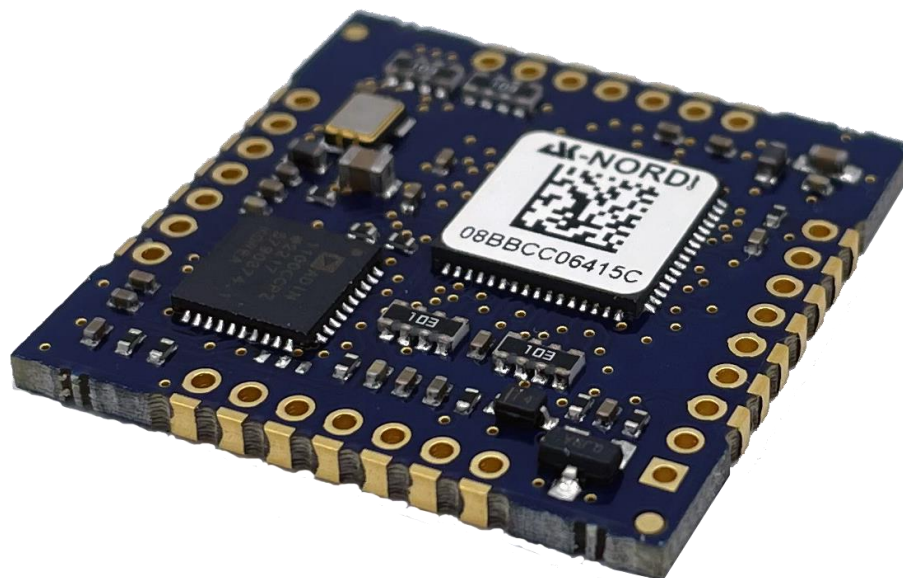




# Technical data sheet

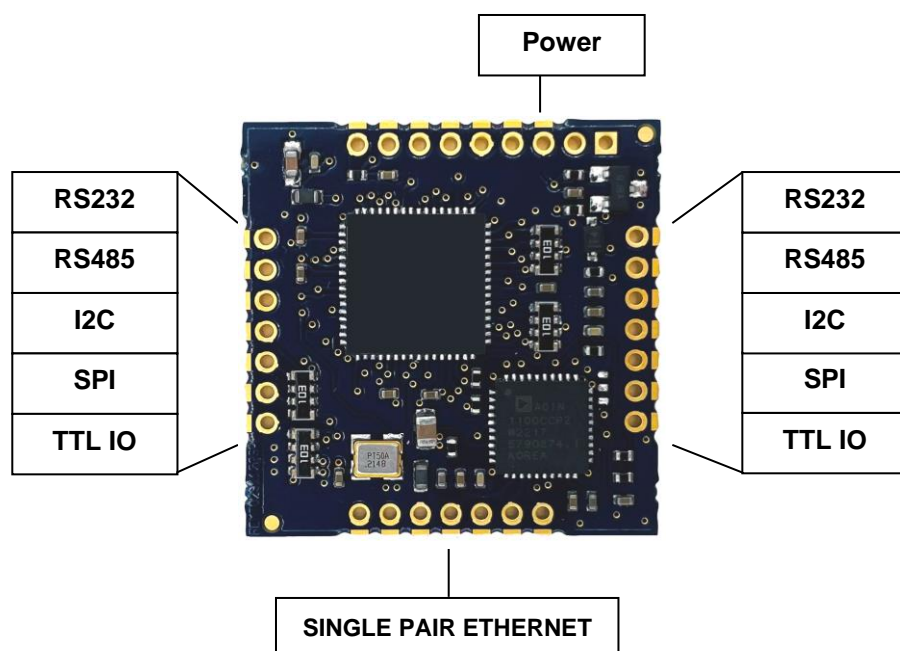
**XT-FEMTO-SPE-SXL**



# XT-FEMTO-SPE-SXL

The XT-FEMTO-SPE-SXL is a very small embedded network module which can be easily integrated into any terminal. The XT-FEMTO-SPE-SXL embedded network module with the dimensions 27 x 27 x 3mm, can be built-in as SMD or as THT component and be used in your switching directly or optionally. A total of two bus systems with five switchable interfaces such as RS232, RS485, I2C, SPI as well as TTL-IO will be made available. With only a few additional components, such as a 3-pin connector and a 3.3Volt power supply, your end device is immediately network-compatible and accessible worldwide. You can bridge distances >1000m from your end device to the first switch.

## Hardware – Description



## Emulations and functions

- Modem Emulation
- Connect-On-Data
- Auto-Connect
- Tunnel-Mode
- DYNDNS-Client
- FTP-Server
- LPR-Server
- I2C – Master
- SPI – Master / Slave
- TTL – IO
- 512KB internes Flashdrive
- Flash-File-System
- SD- und DF-CARD
- 4bit- und SPI - DISPLAY
- E-Mail – Client
- TCP/UDP -Client
- TCP/UDP –Server
- SYSLOG-Client
- M2M

## Supported systems

1. Windows
2. Linux
3. UNIX

## Management

1. Telnet
2. Browser
3. Serielle Interface

## Technical Data

**Temperature range:**  
-40°C.. + 85°C

**Standards:**  
CE / WEEE / RoHS  
EN 55022 Class B  
EN 55024 Class A

**Power supply:**  
3.3 Volt  
170 mA

**Dimensions:**  
27 x 27 x 3 mm

**Weight:**  
3 Gramm

**Single Pair Ethernet (SPE)**  
10 Half Duplex  
10 Full Duplex  
Master/Slave  
AutoSensing

### Interfaces – Features

- All data pins 3.3 volts TTL, 10K Pullup  
- All data interfaces are freely selectable

#### 2 x RS232/RS485

Baud rate: up to 2.5 Mbaud  
DataBits: 7,8  
Parity: Odd, Even, None  
Mark, Space  
Signals: TXD, RXD, RTS, CTS,  
DSR, DTR, DCD  
RS485: ReadWrite

#### 2 x I2C

Mode: Master  
DataBits: 8  
Data rate: 100KHz bis 2.5 MHz  
Signals: SDA, SCL

#### 2 x SPI

Mode: Master/Slave  
DataBits: 8  
Datarate: up to 25 MBit (Master)  
up to 2.5 MBit (Slave)  
Signals: MISO, MOSI, SCK, SS  
SD-CARD: CardDetect, CardLock

#### 1 x Single Pair Ethernet(SPE)

Signals: RX+, RX-, TX+, TX-, AVDD,  
LED-ACT, LED-LINK

#### 2 x TTL-IO

Mode: digital Input/Output  
Signals: 7 Pin

## Supported protocols IP-Dual-Stack

- |            |                  |
|------------|------------------|
| 1. IPv4    | 20. IPv6         |
| 2. TCP     | 21. NDP          |
| 3. UDP     | 22. ICMPv6       |
| 4. FTP     | 23. DHCPv6       |
| 5. TFTP    | 24. TCPv6        |
| 6. ICMP    | 25. UDPv6        |
| 7. ARP     | 26. Netbios-NS   |
| 8. SNMP    | 27. LLMNR        |
| 9. LPR     | 28. ZeroConfig   |
| 10. DHCP   | - APIPA          |
| 11. BOOTP  | - AutoIP         |
| 12. DNS    | 29. IP-Multicast |
| 13. TELNET | 30. AK-M2M       |
| 14. HTML   | 31. SSL 3.0      |
| 15. http   | 32. TLS1.0       |
| 16. DYNDNS | 33. TLS1.1       |
| 17. SMTP   | 34. TLS1.2       |
| 18. POP3   |                  |
| 19. SYSLOG |                  |

## Emulations and functions

### RS232(TTL)

It is possible to use up to 2 independent, individually operating serial interfaces. Each interface can be individually set and it is possible to transfer data rates of up to 2.500.000 bauds. Furthermore, it is possible to additionally set emulations such as modem, Auto-Connect, Connect-On-Data, TCP / UDP client using up to 10 parallel connections, TCP/UDP server, tunnel mode with transfers of the signal modes as well as settings, E-Mail client including sending and receiving of e-mails.

## Emulations and functions

### RS485(TTL)

It is possible to use up to 2 independently operating RS485 interfaces. This mode also supports so-called 2-wire components, e.g. the MAX3072E, since it does not possess a proper control wire. Each interface can be individually set and it is possible to transfer data rates of up to 2.500.000 bauds. Furthermore, it is possible to additionally set emulations such as modem, AutoConnect, Connect-On-Data, TCP/UDP client using up to 10 parallel connections, TCP/UDP server, tunnel mode with transfer of the signal modes as well as settings, E-Mail client including sending and receiving of e-mails.

### I2C

It is possible to use up to 2 independently operating I2C interfaces. A data mode has also been implemented to achieve a maximum of flexibility. The interface can be individually set up and it is possible to transfer data rates of up to 2.500.000 bits/sec. Furthermore, you can additionally set emulations such as modem, AutoConnect, Connect-On-Data, TCP/UDP client using up to 10 parallel connections, TCP/UDP server, E-Mail client including sending and receiving of e-mails.

### SPI

It is possible to use up to 2 independently operating SPI interfaces in the master or slave mode. Each interface can be set up individually and it is possible to transfer data rates of up to 25MBit(Master) and 2.5Mbit(Slave). Furthermore, it is possible to additionally set emulations such as AutoConnect, Connect-On-Data, TCP/UDP client using up to 10 parallel connections, TCP/UDP server, E-Mail-Client including sending and receiving of e-mails.

By making adjustments in the setup, the SPI interface can directly operate SD cards, DF cards or Data-Flash components. An implemented Flash-File system with FAT12/16/32 structure supports the FTP to save data on it or to read data from it. Now it is possible to save your own homepage or JAVA applet in order to present a proper and individual look to the customers via the WEB server.

SD cards:

- Up to 4 GByte
- FAT12/16/32
- PC-compatible

DF cards / components:

- Up to 4 GByte
- FAT12/16/32
- AT45DB011B,AT45DB021B
- AT45DB041B,AT45DB081B
- AT45DB0161B,AT45DB0321B AT45DB0642, AT45DB1282  
will be directly identified.

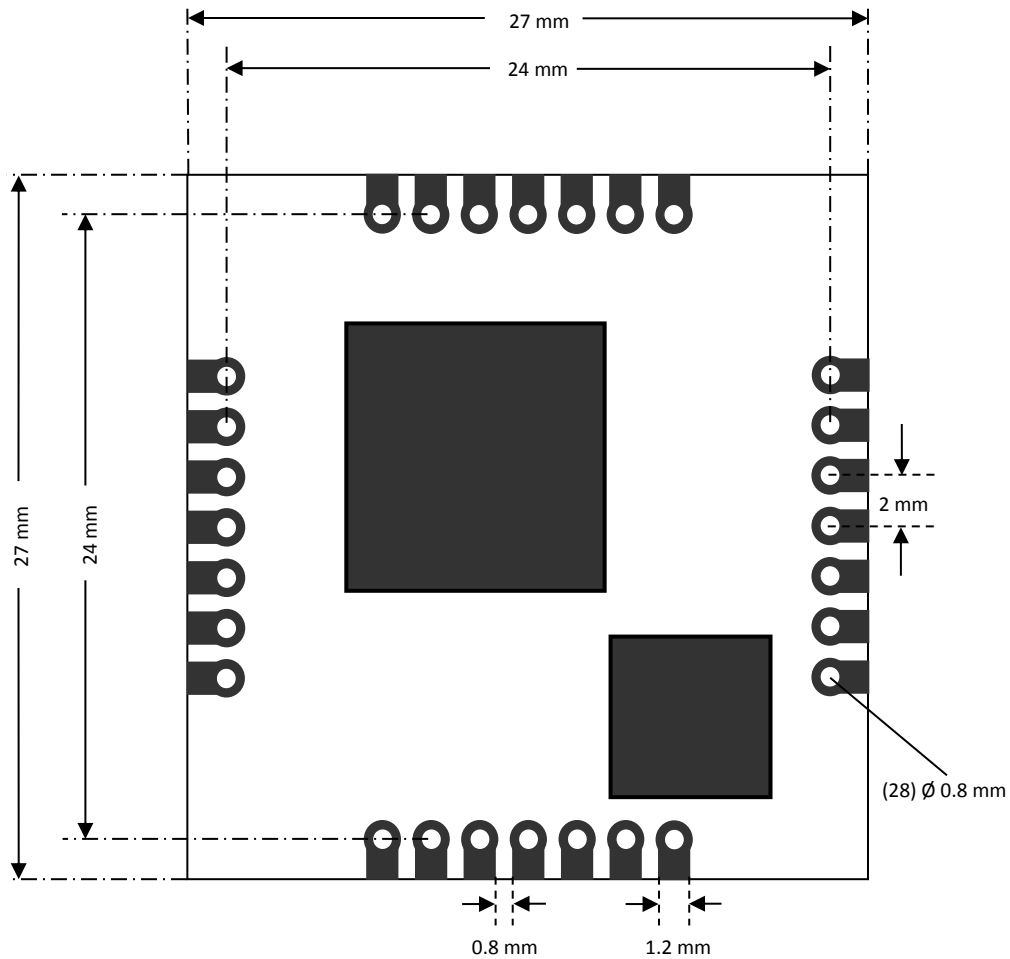
The SPI interface can also directly control as SPI display, e.g. the EA DOGM162B-A, which you can directly use via TCP/IP.

### TTL IO

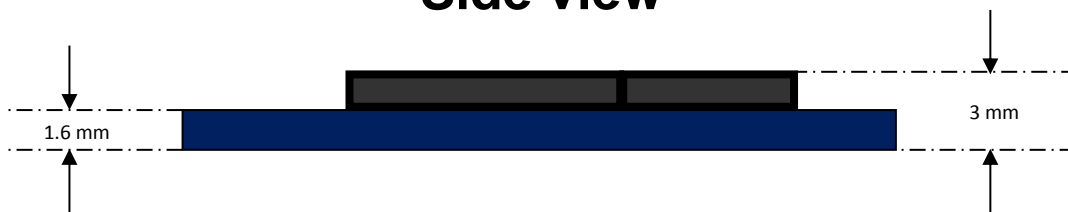
It is possible to directly control up to 14 pins via two interfaces. To do so, there is a proper control mode which can read the signals, switch them on or off. A tunnel mode allows the automatic transfer of the signal modes.

## Dimensions

### Top view

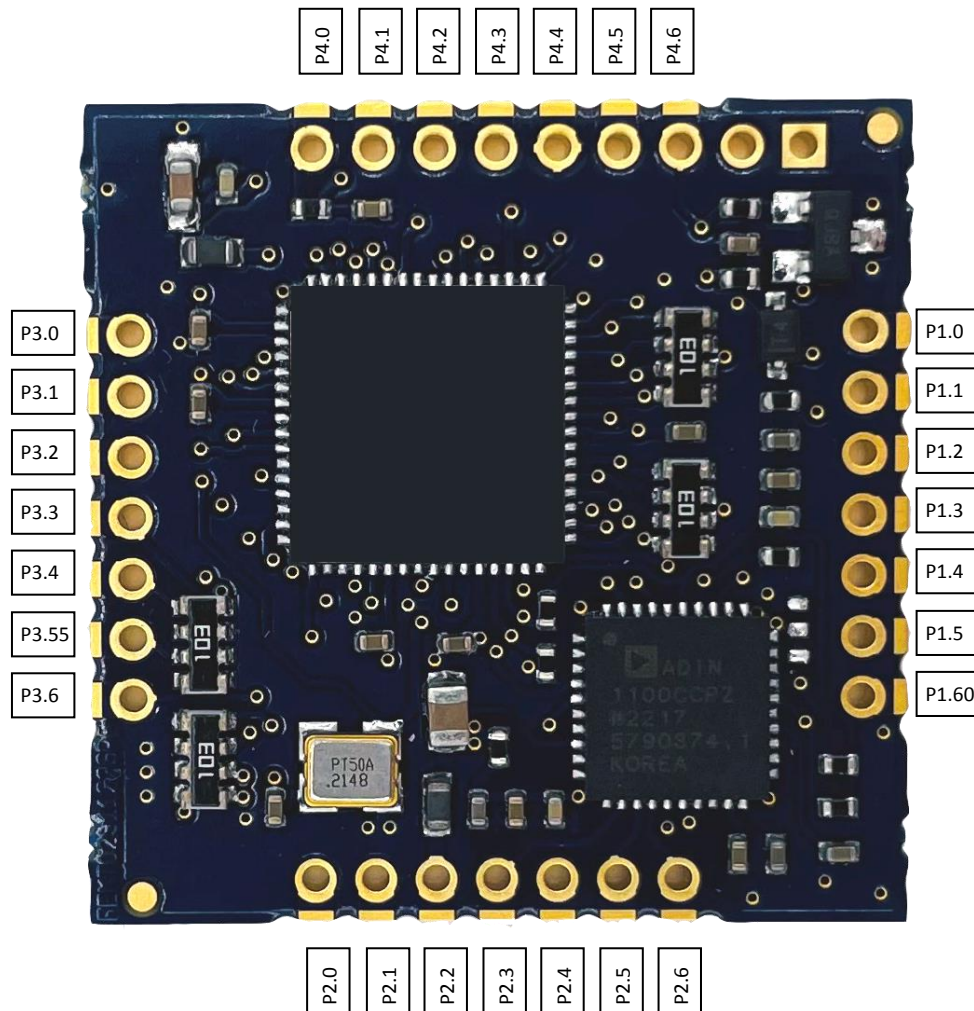


### Side view



## PIN – Description

### Top view



### Absolute Maximum Ratings

Ambient temperature under bias	-40°C to +85°C
Storage temperature	-65°C to +150°C
Voltage on VDD	-0.3V to +4.0V
Voltage on any 3.3 V pin	-0.3V to (VDD + 0.3V)
Voltage on any 5V tolerant pin	-0.3V to +5.5V

## PIN – Description

### Port 1:

PIN	RS232	RS485	I2C	SPI	TTL-IO	PULLUP	Type	VDD max
P1.0	TXD0	TXD0		MISO0	PIN1	10K	I/O	+3.3Volt
P1.1	RXD0	RXD0		MOSI0	PIN2	10K	I/O	+3.3Volt
P1.2	RTS0		SCL0		PIN3	10K	I/O	+3.3Volt
P1.3	CTS0		SDA0		PIN4	10K	I/O	+3.3Volt
P1.4	DTR0	R/W0		SS0	PIN5	10K	I/O	+3.3Volt
P1.5	DSR0			SCK0	PIN6	10K	I/O	+3.3Volt
P1.6	DCD0				PIN7	10K	I/O	+5V tolerant

### Port 2:

PIN	Single Pair Ethernet	PULLUP	Type	VDD max
P2.0	LED LINK		0	+3.3Volt
P2.1	LED ACT		0	+3.3Volt
P2.2	AVDD 3.3		PWR	
P2.3	TX-		I/O	
P2.4	TX+		I/O	
P2.5	RX-		I/O	
P2.6	RX+		I/O	

### Port 3:

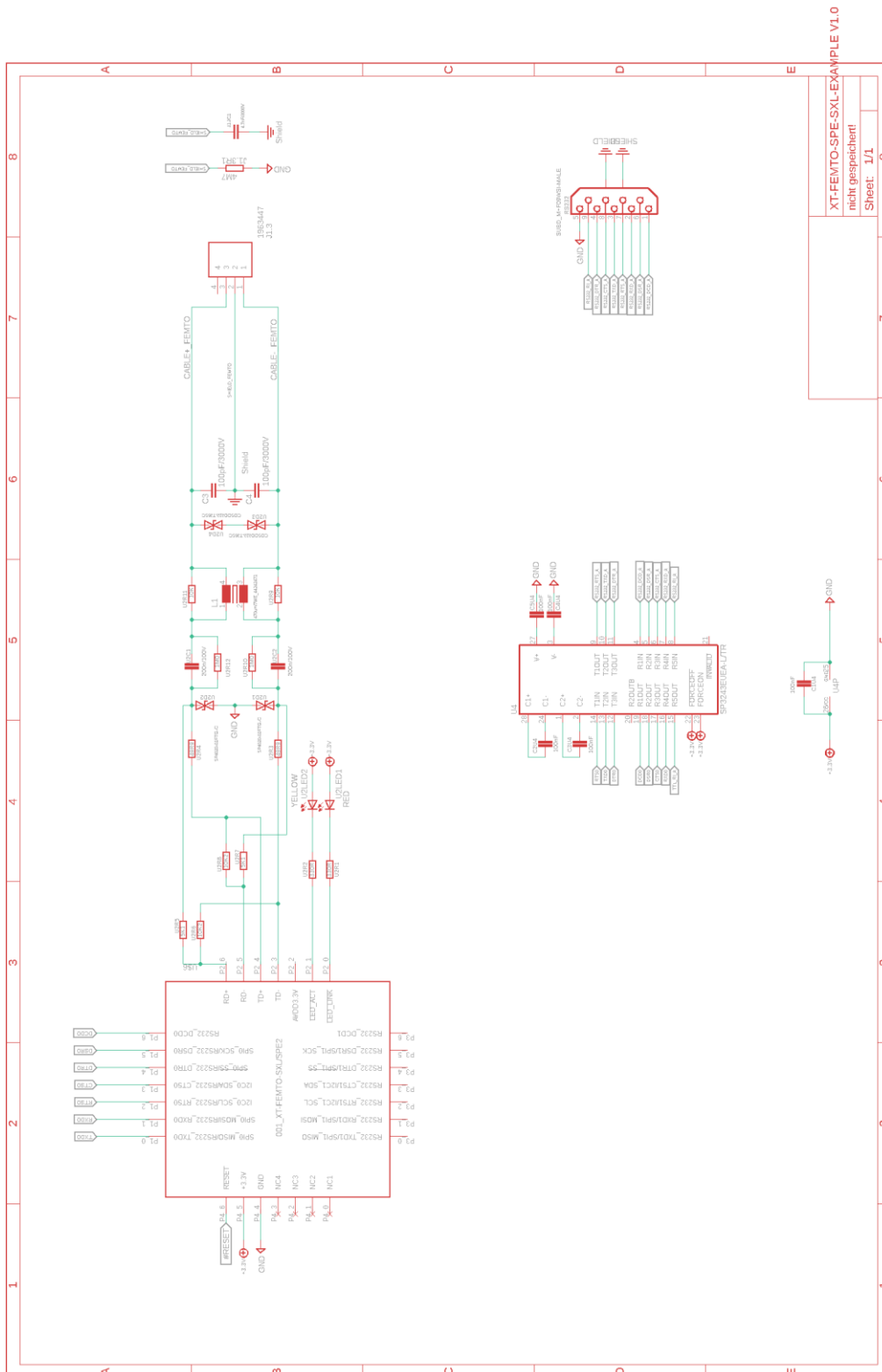
PIN	RS232	RS485	I2C	SPI	TTL-IO	PULLUP	Type	VDD max
P3.0	TXD1	TXD1		MISO1	PIN1	10K	I/O	+3.3Volt
P3.1	RXD1	RXD1		MOSI1	PIN2	10K	I/O	+3.3Volt
P3.2	RTS1		SCL1		PIN3	10K	I/O	+5V tolerant
P3.3	CTS1		SDA1		PIN4	10K	I/O	+5V tolerant
P3.4	DTR1	R/W1		SS1	PIN5	10K	I/O	+3.3Volt
P3.5	DSR1			SCK1	PIN6	10K	I/O	+3.3Volt
P3.6	DCD1				PIN7	10K	I/O	+5V tolerant

### Port 4:

PIN	POWER	RESET	Type	PULLUP	VDD max
P4.0					
P4.1					
P4.2					
P4.3					
P4.4	GND		PWR		0
P4.5	VDD		PWR		+3.3Volt
P4.6		RESET	I	10K	+5V tolerant

= ActiveLow

# Schematic



(28) Ø1.42 mm