

"can_sensor_network_example"

CAN Software Network Example

AT90CAN32/64/128

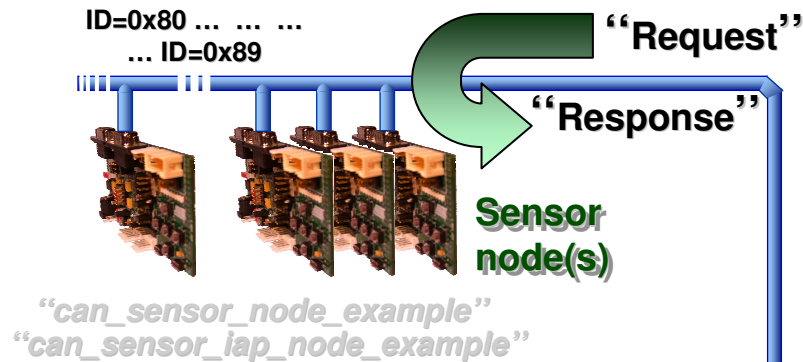


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Demo. program

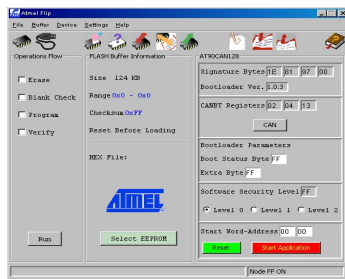
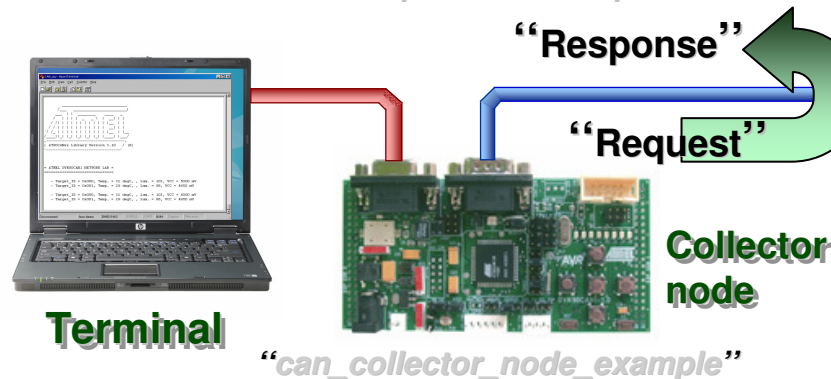
Sensor:

- One dedicated CAN identifier (ID_{11}) for each sensor node.
- The sensor node has to answer a data frame with the same ID_{11} than the request and as data, the values of its 3 local sensors:
 - Local temperature
 - Local luminosity
 - Local power-supplying



Sensor - IAP:

- **IAP:** In Application Programming
- The application behavior is the same that "Sensor".
- Sensor node have to load on board a CAN - Bootloader.
- The node can be re-programmed while the network is working
- Flip3 is dedicated to allow this task, ex: changing the attributed ID_{11} .



Flip3

Collector:

- Resquest frames are periodically send (ID_{11} 0x80 up to 0x89).
- If a response exists, it is re- sent to the Terminal.
- The Terminal displays sensor data of the requested board:
 - Local temperature
 - Local luminosity
 - Local power-supplying

Demo. environment

■ IDE:

AVR Studio 4.13.528 (or higher), AVRGCC plug-in & CAN plug-in

■ C Compiler:

WinAVR-20070122

■ Default targets:

DVK90CAN1 Atmel development boards

■ Configuration:

▪ Software:

Described in «**config.h**» in main root of the following projects:

- «**can_sensor_node_example**» project,
- «**can_sensor_iap_node_example**» project,
- «**can_collector_node_example**» project.

▪ Hardware:

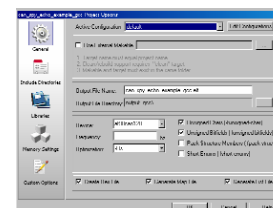
Described in «**..\libraries\lib_board\dvk90can_board.h**» (called by «**config.h**»)

▪ Default setting:

- Microcontroller: **AT90CAN128** at 8 MHz (external crystal - no internal RC)
- For Collector - **UART_0** - baudrate: **38400** bds (8-bit, no parity, 1 stop-bit)
- CAN bitrate: **250** Kbps (fixed)



WINAVR



“CAN Traffic” screen shot example

- Request frames: ID₁₁ from 0x080 up to 0x089, DLC=4
- Answer (data) frame: Same ID₁₁, DLC=4

MiniMon V3 by IXXAT

File Edit View Functions Options Help

IXXAT Interfaces

- USB-to-CAN compact
- CAN A: SJA 1000

Transmit message / mSec State Mode Identifier Data

Time	State	Mode	Identifier	Data
00:01:37.318	Rtr	11	80	Remote request DLC = 4
00:01:37.318		11	80	20 67 01 F4
00:01:37.385	Rtr	11	81	Remote request DLC = 4
00:01:37.385		11	81	1D 62 81 EF
00:01:37.452	Rtr	11	82	Remote request DLC = 4
00:01:37.501	Rtr	11	83	Remote request DLC = 4
00:01:37.551	Rtr	11	84	Remote request DLC = 4
00:01:37.601	Rtr	11	85	Remote request DLC = 4
00:01:37.650	Rtr	11	86	Remote request DLC = 4
00:01:37.700	Rtr	11	87	Remote request DLC = 4
00:01:37.749	Rtr	11	88	Remote request DLC = 4
00:01:37.799	Rtr	11	89	Remote request DLC = 4
00:01:39.821	Rtr	11	80	Remote request DLC = 4
00:01:39.822		11	80	20 67 01 F4
00:01:39.888	Rtr	11	81	Remote request DLC = 4
00:01:39.889		11	81	1D 62 01 EF
00:01:39.955	Rtr	11	82	Remote request DLC = 4
00:01:40.005	Rtr	11	83	Remote request DLC = 4
00:01:40.054	Rtr	11	84	Remote request DLC = 4
00:01:40.104	Rtr	11	85	Remote request DLC = 4
00:01:40.153	Rtr	11	86	Remote request DLC = 4
00:01:40.203	Rtr	11	87	Remote request DLC = 4
00:01:40.253	Rtr	11	88	Remote request DLC = 4
00:01:40.302	Rtr	11	89	Remote request DLC = 4

Controller initialized

Low speed transceiver

Transmit pending

Data overrun

Error warning level

Bus off

Baudrate: 250 Kbaud

Busload in percent

Tx ID EXT RTR Data

Tx	ID	EXT	RTR	Data
		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	

Status Features

Transmit the selected message

Messages: 480

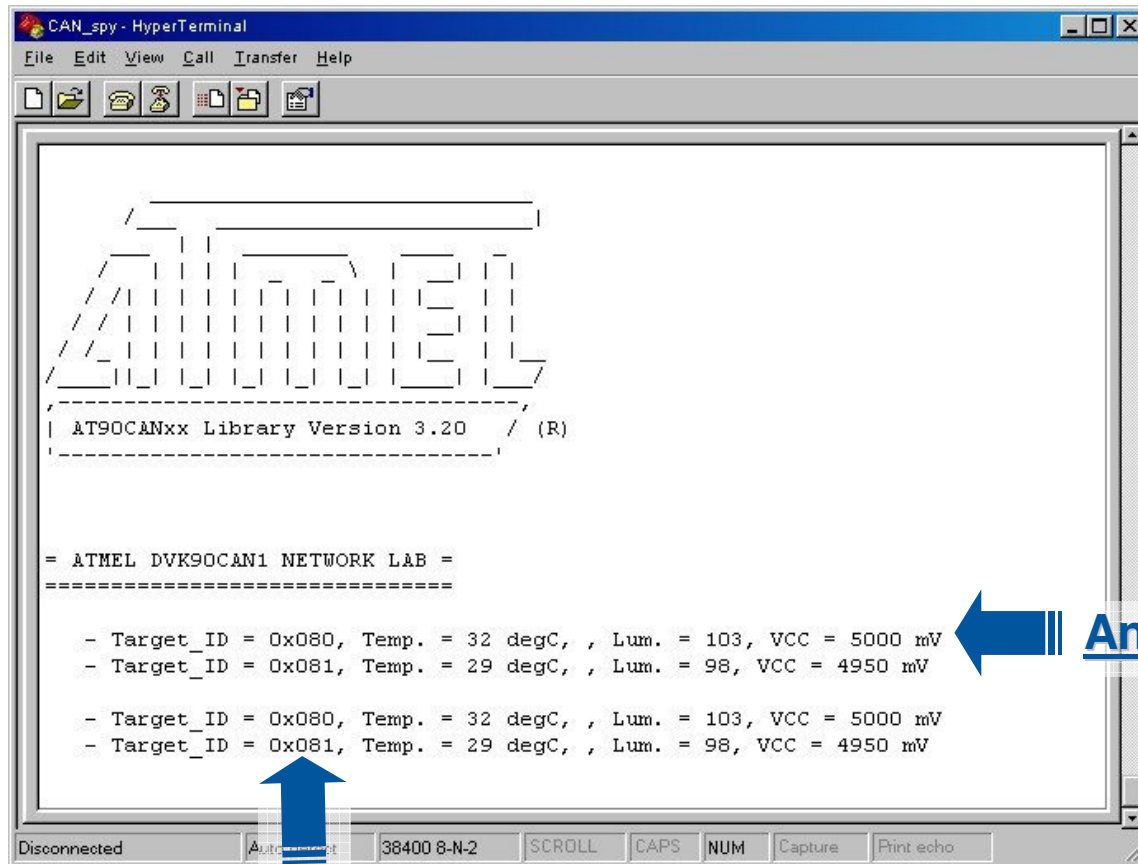
CAN 2.0A (11-bit ID)

RTR: 0x080

Answer: 4 bytes



"Terminal" screen shot example



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CAN_spy - HyperTerminal
File Edit View Call Transfer Help

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| AT90CANxx Library Version 3.20 / (R) |
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= ATMEL DVK90CAN1 NETWORK LAB =
=====

- Target_ID = 0x080, Temp. = 32 degC, , Lum. = 103, VCC = 5000 mV
- Target_ID = 0x081, Temp. = 29 degC, , Lum. = 98, VCC = 4950 mV

- Target_ID = 0x080, Temp. = 32 degC, , Lum. = 103, VCC = 5000 mV
- Target_ID = 0x081, Temp. = 29 degC, , Lum. = 98, VCC = 4950 mV

Disconnected Auto 38400 8-N-2 SCROLL CAPS NUM Capture Print echo
```

Answer: ID 0x81

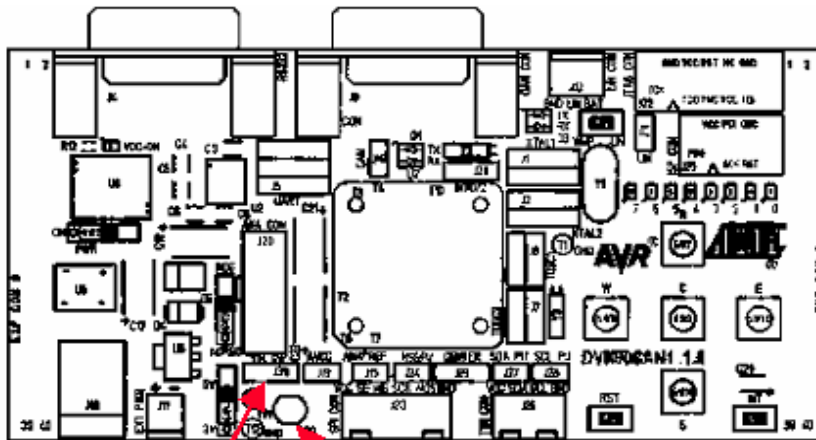
- Temp = 32 °C
- Lumisosity ~ 103 Lux
- Vcc = 5.00 Volts

Answer: ID 0x81

- Temp = 29 °C
- Lumisosity ~ 98 Lux
- Vcc = 4.95 Volts

DVK90CAN1 sensor details

Component side



Vcc
Switch
Measurement

Luminosity
Sensor

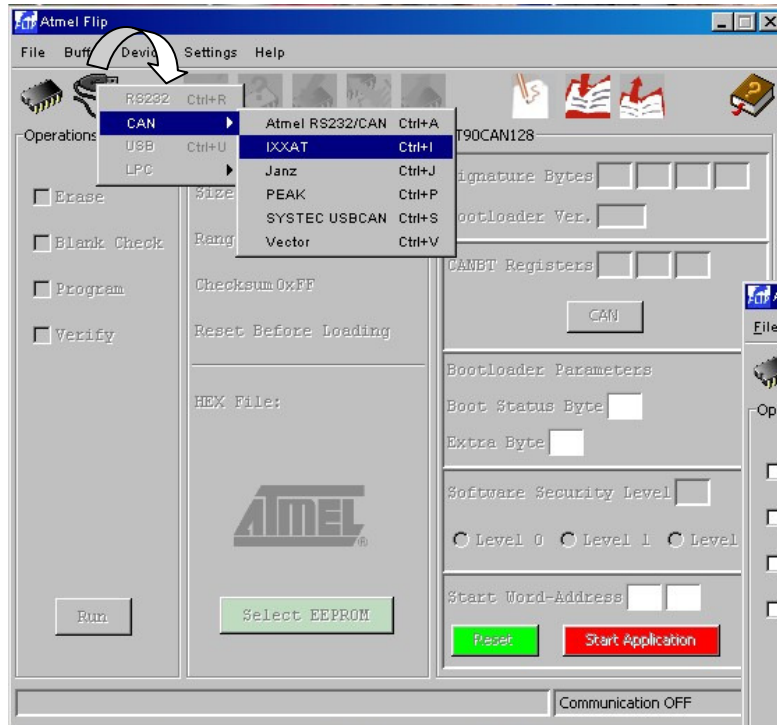
Solder side

R31
Thermistor

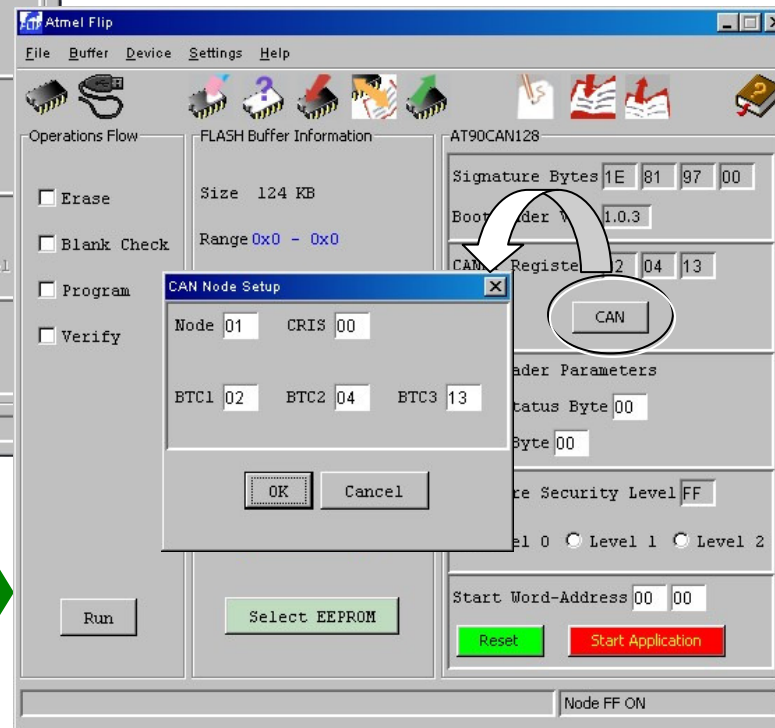


"can_sensor_network_example"

"Flip 3" using (1)



← **Flip** connection:
- Device
- Medium



Flip set: →
- BSB & EB bytes
- NNB & BTCx

"Flip 3" using (2)



The screenshot shows the Atmel Flip software interface. The 'File' menu is open, highlighting 'Load HEX File...'. A red arrow points to this menu with the text 'Flip load file'. Below it, the 'Load HEX/A90 File' dialog box is open, showing a list of files in the 'pre_compiled_hex_file' directory, including 'can_sensor_iap_node_0x80_example_gcc.hex' through '0x83_example_gcc.hex'. The 'Run' button is circled with a green arrow pointing to the text 'Flip command:'. The main window shows the 'Operations Flow' section with 'Erase', 'Blank Check', 'Program', and 'Verify' checked. The 'FLASH Buffer Information' section shows 'Size 124 KB', 'Range 0x0 - 0x2831', and 'Checksum 0x123B5D'. The 'AT90CAN128' section shows 'Signature Bytes 1E 81 97 00' and 'Bootloader Ver. 1.0.3'. The 'Reset' button is circled with a green arrow pointing to the text 'Reset or Start Appli @xxx'.

Flip command:

- Run: Erase, Blank Check, ...
- Reset or Start Appli @xxx



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