

TBC1-1VDSL2-1 card

Installation Manual

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Warranty

This publication is subject to change.

bintec elmeg offers no warranty whatsoever for information contained in this manual.

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Chapter 1 About this Manual

This installation guide contains step by step instructions on how to correctly install, uninstall and replace the **TBC1-1VDSL2-1** expansion card in bintec RM3000 / RM5000 / RM7000 routers.

1.1 Supported devices

The information provided in this installation manual only applies to the **TBC1-1VDSL2-1** card.

1.2 Warning and notes

Observe the warnings and instructions set forth in this manual to avoid any injuries or damage during installation and maintenance. Please follow the security procedures and guidelines when working near electrical equipment. The warnings and notes are provided in each chapter as appropriate.

1.3 Who should read this manual?

This manual should be read by installers and network administrators who need to install, configure or maintain networks. This guide assumes that the installer is familiar with network electronics and technologies.

1.4 What is in this manual?

This installation guide contains the following information:

- A description of the general characteristics of the **TBC1-1VDSL2-1** expansion card.
- A description of the steps to carry out in order to install the **TBC1-1VDSL2-1** card in bintec RM3000 / RM5000 / RM7000 routers.
- A description of the **TBC1-1VDSL2-1** expansion card LEDs and connector pin-outs.

1.5 How is the information organized?

This document aims to provide all the information necessary to install the **TBC1-1VDSL2-1** expansion card in the bintec RM3000 / RM5000 / RM7000 router family.

- **TBC1-1VDSL2-1** expansion card characteristics.
- **TBC1-1VDSL2-1** expansion card connectors.
- Requirements prior to installation.
- Installing the **TBC1-1VDSL2-1** expansion card.

1.6 Technical support

bintec elmeg offers a technical support service. Device software can be upgraded on a regular basis for maintenance purposes and for new features.

Contact information:

Web: <http://www.bintec-elmeg.com>

Tel. No.: +49 - 911 - 9673 0

Fax: +49 - 911 - 688 0725

Email: support@bintec-elmeg.com

1.7 Related documentation

bintec Dm569-I *bintec RM3000 Installation*.

bintec Dm741-I *ADSL-VDSL*



Note

The manufacturer reserves the right to make changes and improvements to the appropriate features in both the software and hardware of this product, modifying the specifications of this manual without prior notice.

The images that show the front and back panels of the device are for information purposes only. The actual device may have some small modifications.

Chapter 2 TBC1-1VDSL2-1 Expansion Card

This manual focuses on the **TBC1-1VDSL2-1** expansion card.

VDSL2 stands for Very high bit rate Digital Subscriber Line version 2, which is defined in the ITU G.993.2 and G.993.5 standards.

VDSL2 has been developed using the ADSL/ADSL2/ADSL2+ technologies as basis, and the main differences areas follows:

- Upstream and downstream channel multiplicity.
- Supports up to 200 Mbps, symmetric (profile 30a).
- It only uses FDM mode, EC mode is not defined (echo cancellation or carrier overlapping).
- Allows for a new encapsulation to be used: PTM.
- Multiple link diagnostics.

For further information on ADSL and VDSL technologies, please see the bintec *Dm741-I ADSL-VDSL* manual.



Fig. 1: TBC1-1VDSL2-1 card

2.1 TBC1-1VDSL2-1 expansion card: Characteristics

The main characteristics of the **TBC1-1VDSL2-1** expansion card are as follows

TBC1-1VDSL2-1 card: xDSL characteristics

Ports	One RJ-45 VDSL/ADSL port.
ADSL	
Standards	ANSI: • T1.413 Issue 2. ITU-T G.991.1 (G.DMT): • Annex A: Full Rate ADSL over POTS. ITU-T G.991.2 (G. Lite) Lite ADSL over POTS. G.992.3 (ADSL2): • Annex A: ADSL2 over POTS. • Annex L: RE-ADSL2 over POTS, • Annex M: ADSL2 with extended upstream over POTS. G.992.5 (ADSL2+): • Annex A: ADSL2+ over POTS. • Annex M: ADSL2+ with extended upstream over POTS.

Downstream Speed	27 Mbps.
Upstream Speed	3 Mbps.
Transfer Mode	ATM (<i>Asynchronous Transfer Mode</i>).
Other characteristics	Dying Gasp: • ITU G.991.2 standard recommendation.
VDSL	
Standards	ITU-T G.993.2 (Annex A and B): • Profiles: 8a, 8b, 8c, 8d, 12a, 12b, 17a ITU-T G.993.5 (vectoring).
Downstream Speed	Up to 100 Mbps.
Upstream Speed	Up to 50 Mbps.
Transfer Mode	PTM (<i>Packet Transfer Mode</i>).
Other characteristics	PTM Transmission Convergence (PTM-TC): • G.993.2 Annex K. Dual-Latency supported. Dying Gasp: • ITU G.991.2 standard recommendation.

2.2 TBC1-1VDSL2-1 expansion card: Connectors

Figure 2 shows the front board of the **TBC1-1VDSL2-1** card:

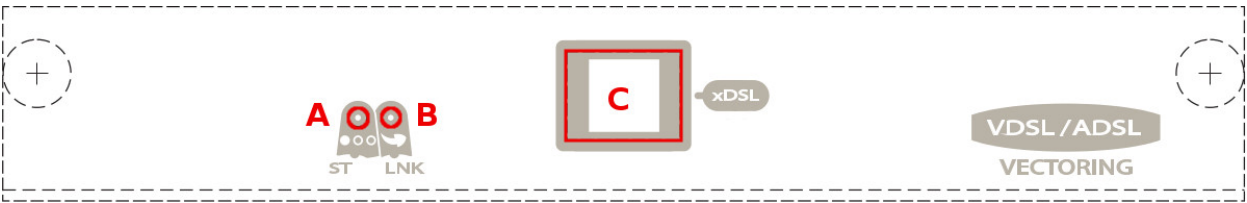


Fig. 2: Front of the TBC1-1VDSL2-1 card

The front board components are as follows:

Component table for the front of the TBC1-1VDSL2-1 card

Item	Description
A	Status LED
B	Link LED
C	xDSL port

Chapter 3 Installing the TBC1-1VDSL2-1 Expansion Card

This chapter provides information on how to install and uninstall the **TBC1-1VDSL2-1** expansion card in bintec RM3000 / RM5000 / RM7000 routers.

This information includes:

- Requirements prior to installation.
- Installing or replacing a **TBC1-1VDSL2-1** expansion card.

3.1 Requirements prior to installation

To configure the card, you must be able to access the bintec RM3000 / RM5000 / RM7000 router through a console or a Telnet connection. For further information, please see the *Connecting for configuration* section under the *bintec Dm569-I bintec RM3000 Installation* manual.

For the **TBC1-1VDSL2-1** expansion cards to work properly, you must load the appropriate firmware file for each card in the router.

If the firmware has not been loaded in the device prior to installing the card, you can still find out what firmware file you need.

3.1.1 Determining the firmware file

There are two options to determine the firmware file needed for the installed xDSL card:

3.1.1.1 FTP "quote site listfirmwares" command

The FTP command **quote site listfirmwares** returns a list containing the names of the firmware files needed for the device to operate properly:

```
ftp> quote site listfirmwares
211 fw000016.bfw
ftp>
```

3.1.1.2 FTP "system firmwares-required" Monitoring command

The **system firmwares-required** monitoring command displays the same information as the previous command, but in the local console:

```
+system firmwares-required
List of required firmwares for detected hardware
-----
Filename                Description          Version/Subv
-----
fw000016.bfw  Lantiq VRX288 TSS-mode      v1.0
+
```

Once the necessary firmware file has been detected, load it onto the device through an FTP connection.

For further information on how to load firmware files in the router, please see the bintec Dm 748-I *Software Updating* manual.

3.2 Installing or replacing the TBC1-1VDSL2-1 expansion card.

To install or replace a **TBC1-1VDSL2-1** card, please see the *Expansion Slot* section under the *bintec Dm569-I bintec RM3000 Installation* manual.

Chapter 4 LEDs and Connector Pinouts: Description

This chapter provides information on the **TBC1-1VDSL2-1** expansion card LEDs and connector pinouts.

4.1 TBC1-1VDSL2-1 expansion card: LEDs

The **TBC1-1VDSL2-1** expansion card for bintec RM3000 / RM5000 / RM7000 routers has three LEDs: STATUS and LINK.

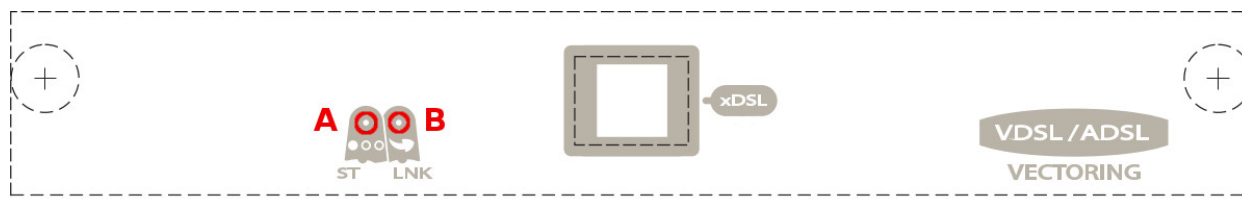


Fig. 3: **TBC1-1VDSL2-1** card

TBC1-1VDSL2-1 card LED table

Item	State
A (Status)	OFF: card not detected. ON: card detected (firmware loaded).
B (Link)	OFF: disabled. Slow blinking: active. Fast blinking: negotiating. Steady: synchronized.

4.2 Connector pinouts

The **TBC1-1VDSL2-1** expansion card has one RJ-45 connector.

4.2.1 RJ-45 Connector

The following figure shows the RJ-45 connector pinouts.

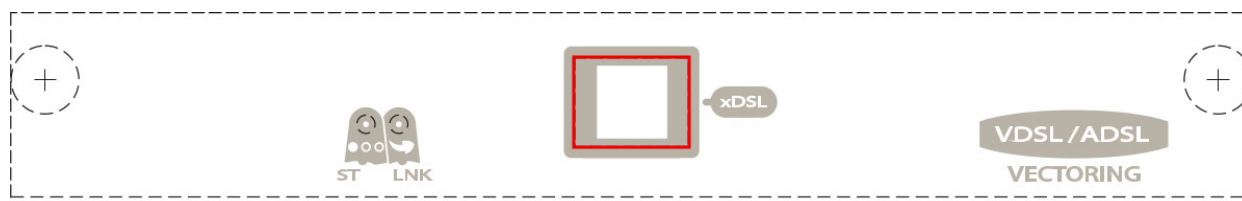


Fig. 4: **xDSL** connector

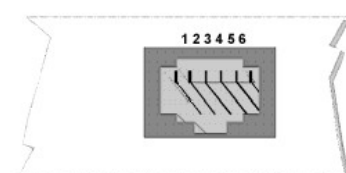


Fig. 5: **RJ-45** Connector Pinouts

The following table display the information associated with each connector pinout:

TBC1-1VDSL2-1 card RJ-11 Connector Pinouts

RJ-45 pinouts	Signal
1	--
2	--
3	--
4	TIP
5	RING
6	--
7	--
8	--

We recommend that you use a 26 AWG cable (at the very least). This may be supplied with the card itself or be described in the safety instructions.

**Warning**

To reduce the risk of fire, only use a 26 AWG cable or a cable with a larger diameter.

Chapter 5 Compliance

5.1 Manufacturer information

<i>Brand</i>	bintec
<i>Manufacturer</i>	bintec elmeg
<i>Country</i>	Germany
<i>Postal Address</i>	Suedwestpark 94 90449 Nuremberg Germany
<i>International Phone</i>	+49 - 911 - 9673 0

5.2 Safety warnings

	To reduce the risk of fire, only use a 26 AWG cable or a cable with a larger diameter.
	Para reducir el riesgo de incendio, utilice sólo un cable 26 AWG o de un diámetro mayor.
	Um das Risiko eines Brands zu reduzieren, verwenden Sie nur Kabel mit einem Durchmesser von 26 AWG oder größer.

5.3 WEEE information

	The crossed-out wheeled bin symbol indicates that the device must be disposed of separately from normal domestic waste at an appropriate waste disposal facility at the end of its useful service life. Das auf dem Gerät befindliche Symbol mit dem durchgekreuzten Müllcontainer bedeutet, dass das Gerät am Ende der Nutzungsdauer bei den hierfür vorgesehenen Entsorgungsstellen getrennt vom normalen Hausmüll zu entsorgen ist. El símbolo del contenedor con la cruz, que se encuentra en el aparato, significa que cuando el equipo haya llegado al final de su vida útil, deberá ser llevado a los centros de recogida previstos, y que su tratamiento debe estar separado del de los residuos urbanos.
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5.4 REACH

In compliance with the REACH Candidate List, the delivered product and product packaging do not contain chemical substances above a concentration limit of 0.1% weight by weight (w/w). This declaration will be updated whenever changes occur or other chemical substances are added to the REACH Candidate List. Information is currently provided to consumers upon request.

5.5 EC declaration of conformity

English (EN)	Hereby, bintec elmeg declares that the radio equipment type TBC1-1VDSL2-1 is in compliance with: Directive 2014/30/EU (EMC) Directive 2014/35/EU (LVD) of the European Parliament and of the Council.
Spanish (ES) Español	Por la presente, bintec elmeg declara que el tipo de equipo radioeléctrico TBC1-1VDSL2-1 es conforme con: Directiva 2014/30/UE (EMC) Directiva 2014/35/UE (LVD) del Parlamento Europeo y del Consejo.
German (DE) Deutsch	Dieses Gerät entspricht den grundlegenden Anforderungen und den weiteren entsprechenden Vorgaben der Richtlinie 2014/30/UE (EMC) Richtlinie 2014/35/UE (LVD) Richtlinie 2011/65/UE (RoHS) des Europäischen Parlaments.

The full text of the EU declaration of conformity and additional product documentation is available at the following internet address: <http://www.bintec-elmeg.com>

This equipment is in conformity with the CE procedures and marking.

5.6 CE marking

This equipment is in conformity with CE procedures and marking.

