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1. UDL5 description

1.1 Components

The UDL5 delivery contains:

- 1x UDL5 UHF mouse
- 1x USB cable
- 1x CD with technical information and software

2. Mechanical Dimensions

All dimensions in mm (inch).



Symbol	LED color	Status
X	red	RF-field on/off
\checkmark	green	reading/writing tags
	blue	power

Further explanation see next section 2.1 "LEDs and Beeper".



2.1 LEDs and Beeper

The device is equipped with three LEDs and one beeper to indicate the reader status. The following table refers to the standard settings (device set in trigger mode).

LEDs	Status UDL5
blue and red: on green: off	reader is ready to operate, RF-field is switched off
blue: on red and green: off	reader is ready to operate, RF-field is switched on, reader is ready to read or write to transponder
blue and green: on red: off beeper: on	reader is ready to operate, communication between reader and tag (reading/writing)
blue, green and red: on	reader carries out a reset, RF-field is switched off, reader is not ready to operate

3. Configuration and setting

Please note: This manual is considered to be prelimiary.

In the standard configuration the device is set in "Trigger Mode". This means the device waits for a "Trigger On" command to switch the RF-field on and a "Trigger Off" command to switch the RF-field off. These software commands can be sent to the device using RDemo software (to be found on the CD which is part of the UDL5 package).

The UDL5 in its current version is EPC class1 gen2 complicant only.

3.1 Transmission protocol

The communication of the UDL5 is based on the "deBus" protocol. For integration into userdefined applications please contact your local sales and service center (see end of document).



4. Getting started

4.1 Installing USB driver

First the USB driver has to be installed. The following steps show how to install the driver under Windows XP (Windows Vista is supported as well):

- Connect the UDL5 via USB cable to a spare USB Port at your Host/PC (USB cable as part of delivery of UDL5).
- Windows XP indicates the new hardware with the message "Found New Hardware: HARVEMAC".



• The "Found New Hardware Wizard" will now be started automatically. Select "No, not this time" and click "Next".

Found New Hardware Wizard	
	Welcome to the Found New Hardware Wizard
	Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission). <u>Read our privacy policy</u>
	Can Windows connect to Windows Update to search for software?
	\bigcirc Yes, this time only
	Yes, now and every time I connect a device
	No, not this time ■
	Click Next to continue.
	< Back Next > Cancel

If this procedure failed, the search for new hardware can be started manually by click on: "Start" -> "Settings" -> "Control Panel" -> "System" -> "Hardware" -> "Device Manager". Select the USB device, marked by a yellow question mark.



• Select "Install from a list or specific location (Advanced)" and click "Next".

Found New Hardware Wizard	
	This wizard helps you install software for: HARVEMAC If your hardware came with an installation CD or floppy disk, insert it now. What do you want the wizard to do? Install the software automatically (Recommended) Install from a list or specific location (Advanced) Click Next to continue.
	< <u>B</u> ack <u>N</u> ext > Cancel

• Select "Search for the best driver in these locations". Enter path name into the combobox or browse to path using the "Browse" button.

Found New Hardware Wizard
Please choose your search and installation options.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM)
Include this location in the search
J:\Driver Browse
O Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< <u>B</u> ack <u>N</u> ext > Cancel



• The screen below will be shown while Windows XP copies the required files.

Found New Ha	ardware Wizard
Please wait	while the wizard installs the software
ţ,	UsbHarve.Sys for Intel Harve RFID MAC
	UsbHarve.Inf To H:\WINXP\INF
	< <u>B</u> ack <u>N</u> ext > Cancel

• The following message indicates a successful installation process. Click "Finish" to close the wizard. Now the UDL5 is successfully installed.

Found New Hardware Wizard		
	Completing the Found New Hardware Wizard	
	The wizard has finished installing the software for:	
	UsbHarve.Sys for Intel Harve RFID MAC	
	Click Finish to close the wizard.	
	< <u>B</u> ack Finish Cancel	



 After successful installation of the USB driver, the UDL5 is ready for use. The "Device Manager" indicates the UDL5 as an additional device named "UsbHarve.Sys for Intel Harve RFID MAC".

🖳 Device Manager	
<u> E</u> ile <u>A</u> ction <u>V</u> iew <u>H</u> elp	
ESTRECHNER Bluetoth Devices Computer Disk drives Display adapters DVD/CD-ROM drives Floppy disk controllers Floppy disk controllers Floppy disk drives DIDE ATA/ATAPI controllers Keyboards Monitors Network adapters Ports (COM & LPT) Sound, video and game controllers System devices Universal Serial Bus controllers UsB Mass Storage Device UsB Mass Storage Device UsB Marve.Sys for Intel Harve RFID MAC	



4.2 Installing RDemo

The RDemo program can be found on the CD as part of the UDL5 package. For installation proceed as follows:

• Start installing RDemo with double click on file or icon:



4.3 Get connection

• After successfull installation of RDemo start the program with double click on file or icon:



• Select "Port" -> "USB".







• Click on button "deBus".

RDemo 1.70.0003		
File Port Reader Transponder	RF power Spe	cial Functions Options View ?
Trigger On Trigger Off	deBus	The RFID Company
Transponder data		

• Select "baud rate: all" and click "Detect Device(s)".

🗑 RDemo : deBus		Σ
cor	nfiguration	polling
detected devices		polled devices
adr bps device		3F I 9 29 21 2 10 2A 23 3 11 2B 24 4 12 2C 25 5 13 2D 26 6 14 2E
Configure	Set As Current Device	
Detect Device(s)	scan settings first address 21 last address 3F	Select <u>A</u> ll
	baud rate al	<u>U</u> nselect All
	200115	Select from Detection List
<u>N</u>	Most <u>R</u> ecent Used	Image: Deling interval Image: Deling interval
deBus <u>s</u> ettings	baud rate : 9600	bps current device : 3F

• RDemo starts scanning for connected deBus devices.

scanning de	vice addresses
	scanning address 2F at 9600bps
	Cancel



• After successful search the UDL5 will be shown as a detected device.

👿 RDemo : deBus		
configuration	polling	
adr bps device 3F 9600 2088-V00.01-00.01 [#110] UDK2	polled devices 3F ✓ 1 9 21 ✓ 23 ✓ 3 11 28 ✓ 24 ✓ 4 12 2C ✓	
Configure Set As Current Device	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	
Detect Device(s) scan settings	Select <u>A</u> ll <u>U</u> nselect All	
interval 250ms Most <u>R</u> ecent Used	Select from Detection List golling interval Polling	
deBus <u>s</u> ettings baud rate : 19200	lbps current device : 3F	

• Select the UDL5 with click on the left mouse button, then click "Set As Current Device" and close the window.



• Click on the "Version" button. A "version received" message in the bottom state bar indicates a successful version request of the UDL5.

🖪 RDemo 1.70.0003]			
File <u>P</u> ort <u>R</u> eader <u>T</u> ra	n sponder - RF po <u>w</u> er - <u>S</u> pecial Fi	unctions <u>O</u> ptions <u>V</u> iew <u>?</u>		
Trigger On Trigger Of	Version deBus	The RFID Com	pany	deister electronic
Transponder data				
Monitor				
<pre><ff><fd><3F><11 <ff><ff><fb><11> <00></fb></ff></ff></fd></ff></pre>	><02><96><9F> <fe> <02><00><6E><00><00<<00><6</fe>)8><20><01><00><01><00><	38><83> <fe></fe>	
-				
number of identifie	d tags			
			Version information received	
USB:0	version received	371 ms	2088-V00.01-00.01 [#110] UDK2	:3F:

• Click on the "Trigger On" button in order to switch on the RF-field. Present an EPC class1 gen2 tag in front of the reader and RDemo will display the tag read.

RDemo 1.70.0003	
File Port Reader Transponder RF power Special Functions Options View ?	
Trigger On Trigger Off Version deBus	deister electronic
Transponder data [1] 300833B2AAAA014035050000 [EPC class1 Gen2]	

• Click on the "Trigger Off" button in order to switch off the RF-field.



4.4 Reading block data

The reading function "Transponder" -> "Read" can be used to read block data of an EPC class1 gen2 transponder. To do so proceed as follows:

• Choose the tag type (please note: The current UDL5 version supports EPC class1 gen2 tags only), the serial number (EPC) of the tag to be read and one of the predefined memory blocks.

READ command	
This window allows you to ser	nd a "read block" command to the device
Iag type EPC class 1 GEN 2	Serial number of the transponder 300833B2AAAA014035050000 refresh list
- memory selection Start <u>b</u> lock (number of first block to read): 66 <u>N</u> umber of blocks to read: 6	predefinded memory blocks Kill Password Access Password EPC Electronic Product Code PC Protocol Control TID Transponder Identification User Memory
	,
	Read! Cancel

• Click on the "Read!" button and present the EPC class1 gen2 tag within the RF-field. The block data will be shown in the "Transponder data" window (see below).

RDemo 1.70.0003	
File <u>P</u> ort <u>R</u> eader <u>I</u> ransponder RF power <u>S</u> pecial Functions <u>O</u> ptions <u>Vi</u> ew <u>?</u>	
Trigger Off Version deBus	deister electronic
Transponder data [1]	
300833B2AAAA014035050000-300833B2AAAA014035050000 [EPC class1 Gen2][BLOCK 66]	

For more details concerning EPC class1 gen2 tag memory organisation see section 5. "EPC class1 gen2 memory organisation".



4.5 Writing block data

The writing function "Transponder" -> "Write" can be used to write block data to an EPC class1 gen2 transponder. To do so proceed as follows:

• Choose a tag type (please note: The current UDL5 version supports EPC class1 gen2 tags only), the serial number (EPC) of the tag, a predefined memory section and the data to be written.

😫 WRITE command	
This window allows (you to write data to a transponder
<u>I</u> ag type	Serial number of the transponder
EPC class 1 GEN 2	300833B2AAAA014035050000
Chip type	
- memory selection	
Startblock (number of first block to write):	predefinded memory blocks
Number of blacks to units:	Access Password
Mumber or blocks to write:	EPC Electronic Product Code PC Protocol Control
	User Memory
Blocksize: 2	
- Data bytes to write to the transponder	
Hex view	ASCII view
11 11 22 22 22 22 44 44 55 55 22 22 20	
	Write! Cancel

 Click on the "Write!" button and present the EPC class1 gen2 tag within the RF-field. The block data will be shown in the "Monitor" window. RDemo indicates successful writing with a "write successful" message (in the "Monitor" bottom state bar, see below).

Monitor				
(00)				
number of identified tags				
0				
USB:0	write successful	2088-V00.01-00.01 (#110) UDK2 :3F:		

For more details concerning EPC class1 gen2 tag memory organisation see section 5. "EPC class1 gen2 memory organisation".



4.6 EPC class1 gen2 tag functions

Additional tag functions like "Kill command" and all others are not supported by the current version of UDL5. Please consult the next sales and service center for details.

4.7 RDemo command builder

For sending a user-defined deBus command to the UDL5, the "Command Builder" is a useful tool.

• Go to "Special Functions" and select "Command Builder".

🖪 RDemo 1.70.0003			
File Port Reader Transponder RF powe	Special Functions Options V w ?		
	Command Builder	Strg+B	
Trigger On Trigger Off Version deBus	Clear List of Transponder Serialnumbers	Umschalt+F7	
	Tag Capture Control		
Transponder data	EPC class1 gen2 transponder personalisation		
	Search for Serial Ports		

• Enter a user-defined deBus command string without dummy bytes, CRC and STOP bytes and then click "send command".

command builder
Build your own deBus command and send it to the device
_ command
FD3F1102
Enter deBus command without dummy bytes, CRC and STOP. Click on a button to see an example :
Show Me "CDM_Version" Show Me "CDM_GetStatus" Show Me "CDM_Polling"
<u>N</u>
send command cancel

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5. EPC class1 gen2 memory organisation

This paragraph refers to the document "EPCglobal™, Specification for RFID Air Interface", Version 1.0.9.

The tag memory is divided into four memory banks. Each memory bank consists of several blocks, each block has the size of 2 bytes. The banks RESERVED, EPC and TID must always be available, the USER bank is optional.

- **RESERVED:** Non-Volatile-Memory, this memory contains a 32 bit Kill Password and a 32 bit Access Password.
- **EPC (Electronic Product Code):** This bank contains the CRC-16 (cyclic redundancy check), PC (Protocol Control) and EPC. The PC bits contain information about the tag, e.g. length of the EPC. The EPC begins at block address 66 (dec), MSB first. In case of a 96 bit EPC it has the size of 6 blocks.
- **TID (Transponder Identification):** The TID memory contains data about the manufacturer. Tags may contain specific data within the TID memory, beginning at block address 130 (dec), e.g. a tag serial number.
- **USER:** allows user specific data storage. The memory organisation is user-defined.

Bank No. (decimal form)	Bank Name	Block Memory Content [MSB:LSB] (decimal form)	Memory Bank Addresses [MSB:LSB] (decimal form)	Block Address (decimal form)
		[15:0]		
3	USER			
		[N:N-15]	[0:15]	192
Z	ID	TID [15:0]	[16:31]	129
		TID [31:16]	[0:15]	128
		EPC [15:0]	_	
	EPC			
		EPC [N:N-15]	[32:47]	66
		PC [15:0]	[16:31]	65
		CRC-16 [15:0]	[0:15]	64
0	RESERVED			
		Access Password [15:0]	[48:63]	3
		Access Password [31:16]	[32:47]	2
		Kill Password [15:0]	[16:31]	1
		Kill Password [31:16]	[0:15]	0



6. Regulatory notices

6.1 Europe

Hereby, deister electronic GmbH declares, that this equipment - if used according to the instructions - is in compliance with the essential requirements and other relevant provisions of the RTTE Directive 1999/5/EC.

A full declaration of conformity can be requested at:

info@deister-gmbh.de



Approved for use in all European countries.

6.2 FCC Digital Device Limitations

Radio and Television Interference

This equipment has been tested and found to comply with the limits for a digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and television reception.

Caution! Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

UDL5 - UHF	mouse •	Quick	start	manual
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Notes:



Notes:	

UDL5 - UHF mouse •	Quick start manual
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Notes:



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