
ULAF+
SIEMENS
V4.0 Highlights and features
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- **ULAF V4.0 consists of the following units:**
  - BSTU : SHDSL transmission via 1- or 2 wire pairs with 2 x G.703, 1 x Ethernet interface, 1 x data module slot
  - BSRU: SHDSL regenerator for 1 - 2 wire pairs
  - QSTU: SHDSL via 1...4 wire pairs with 4 x G.703 interfaces - new firmware for interworking with BSTU and BSRU
  - Prepared for ULAF+ V5.0 subrack

BSTU – Key features (1)

BSTU is new termination unit based on latest SHDSL technology. The unit replaces STU and STU2, which will be phased-out.

SHDSL features

- Enhanced SHDSL performance using the 3rd generation of SHDSL transceivers
- Support of SHDSL.bis transmission with line codes TC-PAM16 (line speed up to 3848kbit/s per UTP) and TC-PAM32 (line speed up to 5696kbit/s per UTP) according to ETSI TS 101 524 and ITU-T G.991.2 recommendations
- New operation mode add/top with full E1 + data via one or two UTPs
- Automatic adjusting of SHDSL line rate possible („Lock bitrate" on/off)

BSTU – Key features (2)

- Embedded clock mode and enhanced jitter/wander suppression enable the applications for clock distribution (e.g. in mobile networks)

- Advantages of the new design
  - **High integration and flexibility**
  - **Extended mapping** features compared with STU and STU2: **flexible time slot allocation** for voice, data and signaling.
  - Various user interfaces on board:
    - **Ethernet switch** (10/100BaseTx) fully configurable with ULAF+ LCT or/and NMS
    - 1 or 2 x **G.703 interfaces** – the impedance is settable to 75 or 120 Ohm using LCT
    - **Data module slot** for all existing modules in ULAF+ equipment (X.21, V.35, V.36, Advanced Bridge & Router)

BSTU – Key features (3)

- Various user interfaces on board:
  - **Ethernet switch** (10/100BaseTx) fully configurable with ULAF+ LCT and NMS :
    - Operation modes: auto negotiation, full/half duplex 10/100BaseT
    - Flow control on/off
    - Bit rate limiting
    - Auto MDI-X on/off
    - Handling of oversized frames up to 1784bytes
  - **1 or 2 x G.703 interfaces** – the impedance is configurable to 75 Ohm or 120 Ohm using LCT
  - **Data module slot** for all existing ULAF+ modules:

X.21, V.35, V.36, Advanced Bridge and Advanced Bridge & Router

BSTU – Key features (4)

The unit is realized in several versions optimized for different voice and data applications (consult, please, the table, on the next slide)

- 1 or 2 SHDSL ports
- 1 or 2 x E1 interfaces
- Ethernet switch (10/100BaseTx) on board
- Data module slot
- Versions with Remote Power Supply (RPS) generate 120/180VDC and 50/60mA for the remote feeding of BSRUs and/or BSTU desktop units

- Applications using 2 UTPs:
  - **One system**: E1 or data distributed into 2 UTPs with half line bit rates to achieve longer distances or
  - **Two independent systems:** each E1 interface allocated to one UTP; add/drop mode fractional E1 + data or Ethernet also possible using Ethernet switch on board or data interface module

BSTU versions and ordering numbers

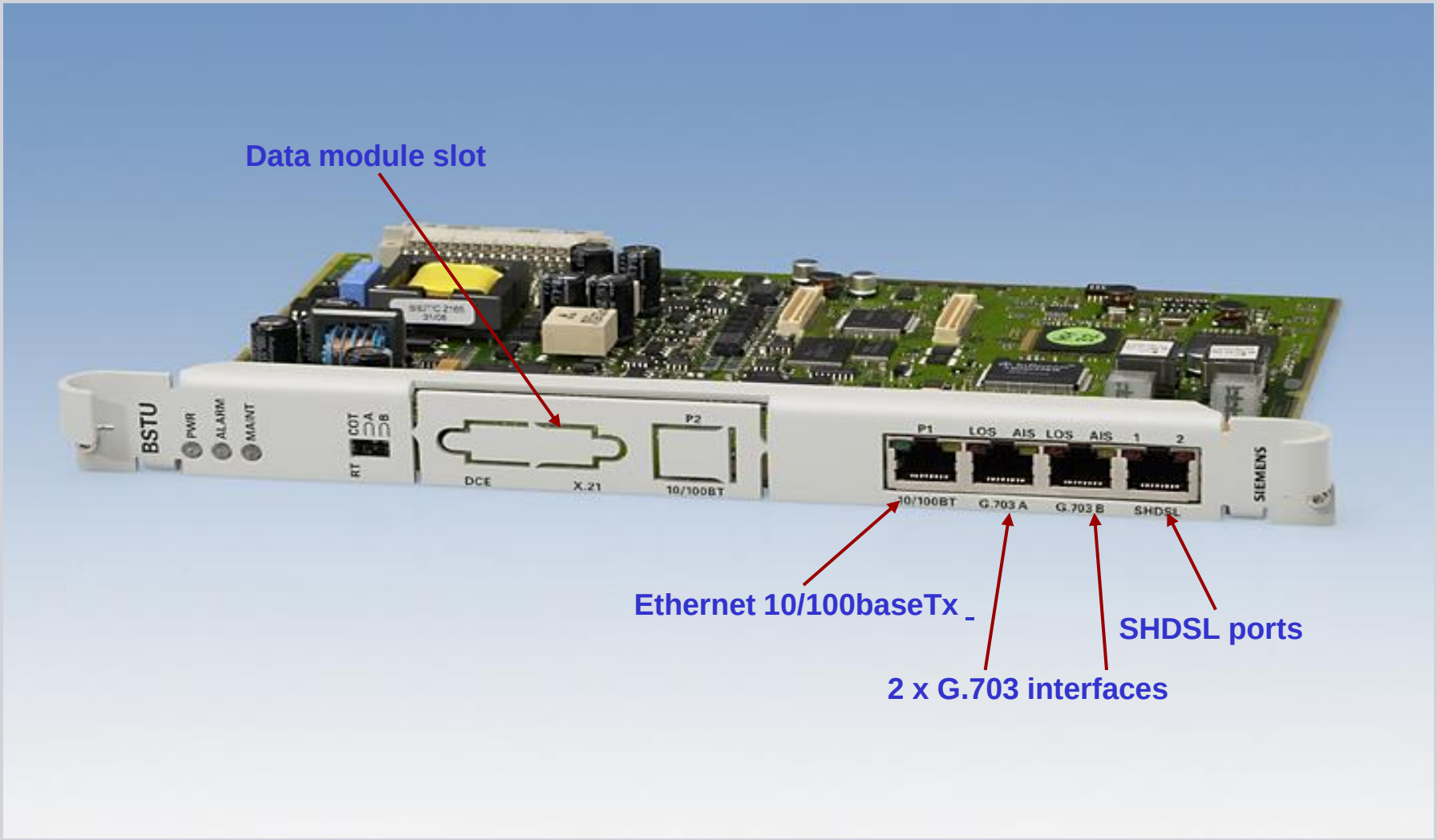
Ordering number	Plug-in (PI) or desktop' (DT)	G.703 (RJ45) on board 1 or 2	Data module slot	Ethernet switch 10/100BaseTx on board	RPS	SHDSL ports	Operation modes for BSTU – BSTU connections
S3118-J632-E111	PI	-	-	X	-	2	Ethernet data up to 11,4Mbit/s
S3118-J632-E112	PI	-	-	X (2 ports)	-	2	Ethernet switch with 2 ports; Ethernet data up to 11,4Mbit/s
S3118-J632-D210	PI	2	X	-	-	2	1 or 2 x E1, 1 x add/drop or add/top, 1 x data up to 4,6 Mbit/s or Ethernet up to 11,4Mbit/s (AB, ABAR)
S3118-J632-D220	PI	2	X	-	X	2	1 or 2 x E1, 1 x add/drop or add/top, 1 x data up to 4,6 Mbit/s or Ethernet up to 11,4Mbit/s (AB, ABAR)
S3118-J632-D221	PI	2	X	X	X	2	1 or 2 x E1 , 1 or 2 x add/drop or add/top , 1 x data up to 4,6Mbit/s or Ethernet up to 11,4Mbit/s
S3118-H631-B110	DT	1	-	-	-	1	1 x E1
S3118-H631-B210	DT	1	X	-	-	1	1 x E1, data (X.21, V.35, V.36) up to 4,6Mbit/s or Ethernet up to 5,7Mbit/s (AB, ABAR)
S3118-H631-E111	DT	-	-	X	-	1	Ethernet up to 5,7Mbit/s
S3118-H631-E210	DT	-	X	-	-	1	Data (X.21, V.35, V.36) up to 4,6Mbit/s or Ethernet up to 5,7Mbit/s (AB, ABAR)
S3118-H632-E111	DT	-	-	X	-	2	Ethernet up to 11,4Mbit/s
S3118-H632-E112	DT	-	-	X (2 ports)	-	2	Ethernet switch with 2 ports; Ethernet data up to 11,4Mbit/s
S3118-H632-D110	DT	2	-	-	-	2	1 or 2 x E1
S3118-H632-D210	DT	2	X	-	-	2	1 or 2 x E1, data (X.21, V,35, V.36) up to 4,6Mbit/s, Ethernet up to 11,4Mbit/s, 1 x add/drop or add/top
S3118-H632-D211	DT	2	X	X	-	2	1 or 2 x E1, data (X.21, V,35, V.36) up to 4,6Mbit, Ethernet up to 11,4Mbit/s, 1 or 2 x add/drop or add/top
S3118-H632-D220	DT	2	X	-	X	2	1 or 2 x E1, data (X.21, V.35, V.36) up to 4,6Mbit/s , 1 or 2 x add/drop or add/top
S3118-H632-D221	DT	2	X	X	X	2	1 or 2 x E1, data (X.21, V,35, V.36) up to 4,6Mbit/s, Ethernet up to 11,4Mbit/s, 1 or 2 x add/drop or add/top

Add/drop: fractional E1+data nx64kbit/s
Add/top: E1+data nx64kbit/s

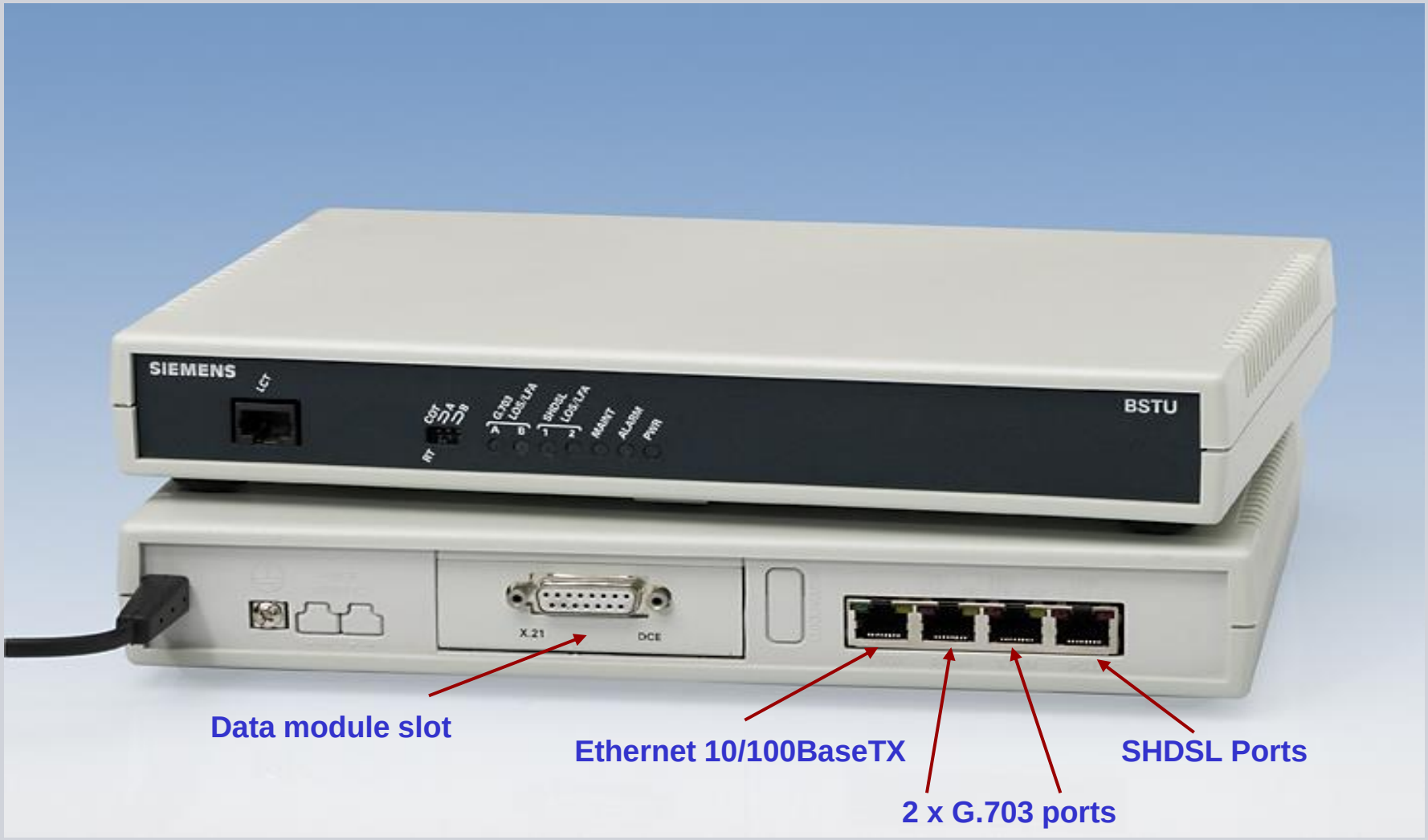
Data module slot can be equipped with legacy X.21, V.35, V.36, **AB** (Advanced Bridge) and **ABAR** (Advanced Bridge & Router) modules.

Keys for ordering numbers: **J** = plug-in (**PI**), **H** = desktop (**DT**); **1** = one SHDSL port; **2** = two SHDSL ports;
B1 = 1 x E1; **D1** = 2 x E1; **D2** = 2 x E1 + data module slot; **E1** = Ethernet switch on board; **E2** = data module slot;
1 = no RPS; **2** = RPS on board; **2** = Ethernet switch with 2 ports on board; **1** = Ethernet switch with 1 port on board; **0** = no Ethernet switch on board

BSTU plug-in unit



BSTU desktop unit



BSRU: SHDSL regenerator for 1 - 2 wire pairs (1)

Main features

Operation modes:

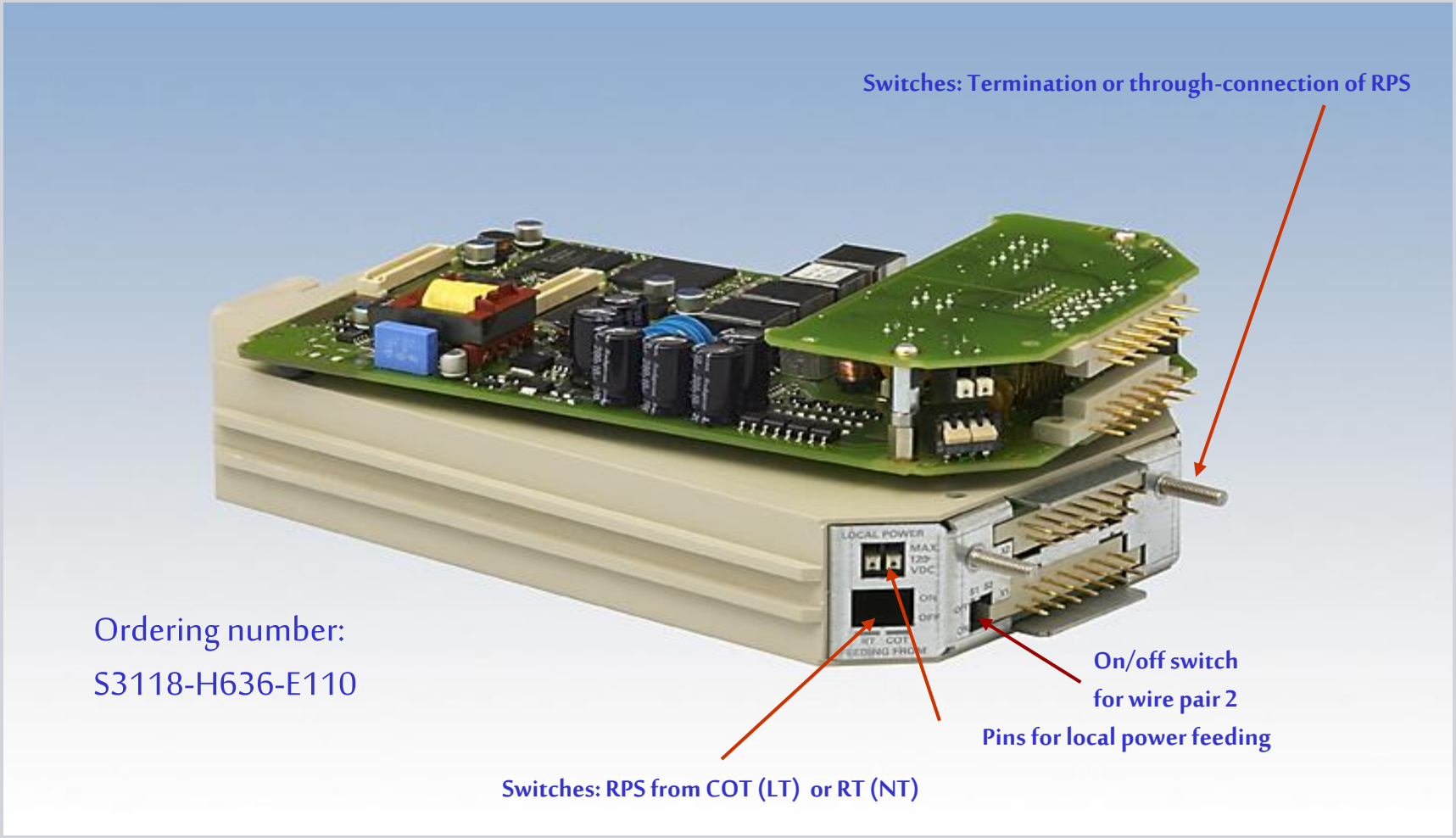
2 x 1 wire pair - two independent systems

1 x 2 wire pairs - payload splitting to achieve longer distances

1 x 1 wire pair – the second system switched-off

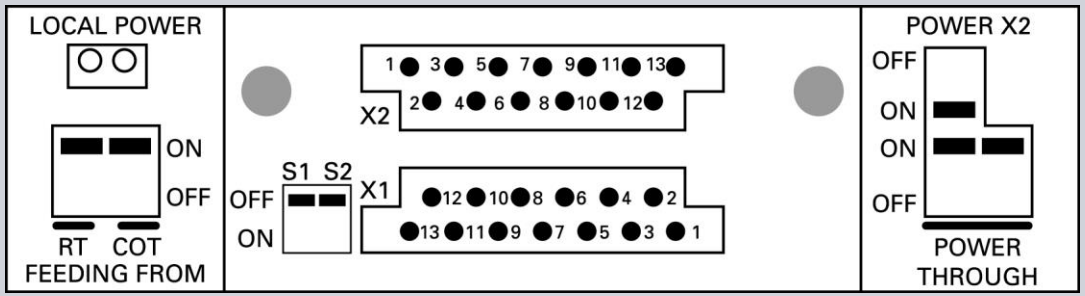
- **All configurations of power feeding and connections are possible without opening the housing**
  - Remote power feeding from COT or RT
  - Remote power feeding terminated or through-connected
  - Switch on/off the second system
  - Local power feeding: possible via clamps or connector
- **Multi-bitrates** from 192kbit/s up to 5696kbit/s are supported
- **The primary overvoltage protection with 3-electrode arrestors included**

BSRU: SHDSL regenerator for 1 - 2 UTPs (2)



- **BSRU is available in DTAG (octagonal) housing**

- **Switches for the configuration**



- **Power consumption**

1 x 2 UTPs, line speed 1024kbit/s; < 2,8W

- **Remote power feeding from QSTU and BSTU**

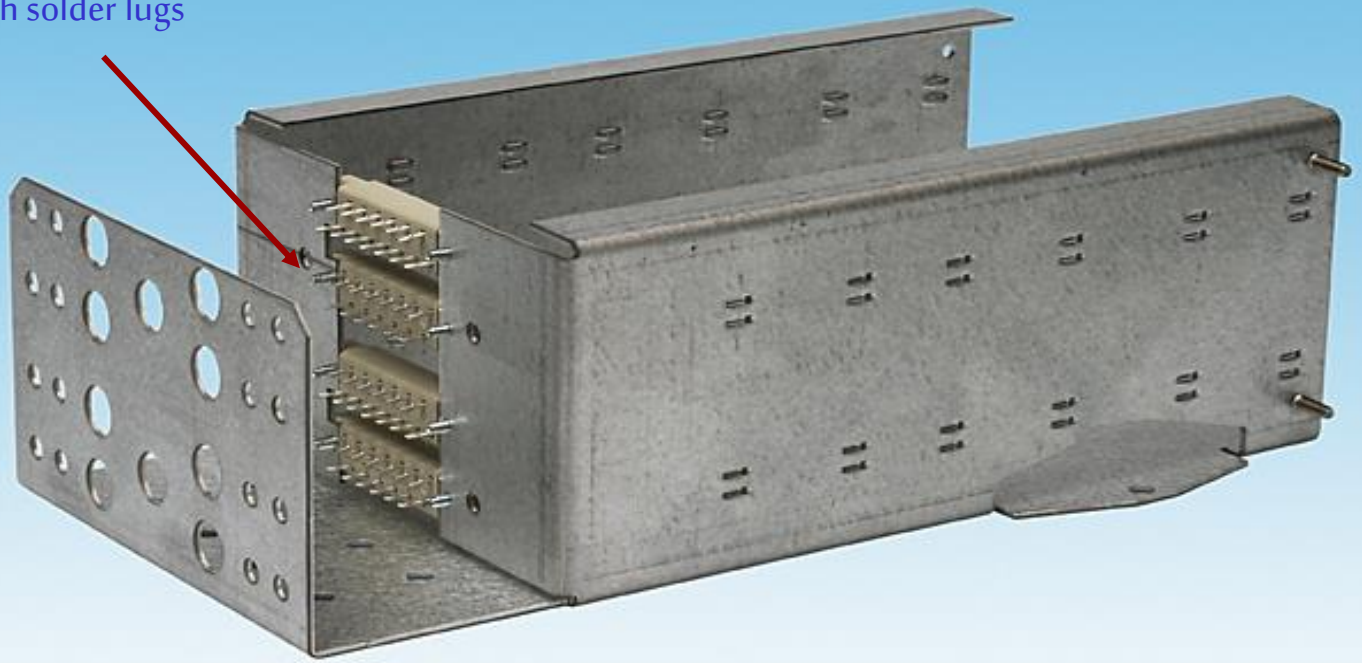
120VDC/50mA: up to two BSRUs or one BSRU and NT desktop (G.703) can be fed on ∅0,4mm cables;
180VDC/60mA: up to three BSRUs or two BSRUs and NT desktop (G.703) on ∅0,4mm cables; up to four BSRUs on cables >∅ 1,0mm

BSRU: SHDSL regenerator for 1 - 2 UTPs (4)

- New fixture for one or two BSRUs

Connectors DIN 617 13-pins

with solder lugs

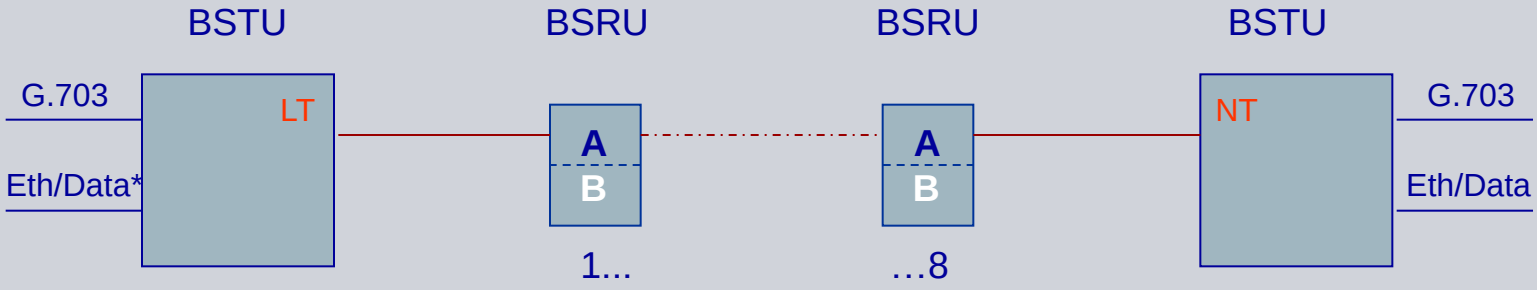


Ordering number: C107-A124-B210

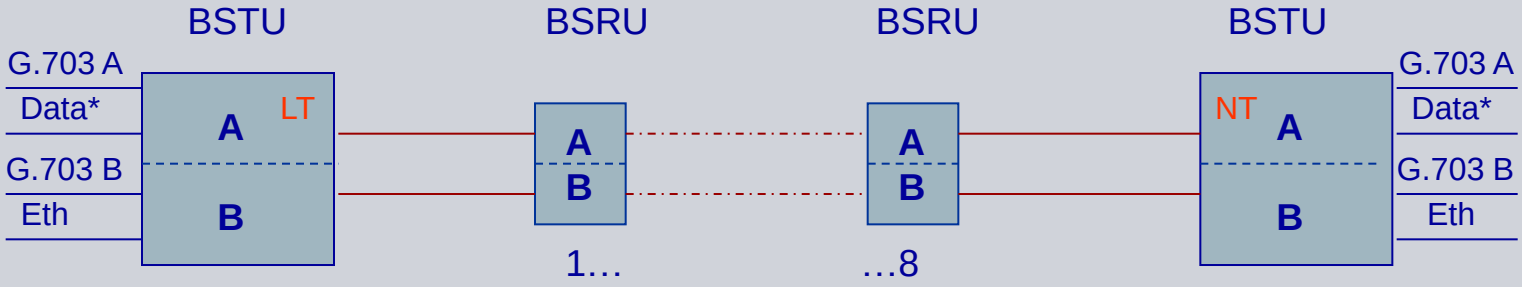
Applications and operation modes

Connections BSTU – BSRU – BSTU (1)

Single pair SHDSL (partial equipped versions of BSTU or second system switched-off)



Single pair SHDSL (two independent systems)



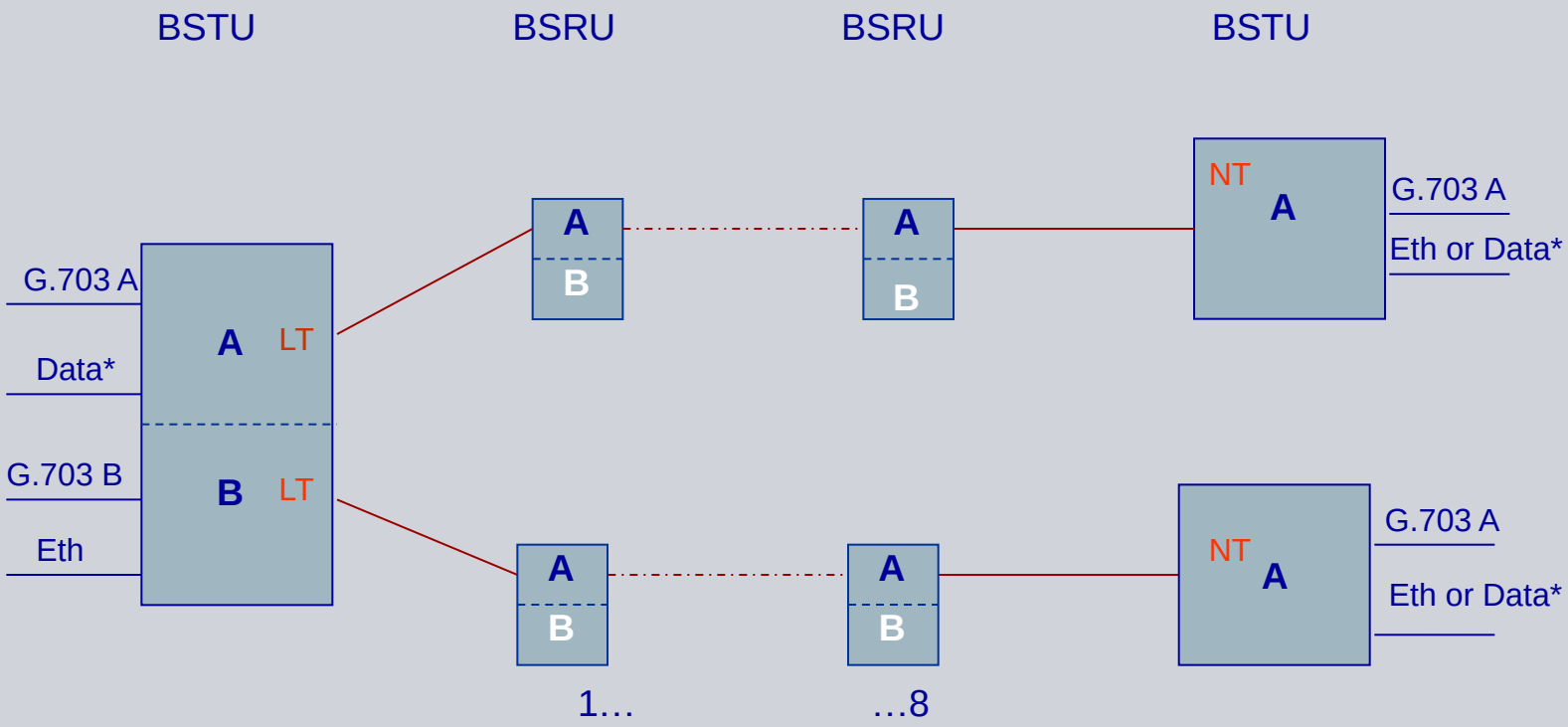
Remark: Maximal bandwidth in data operation mode up to 5696kbit/s

B : System switched-off

* Data module slot

Connections BSTU – BSRU – BSTU (2)

Single pair SHDSL (two independent systems)



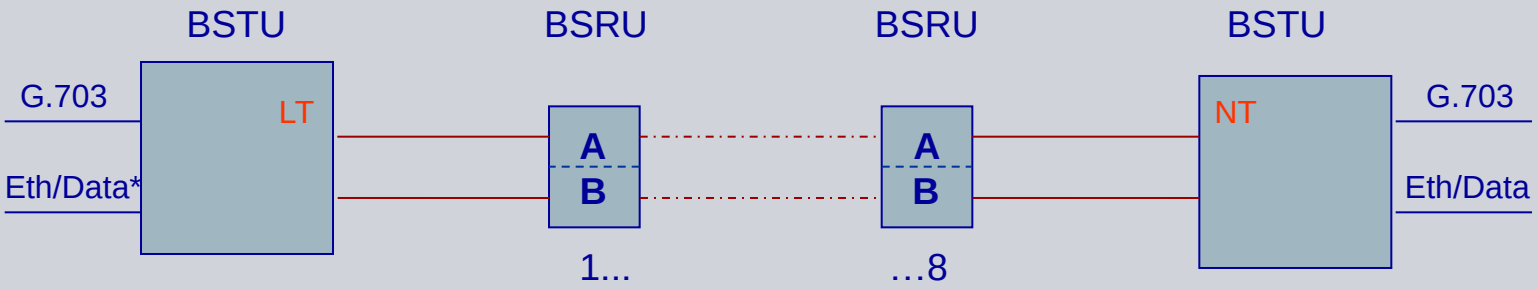
Remark: Maximal bandwidth in data or add/top operation mode up to 5696kbit/s

B : System switched-off

* Data module slot

Connections BSTU – BSRU – BSTU (3)

2 pair SHDSL with payload splitting or sharing

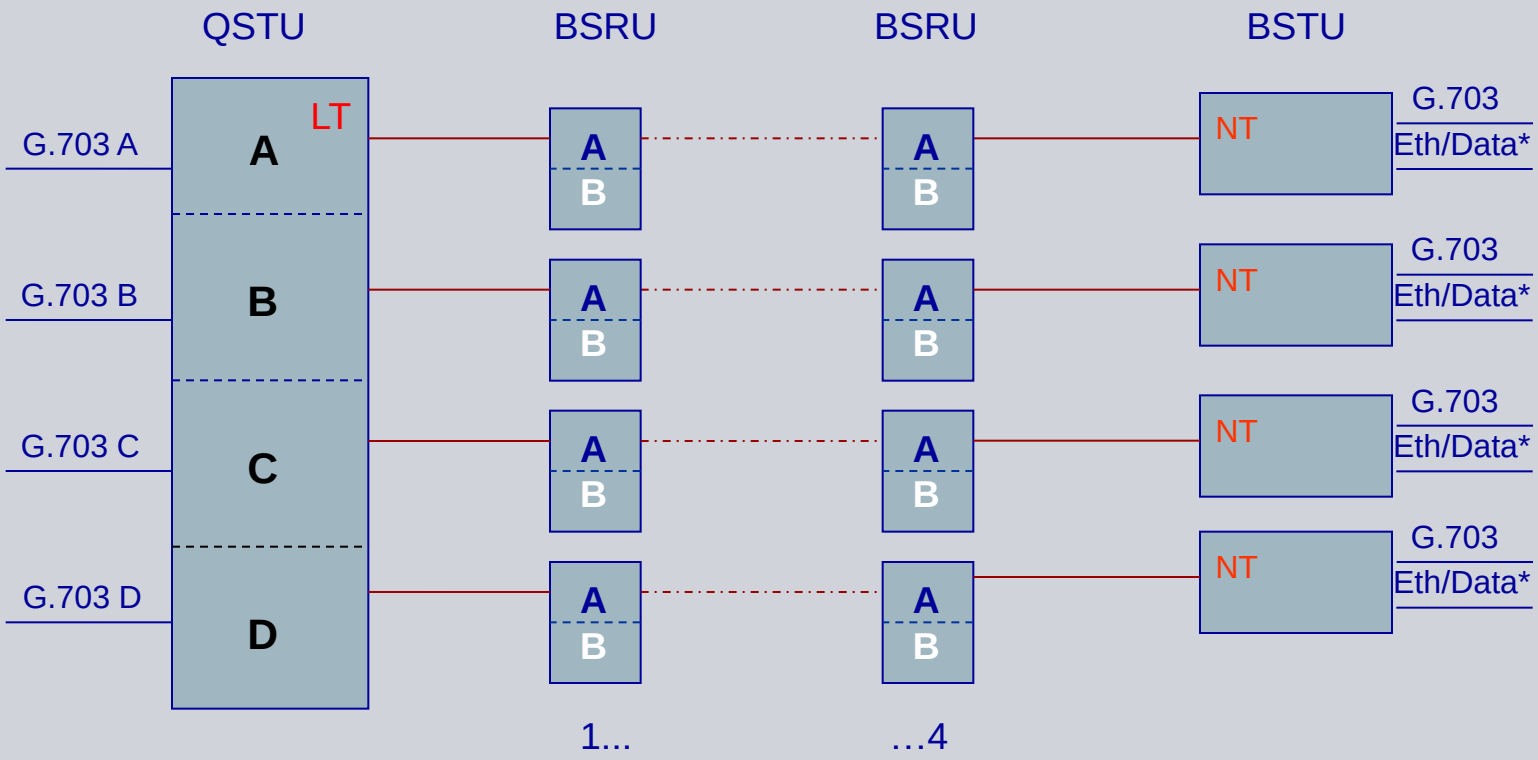


Remark: Maximal bandwidth in add/top or data operation mode
up to 11,392Mbit/s (5,696Mbit/s per wire pair)

* Either Ethernet switch or data module slot

Connections QSTU – BSRU – BSTU (1)

4 x single pair SHDSL

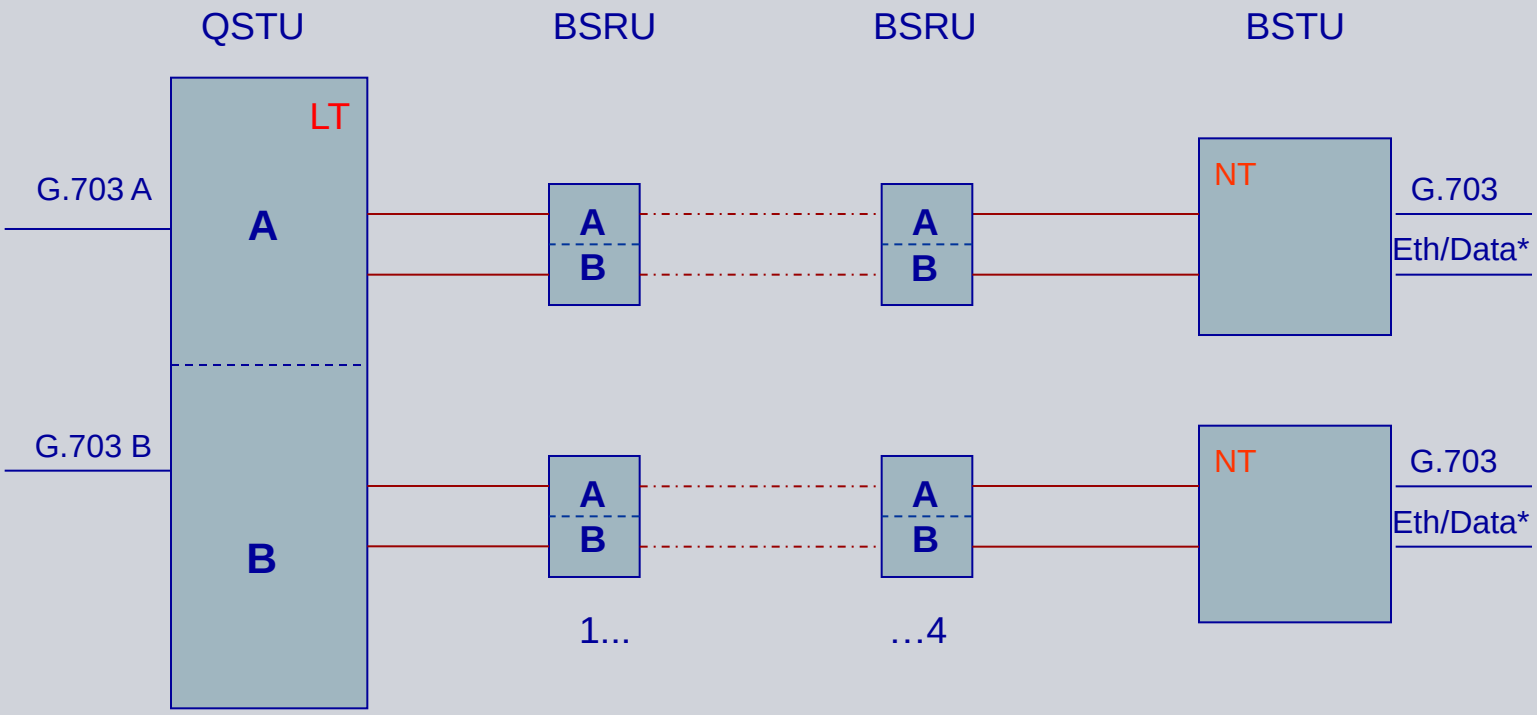


B : System switched-off

* Data module slot

Connections QSTU – BSRU – BSTU (2)

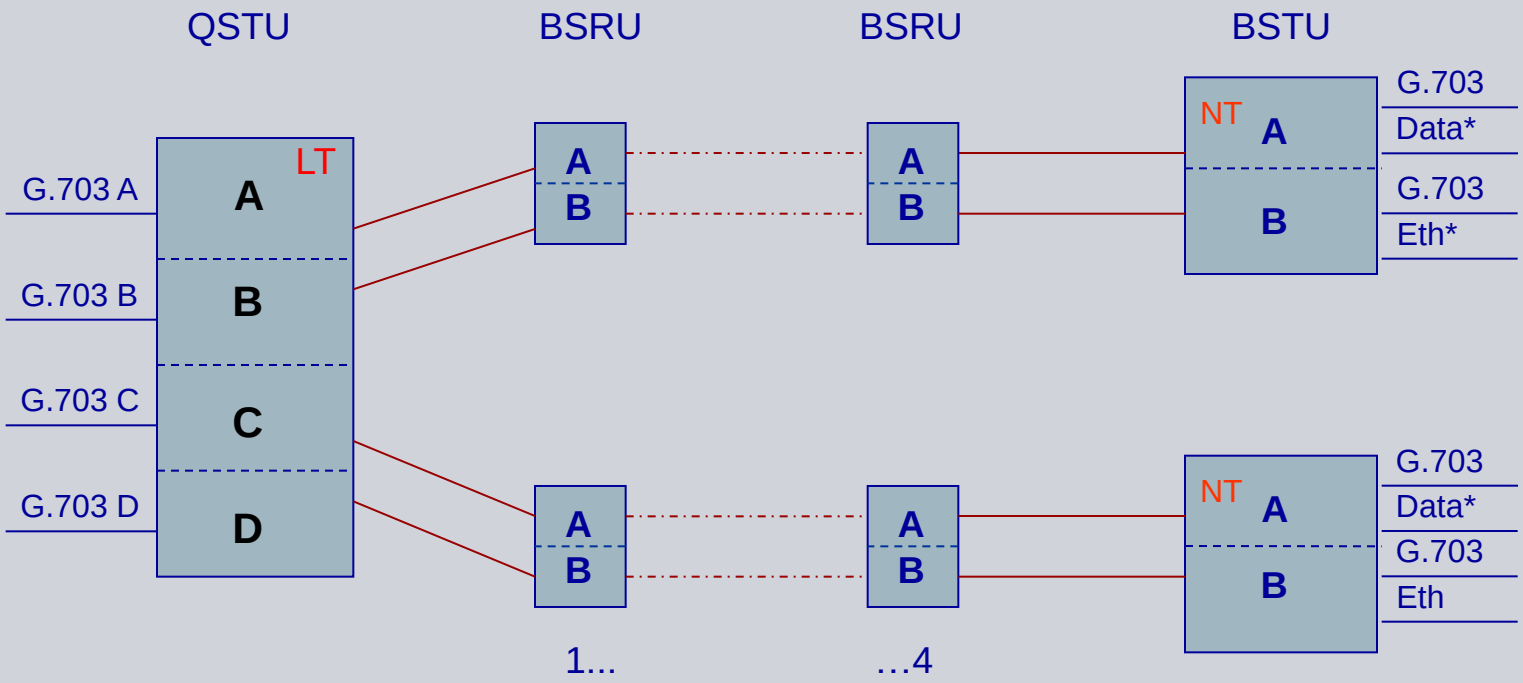
SHDSL via 2 x 2 pairs operation mode (payload splitting)



*Data module slot

Connections QSTU – BSRU – BSTU (3)

Single pair SHDSL operation mode



*Data module slot

Back-up slides

BSTU: SHDSL Reach

Loop bit rate	ETSI	BSTU – BSTU				
	PE0.4 +6dB	PE0.4 +6dB Noise central	PE0.4 +0dB Noise central	PE0.4 +6dB Noise remote	PE0.4 +0dB Noise remote	PE0.4 no Noise
192 kBit/s	—	6000m [1]	6600m [1]	6200m [1]	7000m [1]	7800m
384 kBit/s	4773m	4600m	5200m	4500m	5200m	6900m
512 kBit/s	4202m	4100m	4800m	4000m	4700m	6500m
768 kBit/s	3392m	3400m	4200m	3300m	4000m	6200m
1024 kBit/s	3058m	3100m	3700m	2900m	3600m	5700m
1536 kBit/s	2439m	2500m	3100m	2400m	3000m	5600m
2048 kBit/s	2135m	2200m	2700m	2100m	2700m	5200m
2304 kBit/s	1913m	2000m	2500m	2000m	2500m	5100m

1) Noise: ETSI noise "B" for COT. 384kBit/s

Line code TC-PAM16;
line rates up to 2304kbit/s;
cable 0,4mm

Loop bit rate	BSTU – BSTU				
	PE0.8 +6dB Noise central	PE0.8 +0dB Noise central	PE0.8 +6dB Noise remote	PE0.8 +0dB Noise remote	PE0.8 no Noise
192 kBit/s	15500m [1] [2]	15500m [1] [2]	15500m [1] [2]	15500m [1] [2]	15500m [2]
384 kBit/s	14000m	15500m [2]	13800m	15500m [2]	15500m [2]
512 kBit/s	12900m	14900m	12500m	15500m [2]	15500m [2]
768 kBit/s	11100m	12900m	10600m	12900m	15500m [2]
1024 kBit/s	9500m	11800m	9300m	11200m	15500m [2]
1536 kBit/s	7600m	9300m	7400m	9000m	15500m [2]
2048 kBit/s	6200m	7850m	6100m	7900m	14800m
2304 kBit/s	5600m	7250m	5700m	7300m	14200m

1) Noise: ETSI noise "B" for COT. 384kBit/s 2) Max. Reach limited by DLS-400

Line code TC-PAM16;
line rates up to 2304kbit/s;
cable 0,8mm

– Average noise conditions

BSTU: SHDSL Reach (2)

Loop bit rate (PAM 16)	ETSI	BSTU – BSTU				
	PE0.4 +6dB	PE0.4 +6dB Noise central	PE0.4 +0dB Noise central	PE0.4 +6dB Noise remote	PE0.4 +0dB Noise remote	PE0.4 no Noise
3072 kBit/s	1561m	1550m	2000m	1650m	2200m	4500m
3840 kBit/s	1286m	1450m	1900m	1450m	1900m	4000m

Line code TC-PAM16;
line rates up to 3840kbit/s;
cable 0,4mm

Loop bit rate (PAM 16)	BSTU – BSTU				
	PE0.8 +6dB Noise central	PE0.8 +0dB Noise central	PE0.8 +6dB Noise remote	PE0.8 +0dB Noise remote	PE0.8 no Noise
3072 kBit/s	4100m	5550m	4500m	6000m	11600m
3840 kBit/s	3400m	4650m	3700m	4900m	10300m

Line code TC-PAM16;
line rates up to 3840kbit/s;
cable 0,8mm

Average noise conditions

BSTU: SHDSL Reach (3)

Loop bit rate (PAM 32)	ETSI	BSTU – BSTU				
	PE0.4 +6dB	PE0.4 +6dB Noise central	PE0.4 +0dB Noise central	PE0.4 +6dB Noise remote	PE0.4 +0dB Noise remote	PE0.4 no Noise
768 kBit/s	3209m	3200m	3800m	3000m	3800m	5600m
1024 kBit/s	2751m	2800m	3500m	2600m	3300m	5500m
1536 kBit/s		2300m	2900m	2100m	2700m	5100m
2048 kBit/s	1810m	1800m	2500m	1700m	2400m	5000m
2304 kBit/s		1700m	2300m	1600m	2200m	4800m

Line code TC-PAM32;
line rates up to 2304kbit/s;
cable 0,4mm

Loop bit rate (PAM 32)	BSTU – BSTU				
	PE0.8 +6dB Noise central	PE0.8 +0dB Noise central	PE0.8 +6dB Noise remote	PE0.8 +0dB Noise remote	PE0.8 no Noise
768 kBit/s	10000m	11500m	9900m	12000m	15500m [2)]
1024 kBit/s	8900m	10900m	8800m	10900m	15500m [2)]
1536 kBit/s	7100m	9000m	7000m	8900m	15500m [2)]
2048 kBit/s	5700m	7500m	5600m	7400m	14800m
2304 kBit/s	5000m	6800m	5000m	6700m	14000m

Line code TC-PAM32;
line rates up to 2304kbit/s;
cable 0,8mm

— Average noise conditions

BSTU: SHDSL Reach (4)

Loop bit rate (PAM 32)	ETSI	BSTU – BSTU				
	PE0.4 +6dB	PE0.4 +6dB Noise central	PE0.4 +0dB Noise central	PE0.4 +6dB Noise remote	PE0.4 +0dB Noise remote	PE0.4 no Noise
3072 kBit/s	1390m	1350m	1800m	1400m	2100m	4300m
3840 kBit/s	1112m	1200m	1600m	1200m	1800m	3900m
4096 kBit/s	1039m	1000m	1450m	1100m	1600m	3900m
5120 kBit/s	808m	800m	1200m	950m	1300m	3500m
5696 kBit/s	713m	600m	1100m	800m	1100m	3200m

Line code TC-PAM32;
line rates up to 5696kbit/s;
cable 0,4mm

Loop bit rate (PAM 32)	BSTU – BSTU				
	PE0.8 +6dB Noise central	PE0.8 +0dB Noise central	PE0.8 +6dB Noise remote	PE0.8 +0dB Noise remote	PE0.8 no Noise
3072 kBit/s	3700m	5400m	4000m	5500m	12000m
3840 kBit/s	2900m	4200m	3200m	4600m	10800m
4096 kBit/s	2700m	4100m	3000m	4400m	10200m
5120 kBit/s	1900m	3200m	2400m	3600m	8900m
5696 kBit/s	1700m	2900m	1900m	3200m	6900m

Line code TC-PAM32;
line rates up to 5696kbit/s;
cable 0,8mm

— Average noise conditions

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