SHDSL.bis

Up to 30Mbps

Ethernet

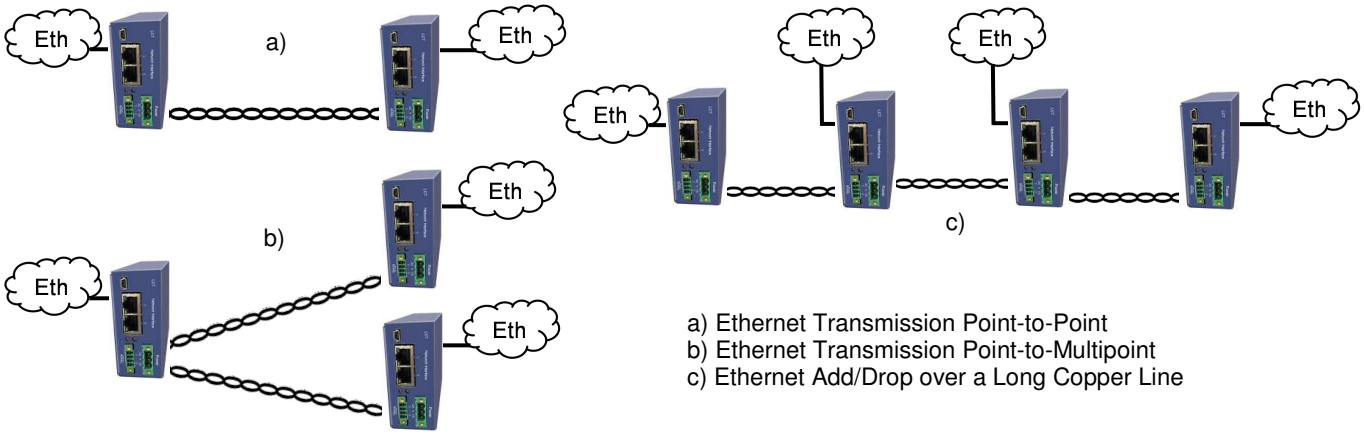
FlexDSL MiniFlex

Features

- Up to 15Mbps Data Transmission per Copper Pair
- SHDSL and SHDSL.bis, TC-PAM16/32
- Additional TC-PAM4/8/64/128 Available
- 1 or 2 Copper Pairs Support
- 2 Port Ethernet Switch (10/100BaseT)
- QoS, VLAN and RSTP Support
- Point-to-Point and Point-to-Multipoint Operation
- Console Port, Telnet, Web, SNMP Management
- 24/48VDC or 110/230VAC Powered, Low Power Consumption
- Included Primary Protection
- Robust DIN-Rail Metal Enclosure
- Smallest Size
- Industrial Temperature Range Available

The FlexDSL Orion3 and MiniFlex SHDSL.bis product family offers a broad range of products, which are based on the latest SHDSL.bis standards (ITU-T G.991.2 & ETS TS 101524), while also being fully interoperable with all our existing SHDSL equipment (Orion1, Orion2). The FlexDSL MiniFlex supports beside of the standardized TC-PAM16/32 also the new extended TC-PAM4/8/64/128 line coding. The support of these extended line codes ensures compatibility with existing SHDSL equipment, that is already installed, in order to protect customer investments, while at the same time providing an upgrade path to the newest DSL technologies.
SHDSL.bis allows symmetrical data and voice transmission at speeds up to 15Mbps over a single pair of copper. In addition, the FlexDSL MiniFlex SHDSL.bis modem range also supports DSL channel bonding for up to 2 copper pairs in order to achieve speeds to 30.4Mbps!!. An integrated 2 port Ethernet layer 2 managed switch with VLAN, QoS and RSTP support (10/100BaseT) ensures connectivity to IP services. The FlexDSL MiniFlex SHDSL.bis modems is a perfect solution for a wide range of applications in which IP services need to be transmitted over copper wires. The MiniFlex product is a small-sized Orion3 unit with all the functionality included.
Like all FlexDSL Orion products the FlexDSL MiniFlex SHDSL.bis modems are based on industrial components and manufactured according to highest quality standards providing additional value due to the extended temperature ranges and higher reliability. The combination of comprehensive functions providing maximum flexibility together with the higher quality of the FlexDSL MiniFlex SHDSL.bis product family make it the perfect choice for all your DSL needs.

Possible Applications



a) Ethernet Transmission Point-to-Point
b) Ethernet Transmission Point-to-Multipoint
c) Ethernet Add/Drop over a Long Copper Line

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Quick Installation Guide

Enter a MiniFlex Device

You can use the Monitor (Local Craft Terminal, USB) interface with Hyper Terminal (or any equal program) or you can address the device with Telnet through the Ethernet interface.

Monitor (LCT, USB) Interface:

- Configure the COM port: Bits per second:9600, Data bits: 8, Parity: None, Stop bits: 1, Flow control: None
- Press <ENTER>.

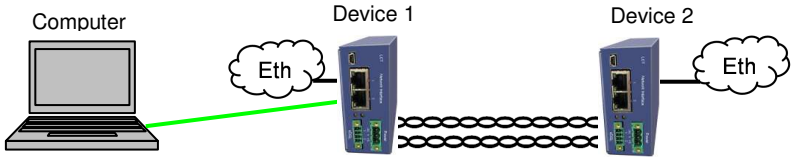
Telnet through Ethernet Interface:

- Type in command line <Telnet 192.168.0.235> and press <ENTER>. This is the default Ethernet Address for MiniFlex devices.

After a successful entering the main menu of the device will be displayed.

Configure a MiniFlex Device

A first installation example with the most important commands and points to care about is shown below. We just like to have an Ethernet transmission between the two devices over 2 SHDSL copper pairs with a speed of 11.4Mbit/s. The pairs should aggregate (bundle) the data traffic and in case of any SHDSL pair failure, the remaining pairs should continue to work.



Enter in device 1 with the Monitor (LCT, USB) or Telnet interface.

Type following commands	Description
3 <↵>	Go to Configuration Management (CM)
<DEFAULT EVERYTHING> <↵>	Set everything to default configuration
<MASTER ON 1> <↵>	Configure SHDSL 1 as MASTER
<MASTER ON 2> <↵>	Configure SHDSL 2 as MASTER
<PAYLOAD WAN 1> <↵>	Configure Ethernet over SHDSL 1
<PAYLOAD WAN 2> <↵>	Configure Ethernet over SHDSL 2
<NET> <↵>	Go to NET menu
<SETIP 10.0.2.200> <↵>	Set the IP-address of the device
<NETMASK 255.0.0.0> <↵>	Set the subnet mask
<GATEWAY 10.0.0.101> <↵>	Set the default gateway
<M> <↵>	Go to Configuration Management (CM)
<M> <↵>	Go to Main Menu
2 <↵>	Go to Fault and maintenance management (FMM)
<APPLY ALL> <↵>	Apply all configurations (written in the running config.)
<CONFIRM> <↵>	Confirm all configurations (written in the startup config.)

In Menu Configuration Management (CM) you can type <CONFIG> to see the following picture:

```
CO_CM>CONFIG
--------------------------------------------------------------------------------

Running Line Configuration

--------------------------------------------------------------------------------

xDSL               DSL1          DSL2
  Mode          :  Master(HTU-C) Master(HTU-C)
  Extended rates:  OFF           OFF
  Line coding   :  PAM32         PAM32
  Baserate      :  89            89
  Annex         :  B             B
  Payload       :  WAN           WAN
  Clock source  :  Int           Int
  GS compatible :  OFF
  NM threshold  :  OFF
  LA threshold  :  OFF
--------------------------------------------------------------------------------

CO_CM>
```

Enter in device 2 with the Monitor (LCT, USB) or Telnet interface.

Type following commands	Description
3 <↵>	Go to Configuration Management (CM)
<DEFAULT EVERYTHING> <↵>	Set everything to default configuration
<MASTER OFF 1> <↵>	Configure SHDSL 1 as SLAVE
<MASTER OFF 2> <↵>	Configure SHDSL 2 as SLAVE
<PAYLOAD WAN 1> <↵>	Configure Ethernet over SHDSL 1
<PAYLOAD WAN 2> <↵>	Configure Ethernet over SHDSL 2
<NET> <↵>	Go to NET menu
<SETIP 10.0.2.201> <↵>	Set the IP-address of the device
<NETMASK 255.0.0.0> <↵>	Set the subnet mask
<GATEWAY 10.0.0.101> <↵>	Set the default gateway
<M> <↵>	Go to Configuration Management (CM)
<M> <↵>	Go to Main Menu
2 <↵>	Go to Fault and maintenance management (FMM)
<APPLY ALL> <↵>	Apply all configurations (written in the running config.)
<CONFIRM> <↵>	Confirm all configurations (written in the startup config.)

In Menu Configuration Management (CM) you can type <CONFIG> to see the following picture:

```
CP_CM>CONFIG
--------------------------------------------------------------------------------

Running Line Configuration

--------------------------------------------------------------------------------

xDSL               DSL1          DSL2
  Mode          :  Slave(HTU-R)  Slave(HTU-R)
  Extended rates:  OFF           OFF
  Line coding   :  PAM32         PAM32
  Baserate      :  89            89
  Annex         :  B             B
  Payload       :  WAN           WAN
  Clock source  :  Int           Int
  GS compatible :  OFF
  NM threshold  :  OFF
  LA threshold  :  OFF
--------------------------------------------------------------------------------

CP_CM>
```

The idea is the following: the default settings help any device to be in an initial state, then the MASTER/SLAVE mode is enabled on the modem, then the transmit data is configured, then the network settings are configured (IP address, default subnet mask and default gateway) and finally, these settings are applied and then are written in the EEPROM.

ATTENTION
DON'T FORGET TO WRITE THE CONFIGURATION IN THE STARTUP CONFIGURATION WITH THE FOLLOWING COMMANDS:

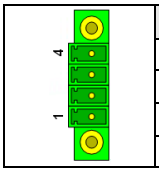
2 <↵>	Go to Fault and maintenance management (FMM)
<APPLY ALL> <↵>	Apply all configurations (written in the running config.)
<CONFIRM> <↵>	Confirm all configurations (written in the startup config.)

Connector Description

SHDSL Technical Specification

Specification	ITU-T G.991.2 G.shdsl and G.shdsl.bis
Line Code	TC-PAM16/32, Extended: TC-PAM4/8/64/128
Impedance	135Ω
Transmit Power	13.5 (Annex A) or 14.5 (Annex B) dBm @ 135Ω
Number of Pairs	2
Bit Rate	192 to 5704kbit/s, Extended: 128 to 15232kbit/s
Overvoltage Protection	ITU-T Rec. K.20/K.21
Connector Type	Phoenix Mini Combicom MC 1,5/4-GF-3,5 (female), 4 pins.
Matching Type for the cable	FK-MCP 1,5/ 4-STF-3,5 For AWG 16-26, Area 0.14–1.5 mm^2 or Diameter 0.4-1.4 mm

SHDSL Connector Specification

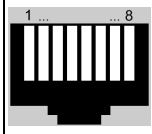


Pin No	Description
1	SHDSL interface A
2	SHDSL interface A
3	SHDSL interface B
4	SHDSL interface B

Ethernet Technical Specification

Standard:	IEEE-802.3, VLAN/QoS IEEE-802.1q/p
Number of Interfaces	2
Data Rate	10/100BaseT, Full/Half Duplex
Protocols	Data, Telnet, SNMP, WEB
Signal Level	Ethernet
MDI/MDI-X auto crossover	Supported
Auto Negotiation	Supported
Connector Type	RJ45 Female, 8 pin

Ethernet Connector Specification



Pin No	Description
1	Tx+ (transmit data)
2	Tx- (transmit data)
3	Rx+ (receive data)
4	NC (not used)
5	NC (not used)
6	Rx- (receive data)
7	NC (not used)
8	NC (not used)

Monitor/Local Craft Terminal Technical Specification

Specification	USB V2.0 full and low speed
Data Rate	12Mbit/s
Protocol	Master/Slave, Uses the USB communication device class (CDC) drivers to take advantage of the installed PC RS-232 software to talk over the USB
Connector Type	USB Type Mini-B female connector

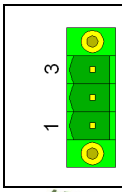
Monitor/LCT Connector Specification

Pin No	Description
1	+5V
2	Data -
3	Data +
4	NC (not used)
5	SGND

Power Supply Technical Specification

Specification	ETSI ETS 300 132-2
Voltage (-24V models)	18-72VDC local power
Voltage (-230V models)	85-264VAC, 120-370VDC local power
Connector Type	Phoenix Combicom MSTB 2,5/ 3-GF-5,08(male), 3 pins.
Matching Type for the cable	FKCT 2,5/ 3-STF-5.08 For AWG 12-24, Area 0.2–2.5 mm^2 or Diameter 0.5-1.75 mm
Power Consumption	Typically 4 Watts

Power Supply Connector Specification



Pin No	Description
1	Negative power terminal or N (Neutral power terminal)
2	Protection ground
3	Positive power terminal or L (Life power terminal)

Panel Description

Connector	LED	RED	GREEN	AMBER	OFF
xDSL 1 (DSL No 1)	1	DSL not working	DSL normal operation		
xDSL 2 (DSL No 2)	2	DSL not working	DSL normal operation		
Ethernet 1 and 2	Left		Blinking = Data		Connection not active
Ethernet 1 and 2	Right			100 Mbit/s data rate	10 Mbit/s data rate

Environment , EMC and Safety

Storage:	ETS 300 019-1-1 Class 1.2	(-25°C … +55°C)
Transportation:	ETS 300 019-1-2 Class 2.3	(-40°C … +70°C)
Operation:	ETS 300 019-1-3 Class 3.4	(-25°C … +70°C)

Higher Operation Temperature range available on request (-25°C … +80°C)

Dimension:	143(W)x87(D)x37(H) mm, 153(W)x87(D)x37(H) mm with Clip	
Weight	< 0.5kg in Metal DIN-Rail Enclosure	
Standards:	EN 300386 V1.4.1:2008	EN 61000-4-2/A2:2001
	EN 50121-4:2006	EN 61000-4-3:2006
	EN 60950-1:2006	EN 61000-4-4:2004
	EN 55022:2006, Class B	EN 61000-4-5:2006
	EN 55024/A2:2003	EN 61000-4-6:2007
		EN 61000-4-6/A1:2001

Available Models

Ordering Code	Interfaces	Power Supply	Attention!
MF-PAM-RAIL2N-2Eth-24V, V1	2xDSL 2xETH	18-72VDC	
MF-PAM-RAIL2N-2Eth-230V, V1	2xDSL 2xETH	110/230VAC	

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