RS-485 to Fiber Solutions

01/05/22

Mini Bit-Driver®

Stand Alone Bit-Driver®

Ruggedized Bit-Driver®

USA & International Headquarters
1101 N. Raddant Road
Batavia, IL 60510
Phone: (630) 761-3640 Fax: (630) 761-3644
Web Site: http://www.sitech-bitdriver.com

RS-485 PRODUCTS

FIELD BUSES

A Field Bus is a digital, serial, two-way multi-drop communication link among controllers and remote I/Os, sensors, actuators, and internet working components. In comparison to local area network (LAN), field buses are specialized for rugged industrial environment, determinism, bus powering and so on.

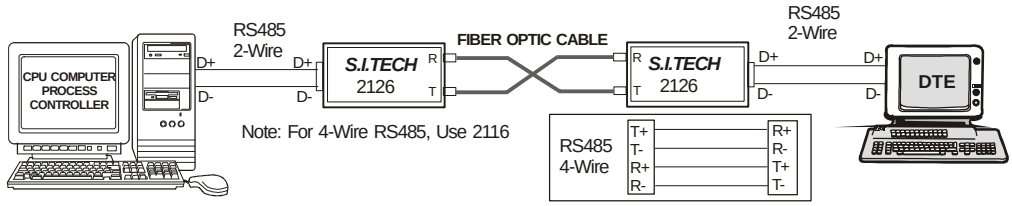
Field buses are covered by IEC Standards. Some of the more popular field buses are:

- Profibus: IEC IS 61158 type 1/3/10. Over 50% of process industry applications use Profibus
- Foundation Fieldbus: IEC IS 61158 Type 1/9
- MOD Bus: Developed by Modicon Inc. Now backed by Schneider Electric
- Inter Bus: IEC IS 61158 Type 8
- Device Net: IEC IS 62026 – 3 (2000)
- CAN Bus: IEC under development

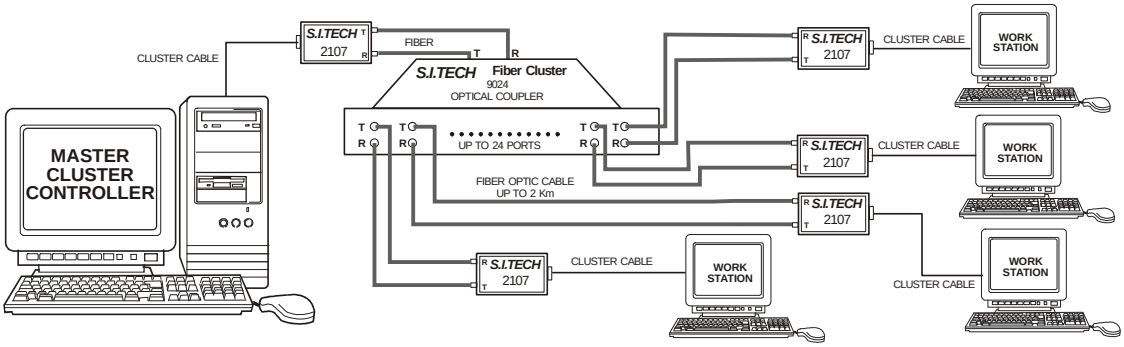
Electric industry association (EIA), RS485 standard bus is used in many of these field buses.

RS-485 PRODUCTS

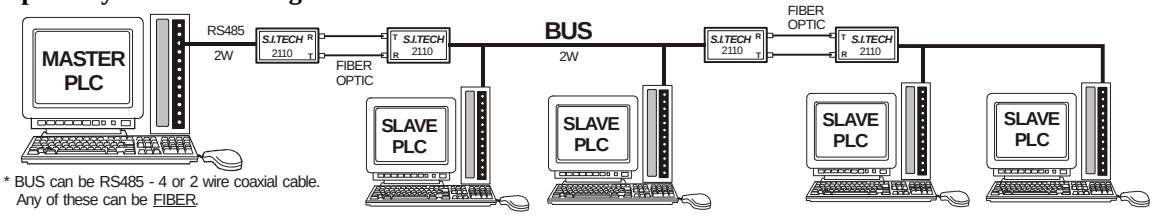
1. Point to Point:



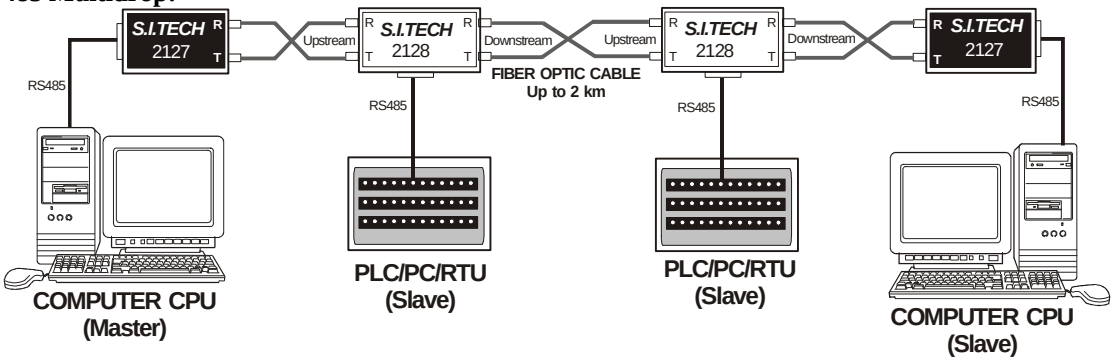
2. User Clusters:



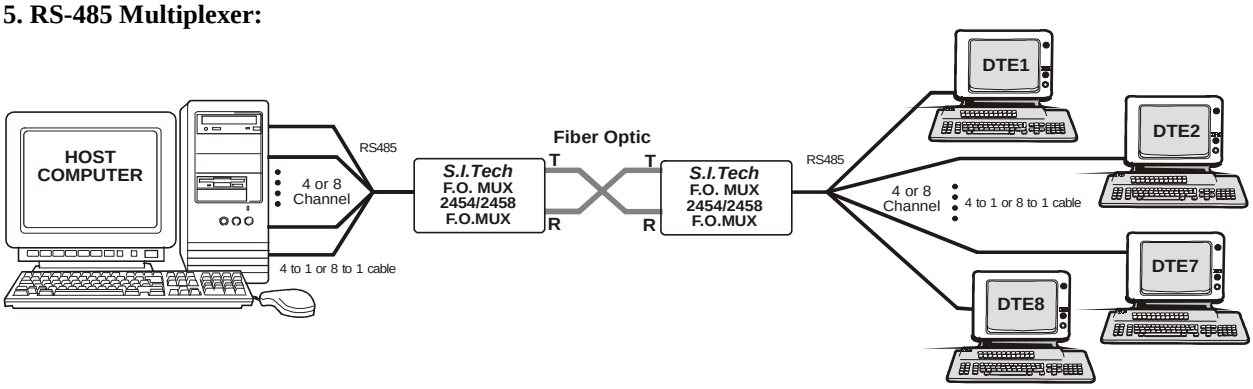
3. Proprietary Networks Using Other Bus Architecture:



4. RS-485 Multidrop:



5. RS-485 Multiplexer:



Note: For RS485 bus, end of line termination is required (typically 120 ohm resistor).

RS-485

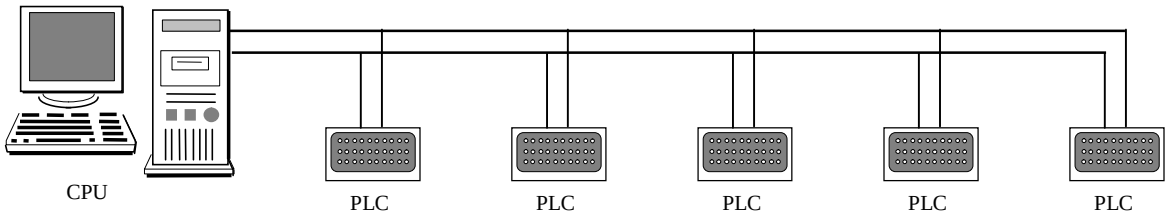
RS-485 (EIA-485) is a standard using twisted pair for extended distance communications and is used on process control, energy management, clustered computers, and security systems.

RS-485 is used as a 2 wire or 4 wire systems. In a 2 wire system, 2 wires (twisted pair) are used for both transmit and receive, thereby requiring communication in half-duplex mode. For example, data is sent from Point A to Point B and then the line is turned around (also called time out) to send data from Point B to Point A.

Data rates most commonly used range from 4800 bps all the way to 12 Mbps. As the data rate is increased data goes from Point A to Point B in less time so the line can be turned around much faster.

RS-485 is used for distributed data communication in a bus topology or "daisy chain". Star, tree, or branch configurations are generally not recommended.

RS-485 BUS



PLC=Programmable Logic Controller

For all RS-485 applications line termination is necessary – typically 100 to 120 ohms can terminate a line. Many manufacturers provide line termination in their equipment (auto terminating).

EIA-485 specifies generators and receivers capable of operating in balanced digital multipoint systems. The parameter values specified in this Standard are similar to those in TIA/EIA-422-B. These values allow generators and receivers to be designed that can be used to meet the requirements of both standards,
(EIA-422 and 485).

EIA-485 is compatible with ISO/IEC 8482*:* 1993 *Information Technology – Telecommunications and information exchange between systems – Twisted pair multipoint interconnections.*

This Standard specifies the electrical characteristics of generators and receivers that may be employed when specified for the interchange of binary signals in multipoint interconnection of digital equipment. When implemented within the guidelines of this Standard, multiple generators and receivers may be attached to a common interconnecting cable.

An interchange system includes one or more generators connected by a balanced interconnecting cable to one or more receivers and terminating resistors.

RS485 CONNECTORS

Please refer to the RS-422 section for discussion of data connectors.

TABLE F
RS-485 TO FIBER BIT-DRIVERS (MODEMS)

Model No.	Package: Stand Alone	Din-Rail	Mini	Rack Mount Card	Rugg-Dized	Data Rate Up to Kbps	Data Format: Async	Sync	Power Option*	2 Wire Data Connector**	Multimode Fiber: Connector	**** Wavelength (SM-1300) nm	Singlemode Fiber Connector	Point to Point	Daisy Chain Multidrop	Distance *** Km: 2	5	10	Weight LB/KG	Remarks
2107			√			1.8 M		√	6	DB-9 F	ST/SMA	850		√	√	√	√		.25/.1	Unisys NGEN
2110		√	√			9.6	√		6	DB-9 M	ST/SMA	880	ST	√	√	√	√	√	.25/.1	Johnson Controls Systems
2126			√			38.4	√		6	DB-9 M	ST/SMA	880	ST	√	√	√	√	√	.25/.1	
2127			√			187.5	√		6	DB-9 F	ST/SMA	850	ST	√	√	√	√	√	.25/.1	Omron Protocol
2128			√			187.5	√		6	DB-9 F	ST/SMA	850	ST	√	√	√	√	√	.25/.1	Omron Protocol
2140			√			230K	√		6	Terminal Block	ST/SMA	820	ST/FC	√	√	√	√	√	.4/.2	Security Systems, Sensor Net
2145		√				12M	√		10	DB-9 F	ST/SMA	820	ST/FC	√	√	√	√	√	1.0/.5	Profibus - DP Repeater
2228			√			187.5	√		4	DB-9 F	ST/SMA	850	ST	√	√	√	√	√	.25/.1	Omron Protocol High Temperature 2128
2310				√		9.6	√		1,2	Terminal Block	ST/SMA	820	ST	√	√	√	√	√	.5/.2	3000 Rack Card / 2110 / 3520 Motherboard
2316				√		115	√		1,2	RJ45	ST/SMA	820	ST/FC	√	√	√	√	√	.5/.2	Eurocard/2616 Siemens
2345				√		9.6	√		1,2	RJ45	ST/SMA	820	ST	√	√	√	√	√	.5/.2	3000 Rack Card / 2110 / 3500 Motherboard
2385				√		38.4	√		1,2	RJ45	ST/SMA	820		√	√	√	√		.5/.2	3000 Rack Card / 2185 / 3500 Motherboard
2562					√	115	√		1,2,3,10	DB-25 F	ST/SMA	820	ST/FC	√		√	√	√	1/1.5	Ruggedized RS-485
2563			√			115	√		6	DB-25 F	ST/SMA	820	ST/FC	√		√	√	√	.4/.2	"Three in One" RS-232/422/485
2610			√			9.6	√		6	DB-9 F	ST/SMA	880	ST	√	√	√	√	√	.25/.1	High Temperature 2110
2616		√	√			115	√		6	DB-9 F	ST/SMA	820	ST/FC	√		√	√	√	.3/.1	Siemens System
2852	√					1 M		√	1,2	Terminal Block	ST/SMA	820	ST/FC/SC	√	√	√	√	√	3/1.4	Omninet, MODBUS +
212110			√			256	√		--	DB-9/USB	--	--	--	--	--	--	--	--	0.25/0.1	USB to RS-485
Kit #10																				Energy Management Kit 2 -2110, 2 -2121, 2 - 7110

* Power Options: See "Power Options and How to Order" sheet (p. 106) for options and ordering instructions.
** Pin outs are specified in data sheets
Temperature range 0 - 50 degrees C unless shown otherwise.
Extended Temperature (ET) range available on some products.
*** Distance: 2 km - STD, 5 km - L, 10 km - XL, 20 km - UL

**** Use one wavelength throughout system except if WDM is used

Unisys is a trademark of Unisys Corp
Johnson Controls is a trademark of Johnson Controls Inc.
Omron is a trademark of Omron Electronics Inc
Texas Instruments is a trademark of Texas Instruments Inc.
Omninet is a trademark of Corvus Systems Inc.

HOW TO ORDER

Base Model Number	Power*	Data Connector**	Distance***	Fiber and Connector: Multimode (MM)-STD	Fiber and Connector: Singlemode (SM)-Specify	Temperature
XXXX	1. 110 VAC - STD 2. 230 VAC - V 4 & 6 - See Chart	M or F (F is STD on most models)	2 Km - STD Other - Specify L, XL, or UL	ST - STD Other-Specify	ST - STD Other-Specify	0 - 50° C - STD -40 to +80° C - ET Other - Call S.I. Tech

e.g. 2852 = RS-485 to Fiber Bit-Driver, 110 VAC, Terminal Block, 2 Km, Multimode, ST Connectors, 0 - 50 ° C
2126 = RS-485 to Fiber Bit-Driver, Needs S.I. Tech #2121 Power Supply, DB-9M, 2 Km, Multimode, ST Connectors, 0 - 50 ° C
Specifications subject to change without notice.

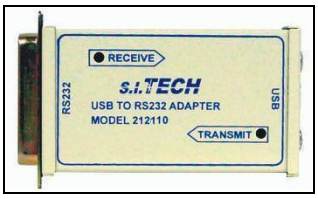
S.I. Tech Inc., Batavia, IL 60510 Phone: (630) 761-3640 Fax: (630) 761-3644
Web Site: http://www.sitech-bitdriver.com

RS-485 TO FIBER OPTIC BIT-DRIVERS®

2110

- Mini Asynchronous Half-Duplex Optical Bit-Driver®
- Data Rate up to 56 Kbps must be set at factory
- Designed for Johnson Controls System – N2 Bus and Bacnet
- Available in Eurocard format as Model 2345 for use in S.I. Tech Model 3000A Card Cage
- Standard Input/Output Interface is DB-9F Female Connector
- Din Rail Option is 2110-DIN
- Multimode or Single mode

212110*



- USB to Serial RS-485
- Can be used to connect legacy RS-485 interface to new PCs with only USB ports
- Supplied with Virtual Comport Drivers
- Can be used with S.I.Tech #2110 RS-485 to Bit-Driver®

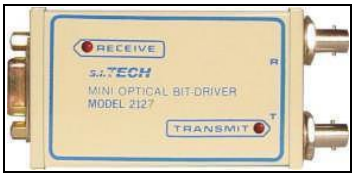
2110-DIN

- Mini Asynchronous Half-Duplex Optical Bit-Driver®
- Data Rate up to 56 Kbps must be set at factory
- Designed for Johnson Controls System – N2 Bus and Bacnet
- Din rail version of 2110

2126

- Mini Synchronous Half Duplex Optical Bit-Driver®
- Data Rate is Switchable from 0.3 to 38.5 Kbps in 6 steps
- Input/Output Interface is RS-485 DB-9M Male Connector
- External Power Supply S.I. Tech Model 2121 (110 VAC) or 2164 (230 VAC)

2127



- Mini Synchronous Half Duplex Optical Bit-Driver®
- Data Rate is 187.5 Kbps
- Custom Designed to work with Omron PLC
- Input/Output Interface is RS-485 DB-9F Female Connector
- External Power Supply S.I. Tech Model 2121 (110 VAC) or 2164 (230 VAC)

2128

- Mini Synchronous Half Duplex Optical Bit-Driver®
- Data Rate is 187.5 Kbps
- Customized units available with different data rates
- Fiber Ports Repeat Data through the 2128 and Drop/Insert Data on the RS-485 Port (DB-9F Female Connector)
- RS-485 Port Inserts Data onto both Fiber Ports and gets Data dropped from either Fiber Port
- External Power Supply S.I. Tech Model 2121 (110 VAC) or 2164 (230 VAC)

2128/2228

- 2128 is Commercial Equipment/2228 is Mil-Spec.
- Mini Synchronous Half Duplex Optical Bit-Driver®
- Data Rate is 256 Kbps
- Fiber Ports Repeat Data through the 2128/2228 and Drop/Insert Data on the RS-485 Port (DB-9F Female Connector)
- RS-485 Port Inserts Data onto both Fiber Ports and gets Data dropped from either Fiber Port
- Host Powered (+12VDC on Pins 8 and 9 of DB-9F connector)
- Extended Temperature Range -40°C to +80°C
- Used with Military Systems

2140*

- RS485 – 2 or 4 Wire Multidrop Bit Driver
- Fiber in, Fiber out, RS485 Drop
- Up to 230 Kbps Data Rate
- Multimode or Single mode
- Repeater with RS485 Drop/ADD
- Used with Security Systems, Sensors

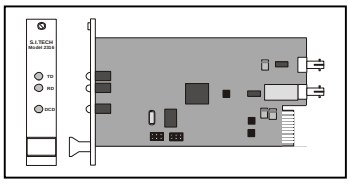
2145*

- RS485 – 2 Wire Profibus - DP
- Fiber in, Fiber out, RS485 Drop
- Data Rates, Switch Selectable to 12 Mbps
- Multimode, Single mode, or Plastic Fiber
- One or two fiber ports
- Used for Process Control
- Din Rail Mounting
- IFC 61168-2, EIA RS485A
- RS485 – 2 wire Modbus

2310

- Card Cage Mounted Asynchronous Half Duplex Optical Bit-Driver®
- Data Rate up to 56 Kbps must be set at factory
- Designed to Work with Johnson Controls System and with S.I. Tech Model 2110 Mini Bit-Driver®
- Eurocard Format, Fits S.I. Tech Model 3000A 19 inch Rack & 3520 Motherboard Bus
- Designed for RS485 Bus

2316*

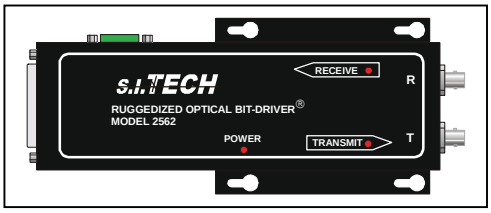


- Up to 115.2 Kbps, Async, 2 Wire, RS485
- Card Version of S.I.Tech 2616, Eurocard Size
- Multimode or Single mode
- Designed to Work with Siemens Systems or Other PLCs

2345

- Card Cage Mounted Asynchronous Half Duplex Optical Bit-Driver®
- Data Rate up to 56 Kbps must be set at factory
- Designed to Work with Johnson Controls System and with S.I. Tech Model 2110 Mini Bit-Driver®
- Input/Output Interface is 8-pin RJ-45 Female Connector
- Eurocard Format, Fits S.I. Tech Model 3000A 19 inch Rack

2562*



- Up to 115.2 Kbps, Async Operation, Switch Selectable
- Extended Temp Range -40°C to +80°C
- Ruggedized Enclosure, Panel Mounting
- Complies with IEEE C37-90-1
- IEC 801 Surge Protection
- Conformal Coated – Environmental
- Various AC/DC Power Option

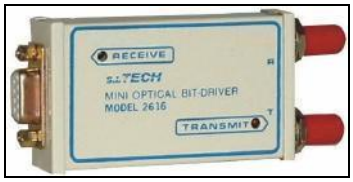
2563*

- "Three in One" Design RS/232/422/485 to Fiber Bit-Driver
- Max Data Rate is 115.2 Kbps, Switch Selectable
- Multimode or Single mode
- Din Rail Option

2610*

- Mini Asynchronous Half Duplex Optical Bit-Driver®
- Data Rate up to 56 Kbps must be set at factory
- Designed to work with Johnson Controls System-N2 Bus or other PLC
- Standard Input/Output Interface is DB-9M Male Connector
- Extended Temperature Range (-40°C to +80°C) Version of Model 2110

2616*



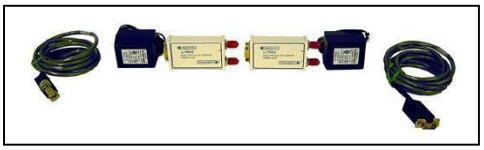
- Up to 115.2 Kbps, Async, 2 Wire, RS485
- Extended Temp Range -40°C to +80°C
- Multimode or Single mode
- Designed to work with Siemens System or Other PLCs

2852

- Synchronous Simplex or Half Duplex Optical Bit-Driver®
- Normal Operating Data Rate is 1 Mbps
- Designed to work with Omninet by Corvus Systems Inc and MODBUS+
- Stand Alone – 110 VAC or 230 VAC power cord
- Input/Output Interface RS-485 2-wire + Ground Terminal Block

S.I. Tech Inc., Batavia, IL 60510 Phone: (630) 761-3640 Fax: (630) 761-3644
Web Site: http://www.sitech-bitdriver.com

Kit #10



- Din Rail Option
- Energy Management System Kit for Plug and Play Consist of :
  2 – 2110 Mini Bit Driver
  2 – 2121 Power Supply
  2 – 7110 Cable Assemblies

TABLE G
RS-485 TO FIBER OPTIC MULTIPLEXERS

Model No.	Package: Stand Alone	Package: Rack Mount	Max. Data Rate Kbps	Data Format: Async	Data Format: Sync	Data Format: Control Signals	Power Option*	Data Connector**	Number of Channels	Point to Point	Multidrop	Distance*** Km: 2	Distance*** Km: 5	Distance*** Km: 10	Weight LB/KG	Multimode (820 nm)/ Singelmode (1300 nm)	Trunk**** Fiber Connector	Remarks
2454	√	Option	256	√			1,2	DB37 F	4	√		√	√	√	3/1.4	MM/SM	ST/SMA	uses 1 to 4 cable 7054
2458	√	Option	76.8	√			1,2	DB37 F	8	√		√	√	√	3/1.4	MM/SM	ST/SMA	uses 1 to 8 cable 7058

* Power Options: See "Power Options and How to Order" sheet (p. 106) for options and ordering instructions.
** Pin outs are specified on data sheets
*** Distance: 2 km - STD, 5 km - L, 10 km - XL, 20 km - UL.
****Other connector options for singlemode are SC and FC.
Temperature range 0 - 50 degrees C unless shown otherwise.

HOW TO ORDER

Base Model Number	Power*	Data Connector**	Distance***	Fiber and Connector: Multimode (MM) - STD	Fiber and Connector: Singlemode (SM)-Specify	Temperature
XXXX	110V-STD 230VAC-V	M or F (F is STD on most models.)	2 Km - STD Other - Specify L, XL, or UL	ST - STD Other - Specify	ST - STD	0 - 50^0 C - STD Other - Call S.I. Tech

e.g. 2454 - RS-485 Async, 4 CH Fiber Multiplexer, 110VAC, DB37 F, 2Km, Multimode ST, 0-50 C

Specifications subject to change without notice.

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Web Site: http://www.sitech-bitdriver.com

RS-485 TO FIBER MULTIPLEXERS

2454

- Four Channel Asynchronous Half Duplex Time Division Multiplexer Optical Bit-Driver®
- Data Rate up to 256 Kbps must be set at factory
- Powered through 110 VAC line cord
- 230 VAC version available as S.I. Tech Model 2454V
- Each unit requires 4-to-1 RS-485 cable S.I. Tech #7054

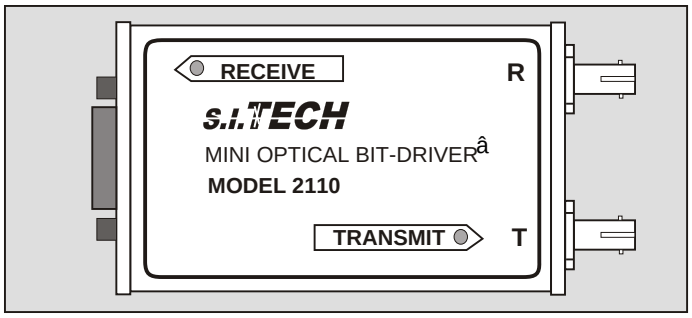
2458

- Eight Channel Asynchronous Half Duplex Time Division Multiplexer Optical Bit-Driver®
- Data Rate up to 76.8 Kbps must be set at factory
- Powered through 110 VAC line cord
- 230 VAC version available as S.I. Tech Model 2458V
- Each unit requires 8-to-1 RS-485 cable S.I. Tech #7058

Model 2110

S.I.TECH

Optical Asynchronous Mini Bit-Driver® Point to Point



Operation Mode: Asynchronous, bi-directional, half duplex

Input/Output Interface: RS485, 9 pin type D, asynchronous at 0 to 56 Kbps** connects directly to terminal (RS485 cable not required)

Transmission Line Interface: ST connector is standard for interfacing with fiber optic cable (SMA option)

Transmission Distance: See distance chart

Optical Power into a 50 Micron Core Optical Fiber: 0.5 microwatt, 10 dB power budget* @ 880 nanometers

Receiver Sensitivity: 50 nanowatts at less than 10^{-9} bit error rate

Operating Temperature: 0 ^{o}C to 50 ^{o}C

Metal Enclosure: 1.75 x 3 x 0.625 in (4.5 x 7.5 x1.6 cm) Panel or DIN rail mounting option

Weight: 0.25 lb (100 grams)

Input Power: External with power supply (S.I. Tech #2121 - 110VAC to 12 Volt DC)

230V Version: Use S.I.Tech 2122 power supply

** Data rate must be set at factory

Meets FCC requirements of Class A, Part 15 Computing Devices Standard.
Specifications subject to change without notice.

UL CE

Features:

- 0 to 56 Kbps asynchronous, RS-485 half duplex operation
- 6600 ft. (2Km) maximum distance capability
- 0 ^{o}C to + 50 ^{o}C operating range
- ST connector receptacle (SMA option)
- Designed to work with Johnson Controls System - N2 Bus and Bacnet (2110BAC)
- For card version use 2310 (N2 Bus) or 2345 (point to point)
- Cable assembly use 7110 (2110 to N2 Bus)
- Data speed set at the factory

RS - 485 9 PIN CONNECTOR - FEMALE
PINS UTILIZED BY 2110 MINI BIT - DRIVER®

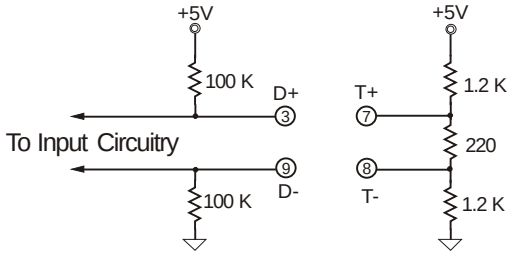
Pin No.	Description	Symbol
1	Signal Ground	SG
2	NC	
3	Data (+)	D +
5	Signal Ground	SG
6	NC	
7	Termination (+)	T +
8	Termination (-)	T -
9	Data (-)	D -

OPERATING DISTANCE FOR FIBER OPTIC CABLE

Fiber Size (Microns)	Attenuation dB/Km	Distance Meters*	Distance Feet*
1000	200	100	330
50	3.0	2000	6600
62.5	4.0	2000	6600
100	5.0	2000	6600
8 SM**	1.0	7000	23000

* High power option available ** Single mode option
1000 Micron is plastic fiber (uses SMA connectors) option

Termination Resistors provided in Bit-Driver

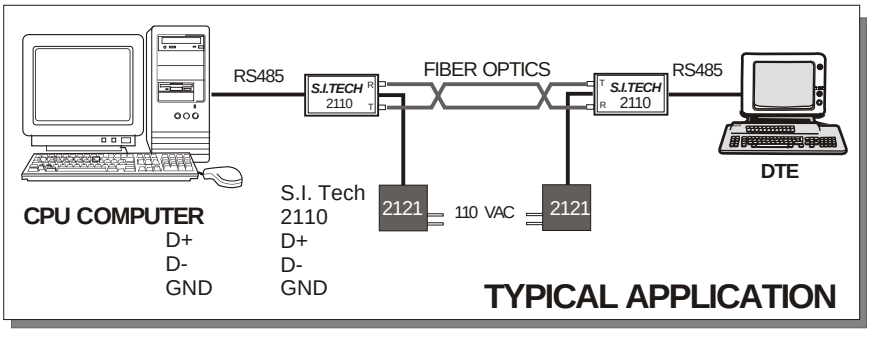


ORDERING INFORMATION

Model Numbers

2110	RS485 to Fiber, Multimode, ST Connector, N2 Bus
2110BAC	RS485 to Fiber, Multimode, ST Connector, Bacnet
2610	RS485 to Fiber, Multimode, ST, High Temp.
2110-SM	RS485 to Fiber, Single Mode, ST
2110-SMA	RS485 to Fiber, Multimode, SMA Connector
2110-660	RS485 to Plastic Fiber, SMA Connector
2110-L	RS485 to Fiber, Multimode, High Power (5Km), ST
2110-DIN	RS485 to Fiber, Multimode, ST, Dinrail Unit
2110-SM-DIN	RS485 to Fiber, Single mode, ST, Dinrail Unit

Notes:
1. Power Supply # 2121 is required for all models (110VAC to 12 VDC).
2. Power Supply #2122 is for 230VAC applications
3. For 2110 rack mounted, use version 2310 (or 2345) Card with 3000 Rack, 4000 Power Supply, and 3520 (or 3500) Motherboard.



For application engineering assistance: 630-761-3640 FAX: 630-761-3644 S.I.Tech, P.O.Box 609, Geneva, Illinois 60134 U.S.A. Web site: www.sitech-bitdriver.com.

Model 2110-DIN

S.I.TECH

Optical Asynchronous Bit-Driver® Point to Point and Bus

Features:

- Asynchronous, RS-485 half duplex operation
- 6600 ft. (2Km) maximum distance capability
- 0 °C to + 50 °C operating range
- ST connector receptacle (SMA option)
- Works with Johnson Controls System - N2 Bus and Bacnet
- For card version use 2310 (N2 Bus) or 2345 (point to point)
- Data speed set at the factory

Operation Mode: Asynchronous, half duplex
Input/Output Interface: RS485, Terminal block asynchronous*
Transmission Line Interface: ST connector is standard for interfacing with fiber optic cable (SMA option)
Transmission Distance: See distance chart
Optical Power into a 50 Micron Core Optical Fiber: 1 microwatt, 10 dB power budget* @ 880 nanometers
Receiver Sensitivity: 100 nanowatts at less than 10^{-9} bit error rate
Operating Temperature: 0 °C to 50 °C
Enclosure Size: 4" H x 5" L x 7/8" W (10 x 12.7 x 2.2 cm)
Weight: 0.25 lb (100 grams)
Input Power: External with power supply (S.I. Tech #2121-DIN 110VAC to 12 VDC) or 8 to 16VDC or 24VDC, 130mA
230V Version: Use S.I.Tech 2164-DIN power supply

* 1200, 2400, 9600, 19.2, 38.4, 57.6, 76.8, 115.2 Kbps

Meets FCC requirements of Class A, Part 15 Computing Devices Standard.
Specifications subject to change without notice.

RS - 485 TERMINAL BLOCK PIN UTILIZED BY 2110 DIN RAIL BIT - DRIVER®

D+	N2+
D-	N2-
T+	Termination (+)
T-	Termination (-)
-	Power Return
+	Power In
REF	N2 Refernece
EARTH	GROUND
Tx	Transmit Fiber
Rx	Receive Fiber

OPERATING DISTANCE FOR FIBER OPTIC CABLE

Fiber Size (Microns)	Attenuation dB/Km	Distance Meters*	Distance Feet*
1000	200	100	330
50	3.0	2000	6600
62.5	4.0	2000	6600
100	5.0	2000	6600
8 SM**	1.0	7000	23000

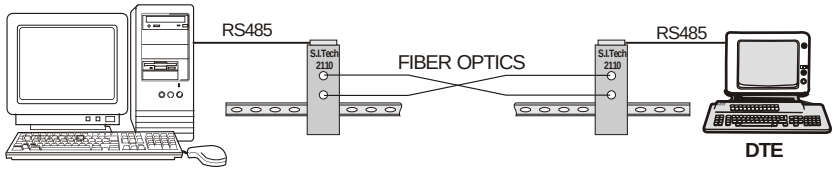
* High power option available ** Single mode option
1000 Micron is plastic fiber (uses SMA connectors) option

ORDERING INFORMATION

Model Numbers

2110	RS485 to Fiber, Multimode, ST Connector, N2 Bus
2110BAC	RS485 to Fiber, Multimode, ST Connector, Bacnet
2610	RS485 to Fiber, Multimode, ST, High Temp.
2110-SM	RS485 to Fiber, Single Mode, ST
2110-SMA	RS485 to Fiber, Multimode, SMA Connector
2110-660	RS485 to Plastic Fiber, SMA Connector
2110-L	RS485 to Fiber, Multimode, High Power (5Km), ST
2110-DIN	RS485 to Fiber, Multimode, ST, Dinrail Unit
2110-SM-DIN	RS485 to Fiber, Single mode, ST, Dinrail Unit
2110-DIN-ET	RS485 to Fiber, Multimode, ST, Dinrail Unit, Extended Temp.

Notes:
1. Power Supply # 2121 is required for all models (110VAC to 12 VDC).
2. Power Supply #2164 is for 230VAC applications
3. For 2110 rack mounted, use version 2310 (or 2345) Card with 3000 Rack, 4000 Power Supply, and 3520 (or 3500) Motherboard.
4. ET-Extended temperature range -40°C to +70°C



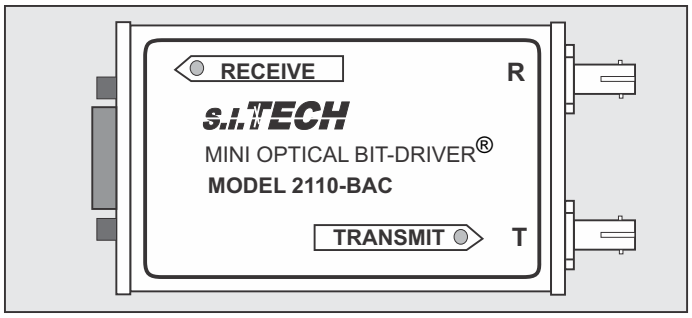
TYPICAL APPLICATION

For application engineering assistance: 630-761-3640 FAX: 630-761-3644 S.I.Tech, P.O.Box 609, Geneva, Illinois 60134 U.S.A. Web site: www.sitech-bitdriver.com.

Model 2110-BAC (Bacnet)

S.I.TECH

Optical Asynchronous Mini Bit-Driver® Point to Point



Features:

- 0 to 76.8 Kbps asynchronous, RS-485 half duplex operation
- 6600 ft. (2Km) maximum distance capability
- 0 °C to + 50 °C operating range
- ST connector receptacle
- Designed to work with 2110-BAC (Bacnet) @ 38.4 Kbps or 2110-BAC(T) @ 76.8 Kbps
- For card version use 2310-BAC
- Cable assembly use 7110
- Data speed set at the factory

Operation Mode: Asynchronous, bi-directional, half duplex

Input/Output Interface: RS485, 9 pin type D, asynchronous at 0 to 76.8 Kbps** connects directly to terminal (RS485 cable not required)

Transmission Line Interface: ST connector is standard for interfacing with fiber optic cable

Transmission Distance: See distance chart

Optical Power into a 50 Micron Core Optical Fiber: 0.5 microwatt, 10 dB power budget* @ 880 nanometers

Receiver Sensitivity: 50 nanowatts at less than 10^{-9} bit error rate

Operating Temperature: 0 °C to 50 °C

Metal Enclosure: 1.75 x 3 x 0.625 in (4.5 x 7.5 x1.6 cm) Panel or DIN rail mounting option

Weight: 0.25 lb (100 grams)

Input Power: External with power supply (S.I. Tech #2121 - 110 VAC to 12 Volt DC)

230V Version: Use S.I.Tech 2164 power supply

** Data rate must be set at factory

Meets FCC requirements of Class A, Part 15 Computing Devices Standard.
Specifications subject to change without notice.

UL CE

ORDERING INFORMATION

Model Numbers	
2110-BAC	Bacnet @ 38.4 Kbps, RS-485 to Multimode Fiber, ST
2110-BAC(T)	Bacnet @ 76.8 Kbps, RS-485 to Multimode Fiber, ST
2110-BAC-SM	Bacnet @ 38.4 Kbps, RS-485 to Single Mode Fiber, ST
2110-BAC(T)-SM	Bacnet @ 76.8 Kbps, RS-485 to Single Mode Fiber, ST
2110-DIN-BAC	Bacnet @ 38.4 Kbps, RS-485 to Multimode Fiber, DIN Rail, ST
2110-DIN-BAC(T)	Bacnet @ 76.8 Kbps, RS-485 to Multimode Fiber, DIN Rail, ST
2110-DIN-BAC-SM	Bacnet @ 38.4 Kbps, RS-485 to Single Mode Fiber, DIN Rail, ST
2110-DIN-BAC(T)-SM	Bacnet @ 76.8 Kbps, RS-485 to Single Mode Fiber, DIN Rail, ST

Notes:
1. Power Supply # 2121 is required for all models (110VAC to 12 VDC).
2. Power Supply #2164 is for 230VAC applications

RS - 485 9 PIN CONNECTOR - FEMALE
PINS UTILIZED BY 2110 MINI BIT - DRIVER®

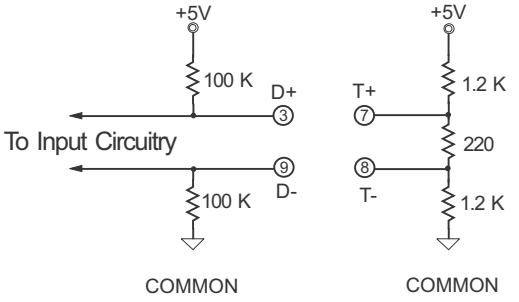
Pin No.	Description	Symbol
1	Signal Ground	SG
2	NC	
3	Data (+)	D +
5	Signal Ground	SG
6	NC	
7	Termination (+)	T +
8	Termination (-)	T -
9	Data (-)	D -

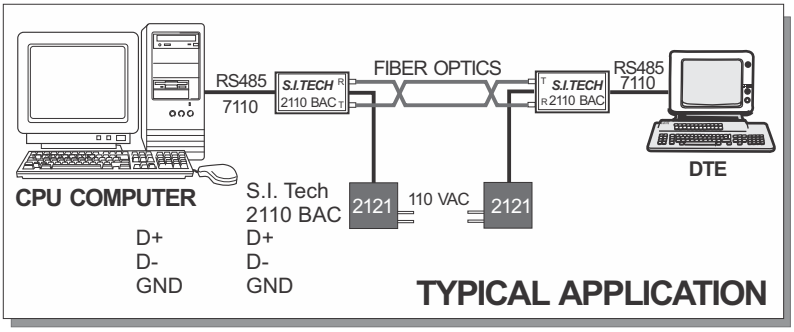
OPERATING DISTANCE FOR FIBER OPTIC CABLE

Fiber Size (Microns)	Attenuation dB/Km	Distance Meters*	Distance Feet*
50	3.0	2000	6600
62.5	4.0	2000	6600
8 SM**	1.0	10,000	33,000

* High power option available ** Single mode option

Termination Resistors provided in Bit-Driver



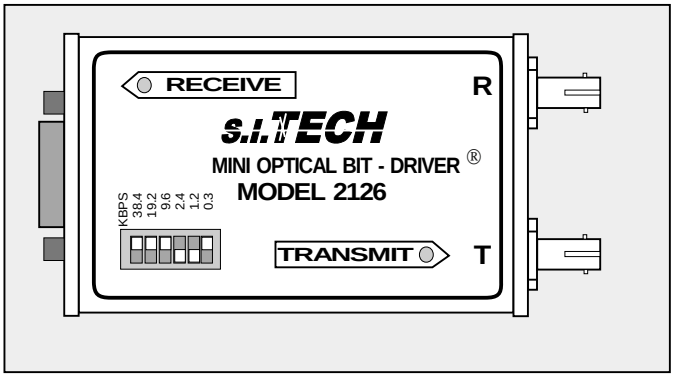


For application engineering assistance: 630-761-3640 FAX: 630-761-3644 S.I.Tech, P.O.Box 609, Geneva, Illinois 60134 U.S.A. Web site: www.sitech-bitdriver.com.

Model 2126

S.I.TECH

Optical Synchronous Mini Bit-Driver® Point to Point



Features:

- 0 to 38.4 Kbps synchronous half duplex operation
- 6600 ft. (2Km) maximum distance capability
- 0 °C to + 50 °C operating range
- ST connector receptacle (SMA option)
- Switch selectable speeds

Operation Mode: Synchronous half duplex

Input/Output Interface: RS-485, 9 pin type D, asynchronous at 0 to 38.4 Kbps, connect directly to terminal (RS 485 cable not required)

Transmission Line Interface: ST connector is standard for interfacing with fiber optic cable (SMA option)

Optical Power into a 50 Micron Core Optical Fiber: 0.5 microwatt, 10 dB power budget* @ 880 nanometers

Receiver Sensitivity: 50 nanowatts

Bit Error rate: 10^{-9}

Operating Temperature: 0 °C to 50 °C

Metal Enclosure: 1.75 x 3 x 0.625 in (4.5 x 7.5 x1.6 cm) Panel or DIN rail mounting option

Weight: 0.25 lb (100 grams)

Input Power: External with power supply (S.I. Tech #2121 - 110 VAC to 12 Volt DC)

230V Version: Use S.I.Tech 2122 power supply

RS - 485 DB-9M MALE CONNECTOR
PINS UTILIZED BY 2126 MINI BIT - DRIVER®

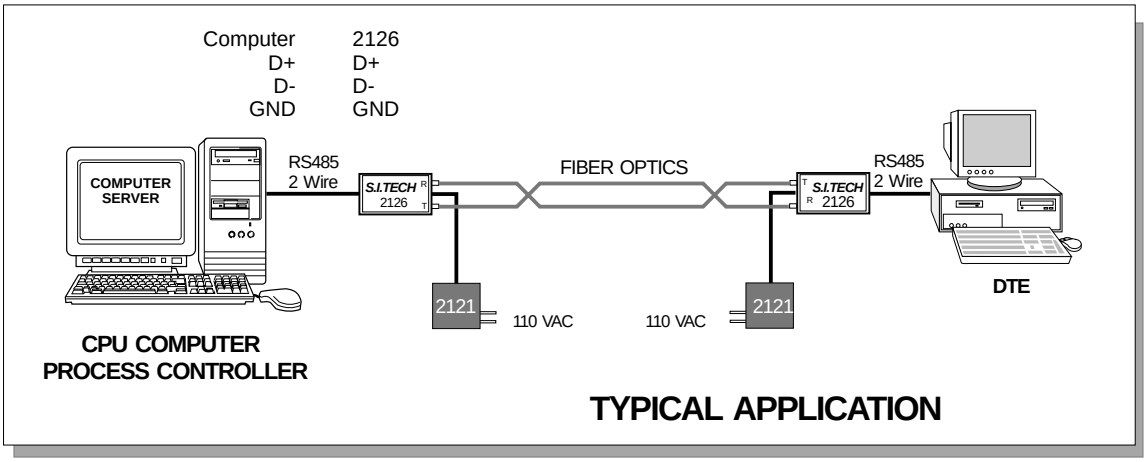
Pin No.	Description
1	Ground
3	Data -
5	Ground
9	Data +

OPERATING DISTANCE FOR FIBER OPTIC CABLE

Fiber Size (Microns)	Attenuation dB/Km	Distance Meters*	Distance Feet*
50	3.0	2000	6600
62.5	4.0	2000	6600
100	5.0	2000	6600

* High power option available

Meets FCC requirements of Class A, Part 15 Computing Devices Standard.
Specifications subject to change without notice.



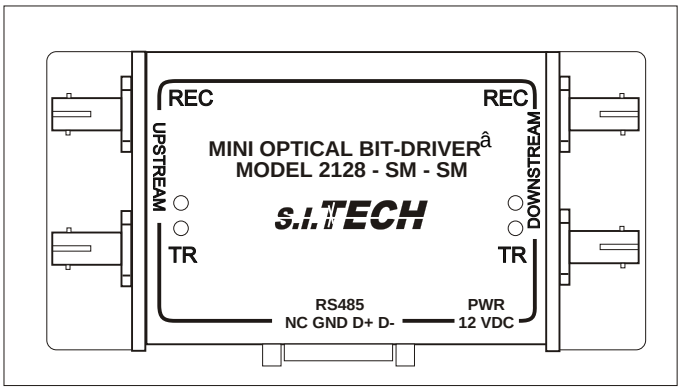
TYPICAL APPLICATION

For application engineering assistance: 630-761-3640 FAX: 630-761-3644 S.I.Tech, P.O.Box 609, Geneva, Illinois 60134 U.S.A. Web site: http://www.sitech-bitdriver.com.

Model 2128

S.I.TECH

Optical Mini Multidrop Bit-Driver ®



Features:

- RS-485 Multidrop
- Various speed options up to 200 Kbps
- Flange Mounting
- Multimode or single mode
- Asynchronous, simplex, half, full duplex

Fiber ports repeat data through the 2128 and drop/insert data on the RS-485 port. The RS-485 port inserts data onto both fiber ports and gets data dropped from either fiber port.

Operation Mode: Asynchronous half duplex

Input/Output Interface: RS-485, 2 wire port operating up to 200 Kbps or DB-9 Connector

Transmission Line Interface: ST connectors are standard for interfacing with fiber optic duplex cable (SMA option)

Optical Power into a 62.5 Micron Core Optical Fiber: 10 microwatts, 13 dB power budget @ 850 nanometers (1300 nm option)

Receiver Sensitivity: 500 nanowatts at less than 10^{-9} bit error rate, 10 microwatts max.

Operating Temperature: 0 ^{o}C to 50 ^{o}C (-40 to +70 ^{o}C option-MM Fiber)

Metal Enclosure: 5.5 x 2.3 x 1.0 in (with flange) (13.97 x 5.84 x 2.54 cm) Panel or DIN rail mounting option

Weight: 0.4 lbs (182 grams)

Input Power: External with power supply (S.I. Tech #2121 - 110 VAC to 12 VDC)

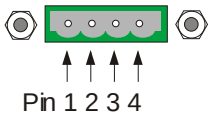
230 Volt Version: Use S.I.Tech 2164 power supply

Meets FCC requirements of Class A, Part 15 Computing Devices Standard.
Specifications subject to change without notice.

RS - 485 CONNECTOR

Pin No.	Description
1	NC
2	Ground
3	Data +
4	Data -

RS - 485 CONNECTOR



DB-9 OPTION

DB-9 Pinout
3 - Data+
9 - Data-
1 & 5 - Ground

OPERATING DISTANCE FOR FIBER OPTIC CABLE

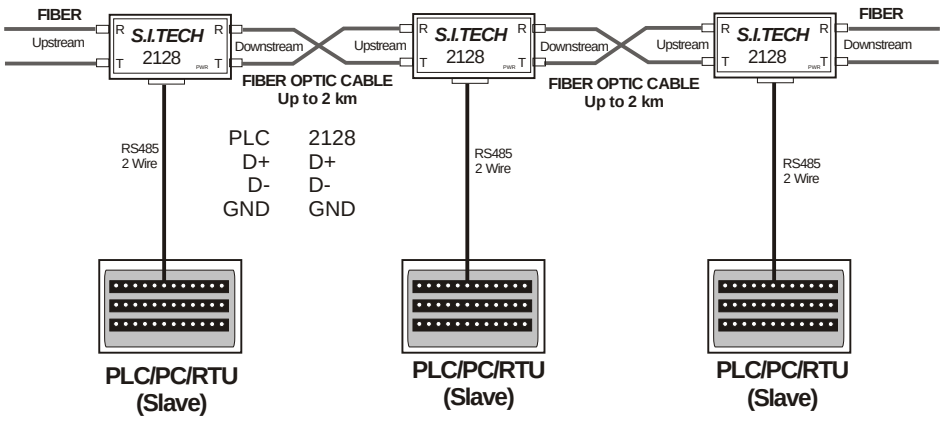
Fiber Size (Microns)	Attenuation dB/Km	Distance Meters*	Distance Feet*
50	3.0	2000	6600
62.5	4.0	2000	6600
10 SM	1.0	10000	33000

* High power option available
SM - Single Mode (1300nm) option (Temp -20 to +60 ^{o}C)

ORDERING INFORMATION

Model Number	Description
2128	Multimode to Multimode, ST Connectors
2128-MM-SM	Multimode to Single Mode, ST Connectors
2128-SM-SM	Single Mode to Single Mode, ST Connectors

TYPICAL APPLICATION

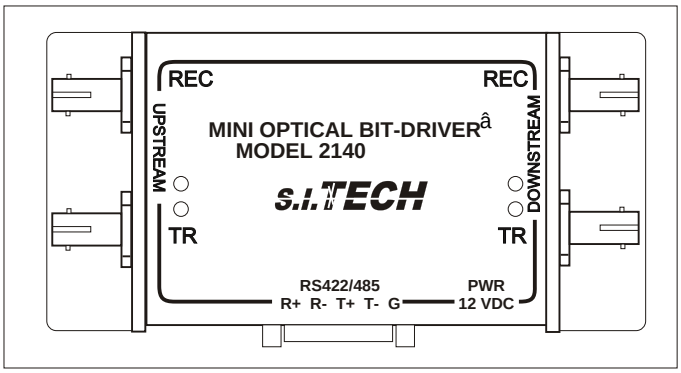


For application engineering assistance: 630-761-3640 FAX: 630-761-3644 S.I.Tech, P.O.Box 609, Geneva, Illinois 60134 U.S.A. Web site: http://www.sitech-bitdriver.com.

Model 2140

S.I.TECH

Optical Mini Bit-Driver ®



Features:

- RS-422/485 Multipoint operation with up to 32 nodes
- Various speeds - 110 bps to 230 Kbps, 4 Wire (Speed set at the factory)
- Flange Mounting
- Multimode or single mode options
- Repeater with 4-wire RS-422/485 Add/Drop

Fiber ports repeat data through the 2140 and drop/insert data on the RS-422/485 port. The RS-422/485 port inserts data onto both fiber ports and drops data from both fiber ports.

Operation Mode: RS-422/485 Full duplex, Async

Input/Output Interface: RS-422/485, 4 wire port operating 110 bps to 230 Kbps (Factory set)

Transmission Line Interface: ST connectors are standard for interfacing with fiber optic duplex cable (SMA option)

Optical Power into a 62.5 Micron Core Optical Fiber: 30 microwatts, 13 dB power budget @ 850 nanometers (1300 nm option)

Receiver Sensitivity: 1 microwatts at less than 10^{-9} bit error rate.

Operating Temperature: 0 °C to 50 °C (-40 to +85 °C option for Multimode, -20 to +60 °C - SM)

Relative Humidity: 10 to 95% Non-condensing

Metal Enclosure: 5.5 x 2.3 x 1.0 in (with flange) (13.97 x 5.84 x 2.54 cm) Panel or DIN rail mounting option

Weight: 0.4 lbs (182 grams)

Input Power: External with power supply (S.I. Tech #2121 - 110 VAC to 12 VDC)

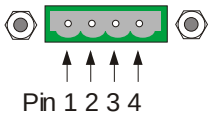
230 Volt Version: Use S.I.Tech 2164 power supply

Meets FCC requirements of Class A, Part 15 Computing Devices Standard.
Specifications subject to change without notice.

RS - 422/485 CONNECTOR

Pin No.	Description	DB-9 Female Pin
1	R+ (Input)	4
2	R- (Input)	6
3	T+ (Output)	3
4	T- (Output)	9
	Ground	1, 5

RS - 422/485 CONNECTOR



OPERATING DISTANCE FOR FIBER OPTIC CABLE

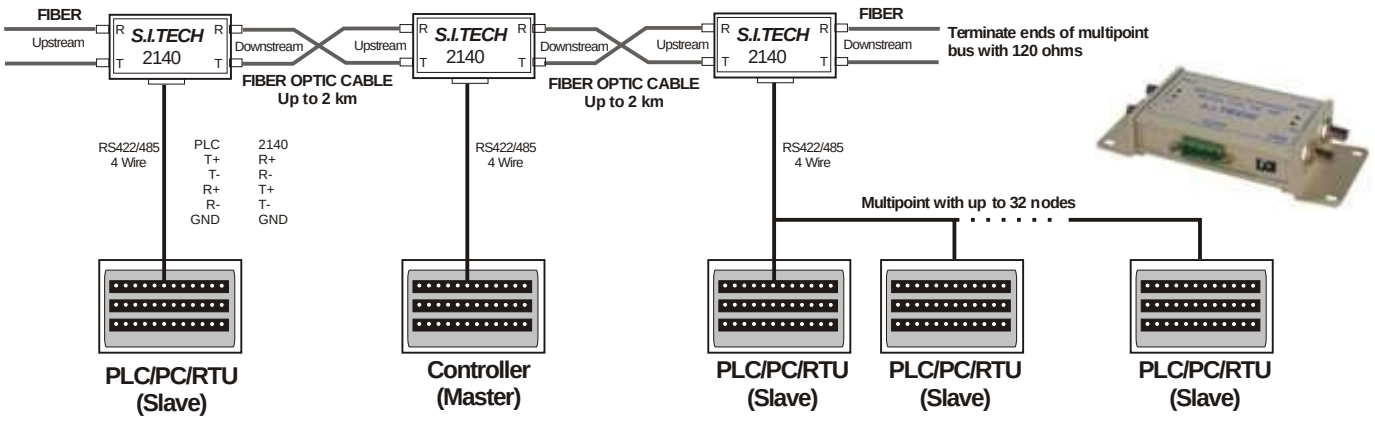
Fiber Size (Microns)	Attenuation dB/Km	Distance Meters*	Distance Feet*
50	3.0	2000	6600
62.5	4.0	2000	6600
10 SM	1.0	10000	33000

* High power option available (20dB)
SM - Single Mode (1300nm). Temp: SM -20° to +60° C

ORDERING INFORMATION

Model Number	Description
2140-MM-B	Multimode to One side blank, ST Connectors
2140-MM-MM	Multimode to Multimode, ST Connectors
2140-MM-SM	Multimode to Single Mode, ST Connectors
2140-SM-SM	Single Mode to Single Mode, ST Connectors

TYPICAL APPLICATION



For application engineering assistance: 630-761-3640 FAX: 630-761-3644 S.I.Tech, P.O.Box 609, Geneva, Illinois 60134 U.S.A. Web site: http://www.sitech-bitdriver.com.

Model 2145

S.I.TECH

Profibus - DP Fiber Optic Bit-Driver ®

Features:

- Meets PROFIBUS-DP specification. **Tested & approved by PROFIBUS Lab**
- Modbus - RS485
- Multimode or single mode, plastic or glass fiber
- 2 port optical repeater, optical T-connector, optical to electrical converter
- 9600 bps to 12 Mbps - switch selectable
- DIN rail mounting
- Status indicators: power, TxD, RxD, invalid switch setting
- Conformal coated boards

The Model 2145 Bit-Driver used in a PROFIBUS-DP application is a two optic port repeater with single TIA/EIA-485-A electrical port. The 2145 operates at rate 9600 baud to 12 Mbaud in linear bus topology. The 2145 can be used as an optical repeater between the fiber optic segments, an optical to electrical converter between an fiber optic segment and electrical station(s), or T-connector/repeater between two fiber optic segments and electrical station(s). The 2145 is transparent and does not evaluate the PROFIBUS data exchange.

Using fiber optics over the physical layer, the 2145 provides longer segment distances, electromagnetic noise immunity and ground potential difference independence in the linear bus topology. The 2145 optics can be optionally equipped with optics of different characteristics.

The 2145 retimes the received optical signal and can link up to 32 fiber optic segments in series. The electrical port supports up to 31 stations.

The 2145 Termination switch can select an internal cable type-A termination. External terminations can derive power from the sub-D connector between pins 6 and 5.

The 2145 unit attaches to EN50022 (35mm DIN) mounting rail. Power is applied through screw terminals and data rate selection made through internal DIP switches.

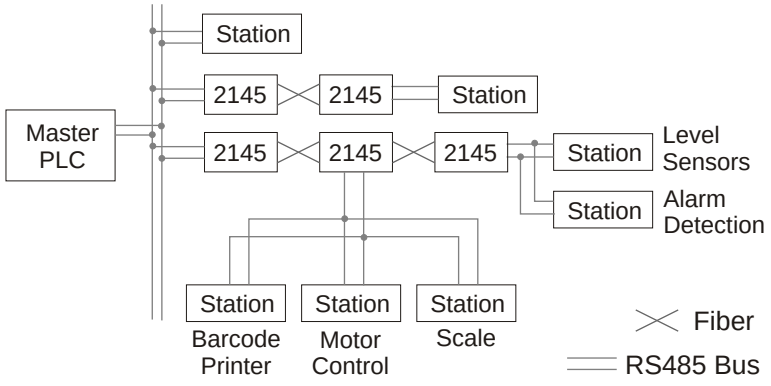
Operation Mode: RS485 - 2 wire
Profibus - DP
Input/Output Interface: EIA RS485A 2 wire
9600bps to 12Mbps
IEC 61158-2, Async, NRZ, 11 Bits
DB9 female
Transmission Line Interface: ST Connectors-standard (SMA option)
Optical Power (TR): See table 1
Receiver Sensitivity: See table 1
Operating Temperature: -25°C to +70°C
(-20°C to +60°C for SM)
Metal Enclosure: DIN Rail Mounting
Weight: 0.5 lb (220 grams)
Input Power: 24VDC, 3 Watts, Terminal block
Electrical Isolation: 1500V
Conducted Emissions: EN55022 Class B
Mechanical: IP 40

TABLE 1

Model	Wavelength (nm)	Fiber Diameter (Micron)	Fiber Type	Connector	TR PWR (-dBm)	REC SEN (-dBm)	Attenuation dB/Km	Distance Meters	Distance Feet	OPT Ports
2145-0	660/850	200	Plastic	BFOC/2.5(STâ)	10	22	10/7	700/1000	2000/3000	2 PL
2145-00	660	1000	Plastic	BFOC/2.5(ST)	7	20	200	100	330	2 PL
2145-MM	850	50 or 62.5	Multimode	BFOC/2.5(ST)	12	24	3.0	3000	10000	1 MM
2145 or 2145-MM-MM	850	50 or 62.5	Multimode	BFOC/2.5(ST)	12	24	3.0	3000	10000	2 MM
2145-MM-SM	850/1300	50 or 62.5/9	MM/SM	BFOC/2.5(ST)	12/15	24/27	3.0/1.0	3000/10000	10000/33000	1 MM, 1 SM
2145-SM-SM	1300	9	SM/SM	BFOC/2.5(ST)	15	27	0.35	10000	33000	2 SM
2145-SM	1300	9	Single Mode	BFOC/2.5(ST)	15	27	0.35	10000	33000	1 SM

Note: Plastic fiber can be used for short distance applications.

TYPICAL APPLICATION



Meets FCC requirements of Class A, Part 15 Computing Devices Standard.
Specifications subject to change without notice.

RS - 485 DB9 FEMALE CONNECTOR PINOUT

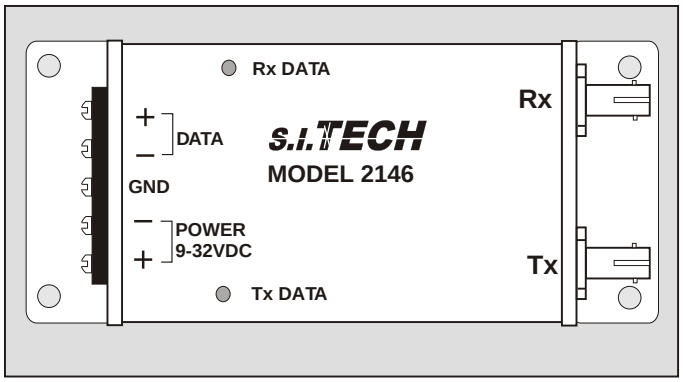
Sub-D	Signal Name	Function
1	Shield	Protective Ground
2	--	--
3	RxD/TxD-P	Data-P (B-Line)
4	--	--
5	DGND	Data Ground
6	VP	Voltage Plus (+5VDC)
7	--	--
8	RxD/TxD-N	Data-N (A-Line)
9	--	--
Body	Shield	Protective Ground

For application engineering assistance: 630-761-3640 FAX: 630-761-3644 S.I.Tech, P.O.Box 609, Geneva, Illinois 60134 U.S.A. Web site: http://www.sitech-bitdriver.com.

Model 2146

S.I.TECH

Optical Mini Bit-Driver®



Features:

- RS-485 to Fiber Bit-Driver
- Works with Honeywell PLCs
- Access control system
- High Speed RS-485

Operation Mode: Half duplex
Input/Output Interface: RS-485, 2 wire port operating up to 1.0Mbps
Transmission Line Interface: ST connector is standard for interfacing with fiber optic duplex cable (SMA option)
Optical Power into a 62.5 Micron Core Optical Fiber: 30 microwatts, 13 dB power budget @ 850 nanometers
Receiver Sensitivity: 1.0 microwatts at less than 10^{-9} bit error rate
Operating Temperature: 0 °C to 50 °C
Metal Enclosure: Panel or DIN rail mounting option
Weight: 0.25 lb (100 grams)
Input Power: 9 to 32VDC (S.I. Tech #2121power supply)
230V Version: Use S.I.Tech 2164 power supply

TERMINALS UTILIZED BY 2146 BIT-DRIVER®

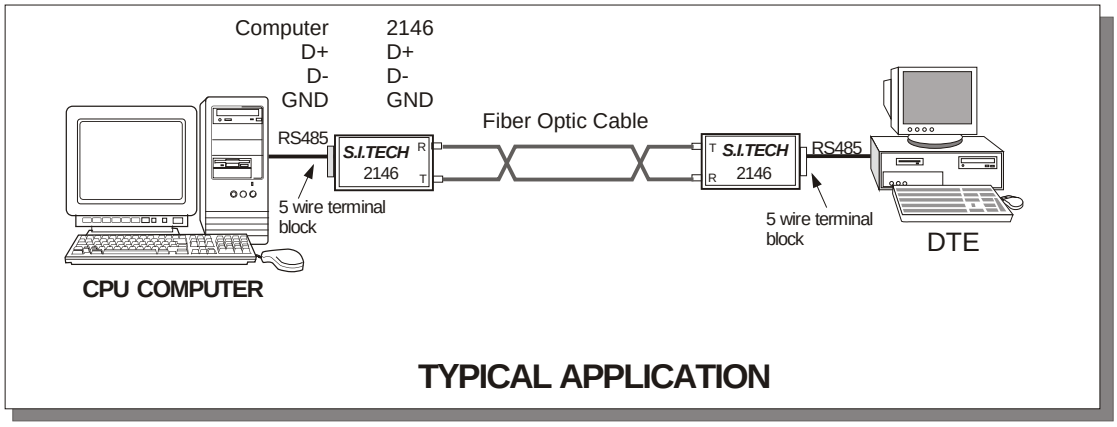
Terminal	Terminals Left to Right
1	D+
2	D-
3	GND
4	PWR-
5	PWR+

OPERATING DISTANCE FOR FIBER OPTIC CABLE

Fiber Size (Microns)	Attenuation dB/Km	Distance Meters*	Distance Feet*
50	3.0	2000	6600
62.5	3.5	2000	6600
10 (SM)	1.0	10000	33000

* High power option available
** SM - Single mode option (1310 nm)

Meets FCC requirements of Class A, Part 15 Computing Devices Standard.
Specifications subject to change without notice.



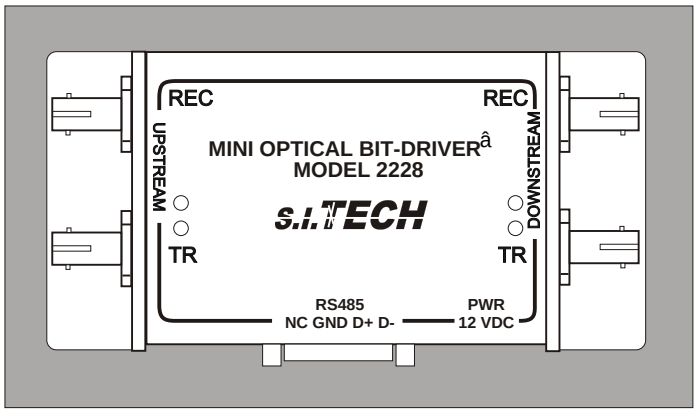
TYPICAL APPLICATION

For application engineering assistance: 630-761-3640 FAX: 630-761-3644 S.I.Tech, P.O.Box 609, Geneva, Illinois 60134 U.S.A. Web site: www.sitech-bitdriver.com

Model 2228

S.I.TECH

Optical Mini Bit-Driver ®



Features:

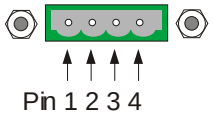
- Wide temperature range Multi-drop RS-485 to fiber Mini Bit-Driver.
- Multimode is standard, Single mode optional.

Fiber ports repeat data through the 2228 and drop/insert data on the RS-485 port. The RS-485 port inserts data onto both fiber ports and gets data dropped from either fiber port.

RS - 485 CONNECTOR
PINS UTILIZED BY 2228 MINI BIT-DRIVER®

Pin No.	Description
3	Data +
4	Data -
2	Ground
1	NC

RS - 485 CONNECTOR



RS - 485 9 PIN CONNECTOR - FEMALE

Pin No.	Description	Symbol
1	Signal Ground	SG
3	Data (+)	D +
5	Signal Ground	SG
9	Data (-)	D -

Operation Mode: Asynchronous half or full duplex
Input/Output Interface: RS-485, 2 wire port operating up to 256 Kbps (Factory set)
Transmission Line Interface: ST connectors are standard for interfacing with fiber optic duplex cable (SMA option)
Optical Power into a 62.5 Micron Core Optical Fiber: 10 microwatts, 13 dB power budget* @ 850 nanometers (1300nm option)
Receiver Sensitivity: 500 nanowatts at less than 10^{-9} bit error rate. 50 microwatts max.
Operating Temperature: -40 ^{o}C to +85 ^{o}C (-20 ^{o}C to +60 ^{o}C SM)
Metal Enclosure: 4.80 x 2.25 x 1.0 in (12.2 x 5.71 x2.54 cm) Panel or DIN rail mounting option
Weight: 0.25 lb (100 grams)
Input Power: External with power supply (S.I. Tech #2121 - 110 VAC to 12 VDC)
230 Volt Version: Use S.I.Tech 2164 power supply

Meets FCC requirements of Class A, Part 15 Computing Devices Standard.
Specifications subject to change without notice.

OPERATING DISTANCE FOR FIBER OPTIC CABLE

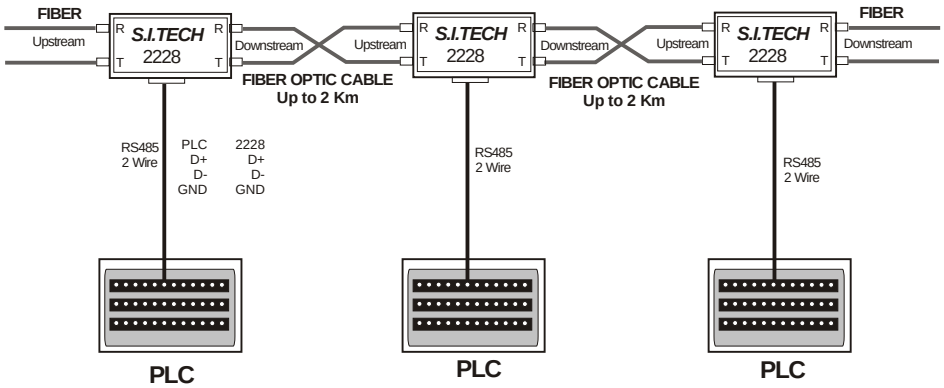
Fiber Size (Microns)	Attenuation dB/Km	Distance Meters*	Distance Feet*
50	3.0	2000	6600
62.5	4.0	2000	6600
10 SM	1.0	10000	33000

* High power option available (20dB)
SM - Single Mode (1300nm) option

ORDERING INFORMATION

Model Number	Description
2228	Multimode to Multimode, ST Connectors
2228-MM-SM	Multimode to Single Mode, ST Connectors
2228-SM-SM	Single Mode to Single Mode, ST Connectors

TYPICAL APPLICATION

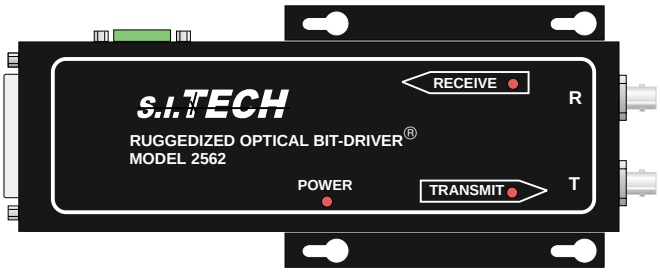


For application engineering assistance: 630-761-3640 FAX: 630-761-3644 S.I.Tech, P.O.Box 609, Geneva, Illinois 60134 U.S.A. Web site: http://www.sitech-bitdriver.com.

Model 2562

S.I.TECH

Optical Asynchronous Ruggedized Mini Bit-Driver ®



Operation Mode: Asynchronous, half duplex
Input/Output Interface: RS-485, DB25F connector
Transmission Line Interface: Metal ST connector is standard for interfacing with fiber optic duplex cable (SMA option, SC and FC option for SM)
Transmission Distance: See Chart
Optical Power into a 62.5 Micron Core Optical Fiber: 30 microwatts, 10 dB power budget @ 820 nanometers (1300 nm Option)
Receiver Sensitivity: 3 microwatts at less than 10^{-9} bit error rate
Operating Temperature: -40 ^{O}C to +80 ^{O}C for Multimode
-20 ^{O}C to +60 ^{O}C for Single mode
Humidity: 0 to 90% Non Condensing
Metal Enclosure: 7.25 X 2.28 X 1.3 in (18.4 X 5.8 X 3.3 cm)
Weight: 0.9 lb. (400 grams)
Input Power: 85 V to 265 VAC or DC (+24 VDC and -48 VDC Option)
Card Version: S.I.Tech #2362 with Series 3000 Rack

DATA SPEEDS (bps) (DIP Switch)-RS485

Data Rate	SW1	SW2	SW3	SW4
300	UP	DOWN	UP	DOWN
1200	DOWN	UP	UP	DOWN
2400	UP	UP	UP	DOWN
4800	DOWN	DOWN	DOWN	UP
9600	UP	DOWN	DOWN	UP
14.4K	DOWN	UP	DOWN	UP
19.2K	UP	UP	DOWN	UP
28.8K	DOWN	DOWN	UP	UP
38.4K	UP	DOWN	UP	UP
57.6K	DOWN	UP	UP	UP
115.2K	UP	UP	UP	UP

Features:

- Up to 115 Kbps asynchronous operation on fiber optic cable, half duplex operation
- –40 ^{O}C to + 80 ^{O}C operating range**
- Metal ST connector receptacle (SMA option)
- LED indicators for power, transmit, and receive data
- Female DB25 connector
- Complies with IEEE C37.90.1
- IEC 801 Surge Protection
- Panel Mounting Brackets, two mounting locations
- Conformal coating
- See distance chart

RS - 485 CONNECTOR PINS UTILIZED BY 2562 MINI BIT - DRIVER (FEMALE)

Pin No.	Description	Symbol
1	Protective Ground	Chassis GND
7	Signal Ground	Sig. GND
14	Data +	D+
15	Data -	D-

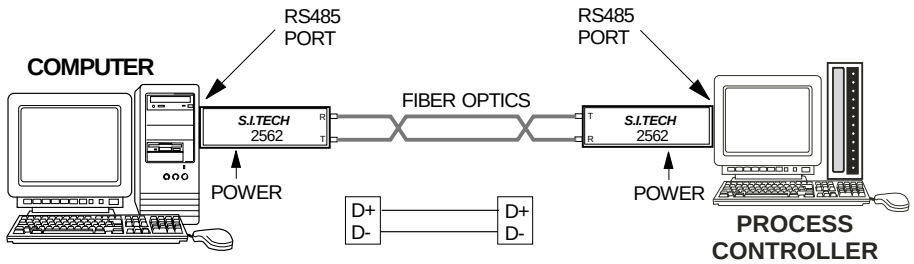
OPERATING DISTANCE FOR FIBER OPTIC CABLE

Fiber Size (Microns)	Attenuation dB/Km	Distance* Meters	Distance* Feet
50	3.0	2000	6600
62.5	4.0	2000	6600
10 SM**	1.0	10000	33000

* High power option available. SM - Single mode (1300nm) option
Optical unit connection: Connect the optical transmission line to the T and R receptacles. Note which cable channel goes to T or R by noting cable imprint. On the other end, reverse the connection.
** SM - Temperature Rating: -20 ^{O}C to +60 ^{O}C

Meets FCC requirements of Class A, Part 15 Computing Devices Standard.
Specifications subject to change without notice.

TYPICAL APPLICATION



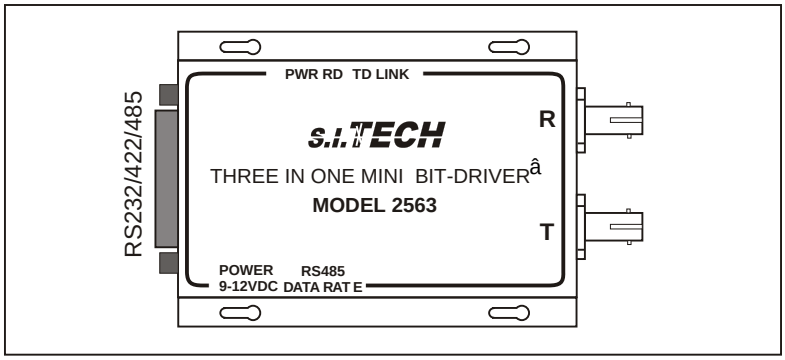
RS485 Connection

For application engineering assistance: 630-761-3640 FAX: 630-761-3644 S.I.Tech, P.O.Box 609, Geneva, Illinois 60134 U.S.A. Web site: http://www.sitech-bitdriver.com

Model 2563

S.I.TECH

Optical Asynchronous (Three In One) Mini Bit-Driver ®



Operation Mode: Asynchronous, simplex or full duplex

Input/Output Interface: Fully independent RS232/RS422/RS485, asynchronous concurrent. DB25 connector

Transmission Line Interface: Metal ST connector is standard for interfacing with fiber optic du plex cable (SMA option, SC and FC option for SM)

Transmission Distance: See Distance Chart

Optical Power into a 62.5 Mic ron Core Optical Fiber: 20 microwatts, 10 dB powe r budget @ 820 nanometers (1300 nm O ption)

Receiver Sensitivity: 2 microwatts at less than 10 $^{-9}$ bit error rate

Operating Temperature: 0 ^{o}C to 50 ^{o}C (Extended Temp. Option -20 ^{o}C to 70 ^{o}C)

Metal Enclosure: 3.6" X 2.3" X 1.2" (9.1 X 5.84 X 3.0 cm) Bracket Optional

Weight: 0.4 lb. (185 grams)

Input Power: 9 to 12VDC, 200m A

OPERATING DISTANCE FOR FIBER OPTIC CABLE

Fiber Size (Microns)	Attenuation dB/Km	Distance* Meters	Distance* Feet
50	3.0	2000	6600
62.5	4.0	2000	6600
10 SM	1.0	5000	16000

* High power option available. SM - Single Mode option
Optical unit connection: Connect the optical transmission line to the T and R receptacles. Note which cable channel goes to T or R by noting cable imprint. On the other end, reverse the connection.

Features:

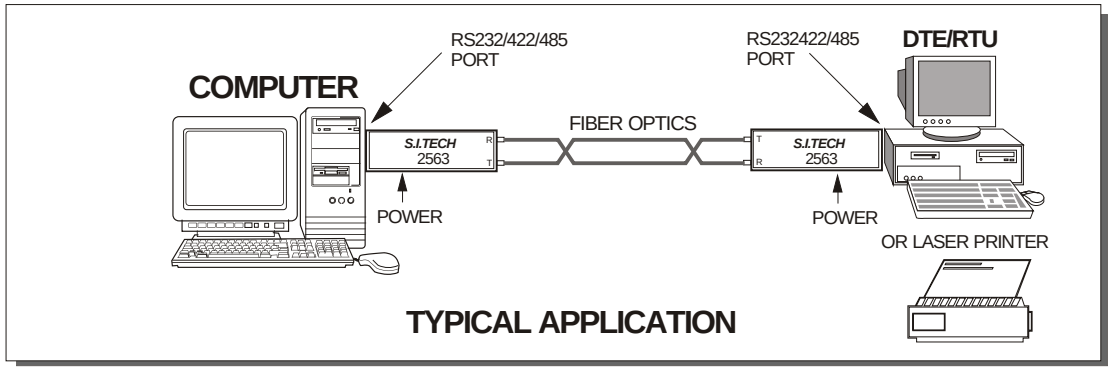
- Concurrent, fully-independent RS232, RS422, and RS485 communication channel over a one duplex fiber optic cable (data is multiplexed over fiber link)
- Up to 115kbps asynchronous operation
- Full duplex RS232 and RS422
  - Optional tri-state control for bus RS422 systems
- Half duplex RS485
  - Rotary switch sets the RS485 bit rate
- Metal ST connector receptacle (SMA option)
- Female DB25 connector RS232 wired as DCE device
- LED indicators for power, optical link status, transmit and receive data
- Optical link status pin
- Multimode or single mode
- DIN rail mounting option

S.I.Tech 2563 is a unique Bit-Driver allowing simultaneous communication using RS232, RS422, and RS485. Each electrical interface is totally independent and share a combined fiber link. This way equipment with different interfaces can be connected over the same fiber i.e. in a manufacturing plant.

DB25 Female Connector Pinout

Pin No.	Description	Direction	
1	Chassis GND		
2	RS232 TXD	Input	
3	RS232 RXD	Output	
4	RTS		4-5 connected together
5	CTS		
6	DSR		6-20 connected together
7	Signal GND		
8	Link Optical Detect	Output	
10	RS485 D+	Bidir	
11	Signal GND		
12	RS422 TX+	Input	
13	RS422 RX+	Output	
20	DTR		
22	RS485 D-	Bidir	
23	Chassis GND		
24	RS422 TX-	Input	
25	Rs422 RX-	Output	

Meets FCC requirements of Class A, Part 15 Computing Devices Standard.
Specifications subject to change without notice.



TYPICAL APPLICATION

RS485 Data Rate

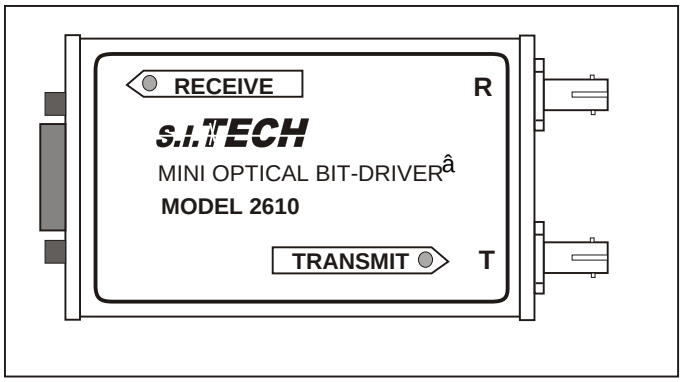
0	1200 bps
1	2400 bps
2	4800 bps
3	9600 bps
4	19.2 Kbps
5	38.4 Kbps
6	76.8 Kbps
7	115.2 Kbps

For application engineering assistance: 630-761-3640 FAX: 630-761-3644 S.I.Tech, P.O.Box 609, Geneva, Illinois 60134 U.S.A. Web site: http://www.sitech-bitdriver.com

Model 2610

S.I.TECH

Optical Asynchronous Mini Bit-Driver® Point to Point



Features:

- 0 to 115.0 Kbps asynchronous, RS-485 half duplex operation
- 6600 ft. (2Km) maximum distance capability
- -40 °C to +80 °C (-20 °C to +60 °C SM) operating range
- Multimode is standard, Single mode optional
- ST connector receptacle (SMA option)
- Designed to work with Johnson Controls System - N2 Bus or other PLC
- High temperature version of 2110
- For BACNET - order 2610-BAC

Operation Mode: Asynchronous, bi-directional, half duplex

Input/Output Interface: RS-485, 9 pin type D, asynchronous at 0 to 115.0 Kbps*** connects directly to terminal (RS 485 cable not required)

Transmission Line Interface: ST connector is standard for interfacing with fiber optic cable (SMA option)

Transmission Distance: See distance chart

Optical Power into a 50 Micron Core Optical Fiber: 0.5 microwatt, 10 dB power budget* @ 880 nanometers

Receiver Sensitivity: 50 nanowatts at less than 10^{-9} bit error rate

Operating Temperature: -40 °C to +80 °C (-20 °C to +60 °C SM)

Metal Enclosure: 1.75 x 3 x 0.625 in (4.5 x 7.5 x1.6 cm) Panel or DIN rail mounting options

Weight: 0.25 lb (100 grams)

Input Power: External with power supply (S.I. Tech #2121 - 110VAC to 12 Volt DC)

230V Version: Use S.I.Tech 2122 power supply

*** Data rate must be set at factory

Meets FCC requirements of Class A, Part 15 Computing Devices Standard.
Specifications subject to change without notice.
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RS - 485 9 PIN CONNECTOR - FEMALE
PINS UTILIZED BY 2610 MINI BIT - DRIVER®

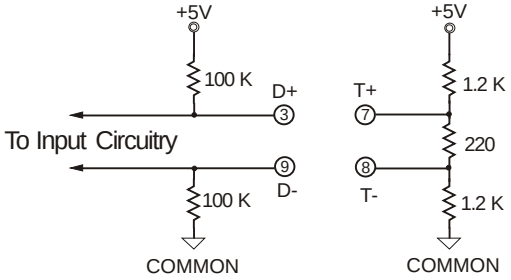
Pin No.	Description	Symbol
1	Signal Ground	SG
2	NC	
3	Data (+)	D +
5	Signal Ground	SG
6	NC	
7	Termination (+)	T +
8	Termination (-)	T -
9	Data (-)	D -

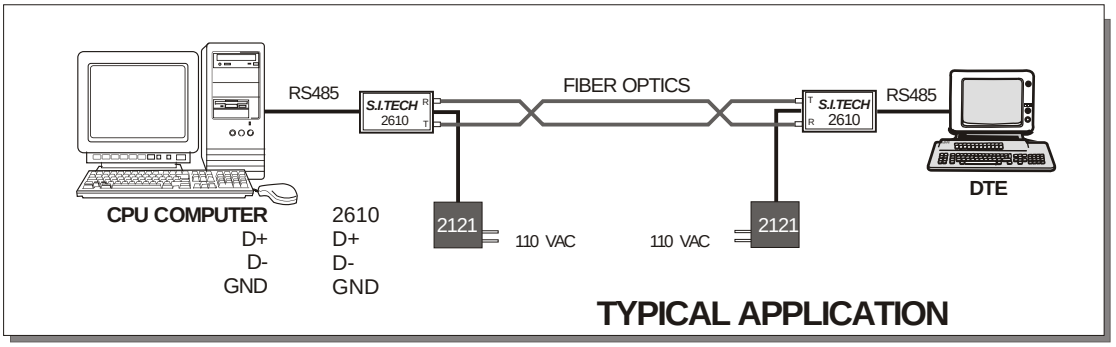
OPERATING DISTANCE FOR FIBER OPTIC CABLE

Fiber Size (Microns)	Attenuation dB/km	Distance Meters*	Distance Feet*
50	3.0	2000	6600
62.5	4.0	2000	6600
100	5.0	2000	6600
10 SM**	1.0	7000	23000

* High power option available
** Single mode (1300nm) option

Termination Resistors provided in Bit-Driver





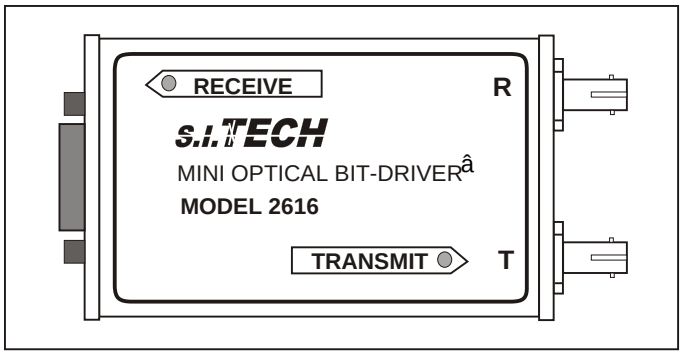
TYPICAL APPLICATION

For application engineering assistance: 630-761-3640 FAX: 630-761-3644 S.I.Tech, P.O.Box 609, Geneva, Illinois 60134 U.S.A. Web site: http://www.sitech-bitdriver.com.

Model 2616

S.I.TECH

Optical Asynchronous Mini Bit-Driver® Point to Point



Features:

- 0 to 115.2 Kbps asynchronous, RS-485 half duplex operation
- 6600 ft. (2Km) distance capability
- -40 °C to +80 °C (-20 °C to +60 °C SM) operating range
- ST connector receptacle (SMA option)
- Designed to work with Siemens Systems or other PLC

Operation Mode: Asynchronous, bi-directional, half duplex

Input/Output Interface: RS-485, 9 pin type D, asynchronous at 0 to 115.2 Kbps*** connects directly to terminal (RS 485 cable not required)

Transmission Line Interface: ST connector is standard for interfacing with fiber optic cable (SMA option)

Transmission Distance: See distance chart

Optical Power into a 50 Micron Core Optical Fiber: 10 microwatts, 10 dB power budget* @ 850 nanometers (1300nm option)

Receiver Sensitivity: 1 microwatt at less than 10^{-9} bit error rate

Operating Temperature: -40 °C to +80 °C (-20 °C to +60 °C SM)

Metal Enclosure: 1.75 x 3 x 0.625 in (4.5 x 7.5 x1.6 cm) Panel or DIN rail mounting options

Weight: 0.25 lb (100 grams)

Input Power: External with power supply (S.I. Tech #2121 - 110VAC to 12 Volt DC)

230V Version: Use S.I.Tech 2122 power supply

*** Data rate must be set at factory

Meets FCC requirements of Class A, Part 15 Computing Devices Standard.
Specifications subject to change without notice.

RS - 485 9 PIN CONNECTOR - FEMALE
PINS UTILIZED BY 2616 MINI BIT - DRIVER®

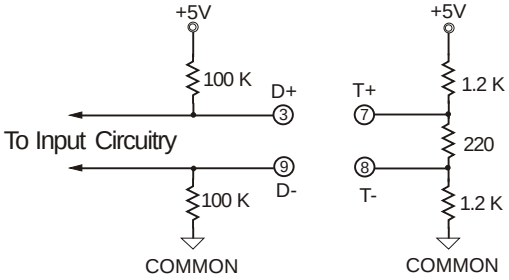
Pin No.	Description	Symbol
1	Signal Ground	SG
2	NC	
3	Data (+)	D +
5	Signal Ground	SG
6	NC	
7	Termination (+)	T +
8	Termination (-)	T -
9	Data (-)	D -

OPERATING DISTANCE FOR FIBER OPTIC CABLE

Fiber Size (Microns)	Attenuation dB/km	Distance Meters*	Distance Feet*
50	3.0	2000	6600
62.5	4.0	2000	6600
100	5.0	2000	6600
10 SM**	1.0	7000	23000

* High power option available
** SM - Single mode (1300nm) option

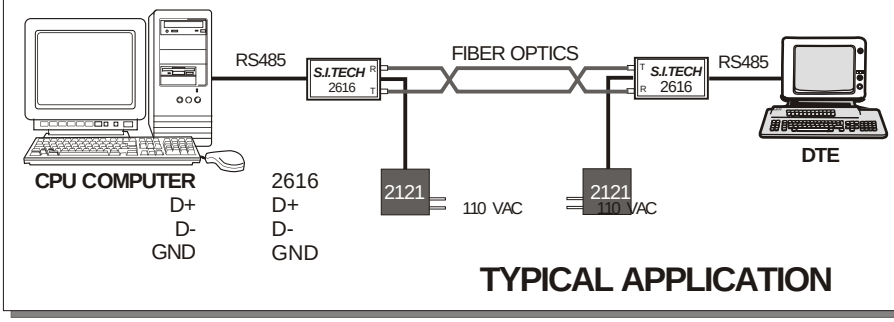
Termination Resistors provided in Bit-Driver



ORDERING INFORMATION

Model Numbers

2616	RS485 to Multimode Fiber, ST
2616-SM	RS485 to Single Mode Fiber, ST
2616-DIN	Multimode, ST, Dinrail Unit
2616-SM-DIN	Single Mode, ST, Dinrail Unit



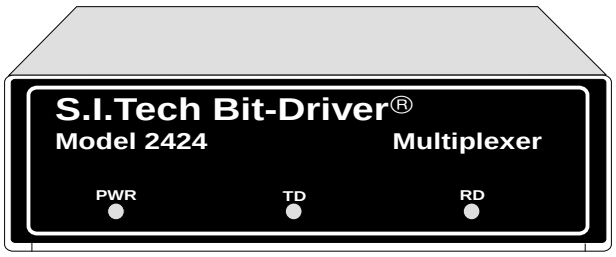
TYPICAL APPLICATION

For application engineering assistance: 630-761-3640 FAX: 630-761-3644 S.I.Tech, P.O.Box 609, Geneva, Illinois 60134 U.S.A. Web site: http://www.sitech-bitdriver.com.

Model 2424/2454

S.I.TECH

Asynchronous Time Division Multiplexer



Model 2424/2454 is a 4 channel communication system providing 4 Bit-Driver links using one optical cable interface.

The 2424 provides 4 full duplex RS422 channels for any data rate on any channel(s) up to 256 Kbps.

The 2454 provides 4 half duplex RS485 channels. The data rate must be set at the factory for data rate up to 256 Kbps.

Operation Mode: Asynchronous, RS422 simplex or full duplex. RS485 half duplex.
Input/Output Interface: RS422/RS485 up to 256 Kbps
Input/Output Connector: 37 pin female (DB37)
Phase Distortion: Less than 10%
Optical Connector: ST standard (SMA option)
Transmission Distance: 6600 ft. (2 Km, 5 Km option)
Optical Power into a 62.5/125 micron Fiber: 10 μW (50 μW option)
Receiver Sensitivity: 0.5 Microwatt @ 10^{-9} BER
System Wavelength: 850 nm (1300 nm option)
Bit Error Rate: 10^{-9}
Operating Temperature: 0 ^{o}C to 50 ^{o}C
Metal Enclosure: 7.5" X 7" X 3" (19 X 17.8 X 7.6 cm)
Weight: 3 lbs.(1.36 kg)/Rack 6 lbs.(2.72kg)
Input Power: 105 to 130 VAC 60 Hz
230 Volt Version: 2424V/2454V

UL & CSA listed. Meets FCC requirements of Class A, Part 15 Computing Devices Standard.
Specifications subject to change without notice.

PIN ASSIGNMENT FOR THE DB37 CONNECTOR

FUNCTION RS422	CHANNEL NUMBER			
	1	2	3	4
TX+	37	35	33	31
TX-	19	17	15	13
RX+	36	34	32	30
RX-	18	16	14	12
Signal Ground	1, 2, 3, 20, 21			
FUNCTION RS485	CHANNEL NUMBER			
	1	2	3	4
Data+	37	35	33	31
Data-	19	17	15	13
Signal Ground	1, 2, 3, 20, 21			

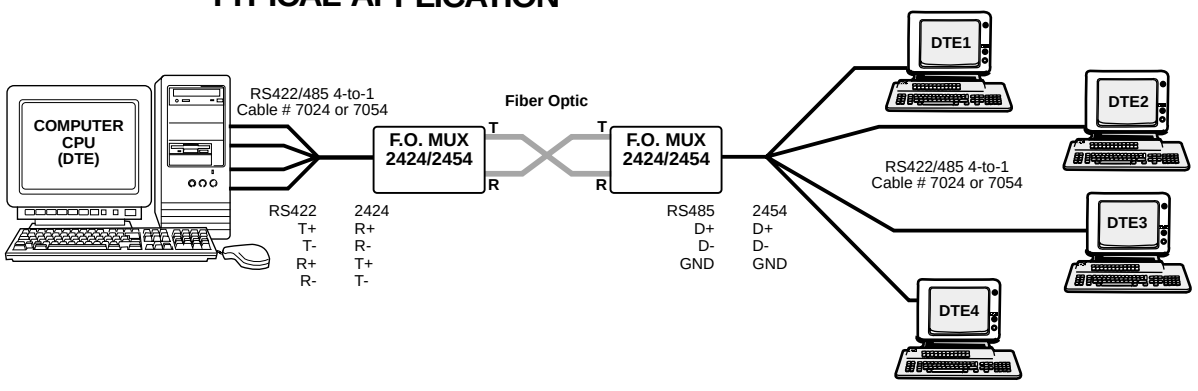
Note: Order 4-to-1 RS422/RS485 Cable #7024 or 7054

Operating Distance for Fiber Optic Cable

Fiber Size (Microns)	Attenuation dB/Km	Distance (Meters)	Distance (Feet)
50	3.0	2000	6600
62.5	4.0	2000	6600
100	5.0	2000	6600
10 SM*	1.0	7000	23000

* Single mode (1300nm) option
(High power option available for longer distance)

TYPICAL APPLICATION

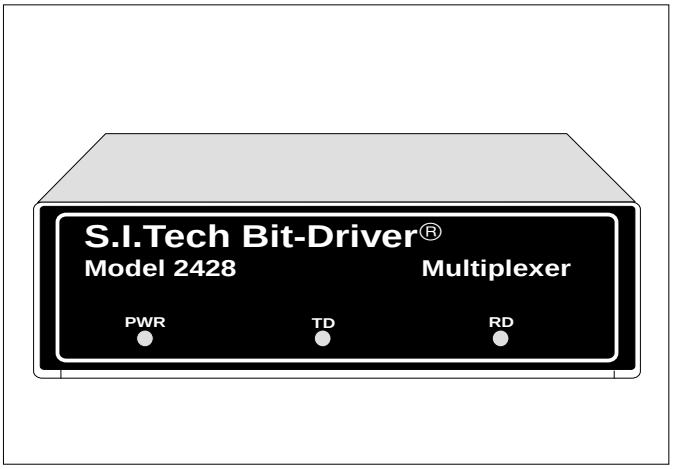


For application engineering assistance: 630-761-3640 FAX: 630-761-3644 S.I.Tech, P.O.Box 609, Geneva, Illinois 60134 U.S.A. Web site:www.sitech-bitdriver.com.

Model 2428/2458

S.I.TECH

Asynchronous Time Division Multiplexer



Model 2428/2458 is an 8 channel communication system providing 8 Bit-Driver links using one optical cable interface.

The 2428 provides 8 full duplex RS422 channels for any data rate on any channel(s) up to 76.8 Kbps.

The 2458 provides 8 half duplex RS485 channels. The data rate must be set at the factory for data rate up to 76.8 Kbps.

Operation Mode: Asynchronous, RS422 simplex or full duplex. RS485 half duplex.
Input/Output Interface: RS422/RS485 up to 76.8 Kbps
Input/Output Connector: 37 pin female (DB37)
Phase Distortion: Less than 10%
Optical Connector: ST standard (SMA option)
Transmission Distance: 6600 ft. (2 Km, 5 Km option)
Optical Power into a 62.5/125 micron Fiber: 10 μW (50 μW option)
Receiver Sensitivity: 0.5 Microwatt @ 10^{-9} BER
System Wavelength: 850 nm, (1300 nm option)
Bit Error Rate: 10^{-9}
Operating Temperature: 0 °C to 50 °C
Metal Enclosure: 7.5" X 7" X 3" (19 X 17.8 X 7.6 cm)
Weight: 3 lbs.(1.36 kg)/Rack 6 lbs.(2.72kg)
Input Power: 105 to 130 VAC 60 Hz
230 Volt Version: 2428V/2458V

UL & CSA listed. Meets FCC requirements of Class A, Part 15 Computing Devices Standard.
Specifications subject to change without notice.

PIN ASSIGNMENT FOR THE DB37 CONNECTOR

FUNCTION RS422	CHANNEL NUMBER							
	1	2	3	4	5	6	7	8
TX+	37	35	33	31	29	27	25	23
TX-	19	17	15	13	11	9	7	5
RX+	36	34	32	30	28	26	24	22
RX-	18	16	14	12	10	8	6	4
Signal Ground	1, 2, 3, 20, 21							
FUNCTION RS485	**CHANNEL NUMBER**							
	1	2	3	4	5	6	7	8
Data+	37	35	33	31	29	27	25	23
Data-	19	17	15	13	11	9	7	5
Signal Ground	1, 2, 3, 20, 21							

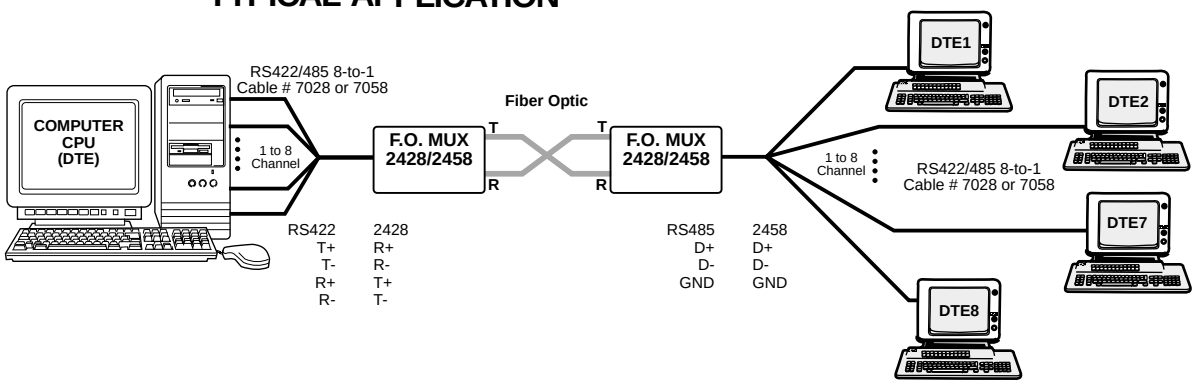
Note: Order 8-to-1 RS422/RS485 Cable #7028 or 7058

Operating Distance for Fiber Optic Cable

Fiber Size (Microns)	Attenuation dB/Km	Distance (Meters)	Distance (Feet)
50	3.0	2000	6600
62.5	4.0	2000	6600
100	5.0	2000	6600
10 SM*	1.0	7000	23000

* Single mode (1300nm) option
(High power option available for longer distance)

TYPICAL APPLICATION

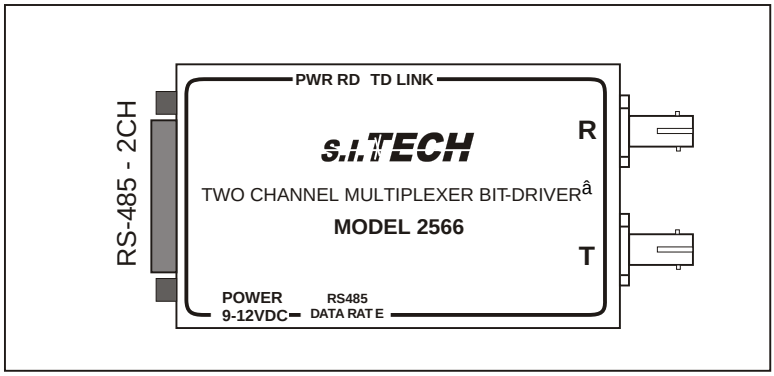


For application engineering assistance: 630-761-3640 FAX: 630-761-3644 S.I.Tech, P.O.Box 609, Geneva, Illinois 60134 U.S.A. Web site:www.sitech-bitdriver.com.

Model 2566

S.I.TECH

Optical Asynchronous Multiplexer



Features:

- 2 Channel RS-485 Multiplexer
- Up to 115.2 Kbps asynchronous operation, each channel
- Half duplex RS-485 - 2 Wire
- Metal ST connector receptacle (SMA option)
- LED indicators for power, optical link status, transmit and receive data
- Multimode or single mode
- DIN rail or panel mounting option

S.I.Tech 2566 is a unique Bit-Driver. The two channel RS-485 electrical interfaces are totally independent and share combined fiber link.

Operation Mode: Asynchronous, simplex or half duplex
Input/Output Interface: 2 CH RS-485 Multiplexer DB25 connector
Transmission Line Interface: Metal ST connector is standard for interfacing with fiber optic duplex cable (SMA option, FC option for SM)
Transmission Distance: See Distance Chart
Optical Power into a 62.5 Micron Core Optical Fiber: 20 microwatts, 10 dB power budget @ 820 nanometers (1300 nm Option)
Receiver Sensitivity: 2 microwatts at less than 10^{-9} bit error rate
Operating Temperature: -40 °C to 85 °C (-20 °C to 60 °C Single Mode)
Metal Enclosure: 3.6" X 2.3" X 1.2" (9.1 X 5.84 X 3.0 cm)
Weight: 0.4 lb. (185 grams)
Input Power: 9 to 12VDC, 200mA

DB25 Female Connector Pinout

Pin No.	Description	
1,7	Signal Ground	
2 3	D1+ D1-	Ch1
16 17	Term1+ Term1-	Ch1 Termination
14 15	D2+ D2-	Ch2
6 20	Term2+ Term2-	Ch2 Termination
Shell	Chassis	

RS-485 Data Rate

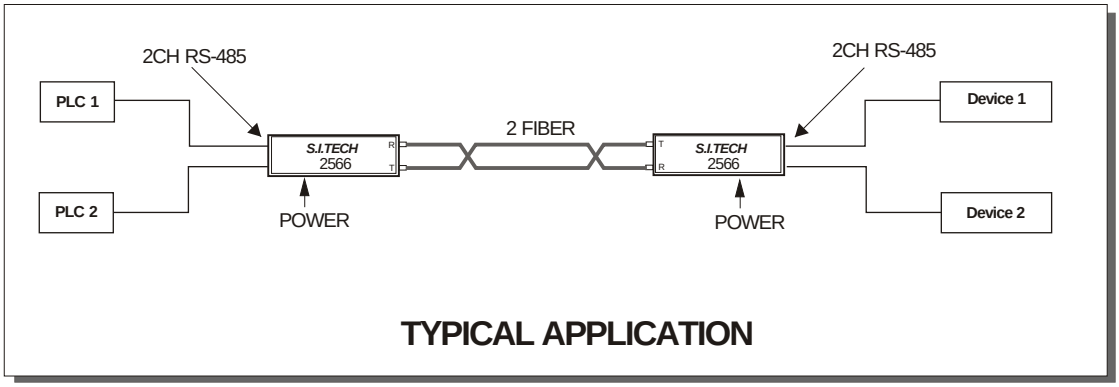
0	1200 bps
1	2400 bps
2	4800 bps
3	9600 bps
4	19.2 Kbps
5	38.4 Kbps
6	76.8 Kbps
7	115.2 Kbps

OPERATING DISTANCE FOR FIBER OPTIC CABLE

Fiber Size (Microns)	Attenuation dB/Km	Distance* Meters	Distance* Feet
50	3.0	2000	6600
62.5	4.0	2000	6600
10 SM	1.0	5000	16000

* High power option available. SM - Single Mode option
Optical unit connection: Connect the optical transmission line to the T and R receptacles. Note which cable channel goes to T or R by noting cable imprint. On the other end, reverse the connection.

Meets FCC requirements of Class A, Part 15 Computing Devices Standard.
Specifications subject to change without notice.



TYPICAL APPLICATION

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