

MANUAL



SOHARD
EMBEDDED SYSTEMS

SH ARCALYZER-USB

ARCNET Network Analyzer

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V 02.00



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1. Introduction

The SH ARC-USB is an ARCNET Device for usage with USB Hosts. It supports USB 1.1 as well as USB 2.0. Due to performance reasons USB 2.0 is recommended.

Different types of the Device are being offered differing in the ARCNET Interface: Coaxial, RS485, fiber optic (ST/SMA/TOSLINK) or twisted pair (TWP).

2. Features

USB Bus

- USB 1.1 compatible
- USB 2.0 compatible
- Firmware is dynamically loaded by the driver
- Various indicators for function control

RS485 Interface

- D-sub DE9F socket
- Galvanically insulated
- Bit rate 19.5 kBit/s .. 10 Mbit/s
- Integrated termination via DIP switch
- Protective circuit

Coaxial Interface

- BNC Jack
- Suitable for RG-62 coaxial cable (93 Ohm impedance)
- Bit rate 2.5 Mbit/s
- Integrated Termination via DIP switch
- Protective circuit
- Optimized for high reliability
- Improved input filter

Optic Fiber Interface

- ST (Bayonet) connector or SMA (threaded) connector
- Bit rate 19.5 kBit/s .. 2.5 MBit/s

TOSLINK Interface

- TOSLINK connector
- Bit rate 19.5 kBit/s .. 2.5 MBit/s

TWP Interface

- RJ45 Jack
- Bit rate 2.5 MBit/s

Extender interface

- D-sub DE9F socket
- potentialfree relaisoutput
- Triggeroutput (for use with an attached scope)
- Opto-decoupled triggerinput
- TTL-triggerinput

More details concerning the use of the several inputs/outputs can be found in the Windows helpfile of the SH ARCALYZER software.

ARCNET

- LED indicating ARCNET activity
- LED indicating access to ARCNET Controller

Miscellaneous

- Drivers for Windows 2000/XP/VISTA
- CE mark guarantees proper function in industrial environments (pleas observe notes in Chapter "Interfaces")

3. Ordering

The following types may be ordered:

Ordering Information	Description
SH ARCALYZER-USB-R	Analyzer with RS485 Interface 19.2 kbps .. 10 Mbps Galvanically insulated RS485 interface, D-sub DE9F socket for connection to twisted pair wire with about 115 Ohm impedance
SH ARCALYZER-USB-K SH ARCALYZER-USB-LWLST	Analyzer with Coaxial Interface 2.5 Mbps for connection to coaxial cable RG62 with 93 Ohm impedance, BNC Jack Analyzer with fiber optic connector 19.2kbps .. 2.5Mbps, 2xST (Bayonet) connector
SH ARCALYZER-USB-LWLSMA	Analyzer with fiber optic connector 19.2kbps .. 2.5Mbps, 2xSMA (threaded) connector
SH ARCALYZER-USB-TOSLINK	Analyzer with fiber optic connector 19.2kbps .. 2.5Mbps, TOSLINK connector
SH ARCALYZER-USB-TWP	Analyzer for connection to twisted pair wire with about 120 Ohm impedance, 2.5Mbps, Dipulse output

More types on request.

4. Function

4.1 Network Interface Settings

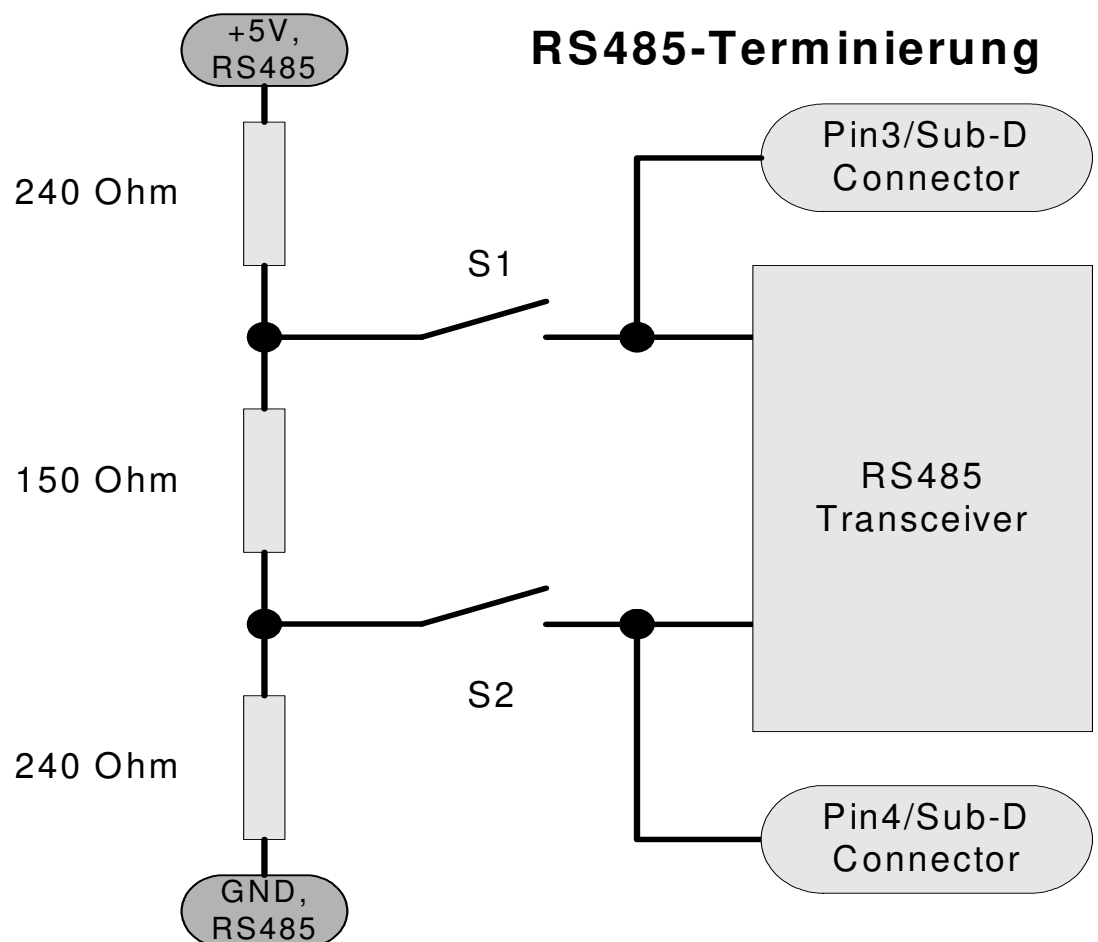
4.1.1 Coaxial/TWP Interface

The termination can be turned on (S1,S2 ON) or off (S1,S2 OFF). Default is Off.

The interface will be activated only if a valid bit rate of 2.5Mbps is selected.

4.1.2 RS485 Interface

The termination can be turned on (S1,S2 ON) or off (S1,S2 OFF). Default is Off.



The shown termination is appropriate for usage with cables having an impedance of approx. 115 Ohm. For cables with other impedances an external termination with appropriate resistors is required.

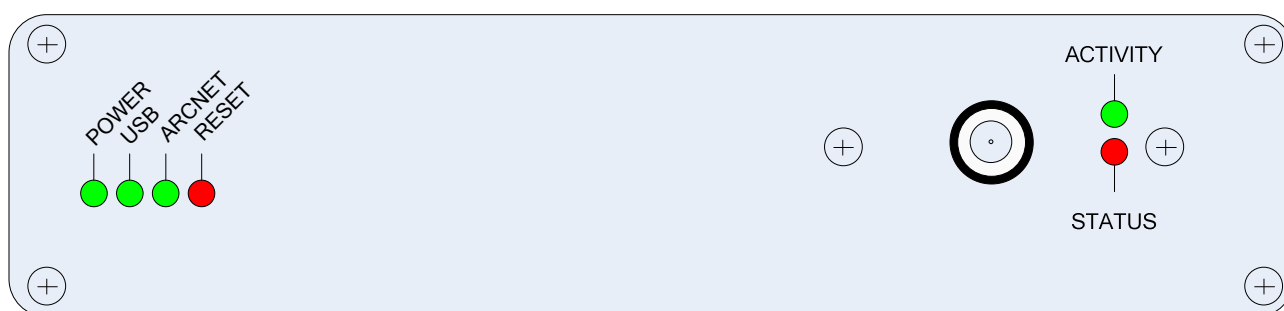
4.2 Access

The Device is registered to the operating system by the USB Host.

The USB parameters required for the identification are as follows:

VID	= 0x1A1C
PID (blank of firmware)	= 0x0003
PID (with firmware downloaded)	= 0x0004

4.3 LED Indicators



(Front panel of Coaxial Type of the ARCNET Device)

LED POWER (green)	Indicates power supply from USB.
LED USB (green)	Flashing when firmware download is complete and controller is running. Slow flashing (approx. 1.2 Hz): USB Interface 1.1 Fast flashing (approx. 2.4 Hz): USB Interface 2.0
LED ARCNET (green)	Slowly flashing (approx. 1.2 Hz) when Analyzer is ready for operation.
LED RESET (red)	Flashing up while controller is being reset.
LED ACTIVITY (green)	Lighting while ARCNET activity is being detected.
LED STATUS (red)	Lighting while data is transferred to the host.

4.4 Dip Switch Settings

Hardware settings apply only to the line termination on the interface module (Coaxial, TWP and RS485). To obtain access to the switches S1 and S2, unscrew the four screws in the corners of the front panel and carefully pull out the panel (3cm or 1 1/5 inch maximum) until the DIP switches come into appearance.

S1	S2	Function	Note
ON	ON	Termination active	
OFF	OFF	Termination inactive	Default setting
ON	OFF	invalid	Not to be used!
OFF	ON	invalid	Not to be used!

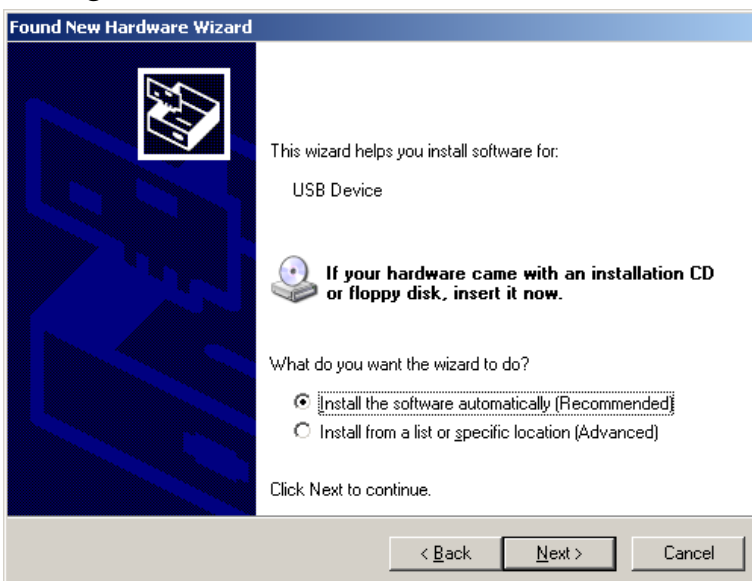
4.5 Driver installation

Hint: To enable Hi-Speed USB 2.0 under Windows 2000 an appropriate driver for the USB Host Controller Chipset has possibly to be installed. Please contact the manufacturer of the main board for supply of this driver.

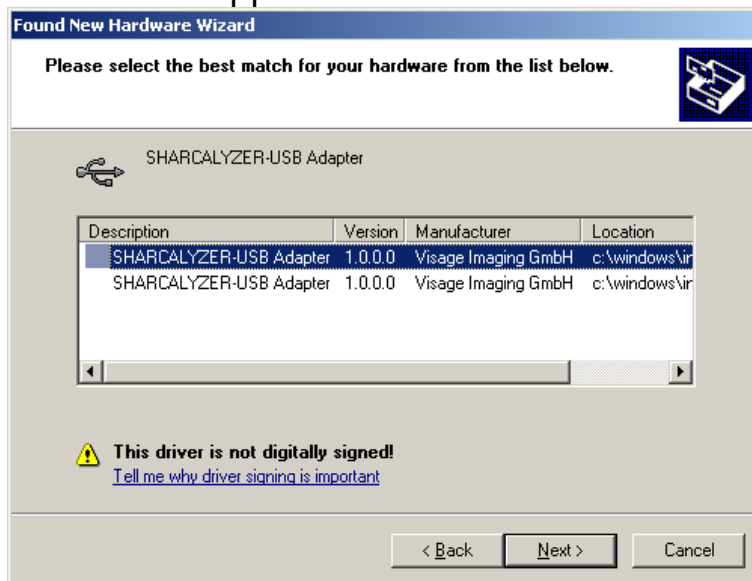
1. Insert the driver disk.
2. Connect the SH ARCALYZER-USB on the Computer using the enclosed USB cable.
3. The operating system will identify a new device „SH ARCALYZER-USB without Firmware“
4. Mark „No, not this time“ in the dialog box shown below and click on „Next“.



5. Subsequently mark „Install the Software automatically“ in the dialog window shown below and click on „ Next“.



6. Afterwards the computer will possibly identify a further device „SH ARCALYZER-USB “. Choose the upper item in the list and click on „ Next“.



7. As another dialog window reports the driver being installed, quit the installation by clicking on “Finish”.

Now the installation is finished and the Analyzer is ready for operation. The LED „USB“ must be flashing.

5. Interfaces

5.1 Coaxial Interface

Connector type: BNC Socket, decoupled from device housing

Pin assignment

Pin	Bezeichnung	Bedeutung
1	Shield	Outer conductor of coaxial cable
2	Center	Inner conductor of coaxial cable

5.2 RS485 Interface

Important: To maintain EC conformity the shield of the cable connected to the D-sub DE9M plug must be solidly attached to the screen of the connector.

Pin assignment is compatible to FARC E3 and SH ARC-PCI ARCNET Cards.

Connector type: D-sub DE9F socket

Pin assignment:

PIN	Designator	Description
1	GND_RS485	Signal and supply ground
2	nc	Reserved
3	DATA-A	Data line A (On higher potential than DATA-B when in idle state)
4	DATA-B	Data line B (On lower potential than DATA-A when in idle state)
5	GND_RS485	Signal and supply ground
6	nc	Reserved
7	nc	Reserved
8	nc	Reserved
9	+5V_RS485	Supply voltage +5V, maximum current 25mA
Shield	AGND	Shield

Insulation is implemented between RS485 pins 1 to 9 on one side and the shields of RS485 and USB on the other side.

5.3 Fiber Optic ST Connector

Connector type: 2 x ST (Bayonet) for transmission and reception respectively. Connect TX to RX and vice versa.

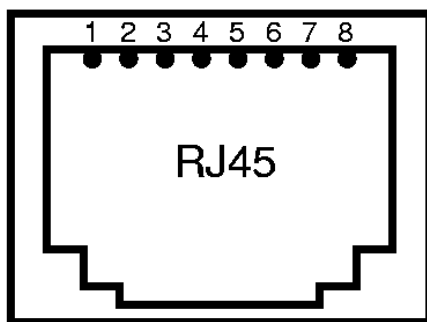
5.4 Fiber Optic SMA Connector

Connector type: 2 x SMA (threaded) for transmission and reception respectively. Connect TX to RX and vice versa.

5.5 TOSLINK Connector

Connector type: 1 x TOSLINK connector (JIS F07/TOSLINK) for transmission and reception.

5.6 TWP Interface



Pin assignment:

Pin	Designator	Description
4	Data+	
5	Data-	
1-3, 6-8	N.C.	Reserved

Important: To maintain EC conformity the shield of the cable connected to the RJ45 plug must be solidly attached to the shield of the connector.

5.7 Extender Interface

Connector type: D-sub DE9F socket

Pinning:

PIN	Name	Description
1	ALARM_COMMON	Common contact of alert relay
2	ALARM_OPEN	Normally open contact of alert relay
3	ALARM_CLOSE	Normally closed contact of alert relay
4	IN_OPTO_+	Positive optically decoupled trigger input
5	IN_OPTO_-	Negative optically decoupled trigger input
6	GND	Common Ground for TRIGGER_OUT and IN_TTL
7	TRIGGER_OUT	Trigger signal output
8	RES_OUT	Reserved
9	IN_TTL	TTL trigger input
Schirm	AGND	Shield

6. Technical Specifications

6.1 General

Temperature range (operation): 0 °C to +55 °C
Temperature range (storage): -20 °C to +85 °C
Power consumption: < 2.5W

Dimensions (without connectors): length 105 mm, height 33 mm, depth 133..147 mm

Weight: max. 0.5 kg (incl. packaging)

6.2 ARCNET

Compatibility: ANSI/ATA 878.1
Data rates: 19,531 / 39,063 / 78,125 / 156,25 / 312,5 / 625KBit/s 1,25 / 2,5 / 5 / 10 MBit/s

6.3 USB Functionality

Compatibility: USB 1.1, USB 2.0
Power supply: +5V, <= 500mA

6.4 Coaxial Interface

Data rate: 2,5Mbps
Input impedance: ≥ 10 kOhm(at f= 5 MHz)
Output peak voltage: max. 16V on terminated 93Ohm line
Output signal shape: Sine dipulse 200ns according to ANSI/ATA 878.1
Cabling: RG62 with Z=93Ohm is recommended
Connector: BNC jack, decoupled to device housing
Input threshold: ≥ 2.5 Vpp

6.5 RS485 Interface

Compatibility: FARC E3 ARCNET card by MCS
Data rate: 19.5 kbps to 10Mbps
Input threshold: +/- 200mV
Polarity in idle state: positive
Input impedance: configurable via DIP switch, about 115 Ohm (with DC-Biasing)
DC-Biasing: configurable via DIP switch, 240 Ohm +5V / 240 Ohm 0V
Differential voltage output: min. 3,0V
Connector: D-sub DE9F socket

6.6 Optic fiber ST/SMA Interface

Data rate:	19.5kbps .. 2.5Mbps
Optical input power:	min. -25dBmW, max. -14dBmW
Peak output power:	typ. -14dBmW when coupled in 50µm fiber, four grades selectable Peak power
wavelength:	820nm
Connector:	2x ST/SMA-Connectors

6.7 TOSLINK Interface

Data rate:	19.5kbps .. 2.5Mbps
Optical input power:	min. -31dBmW, max. -14dBmW
Peak output power:	min. -20dBmW max. -14dBmW when coupled in 200µm fiber
wavelength:	800nm
Connector:	JIS F07/TOSLINK

6.8 TWP Interface

Data rate:	2.5Mbps
Input impedance:	120Ohm
Output peak voltage:	max. 16V on terminated 93Ohm line
Output pulse shape:	Sine dipulse 200ns according to ANSI/ATA 878.1
Cabling:	Twisted pair wire with Z=120Ohm is recommended
Connector:	Shielded RJ45 socket

6.9 Extender Interface

Relay output:	max. 30V/1A
Optically decoupled input:	12..30V
Trigger output:	Low 0.1V, High 4.8V typically
TTL input:	valid Low 0.8V max., valid High 2V min. Voltage may not exceed 0..5V

7. Troubleshooting

- **LED POWER inactive**

Possible causes:

- Defective USB cable
- Defective USB port
- Insufficient current from USB port → Use self-powered USB hub

- **LED USB inactive**

Possible causes:

- Driver not started or not installed
- Defective hardware
- Defective USB cable
- Insufficient current from USB port → Use self-powered USB hub

- **LED ARCNET not flashing after start of application**

Possible causes:

- Driver not started or not installed
- Defective hardware

- **LED ACTIVITY inactive**

Possible causes:

- Software misoperation
- Defective hardware

- **LED RESET continuously lighting or sporadically flashing**

Possible causes:

- Insufficient current from USB port → Use self-powered USB hub and/or shorter USB cable

8. EC Declaration of Conformity

EC Declaration of Conformity



EC Declaration of Conformity
in accordance with Annex IV of Directive 2004/108/EC

Name of Supplier: **SOHARD
Embedded Systems GmbH**

Address of Supplier: **Würzburger Str. 197
D-90766 Fürth
Germany**

declares that the present product named


Product name: **SH ARCALYZER-USB**

meets the requirements of Directive 2004/108/EG of the European Parliament and of the Council as specified in Annex I of the said Directive. In accordance with Article 6 of the said Directive this Declaration is based on the following harmonized Standards

Safety: **EN60950: 1992
+ A1: 1993 + A2: 1993
+ A3: 1995 + A4: 1997**

EMC: **EN 55022:1998 + A1:2000 + A2:2003
EN 55024:1998 + A1:2001 + A2:2003
EN 61000-6-2:2001**

Fürth, 13.06.2008


(Sebastian Schnitzenbaumer, Managing Director)

9. Support

In case of problems when operating the device please read manual again before contacting us

9.1 Contacts

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Würzburger Str. 197
90766 Fürth
Germany

Tel: +49 (0)911 97341 - 522 (Order Management)
- 566 (Technical support)

Fax: +49 (0)911 97341- 510

eMail: arcnet@sohard.de

Latest manuals and technical information to this product are available under <http://www.sohard.de>.

10. References

Reference	Document
[1]	ANSI/ATA 878.1 Local Area Network: Token Bus (2.5 Mbps), ATA 1992, http://www.arcnet.com

11. Warranty

Warranty is granted by SOHARD Embedded Systems GmbH according to our General Terms and Conditions.