

# ***IGW/400-CAN*** ***WLAN Device Server***

## Smart Command Line Interpreter Reference

Firmware Version 1.010



### **SSV Embedded Systems**

Heisterbergallee 72  
D-30453 Hannover  
Phone: +49-(0)511-40000-0  
Fax: +49-(0)511-40000-40  
E-mail: [sales@ist1.de](mailto:sales@ist1.de)

Manual Revision: 1.2  
Date: 2005-11-30

# CONTENT

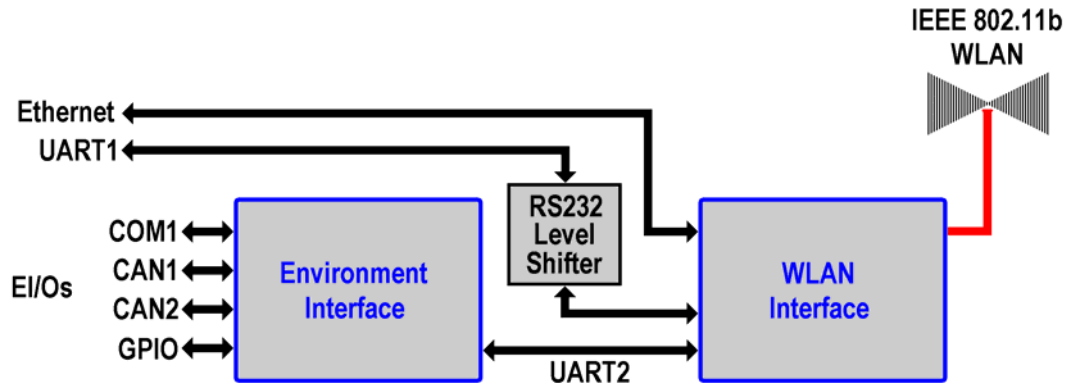
---

1	INTRODUCTION.....	3
2	CAN ASCII COMMANDS.....	5
2.1	<b>1</b> - Select CAN1 Interface.....	5
2.2	<b>2</b> - Select CAN2 Interface.....	6
2.3	<b>?</b> - Request Selected CAN Interface.....	7
2.4	<b>In</b> - Set Channel IDs for CAN Interfaces.....	8
2.5	<b>Sn</b> - Setup Standard CAN Bitrates.....	9
2.6	<b>O</b> - Open CAN Channel.....	10
2.7	<b>C</b> - Close CAN Channel.....	11
2.8	<b>tiildd</b> - Transmit a Standard CAN Frame (11-bit).....	12
2.9	<b>Tiiiiildd</b> - Transmit an Extended CAN Frame (29-bit).....	13
2.10	<b>P</b> - Poll Incoming FIFO for one CAN Frame.....	14
2.11	<b>A</b> - Poll Incoming FIFO for all CAN Frames.....	15
2.12	<b>Xn</b> - Set Auto Poll/Send for CAN Frames.....	16
2.13	<b>F</b> - Read CAN Status Flags.....	17
2.14	<b>Zn</b> - Set Time Stamp for CAN Frames.....	18
2.15	<b>Mxxxxxxxx</b> - Set Acceptance Code Register.....	19
2.16	<b>mxxxxxxxx</b> - Set Acceptance Mask Register.....	20
2.17	<b>Un</b> - Set UART Baud Rate.....	21
2.18	<b>V</b> - Get Version Number of Smart Command Line Interpreter.....	22
2.19	<b>N</b> - Get Serial Number of IGW/400-CAN.....	23
3	SAMPLE SESSION.....	24
	CONTACT.....	25
	DOCUMENT HISTORY.....	25
	COPYRIGHT.....	25

# 1 INTRODUCTION

The IGW400-CAN comes with a build-in Smart Command Line Interpreter (SCLI). This firmware runs on an internal ARM7TDMI microcontroller with 256 Kbytes flash and 16 Kbytes SRAM memory as part of the environment interface.

The SCLI allows you to control the CAN channels CAN1 and CAN2 with simple ASCII commands over the serial port UART2.



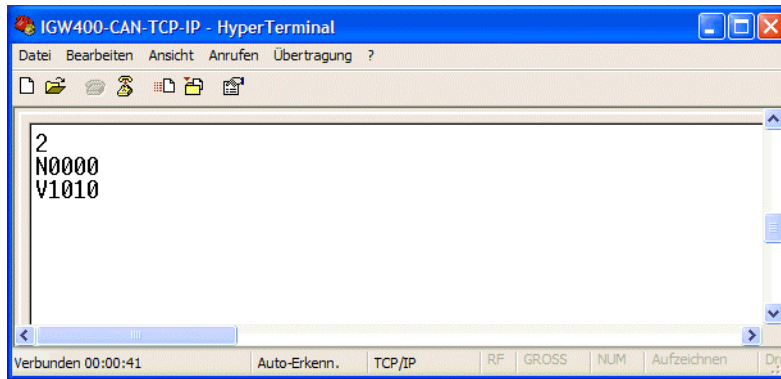
**Figure 1: Block diagram of IGW/400-CAN**

The SCLI consists of 19 simple ASCII commands. Some of these commands are based on a simple single letter or digit and a **CR (Carriage Return)**. Other commands need parameters in addition between the command letter and the CR. All commands are **case sensitive**. The following table shows an overview.

Command	Function
1[CR]	Select CAN1 Interface
2[CR]	Select CAN2 Interface
?[CR]	Request Selected CAN Interface
In[CR]	Set Channel IDs for CAN Interfaces
Sn[CR]	Setup Standard CAN Bitrates
O[CR]	Open CAN Channel
C[CR]	Close CAN Channel
tiiidd...[CR]	Transmit a Standard CAN Frame (11-bit)
Tiiiiiiidd...[CR]	Transmit an Extended CAN Frame (29-bit)
P[CR]	Poll Incoming FIFO for one CAN Frame
A[CR]	Poll Incoming FIFO for all CAN Frames
Xn[CR]	Set Auto Poll/Send for CAN Frames
F[CR]	Read CAN Status Flags
Zn[CR]	Set Time Stamp for CAN Frames
Mxxxxxxx[CR]	Set Acceptance Code Register
mxxxxxxx[CR]	Set Acceptance Mask Register
Un[CR]	Set UART Baud Rate
V[CR]	Get Version Number of Smart Command Line Interpreter
N[CR]	Get Serial Number of IGW/400-CAN

**Table 1: SCLI command overview**

**Please note:** The IGW/400-CAN does not send an echo for commands and parameters. Please turn on the local echo of your terminal emulation software if necessary.



**Figure 2: The SCLI is accessible with a simple terminal emulation program**

Figure 2 shows how to access the SCLI with the HyperTerminal terminal emulation program. This program comes with each Windows-based PC. For this screenshot HyperTerminal runs in Telnet (TCP/IP) mode. This operation mode allows you a TCP/IP-based connection to the IP address 192.168.3.126 and the TCP port 10002 (the factory setup default parameters for your IGW/400-CAN).

If you press a key, HyperTerminal sends the ASCII code for that key over the TCP/IP link to the IGW/400-CAN TCP server at port 10002 and IP address 192.168.3.126. An additional CR (Carriage Return) invokes the execution of a command.

## 2 CAN ASCII COMMANDS

---

**Please note:** All CAN232 commands are case sensitive and must end with [CR] = carriage return (ASCII = 13).

### 2.1 Select CAN1 Interface

---

**1 [CR]**

**Example:** 1 [CR] (select CAN1 interface)

**Return:** CR (ASCII 13) = OK or  
BELL (ASCII 7) = ERROR

After this command all following commands refer to the CAN1 interface.

**Please note:** The CAN1 interface is selected by default after a reset of the IGW/400-CAN.

## 2.2 Select CAN2 Interface

---

2 [CR]

**Example:** 2 [CR] (select CAN2 interface)

**Return:** CR (ASCII 13) = OK or  
BELL (ASCII 7) = ERROR

After this command all following commands refer to the CAN2 interface.

**Please note:** The CAN1 interface is selected by default after a reset of the IGW/400-CAN.

## 2.3 Request Selected CAN Interface

---

? [CR]

**Example:** ? [CR] (request actual selected CAN interface)

**Return:** 1[CR] = CAN1 interface or  
2[CR] = CAN2 interface

## 2.4 Set Channel IDs for CAN Interfaces

---

**In** [CR]

**1. Example:** I0 [CR] (set channel IDs for received CAN frames OFF)

**2. Example:** I1 [CR] (set channel IDs for received CAN frames ON)

**Return:** CR (ASCII 13) = OK or  
BELL (ASCII 7) = ERROR

If the channel IDs are turned ON, the received CAN frames start with a prefix. This prefix displays which CAN interface has received the data (“1:data...” or “2:data...”).

**Please note:** The default value for the channel IDs is OFF.

## 2.5 Setup Standard CAN Bitrates

**S<sub>n</sub> [CR]**

**Example:** S5 [CR] (set CAN bitrate to 250 Kbit)

**Return:** CR (ASCII 13) = OK or  
BELL (ASCII 7) = ERROR

The following table shows the possible values for **n**:

Command	Function
S0	CAN bitrate 10 Kbit
S1	CAN bitrate 20 Kbit
S2	CAN bitrate 50 Kbit
S3	CAN bitrate 100 Kbit
S4	CAN bitrate 125 Kbit
S5	CAN bitrate 250 Kbit
S6	CAN bitrate 500 Kbit
S8	CAN bitrate 1 Mbit

**Table 1: Standard CAN bitrates**

**Please note:** This command works only if the CAN channel is closed.

## 2.6 Open CAN Channel

---

O [CR]

**Example:** O [CR] (open the CAN channel)

**Return:** CR (ASCII 13) = OK or  
BELL (ASCII 7) = ERROR

**Please note:** This command works only if the CAN channel is closed and has been initiated before with the S command (see chapter 2.5).

## 2.7 Close CAN Channel

---

**C [CR]**

**Example:** C [CR] (close the CAN channel)

**Return:** CR (ASCII 13) = OK or  
BELL (ASCII 7) = ERROR

**Please note:** This command works only if the CAN channel is open.

## 2.8 Transmit a Standard CAN Frame (11 Bit)

---

**tiiiidd...** [CR]

**iii** hex identifier (0x000 – 0x7FF)

**l** data length (0 – 8)

**dd** byte in hex value (0x00 – 0xFF)

If this value does not match the data length an error occurs.

**1. Example:** t0002221C [CR]  
(transmit an 11 bit CAN frame with ID = 0x000, 2 bytes with the hex values 0x22 and 0x1C)

**2. Example:** t0FF0 [CR]  
(transmit an 11 bit CAN frame with ID = 0xFF and 0 bytes)

**Return:** If auto poll is enabled (default):  
z[CR] = OK or  
BELL (ASCII 7) = ERROR

If auto poll is disabled (X command, see chapter 2.12):  
CR (ASCII 13) = OK or  
BELL (ASCII 7) = ERROR

**Please note:** This command works only if the CAN channel is open.

## 2.9 Transmit an Extended CAN Frame (29 Bit)

---

**Tiiiiiiiildd... [CR]**

**iiiiiii** hex identifier (0x00000000 – 0x1FFFFFFF)

**l** data length (0 – 8)

**dd** byte in hex value (0x00 – 0xFF)

If this value does not match the data length an error occurs.

**Example:** T000010002221C [CR]  
(transmit a 29 bit CAN frame with ID = 0x1000, 2 bytes with the hex values 0x22 and 0x1C)

**Return:** If auto poll is enabled (default):  
Z[CR] = OK or  
BELL (ASCII 7) = ERROR

If auto poll is disabled (X command, see chapter 2.12):  
CR (ASCII 13) = OK or  
BELL (ASCII 7) = ERROR

**Please note:** This command works only if the CAN channel is open.

## 2.10 Poll Incoming FIFO for one CAN Frame

---

**P [CR]**

**Example:** P [CR] (Poll only one CAN frame from the FIFO queue)

**Return:** A CAN frame (with the same format as a sent CAN frame) which ends with CR (ASCII 13) = OK or if there is no pendant CAN frame it returns only CR = OK or if the CAN channel is closed it returns BELL (ASCII 7) = ERROR

If the time stamp is enabled (Z command, see chapter 2.14) it writes the time in milliseconds between the last data byte and the CR.

**Please note:** This command works only if auto poll is enabled.

---

## 2.11 Poll Incoming FIFO for all CAN Frames

---

### A [CR]

**Example:** A [CR] (Poll all CAN frames from the FIFO queue)

**Return:** CAN frames (with the same format as sent CAN frames separated with CR (ASCII 13)) which end with ACR (ASCII 13) = OK or  
If there is no pendant CAN frame it returns only ACR = OK or  
If the CAN channel is closed it returns BELL (ASCII 7) = ERROR

If the time stamp is enabled (Z command, see chapter 2.14) it writes the time in milliseconds between the last data byte and the ACR.

**Please note:** This command works only if auto poll is enabled.

## 2.12 Set Auto Poll/Send for CAN Frames

---

**Xn [CR]**

**1. Example:** X0 [CR] (set auto poll/send for received CAN frames OFF)

**2. Example:** X1 [CR] (set auto poll/send for received CAN frames ON)

**Return:** CR (ASCII 13) = OK or  
BELL (ASCII 7) = ERROR

The setting of this command is saved in the EEPROM. After a reset you do not have to set it again. If auto poll/send is turned OFF, the **A** and **P** command will be enabled and the return value of the **t** and **T** command will change (see chapters 2.8 and 2.9).

**Please note:** The default value for auto poll/send is ON. This command works only if the CAN channel is closed.

## 2.13 Read CAN Status Flags

---

### F [CR]

**Example:** F [CR] (Read the status flags)

**Return:** An F with 2 bytes error code as hex value plus CR (ASCII 13) = OK or  
If the CAN channel is closed it returns BELL (ASCII 7) = ERROR

The following table shows the possible status flags:

Bit	Status
1	CAN transmit FIFO queue full
2	Error warning (EI)
3	Data overrun (DOI)
7	Bus error (BEI)

**Table 2: CAN status flags**

**Please note:** This command works only if the CAN channel is open.

## 2.14 Set Time Stamp for CAN Frames

---

### Zn [CR]

**1. Example:** z0 [CR] (set time stamp for received CAN frames OFF)

**2. Example:** z1 [CR] (set time stamp for received CAN frames ON)

**Return:** CR (ASCII 13) = OK or  
BELL (ASCII 7) = ERROR

The setting of this command is saved in the EEPROM. After a reset you do not have to set it again. If the time stamp is turned ON, it will add a 4 bytes long time stamp in hex value to the return of the **A** and **P** command respectively to the auto poll return.

The time stamp counts the time in milliseconds. The hex value of the time stamp ranges from 0x0000 (0 ms) up to 0xEA5F (59,999 ms). After reaching its maximum, the time stamp starts again at 0x0000.

If the time stamp is turned OFF, the received CAN frames look like this:  
t0002221C [CR]

If the time stamp is turned ON, the received CAN frames look like this:  
t0002221C0000 [CR]

**Please note:** The default value for the time stamp is OFF.  
This command works only if the CAN channel is closed.

## 2.15 Set Acceptance Code Register

---

**Mxxxxxxxx [CR]**

**Please note:** In the current version (V1010) of the Smart Command Line Interpreter this command has NO effect. In future versions this command will be implemented.

## 2.16 Set Acceptance Mask Register

---

`mxxxxxxxx [CR]`

**Please note:** In the current version (V1010) of the Smart Command Line Interpreter this command has NO effect. In future versions this command will be implemented.

## 2.17 Set UART Baud Rate

---

Un [CR]

**Please note:** In the current version (V1010) of the Smart Command Line Interpreter this command has NO effect. In future versions this command will be implemented.

---

## 2.18 Get Version Number of Smart Command Line Interpreter

---

V[CR]

**Example:** V[CR] (get the version number of the SCLI)

**Return:** A V with 4 bytes version number plus CR (ASCII 13) = OK  
e.g. V1010[CR] (that corresponds to the firmware version 1.010)

## 2.19 Get Serial Number of IGW/400-CAN

---

**N [CR]**

**Example:** N [CR] (get the serial number of the IGW/400-CAN)

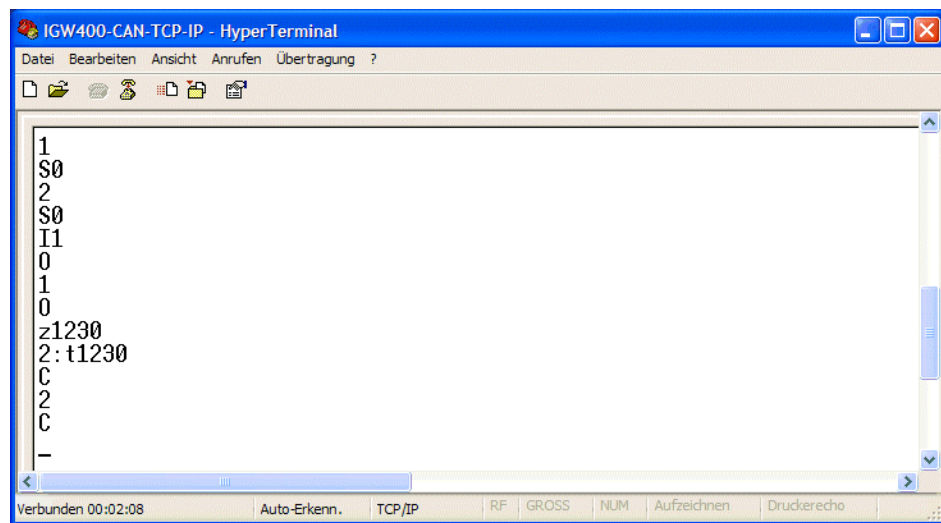
**Return:** An N with 4 bytes serial number plus CR (ASCII 13) = OK  
e.g. N0000[CR]

**Please note:** The serial number can contain numerical and alpha numerical values.

### 3 SAMPLE SESSION

This chapter describes a simple SCLI sample session. Please run your HyperTerminal terminal emulation program in the TCP/IP-based Telnet mode. Make sure that the local echo is on.

First prepare your IGW/400-CAN. This sample needs a loop-back connection between the CAN channels CAN1 and CAN2 (connect the 14-pin environment interface connector pin 9 with pin 12 and pin 11 with pin 14). Then connect HyperTerminal with the IP address **192.168.3.126** and the TCP port **10002** (ex factory settings of your IGW/400-CAN).



```

IGW400-CAN-TCP-IP - HyperTerminal
Datei Bearbeiten Ansicht Anrufen Übertragung ?
1
S0
2
S0
I1
O
1
O
z1230
2:t1230
C
2
C
-
Verbunden 00:02:08 Auto-Erkenn. TCP/IP RF GROSS NUM Aufzeichnen Druckerecho

```

**Figure 3: SCLI session with loop-back connection between CAN1 and CAN2**

Figure 3 shows the setup for CAN1 and CAN2 and the transmission of a CAN frame with an 11-bit identifier from the IGW/400-CAN channel CAN1 to CAN2.

Step	Command	Function
1	1[CR]	Select CAN1 Interface (the following command address CAN1)
2	S0[CR]	Setup Standard CAN Bitrates (CAN1 = 10 Kbps)
3	2[CR]	Select CAN2 Interface (the following command address CAN2)
4	S0[CR]	Setup Standard CAN Bitrates (CAN2 = 10 Kbps)
5	I1[CR]	Select Channel IDs ... (set channel ID for CAN1 = ON)
6	O[CR]	Open CAN Channel (open CAN1)
7	1[CR]	Select CAN1 Interface (the following command address CAN1)
8	O[CR]	Open CAN Channel (open CAN2)
9	t1230[CR]	Transmit a Standard CAN Frame (transmit CAN frame over CAN1)
10	C[CR]	Close CAN Channel (close CAN1)
11	2[CR]	Select CAN2 Interface (the following command address CAN2)
12	C[CR]	Close CAN Channel (close CAN2)

**Table 3: Command overview for SCLI sample session**

**Please note:** Step 9 “Transmit a Standard CAN Frame” generates a ”z” if no error occurs. This echo overwrites the “t”. The following line “2:t1230” within HyperTerminal shows the received data of CAN2.

## CONTACT

---

**SSV Embedded Systems**  
Heisterbergallee 72  
D-30453 Hannover / Germany  
Phone: +49-(0)511-40000-0  
Fax: +49-(0)511-40000-40  
E-mail: sales@ist1.de  
Internet: www.ssv-embedded.de

## DOCUMENT HISTORY

---

Revision	Date	Remarks	Name
1.0	2005-11-25	first version	WBU
1.1	2005-11-28	text format adjusted	WBU
1.2	2005-11-30	some error corrections	KDW

## COPYRIGHT

---

The content of this document can change any time without announcement. There is taken over no guarantee for the accuracy of the statements. The user assumes the entire risk as to the accuracy and the use of this document. Information in this document is provided 'as is' without warranty of any kind. Some names within this document can be trademarks of their respective holders.

© 2005 SSV EMBEDDED SYSTEMS. All rights reserved.