

**INSTALLATION INSTRUCTIONS
FOR
CASE MEGASTREAM OPTICAL 1A
AND
CUSTOMERS 2MBIT/S OPTICAL
FIBRE LINE TERMINAL**

(not to be removed from site)



British Telecom Private Circuit Services
UKC/PCS4.2.1

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1 SAFETY

THE EQUIPMENT THAT WILL BE INSTALLED WITHIN THIS CASE WILL BE USED TO PROVIDE A 2MBIT/S MEGASTREAM PATH ON OPTICAL FIBRE. IT SHOULD BE BORNE IN MIND THAT ANY WORK DONE ON OPTICAL SYSTEMS CAN PRESENT A SAFETY RISK IF NOT CARRIED OUT IN A PRESCRIBED MANNER BY TRAINED STAFF. TO THIS END ANY WORK CARRIED OUT ON THE OPTICAL EQUIPMENT MUST BE CARRIED OUT IN ACCORDANCE WITH ISIS DOCUMENT SFY/CSP/B039 "SAFE WORKING PRACTICES FOR OPTICAL FIBRE SYSTEMS".

2 GENERAL

The Case MegaStream Optical No1A (CMO1A) is a wall or table top mounted unit for housing the line terminal equipment associated with two separate 2Mbit/s Optical Fibre Digital Line Sections (OFDLS) in customers premises.

3 DESCRIPTION

The CM01A is approximately 540mm x 305mm x 150mm and is designed for wall or table top mounting. The front feet are raised for table top mounting and lowered for wall mounting.

The case is divided into two compartments, one for each terminal. The customers interface for each system is provided at the rear of the case via two BNC connectors. Provision has been made to label the case with the MegaStream circuit numbers to aid with maintenance. In addition a locking switch has been provided to permit the customer to apply local loopbacks at the interface along with LED's to indicate Network or Customers alarms.

The case requires a single -50V power supply and takes a maximum current of 1A. This may be obtained from the customer's power system or from a suitable mains power converter.

4 CONTENTS

Packed with the case should be the following items;

No.10x2 inch screws	4
No.10x1 inch wall plugs	4
Connector 237C/3A	1
Sockets Power 2A	3

5 ADDITIONAL EQUIPMENT

5.1 Optical Fibre Termination The equipment used to terminate the external optical fibres within the customers premises will depend upon whether the lead-in is supplied on dedicated cable or on blown fibre. The particular items for each technique are described in the Access Network Information Manual (ANIM) published by LLS1.

A pair of tail cables will be required between the fibre termination housing and the CMO1A. They are available in two lengths and should be chosen as appropriate, these are;

Termination Optical 1001A/005	(5 metres)
Termination Optical 1001A/015	(15 metres)

5.2 Case Installation Various cables are required to supply power and earth connections to the CMO1A.

- Cable ELP 6941X 1.5mm sq. 1W (Green/Yellow).
- Cable ELP 6941X 1.0mm sq. 1W (Blue).
- Cable ELP 6941X 1.0mm sq. 1W (Black).

5.3 OFDLS Units The following additional items are required for each OFDLS;

- Equipment Optical Terminating No13A.
- X-Stream Interface Module No6/1A.

6 FIXING LOCATION

The case shall be fixed to a solid wall or table mounted in a position mutually agreed between the customer and the BT representative. If wall mounted, the case shall be fixed at a height between 1 and 1.5 metres above finished floor level with the BNC connectors to the bottom, such that cables can be easily terminated on the unit.

The position of the case must not contravene any safety regulations or constitute a hazard to anyone or anything. The unit, where possible should be located above the flood level of the building with a minimum of 100mm access on each side. It must be located within easy reach of the optical fibre terminating case where the connection between the external fibre and the internal fibre tails is made. Access to the top and front covers of the case must be such that they can be easily removed for additional installation and maintenance work.

7 CASE INSTALLATION

7.1 Fixing Remove the top of the case and offer the base up to the wall ensuring that the unit is the correct way up. Mark the position of the fixing holes and drill the wall with a No. 10 masonry bit. Fix the case to the wall using the wall-plugs and screws provided.

When installation is complete fix the top cover in place and fit the plastic front cover so that the MegaStream motif is on the right of the case.

7.2 Power and Earth A single 1A –50V power supply is required for the case. This will provide sufficient power for both of the OFDLS in the case. The power can be obtained from the customers supply or from a suitable mains to DC converter. It must be connected to the case using the Cable ELP together with the Connector 237 and Sockets Power supplied in the installation kit as follows;

–50V	-	Pin 2	-	Cable ELP 1.0 mm sq. Blue
OV	-	Pin 1	-	Cable ELP 1.0 mm sq. Black

The wires should be fed into the bottom of the case via the small cable aperture on the left hand side. The Connector 237 can be inserted into either of the receptable connectors mounted on the backplanes within the case, however it is recommended that the left hand backplane is used in order to keep cabling within the case as neat as possible.

6.0 Ohm ~~sq.~~ A safety earth connection must be made to the case using Cable ELP ~~sq.~~ sq. Green/Yellow. This must be cabled through the large right-hand cable aperture on the case and terminated on the main earth post. The cable must be connected to the building earth using as short a run as possible but not exceeding 100 metres. The resistance of the earth must not exceed 8 ohms.

7.3 Optical Cabling The Termination Optical 1001A must be fed into the case via either the central or right hand cable apertures, through the captive plastic cable ties and the appropriate cable tunnel to the front of the case. The tails should extend from the front of the tunnel for sufficient distance to permit them to be connected to the EOT13A without any tight bends and without cramping when the cover is fitted. The tails should be secured at the point of entry to the case using the plastic ties.

8 APPARATUS INSTALLATION

8.1 Description and Link Settings The EOT13A provides the electro-optic conversion for the line system. Eleven LED's on the front edge of the card indicate the following alarm conditions;

1. Power Fail
2. Terminal Looped Back (Not Used)
3. Receive Attn (Not Used)
4. HDB3 Input Fail
5. Optical Input Fail
6. Supy. System Fail
7. Far End Alarm
8. AIS Detected
9. Single Error (Yellow LED)
10. Errors 10E-5
11. Errors 10E-3

A Label 604A is available which shows the LED indications.

Prior to insertion in the shelf the following links should be checked;

- i. Link 3 - insert vertically on rear pins.
- ii. Link 5 - insert in LONG positions.

Also ensure that the lamp lock switch between LED's 3 and 4 is OFF with the switch in the upper position and that DIL switches 1 and 2 immediately below the LED's are in the OFF position.

8.1.2 Pre-commissioning Checks The EOT13A must be fitted in the upper card location within the shelf. The optical performance of the EOT13A must be checked on installation using the following equipment;

- i. Optical Power Meter No2A.
- ii. Variable Optical Attenuator. 1A
- iii. Cords Test Optical 1/02B. P
- iv. 2Mbit/s pseudo-random pattern generator.
- v. 2Mbit/s bit by bit pattern detector capable of displaying error count and error ratio.

NOTE THE EOT13A OPERATES AT 850nm WAVELENGTH, ENSURE THAT THE POWER METER IS SET ACCORDINGLY BEFORE MAKING TESTS.

TEST RESULTS MUST BE RECORDED ON FORM A5022.

TEST 1. LAUNCH POWER.

Connect the power meter to the OPTO OUT point on the EOT13A. Check that the launched power is $\geq 33\text{dBm}$. Record result on the test form.

TEST 2. RECEIVER SENSITIVITY.

Connect the OPTO OUT and OPTO IN together via the variable optical attenuator set at 0dB. Connect the pseudo random generator to the TFC.IN and the detector to the TFC.OUT. Increase the optical attenuation until the detector shows an error ratio of $1\text{E-}6$. Without disturbing the attenuator setting disconnect the OPTO IN port and connect to the power meter, ensure that the received power level is $\leq 50\text{dBm}$. Record the result on the test form.

With the power meter still connected, reduce the setting of the attenuator until the level of -48db is shown. Disconnect the power meter and connect the fibre to the OPTO IN port. Switch the detector to display Error Count and monitor the signal for 2 minutes for a zero error count. Record the result on the test form.

8.2 X-Stream Interface Module 6/1A

8.2.1 Description The X-Stream Interface Module 6/1A (IM6/1A) provides the alarm detection and loopback facilities required at the customers premises. A series of LED's on the front edge of the card indicate the following alarms;

- | | |
|------|-----------------------|
| D25. | Remote Traffic Fail |
| D24. | Remote Line Fail |
| D26. | Remote Loop Activated |
| D30. | Remote Power Fail |
| | |
| D7. | Local AIS Line |
| D6. | Local AIS Traffic |
| D5. | Local Traffic Fail |

A pair of switches and a further LED on the lower front edge of the board are not used in the customers premises.

8.2.2 Link Settings The X-Stream Interface Module No6/1A is used at both the exchange and customer end of the system. Prior to installation the case various links must be set on the card for customer end operation;

LINK 1	IN	LINK 9	a-b
LINK 2	OUT	LINK 10	a-b
LINK 3	OUT	LINK 11	IN ?
LINK 4	OUT	LINK 12	IN ?
LINK 5	IN OUT	LINK 13	IN ?
LINK 6	OUT IN	LINK 14	OUT
LINK 7	a-b	LINK 15	OUT
LINK 8	IN	LINK 16	OUT

Links 1 and 2 form a matched pair. In the event that the HDB3 signal input from the customer is very low, removing the link 1 and inserting it in link 3 will alter the input threshold of the IM6/1A to permit detection of low level signals. Link 3 may be inserted in situations where the coaxial cable carrying the customers input signal does not have it's screen earthed by the customers terminal equipment.

8.2.3 Connections The IM6/1A should be fitted in the lower card position within the shelf and the following connections made to the EOT13A:

- i. Using the two coaxial links provided with the IM6/1A connect PLB of the IM6/1A to TFC IN of the EOT13A and PLC to TFC OUT.
- ii. Connect the 16 way ribbon header from the IM6/1A to the receptacle on the EOT13A. (It may be necessary to fit this prior to fully inserting the EOT13A).

The coaxial tails from the BNC connectors at the rear of the case should be connected with the tail marked TFC IN connected to PLA and TFC OUT connected to PLD.

9 COMMISSIONING

REMOVE LINK 8

9.1 Alarm and Local Loopback Tests

9.1.1 Alarms The EOT13A and IM6/1A should be connected together as described in par. 8.2.3 and the OPTO IN and OPTO OUT ports on the EOT13A should be connected via the optical attenuator.

Note that the Red LED in the LOOP switch at the rear of the case is glowing.

TEST 1.

Apply a pseudo random signal to TFC IN port on the case and monitor at the TFC OUT. Ensure that no alarm LED's are lit on either of the boards. Gradually increase the value of the attenuator setting noting that LED's glow in the following sequence:

EOT13A	IM6/1A	Case Indicators
i. Yellow LED flashes as errors occur.		
ii. Errors 10E-5 Dist Alm		
iii. Errors 10E-3	Local AIS Line Remote AIS Line	Network LED
iv. LOI Line	As above	As above.

Note that AIS is received on the monitor.

Restore the attenuator to normal ensuring that all LED's are extinguished.

TEST 2.

Remove the signal from the TFC IN port of the case and note that the following LEDs glow;

EOT13A	IM6/1A	Case Indicators
LOI line	Local Traffic Fail	Customer LED
AIS Detect	Local IAS Line	Network LED
Dist ALM	Remote Traffic Fail	
	Remote AIS Line	

Re-connect the signal at the TFC IN point and note that LED's are extinguished.

9.1.2 Local Loopback With the signal generator and monitor connected as described in par. 9.1.1, disconnect the optical path. Press the LOOP switch on the rear of the case noting that it's Red LED is extinguished, and that an error free signal is detected. Press the LOOP switch once more to restore.

9.2 Overall System Tests

9.2.1 General The overall system checks must be carried out in co-operation with the Serving Exchange. The only equipment required at the customers premises is the Optical Power Meter 2A.

9.2.2 Received Level Measurement The fibre tail which is designated to carry the received optical signal should be connected to the OPTO OUT port of the exchange end terminal. Using the OPTICAL Power Meter 2A, check the received power level at the customers premises this should be no less than -45dB.

Record the result on the test form used in par. 8.1.

The tail should now be connected to the OPTO IN port of the EOT13A. The tail of the fibre carrying transmission from the customers premises to the Serving Exchange should be connected to the EOT13A OPTO OUT port for a similar test to be carried out in the opposite direction.

9.2.3 Stability Tests Stability tests should be carried out by placing the customers terminal in loopback under control of the Serving Exchange terminal. All test equipment will be connected at the Serving Exchange DDF and results recorded on the exchange end test form. With the system set up as described percussion tests should be carried out on all electrical connectors and cables. **ON NO ACCOUNT MUST PERCUSSION TESTS BE APPLIED TO THE OPTICAL CABLES.**

The results of the stability test must be recorded on the test form.

10 FAULT PROCEDURE

Any equipment which fails to meet the test requirements laid out in this document must be repackaged and returned to stores with an appropriate fault label for exchange with a new item.

