



TBC1-GFAST card

Installation 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-GFAST** expansion card in bintec RM3000 / RM5000 / RM7000 routers.

1.1 Supported devices

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

1.2 Warning and notes

Observe the warnings and instructions given in this manual to avoid and prevent injuries or damage during installation and maintenance. Please follow the security procedures and guidelines when working near electrical equipment. All relevant 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-GFAST** expansion card.
- A description of the steps to carry out in order to install the **TBC1-GFAST** card in bintec RM3000 / RM5000 / RM7000 routers.
- A description of the **TBC1-GFAST** 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-GFAST** expansion card in bintec RM3000 / RM5000 / RM7000 routers.

- **TBC1-GFAST** expansion card characteristics.
- **TBC1-GFAST** expansion card connectors.
- Upgrading the firmware in the **TBC1-GFAST** expansion card.
- Installing or replacing a **TBC1-GFAST** 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 to install new features.

Contact information:

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

Tel. N°: +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-VDSL2-GFAST*



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 showing the front and back panels of the device are for information purposes only. Some small modifications may exist in the actual device.

Chapter 2 TBC1-GFAST Expansion Card

This manual focuses on the **TBC1-GFAST** expansion card.

This expansion card supports:

- G.Fast 212a and 106a, as defined in the ITU G.9700 and G.9701 standards.
- VDSL2 up to 35b supervectoring, as defined in the ITU G.993.2 and G.993.5 standards.
- ADSL2+ for POTS and ISDN, as defined in the ITU G.992.5 standard.
- ADSL2 for POTS and ISDN, as defined in the ITU G.992.3 standard.
- ADSL for POTS and ISDN, as defined in the ITU G.992.1 standard.

For further information on ADSL, VDSL2 and G.Fast technologies, please see the bintec *Dm741-I ADSL-VD-SL2-GFAST* manual.



Fig. 1: TBC1-GFAST card

2.1 TBC1-GFAST expansion card: Characteristics

The main characteristics of the **TBC1-GFAST** expansion card are as follows:

TBC1-GFAST xDSL Characteristics

Ports	Up to two RJ-45 GFAST/VDSL2/ADSL ports
ADSL	
Standards	<p>ANSI:</p> <ul style="list-style-type: none"> • T1.413 Issue 2. <p>ITU-T G.992.1 (G.DMT):</p> <ul style="list-style-type: none"> • Annex A: Full Rate ADSL over POTS. • Annex B: Full Rate ADSL over ISDN. <p>ITU-T G.992.2 (G.Lite).</p> <p>G.992.3 (ADSL2):</p> <ul style="list-style-type: none"> • Annex A: ADSL2 over POTS. • Annex B: ADSL2 over ISDN. • Annex L: RE-ADSL2 over POTS. • Annex M: ADSL2 with extended upstream over POTS. • Annex J: ADSL2 all digital over ISDN. <p>ITU-T G.992.4 (ADSL2.Lite).</p>

	G.992.5 (ADSL2+): <ul style="list-style-type: none"> • Annex A: ADSL2+ over POTS. • Annex B: ADSL2+ over ISDN. • Annex M: ADSL2+ with extended upstream over POTS. • Annex J: ADSL2+ all digital over ISDN.
Downstream Speed	27 Mbps.
Upstream Speed	3 Mbps.
Transfer Mode	ATM (<i>Asynchronous Transfer Mode</i>).
VDSL2	
Standards	ITU-T G.993.2 and G.993.5: <ul style="list-style-type: none"> • Profiles: 8a, 8b, 8c, 8d, 12a, 12b, 17a, 30a, 35b • Vectoring and super-vectoring
Downstream Speed	Up to 300 Mbps.
Upstream Speed	Up to 50 Mbps.
Transfer Mode	PTM (<i>Packet Transfer Mode</i>).
G.Fast	
Standards	ITU-T G.9700 and G.9701: <ul style="list-style-type: none"> • Profiles: 106a and 212a
Downstream Speed	Up to 1.2 Gbps.
Upstream Speed	Up to 600 Mbps.
Transfer Mode	PTM (<i>Packet Transfer Mode</i>).

2.2 TBC1-GFAST expansion card: Connectors

Figure 2a shows the front board of the single-port **TBC1-GFAST** card:



Fig. 2: Front of the single-port **TBC1-GFAST** card

Figure 2b shows the front board of the double-port **TBC1-GFAST** card:



Fig. 3: Front of the double-port TBC1-GFAST card

The front board elements are as follows:

Elements table for the front of the TBC1-GFAST card

Item	Description
A and A'	xDSL port 0 and 1
B and B'	Port 0 and port 1 enabled LED.
C and C'	Port 0 and port 1 xDSL link status LED.

Chapter 3 Installing the TBC1-GFAST Expansion Card

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

This information includes:

- Upgrading the firmware in the **TBC1-GFAST** expansion card.
- Installing or replacing a **TBC1-GFAST** expansion card.

3.1 Upgrading the firmware

TBC1-GFAST expansion cards run a firmware that is embedded in the card itself and that can be upgraded if necessary (to add a new feature, fix bugs, etc.).

Upgrading is only required in specific situations, and the relevant upgrade files will be provided.



Warning

In the case of the double-port card, the upgrade procedure should be done twice (once for each port).

3.1.1 Uploading the upgrade file to the host router

The firmware upgrade file (upg00025.upf) must be loaded into a temporal buffer on the host router through an FTP connection (that is, without using the **quote site savebuffer** FTP command).

This is important because the file can be too big to fit into the available flash memory on the host router.

Once the upgrade process has finished, the temporal buffer should be released (see next section).

3.1.2 Transferring the firmware to the card

The **upgrade-fw start** monitoring command initiates the transfer:



Warning

Switching off or rebooting the device during the upgrade process may corrupt the memory and prevent a port from booting.

```
DUT *monitor
Console Operator

DUT+net atm2/0

-- ATM Console --

DUT atm2/0 monitor+upgrade-fw start
Locking FTP buffer
Upgrade file len 17168384 bytes
Upgrade file version 1.0.0.0 0.0.0.0
Upgrade file checksum verification ok
UBoot Version '2' (2)
OS Version '2' (2)
About to set upgrade OS mode
Wait until the command finishes
File transfer OK
```

```

File transfer OK
Wait for upgrade checking
Upgrade verified
Done!
Unlocking FTP buffer

Do you want to erase upgrade file from memory?(Yes/No)? n

```

Note **atm2/0** may change depending on the specific hardware configuration or port to be upgraded.

If the upgrade is not needed, this will be the output:

```

DUT atm2/0 monitor+upgrade-fw start
Locking FTP buffer
Upgrade file len 17168512 bytes
Upgrade file version 1.0.0.0 0.0.0.0
Upgrade file checksum verification ok
UBoot Version '1' (2)
OS Version '1' (2)
About to set upgrade OS mode
Wait until the command finishes
Upgrade version matches installed version!
Unlocking FTP buffer

Do you want to erase upgrade file from memory?(Yes/No)? n

```

If the upgrade has been started through an access provided by the port being updated, the connection will be interrupted.

Once the upgrade has finished, communication will be restored and the process-related log can be retrieved:

```

DUT atm2/0 monitor+upgrade-fw show-log

----- UPGRADE FW LOG BUFFER START (302) -----

Locking FTP buffer
Upgrade file len 17168512 bytes
Upgrade file version 1.0.0.0 0.0.0.0
Upgrade file checksum verification ok
UBoot Version '1' (2)
OS Version '1' (2)
About to set upgrade OS mode
Wait until the command finishes
Upgrade version matches installed version!
Unlocking FTP buffer

----- UPGRADE FW LOG BUFFER END -----

```

You may not want to release the temporal buffer in case you want to upgrade more than one card or port.

As soon as the upgrade file is not needed, it can be released:

```

DUT atm2/0 monitor+upgrade-fw release-mem
File erased!
DUT atm2/0 monitor+upgrade-fw release-mem
No file to be erased

```

3.2 Installing or replacing the TBC1-GFAST expansion card.

To install or replace a **TBC1-GFAST** card, please see the *Expansion Slot* section under manual: *bintecDm569-I bintec RM3000 Installation*.

Chapter 4 LEDs and Connector Pinouts: Description

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

4.1 TBC1-GFAST expansion card: LEDs

The **TBC1-GFAST** expansion card has two LEDs per port: En and Link.



Fig. 4: TBC1-GFAST card : LEDs .

TBC1-GFAST card LEDs

Item	State
A and A'	Yellow => Lights up when the port is enabled.
B and B'	Slow blinking => looking for connection. Rapid blinking => negotiation. Steady => connected.

4.2 Connector pinouts

The **TBC1-GFAST** expansion card has one RJ-45 connector per port.

4.2.1 RJ-45 connector

The following figure shows the RJ-45 connector pinouts:

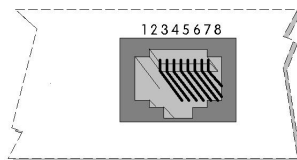


Fig. 5: RJ-45 connector pinouts

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

TBC1-GFAST card RJ-45 Connector Pinouts

RJ-45 pinouts	Signal
1	--
2	--
3	--
4	TIP

5	RING
6	--
7	--
8	--

We recommend 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 Regulatory Compliance and Safety Information

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 Risk identification



WARNING: Signal word used to designate a potentially dangerous situation that may cause severe injuries or death if not avoided.

5.3 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.



This equipment has been designed to run in a wide range of room temperatures, up to 45 °C (113 °F). Under these conditions, the metal surface can reach dangerously high temperatures that may cause injuries.

Este equipo ha sido diseñado para funcionar con una temperatura ambiente de rango extendido de hasta 45 °C (113 °F) y bajo estas condiciones la superficie metálica puede alcanzar temperaturas que pueden causar daños.

Dieses Gerät ist für den Betrieb in einem großen Temperaturbereich - bis zu 45 °C (113 °F) - ausgelegt. Unter diesen Bedingungen können Metalloberflächen gefährlich hohe Temperaturen annehmen, die zu Verletzungen führen können.

5.4 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.

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.

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.

5.5 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 any changes occur or other chemical substances are added to the REACH Candidate List. Information is currently provided to consumers upon request.

5.6 EC declaration of conformity

English (EN)	<p>This equipment is in compliance with the essential requirements and other relevant provisions of:</p> <p>Directive 2014/30/EU (EMC)</p> <p>Directive 2014/35/EU (LVD)</p> <p>Directive 2011/65/EU (RoHS)</p> <p>of the European Parliament</p>
Spanish (ES) Español	<p>Este dispositivo cumple con los requisitos esenciales y con las normas correspondientes de las siguientes directivas:</p> <p>Directiva 2014/30/UE (EMC)</p> <p>Directiva 2014/35/UE (LVD)</p> <p>Directiva 2011/65/UE (RoHS)</p> <p>del Parlamento Europeo</p>
German (DE) Deutsch	<p>Dieses Gerät entspricht den grundlegenden Anforderungen und den weiteren entsprechenden Vorgaben der</p> <p>Richtlinie 2014/30/UE (EMC)</p> <p>Richtlinie 2014/35/UE (LVD)</p> <p>Richtlinie 2011/65/UE (RoHS)</p> <p>des Europäischen Parlaments.</p>

**Note**

Directive 2014/30/EU (EMC) replaced Directive 2004/108/EC (EMC) on 20th April 2016

Directive 2014/35/EU (LVD) replaced Directive 2006/95/EC (LVD) on 20th April 2016

The EC declaration of conformity and additional product documentation can be accessed here: <http://www.bintec-elmeg.com>

5.7 CE marking

This equipment is in conformity with CE procedures and marking.

