

THE SECURITY  
LONG RANGE  
AND QUALITY  
OF FIBRE OPTICS

The AFO485 family of fibre optics modems allows data transmission over multimode or single mode fibre optics for industrial applications.

Great attention was focused on security functions; all models provide an alarm output in case of reception failure, as well as a double DC supply input to facilitate maintenance operations.



### Key-features

- Up to 1.5 Mb/s asynchronous
- RS232 / RS485 / RS422
- Profibus, Modbus, Unitelway, DH485, Sysmacway, CAN
- Up to 68 km range
- Alarm output
- Double DC supply
- DIN rail mounting
- 9 to 40 VDC power supply



# AFO485

# Fibre optic modem RS232-RS485-RS422 or CAN interface

## A range of products for asynchronous field bus protocols

The AFO485 with asynchronous RS232-RS485-RS422 interfaces are available as well for multimode F.O. (820 nm or 1300 nm optical wavelength) or single mode F.O. (1300 nm optical wavelength).

The AFO485-AST70 model has a high optical power budget ensuring a 68 km range through single mode F.O..

## AFO485-CXX for CAN OPEN protocol

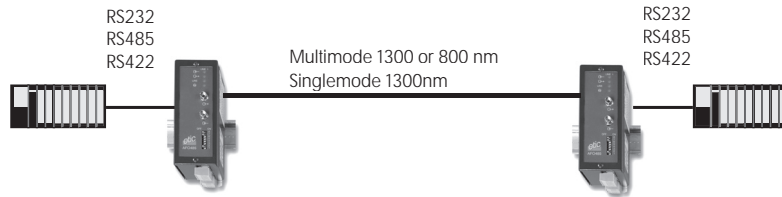
The AFO485-C10 or -C20 or -C30 provides the capability to bridge 2 remote CAN networks.

The interface of the product conforms with CAN ISO DIS 11898.

## Designed for network security

The alarm output provides the information of failure on the F.O. link.

The double DC supply input allows the maintenance of the PLC cabinet without interrupting the network.



### Characteristics

Dimensions	115 x 48 x 97 mm (h, l, d)
E.M.I.	89/366/CEE / EN 50082-2 / EN 5522 / EN 61000-4-5
Protection class	IP30
Power requirements	9 to 40 VDC 160 mA / 24 VDC
Operating temperature	-20°C / + 60°C dry air
RS232 RS485 - RS422 interface	<ul style="list-style-type: none"> <li>■ Not isolated</li> <li>■ Asynch. 7 or 8 bits + 1 start, 1 or 2 stops</li> <li>■ Parity: None / odd / even</li> <li>■ 1,2 to 115,2 kb/s - 93.5 - 187.5 - 500 - 1500 kb/s</li> </ul>
Field bus	PROFIBUS DP, MODBUS, UNITELWAY, DH-485, SYSMAC-WAY, CAN ISO-DIS-11898
Configuration	8 micro-switches
Type of F.O.	<ul style="list-style-type: none"> <li>■ Multimode or single mode</li> <li>■ Reception and transmission fibers</li> </ul>
Optical connector	ST or SC
Modulation	«On-line» Miller code
Alarm output	Relay digital output: Open when the power is off or when a carrier failure has been detected on the RX or TX F.O.

AFO485 - . . .	10	20	30	40	C10	C20	C30	C40
RS485	•	•	•	•				
RS422 - RS232 half-duplex	•	•	•	•				
CAN DIS ISO 11898					•	•	•	•
Multimode F.O.	•	•			•	•		
Single mode F.O.			•	•			•	•
820 nm	•				•			
1300 nm		•	•	•		•	•	•
Power budget min 25°C (dB)	12	12	17	10	12	12	17	10
Alarm output	•	•	•	•	•	•	•	•
Double supply V. input	•	•	•	•	•	•	•	•
Connectors	ST only							

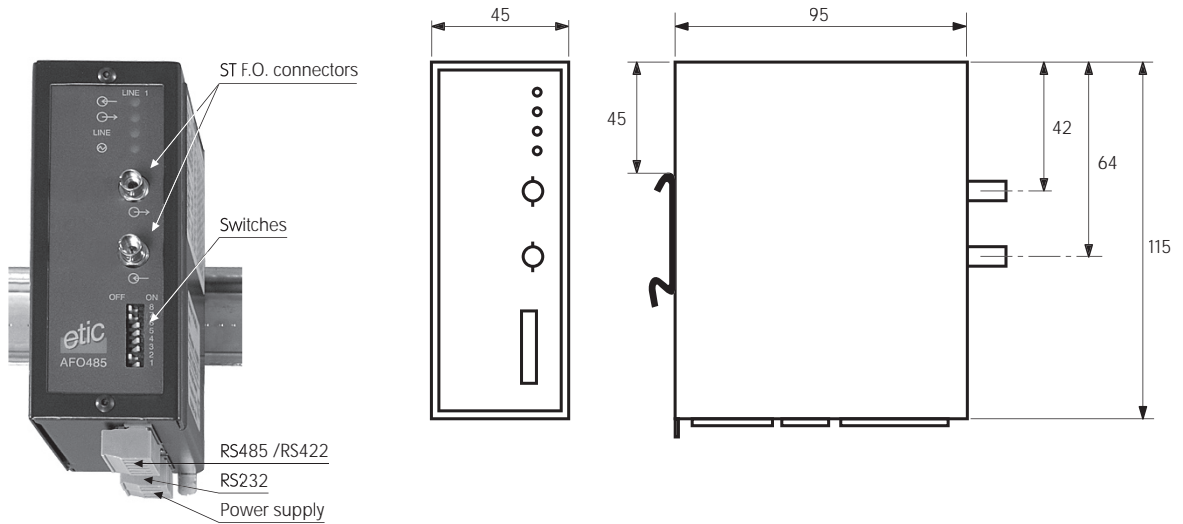
### References for new designs

AFO485 -AST• •	20	30	40	50	60	70
AFO485 -ASC• •						
RS485	•	•	•	•	•	•
RS422 - RS232 full-duplex	•	•	•	•	•	•
Multimode F.O.	•					
Single mode F.O.		•	•	•	•	•
1300 nm	•	•	•	•	•	•
Power budget min 25°C (dB)	11	19	12	30	34	37
Alarm output	•	•	•	•	•	•
Double supply V. input	•	•	•	•	•	•
Optical connectors :	SC or ST					

# Fibre optic modem RS232-RS485-RS422 or CAN interface

# AFO485

## Description



## Range (RS232 / RS485 / RS422 models)



Table 1: Range (Km) using multimode F.O.

Reference	Optical source	Optical pow. (dB)		F.O. type G50/125		F.O. type G62/125	
		A	B	Attenuation (dB/km)	Range (km)	Loss (dB/km)	Range (km)
				C	$D1=(A-B)/C$	C	$D1=(A-B)/C$
AFO485-10	820 nm	12	3	2,5	3,5	3,5	2,6
AFO485-20	1300 nm	12	3	1	9	1,5	6
AFO485-AST20	1300 nm	11	3	1	8	1,5	5,3

Table 2: Range (Km) using single mode F.O.

Reference	Optical source	Optical pow. (dB)		Loss (dB/km)	Range (km)
		A	B		
				C	$D1=(A-B)/C$
AFO485-30	1300 nm	17	3	0,5	28
AFO485-40	1300 nm	10	3	0,5	14
AFO485-AST30	1300 nm	19	3	0,5	32
AFO485-AST40	1300 nm	12	3	0,5	18
AFO485-AST50	1300 nm	30	3	0,5	54
AFO485-AST60	1300 nm	34	3	0,5	62
AFO485-AST70	1300 nm	37	3	0,5	68

## Range (CAN OPEN models)



The range D1 cannot exceed the smallest value between :

- The optical range as given by table 3 or 4 below (according to the F.O. type and the optical source).
- The CAN BUS range as given by table 5 (according to the CAN BUS data rate).

Table 3: Range (Km) using multimode F.O.

Reference	Optical source	F.O. type G50/125			F.O. type G62/125		
		Optical pow. (dB)	Reserve (dB)	Loss (dB/km)	Range (km)	Loss (dB/km)	Range (km)
		A	B	C	$D1=(A-B)/C$	C	$D1=(A-B)/C$
AFO485-C10	820 nm	12	3	2,5	3,5	3,5	3,5
AFO485-C20	1300 nm	12	3	1	9	1,5	8

Table 4: Range (Km) using single mode F.O.

Reference	Optical source	Optical pow. (dB)	Reserve (dB)	Loss (dB/km)	Range (km)
		A	B	C	$D1=(A-B)/C$
AFO485-C30	1300 nm	17	3	0,5	28
AFO485-C40	1300 nm				

Table 5: CAN BUS Range (Km)

Data rate	1/2 Tb	2/3 Tb	CIA (87%)	Data rate	1/2 Tb	2/3 Tb	CIA (87%)
10 Kb/s	5,9	6,5	3,6	125 Kb/s	0,3	0,4	0,6
20 Kb/s	2,4	3,2	4,3	250 Kb/s	0,1	0,16	0,23
50 Kb/s	0,9	1,2	1,6	500 Kb/s	-	0,06	0,15
100 Kb/s	0,4	0,5	0,8				

## Accessories

Designation	Characteristics	Reference
RS232 cable	L. 1,5 m - DB9 M / RJ45	CAB593
Multimode F.O. cable	L. 1 m - ST connector	CAB594
Monomode F.O. cable	L. 1 m - ST connector	CAB595
Power supply modules	Refer to Power supply modules for details	AS05 - AS06 - AS07
Power supply surge protection	Refer to Protections for details	PS05

## Connecting cables for PLCs

Refer to CABLES section to select the cable corresponding to your application.

## Delivery content

AFO485 - User guide in English