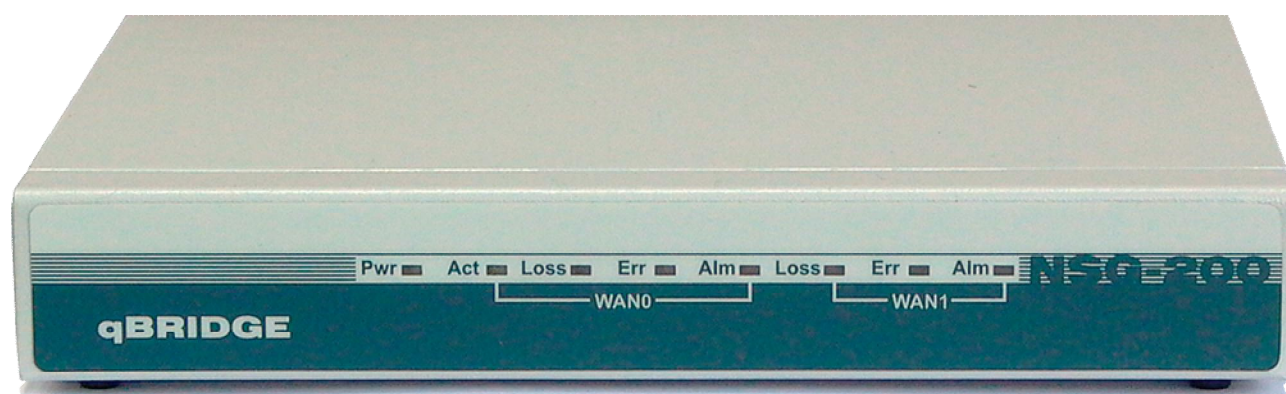


# High performance access device "qBRIDGE"

User's Manual

**qBRIDGE-201**

**Dual E1 access unit/ "Drop-Insert" Multiplexer**



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**Attention**            When you receive devices you need to check your box and make sure that all items are inside (see Appendix B). Especially check the presence of all required cables and certificate of guarantee. The absence of certificate of guarantee with mark of distributor is a reason for refusal in after-sales service and technical support from NSGate LTD.

## Revision history

- 11.10.2006 First release of English version of this document
- 03.03.2007 Ordering information has been reviewed

## 1. Introduction

### 1.1. Purpose and area of application

**qBRIDGE** – is a series of low cost and high performance access devices (modems/ converters) functioning in "Bridge connection" mode. They are meant for connecting together distant segments of Ethernet 10/100Base-TX LANs using different technologies of data transmission over copper or fiber lines. qBRIDGE is a high performance bridge that encapsulates Ethernet frames into HDLC frames and visa versa. Peak performance is 90000 frames per second. Frame buffer capacity is 340 frames. It's possible to use any synchronous serial interface as a WAN port. WAN interface speed is up to 50 Mbps. User can choose WAN interface type from a set of already available interfaces. There is a possibility of manufacturing devices with WAN interface by customer request. The "Bridge connection" mode provides transport for any protocol including TCP/IP, IPX and so on. qBRIDGE supports transparent transmission of "long" Ethernet frames with VLAN tag.

All qBRIDGE modifications can be used for point to point connection of distant LAN segments. Moreover it's possible to use some modifications for point-multipoint connection for example to connect remote users to ISP. qBRIDGE-105 [sdsl] can be used as a CPE for 8-port mini-DSLAM NSG-800/maxS-8. qBRIDGE-106 [g.shdsl] can be used as a CPE for 24-port Ethernet-based mini-DSLAM NSG-800/maxS-24.

qBRIDGE series include modifications listed below:

- qBRIDGE-100 : Bridge with one port 10/100M Ethernet & one port G.703 (E1 Unframed)
- qBRIDGE-101 : Bridge with one port 10/100M Ethernet & one port E1 (E1 Framed/ Unframed)
- qBRIDGE-201 : Bridge with one port 10/100M Ethernet & two ports E1 (E1 Framed/ Unframed)
- qBRIDGE-401 : Bridge with four ports 10/100M Ethernet & four ports E1 (E1 Framed)
- qBRIDGE-102 : Bridge with one port 10/100M Ethernet & one port E2
- qBRIDGE-103 : Bridge with one port 10/100M Ethernet & one port E3
- qBRIDGE-105 : Bridge with one port 10/100M Ethernet & one port SDSL
- qBRIDGE-106 : Bridge with one port 10/100M Ethernet & one port G.SHDSL
- qBRIDGE-206 : Bridge with one port 10/100M Ethernet & one/two/four ports G.SHDSL.bis

**qBRIDGE-201** is a dual E1 access unit with an opportunity of allocation of a part of E1 bandwidth (timeslots) for Ethernet traffic. The device has one 10/100Base-TX Ethernet port and two E1 ports. It can be used in a standard mode of interface converter (like qBRIDGE-101 with redundant E1 channel) as well as in a mode of "Drop-Insert" (Add-Drop) multiplexer with transparent transfer of unused timeslots from one E1 port to another. E1 ports meet all requirements of ITU-T recommendations G.703, G.704, G.706, and G.732.

In a mode of interface converter qBRIDGE-201 can be used for connection of remote LAN segments over standard E1 channels. The converter supports all functions of the qBRIDGE-101 but has a possibility of switching to redundant E1 channel if main channel link is broken.

A "Drop-Insert" multiplexer has the capability to add/remove Ethernet data to/from an existing E1 stream. In a "Drop-Insert" mode qBRIDGE-201 accepts an input E1 stream at one WAN port then inserts Ethernet data to user selected group of timeslots and outputs a multiplexed stream to another E1 port. Any group of timeslots can be used for Ethernet traffic.

qBRIDGE-201 supports installation of a special relay module to provide transparent bypass commutation of E1 ports in case of power failure.

The product is available as a standalone unit in metal case or as a card for 19" rack 6U.



## 1.2. Advantages

- Embedded Add/Drop timeslot multiplexer
- Simple configuring using DIP-switches
- Ethernet 10/100Base-TX with auto-negotiation & auto-MDIX
- VLAN Support: VLAN tag pass-through
- High performance: Filtering and Forwarding- 90,000 pct/s; Frame Buffer- 340 frames
- Small-size metal case or card for 19" rack 6U form factor

## 1.3. Features

### LAN

- IEEE 802.3/802.3u; IEEE 802.3x flow control
- Half / Full duplex: 10/100Mbps - Half Duplex / 20/200Mbps - Full duplex
- Auto-negotiation 10/100 Mbps & Auto-MDIX
- Connector: RJ-45

### “Bridge connection” mode

- IEEE 802.1D transparent learning bridge
- 256 MAC-address table
- IEEE 802.1q VLAN pass-through
- Filtering and Forwarding: 90,000 packets/sec; Delay: 1 frame
- Frame Buffer size – 340 frames

### WAN: E1 Framed/Unframed

- Number of ports: 2
- Unused timeslots pass-through
- Automatic switching to redundant E1 channel
- ITU-T G.703
- Line speed: 64-2048 Kbps  $\pm$  0,005% with 64 Kbps step full duplex
- Line coding: HDB3
- Line: 120-ohm two-pair twisted cable
- Fractional E1 mode
- Automatic alarm generation
- Remote loopback
- Jitter tolerance according to ITU-T G.823
- Improved receiver sensitivity: -43 dB at 1024 KHz
- Selectable G.703 transmit clock source: local oscillator or recovery from E1 line
- Relay module for providing transparent bypass commutation of E1 ports in case of power failure (optional)
- Connectors: 2 x RJ-45

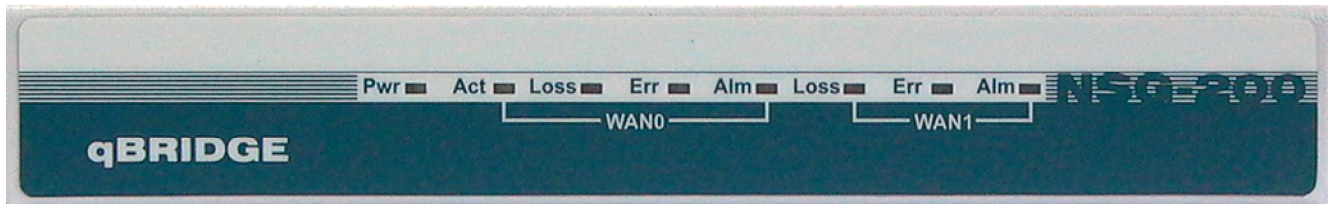
### Other features

- LED indicators
- Dimensions: 182×140×30 mm
- Power: 36÷72V DC or external 100÷240V AC to 9V DC adapter
- Power consumption: 3W
- Temperature: 0 ÷ 45 °C
- Humidity: 0 ÷ 95% without condensation

## 1.4. Connectors, LED indicators and DIP-switches



**LEDs:** LED indicators show qBRIDGE status.



### LEDs description:

- PWR:** ON when power is applied to the device
- WAN ACT:** Blinking when receiving/transmitting Ethernet data through WAN port
- WAN LOSS:**
- ON (green) when the E1 line interface detects a loss of carrier in unframed mode
  - ON (yellow) when the E1 line interface detects a loss of carrier in framed mode
  - ON (red) when the E1 synchronizer is searching for the frame FAS/NFAS (LOF, loss of frame) and multiframe CAS MFAS (CAS LOMF, loss of CAS multiframe), CRC4 (CRC4 LOMF, loss of CRC4 multiframe)
- WAN ALM:** This LED is refreshed every second
- ON (green) when RAI (ITU-T O.162 2.1.4) received
  - ON (red) when AIS (ITU-T O.162 1.6.1.2) received
  - ON (yellow) in remote loopback mode
- WAN ERR:** This LED is refreshed every second.
- ON (green) when there was less than 1E-3 line coding violations
  - ON (red) when there was more than 1E-3 line coding violations
  - ON (yellow) in remote loopback mode

**Rear panel:** Device has LAN connector (RJ-45 with LED indicators), WAN connectors (2 x RJ-45) and power connector on the rear panel



Embedded LEDs of the LAN connector show status of LAN port of qBRIDGE-201.

- LAN 100M:** ON/Blinking when LAN port is in 100 Mbps mode
- LAN 10M:** ON/Blinking when LAN port is in 10 Mbps mode
- DC-IN:** 9 V or 36 ÷ 72 V DC power supply (see ordering information)
- LAN:** Ethernet 10/100BaseT (RJ-45 connector with LEDs)
- WAN0:** E1 WAN port 0 (RJ-45 connector)
- WAN1:** E1 WAN port 1 (RJ-45 connector)

## 2. Device Configuration

### 2.1. Powerup

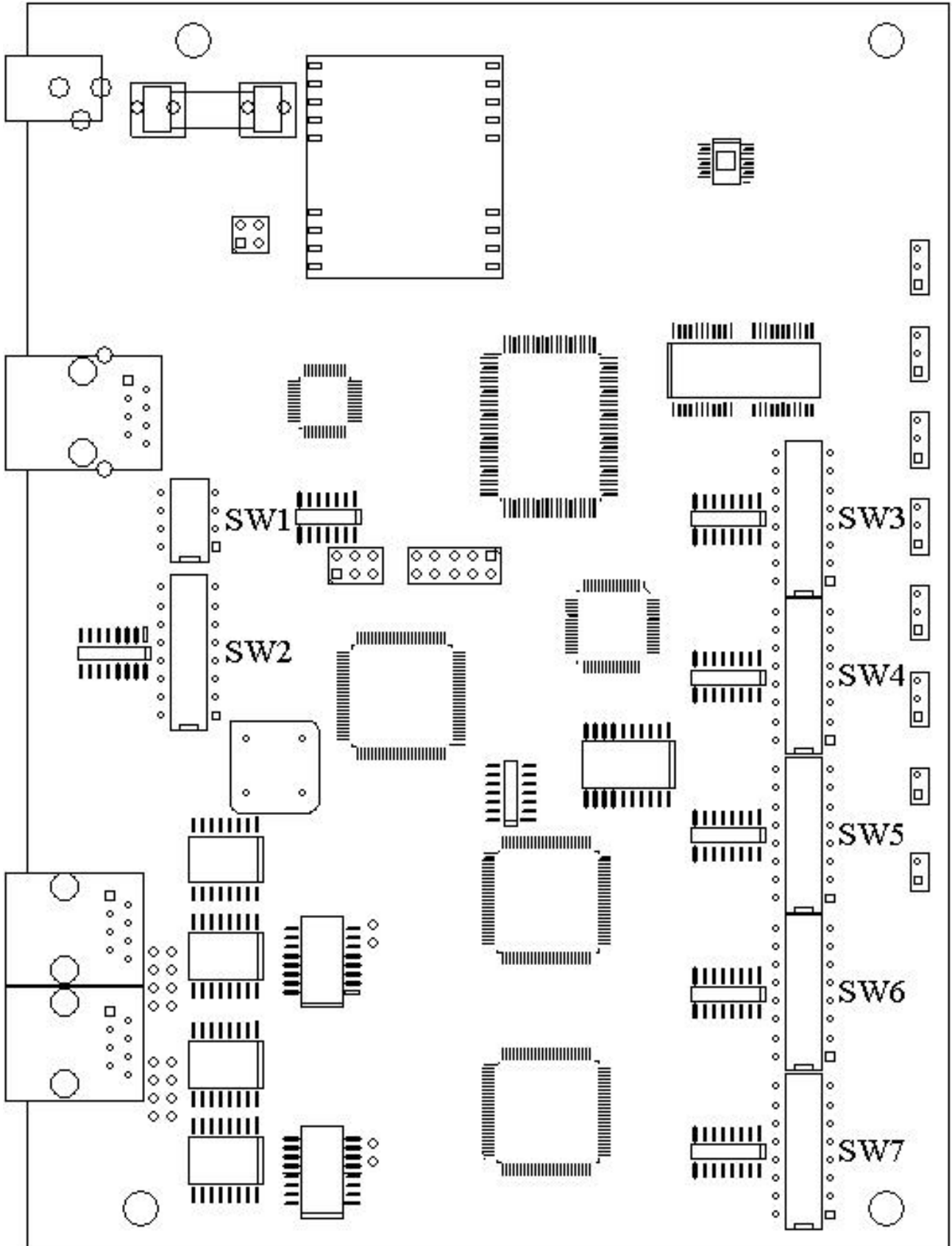
1. Configure qBRIDGE according paragraphs 2.2 – 2.17 of this manual.
2. Connect LAN port of the device to HUB/Switch or to a PC using a Patch Cord. Device supports auto-MDIX therefore Patch Cords cable may be any type (cross or straight).
3. Connect WAN ports (connectors with "WAN" mark) to E1 channels or equipment with E1 interface. Use cables with RJ-45 connectors.
4. Connect power adapter (DC 9 V) or 36 ÷ 72 DC power supply (see ordering information) to the connector with "DC-IN" mark.

**ATTENTION!** Do not use 36 ÷ 72 V DC power supply for qBRIDGE-201 device which is shipped with external 100÷240V AC to 9V DC power adapter. It can cause permanent device damage.

**ATTENTION!** Connect 36 ÷ 72 V DC power supply to the qBRIDGE-201-DC using special cable shipped with the device. Connect terminal with red wire to positive pole and terminal with black wire to negative pole. Wrong polarity can cause permanent device damage.

**ATTENTION!** You must turn off the power of the device before making any DIP-switch configuration changes. Turn the power on again when configuration is complete.

To access DIP-switches SW1- SW7 you need to remove the cover of the device's case. For this purpose twist two screws on the bottom of the case and remove cover. Figure below shows the disposition of DIP-switches on the PCB inside the case.





## 2.2. Operation mode (SW2.8 – SW2.7)

qBRIDGE-201 has three operation modes:

1. "drop & insert" mode
2. "drop & insert" mode with internal WAN0 transmit clock source
3. bridge (converter Ethernet - E1) mode with redundant E1 channel

When functioning in "drop & insert" modes **1** & **2** both E1 interfaces work in framed mode i.e. data flow is divided into 32 timeslots. Internal Add-Drop Multiplexer (ADM) accepts E1 stream through WAN1 port and inserts data from Ethernet port into user selected via DIP-switches **SW3.7** – **SW6.1** timeslots. Then ADM provides concatenated E1 data stream on WAN0 port. Any desired combination of timeslots can be used for Ethernet port traffic.

When functioning in **mode 1** "drop & insert" transmit clock of WAN0 is driven by recovered receive clock of WAN1 interface and visa versa transmit clock of WAN1 is driven by recovered receive clock of WAN0 interface. Frame Alignment Signal (FAS) and Not Frame Alignment Signal (NFAS) including Sa and RAI bits are transmitted between WAN interfaces transparently with no changes.

When functioning in **mode 2** "drop & insert" with internal WAN0 transmit clock source transmit clock of WAN0 is driven by local oscillator and transmit clock of WAN1 is driven by recovered receive clock of WAN0 interface. In this mode of operation Frame Alignment Signal (FAS) and Not Frame Alignment Signal (NFAS) including Sa and RAI bits are generated by qBRIDGE-201.

When functioning in converter Ethernet - E1 mode (**mode 3**) E1 interfaces can operate in framed or unframed mode. In **mode 3** both E1 interfaces are independent and there is no timeslots interchanging between interfaces (i.e. internal ADM is switched off). In case of working in framed mode user can select timeslots which will be used for Ethernet traffic transfer using DIP-switches **SW3.7** – **SW6.1**. Unused timeslots will be filled with idle code (see 2.12). In normal conditions port WAN0 is used for transmitting Ethernet data. If at list one of events listed below happens (i.e. LOSS condition is detected) Ethernet data transmission automatically switches to port WAN1.

- WAN0 E1 line interface detects a loss of carrier
- WAN0 E1 line interface loose frame FAS/NFAS (LOF, loss of frame) synchronization
- WAN0 E1 line interface loose multiframe CAS MFAS (CAS LOMF, loss of CAS multiframe), CRC4 (CRC4 LOMF, loss of CRC4 multiframe) synchronization

| SW2.8 | SW2.7 | Mode of operation |
|-------|-------|-------------------|
| on    | on    | <b>mode 1</b>     |
| off   | on    | <b>mode 2</b>     |
| on    | off   | <b>mode 3</b>     |
| off   | off   | reserved          |

## 2.3. WAN (E1): automatic resynchronization in mode 1 (SW2.5, SW2.2)

In **mode 1** transmitters of each WAN interface are synchronized with recovered receive clock of another interface. Therefore in case of failure of one E1 interface (LOSS condition, see 2.2) another interface has to resynchronize its transmitter. When normal condition of E1 interface is reached back synchronization of another interface will be sourced from its recovered receive clock again automatically.

DIP-switch **SW2.5** is used to select WAN0 transmit clock source when there is LOSS condition on WAN1 port. DIP-switch **SW2.2** is used to select WAN1 transmit clock source when there is LOSS condition on WAN0 port.

| SW2.5 | WAN0 E1 Transmit clock source |
|-------|-------------------------------|
| on    | local oscillator              |
| off   | WAN0 receive clock            |

| SW2.2 | WAN1 E1 Transmit clock source |
|-------|-------------------------------|
| on    | local oscillator              |
| off   | WAN1 receive clock            |

When LOSS condition is detected on E1 interface FAS and NFAS of another interface are generated internally by qBRIDGE-201 and timeslots that were transferred between WAN interfaces are filled with idle code (see 2.12).

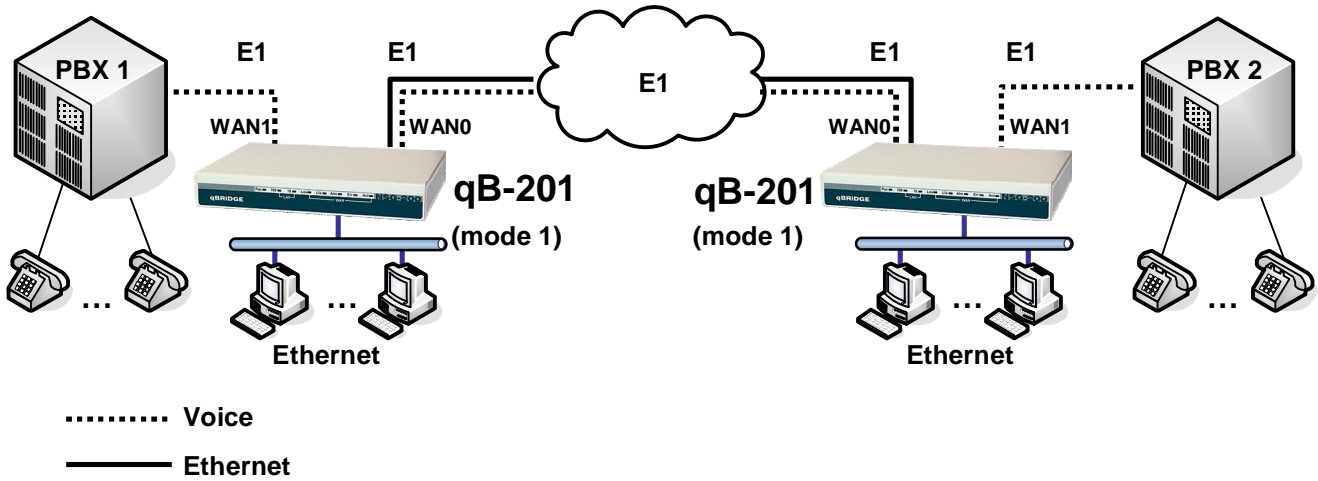
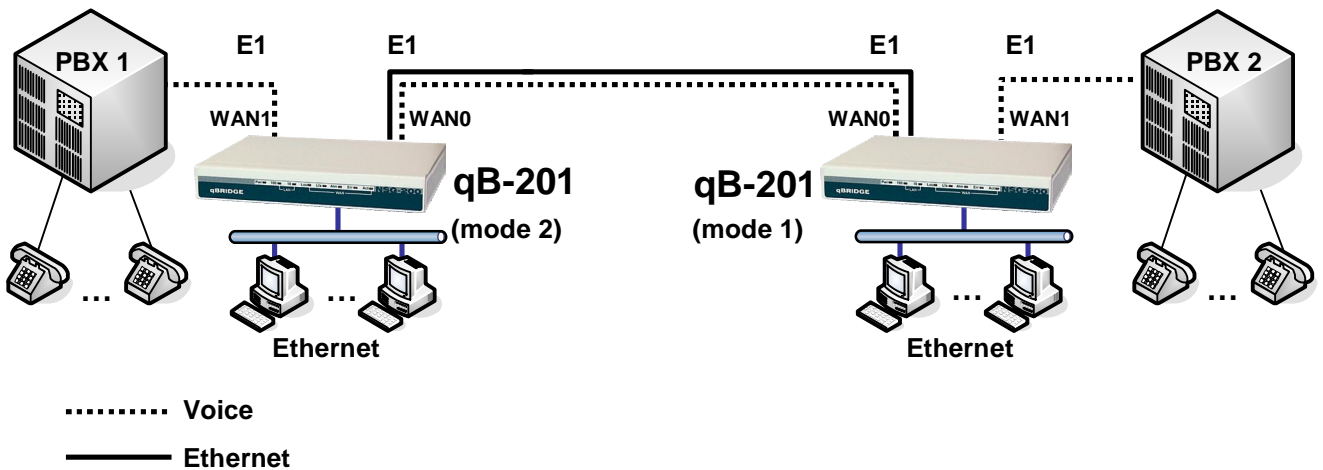


Figure above shows how two PBXes and two LANs are connected using single E1 channel. Both qBRIDGE-201 are transparent for E1 synchronization in direction from WAN0 to WAN1 and visa versa. So qBRIDGE-201 functioning in **mode 1** is transparent in terms of synchronization. Usually E1 network is a global source of synchronization and E1 transmit clock of both PBXes is driven from recovered receive E1 clock. So to achieve stable LAN connection in case of power failure of PBXes user should setup both qBRIDGE-201 to drive WAN0 transmit clock in case of LOSS condition from recovered WAN0 receive clock (i.e. SW2.5 should be "off").

**2.4. WAN (E1): automatic resynchronization in mode 2**

In **mode 2** "drop & insert" with internal WAN0 transmit clock source transmit clock of WAN0 interface is always driven by local oscillator. Normally WAN1 transmit clock is driven by recovered receive clock of WAN0. If LOSS condition of WAN0 is detected WAN1 transmit clock is driven by local oscillator. Idle code is inserted into timeslots that are passed through qBRIDGE-201 if WAN0 and/or WAN1 LOSS condition is detected.



In this figure E1 transmit clock of both PBXes is driven from recovered receive E1 clock. qBRIDGE-201 in **mode 2** serves as a synchronization source for all devices shown in the figure. qBRIDGE-201 functioning in **mode 1** is transparent in terms of synchronization. To achieve stable LAN connection in case of power failure of PBX1 or/and PBX2 it's necessary to drive the transmit clock of WAN0 of qBRIDGE-201 in **mode 1** from its recovered receive clock in case of switching off PBX2 (and therefore there is no signal detected on WAN1). So user should switch SW2.5 "off". If both PBX turns off LAN connection won't break irrespective of position of SW2.5 of qBRIDGE-201 in **mode 1**.

## 2.5. WAN (E1): E1 Mode selection in mode 3 (SW2.6, SW2.3)

In **mode 3** (converter Ethernet - E1) with redundant E1 channel each E1 interface can work in Framed or Unframed mode. The difference between E1 (Framed) and E12 (Unframed) stream is (according to G.703.6) that E12 stream transmits bit sequence at speed 2048 Kbit/s and have no structure while E1 stream has frame structure that is described in ITU-T G.704 specification. Mode selection of WAN0 interface is controlled by DIP-switch **SW2.6**. Mode selection of WAN1 interface is controlled by DIP-switch **SW2.3**.

| SW2.6 | WAN0 interface mode |
|-------|---------------------|
| on    | framed              |
| off   | unframed            |

| SW2.3 | WAN1 interface mode |
|-------|---------------------|
| on    | framed              |
| off   | unframed            |

## 2.6. WAN (E1): Transmit clock source selection in mode 3 (SW2.5, SW2.2)

In **mode 3** (converter Ethernet - E1) with redundant E1 channel E1 transmit clock of each WAN port can be driven from local oscillator or from its own recovered receive clock. User should choose synchronization from recovered receive clock when connecting qBRIDGE-201 to E1 channels. When using two qBRIDGE-201 to communicate over media transparent in terms of synchronization or over dedicated lines one of them must synchronize its E1 transmitter from local oscillator and another – from recovered receive clock. User can select mode of E1 transmitter synchronization using DIP-switches **SW2.5** and **SW2.2**.

| SW2.5 | WAN0 E1 Transmit clock mode                            |
|-------|--|
| on    | E1 Transmit clock is driven by local oscillator        |
| off   | E1 transmit clock is driven by recovered receive clock |

| SW2.2 | WAN1 E1 Transmit clock mode                            |
|-------|--|
| on    | E1 Transmit clock is driven by local oscillator        |
| off   | E1 transmit clock is driven by recovered receive clock |

## 2.7. WAN (E1): Time slots selection (SW3.7 – SW6.1)

When WAN interface is in framed mode user can select time slots that are used for Ethernet frames transmission. Time slot 0 is always used for FAS, NFAS, international bits, CRC4 reminder and so on. Each of 31 alternate timeslots has corresponding DIP-switch and can be used for transmission of Ethernet frames. When DIP-switch is “**on**” corresponding timeslot is not used for Ethernet transmission. When DIP-switch is “**off**” corresponding timeslot is used for Ethernet transmission. If WAN interface is in unframed mode (see 2.5) the state of SW3.7 – SW6.1 is ignored for this interface and all 2048 Kbit/s bit stream is used for transmission of Ethernet frames.

| DIP-switch | Timeslot |
|------------|----------|
| SW3.7      | 1        |
| SW3.6      | 2        |
| SW3.5      | 3        |
| SW3.4      | 4        |
| SW3.3      | 5        |
| SW3.2      | 6        |
| SW3.1      | 7        |
| SW4.8      | 8        |
| SW4.7      | 9        |
| SW4.6      | 10       |
| SW4.5      | 11       |
| SW4.4      | 12       |
| SW4.3      | 13       |
| SW4.2      | 14       |
| SW4.1      | 15       |
| SW5.8      | 16       |

| DIP-switch | Timeslot |
|------------|----------|
| SW5.7      | 17       |
| SW5.6      | 18       |
| SW5.5      | 19       |
| SW5.4      | 20       |
| SW5.3      | 21       |
| SW5.2      | 22       |
| SW5.1      | 23       |
| SW6.8      | 24       |
| SW6.7      | 25       |
| SW6.6      | 26       |
| SW6.5      | 27       |
| SW6.4      | 28       |
| SW6.3      | 29       |
| SW6.2      | 30       |
| SW6.1      | 31       |

If device is functioning **in mode 3** and both WAN interfaces are in framed mode then DIP-switches **SW3.7 – SW6.1** define timeslots used for Ethernet traffic for both WAN interfaces simultaneously.

User should take care of using timeslot 16 for Ethernet traffic (**SW5.8** should be "on") because it can be used for signaling in applications like shown in paragraph 2.3 of this manual. In this case user should also disable CAS signaling (see 2.9).

### 2.8. WAN (E1): Receive equalizer gain limit (SW7.8)

It's possible to adjust WAN interfaces receive equalizer gain limit using DIP-switch **SW7.8**. WAN interface receive equalizer gain can be -12 or -43dB. When receive equalizer gain limit is -43 dB the maximum rich over 24 AWG cable is up to 2 km.

| SW7.8 | Receive equalizer gain limit |
|-------|------------------------------|
| off   | -12 dB                       |
| on    | -43 dB(default value)        |

### 2.9. WAN (E1): CAS signaling (SW7.7)

To enable/disable CAS signaling use DIP-switch **SW7.7**. Timeslot 16 is used to transmit CAS signaling. So when CAS signaling is enabled timeslot 16 can't be used for Ethernet frames transmission.

| SW7.7 | CAS signaling            |
|-------|--------------------------|
| on    | disabled (default value) |
| off   | enabled                  |

### 2.10. WAN (E1): CRC4 multiframe (SW7.6)

DIP-switch **SW7.6** is used to control CRC4 multiframe.

| SW7.6 | CRC4 multiframe          |
|-------|--------------------------|
| on    | disabled (default value) |
| off   | enabled                  |

### 2.11. WAN (E1): Automatic remote alarm indication (SW7.4 - SW7.3)

Use DIP-switches **SW7.4 – SW7.3** to control remote alarm indication.

| SW7.4 | SW7.3 | Remote alarm indication  |
|-------|-------|--------------------------|
| on    | on    | disabled (default value) |
| off   | on    | transmit RAI             |
| on    | off   | transmit AIS             |
| off   | off   | transmit AIS             |

### 2.12. WAN (E1): Idle code (SW7.2)

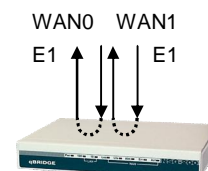
Use DIP-switches **SW7.2** to select idle code that is inserted to timeslots that are not used for Ethernet transmission.

| SW7.2 | Idle code |
|-------|-----------|
| on    | 0x55      |
| off   | 0x7E      |

### 2.13. WAN (E1): Remote loopback (SW7.1)

Use DIP-switches **SW7.1** to enable or disable remote loopback functionality. When remote loopback is enabled all data received from both E1 interfaces is looped back into the line. This feature is used for testing and troubleshooting and isn't enabled normally. LED indicators **WAN ALM** and **WAN ERR** are ON (yellow) in remote loopback mode.

| SW7.1 | Remote loopback          |
|-------|--------------------------|
| on    | disabled (default value) |
| off   | enabled                  |



## 2.14. LAN: Frame buffer configuration (SW1.3 – SW1.4)

qBRIDGE has internal RAM (Frame Buffer) to store Ethernet frames. The entire Frame Buffer capacity is 340 frames. One part of the Frame Buffer is used to store frames passing from LAN to WAN port and the second part is used to store frames passing from WAN to LAN port. To increase device performance user can configure the way of dividing of the Frame Buffer. Use DIP-switches SW1.3-SW1.4 for this purpose.

| <b>SW1.3</b> | <b>SW1.4</b> | <b>LAN-to-WAN buffer capacity</b> | <b>WAN-to-LAN buffer capacity</b> |
|--------------|--------------|-----------------------------------|-----------------------------------|
| on           | on           | 308 packets                       | 32 packets                        |
| on           | off          | 170 packets                       | 170 packets                       |
| off          | on           | 32 packets                        | 308 packets                       |
| off          | off          | reserved                          | reserved                          |

## 2.15. LAN: Filtering mode (SW1.2)

qBRIDGE supports Real-time MAC-address filtering with 256 address table and Automatic address learning and aging. If filtering is enabled, only broadcast, multicast and destined for remote LAN frames are forwarded to WAN. The address table can store up to 256 MAC-addresses and is automatically updated. The individual address will be aged and deleted from address table if frames with this address have not been received within 5 minutes. User can enable or disable filtering using DIP-switch SW1.2.

| <b>SW1.2</b> | <b>Filtering</b>        |
|--------------|-------------------------|
| on           | enabled (default value) |
| off          | disabled                |

## 2.16. LAN: IEEE 802.3x flow control (SW1.1)

qBRIDGE provides IEEE 802.3x flow control for more effective packet forwarding. If the number of packets buffered in memory exceeds the predefined value, qBRIDGE transmits the PAUSE frame to pause the data flow. When qBRIDGE receives the PAUSE frame it pauses the transmission until the requested time is expired. User can enable or disable flow control support using DIP-switch SW1.1.

| <b>SW1.1</b> | <b>Flow control</b>      |
|--------------|--------------------------|
| on           | enabled                  |
| off          | disabled (default value) |

## 2.17. LAN: Disabling Ethernet port (SW3.8)

qBRIDGE-201 provides capability of automatic Ethernet port transmitter disabling when link or frame/multiframe synchronization on WAN port is not established. This feature is useful to let know to the equipment connected to LAN port of qBRIDGE-201 that WAN port link is broken or WAN cable is disconnected. User can enable or disable automatic disabling of Ethernet port using DIP-switch SW3.8.

| <b>SW3.8</b> | <b>Automatic disabling of Ethernet port</b> |
|--------------|---|
| on           | enabled                                     |
| off          | disabled (default value)                    |

## Appendix A. Connector pin-outs

### qBRIDGE-201. WAN (RJ-45)

| Pin | Name            | Description         |
|-----|-----------------|---------------------|
| 1,2 | XMT (tip, ring) | Transmit Data - out |
| 4,5 | RCV (tip, ring) | Receive Data - in   |
| 3,6 | Chassis         |                     |

## Appendix B. Relay module for transparent connection of WAN interfaces



qBRIDGE-201 supports installation of a special relay module for providing transparent bypass commutation of E1 ports in case of power failure. There is special slot for installation of this module inside of qBRIDGE-201. User should remove jumpers from this slot before installing relay module. When power is applied to the device relay module don't affect to the device functioning but if there is power failure relay module shorts WAN interfaces together providing connection between devices connected to qBRIDGE-201.

## Appendix C. Ordering information

|                                |                              |
|--------------------------------|------------------------------|
| P/N: 36BEU201 (qBRIDGE-201)    | 100÷240V AC to 9V DC adapter |
| P/N: 36BED201 (qBRIDGE-201-DC) | DC power supply 36 ÷ 72 V    |
| P/N: 36BER201 (qBRIDGE-201-R)  | Card for 19" rack 6U         |

## Appendix D. Checking in the box

|   |                              |
|---|------------------------------|
| P/N: 36BEU201 (qBRIDGE-201)                               | 1 (according to the order)   |
| P/N: 36BED201 (qBRIDGE-201-DC)                            | 1 (according to the order)   |
| P/N: 36BER201 (qBRIDGE-201-R)                             | 1 (according to the order)   |
| Power adapter (100÷240V AC to 9V DC)                      | 1 (with qBRIDGE-201 only)    |
| Cable for DC 36 - 72 power supply connection              | 1 (with qBRIDGE-201-DC only) |
| Certificate of guarantee                                  | 1                            |
| User's manual   | 1 for two devices            |
| Patch Cord cable "Straight RJ-45" or "Crossover RJ-45"    | 1                            |
| Relay module for transparent connection of WAN interfaces | 1 (Optional)                 |