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OPT-700

FIRST IN FIELDBUS

OPT-700 - SERIAL TO FIBER OPTIC CONVERTER

FOUNDATION

OPT700ME

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OPT-700 –Serial to Fiber Optic Converter

(Supports Hot Swap)

Part Number

OPT-700 (EIA-232/EIA-485 to Fiber Optics Converter)

Description

The OPT-700 is a Fiber Optic Modem designed to provide a versatile connection between asynchronous serial communication interfaces such as EIA-232-C and EIA-485 using Fiber Optic cable. It will allow any piece of equipment that uses half-duplex asynchronous serial communication at distances up to 4.0 km with great benefit of EMI immunity.

It can be configured point-to-point or in a multidrop configuration using the Repeat feature.

The OPT-700 supports a broad range of configurable baud rates for the asynchronous serial communication. EIA-232-C can work between 2400 and 115.2Kbps, while EIA-485 works from 2400 till 920Kbps.

Once Fiber Optic is immune to EMI/RFI and ground loops, the Modem can replace converters and isolators when connecting remote devices.
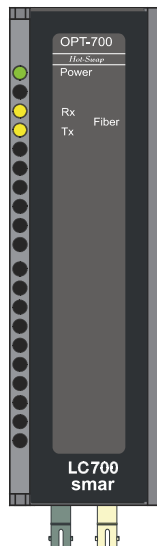

Figure 1 - Serial to Fiber Optics Converter- OPT-700

Main Characteristics

✓ It works directly in the LC700/DFI backplane draining power from the Inter-Module-Bus (IMB).

✓ It can be used in a stand-alone mode with an external power supply.

✓ It accepts EIA-232-C or EIA-485 with configurable baud rates.

✓ It supports Point-to-Point or Multidrop Fiber Optic communication.

✓ It is a great solution to increase link distances and eliminate EMI or Grounding problems.
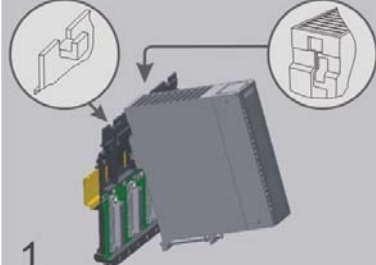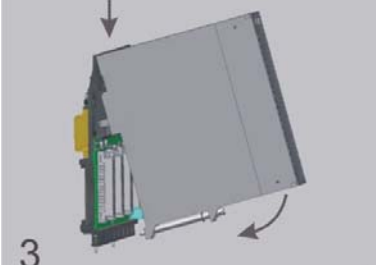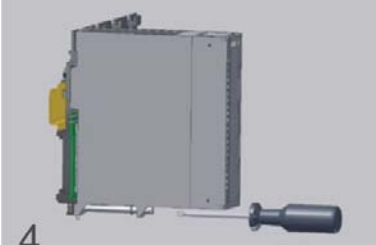
Fiber Optic Cable
This is a Dual or Simple multimode, 62.5 or 50/125µm fiber optic cable with ST connectors and a Maximum length of 4000m (12,000ft).

Basic Installation Steps

✓ Set the internal jumper (J1) to use internal or external power supply. To remove the circuit board from the plastic module push with moderate pressure each tab (top and bottom) close to the grids, while forcing to separate the box from the front plastic panel.

✓ Decide which RS asynchronous interface is going to be used. Configure Switch #1 (see table below.)

✓ Find out the working baud rate and configure Switch #2 (high or low baud rate range) then turn on only one of the switches between #4 and #8.

✓ Determine the necessity to work with point-to-point or multi-drop connection and define all necessary cable, and then make sure the repeat Switch#2 is correctly configured on each OPT-700 converter.

✓ Make all connections and start the system. Follow the signal by the Rx and Tx LEDs on the front panel. They will blink according to the data across the fiber line.

✓ If there are any problems go to the "Troubleshooting" section of this Manual.

Installing the Module in the Rack

Follow the steps below to install the module in the rack.

1	Attach the top of the module (with a 45° inclination) to the module support located on the upper part of the rack.
2	Mounting detail.
3	Push the module fixing it to the module connector.
4	Next, fix the module to the rack using a screwdriver, and fasten the fixation screw at the bottom of the module.

Front Panel Overview

The figure below shows the OPT-700 module with the front cover opened. From top to bottom we can see the DB9 connector for the EIA-232-C, the 5-position terminal for the EIA-485 and external power supply, 8 DIP switches for configuration, and finally the fiber optic receiver and transmitter.

Note
If the connection with the DB9 port is permanent, the DB9-EXT cable must be used to allow the panel to be opened.
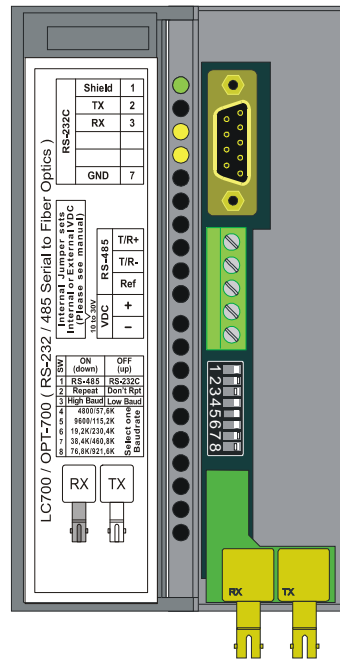
Figure 2- Overview of the front panel

Connecting in an External Source

Using this modem as a stand-alone device requires that the internal jumper (J1) be removed from the default position and placed into the "external PS" position. The circuit must be removed from the box to modify the jumper configuration.

Next connect an external power supply to terminal VDC +/-. The OPT-700 can work with a range of 12 to 30 Vdc and will drain a maximum current of 200mA.
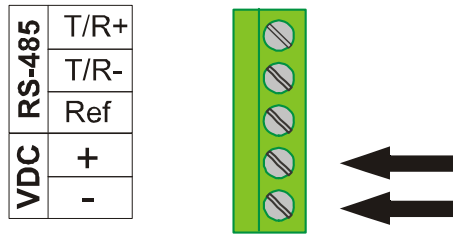
Figure 3 - Connecting an external source

RS-232 CONNECTOR

Pin	Function
1	Shield
2	Receives
3	Transmits
7	Ground (Reference Signal)

Point to Point Operation

It is the simplest type of link. Configure each side of the link with the appropriate RS interface and Baud rate. Notice that the RS interfaces on both sides can be different and the baud rate on both sides need to match. In this case both units must have the Repeat Switch #2 OFF. See figure below.

Figure 4 – Point to point operation

Multi-drop Operation

The OPT-700 can also be used for multiple drops by forming a ring configuration. In this way when a Master modem transmits the signal all of the slave devices are able to receive the information.
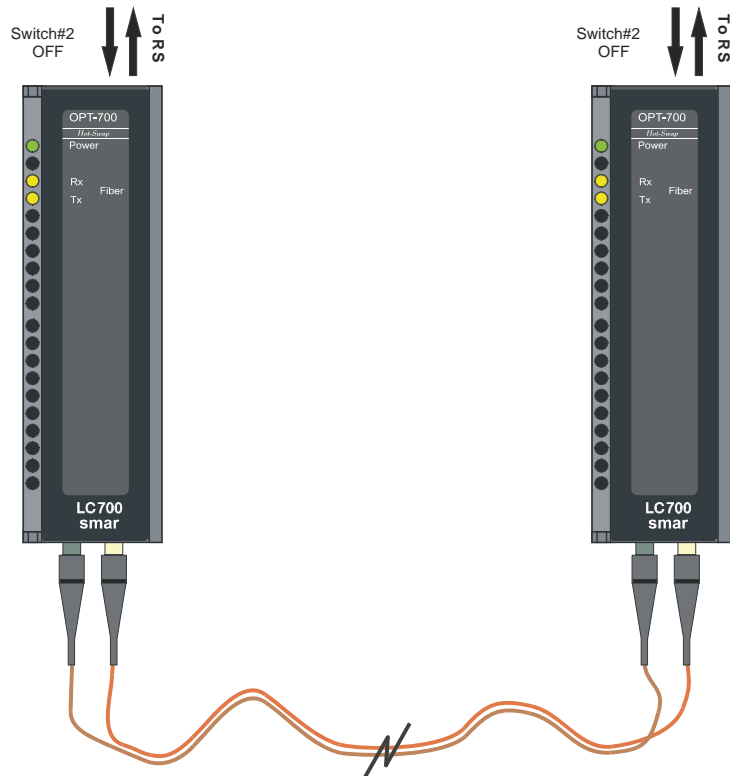
The Master OPT-700 will be in the "Do Not Repeat" mode Switch#2 OFF while all slaves require Switch #2 set to the ON position (Repeat Mode.)
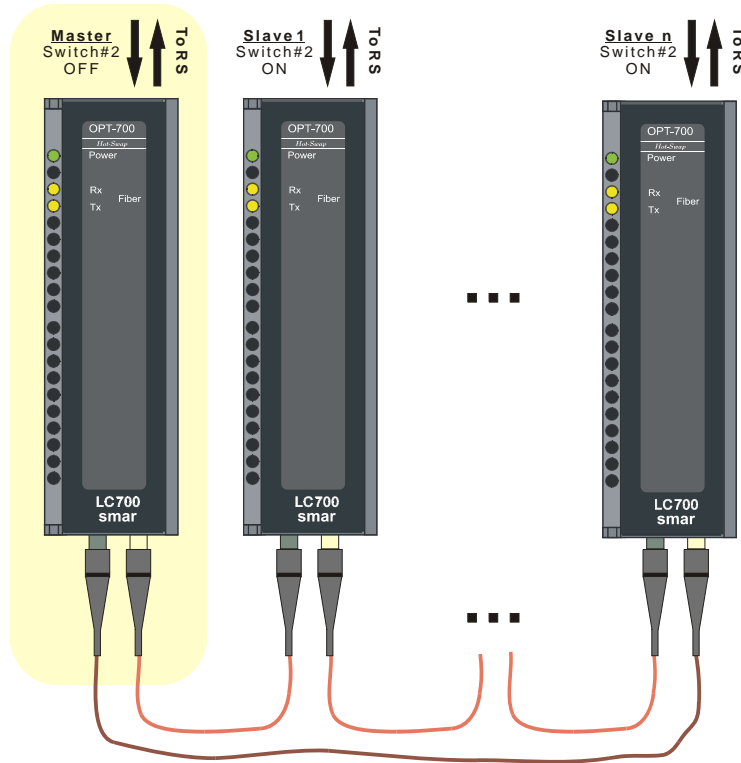
Figure 5 - Multi- Drop Operation

LC700 Applications

The OPT-700 is a great solution for reliable long distance communications with the Smar LC700 Universal Hybrid Controller.

It can be used in the following ways:
- MODBUS Point-to-point to a computer for Monitoring or Configuration. Computer is the Master and LC700 is the Slave.
- MODBUS Multidrop. One computer connects to many LC700s and other MODBUS devices. Computer is the Master and all others are Slaves.
- Connect the LC700 CPU to the Remote I/O Interfaces. One RIO interface in point-to-point or more than one RIO in a multidrop repeat optical loop.

Configuring the DIP Switches

1
EIA - 232=off / 485=on = Switch 1 ON
EIA-485=off / 232=on = Switch 1 OFF

2
Repeater ON= Switch 2 ON
Repeater OFF = Switch 2 OFF

3
Higher baud rate Range = Switch 3 ON
Lower baud rate Range= Switch 3 OFF

Switch settings for baud rate selection:
Only one switch should be On to select the baud rate. Check switch # 3 for baud rate Range.

Switch
Lower baud rate Range
Higher baud rate Range

4
4.8k
57.6k

5
9.6k
115.2k

6
19.2k
230.4k

7
38.4k
460.8k

8
76.8k
921.6k

ON

CircuitBoard

1 2 3 4 5 6 7 8

Figure 6 – Configuring the DIP Switches

Technical Specifications

Internal Source	
IMB	5 Vdc
Power Consumption	1.9 W
Current Consumption	260 mA max.

External Source	
Voltage Range	10 to 35Vdc
Current Consumption	80 mA @ 24 Vdc

Optical Transmission	
Optical Transmission Line	62,5 or 50/125 µm optical cable with ST connectors
Optical Wavelength	820 nm
Typical Maximum Fiber Length	4000 m (12000 ft.)
Baud Rates	EIA-232, 2.4Kbps to 57Kbps EIA-485, 4.8Kbps to 920Kbps

Troubleshooting

- Make sure that all of the connections are complete and the power is ON. If power is not on then check the power supply selection jumper that is located on the circuit board "J1".

- While you are using the EIA-232 configuration, the EIA-485 should be disconnected and the switch # 1 should be in the off position. The repeater switch # 2 should be in the off position (except for OPT-700 connected to Slave devices in a multidrop mode).

- While you are using the EIA-485 configuration, the EIA-232 should be disconnected and the switch # 1 should be in the on position. For the multidrop mode, the repeater switch#2 should be in the on position for all OPT-700 except the one attached to the Master device.

- Make sure that all of the devices in the communication system are using the same baud rate.

- All fiber cables should be connected, see point-to-point or multi-drop connection.

Appendix A

<table>
<tr>
<td rowspan="2">smar</td>
<td colspan="2" align="center">SRF – SERVICE REQUEST FORM</td>
</tr>
<tr>
<td align="center">OPT700 – Serial to Fiber Optic Converter</td>
<td>Proposal Nº:</td>
</tr>
</table>

COMPANY INFORMATION

Company: _____

Unit: _____

Invoice: _____

COMMERCIAL CONTACT

Full Name: _____

Phone: _____ _____ _____ _____ **Fax:** _____

E-mail: _____

TECHNICAL CONTACT

Full Name: _____

Phone: _____ _____ _____ _____ **Extension:** _____

E-mail: _____

EQUIPMENT DATA

Model: _____

Serial Number: _____

PROCESS DATA

Process Type (Ex. boiler control)**:** _____

Operation Time: _____

Failure Date: _____

FAILURE DESCRIPTON

(Please, describe the failure. Can the error be reproduced? Is it repetitive?)
_____
_____
_____
_____
_____

OBSERVATIONS

_____
_____
_____
_____
_____

USER INFORMATION

Company: _____

Contact: _____

Section: _____

Title: _____ **Signature:** _____

Phone: _____ _____ _____ _____ **Extension:** _____

E-mail: _____ **Date:** _____/ _____/ _____

For warranty or non-warranty repair, please contact your representative.
Further information about address and contacts can be found on **www.smar.com/contactus.asp**