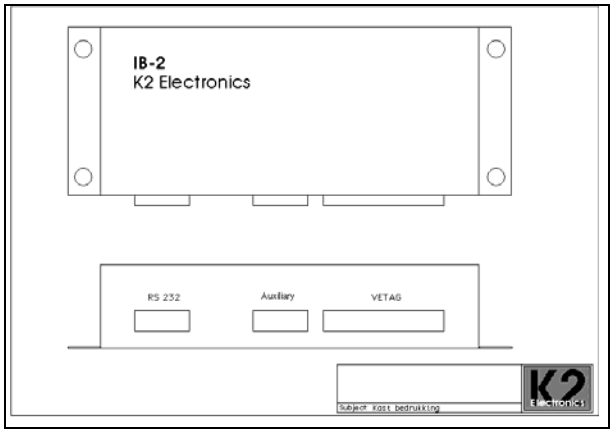
ViaTag/IB2(S) documentation.



K2 Electronics			
Project	IB2(S)	**Status**	Final
Revision	7.3.1	**Date**	September 2007
Author(s)	P. C. Krom, F. W. Krom		
Website	http://www.k2electronics.nl		

History

No	Date	Author	Description of change
0.1	Mar. '97	F. W. Krom	Initial version
0.2	Nov. '97	F. W. Krom	Production IB-2 version
0.4	Mar. '98	J. in het Veld	Definitive version
0.5	Oct. '98	F. W. Krom	IB2 MK-II version
0.6	Oct. 2000	F. W. Krom	Extra information added.
4.4	Mar 2003	W. Anthonissen	Extra information added.
4.5	Mar 2003	W. Anthonissen	Extra information added.
7.3.1	Sept 2007	P.C. Krom	Alignment with Dutch version 7.3.1

Contents

1 Introduction

This document describes the functionality, use and connections of the IB-2 Mk-II unit. This unit provides the communication between the Combofoon, the different keys and the VETAG unit.
With a vetag unit output, the VETAG transponder in the vehicle can be supplied with the line and SeqNo that it is known in the Combofoon. The halt, auto/manual, direction and a general switch can also be connected.
The IB2 can be configured by means of a Windows PC, so a translation table is possible between all 1000 combo line numbers and the vetag transponder line number.

1.1 Terms and abbreviations

Term	Description
Combofoon	Radio Terminal equipment, mobilofoon.
VETAG	VEhicle TAGging system, vehicle identification system.
IB2	intelligent Button 2.
Interrogator	Vetag receiver unit alongside the route.
Transponder	Vetag response transmitter under the vehicle.

1.2 References

Ref.	Doc.ID	Description
[1]	0517.4.11150.URD.B0	Man Machine Interface Radio Terminal, RadioHolland, 20 April 1994
[2]		Vetag course, Dirksen Elektronica training.

2 Functionality

The IB-2 performs various activities. The unit can act directly as a replacement for the Vetag code controller box and lifts the restrictions on the VCCB such as maximum line - and serial number 399/79 completely by means of a line number translation table.
In general terms, it communicates with the vetag unit, combofoon, halt lamp and the various switches and/or pushbuttons.
To this end, the IB-2 has the following functionality:

- F Recognition of the combofoon on startup of the unit or after a reset.
- F Periodic scanning of the combofoon connection, every second.
- F Conversion of combofoon line & run no. into a VETAG line & run no.
- F Control the Vetag transponder system and updating after status changes.
- F The vetag Halt, auto/hand, direction and general switch handling.
- F Controlling the *At Stop* lamp on recognition of the interrogator.
- F Being able to configure various parameters by means of a PC
- F Managing a line number translation table (changed with a PC)
- F Status indication by means of an LED.
- ☞ Watchdog timer for resetting the system in case of problems.
- ☞ Do not use lines 400 and 800!

2.1 Halt key.

If the system senses that it is within a stop, and therefore the *stop lamp* is lit, then by pressing this key the halt code is sent to the vetag. The vetag continues to send this code until the system has moved outside the range of the stop. The software within the stop must take measures as necessary on receiving the stop code so that the vehicle can depart from the stop.
Is the system senses that it is not at a stop, this key does nothing, the stop lamp must be lit first.

2.2 Auto or manual switch.

The auto / manual switch indicates whether the direction switch is active. In auto mode, the stop knows the direction of the bus and will ensure that the stop lights are set to the right status. If the driver wishes to deviate from these standard settings, he must set the switch to manual mode and indicate the required direction with the direction switch (left, straight on, right turn).

2.3 Direction switch.

This switch operates in conjunction with the auto / manual switch; see above.

2.4 General switch.

This switch has two functions, it can be used as a pushbutton for sending a specific code to the combo or for setting the 19th vetag bit.

2.5 Watchdog.

The IB-2 is equipped with a watchdog timer. This means that if the software has crashed because of a malfunction, it will reset itself after 12 seconds. Then the system starts normally again!

2.6 Status LED.

The IB-2 Vetag has an (internal) status LED that indicates information or error reports. This is done by the number of times that the LED flashes. The following table shows the meaning of the possible codes:

	IB2 Vetag status reports	
1	Startup	Start of the program, or after a watchdog timeout (system restart).
2	Timeout	The combofoon no longer reacts to commands from the IB2. Possible problems with the RS232 connection.
3	EnterStop	The vetag transponder sees a stop (Vx signal) and we are now inside that stop.
4	ExitStop	We are leaving the stop again, the vetag transponder doesn't see a stop any longer (no Vx signal).
5	Serial	Serial transponder (IT1) detected
6	Parallel	Parallel transponder detected
7…9	Spare	Not in use
10	IT1 Error	No serial link with IT1 transponder
11	Programmer	The IB2 is in program mode and can receive configure_commands from the PC.
12	Eeprom init	The EEPROM is initialised with default values.
13	Protocol	An error has occurred in the communication between the combofoon and the IB2.
14	CRC	There was a CRC error in an info message from the combofoon. (A retry has been carried out)
15	Msg unknow	Message type in the combo communication unknown.
16...19	I2C	Problems with the internal I2C bus, report to service!
20	Info dropped	The info frame from the IB2 for the combo cannot be delivered to the combofoon.
21	Prg unknow	Unknown program command.

2.7 Software module description.

From a software point of view the IB2 consists of a number of modules, each with its own specific functionality. All modules are written in the high-level C programming language.

3 PC Software.

A number of test and configuration tools are available for the IB2. These can be obtained from ComboNet B.V. or downloaded from the K2 Electronics website http://www.k2electronics.nl
The tools are generally available in a Windows version.
For loading the configuration data into the IB2 there is a program called ***ib2prg.exe***. The desired configuration can be described in an IB2 configuration file which is then loaded by means of the ib2prg program into the IB2. The data is saved in the IB2 and also preserved if the voltage is disconnected.
For testing the various inputs and outputs of the IB2, **ib2io.exe** or **IB2Wtest.exe** (Win95) can be used.

3.1 Programming capabilities.

The IB2 a number of configurable capabilities that can be set by a programmer. For the use of the programmer, refer to the software readme.txt file.

Possible programmer options are:

- Setting the configuration to the factory defaults.
- Setting the VETAG T1 bit to 0 or 1 (if it is connected).
  1 (default) means public transport, 0 means auxiliary services.
- Setting the VETAG T2 bit to 0 or 1.
  1 (default) means regional transport, 0 means city transport.
- Setting the VETAG T19 bit for normal use or the value of the general switch.
- Activating the line number translation table.
- Setting the handling of the combo service numbers in the range from 80-199 into VETAG numbers. By default they are set to 0, mod80 is also possible.
- Sending a datacall if the line or run number changes,
- Sending a datacall when the system starts.
- Sending a datacall by means of the general switch.
- Values identify the different datacalls.

4 **IB2 connections**. (drawing 4.5)

The IB2 Mk-II has three DIN connectors for connecting to the combofoon, power supply, VETAG unit, switches and the lamp.
The left 9-pin DIN male connector is for the RS232 connection to the combofoon (or the programmer PC), the middle 9-pin DIN female connector for the power supply, lamp and switches and the right 25-pin DIN female for the connection to the vetag unit. Each connector will be discussed in the following sections.

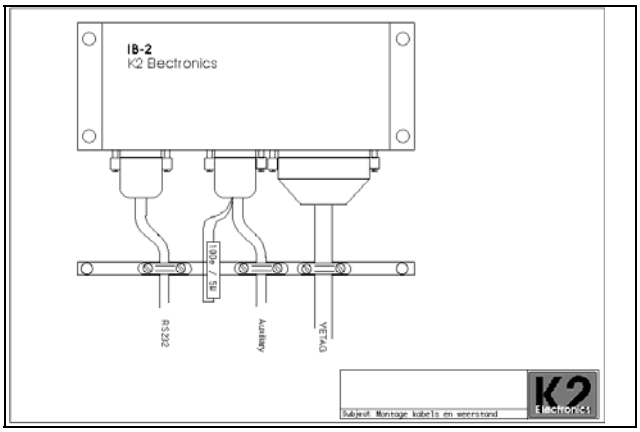


Figure 2: Example IB2 assembly.

4.1 Combofoon connection.

The left 9-pin male DIN connector is for the RS232 connection to the combofoon. The connector is a standard RS232 connection and can be connected to the Combofoon with a three-core cable. The RS232 connection is configured for 1200 baud, 8 bit, no parity and 1 stop bit.

pin			pin		
1	N.C.		6	N.C.	
2	RXinput	RS232 receive signal	7	N.C.	
3	TX output	RS232 transmit signal	8	N.C.	
4	N.C.		9	N.C.	
5	GND	Ground			

This connection is also used for programming the IB2, for which it must be connected to an RS232 connection of a PC. This must be done by means of a link cable, full modem or null modem. The modem signals are not necessary for the IB2 but Windows does need them.

A cable with two female 9-pin DIN connectors with the following connections can be used:

Pin A	Pin B		Pin A	Pin B	
1	4	DCD	6	4	DSR
2	3	Rx Data	7	8	RTS
3	2	Tx Data	8	7	CTS
4	6	DTR	9	9	RI
5	5	Gnd			

4.2 Auxiliary connection. (drawing 4.6)

For the connection of the various switches, halt lamp and power supply the middle 9-pin female DIN connector is available.

The unit needs two supply voltages in order to limit the heat dissipation and current consumption. The LO supply must be 12 V and consumes approximately 100 mA, the HI supply is for the VETAG unit and can be between 15 and 24 V.
If there is no 12 V supply available, a 150 Ohm resistor (min. 5 W; see drawing 4.6) can be positioned between the LO and HI supply and the 24 V supply voltage connected to HI (pin 1).

All IB-2/Viatag input signals need to be activated by switches or relays specific for this function. The switch contacts should not activate any other device (like a lamp, relays or motor)

The switches and pushbutton must switch to ground and switch approximately 4 mA.

The halt lamp must be connected to the +24 V and connection pin 3.

The general switch (pin 4) can be used for sending a
so-called Datacall message or for setting bit 19 in the vetag transponder. Both possibilities can be activated by through the IB2 programming. If this is not done, this switch (pushbutton) will have no effect.

pin			pin		
1	+24 V	HI supply for VETAG	6	GND	Supply ground
2	+12 V	LO supply for IB-2	7	Manual	Manual direction
3	LAMP	Stop lamp	8	Direction RA	We are turning right
4	Gen.	General switch	9	Direction LA	We are turning left
5	Stop	Leaving stop			

4.3 IB-2 VETAG connection. (drawing 4.5)

This right 25-pin female DIN connector is for the connection to the VETAG transponder.
It provides the 19 vetag output signals (T1 .. T19), the vetag Vx input signal plus the 24 V supply for the vetag transponder. The vetag input lines are switched by the IB2 between 0 and 24 V, the Vx signal can be between 0 and 24 V.

A 25-pin DIN connector must be provided for the transponder cable or an extension cable between the IB2 and the transponder connection.
Note that the connection to VETAG T1 is not always available on the transponder, in that case the VETAG T1 output of the IB2 must not be connected. No VETAG output on the IB2 may ever be connected to the +12 V or +24 V because permanent damage will be caused to the IB2. Connection with 0 (ground) is not harmful but is certainly not recommended!

pin		pin	
1	+24 V	14	VETAG T13 service 08
2	VETAG T1 tram	15	VETAG T14 service 04
3	VETAG T2 region	16	VETAG T15 service 02
4	VETAG T3 service 40	17	VETAG T16 service 01
5	VETAG T4 line 40	18	VETAG T17 line 80
6	VETAG T5 line 20	19	VETAG T18 line 100
7	VETAG T6 line 10	20	VETAG T19 line 200
8	VETAG T7 line 08	21	N.C.
9	VETAG T8 line 04	22	N.C.
10	VETAG T9 line 02	23	N.C.
11	VETAG T10 line 01	24	Vx
12	VETAG T11 service 20	25	Gnd
13	VETAG T12 service 10		

The next part is only meant for appendices. If you do not need any appendices, you can delete it. Do not delete the code [Par Num Def:] (reveal codes) before this comment, otherwise the numbering will be incorrect.

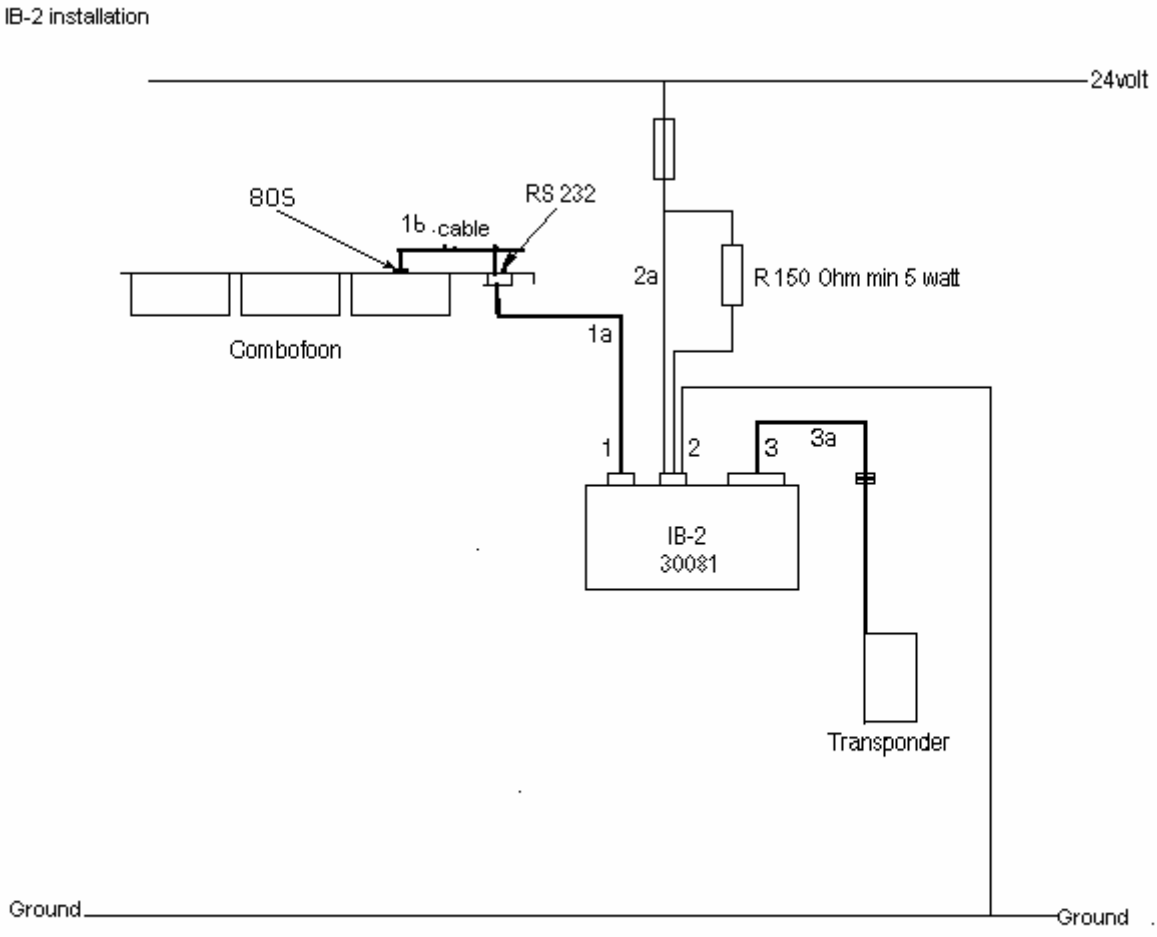
4.4 VETAG transponder connection.

The VETAG transponder is connected by an adapter cable (30080) to the IB-2

Pin		Pin	
A2	+24 V	B2	VETAG T13 service 08
C5	VETAG T1	A6	VETAG T14 service 04
C1	VETAG T2 regional	C2	VETAG T15 service 02
B3	VETAG T3 service 40	B6	VETAG T16 service 01
A7	VETAG T4 line 40	B4	VETAG T17 line 80
C3	VETAG T5 line 20	A4	VETAG T18 line 100
B7	VETAG T6 line 10	B1	VETAG T19 line 200
B5	VETAG T7 line 08	A1	Vx
A5	VETAG T8 line 04	A3	Gnd
A8	VETAG T9 line 02		
C6	VETAG T10 line 01		
C4	VETAG T11 service 20		
B8	VETAG T12 service 10		

4.5 Vehicle installation schematic diagram

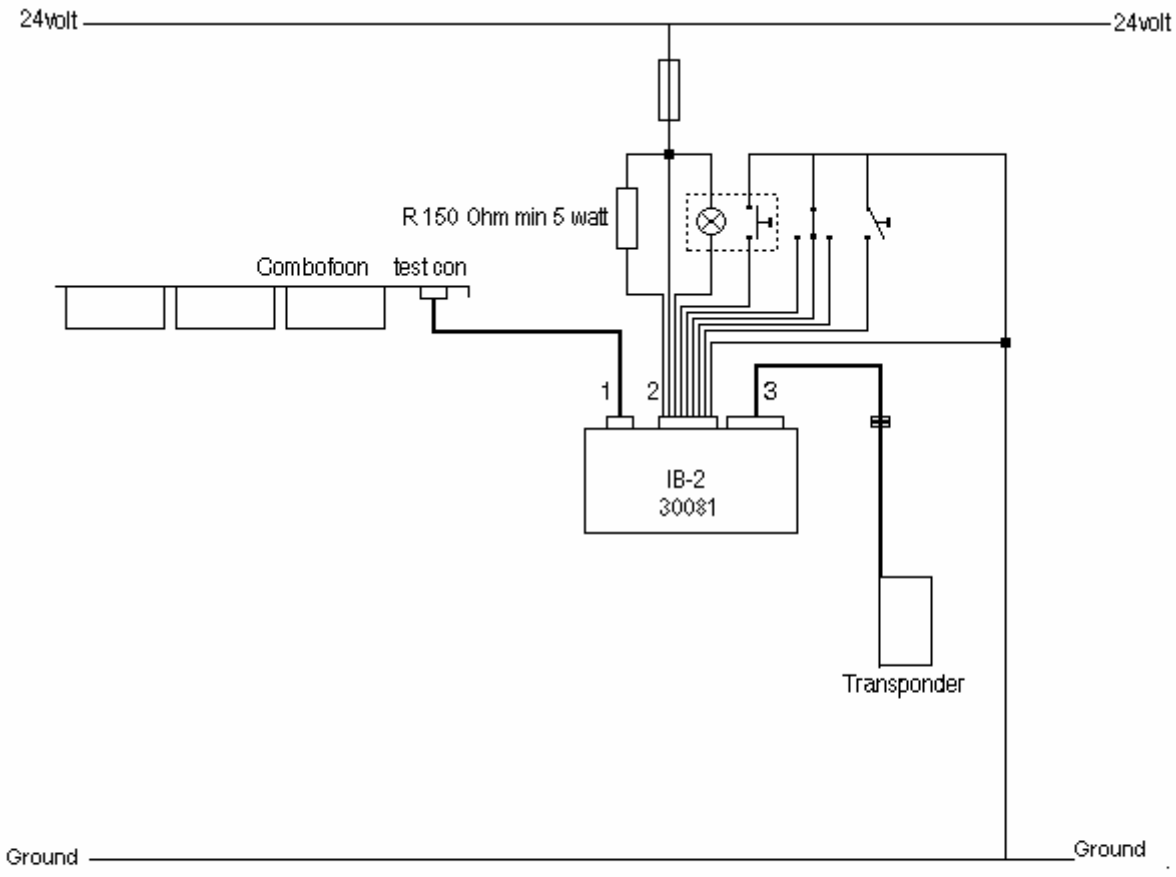
IB-2 schematic



1. RS 232 port
2. Auxiliary connection
3. Transponder connection

1a .RS232 cable
2a power supply
3a IB-2 30080 extension cable

1b .cable test connection



1. 9-pin RS232 cable
2. IB-2 power supply
3. IB-2 30080 extension cable

No rights can be derived from the drawings

4.6 Auxiliary connection schematic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