fibre optics modems

FIBRE-OPTIC (FO) TRANSMISSION TRADITIONALLY IS PRESENT IN LONG HAUL BACKBONE AND METROPOLITAN AREA NETWORKS.

However, since increasingly more fibre becomes available in campus-based and local loop infrastructures, fibre optic transmission becomes also important as a method for the direct connection of traditional end-user applications.

The equipment in this chapter offers a flexible way for the connection of a variety of applications by different types of fibre media. The units support applications based on serial connections, G.703 connections or Ethernet at speeds ranging from 64 kbps up to 45 Mbps.

CROCUS FO10M

FEATURES & BENEFITS

- > MODEM FOR FIBRE OPTIC CONNECTIVITY UP TO 10MBPS
- > WIDE RANGE OF EXCHANGEABLE FIBRE OPTIC MODULES FOR MULTI-MODE AND SINGLE-MODE FIBRE
- > MULTIPLE EXCHANGEABLE DATA INTERFACES FOR CONNECTIVITY TO ANY TYPE OF APPLICATION
- > FULLY MANAGEABLE BY FREE MAINTENANCE SOFTWARE (TMA®)
- > INTEGRATION WITH HP OPENVIEW® MANAGEMENT PLATFORM
- > OPTIONAL REDUNDANCY ON THE OPTICAL LINK

> THE CROCUS FO10M IS A HIGH-SPEED MODEM DESIGNED FOR CONNECTING END-USER EQUIPMENT USING OPTICAL FIBRE.

Thanks to the field exchangeable fibre modules, the Crocus FO10M can be used for almost any type of fibre medium, ranging from short haul multimode fibre, to the long haul singlemode fibre connection. When using a long haul module, distances of over 70 km can easily be covered.

AVAILABLE OPTIC MODULES

Direct SC/PC or ST/PC connectors*
Multimode or single mode modules
Dual fibre or single fibre modules
Up to 70 km
*Note: SC/PC to FC/PC and FC/APC adapter cables (male/male) are also available

USER SPEEDS

- > Internal clocking: Nx64 kbps (up to 2 Mbps) Nx2 Mbps (up to 10 Mbps)
- > Slave/Receive clocking: Nx64 kbps (up to 2 Mbps) Nx2 Mbps (up to 10 Mbps)
- > External clocking: Nx32 kbps (up to 10 Mbps)

AVAILABLE APPLICATION INTERFACES

- > V.35: up to 10 Mbps
- > V.36/RS-449: up to 10 Mbps
- > X.21: up to 10 Mbps
- > RS-530/RS-530A: up to 10 Mbps
- > V.24/RS-232: up to 128 kbps
- > G.703 E1: 2 Mbps (E1 or FE1) fixed
- > Quad G.703 E1: 4 x 2 Mbps (E1) fixed
- > Ethernet IP Router 2M: up to 2 Mbps
- > Ethernet IP Router 10M: up to 10 Mbps

FRONT PANEL

- > Testloops
  AL: Analogue Loop
  RDL: Remote Digital Loop
  DL: Local Digital Loop
  ET: Error Test generator (test pattern 215-1)
- > Indications
  PWR: Power
  TST: Test indicator (circuit 142)
  ERR: Bit Error Indicator (Error test) - AIS for G.703
  DCD A: Data Carrier Detect for fibre module A (circuit 109)
  DCD B: Data Carrier Detect for fibre module B (circuit 109)
  TXD: Transmit data (circuit 103)
  RXD: Receive data (circuit 104)

SUPPLEMENTARY FEATURES

- > The modem has a flash memory to allow firmware upgrades
- > Maintenance of local and remote modem with free Windows ® software
- > Integrated network management module for HP OpenView ®
- > Optional Second optic module for redundancy

MECHANICAL DATA (H X W XD)

- > Desktop versions: 50 x 200 x 350 mm weight: 1.4 kg
- > Rack-mount versions: 235 x 20 x 300 mm weight: 1 kg

POWER REQUIREMENTS

- > Desktop versions 230Vac +/-10% 50-60 Hz: 60 mA
  115Vac +/-10% 50-60Hz: 120 mA
  24/48Vdc (18Vdc - 72Vdc): 160 mA
- > Rack-mount version 48Vdc (36Vdc - 72Vdc): 180 mA

SALES CODES: BASIC UNITS (REQUIRES ADDITIONAL MODULAR DATA AND FIBRE INTERFACE)

- > 175659 Crocus FO10M TT BU 230V
- > 159645 Crocus FO10M TT BU 24/48V
- > 175658 Crocus FO10M TWIN-CV BU

SALES CODES: INTERFACES

- > 154404 G703 intf. Crocus SDSL-FO
- > 163369 4E1 Intf. Crocus

All other transparent data interface and fibre modules are found in the sales codes quick reference section

The Crocus FO10M allows the user to connect at speeds up to 10 Mbps, and can be terminated on almost any type of data interface. Not only traditional serial interfaces like V.35, V.36, RS-530 and X.21, but also G.703 (transparent 2 Mbps or with G.704 framing) and direct Ethernet 10/100Base-T connections with integrated bridge or router functionality are available. It is possible to combine different types of interfaces on the two sides of the communication link, so eliminating the need for external interface conversion. All these interface boards can be exchanged in only a few seconds, so flexibility is maximised. The actual speed of the connection can be locally or centrally configured in multiples of 64 kbps (up to 2Mbps), or in multiples of 2 Mbps (up to 10 Mbps). This makes the equipment also very suited for offering multiple user speeds in carrier access environments.

For critical connections, it is possible to create 100% redundancy on the optical link, by inserting a second optical interface into the Crocus FO10M. This creates a complete 1-to-1 backup of the physical connection.

For large concentration sites, rackmount versions are mounted in a CN4 cardnest and can offer densities of up to 30 modems per nest. Both 230/115 Vac and direct 24/48 Vdc powering can be used.

The unit is designed for integration into demanding network environments and can be controlled by the complete set of network maintenance and management tools as they are described in this catalogue.

V TMA INTERFACE

CLASS 1 LASER PRODUCT LASER RADIATION: AVOID EXPOSURE TO THE BEAM
To avoid possible eye damage, do not view into an uncovered optical module when the equipment is operational.

CROCUS FO45M

> THE CROCUS FO45M IS A HIGH-SPEED MODEM DESIGNED FOR CONNECTING END-USER EQUIPMENT USING OPTICAL FIBRE.

Thanks to the field-exchangeable fibre modules, the Crocus FO45M can be used for almost any type of fibre medium, ranging from short-haul multi-mode fibre, to the long-haul single-mode fibre connection. When using a long-haul module, distances of over 70 km can easily be covered.

The Crocus FO45M allows the user to connect at speeds up to 45 Mbps, and can be terminated on almost any type of data interface. Not only traditional serial interfaces like V.35, V.36, RS-530 and X.21 , but also G.703 E1 (transparent 2Mbps or with G.704 framing), G.703 E3 (34 Mbps), G.703 T3 (45 Mbps) , HSSI (High Speed Serial Interface) and direct Ethernet 10/100Base-T connections with integrated bridge or router functionality are available. It is possible to combine different types of interfaces on the two sides of the communication link, eliminating the need for external interface conversion. All these interface boards can be exchanged in only a few seconds, so flexibility is maximised. The actual speed of the connection can be configured in multiples of 64 kbps (up to 2Mbps), in multiples of 2 Mbps (up to 10 Mbps), or for 34 and 45 Mbps. This makes the equipment well suited for offering multiple user-speeds in carrier access environments.

For critical connections, it is possible to create 100% redundancy on the optical link by inserting a second optical interface into the Crocus FO45M. This creates a complete 1-to-1 backup of the physical connection.

V MODULAR INTERFACES

For large concentration sites, rackmount versions are mounted in a CN4 cardnest and can offer densities of up to 30 modems per nest. Both 230/115 Vac and direct 24/48 Vdc powering can be used.

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FEATURES & BENEFITS

- > MODEM FOR FIBRE OPTIC CONNECTIVITY UP TO 45 MBPS
- > WIDE RANGE OF EXCHANGEABLE FIBRE OPTIC MODULES FOR MULTI-MODE AND SINGLE-MODE FIBRE
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- > FULLY MANAGEABLE USING FREE MAINTENANCE SOFTWARE (TMA®)
- > OPTIONAL REDUNDANCY ON THE OPTICAL LINK

AVAILABLE OPTIC MODULES

- > Direct SC/PC or ST/PC connectors*
- > Multimode or single mode modules
- > Dual fibre or single fibre modules
- > Up to 70 km

  * Note: SC/PC to FC/PC and FC/APC adapter cables (male/male) are also available

USER SPEEDS

- > Internal clocking: Nx64 kbps (up to 2 Mbps)
  Nx2 Mbps (up to 10 Mbps)
  34 Mbps
  45 Mbps
- > Slave/Receive clocking: Nx64 kbps (up to 2 Mbps)
  Nx2 Mbps (up to 10 Mbps)
  34 Mbps
  45 Mbps
- > External clocking: Nx32 kbps (up to 10 Mbps)
  34 Mbps
  45 Mbps

AVAILABLE APPLICATION INTERFACES

- > V.35, V.36/RS-449, X.21, RS-530/RS-530A: up to 10 Mbps
- > V.24/RS-232: up to 128 kbps
- > G.703 E1: 2 Mbps (E1 or FE1) fixed
- > Quad G.703 E1: 4 x 2 Mbps (E1) fixed
- > Ethernet IP Router 2M: up to 2 Mbps
- > Ethernet IP Router 10M: up to 10 Mbps
- > G.703 E3/T3: 34 or 45 Mbps fixed
- > HSSI: up to 45 Mbps

FRONT PANEL

- > Testloops
  AL: Analogue Loop
  RDL: Remote Digital Loop
  DL: Local Digital Loop
  ET: Error Test generator (test pattern 215-1)

CLASS 1 LASER PRODUCT LASER RADIATION: AVOID EXPOSURE TO THE BEAM
To avoid possible eye damage, do not view into an uncovered optical module when the equipment is operational.

- > Indications
  PWR: Power
  TST: Test indicator (circuit 142)
  ERR: Bit Error Indicator (Error test) - AIS for G.703
  DCD A: Data Carrier Detect for fibre module A (circuit 109)
  DCD B: Data Carrier Detect for fibre module B (circuit 109)
  TXD: Transmit data (circuit 103)
  RXD: Receive data (circuit 104)

SUPPLEMENTARY FEATURES

- > The modem has a flash memory to allow firmware upgrades
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  24/48Vdc (18Vdc - 72Vdc): 160 mA
- > Rack-mount version 48Vdc (36Vdc - 72Vdc): 180 mA

SALES CODES: BASIC UNITS (REQUIRES ADDITIONAL MODULAR DATA AND FIBRE INTERFACE)

- > 171277 Crocus FO45M TT BU 230V
- > 171278 Crocus FO45M TT BU 24/48V
- > 171279 Crocus FO45M TWIN-CV BU

SALES CODES: INTERFACES

- > 154404 G703 intf. Crocus SDSL-FO
- > 163369 4E1 Intf. Crocus
- > 171280 E3/T3 Intf Crocus FO45 BNC

All other transparent data interface and fibre modules are found in the sales codes quick reference section

CROCUS FIBRE MODULES & ADAPTERS

CROCUS FIBRE MODULES

> THE CROCUS FIBRE MODULES ARE USED ON THE DIFFERENT TELINDUS FIBRE-OPTIC TRANSMISSION EQUIPMENT AND CAN EASILY BE EXCHANGED IN FUNCTION OF THE DESIRED CONNECTOR AND TRANSMISSION CHARACTERISTICS.

CROCUS FO SC TX13 RX15 SM-MH

> CONNECTOR TYPE: single SC/PC
> TRANSMISSION WAVELENGTH (NM): 1310
> RECEIVE WAVELENGTH (NM): 1550
> OPTICAL SOURCE: Laser, single-mode
> MINIMUM OPTICAL BUDGET (DB): 17
> TYPICAL OPTICAL BUDGET (DB): 24
> TYPICAL DISTANCE (KM): 15
> SALES CODE: 177620
> To be used in combination with Crocus FO SC TX15 RX 13 SM-MH on peer modem

CROCUS FO SC TX15 RX13 SM-MH

> CONNECTOR TYPE: single SC/PC
> TRANSMISSION WAVELENGTH (NM): 1550
> RECEIVE WAVELENGTH (NM): 1310
> OPTICAL SOURCE: Laser, single-mode
> MINIMUM OPTICAL BUDGET (DB): 17
> TYPICAL OPTICAL BUDGET (DB): 24
> TYPICAL DISTANCE (KM): 15
> SALES CODE: 177621

CROCUS FO SC TX13 RX15 SM-LH

> CONNECTOR TYPE: single SC/PC
> TRANSMISSION WAVELENGTH (NM): 1310
> RECEIVE WAVELENGTH (NM): 1510
> OPTICAL SOURCE: Laser, single-mode
> MINIMUM OPTICAL BUDGET (DB): 29
> TYPICAL OPTICAL BUDGET (DB): 33
> TYPICAL DISTANCE (KM): 60
> SALES CODE: 179173
> To be used in combination with Crocus FO SC TX15 RX 13 SM-LH on peer modem

CROCUS FO SC TX15 RX13 SM-LH

> CONNECTOR TYPE: single SC/PC
> TRANSMISSION WAVELENGTH (NM): 1550
> RECEIVE WAVELENGTH (NM): 1310
> OPTICAL SOURCE: Laser, single-mode
> MINIMUM OPTICAL BUDGET (DB): 29
> TYPICAL OPTICAL BUDGET (DB): 33
> TYPICAL DISTANCE (KM): 60
> SALES CODE: 179175

CROCUS FO ST13 MM-SH MODULE

> CONNECTOR TYPE: dual ST/PC
> TRANSMISSION WAVELENGTH (NM): 1310
> OPTICAL SOURCE: LED, multi-mode
> MINIMUM OPTICAL BUDGET (DB): 11
> TYPICAL OPTICAL BUDGET (DB): 17
> TYPICAL DISTANCE (KM): 2
> SALES CODE: 159650

CROCUS FO ST13 SM-MH MODULE

> CONNECTOR TYPE: dual ST/PC
> TRANSMISSION WAVELENGTH (NM): 1310
> OPTICAL SOURCE: Laser, single-mode
> MINIMUM OPTICAL BUDGET (DB): 16
> TYPICAL OPTICAL BUDGET (DB): 25
> TYPICAL DISTANCE (KM): 50
> SALES CODE: 159652

CROCUS FO ST13 SM-LH MODULE

> CONNECTOR TYPE: dual ST/PC
> TRANSMISSION WAVELENGTH (NM): 1310
> OPTICAL SOURCE: Laser, single-mode
> MINIMUM OPTICAL BUDGET (DB): 29
> TYPICAL OPTICAL BUDGET (DB): 33
> TYPICAL DISTANCE (KM): 70
> SALES CODE: 160525

CROCUS FO SC13 MM-SH MODULE

> CONNECTOR TYPE: dual SC/PC
> TRANSMISSION WAVELENGTH (NM): 1310
> OPTICAL SOURCE: LED, multi-mode
> MINIMUM OPTICAL BUDGET (DB): 11
> TYPICAL OPTICAL BUDGET (DB): 17
> TYPICAL DISTANCE (KM): 2
> SALES CODE: 159646

CROCUS FO SC13 SM-MH MODULE

> CONNECTOR TYPE: dual SC/PC
> TRANSMISSION WAVELENGTH (NM): 1310
> OPTICAL SOURCE: Laser, single-mode
> MINIMUM OPTICAL BUDGET (DB): 16
> TYPICAL OPTICAL BUDGET (DB): 25
> TYPICAL DISTANCE (KM): 50
> SALES CODE: 159648

CROCUS FO SC13 SM-LH MODULE

> CONNECTOR TYPE: dual SC/PC
> TRANSMISSION WAVELENGTH (NM): 1310
> OPTICAL SOURCE: Laser, single-mode
> MINIMUM OPTICAL BUDGET (DB): 29
> TYPICAL OPTICAL BUDGET (DB): 33
> TYPICAL DISTANCE (KM): 70
> SALES CODE: 159649

FIBRE OPTIC ADAPTER CABLES

> FIBRE OPTIC ADAPTER CABLES ALLOW MATCHING OTHER TYPES OF FIBRE CONNECTORS. THE ADAPTER CABLES HAVE A SC/PC MALE CONNECTOR AT ONE END (COMPATIBLE WITH THE CORRESPONDING TELINDUS FIBRE MODULES) AND A VARIETY OF (MALE) CONNECTOR TYPES AT THE OTHER END.

The adapter cables are based on single-mode fibre. Because some of the Telindus Fibre Modules have dual connectors (transmit and receive), two adapter cables may be required per Telindus Fibre Module.

FO PATCHCBL SC/PC_FC/PC_2M

> CONVERTS TO: FC/PC male
> SALES CODE: 172741

FO PATCHCBL SC/PC_FC/APC_8_2M

> CONVERTS TO: FC/APC 8 degrees male
> SALES CODE: 172744

FO PATCHCBL SC/PC_SC/APC_8_2M

> CONVERTS TO: SC/APC 8 degrees male
> SALES CODE: 172735

FO PATCHCBL SC/PC_SC/APC_9_2M

> CONVERTS TO: SC/APC 9 degrees male
> SALES CODE: 172738

FO PATCHCBL SC/PC_ST/PC_2M

> CONVERTS TO: ST/PC male
> SALES CODE: 177623