

Morse ID generator

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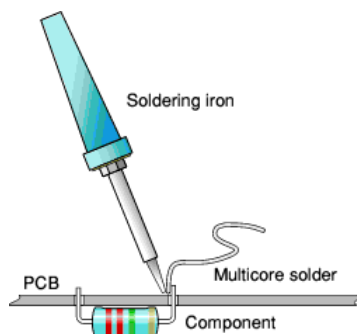
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Introduction

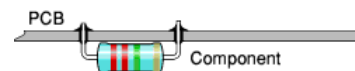
The hardware of this Morse ID generator is heavily based on the KF163-Tracker circuit. It uses the same PCB as the KF163-Tracker. Only a few components are different, and of course the software embedded in the PIC microcontroller is different.

The Morse ID generator can be configured using a computer and a standard terminal program. The actual ID text, the ID interval, and the behavior can be configured. Configuration settings are stored in the PIC's internal EEPROM. Once configured the Morse ID generator does not need to be connected to the computer anymore.

Soldering Tips



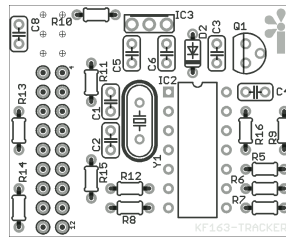
Soldering is not difficult. However, if you are completely unexperienced, or if it has been a long time ago since you've last soldered electronic components, you may wish to practice a bit on some old PCBs and components. If you still don't feel confident, ask an electronics hobbyist for assistance. There are many electronics enthusiasts around and most of them will be delighted to help you out. The PCB in the kit is of professional quality. It contains tracks on both sides and the holes are through plated. The latter is particularly useful as it will help the solder to flow better, resulting in a better connection.



Use a good quality soldering iron with a small tip of about 25 to 40 Watt. If the iron is too hot, you are likely to damage the components. If it's too cold, it takes too long for the solder to start flowing, which may also cause damage. Wipe the tip often on a wet sponge or cloth to keep it clean. Then apply solder to the tip to give it a wet look. This will protect the tip, improve transfer of heat and enables you to make good quality solder joints. Always use appropriate multi-core solder. Don't use solder paste or solvents. You may want to bend the leads of the component a little bit, to ensure that they stay in position when you turn the PCB upside down. Don't bend the leads too much! Some components get easily damaged when the leads are bent too far. Furthermore, it may result in badly soldered connections and may even lead to short circuits. You may also use a sponge to keep the components pressed to the PCB when turning the board. Please note that the PCB has two sides. One side has got the numbers of all components printed on it. This side is called the Component Side. Unless stated otherwise, all components must be fitted at the component side. The leads of each component must be soldered at the other side of the board (at the soldering side). Please note that some components, such as resistors, have no polarity and may be fitted either way around. Other components, such as diodes, transistors and ICs, MUST be fitted exactly in the way it is printed at the component side of the PCB.

Also, take extra care in identifying the resistors. Brown, orange, and sometime red color rings on the resistors may look alike. It is always a good idea to use a multimeter to verify resistance before mounting the resistors.

Assembly



Qty	Ref.	Description
1		PCB KF163-Tracker (combined with PLL CTL)
-	R13	Not used
1	D2	DIODE, SCHOTTKY DO-34, BAT85
2	R9, R10	See assembly instruction
2	R11, R15	RESISTOR, 0.125W 10kΩ (color coded brown black black red brown)
2	R12, R14	RESISTOR, 0.125W 330Ω (color coded orange orange brown gold)
1	R5	RESISTOR, 0.125W 8k2Ω (color coded gray red black brown brown)
1	R6	RESISTOR, 0.125W 3k9Ω (color coded orange white red gold)
2	R7, R16	RESISTOR, 0.125W 2kΩ (color coded red black black brown brown)
1	R8	RESISTOR, 0.125W 1kΩ (color coded brown black red gold)
2	C1, C2	CAPACITOR, 22pF 50V
5	C3, C4, C5, C6, C8	CAPACITOR, 100nF 50V
1	Y1	Crystal 10 MHz HC49/4H
1		Mylar insulator for HC49 crystal
1	IC2	MICROCONTROLLER PIC16F636-I/P
1	IC3	VOLTAGE REGULATOR 0.1A +5.0V, 78L05
1	Q1	TRANSISTOR, NPN BC547C TO-92

When assembling the tracker PCB it is recommended to mount the components in order of size. First mount the smaller components, followed by the slightly taller components.

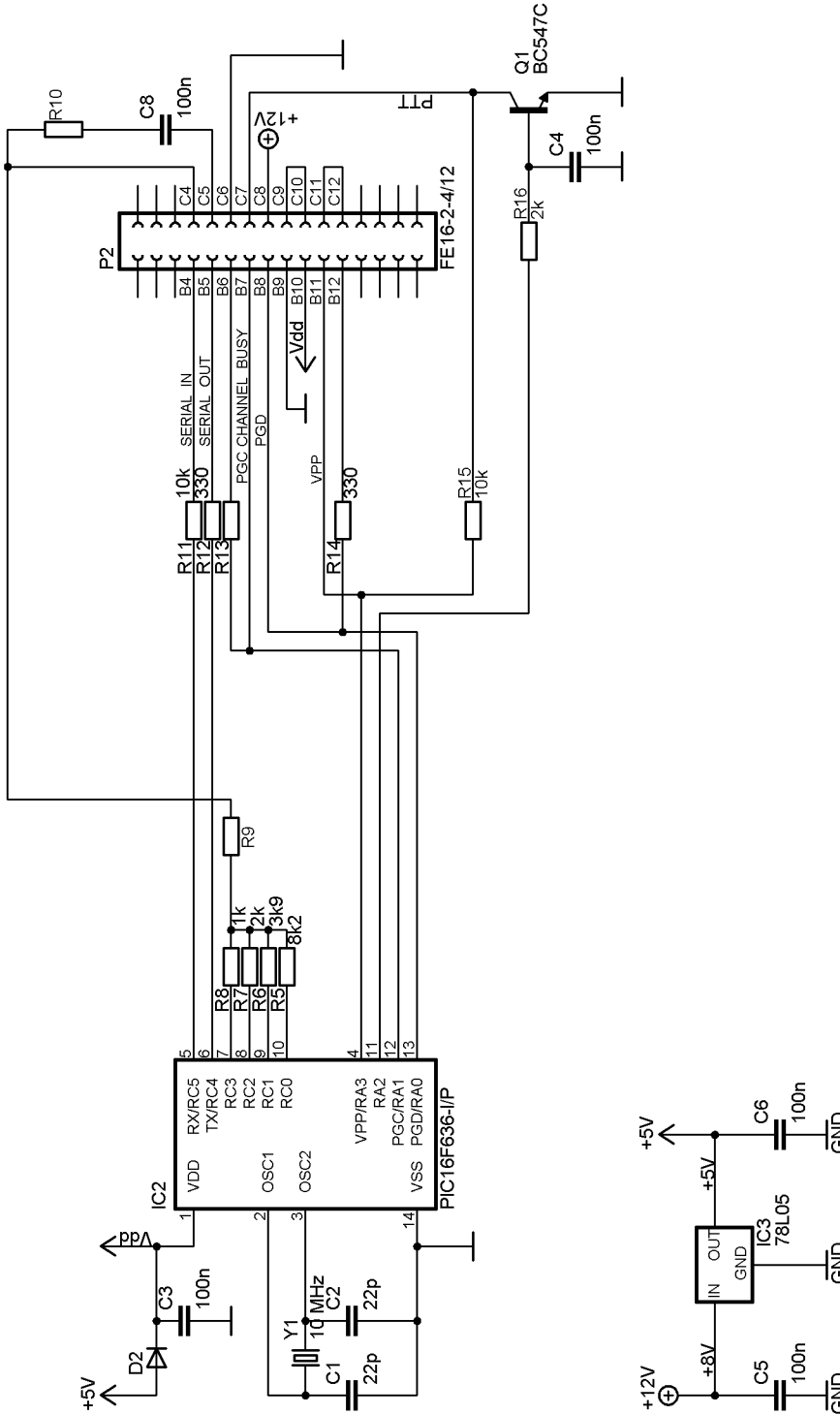
When mounting the crystal make certain to insert it in the mylar spacer to isolate it from copper traces and pads on the board.



The circuit does not have a variable resistor to adjust the audio output voltage. Instead you can select a value for R9 and/or R10. Depending on your need you can select an appropriate value.

E.g. R9 is a wire jumper, and R10 is 100k.

Schematic



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TITLE: morse-calligever

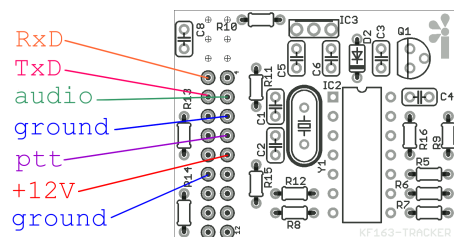
Document Number:
SCH/PBA10102/2

REV:
A

Date: 2008-05-18 15:28:12

Sheet: 1/1

Connections



Configuration

Solder Ground, RxD and TxD connection to a DB-9 connector.

RxD of the Morse ID generator should connect with TxD of the PC's serial port

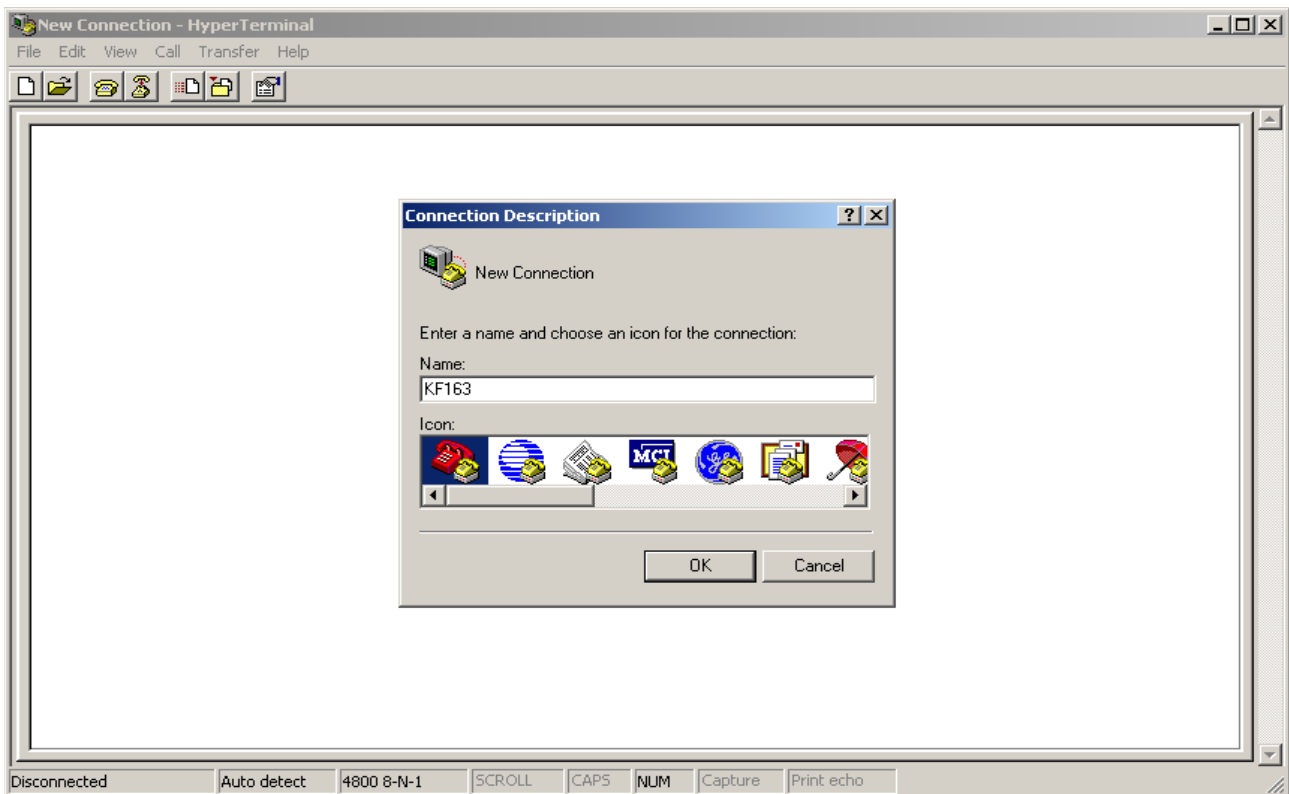
TxD of the Morse ID generator should connect with RxD of the PC's serial port

Connect the Morse ID generator to the PC's RS232 serial port.

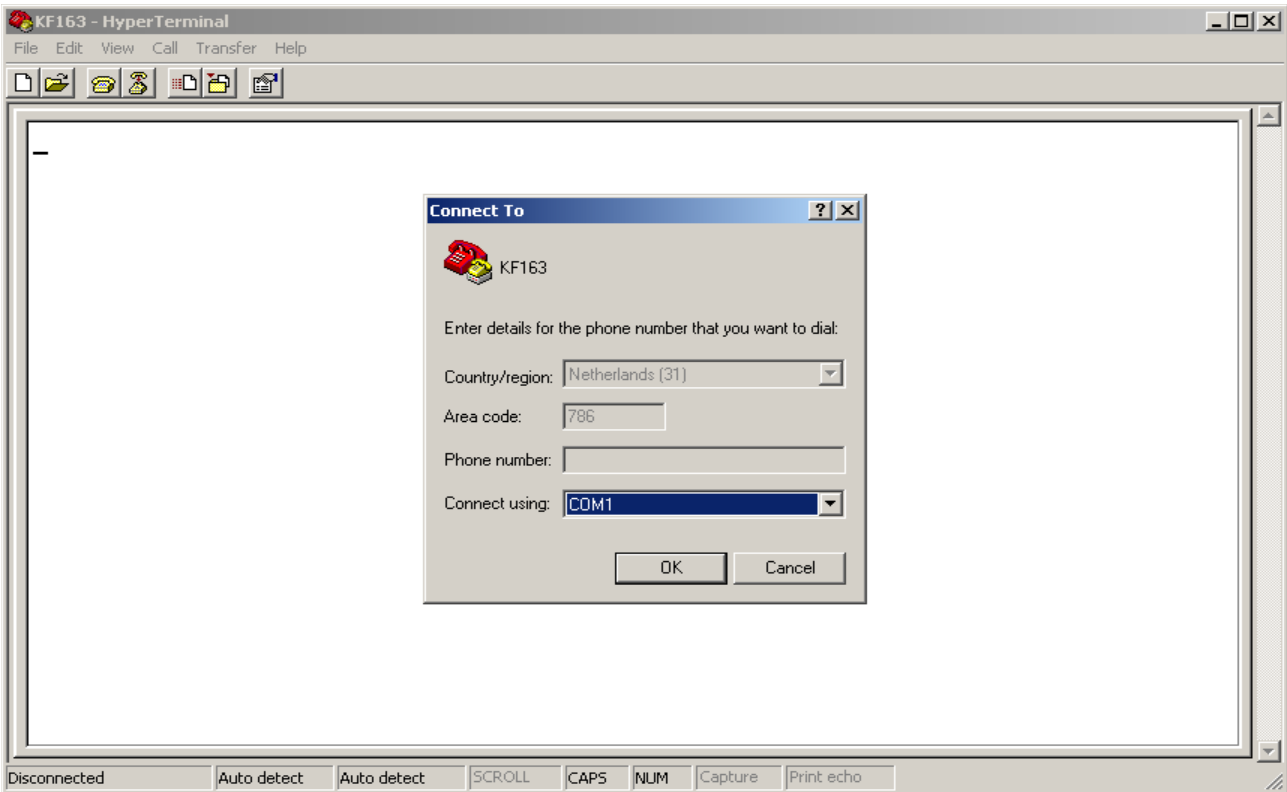
Start a terminal program, e.g. Hyperterminal.

Hyperterminal will ask to name the new connection. Any name will do, e.g. Morse-ID

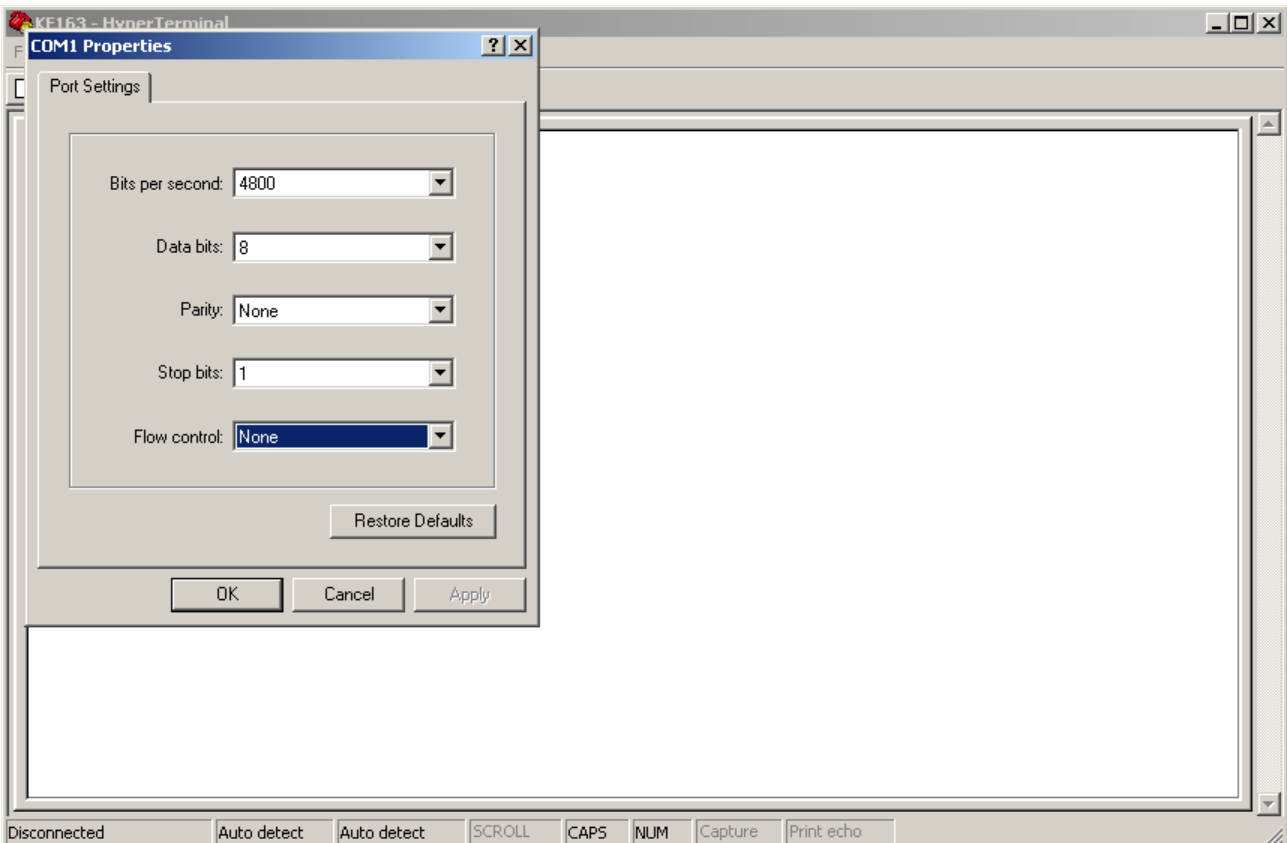
Then click OK.



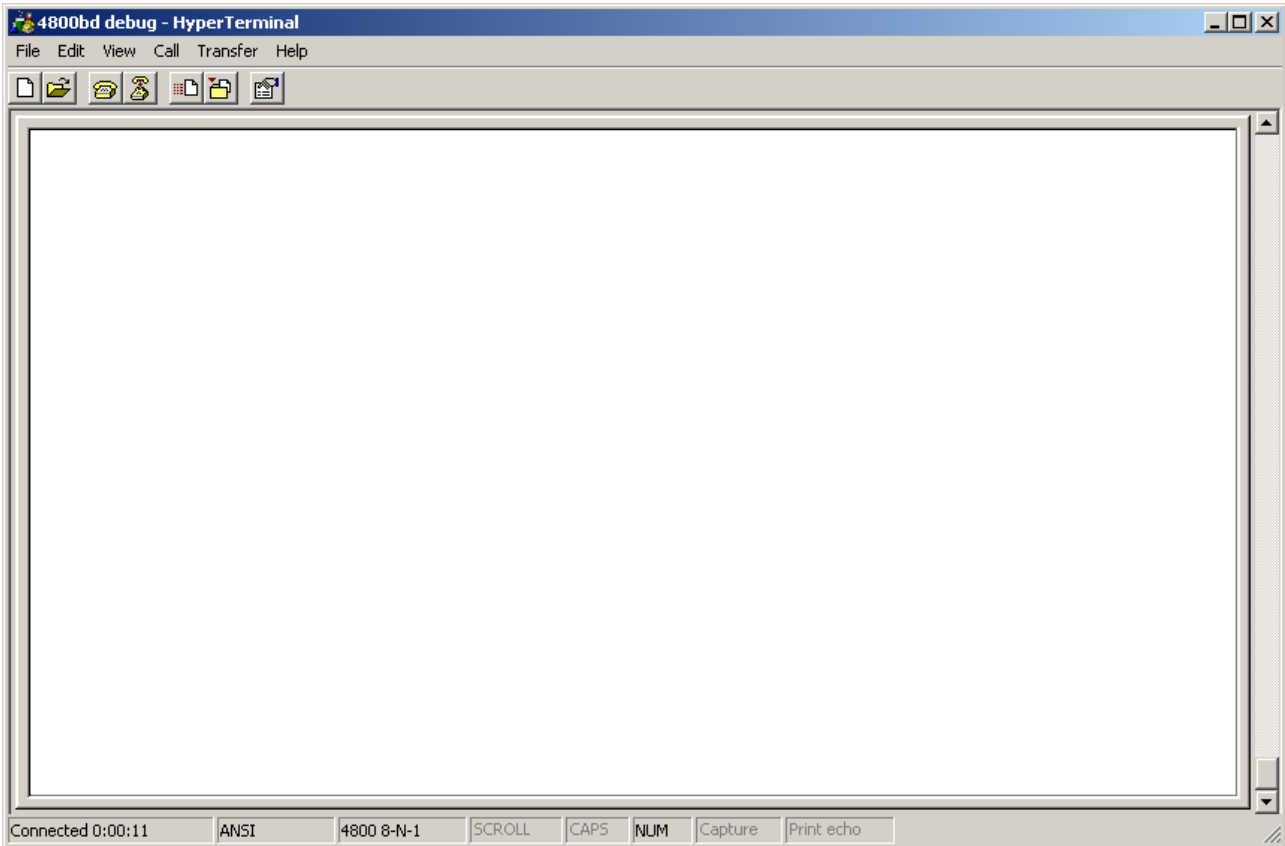
Next a small window appears in which you need to select the serial port number. (e.g. COM1)



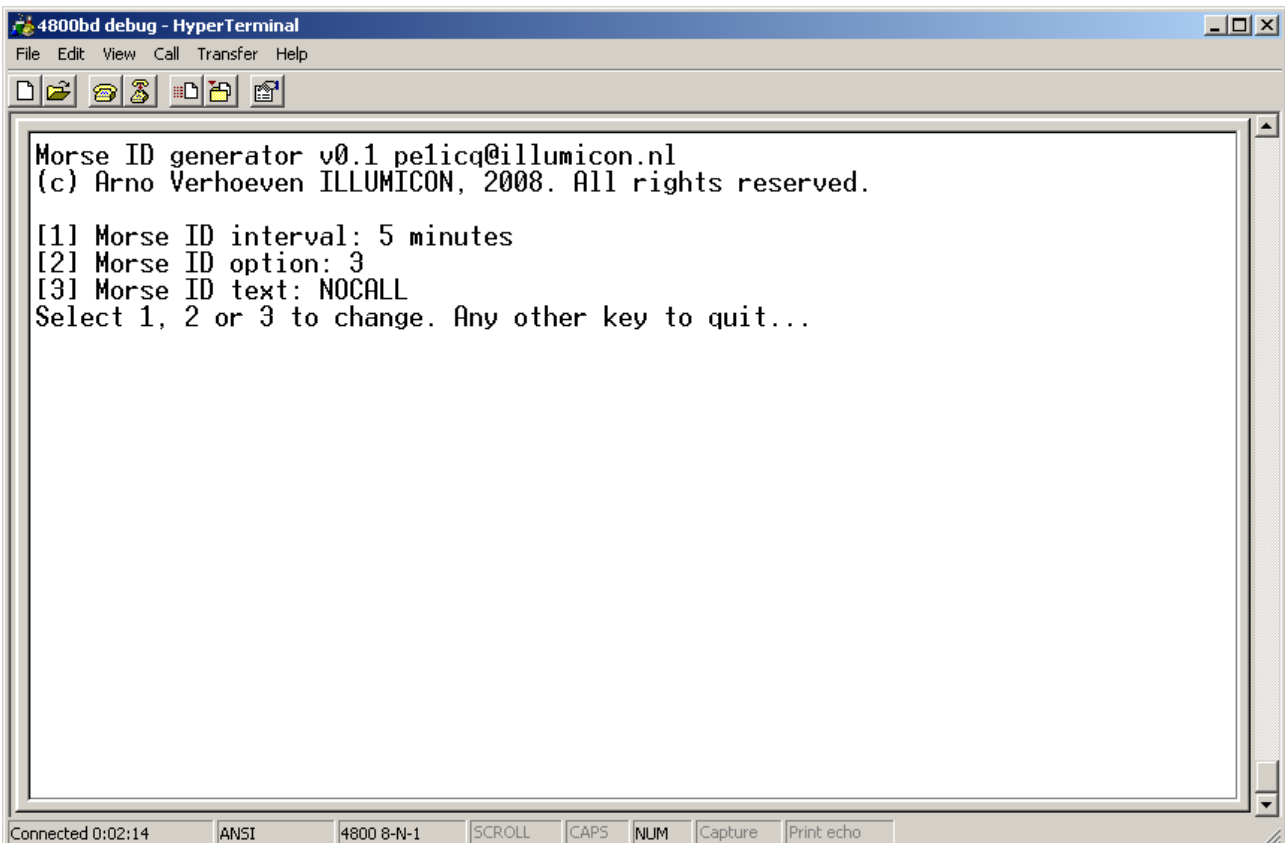
Then enter the ports bit rate (speed) and flow control options. Select 4800 8-N-1 and no Flow-Control:



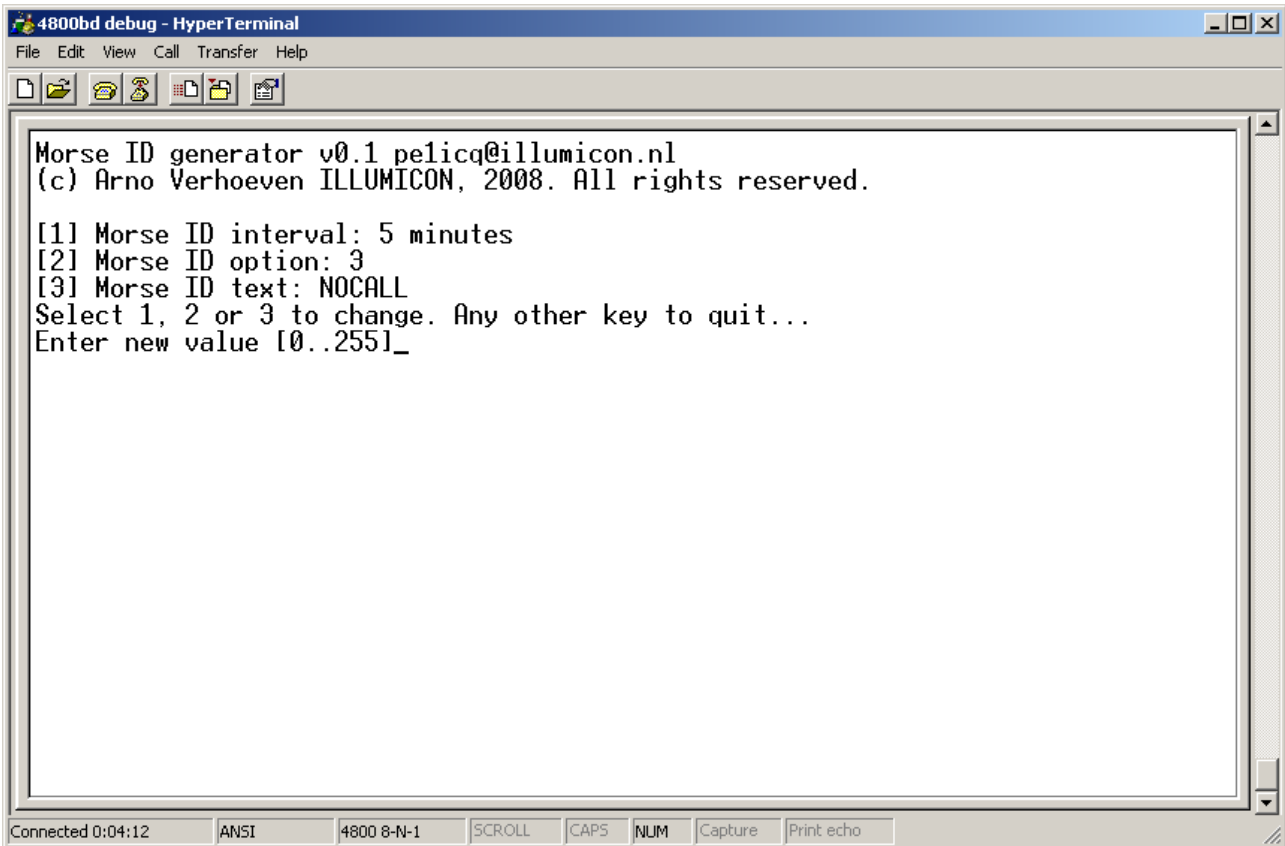
Hyperterminal is now ready for use:



Now switch on the +12V power supply to the Morse ID generator, and type a single !-character on the terminal. The following text will appear:



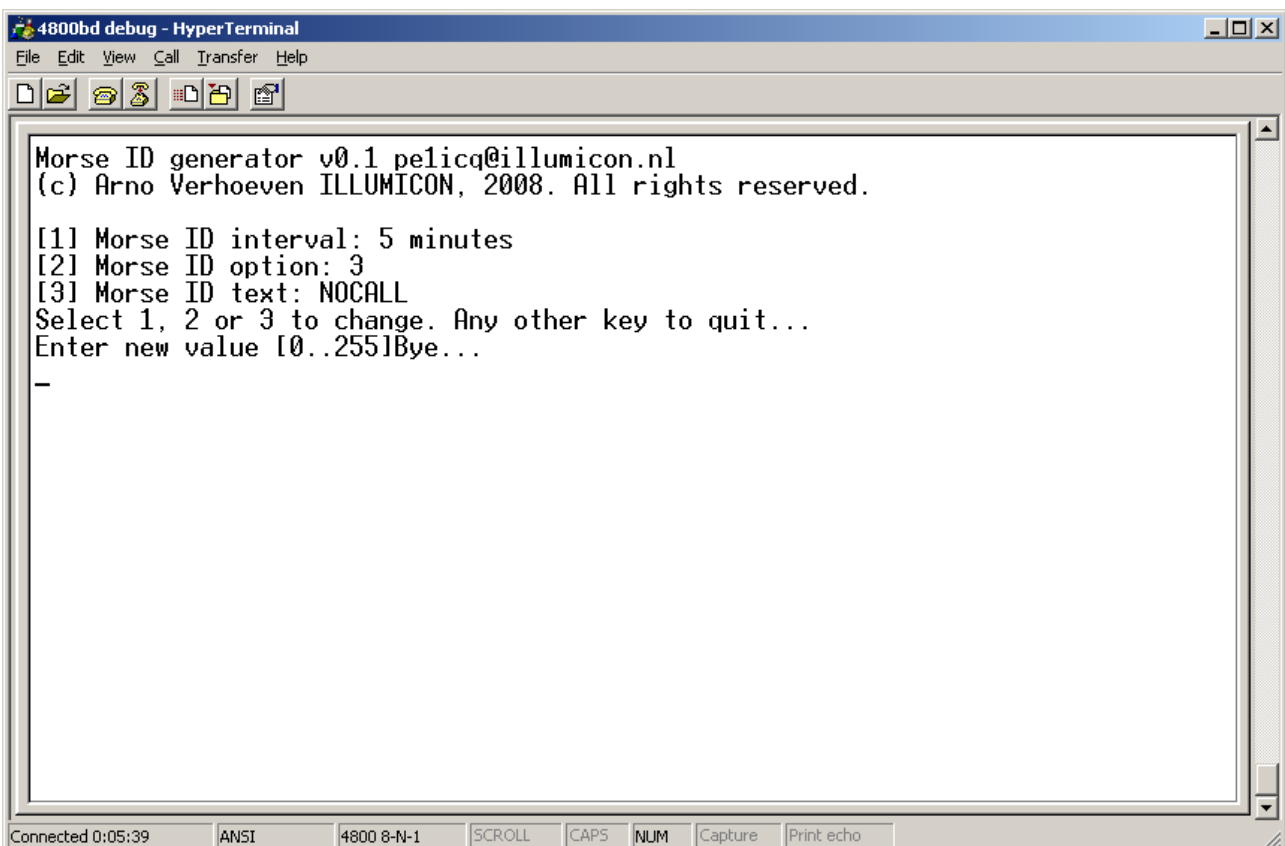
To change the interval type 1



```
Morse ID generator v0.1 pelicq@illumicon.nl
(c) Arno Verhoeven ILLUMICON, 2008. All rights reserved.

[1] Morse ID interval: 5 minutes
[2] Morse ID option: 3
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
Enter new value [0..255]_
```

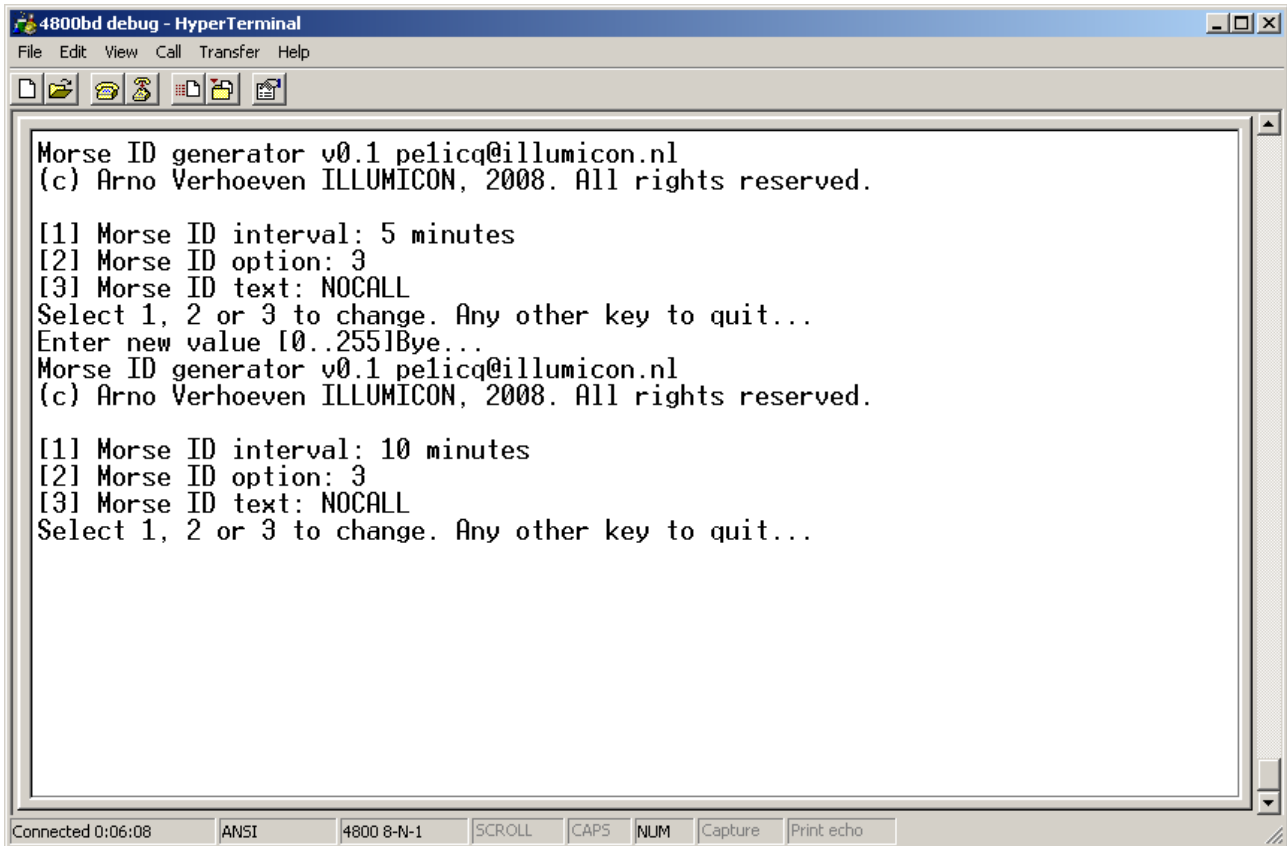
You can enter the new number of minutes for the interval. You can enter any number between 0 and 255,. Hit the Enter-key to complete entry. Typed characters are not echoed, so you may not see what you type.



```
Morse ID generator v0.1 pelicq@illumicon.nl
(c) Arno Verhoeven ILLUMICON, 2008. All rights reserved.

[1] Morse ID interval: 5 minutes
[2] Morse ID option: 3
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
Enter new value [0..255]Bye...
-
```

To review what you have entered, you can simply type a !-character again.



```
4800bd debug - HyperTerminal
File Edit View Call Transfer Help

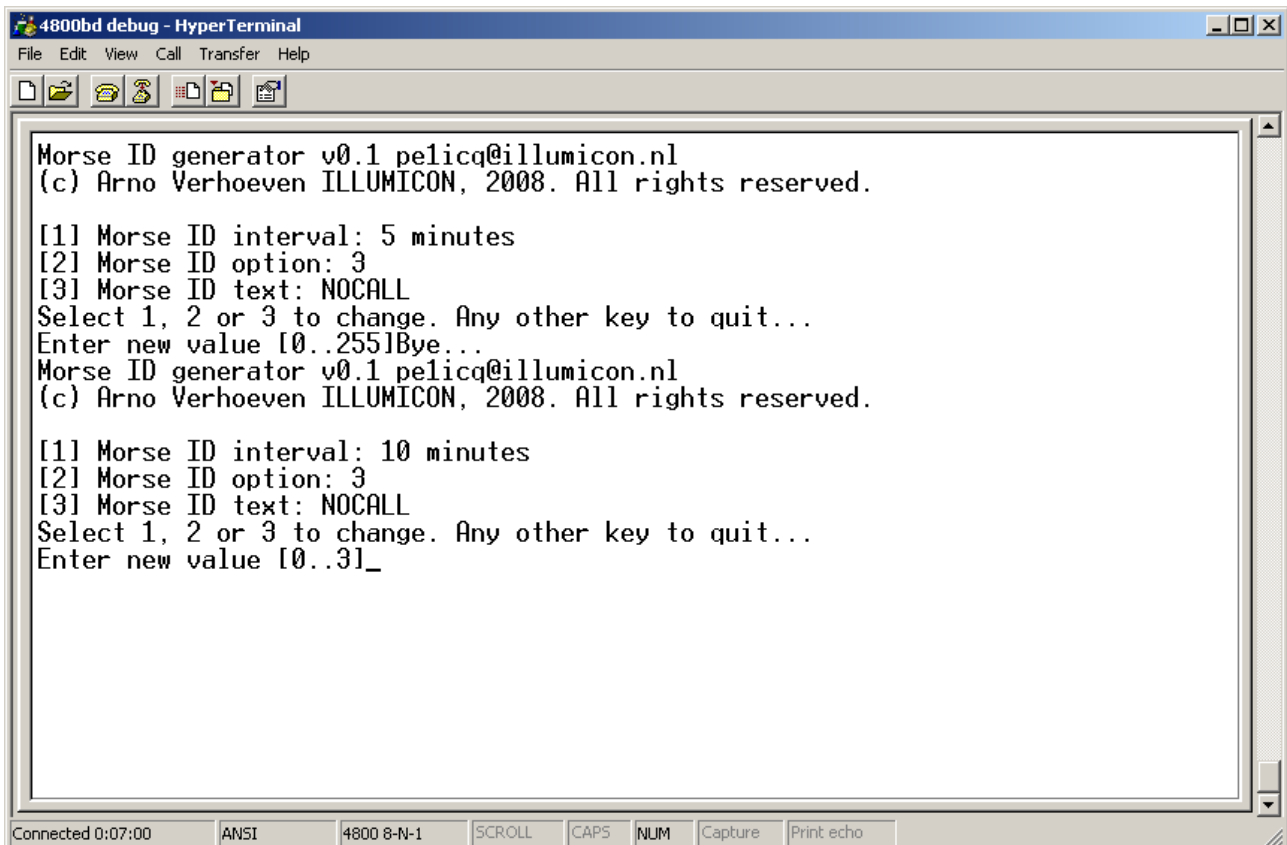
Morse ID generator v0.1 pelicq@illumicon.nl
(c) Arno Verhoeven ILLUMICON, 2008. All rights reserved.

[1] Morse ID interval: 5 minutes
[2] Morse ID option: 3
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
Enter new value [0..255]Bye...
Morse ID generator v0.1 pelicq@illumicon.nl
(c) Arno Verhoeven ILLUMICON, 2008. All rights reserved.

[1] Morse ID interval: 10 minutes
[2] Morse ID option: 3
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...

Connected 0:06:08  ANSI  4800 8-N-1  SCROLL  CAPS  NUM  Capture  Print echo
```

To change the behavior of the Morse ID generator type **2**



```
4800bd debug - HyperTerminal
File Edit View Call Transfer Help

Morse ID generator v0.1 pelicq@illumicon.nl
(c) Arno Verhoeven ILLUMICON, 2008. All rights reserved.

[1] Morse ID interval: 5 minutes
[2] Morse ID option: 3
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
Enter new value [0..255]Bye...
Morse ID generator v0.1 pelicq@illumicon.nl
(c) Arno Verhoeven ILLUMICON, 2008. All rights reserved.

[1] Morse ID interval: 10 minutes
[2] Morse ID option: 3
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
Enter new value [0..3]_

Connected 0:07:00  ANSI  4800 8-N-1  SCROLL  CAPS  NUM  Capture  Print echo
```

You can enter a 0, 1, or 3 to change the behavior.

Option value 0 results in the following behavior:

The Morse ID generator continuously counts elapsed time, also when not transmitting. If the preset interval time has elapsed, then at the very next time PTT is activated, the ID text is transmitted.

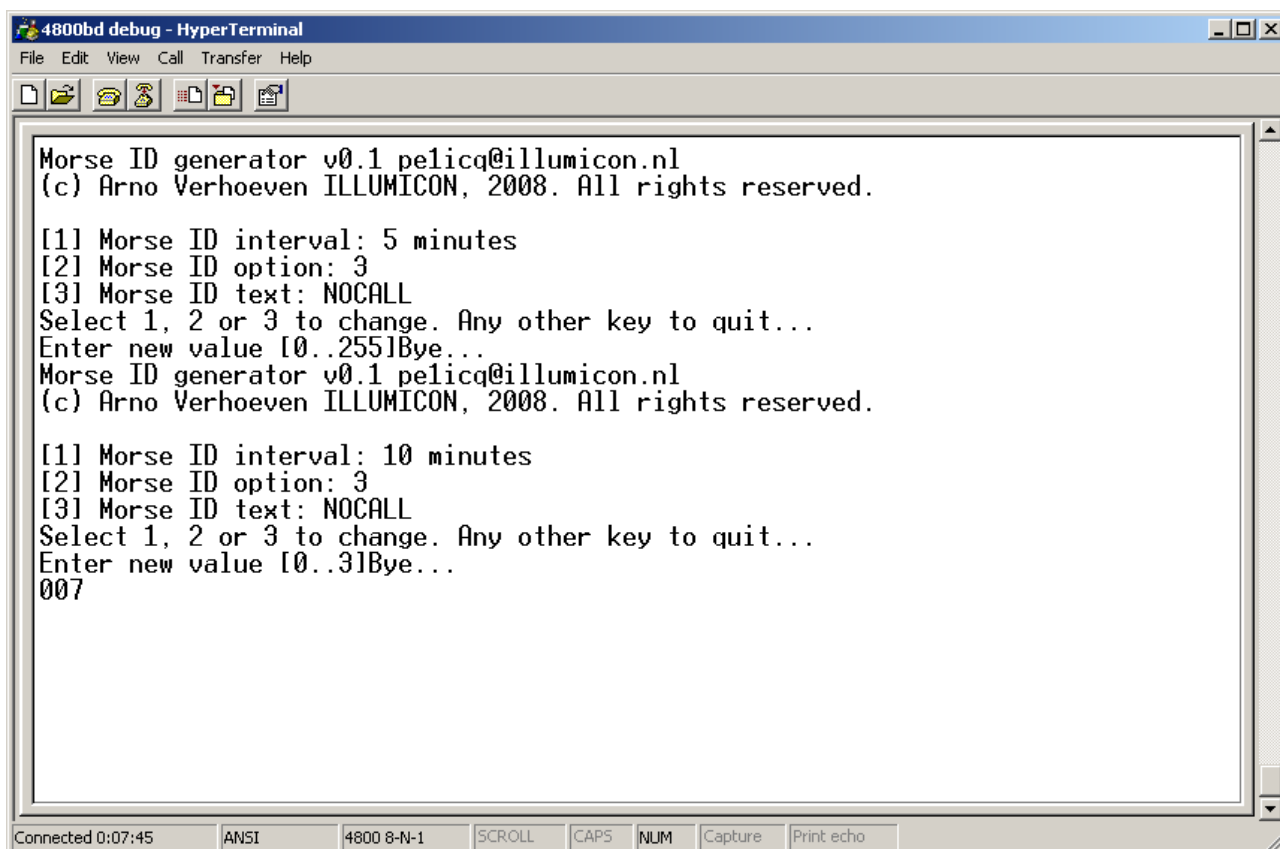
Option value 1 results in the following behavior:

the Morse ID generator starts counting elapsed time when PTT is activated. If the preset interval time has elapsed the ID text is transmitted. Then the counter is reset, and starts counting again.

Option value 3 results in the following behavior:

The behavior is the same as with value 1, but in addition to the preset intervals, the ID text is also transmitted 15 seconds after activating PTT.

If you select option value 0, then you will notice that the counter starts running immediately:



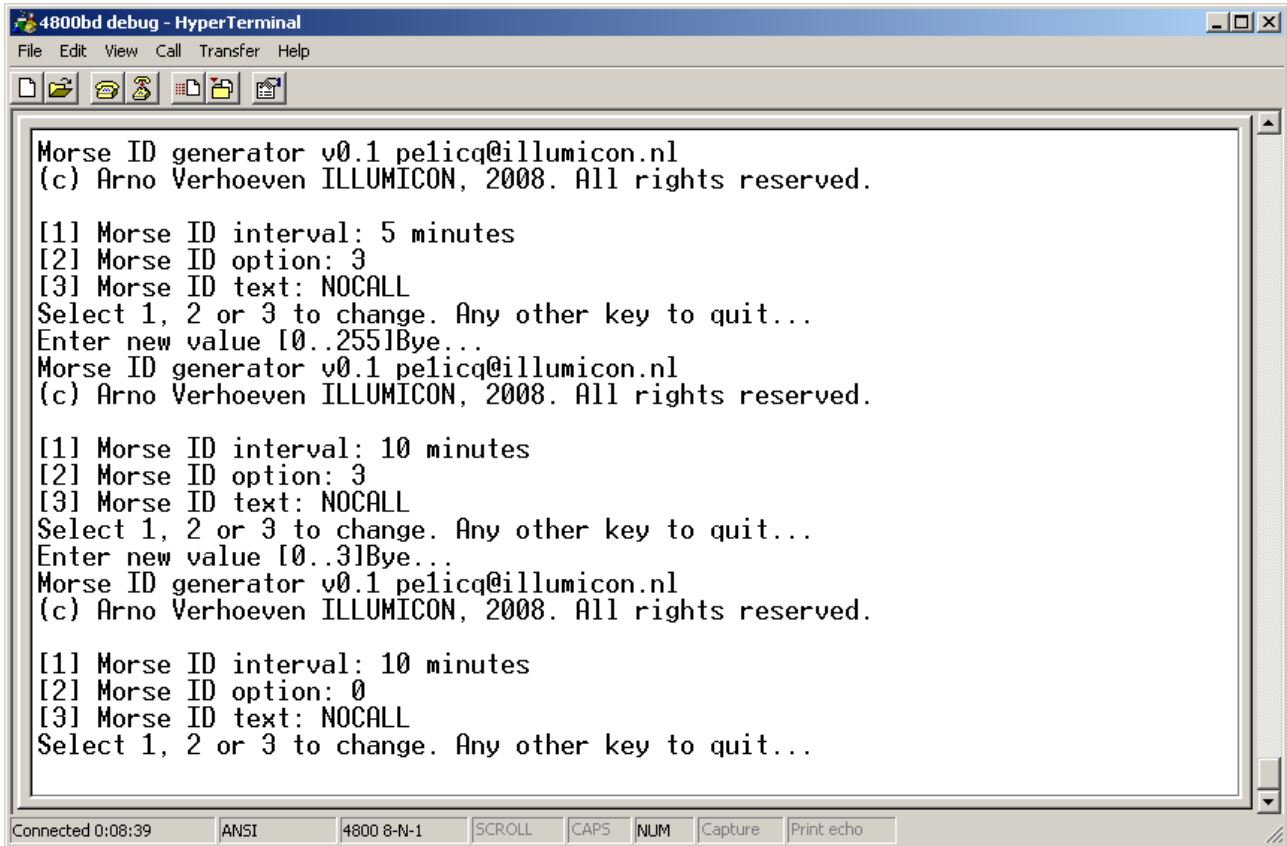
```
4800bd debug - HyperTerminal
File Edit View Call Transfer Help
Morse ID generator v0.1 pelicq@illumicon.nl
(c) Arno Verhoeven ILLUMICON, 2008. All rights reserved.

[1] Morse ID interval: 5 minutes
[2] Morse ID option: 3
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
Enter new value [0..255]Bye...
Morse ID generator v0.1 pelicq@illumicon.nl
(c) Arno Verhoeven ILLUMICON, 2008. All rights reserved.

[1] Morse ID interval: 10 minutes
[2] Morse ID option: 3
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
Enter new value [0..3]Bye...
007

Connected 0:07:45  ANSI  4800 8-N-1  SCROLL  CAPS  NUM  Capture  Print echo
```

Press ! again to change an other setting:



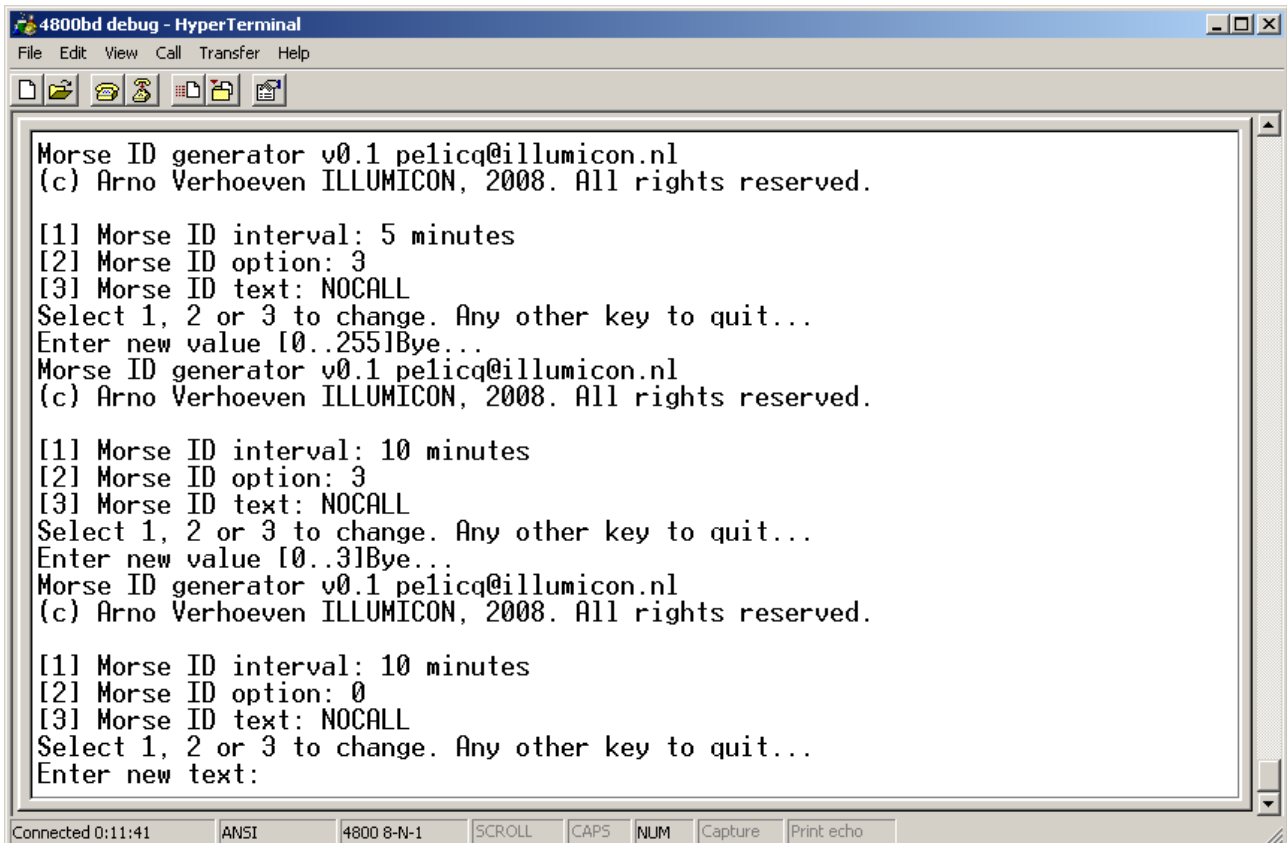
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Morse ID generator v0.1 pelicq@illumicon.nl
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[1] Morse ID interval: 5 minutes
[2] Morse ID option: 3
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
Enter new value [0..255]Bye...
Morse ID generator v0.1 pelicq@illumicon.nl
(c) Arno Verhoeven ILLUMICON, 2008. All rights reserved.

[1] Morse ID interval: 10 minutes
[2] Morse ID option: 3
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
Enter new value [0..3]Bye...
Morse ID generator v0.1 pelicq@illumicon.nl
(c) Arno Verhoeven ILLUMICON, 2008. All rights reserved.

[1] Morse ID interval: 10 minutes
[2] Morse ID option: 0
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
```

Type **3** to change the Morse ID text:



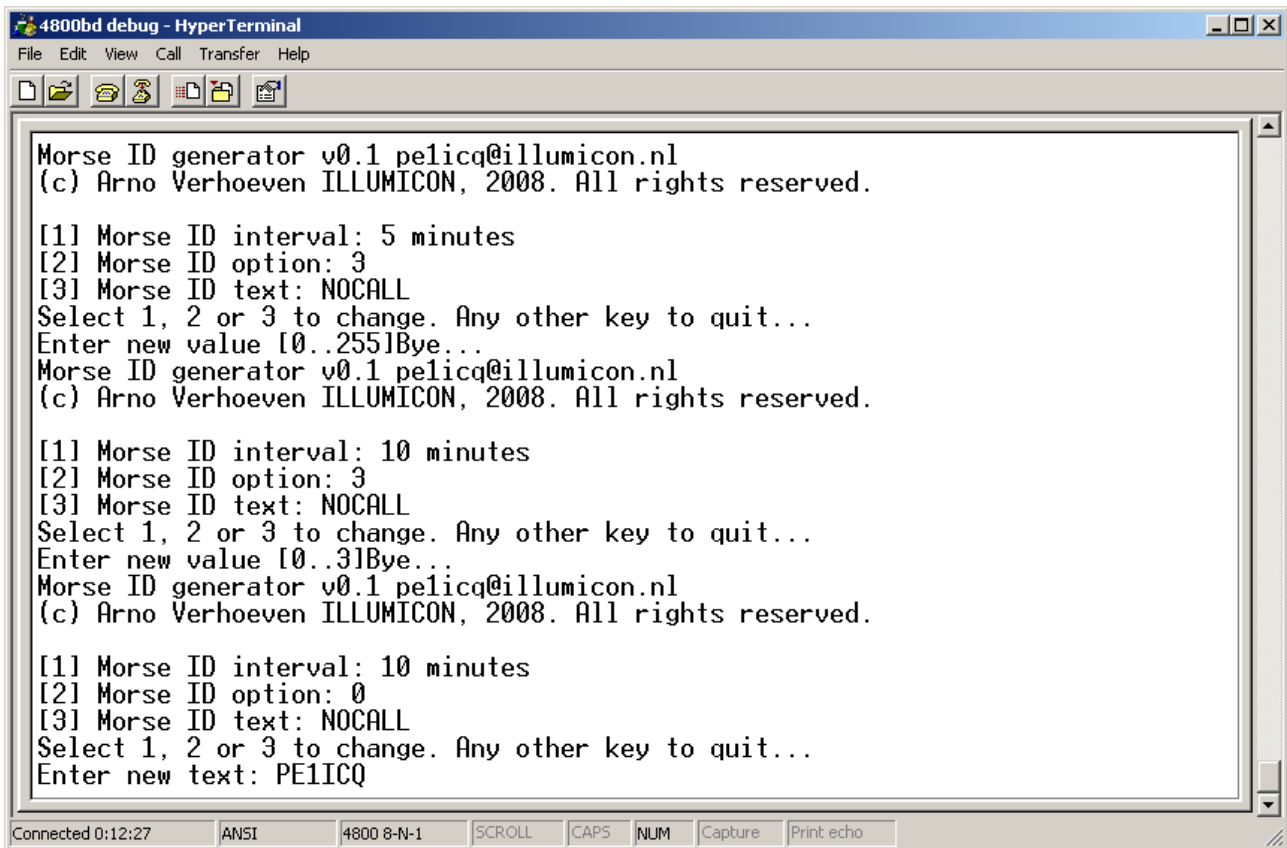
```
Morse ID generator v0.1 pelicq@illumicon.nl
(c) Arno Verhoeven ILLUMICON, 2008. All rights reserved.

[1] Morse ID interval: 5 minutes
[2] Morse ID option: 3
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
Enter new value [0..255]Bye...
Morse ID generator v0.1 pelicq@illumicon.nl
(c) Arno Verhoeven ILLUMICON, 2008. All rights reserved.

[1] Morse ID interval: 10 minutes
[2] Morse ID option: 3
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
Enter new value [0..3]Bye...
Morse ID generator v0.1 pelicq@illumicon.nl
(c) Arno Verhoeven ILLUMICON, 2008. All rights reserved.

[1] Morse ID interval: 10 minutes
[2] Morse ID option: 0
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
Enter new text:
```

You can enter only letters A through Z, digits 0 through 9, and spaces. Any other character will be ignored:



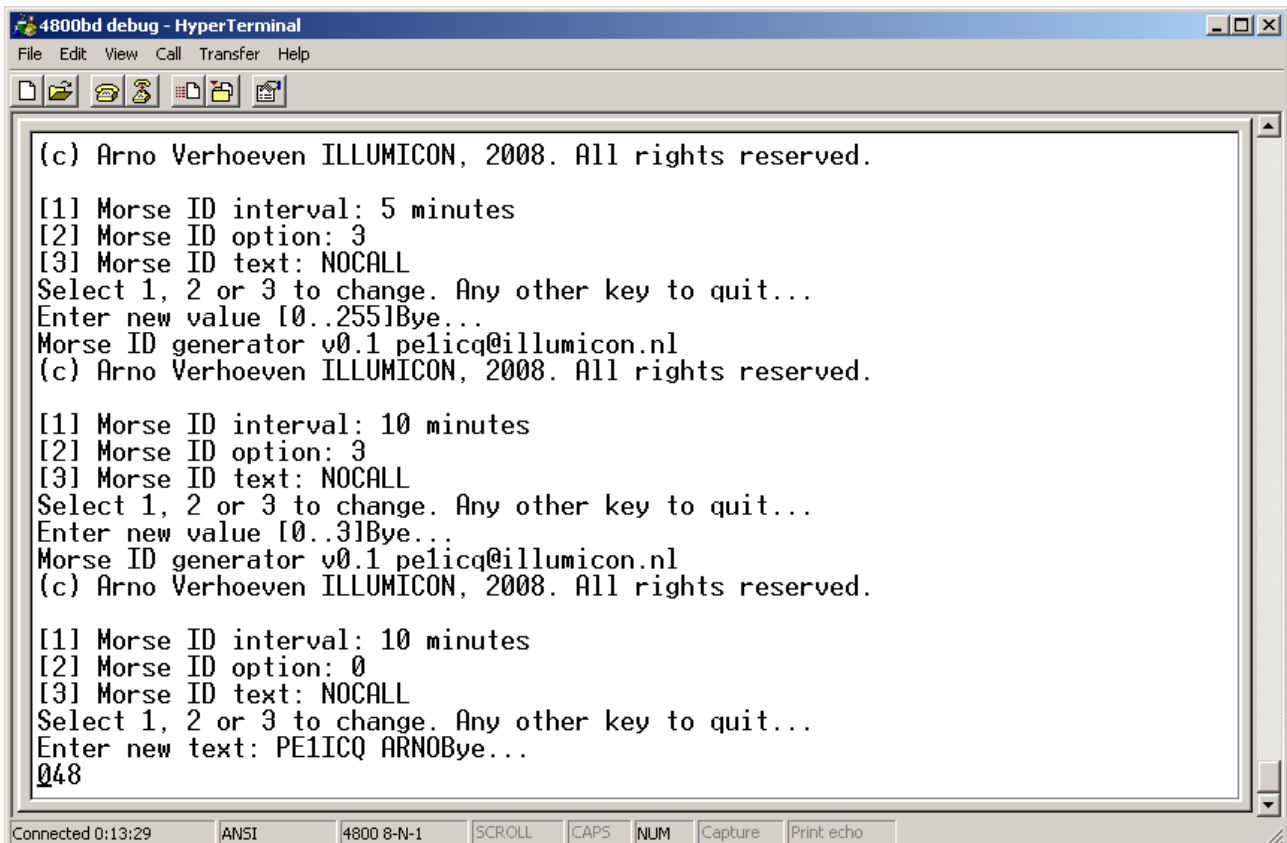
```
Morse ID generator v0.1 pelicq@illumicon.nl
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[1] Morse ID interval: 5 minutes
[2] Morse ID option: 3
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
Enter new value [0..255]Bye...
Morse ID generator v0.1 pelicq@illumicon.nl
(c) Arno Verhoeven ILLUMICON, 2008. All rights reserved.

[1] Morse ID interval: 10 minutes
[2] Morse ID option: 3
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
Enter new value [0..31]Bye...
Morse ID generator v0.1 pelicq@illumicon.nl
(c) Arno Verhoeven ILLUMICON, 2008. All rights reserved.

[1] Morse ID interval: 10 minutes
[2] Morse ID option: 0
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
Enter new text: PE1ICQ
```

Hit the Enter-key to complete your entry.



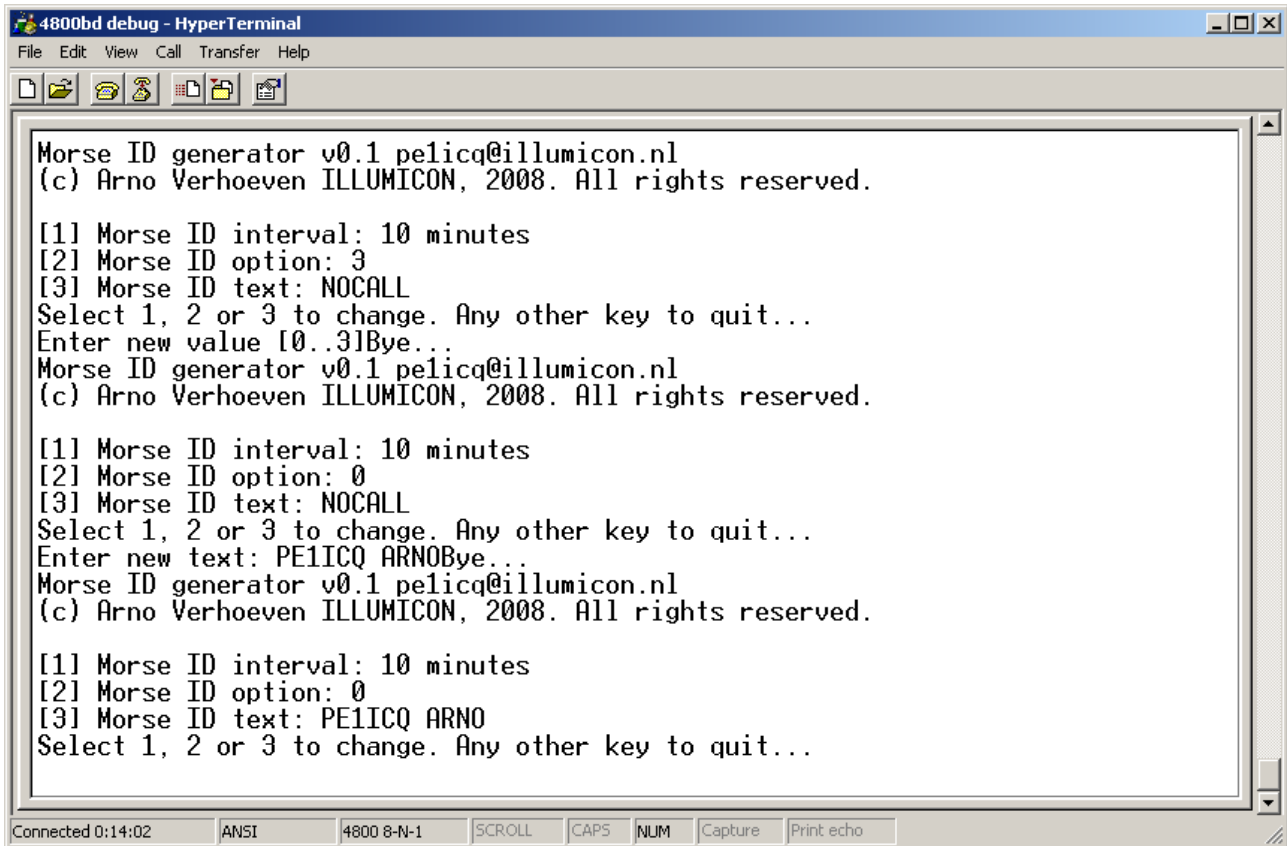
```
(c) Arno Verhoeven ILLUMICON, 2008. All rights reserved.

[1] Morse ID interval: 5 minutes
[2] Morse ID option: 3
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
Enter new value [0..255]Bye...
Morse ID generator v0.1 pelicq@illumicon.nl
(c) Arno Verhoeven ILLUMICON, 2008. All rights reserved.

[1] Morse ID interval: 10 minutes
[2] Morse ID option: 3
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
Enter new value [0..31]Bye...
Morse ID generator v0.1 pelicq@illumicon.nl
(c) Arno Verhoeven ILLUMICON, 2008. All rights reserved.

[1] Morse ID interval: 10 minutes
[2] Morse ID option: 0
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
Enter new text: PE1ICQ ARNOBye...
Q48
```

If you review your settings by typing a !-character, then don't forget to type any key (except 1, 2 or 3) to leave the configuration menu. Otherwise the Morse IS generator will continue to wait for your input and meanwhile suspends normal operation.



```
4800bd debug - HyperTerminal
File Edit View Call Transfer Help

Morse ID generator v0.1 pelicq@illumicon.nl
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[1] Morse ID interval: 10 minutes
[2] Morse ID option: 3
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
Enter new value [0..3]Bye...
Morse ID generator v0.1 pelicq@illumicon.nl
(c) Arno Verhoeven ILLUMICON, 2008. All rights reserved.

[1] Morse ID interval: 10 minutes
[2] Morse ID option: 0
[3] Morse ID text: NOCALL
Select 1, 2 or 3 to change. Any other key to quit...
Enter new text: PE1ICQ ARNOBye...
Morse ID generator v0.1 pelicq@illumicon.nl
(c) Arno Verhoeven ILLUMICON, 2008. All rights reserved.

[1] Morse ID interval: 10 minutes
[2] Morse ID option: 0
[3] Morse ID text: PE1ICQ ARNO
Select 1, 2 or 3 to change. Any other key to quit...

Connected 0:14:02  ANSI  4800 8-N-1  SCROLL  CAPS  NUM  Capture  Print echo
```