DAISY

RF/ID reader module DHP101/102

User Manual

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1 Introduction

The reader modules DHP 101/102 are highest quality components from the DAISY series.

Together with the programmable PSION® -workabout handheld computer you have a powerful mobile RF-ID-system which can easily adapt to your application.

Please read these manual carefully before using the system for the first time. The following descriptions will help you using the full efficiency of the system. A description of the protocols in chapter 5 will give you information for embedding the reader into your own application on the PSION® -workabout to profit from all benefits and features the system offers to you.

1.1 Content of package

Please check the content for completeness immediately after unpacking the system.

- The PSION® Readermodule
- A disc containing the software
- This manual

In the case of incompleteness please refer to your autorised dealer.

1.2 Content of manual

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2 Reader Module DHP 101

2.1 Description

The DHP 101 and 102 are **RF reader modules** from the DAISY product line and is used for contactless identification of objects by means of passive transponders.

These products were developed specifically as an add-on equipment for the PSION®-workabout hand-held computer, **for mobile applications.** The combination of this hardware provides a very flexible and versatile RF ID System and excellent cost-efficiency. A high standard of user comfort is achieved thanks to the ergonomic design, compact outline and low weight.

Note: Use only PSION®-workabout computers with an „RS 232/RS 232 TTL" option!

The DAISY Reader Module is **fully compatible** with the **ISO 11784/5** standards and is capable of reading **HDX or FDX-B-compatible** transponders. **H 4002-compatible** transponders are also supported. The acquisition of transponders takes place within a large acquisition range and is very fast. Some of the parameters for the reading function allow configuring to user requirements.

Operation of the equipment requires an application software for the PSION®-workabout computer addressing the reader module and processing the transponder data. Very **efficient programming tools** are available for preparation of the user software for the PSION®-workabout (e.g. OPL, OVAL, C) ensuring a high degree of flexivity, fast implementation and optimal adaption to user needs.

Thanks to the configurable outputting format of the acquired transponder data an optimal adaption to the application software is possible. The software example supplied with the equipment for communication between the reader and the PSION gives you a good start for programming.

2.2 Contactless RF-ID Identification

RF Identification - Functioning Description

The objects to be identified are fitted with passive transponders carrying the identification data. You then need a reader for communication with the transponders. The reader generates a high-frequency field which activates the transponder once the latter has entered the acquisition range. The high-frequency field serves as a power source for the transponders and as a data transfer channel towards the reader. The transponder data (unprocessed) thus received are used by the reader to generate a data block (ID Output) which it makes available for further processing through an interface.

Aside from the readers for mobile use, like the DHP 101/102 the DAISY product line also offers stationary readers for fixed installation.

Benefits:

The benefits of RF identificaiton relate to the comfortable and easy-to-automate acquisition process. The data exchange takes place in a contactless fashion, without optical contact and without need to know the exact position of the transponder.
The transponder is resistant to the typical environmental factors associated with their employment, enjoys a long service life and suffers no wear.

Typical Applications:

The range of applications in the farming business covers all acquisition processes involving animals with electronic transponder marking:

* Automation, documentation and statistics for feeding, weighing, etc.
* Proof of animal origin for the entire life span of the animal down to the end user
* Inspections and checking in the veterinary and trading domain.

Further applications relate to marking, identification and automation within the scope of automation technologies and logistics.

2.3 Transponders supported by the system

The DAISY Reader Module is fully compatible with the **ISO 11784/5** standards and supports **HDX and FDX-B-compatible** transponders. In addition, the reading of **H4002-compatible** transponders is also possible.

Types of transponders: -FDX-B transponders I.A.W. ISO-11784/11785
- HDX-transponders I.A.W: ISO-11784/11785
- H4001/4002/4003 transponders and H4002 compatible transponders

3 Installing the Reader Module on the PSION®-workabout

The DHP 101/102 reader module is mounted to the top of the PSION®-workabout. For this purpose, place the module on the upper surface of the computer properly oriented and install it by means of the two pre-assembled screws (antenna lefthand-side, Fig. 3).

This also ensures the electrical connection of the module to the PSION®-workabout for power supply and communication.

IMPORTANT: Never apply force to the screwing connection to avoid damage to the reader module or the PSION®-workabout. Make sure, the reader module is never exposed to extensive physical strain.

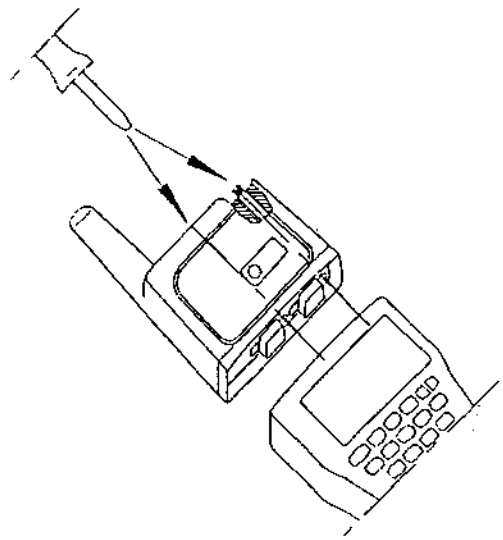


FIG. 1
Installing the DHP 101/102 Reader Module on the PSION®-workabout

3.1 Operation

3.1.1 Basic Settings

The DHP 101/102 Reader Module is pre-set to the reading mode by the manufacturer. After installation on the PSION®-workabout hand-held computer it is ready to function with the suitable application software.

3.1.2 Activation of the Reading Function

the opening of the PSION®-workabouts TTL port by the application software switches on the power supply for the DHP 101/102 Reader Module (see Operating Instructions for the PSION®-workabout and the reference program at chapter 5.6).

In the **Read Mode,** the reading function is activated at once. After recognition of a transponder in the antenna field, the module automatically transmits the pre-processed „raw data" as an ID output via the serial interface. As long as a transponder stays in the antenna field, the data are transmitted at a configurable repetition rate. Deactivcation of the reader module only takes place when closing the TTL port by means of the software.

In the **Request Mode,** the reading function is only activated after receiving a command (Get single ID).

The reading function is terminated after recognition of a transponder and the transmission of the ID output, or after expiration of a time-out function.

Take the transponder to be read into the acquisiton range of the activated reader module (see chapter 2.3.3).

The operating mode (READ or REQUEST) and several parameters of the reading function may be configured according to the specific application. The modificaiton of parameter settings is effected via commands from the PSION®-workabout (see chapter 5.4).

3.1.3 Reading Function

After activation of the reading function a transponder entering the acquisition range can be read very quickly. The DHP reader module achieves the following range performance dpending on the particular type of transponder:

* 25 cm with HDX-compatible transponders (30 mm in dia.)
* 19 cm with FDX-B-compatible transponders (DAISY DTE 530)
* 17 cm with H4002-compatible transponders (DAISY DTE 230)

At the indicated range values, a stationary transponder will be acquired within 1 second. the reading range is the distance of a transponder from the vertical edge of the DHP 101/102 reader module housing (see FIG. 1) as measured along the imaginary antenna axis.

Please note the following factors influencing the acquisition range of the equipment:

* **Orientation of the transponder** with respect to the reader module: The transponder axisshould be parallel to the axis of the reader antenna (see Fig. 1, 2 for disk or rod-shaped transponders). The larger the angle between the axes, the shorter the effective range.

* **Temperature range / environmental conditions:** An optimal result is achieved within the admissible operating temperature range for the equipment and within an environment free from interference (see chapter 6, Technical Data).

* **Installation** of the transponder **on metal** surfaces: This may adversely affect the reading distance

* **Transponder size**: The size of the transponder is directly proportional to the achievable reading distance.

* **Simulataneous operation of multiple RF ID systems:** The individual systems may interfere with each other.

IMPORTANT: Please make sure there is only one transponder within the acquisition range of the reader module. The presence of multiple transponders may greatly affect the acquisition reliability of the system.

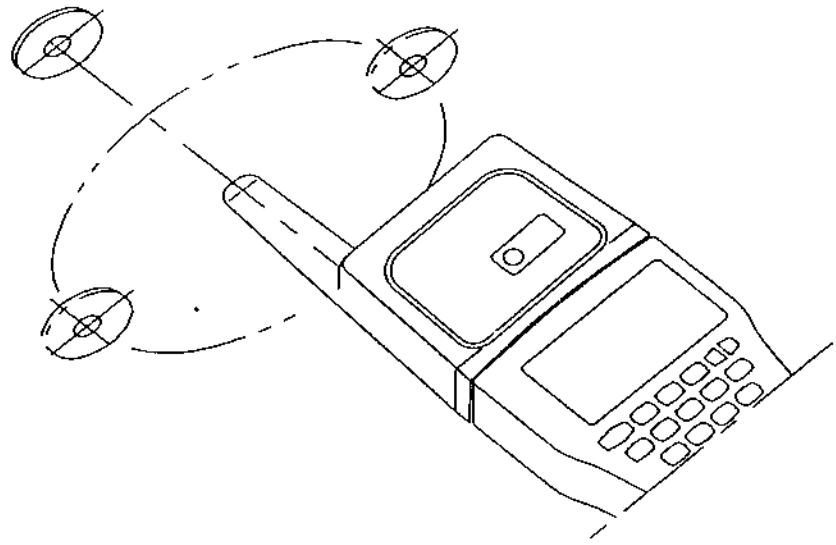


Fig. 2
Optimal orientation of a disk transponder with respect to the DHP 101/102 reader module

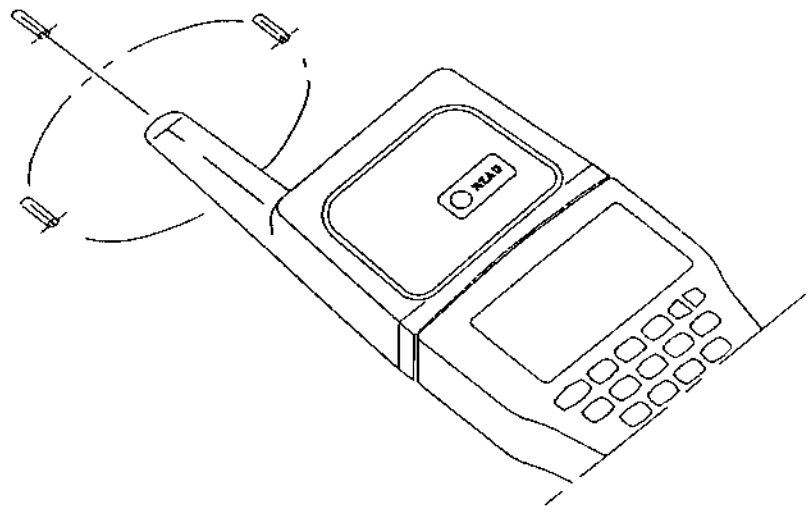


Fig. 3:
Optimum orientation of a rod/glasstransponder with respect to the DHP 101/102 reader module

3.1.4 Indication of reading function

The reader module will confirm the successful reading of a transponder by means of an optical signal, i.e. flashing of the „READ" indicator on the front display (see Fig. 1,2).

3.1.5 Output of Transponder Data

The transponder data collected by the reader module may be made available to the communication interface as an „ID Output" in different formats.

The data formats of the ID Output selectable by configuration (e.g. ASCII or binary) enable the user to achieve optimal integration within his particular application.

The content of the raw data and the ID output differ according to the type of transponder:

Type of transponder	Raw data	ID output *) in ASCII	ID output*) in bibary/com-pact coding	ID output*) raw data
HDX according to ISO-11784/85	104 Bit (w/o) 16 prebits/8 bit header	16 characters (decimal according to ISO)	8 Byte	13 Byte
FDX-B according to ISO-11784/85	128 Bit	16 characters (decimal according to ISO)	8 Byte	16 Byte
H4001/4002/ 4003 and compatible	64 Bit	10 characters hexadecimal	5 Byte	8 Byte

*) complete frame shape see chapter 5.3

3.1.6 Power Supply

The power supply and communication of the DHP 101/102 reader module is effected via the TTL port of the PSION®-workabout. No separate power supply is required.

The PSION®-workabout can be powered by two primary cells of the „Mignon" type. The use of alkaline primary cells will allow 3000 reading cycles (typically).

For permanent operation of the equipment we suggest the use storage batteries which are rechargeable by means of the charge station within the equipment (both items are PSION® accessories).

Using the appropriate accessories the PSION®-workabout can also be operated via external power pack.

To avoid cutting down on battery life of the PSION®-workabout the application software should only activate the highly current consuming functions of the reader module as long as required for reading the transponders.

In the Read Mode of the reader module this is possible using the respective software commands for the opening and closing of the TTL port of the PSION®-workabout.

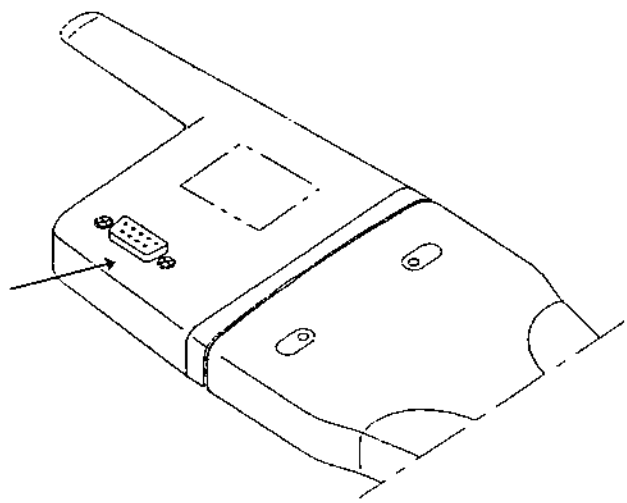
In the Request Mode, the reading cycle will start on a signal from the PSION®-workabout and will terminate automatically after reading of the transponder.

4 DHP Version 102

For applications requiring an online link between the identification data with data from external equipment an additional interface is needed. Thus, supplementary data (e.g. from barcode scanners or weighing systems) can be read into the PSION®-workabout or the identification data can be outputted for further processing (e.g. to a PC, network or printer).
The PSION®-workabout hand-held computer with the RS232/TTL option already provides a second, unused RS232 interface mechanically concealed by the housing of the reader module.. With the DHP 101 connection to external equipment is only possible when using the PSION®-interface module „3-Link" or the PSION® Base Station (PSION® accessory equipment).

The DHP version 102 variant makes the RS232 interface accessible from the outside. The associated SUB-D connector is located at the bottom of the housing to prevent the connecting cable from interfering with the reading operations.

Fig. 4:
RS232 interface
of the DHP 102
reader module



IMPORTANT: Use the supplied protective cap to protect the connector when not in use.

Use only the connecting cable offered as part of the DAISY accessory program.
The spiral shape of the cable (extendable from 50 cm to 200 cm in length) the angular connector housing and the stress-relief feature of the cable on the DHP 101/102 with a cable clamp are perfectly adapted to the intended use as a hand-held equipment accessory. The integrated anti-interference ferrit prevents mutual interference.

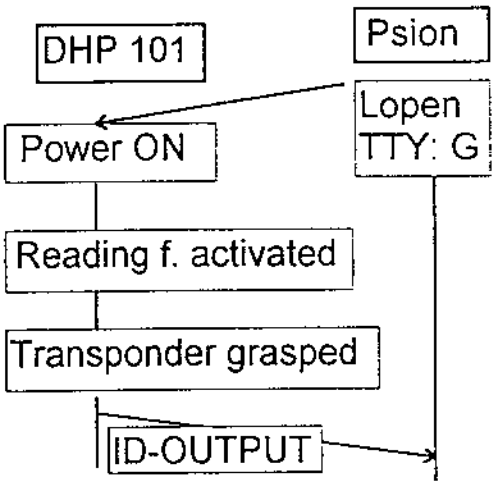
5 Operating Mode

The reader modules support two operating modes, selectable as per configuration.

5.1 Read Mode / Default Setting

The DHP 101/102 reader modules are set to the read mode (default mode) by the manufacturer of the equipment. The reader module starts a reading cycle as soon as the supply voltage is applied (controlled by the PSION´s application software; LOPEN TTY:G). When a transponder is detected, the acquired and processed transponder data are ASCII coded as an „ID output" and transferred to the serial interface. The ID output is repeated for as long as the transponder is located within the acquisition range.

The format of the ID output is described at chapter 5.3. The communication is unidirectional from the reader to the PSION® - workabout, with no response required. It is not required that the entire record of the reader module be implemented into the application software, when limited to the read mode. The ID output may be received as a simple ASCII string and the frame may be cut off.

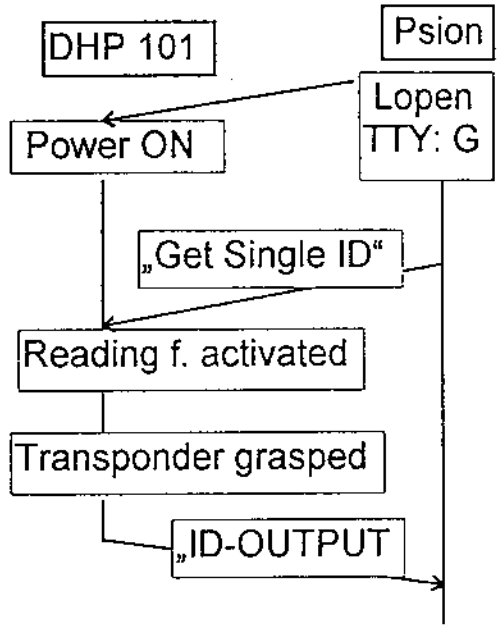


When receiving a command, the reading cycle is interrupted for processing of the command. Should the reader module be busy with an ID output, then the command will be neglected and must be repeated.

5.2 Request Mode

While the DHP 101/102 operates as a mere data sensor in the Read Mode under chapter 4.1, it will also allow bidirectional communication with the PSION®-workabout in the Request Mode.

The PSION® aplication software may control the reading function. The „Get_Single_ID" command will start a reading cycle based on the programmed configuration: The ID output of a recognized transponder will be transferred once to the interface in the respective format. The reading function terminates after such recognition of a transponder and transmission of the ID output or after expiration of a preset timeout.



The reading cycle is repeated when a new „Get_Single_ID" command is transmitted.
In this mode, the interface record is a bi-directional one. In this context, the PSION®-workabout serves as a command transmitter and the reader module as a responding „partner". The commands are confirmed by the receiver.
A change to the configuration (see chapter 5.7) will allow adaption of the following characteristics to the required application:

* Readable types of transponder, e.g. FDX only, will increase the reading speed.
* Reading characteristics, e.g. lower repeat rate of the ID output, if a transponder continues to stay within the acquisition range.
* Output format, e.g. binary output/Compact Coding reduces the space required for storing the Ids.

5.3 Description of Record

The following description fo record contains the complete information required for integration of the DHP 101/102 into an application software.

5.3.1 Data Transmission

Asynchronous semi-duplex transmission: 9600 baud, 1 start bit, 8 data bits, No Parity, 1 stop bit via TTL port of the PSION®-workabout, TTL level negated.

5.3.2 Frame configuration

All messages are packed into frames, the frame is configured as follows:

STX	DestrAdr	Source Adr	Message	CRC 8	ETX

The messages may be commands from the PSION®-workabout or replies or ID outputs from the reader module. For the following description of messages please note that they should be considered as a frame segment.

5.3.3 Stuffing Byte

Data bytes may be differentiate from the control characters STX, ETX DLE (0x02, 0x03, 0x10) is possible, if required, by using an upstream DLE stuffing byte (0x10, Esc character).

5.3.4 Addresses

Adr for PSION®-workabout:	const. 0x F0
Adr for reader module DJP 101/102:	const. 0x F3
Adr for broadcast:	const. ox FF

5.3.5 CRC

The check sum is computed automatically according to the CCITT-C Polynom $x^8 + x^4 + x^3 + x^2 + 1$ thru all bytes of the frame up tc excluding) the checksum itself. the stuffing character possibly us front of the checksum must also be included in the chec computation. For the transmission form the DHP 101/102 to the PSI workabout there will always be a DLE added in front of the CRC. following formula may be used to compute the checksum:

/* CalcCRC8(): Computes the CCITT-CRC-8 of the indicated charac the starting value will be the indicated CRC value. Th function must be called up, for every byte of the strin using the value of the preceding call as a starting valu The starting value of the first call is always 0x00.

```
static char CalcCRC8 ( char CRC, char character )
    {       unsigned char Count;
            for ( Count = 0; Count < 8; ++ Count )
            {       if ( (CRC & 0x01) ^ (character & 0x01) != 0 )
                    {       CRC ^= 0x70;
                            CRC >> = 1;
                            CRC |= 0x80;
                    }
                    else
                    {       CRC >>= 1;
                            CRC &= 0x7F;
                    }
                    Zeichen >>= 1;
            }
            return ( CRC );
}
```

5.4 Commands and Acknowledgements

The following commands are supported by the reader module (to be transmitted in the „Message" segment of a frame).

Command	Coding	Additional Data	Function
Get_Single_Id	0x22	-	Start a reading cycle in the Requ_ Mode. Autom. shut- down after acquisition process
Set_Config	0x28	cfg_new	Adopt new Configuration
Get_Config	0x29	-	Show present Configuration
Reset_All	0x18	-	Default-Configuration into EEPROM
Get_Version	0x09	-	Show Reader and Software version
Get_SNR	0x0A	-	Show Reader serial number

Get_ Single_ID:

Starts a reading cycle in the Request Mode. The reading cycle will be interrupted after acquisition of a transponder or after timeout. Response in the Read Mode is by means of a NACK.

Byte position in the Message segment	Value	Meaning	Remarks
0	0x22	Get_Single_ID	Starts a reading cycle in the Request_Mode

Frame:

STX	FF	F0	22	DLE**	CRC 8	ETX

DLE**: if required

Set_Config:

Programs a configuration register using the new values as follows:

Byte position in the Message segment	Value	Meaning	Remarks
0	0x28	Set_Cfg	Programming of new config. data
1	xx	Cfg_Adr	Address of the config. register
2	yy	Cfg	New content of the config. register

Frame:

STX	FF	F0	28	xx	yy	DLE**	CRC 8	ETX

Get_Config:

Reads the content of a configuration register

Byte position in the Message segment	Value	Meaning	Remarks
0	0x29	Get_Cfg	Show current configuration data on interface
1		Cfg_Adr	Address of the config. register

Frame:

STX	FF	F0	29	32	DLE**	CRC 8	ETX

Reset_All:
Recovers the Read Mode (Default) overwriting all configuration registers

Byte position in the Message segment	Value	Meaning	Remarks
0	0x18	Reset_All	Set configuration data to default values

Frame:

STX	FF	F0	18	DLE*	CRC 8	ETX

Get_ Version
Show the Reader and Software Version

Byte position in the Message segment	Value	Meaning	Remarks
0	0x09	Get_Version	Show version

Frame:

STX	FF	F0	09	DLE*	CRC 8	ETX

*DLE if required

Get_ SNR:

Show Reader serial number

Byte position in the Message segment	Value	Meaning	Remarks
0	0x0A	Get_SNR	Show serial number

Frame:

STX	FF	F0	0A	DLE*	CRC 8	ETX

Acknowledgements

the following acknowledgements are used by the Reader (transmitted in the „Message" segment of a frame):

Acknowledgements	Code	Arguments	Remarks
ACK	0x06	cmd	last cmd was successfully performed
NAK	0x15	cmd	couldn´t perform last cmd
Frame Error	0x08		receive damaged frame

ACK:

Correctly received data and processed commands are acknowledged by means of an ACK

Byte position in the Message segment	Value	Meaning	Remarks
0	0x06	ACK	Command was successfully performed
1		Cmd	Command to which this ACK relates
2 and greater		Data	additional data, if applicable

Frame:

STX	F0	F3	06	Cmd	Data 0	..	Data n	DLE	CRC 8	ETX

Example:
Content of the Data field:
after the Get_Version command: DHP101V1.05" (ASCII)
after the Get_SNR command: 000023 (ASCII)

056

NACK:

No correct data received, unknown commands or „not able to process commands" results in a NACK

Byte position in the Message segment	Value	Meaning	Remarks
0	0x15	NACK	Unable to process command
1		Command	Command to which this NACK relates
2		Error	Error Code, e.g. 01=unknown command

Frame:

STX	F0	F3	15	Cmd	01	DLE	CRC 8	ETX

5.5 ID Output

After recognition of a transponder, the related ID is transmitted accor to the pre-set format as an Output ID.

Message	Code	Arguments	Remarks
ID_Output	0x23	ID	ID received follows in the fra

Frame:

STX	F0	F3	23	ID 0	...	ID n	DLE	CRC 8	ETX

Due to the different lengths (depending on type of transponder and output format) an interlaced string is used as an ID output structure. Tl list contains the ID field with the transponder identification and the „typ field with the transponder type.

Construction of the ID output:

Byte position in the Message segment	**Value**	**Meaning**	**Remarks**
0	0x23	ID Output	Identification: This is an ID Output
1	Ptr1		Length of the ID field incl. Ptr 1
2	ID Field	ID Field	Data of length „n Bytes"
2+n	Ptr2		Length of the Type Field incl. Ptr2
3+n	Type Field	Type Field	Data of length „m Bytes"
3+n+m	0x00		0-Ptr as a termination mark

Message (ID):

23	Ptr1	ID field 0	...	ID Field n	Ptr2	Type Field 0	...	Type Field M	00

5.6 Output formats for the ID Field

The output format is defined by the configuration of the Cfg_Format" Register by means of a „Set_Config"command. The following formats are supported:

Output Format	Value of Cfg Format	Fmt_ Deziso	Fmt_ Bin	Fmt_ Raw Data	Remarks	Bytes for ISO	Bytes for 4002
ASCII (default)	0x01	1	0	0	ID field is ASCII coded for FDX-B and HDX ID and Country Code I.A.W. ISO 11784 for H 4002 data	16	10
Com-pact Coding (binary)	0x03	1	1	0	ID field is binary coded for FDX-B and DDX: ID and Country Code I.A.W. ISO 11784 for H 4002 data	8	5
Trans. Byte Struct.	0x02	0	1	0	Data I.A.W. ISO are binary coded for FDX and HDX: Data (ID, Country Code, reserv. data field, Animalflag) + CRC + Trailer for H 4002 correspond to „Compact Coding"	13	5
Transp. „Raw Data"	0x06 or 0x07	don´t care	1	1	Raw Data: binary coded for FDX-B: 128 bit raw data for HDX: 104 bit raw data (w/o header, prebits) for H 4002 64 bit raw data	16 HDX: 13	8

5.6.1 ASCII Output (Default Setting)

The ID output comprised of ID and Country Code as per ISO is transferred in the ASCII format. Transponders with invalid CRC or parity bits are rejected. The reserved data field, CRC and Trailer are not transferred under this format.

*** FDX-B and HDX Transponders:**

16 ASCII coded characters (16 Bytes), MSDigit first.

Cty_ ASCII_Char_3	...	Cty_ ASCII_Char_0	ID_ ASCII_Char_12	...	ID_ ASCII_Char_0

Cty_ASCII_Char_n: The number „n" byte of the Country Code according to ISO (consists of 4 digits 0-9) coded in ASCII.

ID_ASCII_Char_n: Number „n" byte of the ID code (consists of 12 digits 0-9) coded in ASCII.

*** H 4002 transponders and compatibles:**

10 ASCII coded characters (10 Bytes) MSDigit first.

ASCII_Char_9	...	...	...	ASCII_Char_0

ASCII_Char_n: Number „n" byte of the ID code (consists of 10 digits 0-9) coded in ASCII.

5.6.2 Compact Coding Output

The ID Output comprised of the ID and the Country Code is tranferred in the binary format. ID outputs with an invalid CRC or parity bit will be rejected. The reserved data field, CRC and Trailer are not transferred under this format.

*** FDX-B and HDX transponders:**

16 BCD coded numbers (8 Bytes), MSDigit first

Cty_BCD_3 : Cty_BCD_2	Cty_BCD_1 : Cty_BCD_0	ID_BCD_11 : ID_BCD_10	...	ID_BCD_1 : ID_BCD_0

Cty_BCD_n: The number „n" half-byte of the Country Code according to ISO (consists of 4 digits 0-9) coded in BCD.

ID_BCD_n: Number „n"half-byte of the ID code (consists of 12 digits 0-9) coded in BCD.

*** H 4002 transponders and compatibles:**

10 hex-coded numbers (5 Bytes), MSDigit first

Hex_9 : Hex_8	...	...	...	Hex_1 : Hex_0

Hex_n: The number „n" half-byte of the ID Code (consists of 10 hexa-digits 0-9) coded in BCD.

5.6.3 Transponder Byte Structure Output

The useful data from ISO - FDX-B/HDX transponders (ID, Country Code, reserved data field, Animal Flag) are outputted in a bibary format according to the sequence of receipt, including the CRC and trailer.The LSBit of an output Byte is the Bit first received by the transponder.
ID outputs with an invalid CRC according to ISO will be rejected.

*** FDX-B and HDX transponders:**
13 Bytes

ID_ Byte_0	..	ID_ Byte_7	CRC_ Byte_0	CRC_ Byte_1	Trail_ Byte_0	..	Trail_ Byte_2

ID_Byte_n: Number „n" Byte of the Bit structure according to ISO (consists of64 bit), bibary coded with reserved data field.
CRC_Byte_n: Number „n" Byte of the CRC according to ISO (consists of two Byte), binary coded,
Trail_Byte_n: Number „n" Byte of the Trailer according to ISO (consists of 3 Byte), binary coded.

*** H 4002 transponder and compatibles:**
in conformance with the „Compact Coding" format.

5.6.4 Raw Data Output

The complete set of raw data from a transponder are outputted in a binary format, in the sequence of receipt. The LSBit of an outputted Byte is the first bit received from the transponder.
For ISO transponders, the useful data (ID, Countra Code, reserve data field, Animal Flag) CRC and Trailer are included. For FDX-B transponders, the header and control bits are included.

ID Outputs with an invalid CRC according to ISO (or an incorrect parity bit for H 4002) are not rejected, which allows reading of transponders with a different structure. (for HDX only in case the header is identical). the absence of error check will also lead to an output of data received with bit errors.

*** FDX-B transponders, 16 Bytes:**

Useful data (starting with Byte 0), CRC and Trailer (with control bits each), Header,

Byte_0	...	...	...	Byte_15

Byte_n: Number „n" Byte of the ID Code

*** HDX- transponders, 13 Bytes:**

Useful data CRC and Trailer without Header (01111110)

Byte_0	...	...	...	Byte_13

Byte_n_ Number „n" Byte of the ID Code

*** H 4002 transponders and compatibles:**

8 Bytes: with Header and Parity Bits

Byte_0	...	...	...	Byte_7

Byte_n: Number „n" Byte of the ID Code (Byte 0= Header)

5.6.5 ID Type Field

The 'type field" designates the type of transponder. The „ID type" field output takes place in the ASCII Mode with 2 ASCII characters, or else with a Byte (binary).

Transponder Type	Value	Remark
HDX	01	HDX transponder according to ISO
H 4002	02	applies also to compatibles (H 4001/3/4...no electrical difference)
FDX-B	05	FDX-B transponders according to ISO
unknown	7F	non-decodable data
no transponder	FF	no transponder within the active field

If a „Get single ID"is interrupted in the Request Mode due to timeout, then an empty „ID Output" without ID Field is outputted, with ID Field Type „FF".

5.7 Optional Configurations

This chapter describes the use of the configuration register. The configuration commands enable the purposeful configuring of the DHP 101/102 Reader Module according to the desired application.
Configuring with a PC is possible using the „DHP_Conf.exe" DOS program included in the programming Kit.

Register	Cfg_Adr	Bit No. (0...7) of Register: Name	Meaning of the Bit when set to „1"	Def.-Value
Cfg_ mode	0x31		Operating Mode	0x00
		1: Mode-Requ	Request Mode: After switch-on wait for command (otherwise „Read Mode")	
Cfg_ Format	0x32		Format of the ID Output	0x01
		0: Fmt_Deziso	Decoding of the trans-ponder data for FDX-B I.A.W. ISO 11784 (otherwise: output Trans-ponder Byte Structure)	1
		1: Fmt_Bin	Output is binary (otherwise ASCII)	0
		2: Fmt_Raw_Data	Output Raw Data w/o CRC or Parity Check (otherwise done only if check is OK)	0
Cfg_Rf	0x33		Configuration of the RF Interface	0x0E
		1: Rf_FDXB_on	FDXB Reception activated (otherwise (FDXB and H4002 Reception off-line)	1
		2: Rf_HDX_on	HDX Reception activated (otherwise HDX Reception off-line)	1
		3: Rf_H4002_on	H4002 Reception activated (only if FDX-B is active, otherwise offline	1
Cfg_ Timeout	0x34		Read function switch-off time for a „Get_Single_ID in the Request Mode if no ID was received until then: Time=Register Value x appr. 50 ms (Register Value 0x00also yields appr. 50 ms)	0x00
Cfg_ Delay time	0x35		Waiting Time for Repeat of ID Output already transmitted in the Read Mode: Time= Register Value x appr. 50 ms (Register Value 0x00 means no repeat of same ID)	0x01

The Configuration Register *Cfg_Mode* defines the Read- or Request Mode.

The *Cfg_Format* Configuration Register is used for setting the output format of the transponder ID.

The *Cfg_RF* determines the type of transponder to be read.

The Configuration Register *Cfg_Timeout* defines the switch-off time for a reading cycle in the Request Mode.

By means of the Configuration Register *Cfg_Delaytime*, you may determine the repeat rate for the same ID Output

The configuration data are stored in an EEPROM and are preserved also after power shut down.

If a „Set_Conf" command is applied to a non-defined register, the system will respond with a NACK message. Non-defined bits within a configuration register will be suppressed.

5.8 Examples of ID -Messages

5.8.1 ISO-FDX-B and HDX

a) ASCII Output

Pos	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Remark	ID	Len1	ID 16 Byte																DLE	Len2	Type		NUL
Ascii	'#'	11	'0'	'9'	'8'	'0'	'0'	'0'	'0'	'0'	'0'	'0'	'0'	'9'	'9'	'7'	'0'	'8'	10	03	'0'	'5'	00

b) Compact Coding Output

Pos	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Remark	ID	Len1	ID 8 Byte								DLE	Len2	Type	NUL
Bin	23	09	09	80	00	00	00	09	97	08	10	02	05	00

c) Transponder Byte Structure Output

Pos	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Remark	ID	Len1	13 Byte													DLE	Len2	Type	NUL
Bin	23	0E	7C	85	01	00	00	F5	00	80	0F	F0	81	C4	A2	10	02	05	00
			8 Databytes + ID, Country, reserv. Data Animal flag								CRC		Trailer						

d) Transponder Raw Data Output for FDX-B Transponder

Pos	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Remark	ID	Len1	Raw Data incl. Header, Yield Data ,CRC, Trailer (+Controllbits) = 128 Bits																DLE	Len2	Type	NUL
Bin	23	11	7C	08	07	04	08	B0	3E	40	C0	0F	E1	07	26	2E	1A	80	10	02	05	00

e) Transponder Raw Data Output for HDX Transponder corresponds to (c) for this type of Transponder)

Pos	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Remark	ID	Len1	Raw Data incl. Header, Yield Data ,CRC, Trailer = 104 Bits													DLE	Len2	Type	NUL
Bin	23	0E	2F	A7	0F	00	80	F5	00	80	A2	04	7E	00	01	10	02	01	00
			8 Data Bytes + ID, Country, reserv. Data, Animal flag								CRC		Trailer or Stopbyte						

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```
REM ---------------------- ----MAIN---- ------------------------------
PROC DHP_DEMO:
        GLOBAL k%,id1%,id2%,id3%,id4%,ret%,pbuf%,buf$(32),end%,len%,ldLen%
        id1%=gcreate(0,0,240,20,1,1)
        gborder 0                                   REM structure of the output
                                                                    mask
        gat 10,17 :gfont 9
        gstyle 24 :gprint "DIEHL IDENT GmbH   DHP 101/102 V1.00"
        id2%=gcreate(0,24,240,48,1,1)
        gborder 0
        id3%=gcreate(0,76,190,24,1,1)
        gborder 0
        id4%=gcreate(194,76,46,24,1,1)
        gborder 0
        gat 10,8 :gclock on                         REM show time
        loadm "rsset"                               REM Module for interface config.
        WHILE 1                                     REM Main loop starting point
                guse id3%
                gcls :gborder 0
                gat 5,15 :gprint "ENTER-Single  *-Continue  ESC"
                                        REM Main menu
                k%=GET                              REM wait for input in k%
                IF k%=27                            REM If esc...
                        break                       REM...then program end
                ELSEIF k%=13                        REM If ENTER: Single-Read
                        gcls :gborder 0             REM delete Border
                        gat 15,15 :gprint "single Reading now "
                        guse id2%
                        gcls :gborder 0
                        Read:                       REM Activate Read Function
                ELSEIF k%=42                        REM If * : Continue-Read
                        gcls :gborder 0             REM delete Border
                        gat 15,15 :gprint "continue Reading now "
                        guse id2%
                        gcls :gborder 0
                        k%=0
                        WHILE k%=0                  REM until key depressed
                                k%=KEY              REM Check Keypad
                                IF k% > 0           REM If keypad...
                                        break       REM ...then loop end
                                ENDIF
                                Read:               REM Activate Read Function
                        ENDWH                       REM WHILE k%=0 End
                        guse id2%                   REM Erase output field
                        gcls :gborder 0
                ENDIF
        ENDWH                                       REM Main loop end
ENDP
```

```
REM ---------- SUBROUTINES ----------

PROC Read:                                  REM Activate Read Function
      lopen "TTY:G"                         REM ser.Interface G to DHP
      rsset:(15,0,8,1,4,&04002400)    REM 9600, 8, N, 1, No
                                                Handshake
      pbuf%=addr(buf$)                      REM Set buffer to start
      DO                                    REM Reading loop....
            len%=32                         REM Length of buffer
            ret%=IOW(-1,1,#UADD(pbuf%,1),len%)
                                            REM Byte from G: Fetch
            pokeb pbuf%,len%                REM Count the Bytes
            end%=LOC(buf$,CHR$(03))         REM Check for Abort
            pokeb pbuf%,len%                REM Safeguard number
      guse id2%                       REM Prepare output
            gfont 12 :gstyle 24             REM Size of Display
            IdLen% = 16                 REM Set ID length
            IF len(buf$) > 23               REM If buffer full
                  BEEP 5, 300
                  buf$ = Mid$(buf$, 6, IdLen%)     REM Part of the
                                                      ID output in ASCII
                  gat 16,36 :gtmode 3 :gprint buf$  REM display data
            ENDIF
      UNTIL end%
      lclose                            REM TTY G: close
      lopen "TTY:A"                         REM open interface A (DHP 102)
      rsset:(15,0,8,1,4,&04002400)      REM 8, N, 1, No     Handshake
      lprint buf$+Chr$(00)+Chr$(42)     REM send ID
      lclose                                REM close Interface A
ENDP

PROC rsset:(baud%, parity%, data%, stop%, hand%, term&)
                                  REM Konfiguration der Schnittstelle
      local frame%, srchar%(6), dummy%, err%
      frame% = data% - 5
      if stop% = 2 : frame% = frame% or 16 : endif
      if parity% : frame% = frame% or 32 : endif
      srchar%(1) = baud% or (baud% * 256)
      srchar%(2) = frame% or (parity% * 256)
      srchar%(3) = (hand% and 255) or $1100
      srchar%(4) = $13
      pokel addr(srchar%(5)), term&
      err% = iow(-1,7,srchar%(1),dummy%)
      if err% : raise err% : endif
ENDP
```

6 Technical Data

Frequency of RF carrier	134.2 kHz
Transponders supported	-HDX-compatible (ISO 11784/5) - FDX-B-compatible (ISO 11784/5) - H4001, H4002, H4003 and compatible (e.g. Sokymat Unique, Mikron Miro)
Typical reading distance for disk transponders with 30 mm diameter	25 cm for HDX compatible transponders 19 cm for FDX-compatible transponders (DAISY DTD 530) 17 cm for H4002-compatible transponders (DAISY DTD230)
Typical reading cycles	up to 3000 battery operation of the PSION®-workabout with alkaline cells and using the Request Mode, unlimited number when using external power supply for the PSION®-workabout
Environmental Conditions	Operation: 0° to 50°C Storage: -20° to 70°C Humidity: 5 to 95% (non-condensing)
Dimensions	90 x 33x127 mm (incl. antenna)
Protection level	IP 54
Power Supply	via PSION®-workabout TTL port, 5 V, typ. 180 mA (max. 200 mA)
Interface	to the PSION®: TTL bidirectional, Konf. : 9600 Baud, 8,N,1. External for DHP 102: RS232, Sub-D 9 pol, female. configurable
Weight	appr. 160 gr for the Reader Module DHP 101 appr. 180 gr for the Reader Module 102

7 Safety and Care

The manufacturer will decline any liability for damage resulting from improper handling or use of the product contrary to the instructions contained herein.

* The DHP 101/102 Reader Module contains no components allowing repair by the user. Any attemps at opening the device will cause damage to the equipment. The product may only be opened by specially authorized after-sales service personnel.

* Please observe the environemtal conditions indicated at Technical Data for operation and storage of the product.

* Please ensure protection from contamination (e.g. dust, water, etc.) for the connecting socket to the PSION®-workabout (prior to installation) and, for the DHP 102, the RS232 port. Use the protective cap supplied for this purpose.

* For cleaning of the DHP 101/102 Reader Module use only a moist rag. Use only water and commercial detergents.

* Any modification of the Reader Module DHP 101/102 will terminate the warranty.

Caution:
Any modification to the equipment not expressively authorized by the party responsible for compliance could void the users authority to operate the equipment.

8 Warranty

A warranty of 6 months is granted for the DAISY DHP 101/102 Reader Module, starting from the date of delivery, on the conditions specified below:

a. The warranty will be granted only against presentation of the purchase voucher.

b. In case of deficiencies the manufacturer is entitled to repair (rework) the equipment (twice) or provide replacement (once) at his discretion. The period of warranty for the repaired or replaced unit is 3 months but will not terminat sooner than the initial period of warranty. Further claims, in particular with respect to indemnification for consequential damage are excluded. The exlusion of liability does not apply to claims forwarded under the producer liability law.

c: The warranty will only be granted if the DAISY system was handled and installed in accordance with the operating instructions.

Specifically, no warranty will be granted if:

a. the damage was caused by improper use of the product, incorrect connection or incorrect use or handling

b. the product was not maintained in accordance with the manufacturer´s recommendations and the damage was caused as a result thereof.

c. the damage was caused by a modification of the product

d. the damage was caused by force majeure, e.g. stroke of lightning etc.

e. the damage was caused by excessive wear and tear of mechanical components.

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