Positioning and Identification
Antenna
– RS232 –
G 71450-A
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1 Identification Systems

To ensure that the operating procedure is working properly, the data transmission between different objects (die carrier, tools, vehicles etc.) and the control system is decisive. Mobile objects have to be identified and positioned fast and safely.

Thus identification systems provide a safe and economical solution, which can be installed easily. Using these systems it is possible to operate and control the process flow.

Such a system is suitable for nearly all sectors in which production and transportation processes have to be automated. For the realization of these automations, data has to be recorded, collected and processed on the route of transport, at their final destination, at the premises and at the manufacturing site.

1.1 Application Examples for the Automation

Automation can be realized within the following sectors:

- Storage
- Position fixing of vehicles and containers
- Production lines
- Control of material flow
- Identification of containers
- Control of loading and unloading processes
- Positioning of vehicles in industrial engineering
- Distance control of track guided vehicles
- Position fixing for public transport

Special advantages of the inductive identification system are a positioning accurate to a millimeter, identification within a far range and an insensitiveness to contamination.

1.2 System Components G 71450-A

Also transponders are needed in order to create a positioning and identification system. Antenna and transponders are available with two different frequencies.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Antenna</th>
<th>Tranponder</th>
</tr>
</thead>
<tbody>
<tr>
<td>125 kHz</td>
<td>71450YA</td>
<td>71325ZA (other types on demand)</td>
</tr>
<tr>
<td>409 kHz</td>
<td>71450ZA</td>
<td>71325YA, 71370-A (switch transponder)</td>
</tr>
</tbody>
</table>

Table 1 Available antennas and transponders

Further Components

Serial/parallel converter HG06150YA
1.3 System Configuration

![System Configuration Diagram](image)

1.4 Functional Description

1.4.1 General Functional Description

When the antenna crosses a transponder it supplies it with energy by an alternating electromagnetic field. As soon as there is enough energy available within the transponder, it starts to attenuate the magnetic field cyclically with its encoder. This attenuation is reflected to the antenna and generates an amplitude measurement (AM) of the transmitting component.

Inside the receiver the useful signal will be regained from the AM, decoded and the data will be output serially. The transponders G 71325 can be rewritten by the magnetic field.
1.4.2 Transmission Range and Function

The field intensity of the magnetic alternating field decreases with an increasing distance between transponders and reading antenna. Thus the information exchange is only feasible within a certain area.

The field length L and the field width B of the transmission range (see Figure 2 auf Seite 6) will be defined via the parallel center line through the reading antenna (road). The distance between reading antenna and the sectional plane is indicated as S.

A faultless function of the system is guaranteed if the transponders and the reading antenna move towards each other with the distance specified by S and within the range defined by L and B - provided that they are properly aligned. The transponder (line B) will even be detected in case of an offset (center deviation). Then the positioning impulse will be output with an offset.

Figure 2  Length and width of the interception area (view from above)

Positioning is effected according to the field compensation method. The resulting field for the transponder will be deleted centrically to the reading station. At the transition to this region (registration gap or datafree range) the position of the transponder at the object will be detected exactly and indicated (see Figure 3 auf Seite 7).
All indications refer to the position of the ferrite rod in the antenna:

### 1.4.3 Signals and Timing

With the transponders G 71310, G 71320 and G 71325.

![Signals and Timing](image)

**Figure 3** Signals and Timing

Initially the data are insecure and the signal strength is still small (range II). Approaching further the signals of the data become stronger and can be read completely. The loss of the interception area is detected via the controller in that the thresholds are reached (3 and 4). Finally the internal interception range (range I) will be achieved.

Crossing the field border at point 4 releases the center signal. Passing the next detection ranges (5 to 8) the data are read again and will be indicated. At the field border, point 8, no center signal will be released. The centre signal will not even be set if the vehicle stops and drives back after having passed point 1 to 4 within the interception gap (4 and 5). The positioning signal for this transponder will only be send again if another transponder with a new code is read in the meantime or a reset is implemented by turning-off or turning-on the operating voltage.

If a vehicle stops before resolution of the central pulse and changes the direction of travel, a “wrong” central pulse is generated on position 1 or 4. These positions can not be defined exactly. **Thus the identification system should only be applied in installations without any change in direction.**
2 Essential Information for Reading this Manual

In documentations of Götting KG the following symbols and assignments are being used at the time of printing this manual:

- Security advices have the following symbols, depending on the emphasis and the degree of exposure:

  NOTE!

  ATTENTION!

  CAUTION!

  WARNING!

- Continuative information and tips are identified as follows:

  Tip!

- Program texts and variables are highlighted by using the font ‘Courier’.

- Whenever input of key combinations is required for the operation of programs, the corresponding keys are highlighted (in Götting KG programs it is usually possible to use small and capitalized characters equally).

- Sections, figures and tables are automatically numbered consecutively throughout the entire document. In addition, each document has an index listed behind the front page, including pages and - whenever the document has more than 10 pages - following the actual system description a figure and table index in the back. In certain cases (for long and/or complicated documents) a subject index is added.

- Each document provides a table block with metainformation on the front page, indicating the system designer, author, revision and date of issue. In addition, the information regarding revision and date of issue are included within the footer of each page, enabling the exact allocation of the information with a date and certain a system revision.

- Online-Version (PDF) and printed manual are generated from the same source. Due to the consistent use of Adobe FrameMaker for the generation of documentation, all directory entries (including page numbers and subject index) and cross references in the PDF file can be clicked on with the mouse and will lead to the corresponding linked contents.
3 Components and Operation

3.1 Components in the Ground (Transponders)

Transponders type G 71325 (by Götting KG) are applied as reference markers within the ground. The system is compatible to all transponders of type G 713XX used so far (depending on the installed version of the reading antenna).

By using the switchable transponder G 71370, a simple point-to-point connection in addition to the positioning is possible. The transponder, e.g. installed within the ground, signals an approaching vehicle to the system. Thus the system is able to transfer a message to the vehicle by selecting one of 4 codes to choose from. Furthermore transponder version G 71370-W is able to change the positioning mode.

The transponder code provides 16 Bit serially or parallel.

3.2 Identifying Antenna G 71450 (RS 232)

The antenna system is in a 53 x 31 x 156.5 mm case of polycarbonate. The antenna is connected by a 5-pole cable. The connecting plug is a M12 circular connector (see Figure 4). Accessory – an elbow jack with different cable lengths is available (standard 2 m).
3.2.1 Pin Allocation

<table>
<thead>
<tr>
<th>Connector</th>
<th>Pin</th>
<th>Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>+U_B</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>POSI out (20 mA)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>TxD (RS 232)</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>RxD (RS 232)</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>GND (data and supply)</td>
</tr>
</tbody>
</table>

Table 2 Pin allocation of the 5-pole circular connector

3.2.2 LEDs

4 LEDs are provided for function control:

<table>
<thead>
<tr>
<th>LED</th>
<th>Signification</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWR</td>
<td>Indicates operating voltage applied</td>
</tr>
<tr>
<td>CD</td>
<td>- flashes, if a transponder approaches (area I in Figure 2 auf Seite 6)</td>
</tr>
<tr>
<td></td>
<td>- is lit constantly, if the transponder is read reliably</td>
</tr>
<tr>
<td>DATA</td>
<td>is lit constantly, if a transponder is detected in area I</td>
</tr>
<tr>
<td>POS</td>
<td>Corresponds to the positioning output</td>
</tr>
</tbody>
</table>

Table 3 Signification of the 4 LEDs G 71450-A

3.2.3 Turn on Characteristics

On activation of power supply the positioning output will be active (approximately 500 ms) for the duration of the reset. All LEDs will be connected additionally for 500 ms. After approximately 2 s the device is ready for operation.

3.2.4 General Information

The code supplied by the transponder has a sequence of 24 bits, 16 bits are coded. They are output serially or parallel with an optional serial / parallel interface.

3.2.5 RS 232 Interface

For communication of the computed data to the outside world the interpreter transmits the code of a transponder in the interception range. The output is realized correspondent to the chosen adjustment via RS 232 interface (see Table 4 auf Seite 11).

If there is no transponder in the field no protocol will be transmitted.
3.2.5.1 Interface Parameters

The parameters of the serial data transmission depend on the adjustment of the DIP switches on the evaluation board (see Figure 5).

![DIP Switches SW1 to SW8, Evaluation Board G 71450](image)

Figure 5 Position of DIP-Switches SW1 to SW8, Evaluation Board G 71450

From the following table you can see which kind of adjustments of the RS 232 interface can be set via the DIP-switches SW1 to SW8.

<table>
<thead>
<tr>
<th>SW</th>
<th>ON</th>
<th>OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW1: Parity</td>
<td>ODD</td>
<td>EVEN *)</td>
</tr>
<tr>
<td>SW2: Baud rate</td>
<td>See Table 4 auf Seite 11</td>
<td></td>
</tr>
<tr>
<td>SW3: Baud rate</td>
<td>See Table 4 auf Seite 11</td>
<td></td>
</tr>
<tr>
<td>SW4: Code output (see below)</td>
<td>*<em>2 Codes <em>)</em></em></td>
<td>CONT</td>
</tr>
<tr>
<td>SW5: Serial Output</td>
<td>ASCII coded (see 3.2.5.2 auf Seite 12)</td>
<td>Binary coded*) (see 3.2.5.3 auf Seite 13)</td>
</tr>
<tr>
<td>SW6</td>
<td>Do not change!</td>
<td>*) Do not change!</td>
</tr>
<tr>
<td>SW7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SW8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*) = Factory Setting

Table 4 Options for adjustments by the DIP-switches of the antenna board G 71450-A

By SW4 the type of telegram output is adjusted:

**SW4 Position ON:** When the transponder enters the antenna field of the reading antenna two identical data sets are put out. Between both data sets there will be a break of approximately 20 ms. As the vertical component of the magnetic field shows a zero point centrically
under the reading antenna the transponder will be activated twice when passing the reading antenna. This leads to an output of 4 data sets.

SW4 Position OFF: The code will be put out permanently as long as the transponder is located in the antenna field. Here the data stream will be interrupted as well, if the transponder is located centrically under the antenna.

<table>
<thead>
<tr>
<th>Baud Rate</th>
<th>SW2</th>
<th>SW3</th>
</tr>
</thead>
<tbody>
<tr>
<td>38400</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>9600 *)</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>19200</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>4800</td>
<td>ON</td>
<td>ON</td>
</tr>
</tbody>
</table>

*) = Factory Setting

Table 5  Baud rate adjustment via SW2 and SW3 (G 71450-A)

3.2.5.2 Telegram Setup ASCII Coding (SW5 = ON)

Example:

Figure 6  Example for a ASCII telegram setup G 71450-A
Adding the values of A1 to A4 and P results in 0 (A1 + A2 + A3 + A4 + P = 0)

Example

Bit sequence: 0001 1001 0000 000 (Transponder-Code 16 Bit) 1900$_{hex}$ in the transponder.

The following bytes will be output:
To sum up: "1", "9", "0", "0" and "6" results in „0“.

3.2.5.3 Telegram Setup of Binary Coding (SW5= OFF)

Example:

```
S  A43  A21  P
```

Check sum
Code D7...D0
Code D15...D8
STX Start character (STX = 02 Hex)

The following bytes will be output:

<table>
<thead>
<tr>
<th>Character</th>
<th>Hex-Value</th>
<th>ASCII-Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>STX</td>
<td>02</td>
<td>STX</td>
</tr>
<tr>
<td>A4</td>
<td>31</td>
<td>„1“</td>
</tr>
<tr>
<td>A3</td>
<td>39</td>
<td>„9“</td>
</tr>
<tr>
<td>A2</td>
<td>30</td>
<td>„0“</td>
</tr>
<tr>
<td>A1</td>
<td>30</td>
<td>„0“</td>
</tr>
<tr>
<td>P</td>
<td>36</td>
<td>„6“</td>
</tr>
</tbody>
</table>

Table 6 Example -telegram ASCII-coded (G 71450-A)

Sum of A43, and P results in 0 (Mod256).

Example:

Bit sequence: 0000 0111 0000 1011 Transponder code 16 bit) 070hex in the transponder

The hexadecimal sum over 0,7, 0B, EE results in (1)00hex.
3.2.6 Positioning Pulse

On crossing the center line the positioning pulse will be released. Its duration is 100 ms. Once the positioning pulse has been activated, 24 V will be switched to the corresponding output with a current limitation of 20 mA.

**NOTE!** Refer to chapter 1.4.3 „Signals and Timing“ on page 7 for the timing of the PosiPuls.

3.2.7 Resetting the antenna

The reset of the antenna is triggered as soon as it receives the sign DC2 (012h) with the right parity. Then the antenna confirms the reception of this command by sending an answer telegram. After that the program resets all internal variables. Any other signs or transmission errors are ignored.

This answer telegram is built up as follows (binary coded):

1. ‘StartofHeader’=01h
2. data byte with the bits 15...8 (bit 8 = LSB of the byte) of the last read code
3. data byte with the bits 7...0 (bit 0 = LSB of the byte) of the last read code
4. check byte: the sum of the telegram identification, the data bytes and this check byte equals 0.

If the ASCII coded output is activated, the code will be displayed as shown in table 6 on page 13. If no transponder has been read until the card is resetted, the value 000h will be put out.

3.3 Serial/parallel interface G 06150Y (optional)

![Interface G 06150Y for mounting bar installation](image)

The serial/parallel interface is within a case suitable for mounting bar installation. The serial data is transferred via the RS 232 interface. The serial output of the antenna has to be set to CONT. The baud rate has to be 19200 bd with the parity EVEN. The serial output has to be ASCII coded. According to this the DIP switches have to be set to the following values:
To control this interface, the LED can be seen through a transparent cover. It flashes while serial telegrams are being decoded. This telegrams are only created if a transponder is situated in the field.

From the data stream the code will be converted into a 16 bit parallel output. The code is located at the outputs until a new code is received. Furthermore, 50ms after the arriving of the codebits a Data_Ready_Impuls (duration: 100ms) is created. A new Data_Ready_Impuls will only be created at a code change.

Whether the transponder is located under the antenna or not is shown through the signal Data_Valid. If there is no transponder in the field, 0V is put out. When the parallel exits Data_Ready and Data_Valid are activated they switch to +Usps (24V). They are neither limited in current nor they are electrically insulated.

### Table 8 DPI switches 1 to 5 for using serial/parallel interfaces

<table>
<thead>
<tr>
<th>SW</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OFF</td>
</tr>
<tr>
<td>2</td>
<td>ON</td>
</tr>
<tr>
<td>3</td>
<td>OFF</td>
</tr>
<tr>
<td>4</td>
<td>OFF</td>
</tr>
<tr>
<td>5</td>
<td>ON</td>
</tr>
</tbody>
</table>
4 Mounting and Setup

4.1 Testing a Transponder

It is possible to test the transponders with a reading antenna and a connected PC (see section 5.2 on page 23).

4.2 Mounting Transponder

Range and positioning accuracy will be influenced by

- metal parts lying on the ground (sheet metals)
- reinforcement laid close to the transponder
- Induction loops, e.g. formed by reinforcement mats

**NOTE!** Individual metal rods have only little influence and may hurt the metal free area partially (see figure Figure 9 on page 17).

There is no influence on the positioning accuracy due to

- environmental influences as snow, ice and water
- contaminations as oil, tar etc.

**Basically the following Mounting Instructions for Transponder G 71325 have to be observed**

- Keep a minimum distance of 500 mm between the transponders.

- Keep a minimum distance to the metal parts (see figure Figure 9 on page 17). The interference on positioning accuracy and range depends on the size and the range of the metal parts.

- The minimum distance between conductors with a diameter smaller than 6 mm has to be 2 mm.

Which end of the transponder is located at the top is insignificant for the range or the function.

4.2.1 Mounting in very solid ground (e. g. concrete)

- No additional protective casing necessary

- Vertical alignment required (otherwise a position error will be generated).

- Transponder should be sealed (e.g. with a two component two-component epoxy resin).

- To protect the transponder use either a covering cap or apply an epoxy resin layer (thickness approximately 1 cm). The drill hole should be wide enough so that the cover cannot put pressure on the transponder.
4.2.2 Mounting in Tough Material (e. g. tar)
- Protection tube necessary (e. g. of fiber glass reinforced plastic). Choose accordingly the diameter of the load.
- Arrange the transponders unmounted or vertical in foamed material (otherwise a position error will occur).
- To protect the transponder use either a covering cap or apply an epoxy resin layer (thickness approximately 1 cm). The drill hole mouth should be wide enough so that the cover cannot press on the transponder.

![Diagram of mounting in tough material](image)

**Figure 9** Metal-free area around the transponder G 71325

4.3 Reading Antenna

4.3.1 Mounting Drills

![Diagram of mounting drills](image)

**Figure 10** Mounting of the identifying antenna: Position and size of the drilling
Mounting and Setup

All indications refer to the position of the ferrite rod in the antenna:

![Diagram](image-url)

**Figure 11** Nominal reading distance / position of the antenna ferrite rod

To achieve a maximum range (> 50 mm) of the reading distance, it is recommendable to mount a 10 mm plastic plate or a 10 mm spacing bolt between the steel or aluminum rack and the reading antenna. When using spacing bolts, a large washer is to be placed under the reading antenna.

**NOTE!** If several antennas are applied within one installation they have to be mounted in a **minimum distance of 1500 mm** to one another to guarantee a smooth production flow.

### 4.3.2 Connection

Connection wires are not part of the scope of supply. Figure 4 on page 9 indicates which kind of cable construction can be applied. These kind of cables are commercially obtainable at many manufacturers (e.g. Binder 79-3444-32-05 M12 line 2 m PUR 5 x 025). For pin allocation please refer to Table 2 on page 10.

Accessory parts as an elbow jack with different cable lengths available (standard 2 m).

If a high interference level is excepted shielded wires ought to be used.
4.4 Interface G 06150Y (optional)

The optional interface has to be installed on a mounting bar. It has the following terminal allocations:

![Configuration of the interface mounting bar casing](image)

The function is described in 3.3 „Serial/parallel interface G 06150Y (optional)” on page 14.

<table>
<thead>
<tr>
<th>Connectors of the Mounting Bar Casing</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Code Bit 1 (low bit)</td>
<td>15 Code Bit 15</td>
<td></td>
</tr>
<tr>
<td>2 Code Bit 2</td>
<td>16 Code Bit 16 (most significant bit)</td>
<td></td>
</tr>
<tr>
<td>3 Code Bit 3</td>
<td>17 Data Ready</td>
<td></td>
</tr>
<tr>
<td>4 Code Bit 4</td>
<td>18 Data Valid</td>
<td></td>
</tr>
<tr>
<td>5 Code Bit 5</td>
<td>19 n. c.</td>
<td></td>
</tr>
<tr>
<td>6 Code Bit 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Code Bit 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Code Bit 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Code Bit 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Code Bit 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Code Bit 11</td>
<td>20 Rx+ (RS 232 Input)</td>
<td></td>
</tr>
<tr>
<td>12 Code Bit 12</td>
<td>21 n. c.</td>
<td></td>
</tr>
<tr>
<td>13 Code Bit 13</td>
<td>37 +24 V Power supply</td>
<td></td>
</tr>
<tr>
<td>14 Code Bit 14</td>
<td>38 GND Ground</td>
<td></td>
</tr>
</tbody>
</table>

Table 9 Terminal allocation of the interface-mounting bar casing
4.5 Maintenance

The system is largely maintenance-free. Generally maintenance is restricted to

- Visual examination of the antenna
- Inspection if all screws, cables and plugs are properly fixed.
5 Software

Transponder Programming and Update of the Internal Software

For the realization of these requirements the reader G 71450-A has to be set to the monitor mode, i.e. connect the serial interface of a PC/laptop with the appropriate pins (Rx and Tx, see table 2 auf Seite 10) of the reading device. Then start the terminal program (see below). The interface parameters have to correspond to those parameters – adjusted by DIP switches – of the reading device (see Table 4 auf Seite 11).

5.1 Terminal program

In the following we refer to the program HyperTerminal® (Hypertrm.exe) which is part of the scope of supply of Microsoft® Windows®. We apply this program because many operators use it. Due to the configuration files we supply, it is user-optimized. It is possible to download the latest version of these files under the following address http://www.goetting.de/en/download/. Enter search term 7145 to find the files for each single reading antenna (7145x.zip; 7145xxxx.ht).

However, it is possible to apply any other terminal program, provided that it implies ANSI emulation. Should you use a different program, please consider the documentation enclosed to this program and adjust it to the values indicated in section 5.1.2. Please continue on page 22 then.

5.1.1 Locate HyperTerminal / Add to the system

First make sure that HyperTerminal is installed on your system. If only the standard version is available, you can easily add Hyper Terminal subsequently using your Windows installation CD.

Open System Control (below in the illustration: Windows 95).

![Adding HyperTerminal to your system](image)

Figure 13 Adding HyperTerminal to your system

1. Click on icon Software. Select the card index tab Windows-Setup in the window Properties of Software Windows-Setup. Then choose the point connections from the components. Click

---

English, Revision 01, Date: 17.08.2009
2. Now check in the window connections if there is a marker before HyperTerminal (yes = ✅, no = ☐). If yes, the program is installed on your system. Then click on (twice) (twice) and switch to the next section. If not, set the marker with the mouse / keyboard and close both windows with ☐.

3. Subsequently you will be asked to insert your setup CD into your CD ROM drive. Install the CD and click on icon ✅. Confirm all installation messages. Hyper Terminal will be installed and will be ready for use then.

5.1.2 Parameter Settings
The following parameter settings are essential. If you use HyperTerminal you do not have to enter the settings manually. It is possible to start HyperTerminal directly by a double click on the corresponding *.ht-file. (7145x48.ht at 4800 baud, 7145x96.ht at 9600 baud, 7145x192.ht at 19200 baud and 7145x384.ht at 38400 baud). If necessary adjust the COM port accordingly.

<table>
<thead>
<tr>
<th>Terminal Settings Monitor program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baud rate</td>
</tr>
<tr>
<td>4800, 9600, 19200 or. 38400 baud depending on the adjustment of the DIP-switches (Table 4 auf Seite 11)</td>
</tr>
<tr>
<td>Terminal emulation</td>
</tr>
<tr>
<td>ANSI</td>
</tr>
<tr>
<td>Parity</td>
</tr>
<tr>
<td>Even or Odd depending on the adjustment of the DIP-switches (Table 4 auf Seite 11)</td>
</tr>
<tr>
<td>Data bits</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>Stop bits</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>Handshake</td>
</tr>
<tr>
<td>XON/XOFF</td>
</tr>
<tr>
<td>PC-Interface (Port)</td>
</tr>
<tr>
<td>COM1 May differ - depending on the PCs (see below)</td>
</tr>
</tbody>
</table>

Table 10 Terminal settings for the monitor program

If you are using a different port than COM1 with HyperTerminal, then adjust the port as follows:
1. Select Properties from the menu File (or click the icon ). The following window will open:

![HyperTerminal configuration window]

2. Choose the respective port via the direct connection in Connect using in the submenu. Confirm with . Save the altered values if you are asked for it when terminating HyperTerminal.

5.2 Monitor Programme

After connection set-up has been effected (see above) enter in the terminal program. The following display will appear:

```
HG71450 Monitor        409kHz / BIN   / 2*Code /  9600 baud / EvnPar

Current Transponder Code [hex/dez]:   9ABC / 39612

(H)ex Input Transponder Code [0..FFFF]:   9ABC
(D)ez Input Transponder Code [0..65535]:   39612
(W)rite Transponder
(V)ersion

(U)pdate Firmware
(Q)uit
```

**Figure 14** Basic menu of the monitor program

The top line visualizes the chosen settings by DIP- switches (page 11).

Below, the last received transponder code will be displayed in hex or decimal. By input of or by switch-off / switch-on of the antenna, the monitor mode will be terminated.
5.2.1 Programming of a Transponder Type G 71325

By using \(\text{hex}\) enter the desired transponder code hexadecimal or by using \(\text{dec}\) decimal. Hold the transponder to the reading device, according to the sketch in Figure 15. Press \(\text{start}\) for starting the programming process. Subsequently the new code will be displayed.

To achieve best possible results on transponder programming keep the transponder approximately 5 cm below the antenna. Make sure not to adjust it concentrically below the antenna. Here the field has a blanking interval, within which no programming is possible (see Figure 3 auf Seite 7).
5.2.2 Update of the Internal Software (Firmware)

First of all check the current firmware version by input of `/c86`

![Figure 16](image1)

In line 7 and 8 you will see the version and the respective date. By pressing any key you will get back to the main menu.

If pressing `/c85` you are asked to enter a password (supplied together with the new firmware). After a correct input the loading version will be displayed. After input of `/c80` the old firmware will be deleted. The screen will show an R if this process is finished.

![Figure 17](image2)

Please wait for 'R' and transfer Intel-Hex file as ASCII upload.
Afterwards it is possible to load the new firmware by ASCII upload.

Using HyperTerminal you transmit the file in the following way:

1. In the menu transmission choose the subitem Send Textfile. The following window will open:

2. Switch to the directory or to the data carrier in which the downloaded files are stored and choose the corresponding firmware file (e.g. 71450A11.10H).

3. Click on . The file will be transferred.

The Upload will be indicated by a sequence of dots and a terminating O. Subsequently call the main menu of the monitor programme by entering /c80 and check the new version of the Firmware with /c86. By pressing any key you will get back to the main menu.

If the programming was not successful, the firmware will be started automatically in the FlashLoader programme. After output of P and R it waits for a new ASCII upload.
# Technical Data

## 6 Technical Data

### 6.1 Identifying Antenna G 71450-A

<table>
<thead>
<tr>
<th>Identifying Antenna</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions</strong></td>
<td>See Figure 4 on page 9</td>
</tr>
<tr>
<td><strong>Casing</strong></td>
<td>Polycarbonat (PC)</td>
</tr>
<tr>
<td><strong>Current consumption</strong></td>
<td>100 mA</td>
</tr>
<tr>
<td><strong>Operating Voltage Range</strong></td>
<td>22 to 28 V (max. ripple 10 %)</td>
</tr>
<tr>
<td><strong>Relative humidity at 25° C</strong></td>
<td>95% (without condensation)</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>230 g</td>
</tr>
<tr>
<td><strong>Protection class</strong></td>
<td>IP 65</td>
</tr>
<tr>
<td><strong>Max. Cable length</strong></td>
<td>3 m</td>
</tr>
<tr>
<td><strong>Connection</strong></td>
<td></td>
</tr>
<tr>
<td>- M12 circular connector 5-pin mounting plug</td>
<td></td>
</tr>
<tr>
<td>- Elbow jack as accessories with different cable lengths available (Standard 2 m)</td>
<td></td>
</tr>
<tr>
<td><strong>Netto Code length</strong></td>
<td>16 Bit</td>
</tr>
<tr>
<td><strong>Nominal reading height (with transponder HG 71325)</strong></td>
<td>50 mm</td>
</tr>
<tr>
<td><strong>Datafree area (D; see figure Figure 2 on page 6)</strong></td>
<td>25 to 30 mm at nominal reading height</td>
</tr>
<tr>
<td><strong>Field width (B; Figure 2 on page 6)</strong></td>
<td>25 mm at nominal reading height</td>
</tr>
<tr>
<td><strong>Field length (L; see Figure 2 on page 6)</strong></td>
<td>Casing length at nominal reading height</td>
</tr>
<tr>
<td><strong>Crossing speed at nominal reading height</strong></td>
<td></td>
</tr>
<tr>
<td>- with function positioning: 1.5 m/s</td>
<td></td>
</tr>
<tr>
<td>- without function positioning: 2 m/s</td>
<td></td>
</tr>
<tr>
<td>- with function positioning: 1.0 m/s</td>
<td></td>
</tr>
<tr>
<td>- without function positioning: 1.5 m/s</td>
<td></td>
</tr>
<tr>
<td><strong>Repeat Accuracy</strong></td>
<td>±2 mm at 0.5 m/s, noise-free environment and nominal reading height</td>
</tr>
<tr>
<td><strong>PosiPuls</strong></td>
<td>24 V, 20 mA, current limited</td>
</tr>
<tr>
<td><strong>Minimum distance between two reading stations</strong></td>
<td>1500 mm</td>
</tr>
<tr>
<td><strong>Environmental temperature</strong></td>
<td>0 to +50° C</td>
</tr>
<tr>
<td><strong>Storage temperature</strong></td>
<td>-20 to +70° C</td>
</tr>
</tbody>
</table>
6.2 Parallel Converter

<table>
<thead>
<tr>
<th><strong>Parallel Converter G 06150Y (optional)</strong></th>
</tr>
</thead>
</table>
| **Casing** | Mounting rail casing 28-pin  
|           | 75 x 75 x 47,5 mm L x W x H |
| **Supply** | 24 V ±10 %, approx. 50 mA |
| **Operation temperature** | 0 to +50° C |
| **Mechanical capacity** | 5 g 11 ms / 2g 10 to 55 Hz |
| **Protection Class** | IP 55 |
| **Connector** | screw terminal |
| **Data Input** | RS 232 |
| **Data Outputs** | 16+2, 24 V, not isolated and not short-circuit proof |

Table 11 Technical Data Parallel Converter G 06150Y (optional)
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