<	0x0600	—	Wake-up, notify of following telegram
<<	0x0600	—	Wake-up, notify of following telegram
<<	0x1BC1B001	10 07 62 60 22 82 58 03	First Frame telegram with command codes, status und 3 Bytes of the UID. The UID is sent LSB
>>	0x1BC00836	30 00 0A	Flow Control telegram
<<	0x1BC1B001	21 3B 62 80 07 E0 00 00	Consecutive Frame with the remaining Byte(s) of the UID

2.4 Read the EPC from an ISO18000-63 Type Tag

The reply telegrams contain additional information:

- 1 Byte Antenna number
- 2 Bytes PC
- NBytes EPC

The command to read the EPC is: 03 22 60 80 00

This will read the EPC from all available antennas.

To address a specific antenna, please use this command: 04 22 60 80 03 – the last Byte gives the antenna number.

Direction	Frame ID	Data	Description
>>	0x1BC00836	03 22 60 80	Read EPC command.
<<	0x1BC1B001	10 12 62 60 80 01 30 00	First Frame telegram with command codes, status and 1 Byte of antenna number and 2 Bytes of the PC word.
>>	0x1BC00836	30 00 0A	Flow Control telegram
<<	0x1BC1B001	21 E2 80 69 94 00 00 60	Consecutive Frame with the next Byte(s) of the UID
<<	0x1BC1B001	21 2D 60 A1 85 95 00 00	Consecutive Frame with the last Byte(s) of the UID

If there is an error the RFID device replies with a short error information: 03 7F 22 FF

2.5 Read Hardware Version

To read hardware version, send the telegram 03 22 60 41 to the RFID device:

USB-CAN Tool V9.11 - USBCAN-II - SN:Serial number: 21D00025F46, firmware version number: V3.37 - ...

Device(D) Operation(O) Settings(S) Information(I) View(V) Help(H) Language(L)

Send Data

Format: Extended Type: Data CANID (HEX): 1B C0 08 36 Channel: 1 Number to send: 1 ID Inc.

Data(HEX): 30 00 0A Send Send Cycle: 10 ms Data Inc.

CAN Routing ID Filter Frm saved: 0 Stop send Send file

Unused CAN1 settings CAN2 settings Receive Enable Clear Save

Statistics:Ch1 Statistics:Ch2

Frm/s R: 1.7 Frm/s T: 0.3 Frm/s R: 0 Frm/s T: 0

Index	System Time	Time Stamp	Channel	Directio	Frame ID	Type	Format	DLC	Data
00000	16:14:51.696	-	chl	Send	0x1BC00836	Data	Extende	0x04	x 03 22 60 41
00001	16:14:51.721	0xD470D6	chl	Receive	0x1BC1B001	Data	Extende	0x08	x 10 27 62 60 41 55 48 46
00002	16:14:57.219	-	chl	Send	0x1BC00836	Data	Extende	0x03	x 30 00 0A
00003	16:14:57.241	0xD548BC	chl	Receive	0x1BC1B001	Data	Extende	0x08	x 21 2D 31 43 48 2D 43 41
00004	16:14:57.271	0xD5492A	chl	Receive	0x1BC1B001	Data	Extende	0x08	x 22 4E 2D 32 35 30 6B 20
00005	16:14:57.271	0xD54998	chl	Receive	0x1BC1B001	Data	Extende	0x08	x 23 56 31 2E 30 20 32 30
00006	16:14:57.271	0xD54A06	chl	Receive	0x1BC1B001	Data	Extende	0x08	x 24 32 35 31 31 31 31 20
00007	16:14:57.301	0xD54A74	chl	Receive	0x1BC1B001	Data	Extende	0x08	x 25 50 4D 00 00 00 00 00

The version information is: 41 55 48 46 2D 31 43 48 2D 32 35 30 6B 20 56 31 2E 30 20 32 30 32 35 31 31 31 31 20 25 50 4D = AUHF-1CH-250k V1.0 20251111 %PM

2.6 Read Firmware Version

To read the firmware version, send command 03 22 60 42 to the RFID device:

USB-CAN Tool V9.11 - USBCAN-II - SN:Serial number: 21D00025F46, firmware version number: V3.37 - ...

Device(D) Operation(O) Settings(S) Information(I) View(V) Help(H) Language(L)

Send Data

Format: Extended Type: Data CANID (HEX): 1B C0 08 36 Channel: 1 Number to send: 1 ID Inc.

Data(HEX): 30 00 0A Send Send Cycle: 10 ms Data Inc.

CAN Routing ID Filter Frm saved: 0 Stop send Send file

Unused CAN1 settings CAN2 settings Receive Enable Clear Save

Statistics:Ch1 Statistics:Ch2

Frm/s R: 0.7 Frm/s T: 0.3 Frm/s R: 0 Frm/s T: 0

Index	System Time	Time Stamp	Channel	Directio	Frame ID	Type	Format	DLC	Data
00000	16:15:27.424	-	chl	Send	0x1BC00836	Data	Extende	0x04	x 03 22 60 42
00001	16:15:27.451	0xD9E2C6	chl	Receive	0x1BC1B001	Data	Extende	0x08	x 10 12 62 60 42 43 6F 72
00002	16:15:32.546	-	chl	Send	0x1BC00836	Data	Extende	0x03	x 30 00 0A
00003	16:15:32.581	0xDAAB03	chl	Receive	0x1BC1B001	Data	Extende	0x08	x 21 65 55 48 46 5F 56 33
00004	16:15:32.581	0xDAAB71	chl	Receive	0x1BC1B001	Data	Extende	0x08	x 22 2E 32 31 2E 31 00 00

The version information is: 43 6F 72 65 55 48 46 5F 56 33 2E 32 31 2E 31 = CoreUHF_V3.21.1