IGW/400-CAN
WLAN Device Server

First Steps

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

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CONTENT

1 INTRODUCTION

The WLAN Device Server IGW/400-CAN integrates typical measurement and control interfaces into a 802.11b/g-compatible WLAN.

This very compact system acts as small, easy to use interface converter, which collects any data of industrial automation components and transmits it via WLAN.

This document describes the hardware components of the IGW/400-CAN. For further information about the individual components of this product you may follow the links from our website at http://www.ssv-comm.de.

Our website contains a lot of technical information, which will be updated in regular periods.

1.1 Block Diagram

Figure 1 shows the block diagram of the IGW/400-CAN. UART1 of the WLAN interface correlates over a level shifter with the Sub-D RS232 connector. UART2 is internally connected to the Environment Interface. This subsystem is based on an ARM7TDMI microcontroller with 256 Kbytes flash and 16 Kbytes SRAM memory. The microcontroller implements the two CAN channels (CAN1, CAN2), one RS232 serial port (COM1) and two GPIOs with I2C and analog inputs.

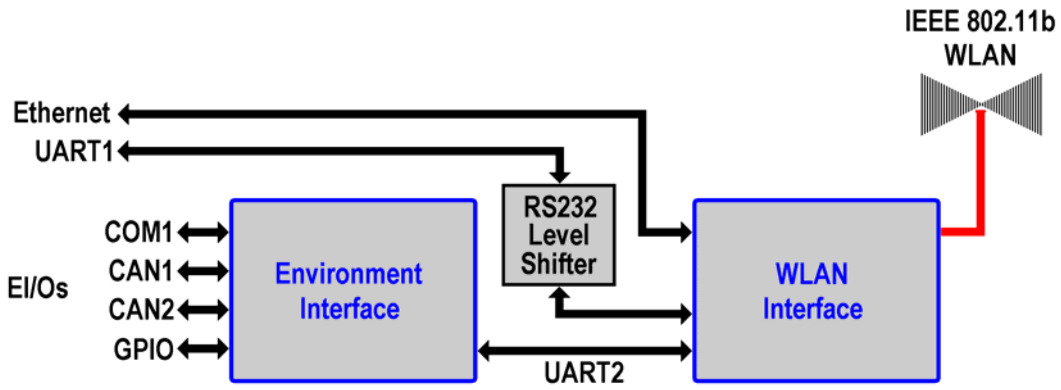

Figure 1: Block diagram of IGW/400-CAN

1.2 Features and Technical Data IGW/400-CAN

Main Functionality: Wireless Device Server with CAN and integrated TCP/IP network stack.

Wireless Interface

Wireless LAN	802.11b/g
Connection type	Antenna
Supported protocols	WEP, TCP/IP, UDP/IP, AutoIP, ARP, ICMP, SNMP, DHCP, TFTP, Telnet, HTTP

Environment Interface

Environment Interface	Active via 32-bit ARM7TDMI microcontroller
Environment I/O	RS232/ 2 x CAN/ 2 x GPIO
Connection type	14-pin plug connector
RS232	max. 230.400 bps, Signals: TxD, RxD
CAN	2 x 10 kbps – 1 Mbps; Signals: CAN_H, CAN_L
GPIO	I2C/ 2 x analog inputs /2 x PIO/ capture, jumper configurable

Further Interfaces

RS232	max. 921.600 kbps; Signals: DCD, RxD, TxD, RTS, CTS, DTR
Connection type	Sub-D, 9-pin
ISP	Signals: RXD, TXD
Ethernet	10/100 Mbps, automatic detection
Connection type	RJ-45

Other

LED Indicators	1 x supply voltage, 1 x wireless activity
Power input	6..30 VDC
Power consumption	max. 3 W
Protection degree	IP20
Operating temperature	-20 °C..70 °C
Dimensions (L x W x H)	70 x 26 x 131 mm (without antenna)
Mounting	Desktop, wall- or DIN rail
LED Indicators	1 x supply voltage, 1 x wireless activity

2 GETTING STARTED

2.1 Connecting the WLAN Antenna

The first step is to connect the WLAN antenna (which is part of the Starter Kit) with the provided interface at the backside of the IGW/400-CAN. Please note, that the antenna has to be screwed until stop with the interface.

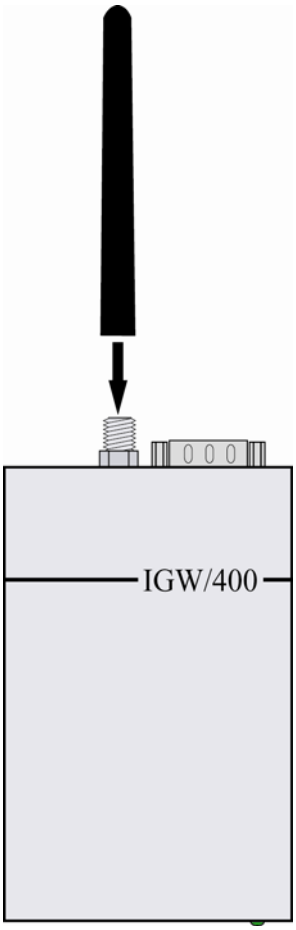

Figure 2: Connecting the WLAN antenna

The IGW/400-CAN uses frequencies in the scope of 2.4 GHz. Therefore special antennas are needed. Please only use antenna equipment, which is offered resp. tested and released by SSV. A wrong antenna might lead to permanent damage to the IGW/400-CAN!

2.2 Connecting the Plug-in Connector

Plug the 14 pin plug-in connector into the corresponding interface at the frontside of the IGW/400-CAN. Then connect the two wires of the power supply cable with the 14 pin plug-in connector. For this purpose a screwdriver is needed, which is usually part of the Starter Kit. Please pay attention to the colors of the wires and to the pin assignment of the 14 pin plug-in connector.

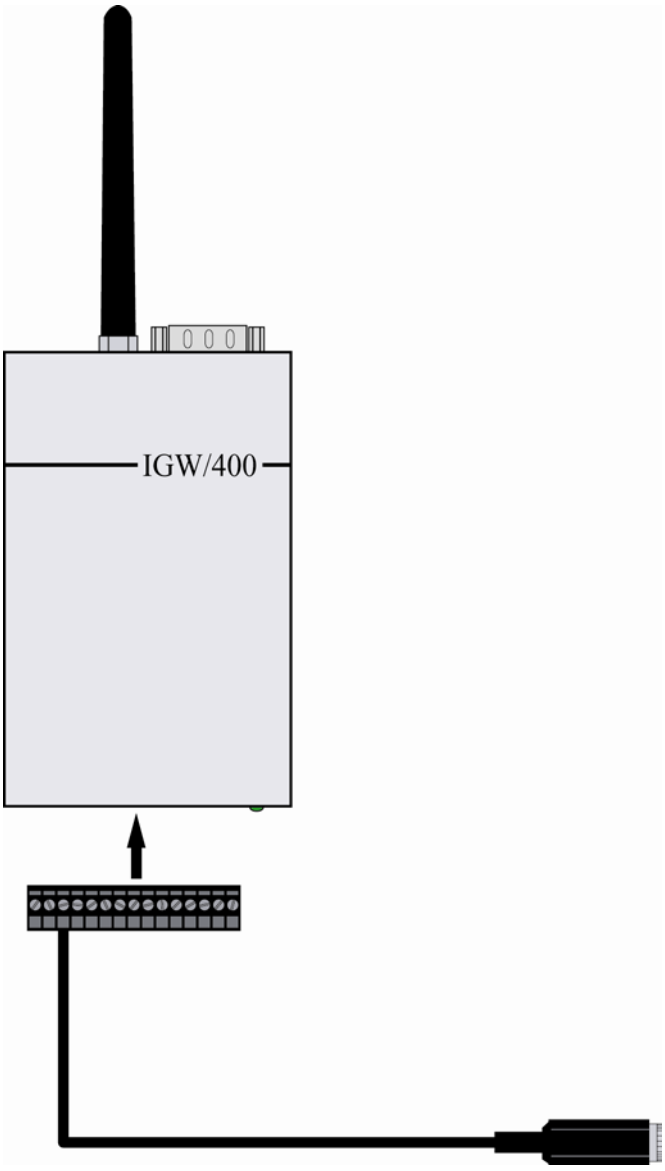

Figure 3: Connecting the plug-in connector

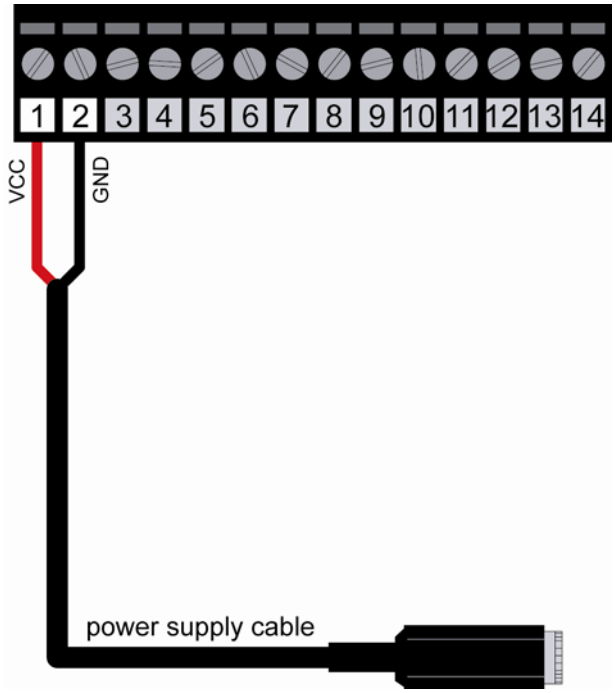

Figure 4: Pin assignment of plug-in connector

Pin	Wire color		Signal
1	red		VCC
2	black		GND

Table 1: Pin assignment of power supply cable

2.3 Creating a Loop-back Connection for Testing Purposes

For a first function test the IGW/400-CAN needs a loop back connection between the CAN channels CAN1 and CAN2. Therefore connect the pin 9 with pin 12 and pin 11 with pin 14 of the 14-pin Environment Interface with two cable bridges.

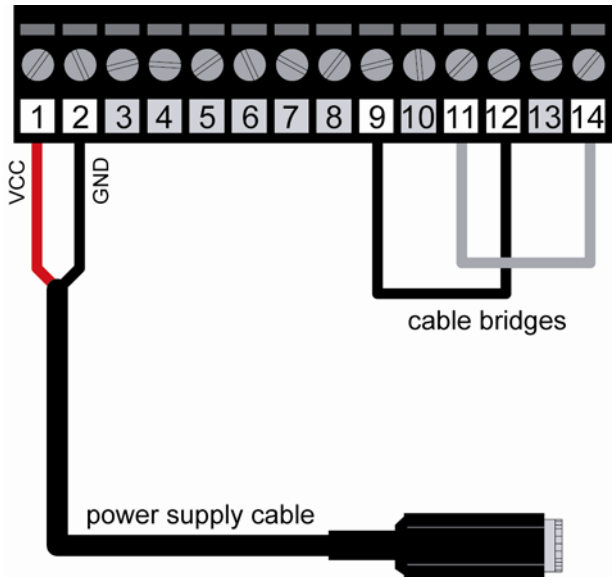

Figure 5: Loop-back connection between CAN1 and CAN2

2.4 Connecting the Power Supply

The IGW/400-CAN is now ready for use. Connect the plug-in power supply which is part of the Starter Kit with the connector of the power supply cable. Plug the plug-in power supply into an outlet to provide the IGW/400-CAN with power. Check if the red power LED at the frontside is on.

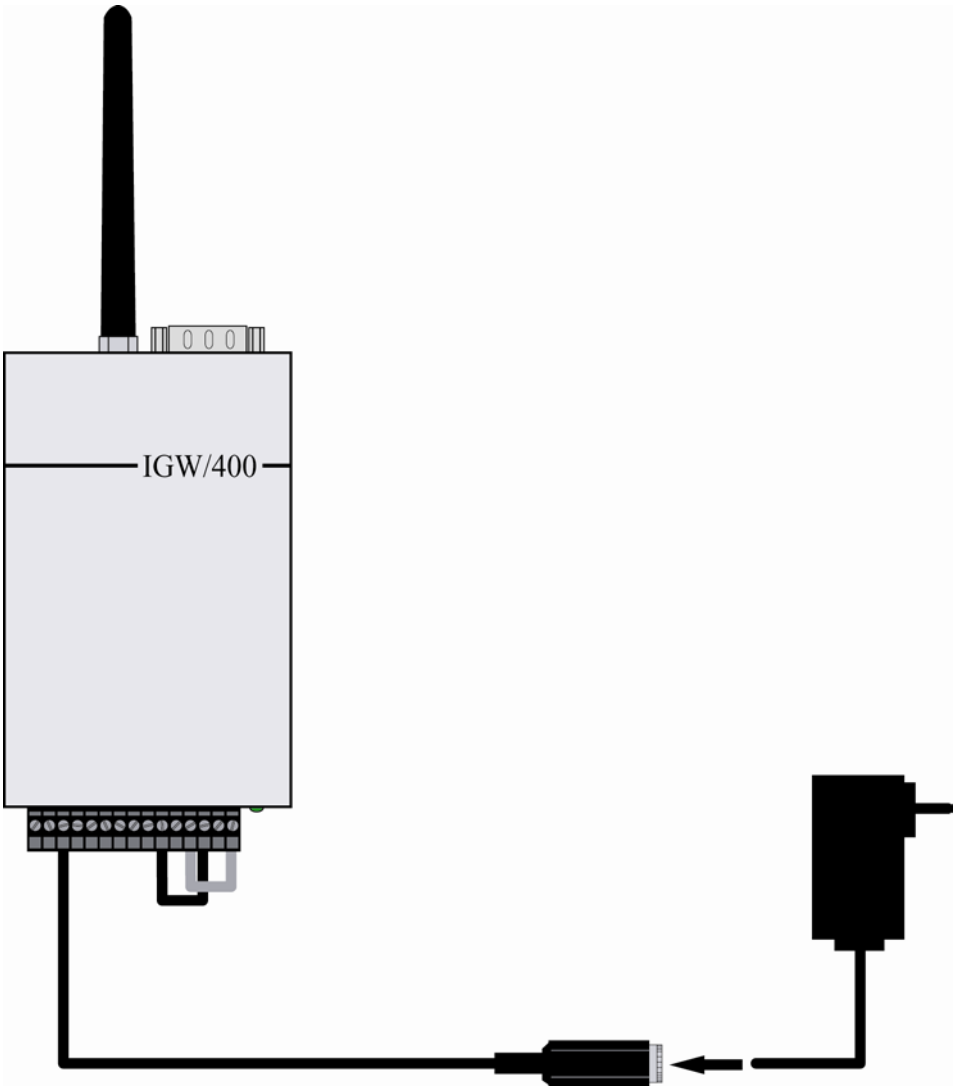

Figure 6: Connecting the power supply

Please pay attention to the polarity of the power connector: the + **pole is in the center!**

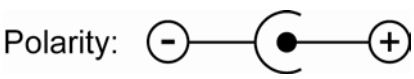

Figure 7: Polarity of the power connector

The IGW/400-CAN is now accessible from your PC. Please note the settings of the WLAN interface (ex factory settings). The following table gives an overview.

Parameter	Setup Value
Network Interface	WLAN
Network Name	SSV_IGW400
Ad Hoc Mode Settings	Enable
Ad Hoc Mode Settings: Network Name	SSV_IGW400
Ad Hoc Mode Settings: Country	USA
Ad Hoc Mode Settings: Network Channel	11
IP Address	192.168.3.126
Network Mask	255.255.255.0
UART1 Settings	9.600 bps, N, 8, 1
UART2 Settings	230.400 bps, N, 8, 1
UART1 TCP/IP Access	TCP, Port 10001
UART2 TCP/IP Access	TCP, Port 10002
Wireless Network Security	None

Table 2: WLAN settings IGW/400-CAN

For the first WLAN connection test you should adapt your PC to the ex factory settings of the IGW/400-CAN for convenience.

2.5 Arranging and Testing the WLAN Connection on the PC

This step requires a PC with an IEEE 802.11b or IEEE 802.11g WLAN interface. This interface can be formed with an USB WLAN stick, a WLAN PC card or similar extensions. If you install such an extension, please follow the instructions of the manufacturer absolutely.

The WLAN interface of your PC can operate in two different modes: the **ad-hoc mode** and the **infrastructure mode**. The ad-hoc mode corresponds to a wireless point-to-point connection, e.g. your PC and the IGW/400-CAN. The infrastructure mode is needed if you want to connect your PC with a WLAN access point. The software of your PC WLAN extension allows to choose between both operating modes. Details can be found in the manual of the manufacturer and in the help system of the WLAN extension.

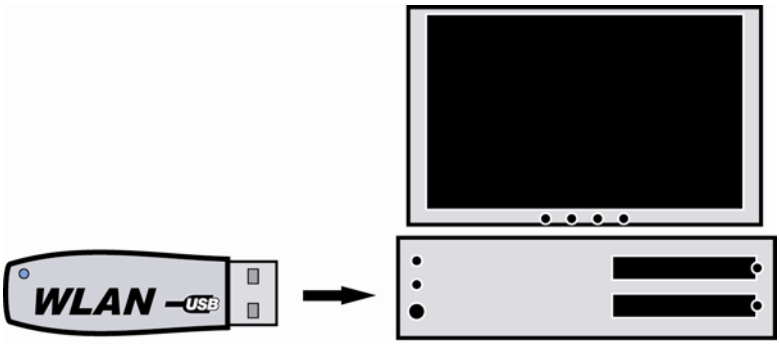

Figure 8: Arranging the WLAN connection

Set the WLAN interface of your PC to **ad hoc mode**. If your WLAN PC software allows it, search for available WLAN devices which run also in ad hoc mode. Most WLAN PC applications offer a button to start the search. The founded WLAN communication partners are shown in a small window. Usually you can choose your desired communication partner. Your WLAN PC software should find a communication partner with the identifier (network name / SSID) **SSV_IGW400**. Connect the WLAN interface of the PC with that device.

Older WLAN PC applications which do not support the automatic search for WLAN devices must be configured manually with the WLAN parameters of the IGW/400-CAN. In that case choose the WLAN **channel 11** and the name (network name / SSID) „**SSV_IGW400**“.

Change the IP address for the WLAN interface of your PC to **192.168.3.1** and the subnet mask to **255.255.255.0**. On a Windows PC you can do that via the system settings. Refer to the Windows help for more information.

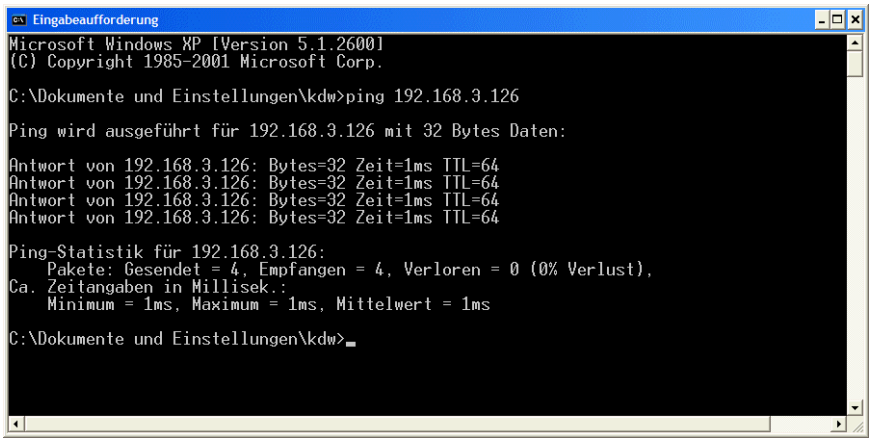

Figure 9: Testing the WLAN connection with *ping*

The IP address of the IGW/400-CAN is set ex factory to **192.168.3.126**. Open a window with a command prompt on your PC and enter

```
ping 192.168.3.126
```

The connection between your PC and the IGW/400-CAN will be tested. A succesful *ping* means that there is a running WLAN connection between both systems.

2.6 Accessing the CAN Interfaces with the SCLI

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. Please see the *IGW/400-CAN WLAN Device Server Smart Command Line Interpreter Reference* manual for more details.

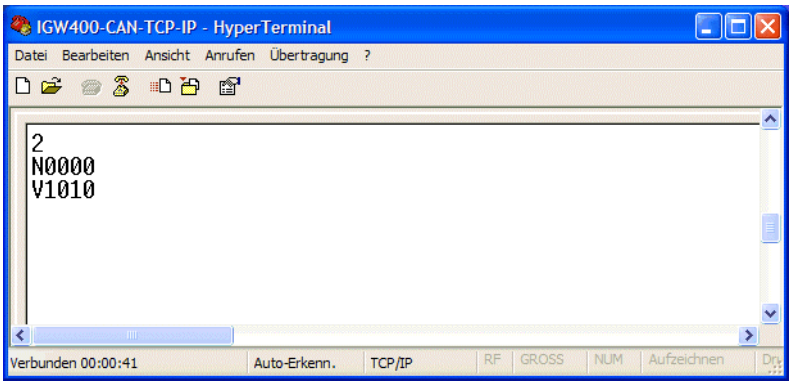

Figure 10: The SCLI is accessible with a simple terminal emulation program

The simplest way to access the SCLI of the IGW/400-CAN is a HyperTerminal session. Start the communication program HyperTerminal on your Windows-PC and configure this terminal emulation program for a telnet connection with the IP address **192.168.3.126** and port **10002** (ex factory settings of your IGW/400-CAN).

Please note that the SCLI does **not** send an echo for any entered character under HyperTerminal. Please turn on the local echo for HyperTerminal if necessary. Furthermore configure HyperTerminal in a way that a new line is created for every received CR (carriage return). After the configuration enter in HyperTerminal

```
?[CR]
```

The IGW/400-CAN must respond with “1” or “2”. This number indicates the selected CAN channel. Now enter

```
N[CR]
```

This SCLI command shows a serial number, which should be ex factory “0000”. By entering

```
V[CR]
```

you can request the version number of the SCLI. The standard respond should be “V1010”.

With a sequence of 12 SCLI commands you can now configure both CAN channels with a transfer bitrate of 10 Kbps. Then you can send a CAN frame with an 11-bit identifier via CAN1 which is received by CAN2 because of the loop-back connection.

The following table shows these 12 commands in the right order.

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
tiiildd…[CR]	Transmit a Standard CAN Frame (11-bit)
Tiiiiiiiildd…[CR]	Transmit an Extended CAN Frame (29-bit)
P[CR]	Poll Incomming FIFO for one CAN Frame
A[CR]	Poll Incomming 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
Mxxxxxxxx[CR]	Set Acceptance Code Register
mxxxxxxxx[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 3: SCLI command overview

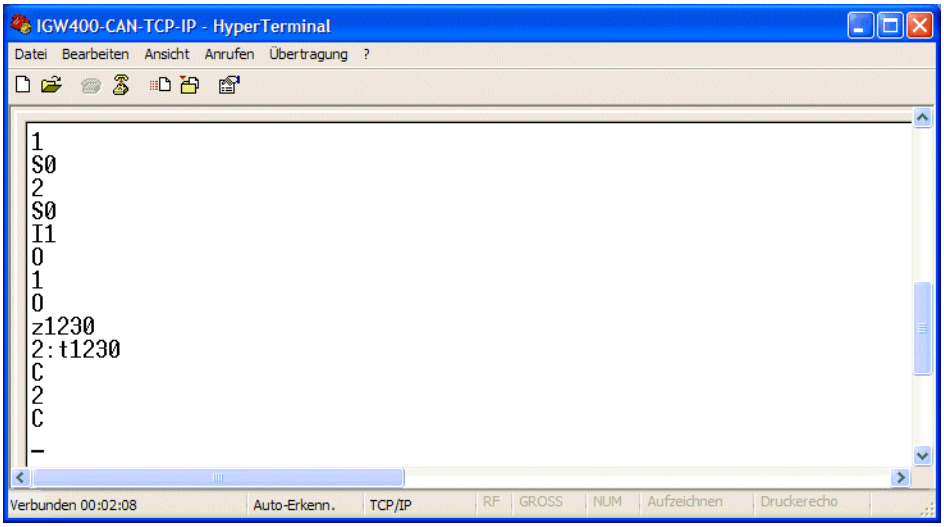

Figure 11: SCLI session with loop-back connection between CAN1 and CAN2

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
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	2005-11-28	first version	WBU

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