R-IN7500 Host Interface and Instruction Manual (for reader unit only. Version B.24 and up)

<mark>1.   Introduction</mark>

1.1. General

This manual is addressed to software trained personal.

This is not a troubleshooting either an installation guide.

This manual is made in 4 sections.

Section 1 is this section.

Section 2 describes the firmware S-IND9

Section 3 describes the firmware, some hardware and the way the reader acts with the S-IND14.

Section 4 describes the communication with the reader and the way to handle the protocol.

The reader unit R-IN7500 is a micro controller sampling data from the antenna unit A-ST7500. It also controls the communications with a host computer. The manner the reader is working depends of the firmware type used. The firmware is the internal software of the reader. There are two different firmwares that can be chosen the S-IND9 and the S-IND14. This decision will be done when the application is clearly defined by the software or application engineer.

The difference between the S-IND14 and S-IND9 firmware is the way the reader will act.

Using the S-IND19, the reader reads continuously and releases a code if one transponder is read. The reader needs no start reading trigger. With no reading trigger, readings are made non-synchronously with the host and if a code is not read the reader and the host will not be aware of it.

The S-IND14 needs a triggered start reading by a host communication command or by two electrical inputs. S-IND14 is fully remote controlled and thus also fully host-synchronized.

The S-IND9 is usually used in manual reading station and S-IND14 in host controlled automated station.

1.2. Minimum site specification

Before installing the R-IN7500 ensure that the site is not disturbed by electromagnetic environment. The frequencies used by the reader are 100-110KHz for the emission (depending of the country) and around 50-55KHz for the Transponder return transmission. These frequencies of 50-55KHz and their harmonics are critical. For ex. If a CRT monitor emits a frequency of this kind the reading distance will be greatly reduced.

Metallic environment will reduce the performance of the reading distance.

A poor power line will also disturb the normal operation of the reader. The R-IN7500 is tested for a Class 3 industrial use.

1.3. Before developing software to interface the reader

Please read the XProbe Manual and understand the concept of S-IND14 and S-IND9.

It is recommended, in an application controlled by a host, to use the Zap command and check all the parameters for their validity (see XProbe Manual).

The reader is shipped out of the factory with defined parameters that may change without notice.

1.4. Before installing or exchanging a reader

It is necessary to use a terminal and check the parameters. A reader is shipped out of the factory with defined parameters that may change without notice.

2. S-IND14 Firmware and Hardware description

Release: S-IND14/**B**.17 and higher.

2.1 CHARACTERISTICS:
The RID))((R-IN7500 is a RF reader controller card to be used with DATAMARS RF transponders.

2.2. Power Supply
The switching power supply is included in the casing. It can be in or out the back panel.

If it is out of the back panel the connection is made to the upper 3 positions terminator with a 12VDC 2A. stabilized noise free power supply.

If it is in the back panel the supply may vary from 18 – 36 VDC 2 A. and is connected to the lower 2 positions terminator.

The controller supplied in the dust proof desk box requires 90VAC to 264VAC 47Hz to 63Hz (no strapping are required).

Back panel connector cabling for PSUP or Switching Power supply :

+12VDC

GND

BUSIND00   Earth
05/08/98

18-36 VDC (+)

(-)
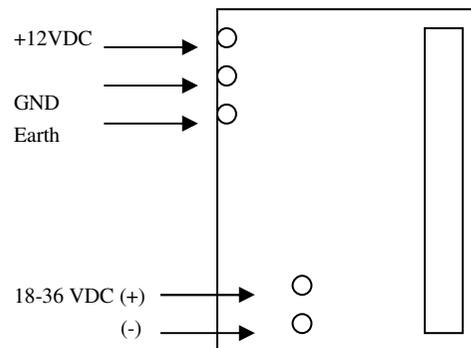
The earth of the power line must be connected to the frame GND. Use only a 3 leads (pins) plug for the dust proof desk box.

If the reader is not in the dust proof box, connect the earth to the frame GND. (see figure above)

2.3. Before power on:
Plug in the ANTENNA and the RS232 connectors. **Do not plug the antenna while the reader is powered on**.

2.4. After power on :
The reader green LED indicates that power is ON. The reader waits for a read start.

Activating Input0 (or 1) signal trigger will start a read. Supplying external voltage (5-24 VDC) to I/O connector pin 2 and 3 will activate Input0 and start the reading at antenna 0. It is also possible to start and stop read by using a communication command (see **Xprobe75B** manual).

The reading will stop when a TAG is read or when the signal at Input0 is released.

If a TAG is present (near the antenna) the code is read and the read cycle will end.

In **Normal Mode** as soon as Input0 is released the code is sent over the RS232 communication. In **Protocol Mode** the code will be released at the scan command. (See Xprobe manual).

If no TAG is present the read cycle continues until the Input0 is released or the stop read command is sent through the communication.

The first stop read will last at least one read cycle. See next page for the output diagram.

For a normal read it is recommended to activate the Input0 or 1 for at least 2 read cycles.

(1 read cycle = approx. 50ms.)

Signal Input0 is at pin 2(+) and pin 3(-) of the I/O connector and Input1 at pin 4(+) and 5(-).

Output0 is activated for about 12 ms when the Input0 is released. 12 ms with a communication baud rate of 9600. There is a relation between the host connection and the beep time. Faster is the communication with the host faster is the beep time.

Output0 is at pin 6(+) and pin 7(-) from the I/O connector. There is no Output1. Output0 activates also for Input1.

2.5. Input0 and 1 electrical characteristics:
These inputs are protected by an optocoupler. An external voltage must be applied in pin 2 and 3 or 4 and 5 from the I/O connector.

Pin **2** is the positive (+) and pin **3** is the negative (-) lead, Pin **4** is the positive (+) and pin **5** is the negative (-) lead.

Voltage:	Min. 4.75 VDC	max. 24 VDC
Input:	about 3 Kohm	
Current:	@4.75VDC 1.8mA	@12VDC 4.5mA

This output is protected by an optocoupler and the power is delivered thru a NPN transistor.

An external voltage thru the load must be applied.

Pin **6** is the positive (+) and pin **7** is the negative (-) lead.

Voltage: Max. 24 VDC

Current: Max. 500 mA.

+ pin6

Output0 signal

- pin7

2.6 Cable specifications:

Reader to Antenna DIN 6 pins 1 to 1

1 Signal IN
2 N/U
3 Tx Antenna
4 GND
5 12VDC
6 Logic GND + cable frame

Communication

Host to reader Sub-D 9 pins 1 to 1

1 CD	_____	DTR (not used)
2 RX	_____	TX
3 TX	_____	RX
5 GND	_____	GND

2.7. Data Communication

S-IND14/B.x version. When Input0 toggles the following telegram will be sent:

|X|X|X|X|X|X|X|X|X|X|CR|LF|

(ex. above using 10 characters and CRLF setup. See Xprobe75B manual)

X   = 10 characters ASCII (0-F or 10 '?' in case of no TAG read)
CR   = carriage return
LF   = line feed

After power on a Power On Check (POC) test will take place and the release level will be sent to the communication. If the message is not the release level, the POC test has failed. The message is 16 characters long with CR/LF.

Default setup is : 9600 baud, 8 bits, 1 stop bit, no parity. (Baud rate up to 38'400 can be selected thru parameters. Version B16 and higher)

Data string is sent without checking if receiver is ready.

2.8. Synchronization diagram using the Input0 to start a reading

If the TAG is read :

Input0
start   stop

Antenna
start   read OK

Telegram & Output0
message = code

No TAG read :

Input0
start   stop

Antenna
start   no read

Telegram   & Output0
message = ??????????
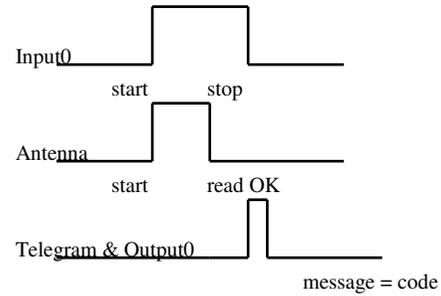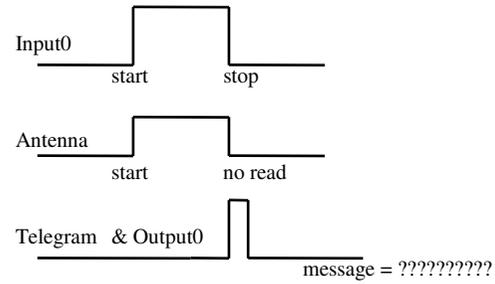
Input 0 start very short less than 50 ms. with TAG read :

Input0
start/stop shorter than 50 ms.
start stop

Antenna
start   read OK

Telegram & Output0
message = code number
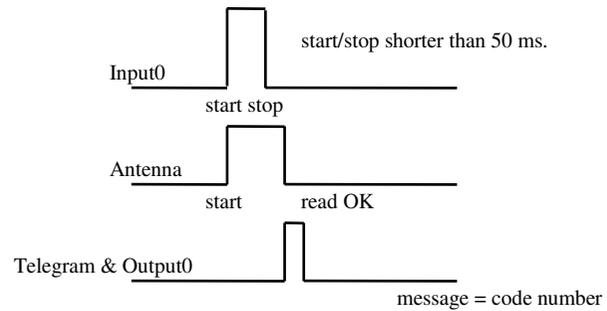
2.9. RS485 CONNECTION

The RS485 is optional and is supplied under request.

The communication configuration is Full Duplex multipoints (or 4 wire multidrops). The master (PLC or P.C.) can be configured as RS422 / RS485 and the slaves (R-IN7500) are all RS485 balanced.
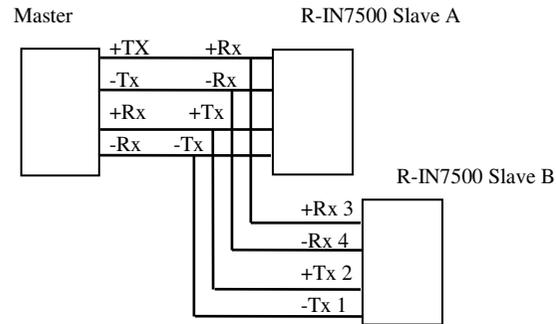
Before installing the R-IN7500 in the multidrop line, it must have some parameters set in S-IND14. (see XPprobe75B Manual).

The plug is a standard RJ-11 6P4C. Both connectors in the PCB are connected in parallel.

Pin #	Signal
4	RX-
3	RX+
2	TX+
1	TX-
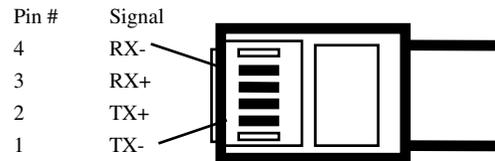
RS485 STRAPPING
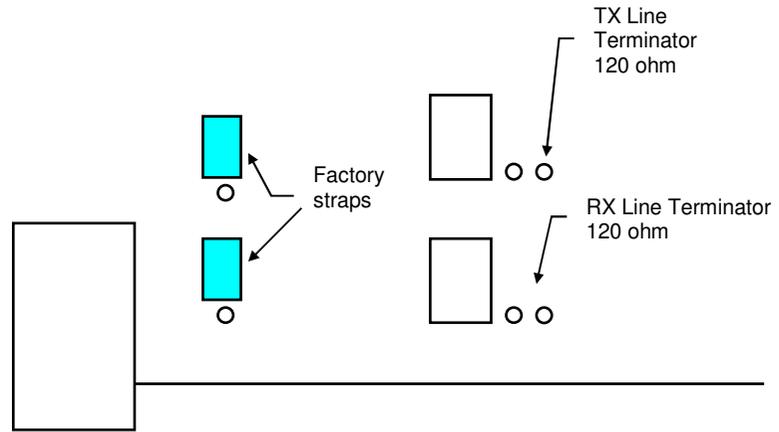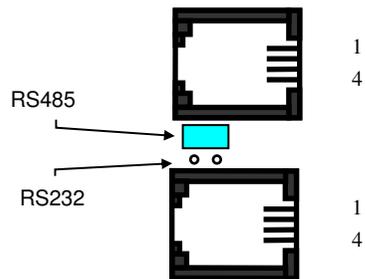
RS485

RS232

The swap between RS232 and RS485 can be done on line and do not require a re-initialization of the R-IN7500.

The Line Terminators can be used to terminate the line communication if no terminators are installed in the line. If the on board terminators are used, be sure that only the unit at the end of the line is strapped with the terminators.

3. S-IND9 Firmware description

Release: S-IND9/**B**.x

3.1. CHARACTERISTICS:

The RID))((R-IN7500 is a RF reader controller to be used with DATAMARS RF transponders.
The S-IND9/B15 (and higher) is a superset of the S-IND/B10 which is able to control 2 antennas.
The S-IND9/B15 and higher firmware is embedded in the S-IND14.B15 and higher. It will be called directly from the communication like any other parameters.
See XProbe75B documentation for more information.

The difference between the S-IND14 and S-IND9 firmware is the way the reader will act.
In S-IND19 the reader reads continuously and releases a code if one transponder is read. The reader needs no start reading trigger. With no reading trigger, readings are made non- synchronously with the host and if a code is not read the reader and the host will not be aware of it.
The S-IND9 is usually used in manual reading station and S-IND14 in host controlled automated station.

3.2. Power Supply
See S-IND14 description.

3.3. Before power on :
Plug in the ANTENNA and the RS232 connectors. **Do not plug the antenna while the reader is powered on**.

3.4. After power on :
The reader green LED indicates that power is ON.
If a TAG is present near the antenna 0 or 1 (depending of the parameters set. See Xprobe75 manual) the code is read and the code is send through the communication.
At the same time the beeper will sound, the yellow LED will blink and the signal Out (pin 6 and 7) of the I/O connector will be activated.
If no TAG is present the read cycle continues. A read cycle will take approx. 50ms.
Output0 is activated for about 12 ms when the Input0 is released. Output0 is at I/O connector pin 6 and 7.

Different parameters are available to setup the R-IN7500 using the S-IND09 firmware. Please refer to the Xprobe75 manual.

3.5. Output0 electrical characteristics:
See the S-IND14 description.

3.6. Cable specifications
See the S-IND14 description.
3.7. Data Communication

When a code is read, the following telegram will be sent: (ex. Using 10 characters and CRLF setup. See Xprobe75 manual.)

 |X|X|X|X|X|X|X|X|X|X|CR|LF|

X = 10 characters ASCII
CR = carriage return
LF = line feed

Any kind of terminal or terminal emulator for P.C. can be used to communicate with R-IN7500. See Xprobe75 manual.
After power on, a Power On Check (POC) test will take place and the result of the test will be sent together with the release level to the communication. The message is 16 characters long with CR/LF. If the test passed the Name and the release number are sent. If the test failed a message "Fail" (or any other message) will be sent.

Communication default setup is: 9600 baud, 8 bits, 1 stop bit, no parity. Communication speed can be set from 9600 up to 38400 bauds. See the XProbe75 manual.
The messages are sent without checking if receiver is ready.

4.   XProbe Manual and Communication description

4.1 CROSS PROBE manual for R-IN7500 series using S-IND14 B (and S-IND9) firmware:

XProbe75B is a built-in utility embedded in the R-IN7500 "S-IND14 B" type firmware. S-IND14 B includes also the version S-IND9 B. S-IND9 is also embedded in S-IND14. S-IND14 is a merge of both firmware S-IND14 and S-IND9. These two firmware can be switched directly from a CRT terminal connected to the R-IN7500.

XProbe75B can be called up immediately after the R-IN is switched on and any time when running. XProbe75B will help you to set different parameters in the R-IN such as code length, beeper on etc.

4.2. How to run XProbe75B:

A terminal or a P.C. set in terminal mode (ProcomPlus, PerfectLink, Windows Terminal or Hyper Terminal, etc.) with a RS232 communication port is required to run XProbe75B.

Connect the R-IN7500 to the terminal with the RS232 communication cable (please use the cable supplied with the R-IN).

The Xprobe75B menu can be called any time once the R-IN has been switched on by typing the following command from the terminal:

                        .x (**dot** and **x** lower case and **c**arriage **r**eturn)

Just type the command and type the [enter] (or return) key.

Xprobe75B (when S-IND9.B is active) will display the following:
_____

*Datamars System RID))(((*

Rel :   S-IND9   B.x

Parameters:
.cl_ : code length 8 + 2
.lc_ : lock code   off
.mt_: multi tag   off
.be_: beeper   off
.sc_ :sec. Code   off
.an_ :antenna   0   selected
.cr_ : CR   on
.nl_ : LF or NL   on
.bc_: bl check   off

Please enter new parameters typing '.' the command and 1 for on 0 for off.
_____

Xprobe75 for S-IND14.B   will display:
_____

*Datamars System RID))(((*

Rel :   S-IND14   B.x

Parameters:
.cl_ : code length 8 + 2
.mt_: multi tag   off
.sc_ :sec. Code   off
.an_ :antenna   0   selected
.cr_ : CR   on
.nl_ : LF or NL   on
.bc_: bl check   off

Please enter new parameters typing '.' the command and 1 for on 0 for off.
_____

The above description is just the menu of which parameters are available to be changed. It is possible to enter directly the command without calling the menu.

In any case the reader is running and able to read transponders, even if the menu was called. A Command can be sent *on the fly* and the reader remains always operational.

4.3. Communications setup

The communication setup default is: 9600 baud, 8 bits, 1 stop bit, no parity. Speed can be changed up to 38400 bauds. See Commands description for S-IND9 & S-IND14.

The data string is sent without checking if the receiver is ready. XON/XOFF flow control can be used. The R-IN7500 will recognize the XON/XOFF from the Host and act as it but it will not send it itself if busy.
Also the R-IN7500 reacts very fast receiving the commands it is recommended to allow 100 ms. delay after every commands set. Do not send more than one command at once. Wait 100ms.before sending the next one.
Ex. Sending several command in a row: Set read security on, and set antenna to 1. [.sc <CR> (wait 100ms) .an1 <CR>]

4.4. Command parameters description for S-IND9:

The command set to change the parameters which are described below does not includes all the commands available. There are more additional commands described later in this chapter which are not used for setting or resetting parameters.
To send a command to the R-IN7500 simply type in the following formats.
The format is: dot, 2 characters for the command (lower case) and 1 character for the value and Carriage Return (char 0D hex or 13 decimal.).
*
.cl_<CR>   :   **c**ode **l**ength to be sent through the telegram (from the reader to the host).

The value to be entered should be the code length minus 8. The minimum code length is 8 characters.
The values are:

0 = 8 characters code	i.e.:	02345A78	
1 = 9 characters code	i.e.:	002345A78	
2 = 10 characters code	i.e.:	D002345A78	(default)
3 = 11 characters code	i.e.:	0D002345A78	
4 = 12 characters code	i.e.:	00D002345A78	
d = 10 characters decimal made over the 8 first characters (only S-IND9)			

If the code is less than 12 characters only the most significant (from the left) characters are discarded. The first 8 characters of the code are guaranteed as unique number.
*
.lc_<CR> :   **l**ock **c**ode options.

The R-IN 7500 can read up to 20 tags/sec. Once the tag is read the code is sent through the communication line to the host. I.e. if the TAG is presented to the antenna for a long time, the same number will be read and send to the host 20 times per second. This might disturb the host or the database software if the same code is sent to the host too often and too fast.
It is possible to send the code once only or slowing down the reading speed by setting the following parameters.:

> **7** = Locks the same code for **7** * 5 (35) readings then releases it again.
> This will slow down reading speed for the same code.
> **6-2** = same as above but with shorter delay. (Multiple of the value * 5).
> **1** = Locks same code forever. This will unlock only when another tag is read.
> **0** = No lock code. Every code read is sent to the communication line. (default)

*
.mt_<CR> :   **m**ulti **t**ag reading.

Give the possibility to read 2 different tags technology (TBT2 / TBT1) if the hardware option is installed.
The value are: **0** = multi tag disable   (default)
                          1 = multi tag enable
                          2 = type 2 mode transponders (reserved, only for 125kHz, please ask Datamars)
*
.be_<CR>   :   **b**eeper **e**nable.

When the beeper is ON the reader will automatically beep longer for about ½ second after every Tag read. It is not recommended to use this option in an automatic sorting and if no external beeper is connected since the reading speed will decrease, pausing for the beep time. This option is used for manual reading and readers equipped with the external beeper option.
The value are: **0** = beeper disable   (default)
                          1 = beeper enable
Note: The internal beeper (if installed) will always beep. It will beep longer if the parameter beeper is on and quicker if beeper is off.
*
.sc_<CR>   :   **s**ecurity **c**ode or **s**econd **c**ode.
The transponder return message is checked by vertical and horizontal parity to ensure the integrity of the code read. Beside this check it is possible in a magnetic disturbed environment to received a false code. If such a problem occurred it will be safe to set the security code. This option will read twice the code and double-check it. Experiences show that this method can guaranty an extremely safe reading. Of course the reading speed will sensibly decrease since the reading is processed twice. (only 7500 xponder type)
The values are :   **0** = read only once and release code.
                                   1 = double check reading. (default)
*

.an_<CR>   :   **an**tenna selection.

The antenna selection will indicate which antenna will be serviced.

The values are :   **0** = antenna 0 will be activated in read continuous.   (default)

                                        1 = antenna 1 will be activated in read continuous.

                                        3 = reading will be switched between antenna 0 and 1 intermittently.

                                        The value 3 is for S-IND9 only.

*

.cr_ <CR>   :   **c**arriage **r**eturn at the end of telegram (between the reader and the host).

The values are :   **0** = CR not present at eom

                                        1 = CR present at eom   (default)

*

.nl_<CR>   :   line feed or **n**ew **l**ine at the end of telegram (between the reader and the host).

The values are :   **0** = LF not present at eom

                                        1 = LF present at eom   (default)

*

.bc_<CR>   :   **b**lock **c**heck character (BCC). This character is calculated over all the

characters in the communication. The BCC is computed by EXOR operation of all characters.

The values are :   **0** = No BCC at the end of the communication telegram

                                        1 = BCC at the end of the telegram

The BCC character is added at the end of the telegram.

4.5. Command parameters description for S-IND14:

The format is: dot, 2 characters (lower case) for the command, 1 character for the value and Carriage
Return (char 0D hex or 13 dec).

*

.cl_<CR>   :   **c**ode **l**ength to be sent through the telegram (from the reader to the host).

The value to be entered should be the code length minus 8 or x (lower case). The minimum code length is 8
characters.

The values are :

            0 = 8 characters code   i.e.:   02345A78

            1 = 9 characters code   i.e.:   002345A78

            2 = 10 characters code   i.e.:   D002345A78   (default)

            3 = 11 characters code   i.e.:   0D002345A78

            4 = 12 characters code   i.e.:   00D002345A78

            x = 13 characters code   i.e.:   000D002345A78

            The value **x** is to be compatible with the INDUST14 used in 7300 readers series.

If the code is less than 12 characters only the most significant (from the left) characters are discarded. The
first 8 characters of the code are guaranteed as unique number.

The x value is used for cross compatibility with RID7300 INDUST14 series. The 13th character indicates
the Input 1 status of 7300 series. For 7500 the 13th character indicates the antenna in use.

*

.mt_<CR>   :   **m**ulti **t**ag reading.

Give the possibility to read 2 different tags technology (TBT2 / TBT1) if the option is installed.

The value are: **0** = multi tag disable   (default)

                                1 = multi tag enable

                                2 = type 2 mode and transponders (reserved, only for 125kHz, please ask Datamars)

*

.sc_<CR>   :   **s**ecurity **c**ode or **s**econd **c**ode.

The transponder return message is checked by vertical and horizontal parity to ensure the integrity of the
code read. Beside this check it is possible in a induction disturbed environment to received a false code. If
such a problem occurred it will be safe to set the security code. This option will read twice the code and
double-check it. Experiences show that this method can guaranty extremely safe reading. Of course the
reading speed will sensibly decrease since the reading is processed twice. (only for 7500 xponders)

The values are :   **0** = read only once and release code.

                                1 = double check reading.   (default)

*

.an_<CR>   :   **an**tenna selection.

The antenna selection will indicate which antenna will be serviced.

The values are :   **0** = antenna 0 will be activated for the next reading.   (default)

                                1 = antenna 1 will be activated for the next reading.

*

.cr_ <CR>   :   **c**arriage **r**eturn at the end of telegram (between the reader and the host).

The values are :   **0** for CR not present at eom

                                1 for CR present at eom   (default)

*

.nl_<CR>   :   line feed or **n**ew **l**ine at the end of telegram (between the reader and the host).

The values are :   **0** = LF not present at eom

                                1 = LF present at eom   (default)

*

.bc_<CR>   :   **b**lock **c**heck character (BCC). This character is calculated over all the
characters in the communication. The BCC is computed by EXOR operation of all characters.
The values are :   **0** = No BCC at the end of the communication telegram
                                            1 = BCC at the end of the telegram
The BCC character is added at the end of the telegram.

.v<CR>   :   Gives the firmware **v**ersion used in the R-IN7500. No other value must be entered.
The answer is 16 characters long, CR/LF. It is also possible to get the version level by calling XProbe75.

*

.x<CR>   :   Call **X**Probe. See above.

*

.z<CR>   :   Call **z**ap status. Zap status is like XProbe but in a short word format.
If zap is called when S-IND9 is activated the word will be like this :

4.6. Command descriptions for S-IND9 & S-IND14

Beside setting the parameters some other commands are available to run the R-IN7500.
The format is : dot, 1 character for the command, [1 or more characters for the value] and Carriage Return
(char 0D hex or 13 decimal).
The character sent must always be lower case.

                                            2 0 0 0 1 0 1 1 0

2 = Code length 8 + **2**
0 = Lock code **OFF**
0 = MultiTag **OFF**
0 = Beeper **OFF**
1 = Security code **SET**
0 = Antenna **0** selected
1 = Carriage return **SET**
1 = Line feed **SET**
0 = **No** BCC

*

.br___ <CR>   :   Set the baud rate from 9'600 to 38'400.
The values are **96** for 9'600 bauds, **192** for 19'200 and **384** for 38'400 bauds.
Ex.   .br384<CR> will set the baudrate to 38'400.
After the baud rate command is sent the reader will answer by this message : *now 38400 bauds*.
The above message is sent in the actual speed. Then the speed is switched to the new selected speed and the
message of the version number is sent. Obviously the last message will not be readable if your terminal has
not yet switched to the new speed.

If zap is called when S-IND14 is activated the word will be like this :

                                            2 0 1 0 1 1 1

2 = Code length 8 + **2**
0 = MultiTag **OFF**
1 = Security code **SET**
0 = Antenna **0** selected
1 = Carriage return **SET**
1 = Line feed **SET**
**0** = **No** BCC

*

.r_<CR>   :   Start/stop **r**ead by the communication. (Only for S-IND14)
The value is **1** to trigger start read and **0** to stop read. The toggle start/stop acts the same way as triggered
by the hardware input signal. Value of **2** will send the last code read to the communication.
Note: The communication start/stop is intended to be used for testing purpose. The hardware input remains
the best way to trigger the reading (see the S-IND14 data sheet).

*

.s-ind9<CR>   :   Switch the firmware to S-IND9.
S-IND9 is a firmware used in continuous reading application. See the Technical Data Sheet S-IND9.

*

.s-ind14<CR>   :   Switch the firmware to the S-IND14.
S-IND14 is used in triggered signal read application. See the Technical Data Sheet S-IND14.

*

4.7. Protocol mode for RS422/RS485 communications (The following section only for version B.16 and up)

The protocol mode is used for a typical configuration using one master and several slaves on the same communication line.
The master in this case is a host such as a P.C. or a P.L.C. and the slaves will all be R-IN7500 readers.
Communication configuration is a full duplex multipoints (or 4 wires multidrops). The master can be configured as RS422 / RS485 and the slaves are all RS485 balanced.

Master   R-IN7500 Slave A
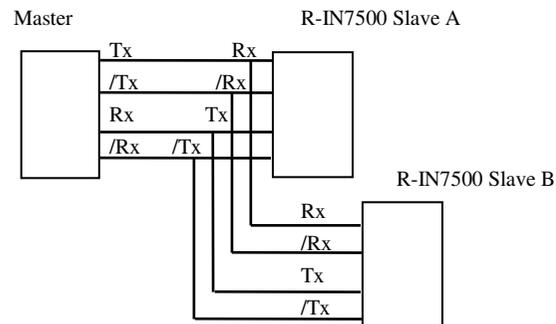
Before installing the R-IN7500 in the multidrops line :

- First check if the R-IN7500 is in S-IND14 firmware.
- Then set the basic parameters (see chapter S-IND14 above).
- Then set the address of the unit (see parameters below).

Never set the parameters on a multidrops line. Always use a single point connection.
If a P.C. is used to set the parameters you can use any terminal emulator (like ProcomPlus, Terminal or HyperTerminal) or use Datamars WinProbe32 utility.
The P.C. can be interfaced directly thru the RS232. It is necessary to set the strapping to RS232.
The start read can still be done by an external trigger but the result will be received only by a scan command. (see below)

4.8. Protocol commands

The commands are entered the same way as the above command descriptions. In normal mode the character "**.**" (dot) is used as the start character. The protocol command start with the "**/**" (slash) character. Any slash sent to the reader will set the reader in protocol mode and then it will stay locked in this mode. See below how to unlock this mode.
The command characters must be lower case and terminate with Carriage Return (char 0D hex or 13 decimal).
Any command should be related to a unit address. The address "**0**" (ASCII 48, HEX 30) is the *Broadcast* Address and will be recognize by any unit. Never use this address on a multi drops line. The purpose of the *Broadcast Address* is to be able to recognize and set the address of an unknown unit.

Note: if the unit number is known you can use it rather than **0**. The examples below uses the *Broadcast Address* for simplicity.

*
/0i<CR>   :   Get the **identification** number (unit number).
                                        The message in return is :   the unit number in ASCII.

*
/0#n<CR> :   Set or change the unit **number**. Value n is one byte long.
                               Minimum recommended values are Hex 21 (! ASCII) up to Hex 7D (} ASCII).
                               Any other value might not be displayed by your terminal.
                               Do not use number **0** ASCII, it is reserved for the *Broadcast Address.*

*
/0a0<CR> :   Select **antenna 0**.
/0a1<CR> :   Select **antenna 1**.

*
/0r<CR>   :   Start **reading**.

/0s<CR>   :   **Stop** read and **send** the message or **scan**. (to see if the start read was done by the
                               input trigger).

This command can be used as a **scan** (or poll) command if the reader has the start read by input signal.

      Returned message is :

unit#Tag#	ex. : 4D0008FD452<CR><LF>	means unit 4 tag code D0008FD452
unit#1	ex. : 41<CR><LF>	means unit 4 status 1(reading unsuccessful)
unit#2	ex. : 42<CR><LF>	means unit 4 status 2 (the reader never received a start read)

*

For any command sent and received correctly but not making part of the commands above the answer from
the reader will be:

      unit#?   ex. 4?   Means unit 4 did not understand.

/.<CR>   :   Return from protocol mode in normal mode. Never use this command in a multidrop
                   line, always use it in single point.
                   This command will be used if a reader needs a change in parameters. (see S-IND14
                   command parameters)

5.   Compatibility between R-IN7500 readers

Several version of print circuit board were delivered since the introduction of R-IN7500.

Some hardware changes are not compatible with the firmware versions.

S-IND14.Bx is a superset of theS-IND14.Ax which is able to control 2 antennas and has more options available. Some hardware changes made to the print circuit board make also the 'B' version not compatible with the 'A' version. The 'A' version runs on PCB CPUIND01 and the 'B' version runs on CPUIND02.

Only the B version is delivered nowadays.

6.   Option: Noise Meter System (NMS)

The NMS displays the receiving signal; it can be used to optimise the antenna positioning and to adjust the noise canceller device (if available) on the antenna.

The NMS consists of three parts:

1. ON-OFF switch
2. Sensitivity switch
3. Led bar

1. ON-OFF switch

This switch turns on & off the Noise Meter.

The red LED confirms that the NMS is ON.

The R-IN7500 works even if the NMS is switched off.

ON   OFF

2. Sensitivity switch

This switch selects three different sensitivity scales; depending on the received noise level. (Low-Medium-High)

LOW   MEDIUM   HIGH

### 3. Led bar

This led bar displays the received noise level (value depends on the sensitivity switch).

6.1 Operating mode

Turn on the R-IN7500 reader with the antenna connected and placed in the position were you intend to use it. Switch on the NMS and chose the sensitivity switch position were you see the level of the interference signal. The level of the interference signal is displayed on the led bar. Adjust now the noise-canceller multi-turn potentiometer (if available – see figure 1) on the antenna's side with a small screwdriver to reach the lowest signal displayed on the led bar, it might be necessary to change the sensitivity switch to see the signal again.
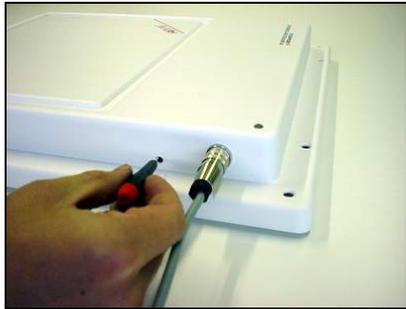
(1)

6.2 Option: Noise Meter System for R-IN7500 CAN

The NMS is also an option for the R-IN7500 CAN (see figure 2).

For Information how to use this option see the operating mode above.

(2)

This reader can work also without the NMS.