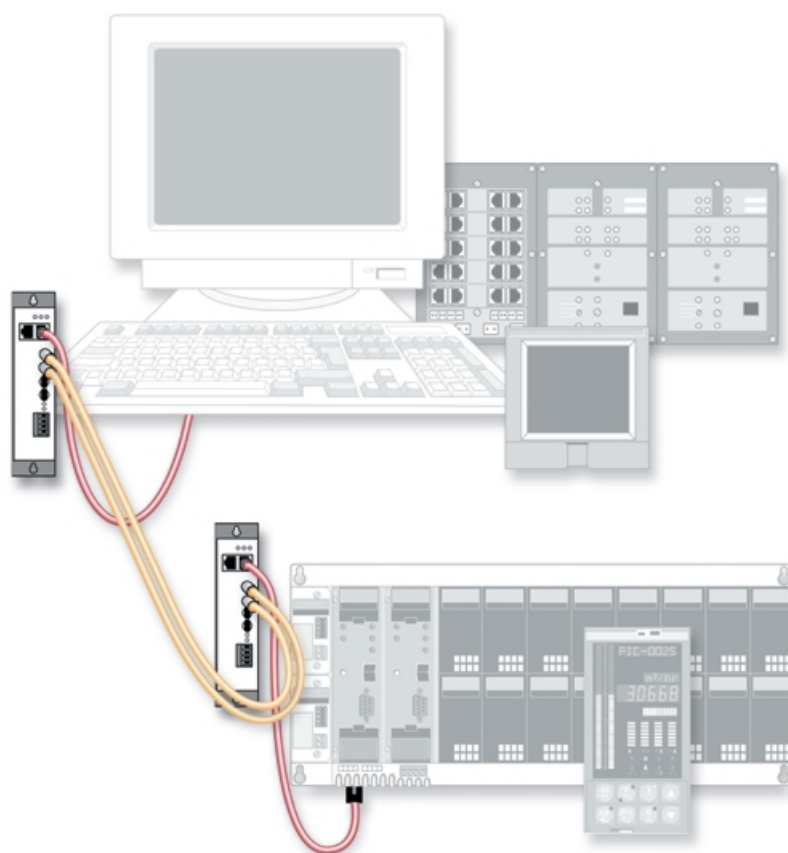


S9576
MODEL

ALIN Compact Active Hubs Product Data



EUROTHERM

CONTROLS
DATA MANAGEMENT
PROCESS AUTOMATION

S9576 ALIN COMPACT ACTIVE HUBS

Twisted-pair or fibre-optic cable

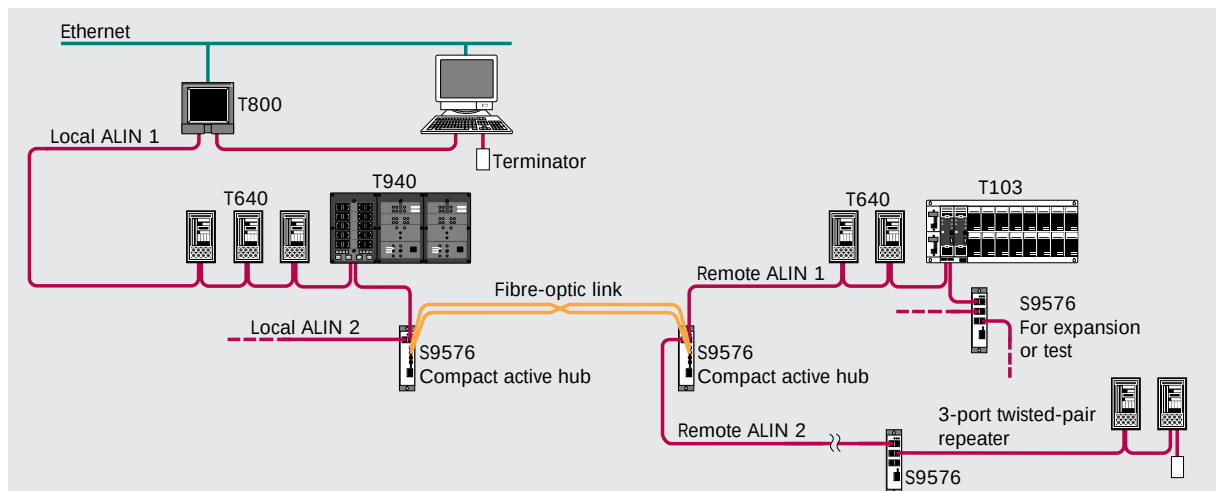
Increase ALIN node capacity to 254 nodes

Transmission distances up to 2700m per fibre-optic link

Electrical isolation

High noise immunity

Redundant connection for dual server workstations



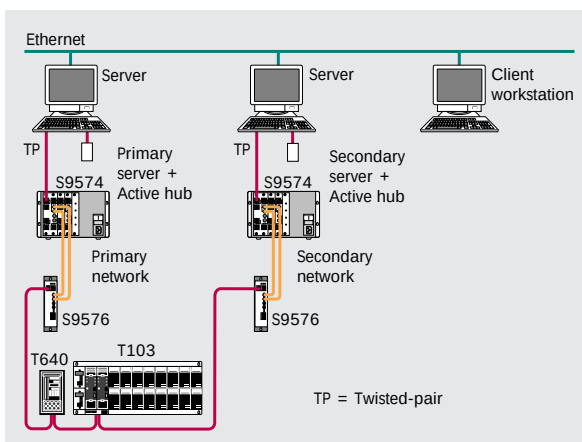
ALIN network connectivity

INTRODUCTION

The Eurotherm Process Automation distributed control system uses the ALIN (Arcnet Local Instrument Network) as a control network to link control units together. This network is able to support up to 16 nodes with a nominal maximum cable length of 100 metres. The network can be expanded by the use of active hubs which support both twisted-pair and fibre-optic technology. These active hubs support multiple cable connections

and allow many more nodes to be connected using a combination of bus and star topology. The ALIN may be run over much longer distances by using a compact active hub at either end of a fibre-optic link to convert the media from twisted-pair to glass or plastic fibre-optic cable. With the use of multiple fibre-optic hubs, the maximum distance over which a network may run is extended to 2.7 kilometres.

The use of this medium is also beneficial in areas with a high degree of electrical noise and inter-building communication or areas with earth potential differences.



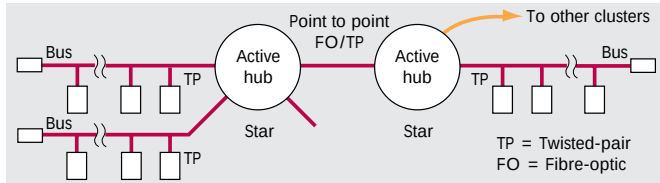
Redundant connection for dual server workstations

REDUNDANT CONNECTION FOR DUAL SERVER WORKSTATION

The integrity of an ALIN segment may be protected against the failure of a cable by the use of an active hub as a buffer/network isolator. Thus two server workstations connections may each be connected via an active hub. In the event of failure of the primary network, hubs or server workstation itself, the operator is assured access via the secondary server and its independent network connection.

NETWORK ARCHITECTURE

The active hub may be considered a buffer/isolator supporting multiple network connections using either twisted-pair or fibre-optic cables. It allows mixed star/bus topologies both for expanding the node capacity of local network clusters, and for extending the network length over considerable distances.



Distributed ALIN bus/star topology

INSTALLATION

ALIN twisted-pair cabling

Connection to the ALIN network is made in 100 ohms shielded category 5 cable using either screw terminals, or an RJ45 connector which is also used to connect to the active hub. The integrity of the cable shield should be maintained throughout the system by having all foil screens or drain wires connected together. A terminal on each T640 loop controller or T221 gateway provides a convenient tie point for the drain wires, while the shield of the RJ45 connectors maintains continuity across T103/T303 units.

Arcnet transceivers

The transceivers used on the ALIN nodes have better performance than conventional twisted-pair bus transceivers and a total of 16 nodes can be supported on one bus segment. However when using active hubs the ARCNET standard of eight nodes per segment should not be exceeded.

Termination

The twisted pair port on the active hub appears as a balanced twisted-pair port with a high input impedance. This port is not a termination and allows the hub to be fitted anywhere in a segment. If the active-hub is connected to the end of an ALIN segment, an end-of-line terminator (LA 249397) must be fitted in the spare RJ45 jack.

Connecting to the compact active hub

Refer to the diagram below when connecting the active hub to either the end of an ALIN segment or between two ALIN segments. Observe correct polarity of signals since reverse polarity will cause unreliable operation.

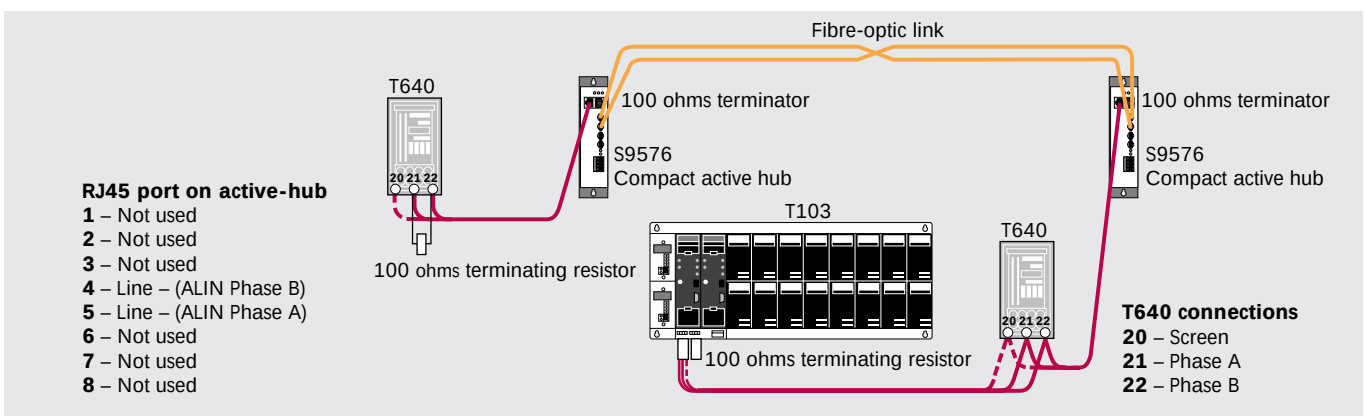
Owing to the nature of fibre-optic communications, a duplex arrangement is needed thus necessitating two cores per connection (1 transmit/1 receive).

Expansion to fibre-optic cables

The compact active hubs provide three ports (3 twisted or 1 twisted-pair with 2 fibre-optic). The twisted pair ports can extend the bus by 122 metres, but the fibre-optic ports can extend the bus upto 2.7km per link.

Fibre-optic cable types and connectors

There are three common diameters of fibre-optic cable that are supported by the active hubs, namely 50/125, 62.5/125 and 100/140 microns.



Typical connection diagram using active hubs to extend an ALIN segment

SPECIFICATIONS

General

CE	CE conforms to EMC Directive 89/336/EEC amended by 93/68/EEC, and also with the Low Voltage Directive 72/23/EEC
Safety:	EN60950
EMC emissions:	EN55022:1995 Class A
EMC immunity:	EN50082-2 Industrial environment
Operating temperature:	0 to +60°C
Storage:	-40 to +85°C
Supply voltage:	24V nominal: 10-36V dc 8-24V ac 47-63Hz
Input power:	4 watts
Isolation:	Individual transformer isolation on each ALIN port; note that the cable screens should be connected to chassis via shielded connector to ensure EMC conformance

Node capacity and cable lengths

	Cable	Connector	Length/ Segment	Notes
Twisted-pair bus:	Cat 5 (shielded)	RJ45	100m	16 nodes max (No active hubs)
Twisted -pair bus	Cat 5 (shielded)	RJ45	122m	8 nodes max per segment with active hubs
Glass fibre-optic:	50/125 ¹	ST	915m	Point to point pair
	62.5/125	ST	1825m	Point to point pair
	100/140	ST	2740m	Point to point pair

Note:
1. 62.5/125 cable generally preferred

Basic ALIN specifications

Data rate:	2.5Mb/s
Access method:	Token passing
Max node addresses/network:	254
Max electrical nodes per segment:	8
Max distance:	6700m approx (with fibre-optic cable and repeaters assuming extended timeouts are not used)

Note: The total combined transmission distance using fibre-optic cable and multiple hubs depends on the signal propagation delay along the transmission media.

Propagation delays

Max one-way delay for	
ALIN segment:	31µs
Active hub:	320ns
Cat 5 cable:	5.7ns/m
Fibre-optic cable:	5ns/m

ORDERING INFORMATION

S9576 ALIN compact active hub

Base unit	Connection			
S9576	AI3-TB5			

Example

Base unit	Code
ALIN compact active hub	S9576

Connection	
3-port twisted-pair with RJ45 connector	AI3-TB5
2-port fibre-optic glass pair with ST connector	AI3-FOG-ST/TB5
and 1-port twisted-pair with RJ45 connector	

S9508-5 ALIN cable

Base unit	Connection			
S9508-5	2RJ45			

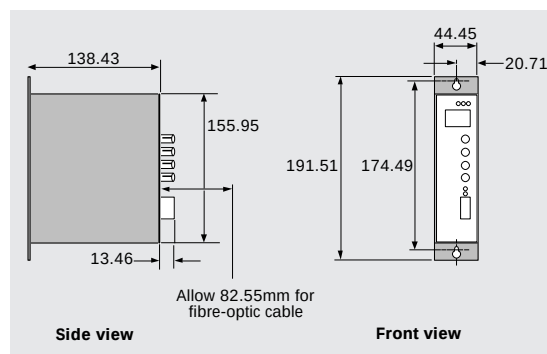
Example

Cable types	Code
ALIN cable Cat 5 shielded 100Ω	S9508-5

Connection	
RJ45-45 adapter (S9576 to S9576, S9574, T103/T303, PCALIN)	2RJ45
RJ45-ferrules (S9576 to T640, T221)	1RJ45
RJ11-RJ45, crossed (S9576 to ALIN (ArcNet) card, ALIN adaptor)	RJ11-45X
RJ11-RJ45, direct (S9576 to PCM20 (PCMCIA) adaptor)	RJ11-45D

Fibre-optic cable: Installation of fibre-optic cables is a specialist activity – consult factory

DIMENSIONS



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