



# Extending the deployment range of BGAN terminals

using Duet Broadcast Systems

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## 1 Overview

Setting up BGAN terminals in densely populated locations can be a challenge, especially where tall buildings or other obstructions impair line of sight. In many situations, standard network cabling may not be of sufficient length to connect the terminal at its optimum orientation with the workstation in use.

Telecast Fiber Cable Reels and Transceiver modules provide a light-weight, easy to deploy solution for BGAN users. This solution enables you to rapidly deploy your satellite terminal in a remote area with good line of sight, while retaining the flexibility of choosing an ideal workplace location.

## 2 Product range

The Telecast Fiber products suggested for use with BGAN are as follows:

- **Tac-Series Fiber Optic Cables** – military grade fiber cables, available in core counts from 1 to 12 fibers, and capable of extending communications for kilometres. They are paired with multipin connectors that protect fiber ends and their fragile alignment mechanisms from damage. Securely stored in durable reels.
- **TR5900 10/100 Base Ethernet Modules** – TR5900 modules are easy to install Ethernet to Fiber interfaces that enable fiber optic communications between the user's laptop and the BGAN terminal. These modules are available in 3 versions:
  - **MTR5900-A** - A throwdown module with a single mode, single fiber connection operating with a -10dBm@1330nm laser output and -30dBm@1550nm laser input
  - **MTR5900-E** – A throwdown module with a single mode, single fiber connection operating with a -10dBm@1550nm laser output and -30dBm@1330nm laser input.
  - **MTR5900-AA** - A throwdown module with a single / multi mode, dual fiber connection operating with a -10dBm @1330nm laser output and -30dBm @1330nm laser output

## 3 Features

Telecast Fiber cable products and transceiver modules offer the following main features to users of BGAN terminals:

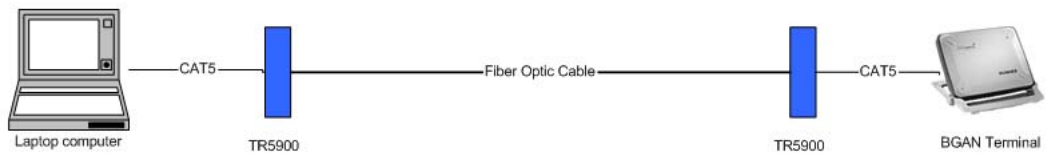
- **Durability** – Tac Series fiber cables are crush resistant, able to operate at extreme temperature ranges and jacketed in polyurethane to protect against cuts, abrasions as well as chemical resistance.
- **Speed and distance** – TR5900 modules are able to transmit data at 10 /100 mbps, over much longer distances than conventional UTP Cat5 cables.
- **Portable** – TR5900 modules are lightweight and easy to include in a setup that already includes a computer, a standard BGAN terminal and a portable means for electricity generation. TAC Cables and OX reels have good weight to distance ratios.
- **Plug and Play** – No additional configuration needed aside from physically deploying the TR5900 and laying the cables. Acts like a standard Ethernet network and allows connection to the BGAN network using the standard interface.

## 4 Benefits to BGAN users

Telecast Fiber cable products and transceiver modules offer the following main benefits to users of BGAN terminals:

- Greater flexibility when choosing a location to deploy a mobile work area, without being hampered by compromises between signal acquisition, ideal location, and work comfort.
- Provides an easy to deploy and pack up solution, without the need for established infrastructure to be already in place.
- Adds only an insignificant amount of additional weight in exchange for the benefits of fiber optic based communications.

## 5 Setting up



### 5.1 Before starting

The following equipment is required for the set up shown above:

- Computer(s) with an Ethernet interface.
- BGAN terminal.
- Standard length of UTP Cat5 Cable
- At least one OX-series Fiber Optic Cable reel with TAC Series cable and ST connectors
- A pair of TR5900 Ethernet to Fiber Interface modules

### 5.2 Setup procedure

Before setting up, determine an ideal location for your BGAN terminal to receive a satellite signal, as well as an ideal workspace location to deploy your computer. Then do the following:

1. Set up both your terminal and workspace as normal.
2. Set up one TR5900 module in each of the two locations, and connect the Cat5 cables from the computer/terminal to the appropriate connectors on the TR5900.
3. Run the length of Fiber Optic Cable between both modules and attach one end of each to the TR5900.
4. Power on your equipment and connect to the BGAN network using normal procedures.

## 6 Inmarsat test results

This solution has been tested with the Thrane & Thrane EXPLORER 110 / 300 / 500 / 700 / 727, Sailor 500, JRC 250, and Wideye Sabre 1 terminals. The computer picked up the Ethernet connection straight away. No special configuration is required.

## 7 Technical summary

The TR5900 modules feature sets are summarized below:

Signal interface	
Data support	10BaseT / 100BaseT
Connector, Twisted pair	RJ45
Cable compatibility	UTP 100Ω Cat.5
EMI & safety	FCC Class A, CE

Electro-optical	
Operating wavelength	1300nm or 1500 nm range
Transmitter output options	-10dBm
Receiver input range	-30dBm
Optical source/detector type	Laser diode/PIN
Fiber compatibility	Single mode

Mechanical/environmental	
Dimensions (W x L x D)	3.35" x 7.66" x 0.94"
Weight (per stand alone module)	10 ounces
Power requirements (typ., per module)	3 watts @10 to 18VDC
Temperature range	0° to + 50°C
Humidity range	10 to 90% RH, Noncond.

Tac Series Cable feature sets are summarized below:

<b>Optical fiber characteristics</b>	
Outer layer	Polyurethane jacket
Inner layer	500µm acrylate primary coating with 900µm diameter hard elastomeric buffer
Fiber core counts	1, 2, 4, 6, 12
Core fiber type	8µm (single mode) 50µm / 62.5µm (multimode)
Pin connectors	Single ST Military Multipin
Attenuation	≤ 1 dB/KM@ 1300nm
Bandwidth, modal (multimode)	≥ 500MHz-km@1300nm
Attenuation	1 dB/KM@ 1300nm
Temperature range	-55°C to +85°C. Storage up to -70°C

<b>Mechanical characteristics</b>				
No fiber	Cable diameter	Cable weight	Load, short term	Load, long term
1	5.0 mm	23 kg/km	400 lbf	130 lbf
2	5.0 mm	23 kg/km	400 lbf	130 lbf
4	6.0 mm	28 kg/km	400 lbf	130 lbf
6	6.0 mm	28 kg/km	400 lbf	130 lbf
12	7.0 mm	42 kg/km	450 lbf	140 lbf

OX Series Reels feature sets are summarized below:

<b>Dimension comparisons</b>			
<b>Dimension</b>	<b>SM</b>	<b>MD</b>	<b>XL</b>
Height (in.)	11.85	16.53	19.88
Length (in.)	11.68	15.41	18.38
Width (in.)	12.72	12.94	14.4
Drum diameter (in.)	6	6	6
Traverse (in.)	8.7	9	9.62
Range diameter (in.)	11	14	17.25
Weight (lbs)	11	15	26

## **8 Further details and support**

### **8.1 Inmarsat contact**

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