# MASTERseries

Release 5.1
## Cell Site Access Platform



### Key Benefits:

- 1/0 grooming reduces link costs
- Integrated IP router for LAN interconnection
- High port density and small footprint conserve valuable space
- Environmental hardening and lightning protection enhance reliability
- Extensive test capabilities reduce operations costs

### Key Applications:

- Cell Site T1 termination (CSU, DSU/CSU)
- T1 IAD (voice, data, LAN interconnection)
- Access IP router for LAN interconnection
- Increase T1 link capacity
- T1 aggregation and grooming
- ATM Access Concentrator

## Consolidated, single-platform solution for delivering next generation wireless voice and data services

The MASTERseries™ platform provides a hardened and cost-effective platform for T1 network access solutions. Various combinations of enclosures, application modules, and plug-on adapters create a flexible and scalable solution to your mission-critical interconnection issues. The MASTERseries provides the capability to provide a wide range of access solutions including DSU/CSU, 32 port 1/0 DCS (Digital Cross-connect Switch), cell site IAD (Integrated Access Device) with ATM (Asynchronous Transfer Mode) access and integral Ethernet router.

MASTERseries is hardened — designed for the demanding needs of mission critical applications and mobile service providers. Hardening includes self-healing lighting protection, a temperature range of -40 °C to 65 °C, optional redundant power supplies and automatic link protection switching.

MASTERseries platform with FLEXmaster Application Modules can be managed by the Carrier Access OMC-Companion element management system, or by standard intuitive web browser-based graphical user interface, Telnet or VT-100 menus.

## Application Modules supported:

| | |
|---|---|
| **FLEXmaster8 TDM Module** | The FLEXmaster8 TDM Module provides 8 T1 ports, 16 T1 mid-plane module-to-module cross-connect, V.35 port, integrated IP Router with 2 10/100 Ethernet ports. |
| **FLEXmaster8 ATM Module** | The FLEXmaster8 ATM Module provides 8 T1 ATM-IMA ports with IWF and CES capability, 16 T1 mid-plane module-to-module cross-connect, V.35 port and 2 10/100 Bridged Ethernet ports. |
| **FLEXmasterDS3c-3 ATM Module** | The FLEXmasterDS3c-3 Module provides 3 DS3c ATM ports, and 16 T1 mid-plane module-to-module cross-connect. The FLEXmasterDS3c-3 ATM Module supports ATM-IMA with IWF and CES capability, 16 T1 mid-plane module-to-module cross-connect, and 2 10/100 Bridged Ethernet ports. |
| **HUBmaster Module** | The HUBmaster Module provides a 5 port 10/100 Ethernet hub. |

## CarrierAccess™

### Platform Features :
- Two different shelf configurations
- 1 Rack Unit (RU) dual slot enclosure
- 3 RU eight slot enclosure
- Integral 1/0 Digital Cross-connect Switch (DCS)
- IP-based management channel concentration
- Support for up to 32 full or fractional T1 links
- Web based GUI, Telnet and Menu support
- Environmentally hardened (-40 °C to 65 °C) with self-healing lightning protection
- Hot swappable application modules and power modules
- Wide Range 24/-48 VDC power
- Optional power redundancy

### Capacities :
- 2 Slot Enclosure
  - 2 Power Modules
  - 2 Interface Adapters
  - Up to 2 FLEXmaster Application Modules
- 8 Slot Enclosure
  - 2 Power Modules
  - 8 universal Application Modules
  - Up to 4 FLEXmaster Application Modules - must be installed where there are open slots on either side of the module to conform to environmental specifications (example: FLEXmaster Modules in slot #1, 3, 5, and 7 if fully populating the 8 slot enclosure)

### Diagnostics :
- Loopback Types: Bi-directional, Fractional DS0/E0, Line, Local, Payload, Equipment, Dataport (local or remote), Remote in-band/out-of-band, fixed or timed options
- BERT: All ones, all zeros, alternating, $2^{24-1}$

### Performance Monitoring :
- Data Storage: Last 24 hours of data in 15 minute increments, 48 and 72 hour summaries
- Monitors: All network interfaces
- Reports: Based on T1.403

### Service Modules Supported :
- FLEXmaster8 TDM Application Module (see individual specification sheet for more information)
- FLEXmaster8 ATM Application Module (see individual specification sheet for more information)
- FLEXmasterDS3c-3 ATM Application Module (see individual specification sheet for more information)

### T1 Interfaces (FLEXmaster8) :
- Line Rate: 1.544 Mb/s (T1)
- Framing: SF/ESF per TR54016/TR62411
- Interface: AMI or B8ZS
- Connector: Female 8 pin RJ-48C
- Timing: Internal or External from any network port
- LED Indicators: YEL/TEST, OOF/LOS, SYNC, AIS, MINOR
- Signaling: Clear channel, bundled or robbed bit

### Data Interfaces :
- Date Rate: N x 56/64 kb/s, N=1-24
- Interface: DCE Synchronous CCITT V.35
- Connector: Female 25-pin DB connector
- LED Indicators: RxD, TxD

### DS3c Interfaces (FLEXmasterDS3c-3) :
- Rear Access SMA DS3 connectors
- Compliant with ATM Forum DS3 Physical Layer Interface af-phy-0054.000
- Line build out: Short: 0-50 ft., Normal: 50-450 ft.
- Line rate: 44.736 Mbps
- Line code: B3ZS
- Framing format: M23 and C-bit parity
- Transmit Impedance: 75. ± 5% resistive, unbalanced
- Transmit Jitter Attenuation: Meets ANSI T1.102

- Transmit Amplitude: Meets ANSI T1.102 pulse mask with 0.36 to 0.85 Vp
- Transmit Length (cable) 500 ft. to cross-connect
- Receive Sensitivity: -10 dB w/r DSX-3 120 mVp to 900 mVp input range with automatic gain control circuit

### IP Routing :
- Dual Ethernet Interfaces: 10/100Mb per IEEE 802.3
- LAN Protocols: TCP/IP
- WAN Protocols: PPP, Frame Relay (RFC 1490)
- DHCP: Server, relay agent, and client
- RIP, RIPv2, static routing, OSPF v1
- Supports un-numbered IP interface
- Security: PAP, CHAP, NAT/NAPT, rules-based firewall
- Ping, Trace Route

### External Alarm :
- Form "C" relay contact closure
- Major/Minor

### Management :
- Managed network element under OMC-Companion
- Remote Access: In band via DS0, Telnet supported
- VT100: RS232 port, 4800-19,200 bps;
- RJ-45 connector, external modem supported
- Password control: three levels of access
- Web browser-based GUI

### Power :
- VDC: 2 slot and 8 slot: +/- 20 to 65 VDC

### Regulatory Approvals :
- USA
  - UL60950-1
  - FCC Part 15, Class A
  - FCC Part 68 and TIA-968-A
- Canada
  - CSA 60950-1
  - ICES-003 Class A
  - CS-03

### Physical :
- 2 Slot Enclosure
  - Dimensions:
    - 1.75 in (1 RU)(H) x 19 in (W) x 10.2 in (D)
    - 44 cm (2 RU)(H) 483 cm (W) 259 cm (D)
  - Weight: 19 lb (8.62 kg) fully loaded
  - Rack mount: 19-inch
- 8 Slot Enclosure
  - Dimensions:
    - 5.25 in (3 RU)(H) x 19 in (W) x 10.2 in (D)
    - 133 cm (2 RU)(H) 483 cm (W) 259 cm (D)
  - Weight: 30 lb (13.61 kg) fully loaded
  - Rack mount: 19-inch

### Environment :
- Operating temperature range: -40 °F to 149 °F (-40 °C to 65 °F)
- Storage temperature range: -40 °F to 158 °F (-40 °C to 70 °C)
- Cooling method is by free air convection (rack mounting requires .5 RU minimum above and below each unit)
- Maximum operating altitude: 10,000 ft (3,048 m)
- Minimum operating altitude: 197 ft (60 m) below sea level
- Maximum non-operating altitude: 40,000 ft (12,192 m)
- Relative humidity (non-condensing) range: 0% to 95%

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