

# iC-BL

## BiSS Line Interface Master/Slave with RS485 Transceiver



### Description

iC-BL aims at motion control and sensor applications and eases the implementation of the BiSS Line protocol as a one-cable technology into any device and platform.

Using a single cable with 2 or 4 wires, robust data and power transmission is obtained according to the BiSS Line protocol description. This includes the master and slave operation with fast cyclic data transmission, bidirectional register communication, as well as data protection by Forward Error Correction (FEC).

For data exchange with sensors, actuators, and controllers, a variety of interfaces are embedded: masters for BiSS C, SPI, and I<sup>2</sup>C. Additionally, an SPI slave interface for access with an external controller is available. Integrated RS485 transceivers enable point-to-point and bus applications with a constant BiSS Line bit rate of 12.5 MHz. The internal voltage generator outputs a selectable sensor supply of 2.5V, 3.3V, or 5V.

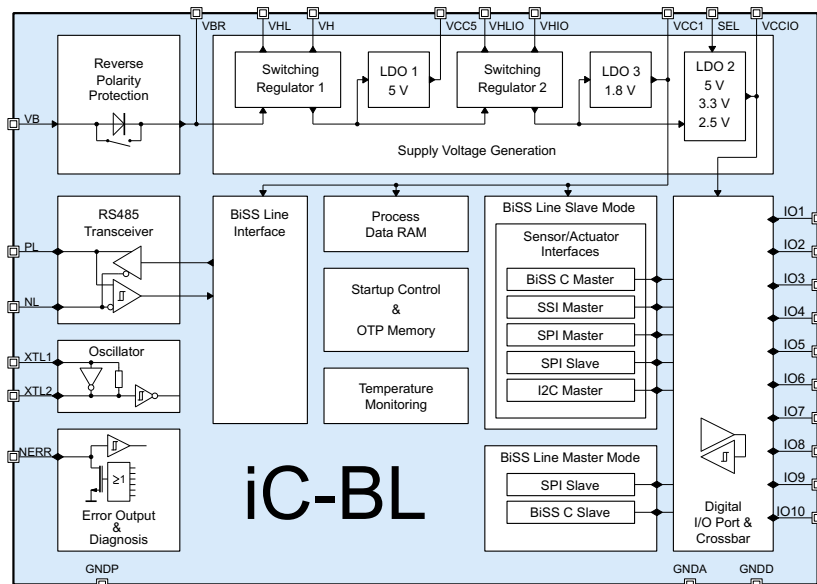
### Features

- BiSS Line slave or master
- 2- and 4-wire BiSS Line interface support
- Full BiSS Line protocol support including Forward Error Correction (FEC)
- Isochronous position data measurement with low jitter
- On-chip RS485 line transceiver for BiSS Line point-to-point and bus structures
- BiSS Line to BiSS C protocol transfer
- Digital I/O port with CMOS drivers/receivers
- Sensor-sided BiSS C master interface for daisy-chaining up to 8 BiSS C slaves with data lengths up to 64 bits each
- Full compatibility with BiSS C and BiSS Safety
- SSI master interface
- SPI slave and SPI master interface
- I<sup>2</sup>C master interface
- Sensor supply voltage: 2.5V, 3.3V, or 5V (max. 200 mA)
- Operation at 5V or from 7V to 30V supply
- Operating temperature range of -40°C to +105°C

### Applications

- One-cable technology BiSS Line master or slave implementations
- 2- and 4-wire sensor interfaces
- Motor feedback
- Position sensing
- Robotics
- Long distance SPI links
- Robust multi-sensor data communication
- BiSS C to BiSS Line adapter
- Device diagnosis and condition monitoring

### Block Diagram



# iC-BL

## BiSS Line Interface Master/Slave with RS485 Transceiver

### Key Specifications

General	
Supply Voltage Input VB	5V or 7V to 30V
Supply Current	Typ. 10 to 15 mA (no load)
Operating Temperature	-40°C to +105°C
Package (RoHS compliant)	28-pin QFN 5.0 mm × 5.0 mm, thickness 0.9 mm
External Oscillator Input	10 MHz

BiSS Line Interface	
Cable Length	Up to 100 m
Coding	8B10B
Frequency	12.5 MHz
Data Protection	Forward Error Correction

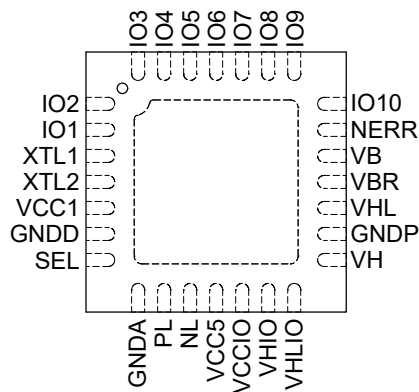
Sensor/ Actuator Interfaces	
BiSS/SSI Master Interface	Up to 10 MHz
SPI Master Interface	Up to 10 MHz
I <sup>2</sup> C Master Interface	For I <sup>2</sup> C devices and configuration from EEPROM
SPI Slave Interface	Up to 10 MHz

Digital I/O Port and Crossbar	OCCUPIED I/O PINS (OF 10)
SPI Slave	4
I <sup>2</sup> C Master (BLS)	IO9, IO10
BiSS C Slave (BLM)	2
Interrupt Output (BLS)	1
End of Transmission Output	1
BiSS C/SSI/SPI Master 1 (BLS)	2...4
BiSS C/SSI/SPI Master 2 (BLS)	2...4
Error Output (BLM)	1
Process Data Request Trigger Input (BLM)	1
Clock Output	1

Supply Voltage Generation	
Sensor Supply Voltage Output	2.5V, 3.3V or 5V
Sensor Supply Current Output	Max. 200 mA

Startup Configuration	
From internal OTP memory or external EEPROM	

### Pin Configuration QFN28-5×5



### Pin Functions

Name	Function
VB	Supply Voltage Input
VBR	Reverse Polarity Protected Supply Voltage
PL, NL	Differential Input/Output Signal of BiSS Line Interface
XTL1, XTL2	External 10 MHz Oscillator Input
IO1 ... IO10	Digital I/O Port & Crossbar
VCC5	5V Sensor Supply Output
VCCIO	5V/3.3V/2.5V Sensor Supply Output
SEL	VCCIO Voltage Selection Input
VHL, VH, VHLIO, VHIO, VCC1	Connection to Passive Circuit Components
NERR	Error Output
GNDA, GNDD, GNDDP	Ground

### Application Example – BiSS Line System Setup (2-Wire)

