COMMUNICATION NETWORKS

We are securing the past in a fast moving future. FOX605 multiservice platform.

All in one solution.

FOX605 is a comprehensive combination of latest MPLS & L2 packet switched technology with traditional legacy interfaces and complemented with state of the art security – and cyber security – features. FOX605 addresses a wide range of applications in harsh environments where traditional TDM services and packet switch technology coexist.

Selected technical highlights.

FOX605's Versatility

Central aspect of FOX605 is a highly versatile, wire-speed switch that supports native L2 Ethernet as well as MPLS. On L2 Legacy interfaces can be accessed in the TDM cross-connect before emulated via SAToP.

AIS 256-bit traffic encryption can be enabled for the optical SFP ports based on selectable criteria such as port, VLAN-tag or MPLS-TP labels. Legacy interfaces can be connected directly to the functional block responsible for circuit emulation or via the digital cross-connect (SEC-64k) that allows bundling/processing services into one or several E1-equivalent streams for SAToP (max. 14 flows).

The timing block is closely interlinked with the PHY because Sync and PTP information have to be derived directly at the physical interface.

Sophisticated Security Features

FOX605 offers service-aware user traffic encryption at layer 2 (MPLS-layer).

This even protect legacy data (e.g. emulated E1-flows) without bringing them in resource and time consuming processes to the layer 3 to make use of IPSEC. Following advantages result: Reduced protocol complexity/lowest impact on network performance/transparent to media. The underlying encryption technology is based on MACsec (IEEE 802.1AK), however is a significantly enhanced form to allow end to end encryption (e2e) even through non-encryption aware networks.

Individual flows can be protected end to end by service-aware encryption. It's up to the user to define which services shall be encrypted and which information shall be transmitted plain text. Criteria is to distinguish the services are port, VLAN-tag or MPLS-labels.

Network Synchronization

FOX605 offers the latest technology for network synchronization.

Reliable distribution of timing information across a network is essential and helps reduce dependence on GPS-time that is a security risk especially for mission critical applications.

For demanding network synchronization tasks FOX605 supports latest PTP/IEEE1588v2 (Boundary) & ordinary model and Sync functionalities. The latter can make use of Quality Level information transmitted similarly to earlier SDH-SLM technology.

For traditional time-distribution schemes, FOX605 can work with up to 5 NTP servers.

Timing info can be exchanged on multiple FOX605 Interfaces and protocols (e.g. ToD, PTP, IRIG-BS/BS2000).

Flexible management tools.

FOX605 complies with latest expectations in terms of managing a communication network. To this end, it provides powerful appropriate tools and features. FOX605 is supported by ABB's wired and wireless communication portfolio of FOX-devices but depending on customer preferences and management tasks a combination of FOX devices can be deployed to achieve a highly efficient and cost effective solution.

The ABB NMS-Suite supports not only FOX but the full range of ABB's wired and wireless communication portfolio.

Browser – Interface

Latest Release Voice VLANs

FOX605 has an embedded server providing a browser based Graphical User Interface (GUI). Extended browser like Firefox or IE can be used. The GUI offers strong method diagnostic & maintenance features and is recommended to be used for the typical Configuration use-cases.

NMS-Suite

FOXView & FOXMAN-UN are two key components of ABB's NMS-suite, supporting a wide range of ABB's communication portfolio of FOX-devices but also the E1- and B3G-suites for Power Line Carrier Protection and protection applications, wireless devices and the AI-family of substations oriented switches/routers/ Firewalls.

CLI – Interface

Local Interface via SSH

FOX605 offers a Command Line Interface including comprehensive help functions. It is a very efficient way especially for complex tasks and configurations. Its usage is further facilitated by documentation like the Command Reference Guide and an Application Use-case manual.
Type-tested for harsh environments.

Like all members of ABB’s FOX-family, FOX605 was successfully type-tested by an independent, internationally accredited European test-lab for EMC, climatic and mechanical compliance according to following standards.

### Standards
- **Safety**: IEC/EN 61010-031, IEC/EN 61010-1
- **Electrical tests**:
  - Conduction immunity: IEC/EN 61000-4-2
  - Surge immunity: IEC/EN 61000-4-5
  - Ringing test: IEC/EN 61000-4-6
- **Electromagnetic tests**
  - Conducted emission: EN 55022 (CISPR–22)
  - Radiated emission: EN 55024
  - Conducted Immunity: IEC/EN 61000-4-2
  - Radiated Immunity: IEC/EN 61000-4-3
  - Lightning immunity: IEC/EN 61000-4-4
  - Electrical fast transients / surges: IEC/EN 61000-4-5
  - ESD: IEC/EN 61000-4-2
  - Voltage dips, Swings, Interrupts and Flicker: IEC/EN 61000-4-11
- **Temperature / Humidity / Vibration / Shock / Acceleration**
  - Temperature: 
    - Start test: IEC/EN 61000-4-2
    - Cold chamber: IEC/EN 61000-4-2
    - Heat chamber: IEC/EN 61000-4-2
  - Humidity: 95% r.h. (non-condensing)
  - Vibration: 1.8 g (rms) maximum, random vibration, horizontal, vertical and axial components
  - Shock: 40 g maximum, 2 ms duration
  - Acceleration: 10 g maximum in each axis

### FOX605 Technical Data.

As FOX605 combines traditional TDM switching technology with the latest packet switch technology it complies to appropriate parts of a wide range of standards and recommendations.

#### Physical Interface/Ports

<table>
<thead>
<tr>
<th>Legacy TDM ports</th>
<th>Physical Interfaces</th>
<th>Description</th>
</tr>
</thead>
</table>
| RJ-45(10,100,1000 Base-T) | 2 ports | Four ports which can be configured as 2x RJ-45 or 1x SFP+ (media converter, not included) in two additional ports: 

  - 1x SFP+ in Combo mode (SFP+ / RJ-45)
  - 2x RJ-45 in Combo mode (SFP+ / RJ-45)
  - 2x RJ-45 in RJ-45 mode

<table>
<thead>
<tr>
<th>Transport</th>
<th>Description</th>
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<tbody>
<tr>
<td>Time-continuous</td>
<td>Packet mode: 802.3u (LLDP-MED); ATM: 56 kbit/s, 144 kbit/s, 2048 kbit/s, 34.312 Mbit/s, 139.26 Mbit/s, 140 Mbit/s. Multi-rate ATM support.</td>
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