Operating and
Programming Manual

RFID Wand MICROSCAN

TIRIS™ Version

Software Version W1.3

1   Content

2   FCC Note

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.

3   Copyright

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4   Notation

[ESC]	keys are printed in square brackets
READ_TIME	keywords are printed in capitals
attention	important notes are marked by two lines

5   Warnings

Under no circumstances try to open the MICROSCAN. Electrical safety cannot be guaranteed if the device is opened by a non-expert. Your health and life are endangered due to high voltage in the electronics.

In case of damage do not continue to use the devices. Send back the device to your local distributor or - along with a copy of the invoice - to DTE Automation GmbH in Herford, Germany for service support.

Do not dip the device into water. Since it is only protected against water splash and rain, serious damages may occur when using or storing this device under water.

Only use original cables and spare parts with this device.

6   Introduction

MICROSCAN is an easy to use transponder read/write device. The TIRIS version reads all TIRIS transponders and writes data into all r/w TIRIS transponders. Since MICROSCAN is driven by a simple ASCII protocol it is easy to integrate the device into any existing or new application.

Please refer to our Internet Web Site at http://www.dte.de for latest information on our products.

Before using the MICROSCAN,
read this manual carefully from the beginning.
It contains important information!

7 Getting Started

In order to prepare the MICROSCAN for the first use carry out all of the following steps:

1. unpack all components

2. switch off your personal computer (PC), connect the MICROSCAN to the serial interface of the PC using the RS-232 interface cable and switch on the PC

3. plug in the mains adapter and connect it to the MICROSCAN. Observe mains voltage!

4. start working with your MICROSCAN

7.1 Quick Start

Start a terminal program on your PC (Telix, Procomm, Hyperterm, or similar).

Choose the serial interface to which you connected the MICROSCAN. Set the parameters as follows:

> 9600 baud
>
> 1 start bit
>
> 8 data bits
>
> no parity
>
> 1 stop bit

Start a reading cycle on the MICROSCAN using the [START] key. MICROSCAN tries to read a transponder within a certain time frame. If a transponder has been read successfully, its data will be sent to the PC and the reading cycle will stop.

8 When MICROSCAN "hangs"

In certain situation, e.g. when there is a configuration error, the pocket MICROSCAN may stop its work. There are two ways of resetting the system:

8.1 Disconnect supply voltage

Simply disconnect the system from the supply voltage and wait for 30 seconds. Connect the MICRSCAN to the supply voltage again.

The system will reset itself and will be operational immediately. Parameters previously set through serial commands will not get lost.

8.2 Send RESET command

If the MICROSCAN produces abnormal results this may have been caused by wrong parameter combinations. You may reset the default parameters anytime with the RESET command (see 10.2.9) through the serial interface.

9 Technical Data

Dimensions:	140 mm x 62 mm x 35 mm (5.5" x 2.4" x 1.4")
Cable:	app. 2 meter with DB9 female connector
Weight:	app. 150 g (5.3 oz.)
Protection Class:	IP43
RFID Frequency:	134.2 kHz
CPU:	Powerful RISC Processor
Memory:	8 Kbytes FLASH for User program, 512 Byte RAM, 512 Byte EEPROM, 16 KB optional EEPROM
Feedback:	3 LED's, internal beeper
Software	DTE or customer specific
Operating Temp.	-10°C to +60°C (14°F to 140°F)
Storage Temp.	-20°C to +60°C (-4°F to 140°F)
Drop test	1.2 m (3'10") on concrete
Interface	serial RS 232 short-cut circuit resistant, 9.600 Baud
Power Supply	9V to 16V AC or DC

10 Software

10.1 Introduction

MICROSCAN is equipped with a powerful interpreter that is controlled by serial ASCII commands.

All commands have to be sent with trailing CR LF (0x0D, 0x0A) characters. MICROSCAN answers with trailing CR LF as well.

If a command contains values between 0 and 255, these parameters have to be sent in hexadecimal format with a leading \ and a trailing \ character. For example, if you want to transfer a horizontal TAB (0x09), you should send \09\ to the MICROSCAN.

MCROSCAN will answer in one of these ways:

[ACK] (0x06)	Acknowledge; the command was successful
I	Ignore; the command was invalid
E	Error; there was an error in the command

10.2 Configuration Commands

These commands are available to configure the MICROSCAN.

Command	Description	Page
CF Clock Format	Configures date and time format	7
CR Clock Read	Reads the clock	7
CW Clock Write	Sets the clock	7
D Data Length	Sets the length of a data record	8
F Transponder Format	Sets the format of the data record	8
K Data Preamble	Defines the characters that lead a data record	8
L Data Postamble	Defines the trailing character behind a data record	9
M Data Midamble	Defines the middle character when data is sent in TIRIS format, e.g. K1111M1111111111111111L	9
S Sysdata	Sets a variety of system values	9

10.2.1 CF Clock Format

PC: CF[aaaaaaaaaaaaaaaaaaaa]

MICROSCAN: [ACK]

Description:

This command sets the format of the clock values. Any characters are valid. Certain characters have special functions.

Y	2-digit year **or**
YY	4-digit year
M	2-digit month
D	2-digit day
h	2-digit hour
m	2-digit minute
s	2-digit second
w	day of the week (1..7)

Example: "CFTime\09\h:m:s D-M"

Result: Time[TAB]hh:mm:ss DD-MM

Default: "CFD.M.YY h:m:s w"

10.2.2 CR Clock Read

PC: "CR"

MICROSCAN: date and/or time string

Description:

MCIROSCAN sends date/time string according to the format previously set with the CF command.

10.2.3 CW Clock Write

PC: "CWDD.MM.YYYY hh:mm:ss w"

MICROSCAN: [ACK]

Description:

Sets the internal clock.

Example: "CW10.09.1999 15:48:00 5"

Result: Sets the clock to 10th September 1999, 3:48:00 PM, Friday

default: 01.01.2000 00:00:00 1

10.2.4 D Data Length

PC: "D[\hh\]"

MICROSCAN: [ACK]

Description:

Sets the length of the transponder data string for decimal and hexadecimal format. If it is set to 0, the entire transponder data will be returned. A value greater than the actual length will be ignored.

If the value is less than the actual length, only the least significant digits will be returned.

Example: "D\06\"

If the transponder data is "126A8F64E30AC5E4" MICROSCAN will return "0AC5E4".

Default: \0\

10.2.5 F Transponder Format

PC: "F[I][D I H I T][C]"

MICROSCAN: [ACK]

Description:

This command sets the transponder format for the string that MICROSCAN send to the PC whenever it reads a transponder.

    I   Type Information (R = read/only, W = read/write)
    DIHIT   decimal I hexadecimal I TIRIS Format
    C   Clock; adds date/time Information

If you choose the TIRIS format, the transponder data is split into a 4 digit application code and a 16 digit identification code.

Example: "FH"

Default: Hexadecimal format

10.2.6 K Data Preamble

PC: "K[aaaaaaaaaaaaaaaaaaaa]"

MICROSCAN: [ACK]

Description:

Sets the fixed leading characters that will be send before the transponder data. Up to 20 characters can be defined.

Example: "KTransponder Data:"

MCIROSCAN will send "Transponder Data:1111111111111111" whenever a transponder is read.

Default: no preamble

10.2.7 L Data Postamble

PC: "L[aaaaaaaaaaaaaaaaaaaa]"

MICROSCAN: [ACK]

Description:

Sets the fixed trailing characters that will be send behind the transponder data. Up to 20 characters can be defined.

Example: "L\0D0A\"

MICROSCAN will send Carrriage Return/ Line Feed behind the transponder data.

Default: Carriage Return/ Line Feed

10.2.8 M Data Midamble

PC: "M[aaaaaaaaaaaaaaaaaaaa]"

MICROSCAN: [ACK]

Description:

Sets the fixed middle characters that will be send between the applications code and the identification code in TIRIS format. Up to 20 characters can be defined.

Example: "M\202020\"

Three blanks will be send between the two codes.

Default: no midamble

10.2.9 S Sysdata

PC: "S[n\hh\]"

MICROSCAN: [ACK]

Description:

This command sets a variety of system values.

Command	Function	Valid values	Default values	Description
S	Get Values	-	-	Returns current system settings
S0	Reset	\00\		All values will be reset to their defaults.
S1	Read Mode	\00\ .. \0F\	\05\ 0 000 0 1 0 1	Used bit-wise: B7,B6,B5,B4,B3,B2,B1,B0 B7 = 0 Sleep-Mode off B7 = 1 Sleep Mode active (will be ignored when 'line mode' is active or START button is locked) B6 .. B4 reserved B3 = 1: Line Mode = fast permanent reading (B2 and B1 will be ignored) B3 = 0: Line Mode off B2 = 1: Activate START button B2 = 0: Deactivate START button B1 = 1: Automatically start a new reading cycle after a successful reading B1 = 0: Stop after successful reading B0 = 1: Only changed transponders will be read B0 = 0: The same transponder will be accepted again and again
S2	Read Time	\0000\ .. \FFFF\	\00C8\= 200	One reading is set to \hh\ * 0.1 seconds
S3	Read Speed	\00\ .. \FF\	\03\	A reading cycle is \hh\ * 0.1 seconds. The "ON" LED flashes.
S4	Beep Time	\00\ .. \FF\	\02\	The beeper sounds for \hh\ * 0.1 seconds when transponder data is send to the PC
S5	"READ" LED Time	\00\ .. \FF\	\02\	The "READ" LED turns on for \hh\ * 0.1 seconds after a successful reading
S6	"OK" LED Time	\00\ .. \FF\	\00\	The "OK" LED turns on for \hh\ * 0.1 seconds when transponder data is send to the PC
S7	Wait Time	\00\ .. \FF\	\05\	The button repeat time is set to \hh\ * 0.1 seconds
S8	Reserved	\00\ .. \FF\	\00\	reserved

Please be careful when changing system values. The parameters will not be checked.
Wrong system values may cause strange results or even lock the reader.

In Sleep Mode MICROSCAN does not accept an commands through the serial interface.
Use the START button to wake it up.

10.3 Operation Commands

The commands are used during normal operation.

Command	Description	Page
V **Get Version**	Returns the software version	11
R **Read Transponder**	Starts a reading cycle	11
Rpp **Read Transponder Page**	Reads a certain transponder page	12
W **Write Transponder**	Writes into a transponder	12
Wpp **Write Transponder Page**	Writes into a certain transponder page	13
Ppp **Page Locking**	Locking of a transponder page	13

10.3.1 V Get Version

PC: "V"

MICROSCAN: "ccctnn"

Description:

The command returns the version of the internal software program.

    ccc   customer code
    t   type
    nn   version number

Example: "V"

MICROSCAN returns "DTEW13". This is a DTE software, type read/write, version 1.3.

10.3.2 R Read Transponder

PC: "R"

MICROSCAN: "thhhhhhhhhhhhhhhh"

Description:

This command starts a reading cycle for a certain time. You may configure the cycle using the S2 command (see 10.2.9).

Variable	Function	Description
t	Transponder Type	R = Read Only (R/O) W = Read/ Write (R/W)
hhhhhhhh hhhhhhhh	Transponder Data	Data will be return in hexadecimal format (16 digits)

If no successful reading took place in the give time interval, MICROSCAN will return "E".

Example:

PC   "R"

MICROSCAN   "W112D33EE55A67788"

10.3.3 Rpp Read Multi Page Transponder

PC: "R\pp\"

MICROSCAN: "Mpshhhhhhhhhhhhhhhh"

Description:

This command starts a reading cycle for a certain time. It tries to read a certain page of an M/P transponder. You may configure the cycle using the S2 command (see 10.2.9).

Variable	Function	Description
M	Transponder Type	M = Multi Page (M/P)

ps	Page and Status Information	this value is used bit wise:
		          pppppp ss
		Page 1 000001 00 Page read
		Page 2 000010 01 Page programmed
		Page 3 000011 10 locked page read
		      ....
		Page 16 010000
		Page 17 010001

hhhhhhhh hhhhhhhh	Transponder Data	Data will be return in hexadecimal format (16 digits)

If no successful reading took place in the give time interval, MICROSCAN will return "E".

Example:

PC   "R\0C\"

MICROSCAN   "M302222222222222222"

MICROSCAN read page 12 with the data '2222222222222222'.

10.3.4 W Write Transponder

PC: "W\hhhhhhhhhhhhhhhh\"

MICROSCAN: "Whhhhhhhhhhhhhhhh"

Description:

This command tries to write data into a read/Write transponder for a certain time. The time may be configured with the S2 command. If the attempt was successful, MICROSCAN returns as shown above. Otherwise it returns "E".

Variable	Function	Description
W	Transponder Type	W = Read/ Write (R/W)
hhhhhhhh hhhhhhhh	Transponder Data	Data will be send in hexadecimal format (16 digits)

Example:

PC   "W\1234567890ABCDEF\"

MICROSCAN   "W1234567890ABCDEF"

10.3.5 Wpp Write Multi Page Transponder Page

PC: "W\pphhhhhhhhhhhhhhhh\"

MICROSCAN: "Mpshhhhhhhhhhhhhhhh"

Description:

This command tries to write data into one page of a M/P transponder for a certain time. The time may be configured with the S2 command. If the attempt was successful, MICROSCAN returns as shown above. Otherwise it returns "E".

Variable	Function	Description
T	Transponder Type	M = Multi page (M/P)

ps	Page and Status Information	this value is used bit wise:
		
		            pppppp ss
		Page 1 000001 00 Page read
		Page 2 000010 01 Page programmed
		Page 3 000011 10 locked page read
		
		         ....
		Page 16 010000
		Page 17 010001

hhhhhhhh hhhhhhhh	Transponder Data	Data will be return in hexadecimal format (16 digits)

Example:

PC   "W\041111222233334444\"

MICROSCAN   "M111111222233334444"

Page 4 of an M/P transponder has been successfully programmed with '1111222233334444'.

The next reading cycle with "R\04" will return "M101111222233334444" since the programming bit will be reset.

10.3.6 Ppp Page Locking

PC: "W\pphhhhhhhhhhhhhhhh\"

MICROSCAN: "Mpshhhhhhhhhhhhhhhh"

Description:

This command tries to lock one page of a M/P transponder. Data of this page cannot be changed anymore after the page has been locked successfully. **There is no function to unlock a locked page.** The time may be configured with the S2 command. If the attempt was successful, MICROSCAN returns as shown above. Otherwise it returns "E".

Variable	Function	Description
T	Transponder Type	M = Multi page (M/P)
ps	Page and Status Information	this value is used bit wise: ppppppp ss Page 1 000001 00 Page read Page 2 000010 01 Page programmed Page 3 000011 10 locked page read .... Page 16 010000 Page 17 010001
hhhhhhhh hhhhhhhh	Transponder Data	Data will be return in hexadecimal format (16 digits)

Example:

PC   "P\04\"

MICROSCAN   "M12hhhhhhhhhhhhhhhh"

Page 4 of an M/P transponder has been successfully locked.

There is no way to unlock a locked page.