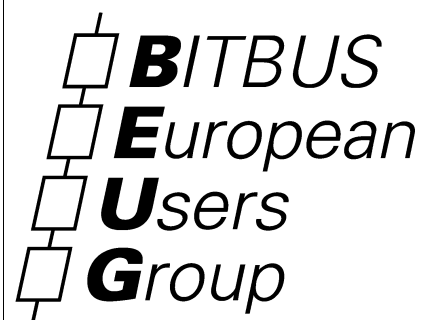


BITBUS
FIBRE OPTIC MEDIA
SPECIFICATION
A BEUG Recommendation



Description: BITBUS Fiber-Optic Link

Date: July 10, 1992

Last Change: July 20, 1998, additional baud rate 3.0 Mbit/s. VG

July 21, 1998, common format for all recommendations, PDF conversion. VG

Status: Draft

Authors: Frank J. Furrer

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This document can be used for documentation purposes by all BITBUS users and
manufactures if their implementation and products meets this specification.*

Contact: e-mail: wg1@bitbus.org

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1. Introduction

IEEE-1118 BITBUS communication is specified over RS-485 (twisted pair cable and twinax). Maximum communications rate is 375kBit/s.

In certain applications a transmission via fiber-optic is required, at the same time allowing communications rates.

In order to make interoperation of BITBUS fiber-optic products of different vendors possible, certain aspects must be standardized.

This paper proposes the minimum standardization required for BITBUS fiber-optic segments.

2. Specification

2.1. Communications Structure

A BITBUS network consists of segments. Individual segments are separated by repeaters. The IEEE-1118 standard only covers and specifies RS-485 segments. The IEEE-1118 repeaters are self-directing repeaters, i.e. they are controlled by the data itself and require no RTS-signal.

The same is true for repeaters/splitters (= "multiport repeaters"), i.e. devices having the double function of repeaters and star-coupler.

Fiber-optic segments shall be point-to-point segments, i.e. they shall link e.g. two repeaters or a BITBUS-station and a repeater/splitter. A dual-fiber shall be used ("upward" and "downward" fiber).

2.2. Baud Rates

In addition to the standard and IEEE-1118 communications rates the new fiber-optic data rate of 1.5 MBit/s is defined. Transmitters, receivers, and the fiber must allow a distance of at least 1'000 meters at this data rate without repeaters.

As an additional baud rate for high performance applications, 3.0 Mbit/s is defined (VG 1998).

2.3. Transmitters, Receivers, Fiber

The make and type of fiber-optic transmitters, receivers, and fiber is not specified. The elements used shall, however, conform to the following technical data:

Transmitter recommendation:

"TOSLINK TODX296" (Dual TX/RX)

Receiver recommendation:

"TOSLINK TODX296" (Dual TX/RX)

Fiber recommendation:

TOSHIBA "TOSLINK TOFC2000Q or TOFC2000C"

2.4. Fiber-Optic Connectors

The make and type of fiber-optic connectors is not specified.

Recommendation: "TOSLINK TOCP200Q or TOCP200X"

2.5. Idle State

The idle state is defined as the line status when no transmission is in progress. In the fiber-optic segment this idle state shall correspond to "light", i.e. the light emitting device of the transmitter emits light when no transmission is in progress (idle = light).

2.6. Optional Light Watchdog

Because in the fiber-optic segment the idle state corresponds to "light", an optional light watchdog can be implemented in all receiving stations.

The light watchdog supervises the incoming fiber light level and detects any loss of light. Any loss of light for a duration of more than a specified, baud rate dependent, time triggers the watchdog alarm. The watchdog thus detects fiber breaks and failure of the transmitting station (e.g. power failure). The watchdog alarm can be used to start emergency processing in the receiving stations, e.g. controlled shut-down of the process controlled by the BITBUS-node.

The time-out is specified as follows:

<i>Baud Rate [kBit/s]</i>	<i>Min. Timeout [msec]</i>	<i>Max. Timeout [msec]</i>
62.5	100	200
375	50	100
750	25	50
1500	10	20
3000	5	10

2.7. Repeaters, Splitters

All repeaters and splitters shall be of the self-directing type, i.e. they are controlled by the data itself and require no RTS-signal. The start of a BITBUS-message shall be detected in less than two bit times (preferably: less than 1 bit time), resulting in the truncation of at most two bits per repeater. The end of a BITBUS-message shall be detected in less than 10 bit times.