

Users Manual

LID EUR 4100 Mini Reader

Installation Manual for the
EUR 4100 Mini Reader
Version Wilms 2.03



Copying this document and giving it to others as well as the use or communication of the contents thereof, are forbidden without express authority.

Offenders are liable to the payment of damages.

All rights are reserved in the event of the grant of a patent or the legal protection of a registered design

October 2005

Firma Gustav Wilms
Im Glanetal 6
D 49152 Bad Essen

GERMANY

Technical changes without notice

Tel.: +49-(0)5427-9423-0
Fax.: +49-(0)5427-9423-33
eMail: wilms@wilms.com
<http://www.wilms.com>
EUR 4100 Version Wilms Firmware 2.03

Page 1 of 26

Table of Contents	Page
1. Safety and Application Instructions.....	3
1.1 General.....	3
1.2 Transport, Storage and Installation.....	4
1.3 Electrical Radiation.....	4
1.4 Approval certificate.....	5
2. Introduction.....	6
3. Technical Data.....	6
3.1 Mechanical Characteristics of the Reader.....	6
3.2 Mechanical Characteristics of the Antenna.....	7
3.3 Block Diagram.....	8
3.4 Electric Characteristics Reader.....	9
3.5 Electric Characteristics Printed circuit board EUR-4100.....	9
3.6 Electric Characteristics Antenna driver EUR-3110.....	9
3.7 The EUR-4100 Printed circuit board.....	10
3.8 Connection Characteristics of the Digital Inputs.....	11
3.9 Connection Characteristics of the Relay Outputs.....	11
3.10 Pin Configuration of the RS 232 Interface.....	11
3.11 Pin Configuration of the Terminal Blocks (for antenna, power lines, etc.).....	11
3.12 Antenna cable.....	11
3.13 DIP-Switches.....	12
3.14 Lights.....	12
4. Firmware 2.03 Version Wilms.....	13
4.1 Security of the Data Transfer.....	14
4.2 Command Set of the Data Transfer.....	14
5. Putting into Operation.....	15
6. Trouble Shooting.....	15
7. Antennas.....	16
8. Special Models RS 422 Interface.....	16
9. Protocol Format.....	17
10. Command Set.....	18
11. Setup Menu.....	22
12. Error Codes.....	24
13. Hyper Terminal Example.....	25

1. Safety and Application Instructions

The directions in this chapter must be absolutely observed for following reasons:

- Safety for people and machines
- Function and susceptibility to faults
- Technical inspectorate acceptance and certification
- Guarantee and warranties

This instruction manual must be made available to any user. Before working with this unit the user must be familiarized with it. This is especially true for the attention, safety and warning guides. The meaning of the pictograms used in this manual are:



Danger
Electric
Shock



Attention
radio
Radiation



Attention
observe at
all costs



Information
Help
Tip

1.1 General



Danger to Life

Transponder identification systems contain dangerous voltages which can cause serious injury or death. During the operation and depending on the type of protection, they can have live, bright, possibly also moving parts as well as hot surfaces.

Care should be taken to ensure correct and safe operation to minimise risk to personnel and equipment.

Do not operate the device with open housing, as there is a danger, that terminals connections with dangerous voltage can be touched. The device should only be opened by trained personal when switched off.



Only Qualified Electro-Personnel

All work from the transport, to installation and start-up as well as maintenance may only be done by qualified personnel (IEC 364 and/or CENELEC HD 384 and IEC-Report 664 and note national safety regulations).

According to this qualified staff means:

- those who are able to recognise and judge the possible danger
- those with knowledge of the relevant standards and who are familiar with the field of RFID transponder systems (as well as the appropriate regulations for your area)

1.2 Transport, Storage and Installation



Protect Against Accidental Contact, Operating Temperature and Voltage

The identification system must be protected against physical damage during transport, installation and use. Components and covers must not be bent or moved as this may affect installation distances. The units contain electrostatically endangered components which can be destroyed by inappropriate handling. For that reason the contact of electronic components and contacts is to be avoided. The equipment must not be switched off if it is damaged as it may no longer comply with mandatory standards. Make sure that during installation there is enough minimum clearance and enough cooling. Indoor use only. Keep the cords away from heat, oil and sharp edges.

1.3 FCC Regulatory, Electrical Radiation

The EUR Mini Reader is an inductive loop system.

This device not causes interference.

This device must accept any interference,
including interference that may cause undesired operation of the device.



People protection

During operation the antenna produces an alternating electro magnetic field. This reader is an active electrical transmission system and radiates in the frequency range of approximately 125 kHz. When connecting a defect or a not suited antenna to the device the radiated power can be higher than 42 dB μ A/m (measured at 10 m distance). The operator is responsible that people at risk are not endangered by the device. (example heart pacemaker) When working on or around the antenna, this should be kept to the minimum. The antenna can be switched through the digital input that transmitted energy is only given off when required.



Antenna protection

Never mount or place the antenna on extended metal parts. Do not bring another antenna close to the operated antenna (second antenna operated or not). In both cases there is a risk, that the antenna may be destroyed. Such defects are not covered by the warranty.

the trovan[®] Identification System
EUR 4100 Mini Reader

1.4 Approval Certificate

When using the original AEG ID antennas suited for that device, the combinations of antenna and reader have the German permission for operation.

The EUR 4100 Mini Reader, with groundantenna by Wilms Company , has the EC certificate of cnformity. With the technical construction file presented according to Annex IV of Directive 1999/5/EC it has been properly demonstrated that the requirements of the Directive have been met.
The product is inconformity with the essential requirements of Article 3 Directive 1999/5/EC.
Identification Number: 0678

CE 0678

Registration Number: G100474M



Regulation authority on telecommunication and mail:
The use of the appliances is allowed in Gemany on the basis of a general allotment of a frequency.
RegTP-Number: 67493-01

Please check, if special permissions are required at the place of operation.

Firma Gustav Wilms
Im Glanetal 6
D 49152 Bad Essen

GERMANY

Technical changes without notice

Tel.: +49-(0)5427-9423-0
Fax.: +49-(0)5427-9423-33
eMail: wilms@wilms.com
<http://www.wilms.com>
EUR 4100 Version Wilms Firmware 2.03

Page 5 of 26

2. Introduction

The reader is designed to read trovan[®] transponders. It is a robust device for industrial applications. The EUR 4100 Mini Reader is especially suited for large reading ranges. The adaptation to the individual needs can be performed by selection of the most optimal antenna.

The wide range of applications for this device includes for example:

Production control in car assembly and paint shops, barrel logistics, rubbish bin identification, ski lift management, goods.

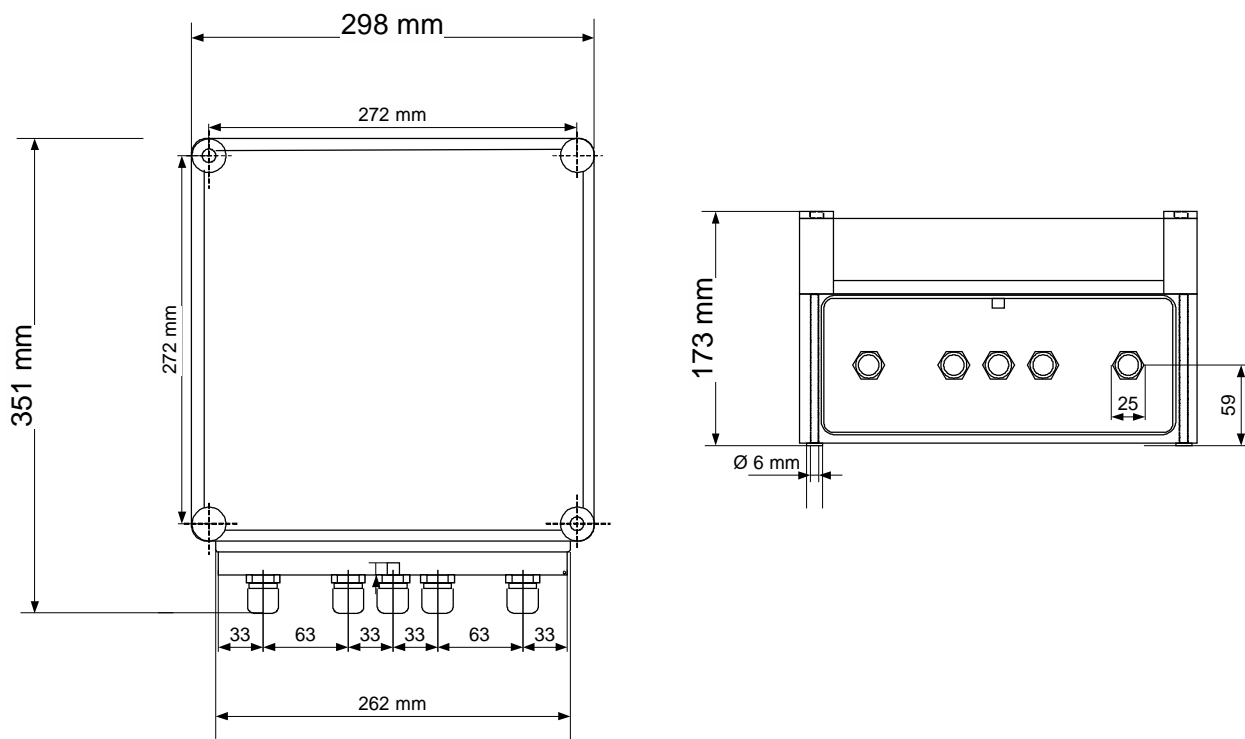
Typical reading range is between 10 cm to 70 cm distance depending on the type of antenna and transponder

3. Technical Data

3.1 Mechanical Characteristics Reader

The meaning of IP followed by two numbers example: IP55, has been taken by using the European Standard "Definition of Protection DIN 40050". IP44 using this table would mean, first digit 4 protection against grain size foreign body, second digit 4, protected against splashed water. The number 0 has a value of no protection. The scanner and the power supply is integrated into an housing with glands for the cable connection. When assembled correctly the housing can also be used in a wet environment according to IP 55. The cable connections are done inside the housing by means of clip terminal blocks.

The dimensions of the housing are:	298 x 351 x 173 mm.
The weight is approximately:	5,2 kg.
Storage and operation temperature:	-5° bis +45°C
Humidity:	95 % bei +45°C (non condensing)



3.2 Mechanical Characteristics Antenna

The ground antenna consists of plywood board with integrated antenna coil and antenna driver.
The antenna driver is integrated into an aluminium die cast housing of the protection class IP44. The complete ground antenna corresponds to the protection class IP 40 and is not suitable for the use in wet areas.

The cable connection takes place using a plug.

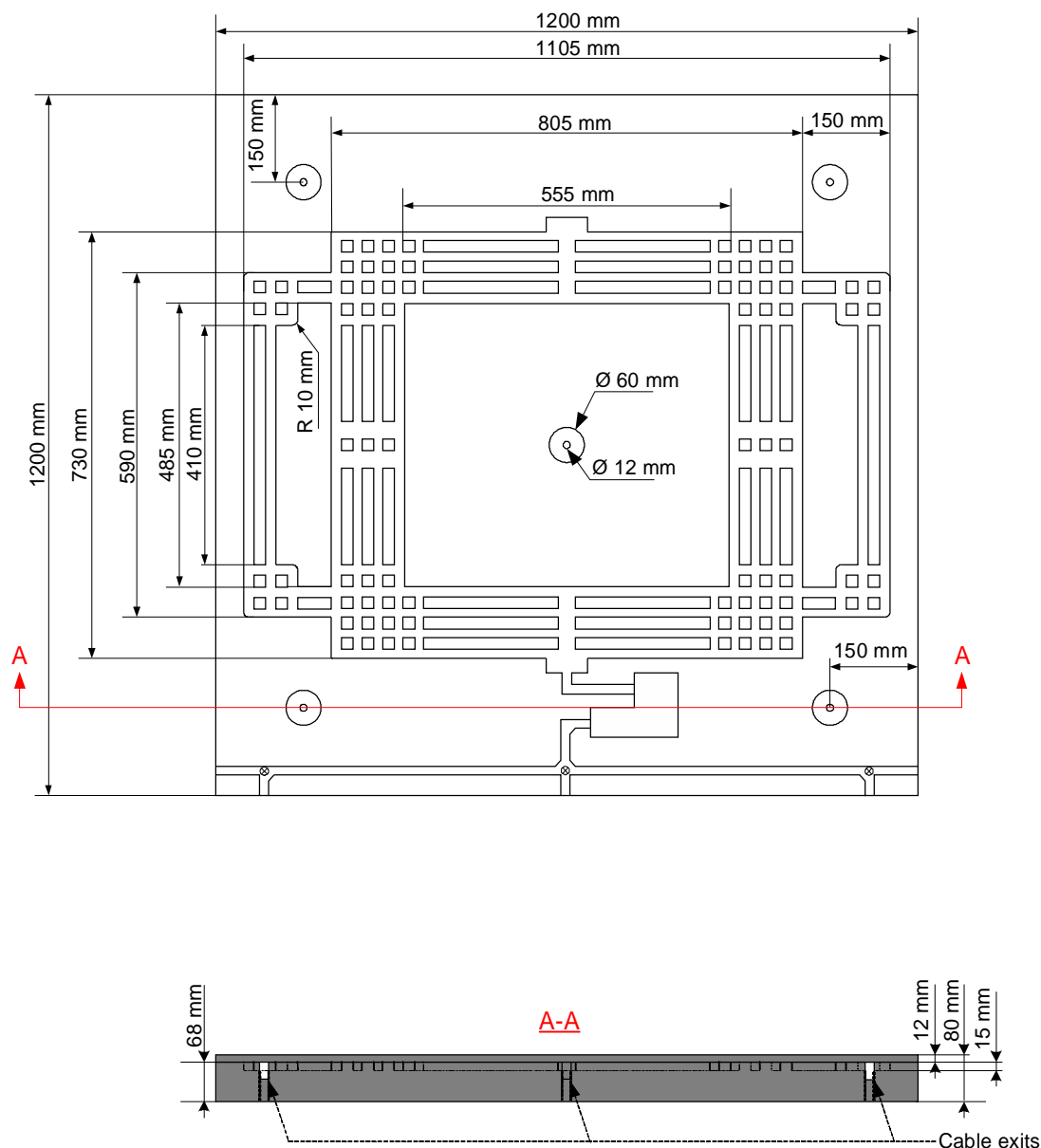
The antenna is available in different dimensions.

Example:

Antenna with dimensions : 1200 x 1200 x 80 mm

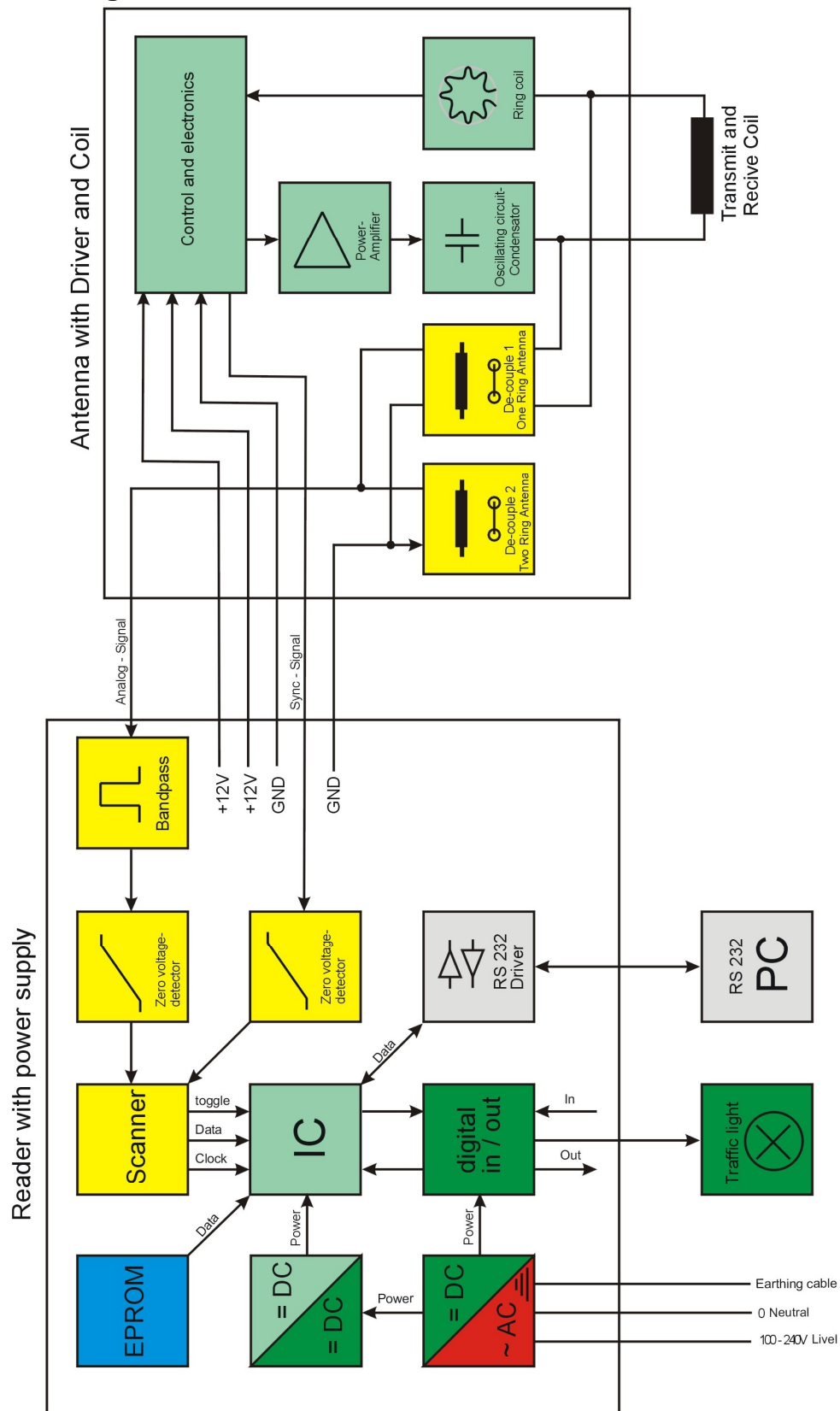
The weight is approximately: 90 kg.

Storage and operation temperature: -5° bis +45°C



3.3 Block Diagram

Block diagram Transponder reading system



14.09.2005

3.4 Electric Characteristics Reader

Voltage range V-in:	100 – 240V AC
Line frequency range:	47 – 63HZ
Rated current I _{in} max.:	1,95 – 0.97A max.
Input power in Standby:	14W
Input power max.	95W
PC interface:	2 wire RS 232
max. cable length PC interface	15 m = 50 Feet
max. cable length Antenna cable	10 m = 33 Feet
Fuse for input power:	4,0 A/250 V T
Number of inputs (coupled optics):	1
Number of outputs:	2
Traffic light:	24V max. 25W
Reading time:	50 ms using default settings

3.5 Electric Characteristics Printed Circuit Board EUR-4100

Voltage range V-in:	24 V (18....30V) DC
Average input current (active antenna included):	1 A max.
Standby input current (antenna not active):	0,07 A
PC interface:	2 wire RS 232
Fuse:	1,6 A/250 V inert
Number of inputs (coupled optics):	1
Number of outputs:	2
Reading time:	50 ms using default settings
Reading error rate ¹ :	<1 ppm

3.6 Electric Characteristics Antenna Driver EUR-3110

Voltage V-in:	12 V DC
Average input current (active antenna included):	400 mA, max.700 mA
Voltage Antenna coil:	400 Vss max.
Debit frequency Antenna coil:	125kHz

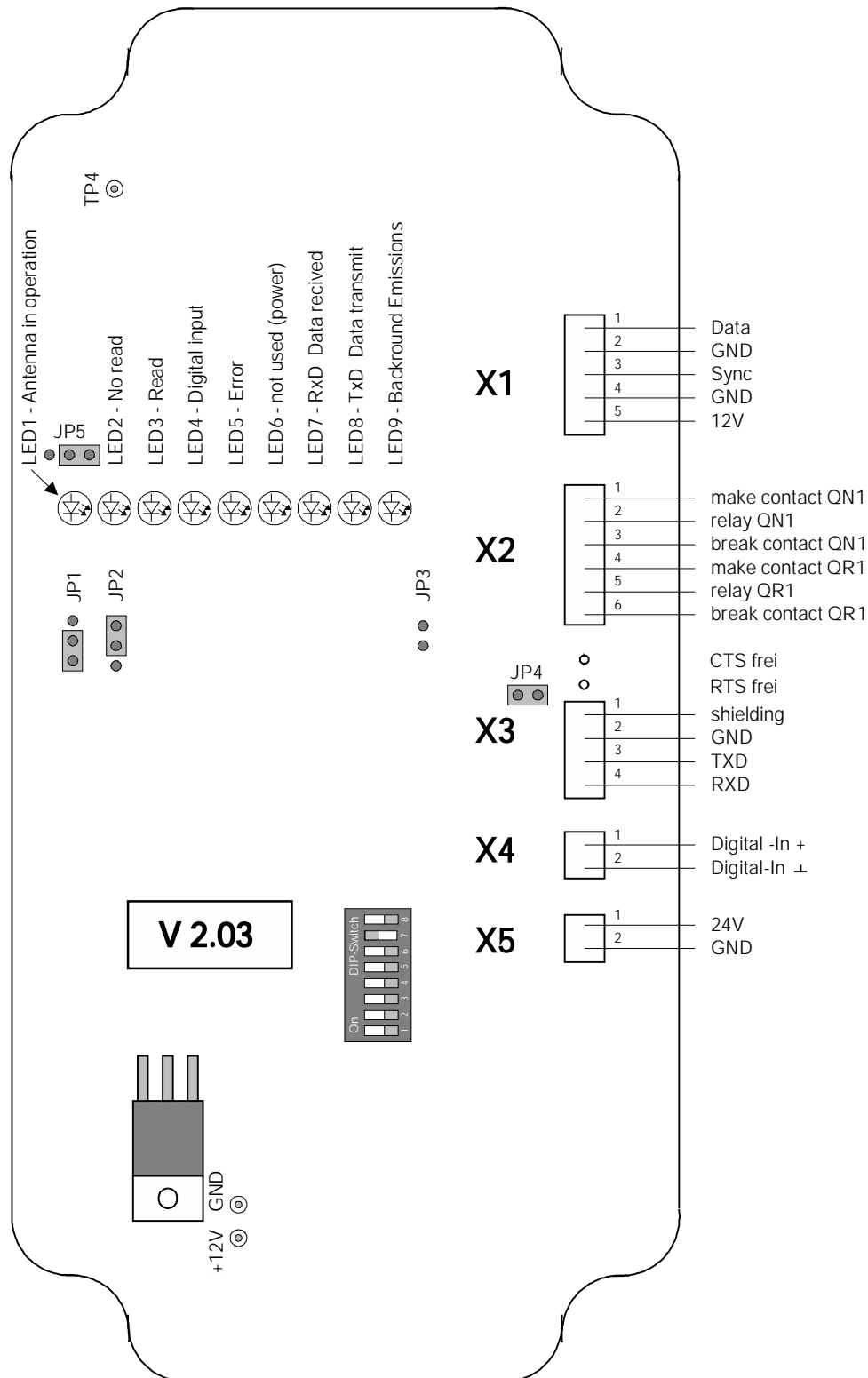


Beware dangerous Voltage

Never operate the device with defective antenna cables. The antenna cables may conduct dangerous voltages. When disconnecting an antenna cable ensure that the device is turned off and the cable was grounded for a short time before touching it. Otherwise stored energy of the antenna may discharge and cause harm.

¹ Definition of the reading error rate: The reader is set to the default values (i.e. NRD1, NID1, TOR5, MD2...). A transponder is located stationary within the optimal antenna field (signal level is at least 250 mV above noise level). The reader is triggered 1,000,000 times using the GT command. The total number of wrong readings is zero.

3.7 The EUR-4100 PCB



3.8 Connection Characteristics of the Digital Inputs

The reader is equipped with an optical isolated digital input. The positive edge causes a trigger signal. The input voltage is 24 V DC.

3.9 Connection Characteristics of the Relay Outputs

Relay 24 V / 1 A / 1 change over switch
The switching conditions can be modified by software parameters.

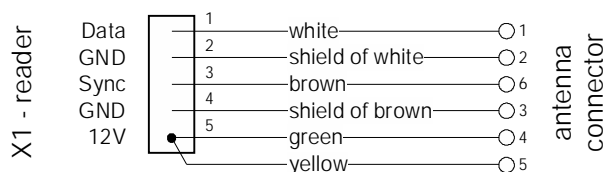
3.10 Pin Configuration of the RS 232 Interface

Reader X3	PC: SUB-D 9	PC: SUB-D 25
4 (RxD)	3	2
3 (TxD)	2	3
2 (GND)	5	7

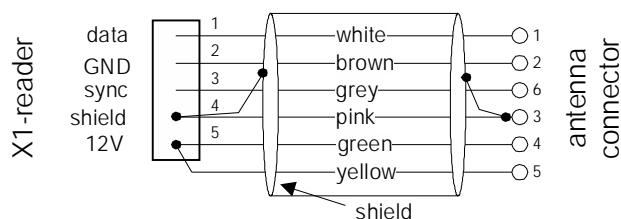
Interface parameters: 19200 baud, 8N1

3.11 Pin Configuration of the Terminal Blocks (for antenna, power lines, etc.)

a) using cable type LiY-LiYCY-Y 2+2x0,5 (delivered until March 2001)



b) using cable type Li2YCY (TP) 3x2x0,34 (delivered from March 2001)



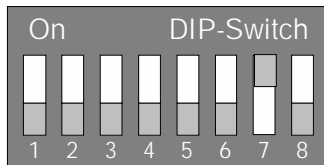
3.12 Antenna cable

See section 3.10

Lapp cabel Li2YCY (TP) 3x2x0,34 max cable length between Antenna and reader 10 meters (33 Feet).

Other cable lengths available on request.

3.13 DIP- Switch



In normal condition (from factory) the DIP-switch 7 is set ON (up) = Auto Start.

If switch 1 is in position ON, the default values (see chapter 4 - firmware) are loaded out of the EPROM at a cold start (when reader is put in operation). For configuration purposes, when setup options are finished this DIP- Switch must be turned to position off again.

3.14 Lights

In the Readerbox there are two deep LEDs - lamps

The white lamp constantly shines if the Reader is switched on.

The green lamp shines as long as a Transponder is in the active reading area of the antenna.

The green lamp shines for a long time after, until the time T2 ran out.



Traffic light: shines with successful reading

There are several LEDs inside of the reader housing on the printed circuit board.

The functions of these LEDs are:

LED 1 on when antenna is in operation.

LED 2 on when last read was not successful.

LED 3 on when last read was a success.

LED 4 on as long as the digital input is high.

LED 5 on when a hardware error was detected.

LED 6 not used (power).

LED 7 on as long as commands are received on the RS 232 interface.

LED 8 on as long as information is transmitted from the RS 232 interface.

LED 9 Background Emissions.

4. Firmware

In the operating mode MD0 = (interface triggered), each reading is commanded through the GT (get tag).

In the operating mode MD1 = (continuous), the antenna is permanently on and ready for reading.

In the operating mode MD2 = (pulse), the antenna is clocked every 30 msec to switch on and off.

In the operating mode MD3 = (hardware triggered), the reading must be triggered by use of hardware.

After powering up the mother board with an antenna connected an EPROM checksum is calculated. If the result is different to the result stored the reader is set into an initialisation mode (red LED (Error) flashes in one second interval). By a power down and subsequent power up the EPROM is initialised with the following values:

Program:	HLT
ReadMode:	command
Echo:	ON
Prompt:	ON
add LF:	ON
RTS/CTS:	OFF
XON/XOFF:	OFF
Preamble:	00
Postamble:	00
OkID= +QX2:	ON
NoID= +QX1:	OFF
unique ID:	OFF
send NoID:	ON
BCC Check:	OFF
Read/Try:	4
Match/Try	2
Telegrams:	8
Bitlevel:	2
NNID/Try:	8
T1 [100ms]:	8
T1 [100ms]:	8
Input IX:	active high

The initialisation of the EPROM is also possible without an EPROM or processor exchange. This can be achieved by switching DIP switch 1 to **on** and a subsequent power down/power up which brings the system into the initialisation mode. After that the switch 1 must be switched to **off** again and another power down/power up sequence has to be generated. Now the basic parameters shown above are valid again.

For more details please read the point 10. Protocol V 2.03.

4.1 Security of the Data Transfer

For security of the data transfer multiple readings are being done. Hereby, the codes are compared with one another and are evaluated via special algorithms. Only after these additional tests are completed with a positive result, the reading is marked and seen as successful and released at the interface for further processing.

The following procedure is standard with the EUR 4100 readers.

Positive recognition of all histograms and output at the interface in ca. 50 ms

Histogram 1 = Histogram 2 = ID 1

Histogram 3 = Histogram 4 = ID 2

ID 1 = ID 2 = Transpondercode – Output

Recognition of a histogram with failure, restart and output at the interface in ca. 100 ms.:

Histogram 1 = Histogram 2 = ID 1

Histogram 3 unlike Histogram 4 = Stop + Restart

Histogram 1 = Histogram 2 = ID 1

Histogram 3 = Histogram 4 = ID 2

ID 1 = ID 2 = Transpondercode – Output

4.2 Command Set of the Data Transfer

NRD Number of Reads Default 4 Please don't change
Maximum number of histogram readings which are used for the evaluation of a transponder code.

NRD[n]

NID Number of IDs Default 2 Please don't change
Number of IDs to match before the transponder code is determined "GOOD" and is presented at the interface.

NID [n] Selection of m (NID) equal ID's from n (NRD)



The parameters NRD and NID are only to be changed after consulting with the Manufactures.

5. Putting into Operation

- a) Connect the antenna with the reader. Connect a Personal Computer or equivalent to the reader via the RS 232 interface. Please assure the interface is set to the right baud rate. Not before, now connect the reader to a 100 – 240V AC source. The white lamp will constantly shine if the Reader is Switched on.
- b) Establish a connection to the reader (parameter: 19200 baud, 8N1) by using an appropriate software (for example Windows terminal program). Test the configuration of the reader with the command VS.
- c) If the device is in operation MD1, the scanner will send transponder numbers to the computer, as long as a transponder is in the active antenna field.
- d) After the device is successfully tested as described above, you can set the reader configuration as needed..

6. Trouble Shooting



Should the reader not work as desired, the problem could lie in the following:

- a) Is the configuration of the reader as requested? Check with help of the command VS!
- b) Is the configuration not known, the baud rates of reader and terminal set different? Restore the basic setting of the parameters values as follows! Put DIP-switch 1 ON, make a cold start by interrupting the power supply put DIP-switch 1 OFF again. Again interrupt the Power supply. Now all parameter values are set to the default values, the reader will work in normal condition.
Attention! All settings are temporary. This means they are lost after switching of the reader. Make the setting permanent using the command VSAVE.
- c) Is the antenna defect or not properly connected? (In this case LED 2 is not on although the reader is in read mode)
- d) The transponder is not in the active antenna field. Bring the transponder closer to the antenna.
- e) Antenna mounting is wrong (for example on a metal plate). In such a case, it can happen that the radiated antenna power is consumed by eddy currents in nearby metal structures. An indication for such situation is an exceptional high current consumption of the reader.
- f) The ideal situation is that LED 9 does not light up as long as there are no transponders in the reading field. Radiated emissions from other sources reduce in general, accurate reading distance.
- g) High frequency fields radiated by other devices interfere with the reader communication. Please check if such devices are near to the antenna or the antenna cables. Typical devices which interfere on the reading range are for example: some monitors for computers, switched power supplies, electrical motors, etc. Please remove such devices or remove the radiated interfering filed by proper grounding.
- h) If the mechanical configuration of metal piece parts can not be changed and/or is not suitable for proper readings, please check, if better reading results can be obtained with a different antenna. Also electrical insulation for metal parts against each other can help to reduce the eddy current effect.
- i) If the noise resistance or reading frequency of the reader was reduced by changing the parameters NID or NRD, please return the reader to the preset configuration of the manufacturer.
- j) LED5 is an indication of a hardware failure. If after checking all above points a reset does not help return the device for repair.

7. Antennas

The following antennas are suitable for this reader:

- | | | |
|----|------------------------|----------|
| a) | AEG high power antenna | AAN FK0 |
| b) | AEG large antenna | AAN FK2 |
| c) | AEG pole antenna | AAN FK3 |
| d) | special antenna Wilms | EUR 3110 |

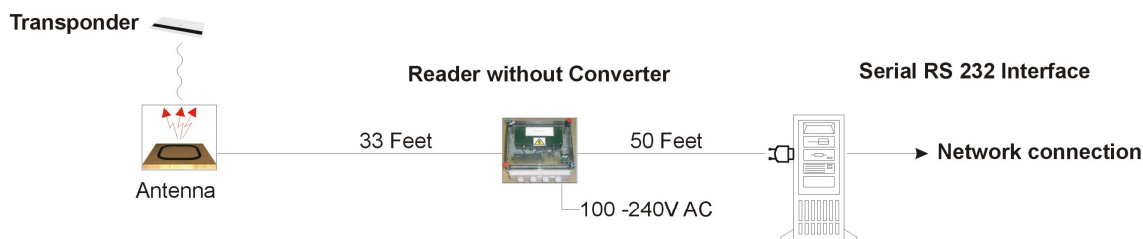
The reader with the above antennae was tested against the requirements according ETS 300683 and ETS 550022 class B.

It is possible that antennae of other manufacturers may fit to the device. However, if connecting such non original manufacturer antennas to the device, the warranty will get be void. A separate operation permission by the local state administration may also be required.

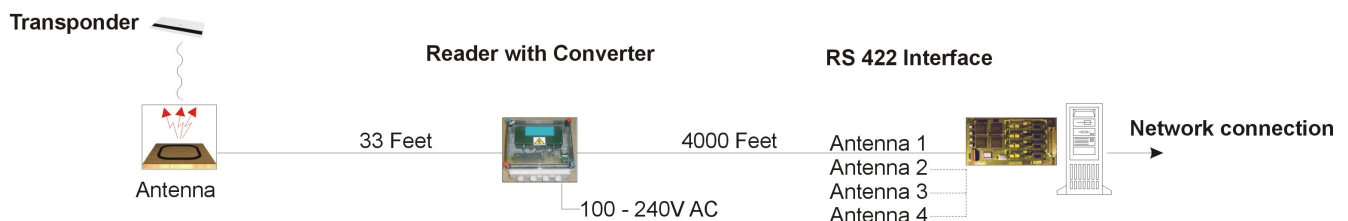
8. Special Models

The standard device is equipped with an RS 232 interface (cable length max. 50ft = 15 Meter).
The Wilms Company reserves the right to modify and make changes to the device.
On request there are special models available which support the RS 422 interface (cable length max. 4000ft = 1200 Meter).

Ground Antenna and Reader with RS 232 interface



Ground Antenna and Reader with RS 422 interface



9. Protocol

Short Description of the Abbreviations and Terms

ASCII	American Standard Code for Information Interchange
BCC	Binary Count Check, procedure to detect errors during data transfer
Bitlevel	Parameter to set the signal/noise ration for telegram evaluation
CTS	Clear To Send, interface signal to control data transfer
ID	Identification
Reading	Interval of telegrams. The result of a reading is a transponder code or NoID. Opposite to the reading cycle a reading is not presented at any external interface of the reader, this means that the result is only processed internally
NID-Matches	Selection parameter, determines the number of equal transponder codes which have to be found within a reading cycle to make it a successful reading (OkID)
NID/Try	Parameter, determines the number of successful readings within a reading cycle
NoID	Output of FFFFFFFFFF if no transponder is detected, perhaps to be used to set the relay output 1 (QX1)
NoRead	see NoID
OkID	Parameter to set the relay output 2 (QX2) with a successful reading.
Preamble	Fixed character, always to be entered before the data string
Postamble	Fixed character, always to be entered behind the data string
ReadMode	Mode for the start of a reading
RTS	Request to Send Interface signal to control the data transfer
Telegrams	Series of 64 data bits during transmission from the transponder to the reader
Superimposition factor	Number of superimpositions of telegrams to reduce signal/noise. To be influenced by the parameter "Telegrams"
uniqueID	single output of the ID, if the transponder is in the antenna field for a longer period
XON/XOFF	Interface signal to control the data transfer

the trovan[®] Identification System

EUR 4100 Mini Reader

Protocol

The request has the following format:

<Preamble><command><SP>Parameter 1<SP>....Parameter x<Postamble>

The parameters can be numerical value as well as "ON" respectively "OFF".

Example: <00>HLP<0D> displays a list of all commands and parameters
 <00>T1<SP>5<0D> sets the timer for Relay 1
 <00>Q1<SP>ON<0D> sets Output 1

The response has the following format:

<PRE><return value><POST> or in case of an error
<PRE><NAK>#n<POST> with n as error number

| Character | Hex value |
|-----------|--------------|
| <ACK> | 06 |
| <NAK> | 15 |
| <LF> | 0A |
| <POST> | 0D enter key |
| <SP> | 20 space key |

Entering of Commands as an Input String

The input string can include up to 32 characters, exclusive <POST>.

The commands can be entered as single command together with <POST> or separated by at least one <SP> as shown in the following example:

<PRE>MD<SP>1<SP>T2<SP>1<SP> T1<SP>5<SP>RUN<POST>



ATTENTION!

The command HLT stops the reading task. Therefore this task must be started again with the RUN command after input of the parameter settings.

In case of a parameter input string with <SP>-separation a "?" has to be entered for commands which do not include a numeric parameter if the status request is to be generated.

Example: <PRE>MD<SP>1<SP>T2<SP>?<SP> Q1<SP>?<SP>RUN<POST>

If INIT is part of an input strings the following has to be noted:

If DIP switch 7 is set to ON, the system is started automatically.

If DIP switch 7 is set to OFF the system must be started again with RUN.

When entering parameter settings via an input string RUN should be entered as final command.

If RST is part of an input string, all commands behind RST up to the <POST> are deleted from the input buffer and the next command can only be sent after RST start up sequence has been completed (processing time approx. 1 second).

10. Command Set

ANR Add antenna number Default: OFF
With this command the additional output of an antenna number (1<SP>) in front of the transponder is enabled or disabled.

| | | |
|------------------------------|-----------------------|---------|
| Example: | Input | Output: |
| Reading of the preset value: | <PRE>ANR<POST> | ON |
| Disable: | <PRE>ANR<SP>OFF<POST> | |

BCC Add BlockCheckCharacter ON/OFF Default: OFF
With BCC ON the security of the data transfer to the PC can be controlled respectively increased.

COP Computer Operating Properly Default ON
This command toggles the watch dog on or off. The watch dog monitors the program in the processor. The system is restarted in case of an error.

| | | |
|------------------------------|-----------------------|---------|
| Example: | Input: | Output: |
| Reading of the preset value: | n <PRE>COP<POST> | ON |
| Disable: | <PRE>COP<SP>OFF<POST> | |

EC Echo Default ON
<PRE>EC<SP>ON With ECHO ON all input characters are echoed from the reader.
<PRE>EC<SP>OFF With ECHO OFF the characters are not echoed.

ERR Display and delete the last error message. To carry on using the reader the last error message must be read. Reading the error message deletes the error buffer.

| | | |
|--|----------------|-------------------|
| Example: | Input: | Output: |
| Reading the error: | <PRE>ERR<POST> | 2 (antenna error) |
| Antenna error is the only error code which can be generated. | | |

FRQ Measurement of the actual sending frequency of the antenna.
Stops the reading task. System must be started again with RUN.

GPLS Good Pulse Default: ON
With a transponder code determined as GOOD the relay output Q2 is set for the time t2. With t2=0 the output remains set.

GT Get Tag
Starts a limited reading and returns the code according to the preset format.

<PRE>GT<POST>

If operating mode 4* or 5* is selected and TimeOut TO is >0 as well as no ID is detected until the timer has elapsed the following error message is shown:

<PRE><NAK>#9<POST>

<PRE>GT<POST> If a code is detected it is returned in the following format:

<PRE>0123456789<POST>

the trovan[®] Identification System

EUR 4100 Mini Reader

HLP Help

<PRE>HLP<POST> Displays the following list of all commands and parameters.

[System] SETUP RST RUN HLT ERR VS FRQ VER SNO INIT HLP
[Reader] GT LID MD NRD NID NPLS GPLS BCC UNIQ NOID ANR
[Serial] LF EC XO RTS PRMT
[Input] IX IXL IXH
[Output] Q1 T1 Q2 T2

<PRE>HLP<SP>name<POST> Help text for command "name".

HLT Stops the reading task to ease the input of parameter changes. The system must be started again with RUN.

INIT Reset onto the values shown in paragraph 1. Stops the reading task. The communication parameters (Baud rate and Data bits) are only active after a cold or warm start. If DIP switch 2 is ON the system is started automatically. If DIP switch 2 is OFF the system must be started again with RUN. When inputting the parameter values via an input string RUN must be the final command. Parameter settings should always be done in the HLT-Mode. The system can be started again with RUN.

IX Display the signal level at the digital input

| | |
|----|----------------|
| 00 | no signal |
| FF | signal present |

IXH Active HIGH Default. HIGH

IXL Active LOW
These commands determine the activation level for the digital input.

LF Extended <LF> to <CR>.

LID Output last read.

MD Reader mode Stops the reading task. System must be started again with RUN.

MD Displays current reader mode.

MD<SP>0 Mode: Command
Reader only starts with 'GT' command for NRD readings.

MD<SP>1 Mode: Continuous
The antenna is not pulsed. With NoID=ON, NoID is output if no ID was detected after NRD readings.

MD<SP>2 Mode: Pulse
The antenna is switched off after NRD readings for NRD*30 ms. Also see MD0.

MD<SP>3 Mode: Trigger
If the digital input is active (IXL/IXH) the antenna starts. When the digital input becomes inactive and NoID was detected NoID is output if NoID=ON.

ATTENTION: The MD commands set the system into HLT mode. It must be restarted with RUN.

the trovan[®] Identification System

EUR 4100 Mini Reader

The parameters NRD and NID are only to be changed after consulting with the Manufactures.

NRD Number of Reads Default 4 Please don't change
Maximum number of histogram readings which are used for the evaluation of a transponder code.

NRD[n]

NID Number of IDs Default 2 Please don't change
Number of IDs to match before the transponder code is determined "GOOD" and is presented at the interface.

NID [n] Selection of m (NID) equal ID's from n (NRD)

NOID If no ID was detected after the set number of readings (NRD) a 10 ASCII character NoID string is sent (FFFFFFFF).
Default ON

NPLS No Pulse Default:OFF

If no transponder code is detected relay output Q1 is set for time t1. With t1=0 the output remains set.

PRMT Prompt ON/OFF Default ON

With PRMT ON a "-" is shown as input request. When resetting the system a system information string including product name, manufacturer, versions no. and a 16 bit ROM checksum in HEX is displayed (also see VER).

No such information is shown with PRMT OFF.

Q1 Output 1 corresponds with Relay 1
This output can be set and reset independently.
With T1>0 the output is reset after T1*100 ms.

| | |
|-----------------|----------------|
| Example: | |
| Q1<POST> | Status request |
| Q1<SP>ON<POST> | Set output |
| Q1<SP>OFF<POST> | Reset output |

Q2 Output 2 corresponds with Relay 2

With T2>0 output 2 is set for T2*100 ms if a valid code was detected.

With T2 =0 the output can be set and reset independently.

| | |
|-----------------|----------------|
| Example: | |
| Q2<POST> | Status request |
| Q2<SP>ON<POST> | Set output |
| Q2<SP>OFF<POST> | Reset output |

T1 Timer 1 for Relay 1

Time in 100 ms after which output 1 is reset. With T1 = 0 the output must be reset explicitly.
Valid values are 0 .. 65.535 with a time range of 0 .. 6.553,5 s.

| | |
|----------------|---------------------|
| Example: | |
| T1<POST> | Status request |
| T1<SP>10<POST> | Timer is set to 1s. |

T2 Timer 2 for Relay 2

Time in 100 ms after which output 1 is reset. With T2 = 0 the output must be reset explicitly.
Valid values are 0 .. 65.535 with a time range of 0 .. 6.553,5 s.

Firma Gustav Wilms
Im Glanetal 6
D 49152 Bad Essen

GERMANY

Technical changes without notice

Tel.: +49-(0)5427-9423-0
Fax.: +49-(0)5427-9423-33
eMail: wilms@wilms.com
<http://www.wilms.com>
EUR 4100 Version Wilms Firmware 2.03

the trovan[®] Identification System

EUR 4100 Mini Reader

- RST** Restart of the reader.
Initiates a warm start of the reader system.
ATTENTION!
The processing time is approx. 1 second.
If RST is part of an input string all commands after RST up to <POST> are deleted from the input buffer.
- RTS** RTS/CTS Enable/Disable Default: OFF
With RTS ON RTS is LOW for the processing period. The input CTS is controlled by the PC. If CTS is set LOW the reader stops.
- Example:
- XO<SP>ON<POST>
XO<SP>OFF<POST>
- RUN** Starts the reader tasks (see HLT and INIT).
- SNO** SNO<POST> displays the serial number, ROM version, ROM checksum.
- UNIQ** uniqueID Default off single output of the ID, if the transponder is in the antenna field for a longer period
When ON only changed transponder codes are send.
- VER** shows the ROM version
Shown is the system info, Product info, Manufacture, Version Number and a 16 bit ROM checksum in HEX
- VS** Show Variables
Overview about the current operating parameters as described in paragraph 1.

Example:

```
Program:      HLT
ReadMode:    command
Echo:        ON
Prompt:      ON
add LF:      ON
RTS/CTS:     OFF
XON/XOFF:    OFF
Preamble: 00
Postamble:  00
OkID= +QX2:  ON
NoID= +QX1:  OFF
unique ID: OFF
send NoID:   ON
BCC Check:   OFF
Reads/Try:   4
Match/Try:   2
Telegrams:   4
Bitlevel:    2
T1 [100ms]:  8
T1 [100ms]:  8
Input IX:    active high
```

- XO** Xon/Xoff
If XO is ON the reader sends XOFF (^S) on receipt of a command. After processing this command, the reader sends XON (^Q).

Example:

XO<SP>ON<POST>
XO<SP>OFF<POST>

Firma Gustav Wilms
Im Glanetal 6
D 49152 Bad Essen

GERMANY

Tel.: +49-(0)5427-9423-0
Fax.: +49-(0)5427-9423-33
eMail: wilms@wilms.com
<http://www.wilms.com>

EUR 4100 Version Wilms Firmware 2.03

11. Setup Menu

SETUP Main menu: Setup

Main Menu

- 1 - Communication
- 2 - Reader Mode
- 3 - In/Output

L - Load defaults
S - Save & Exit

X - Exit

Choice : 1

Sub Menu: Communication (1)

Settings of the serial interface

Communication

- 1 - Baud rate: 19200 bd
- 2 - Data format: 8 NONE 1
- 3 - Echo: ON
- 4 - Prompt: ON
- 5 - add LF: ON
- 6 - XON/XOFF: OFF
- 7 - RTS/CTS: OFF
- 8 - Preamble: 00h
- 9 - Postamble: 00h

X - Done

Choice : 1

Sub Menu Communication: Baud rate (1)

Settings of the baud rate

Baud rate: = 19200 bd

- 0 - 2400 bd
- 1 - 4800 bd
- 2 - 9600 bd
- 3 - 19200 bd
- 4 - 38400 bd

X - Done

Choice :

the trovan[®] Identification System
EUR 4100 Mini Reader

Sub Menu Communication: Data format (2)

Settings of the data format

Data format: = 8 NONE 1

- 0 - 8 NONE 1
- 1 - 8 EVEN 1
- 2 - 8 ODD 1
- 3 - 7 EVEN 1
- 4 - 7 ODD 1

X - Done

Choice :

Sub Menu Reader Mode

- 1 - ReadMode: command
- 2 - send NoID: ON
- 3 - unique ID: OFF
- 4 - add ANT-NR: OFF
- 5 - BCC Check: OFF
- 6 - NID/Try: 04
- 7 - ID-Matches: 02
- 8 - Telegrams: 04
- 9 - Bitlevel: 02

X - Done

Choice: 1

Sub Menu ReadMode

ReadMode : = command

- 0 - command
- 1 - continuous
- 2 - pulsed
- 3 - trigger

X - Done

Choice :

the trovan[®] Identification System
EUR 4100 Mini Reader

Sub Menu In/Output

In/Output

1 - OkID= +QX2: ON
2 - T1 [100ms]: 8

3 - NoID= +QX1: OFF
4 - T2 [100ms]: 8

5 - Input IX : active high

X - Done

Choice :

Choice: 1

Sub Menu Read Mode

Read Mode : = command

0 _ command
1 _ continuous
2 _ pulsed
3 _ trigger

X _ Done

Choice :

12. Error Codes



Protocol errors are shown in the format.

<NAK>#n<POST> with n between 0 .. 9.

| Error Numbers: | Meaning: |
|----------------|------------------------------------|
| Error# 00 | Command unknown |
| Error# 01 | Numerical argument without command |
| Error# 08 | Antenna error |

13. HYPERTERMINAL Example

When using Windows '98, 2000, XP:

start **Hyperterminal**

In the **File Menu**: select **New Connection**

Enter a **Name** and select an **Icon**. Click on **OK**.

In the next menu enter the field **Connection via**, click onto the small arrow on the right. The window opens, select e.g. **direct connection via COM 1**. Click onto **OK**.

| | | |
|------------------------|------------------------|--------------|
| Set the parameters to: | Bits per second | 19200 |
| | Data bits | 8 |
| | Parity | no |
| | Stop bits | 1 |
| | Protocol | No |

Click on **OK**, the reader is connected with the computer.

First Power Up of the Reader System

ATTENTION!

If you enter **md 1<SP>RUN** and terminate the input with the Enter key <POST> the green LED 6 lights up.(also see RUN/HLT).

If you now hold a transponder into the antenna field, the transponder code is immediately displayed on the screen as follows:

Example: 0400E83AF2