



ADSL Testing for Frame Staff

Staff responsible for the provisioning of Asymmetrical Digital Subscriber Line (ADSL) services in large Main Distribution Frames (MDFs) are often required to make many new connections every day, especially with increasing demand from unbundled carriers.

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Testing the World's Networks

TrendCommunications

INTRODUCTION

Staff responsible for the provisioning of Asymmetrical Digital Subscriber Line (ADSL) services in large Main Distribution Frames (MDFs) are often required to make many new connections every day, especially with increasing demand from unbundled carriers. While the installation of the new tie cables is normally a routine operation, the possibility of errors is real, and increases with the increasing workload.

This possibility creates a need for technicians to test the connections they have made to ensure high quality of deployment and customer satisfaction, and to maximise revenues for their Company. The skills of these staff are focussed on high productivity wiring operations, and their detailed knowledge of how ADSL works may be limited, so conventional ADSL test equipment, which provides a detailed result analysis, is not usually appropriate. They need a tester which can confirm the quality of their work in a simple and straightforward way with a minimum of training and knowledge. Trend's MC2+ ADSL Tester is ideally suited to this requirement

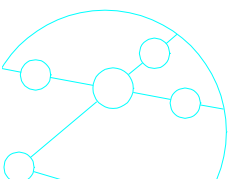
MDF ARCHITECTURES

The detailed routing of the tie cables in an MDF varies in different organisations, and can be quite complicated, but the fundamental architecture is quite standard. One side of the MDF, normally referred to as the "front" of the MDF, faces the many thousands of subscriber loops, each of which terminates on one of a number of different styles of bar-pair. These have a method of disconnection for isolation of the subscriber's line and for test access.

In general, the subscribers connected to an MDF are a mixture of POTS (or ISDN) subscribers and ADSL subscribers. Tie wires are routed from the bar-pairs to the "back" of the MDF where the multi-way cables from the Plain Old Telephone System (POTS) or Integrated Digital Subscriber Network (ISDN) switches and the ADSL Digital Subscriber Line Access Multiplexers (DSLAMs) are terminated.

The multi-way DSLAM cable connects each ADSL subscriber first to a POTS (or ISDN) splitter. This routes the voice part of the signal to the POTS network and the ADSL part to a DSLAM. The DSLAM may belong to the Telecom Company that owns the MDF, or it may belong to an unbundled operator. The back of the DSLAM connects to the Internet Backbone Network.

This simplified MDF architecture is illustrated in Figure 1.



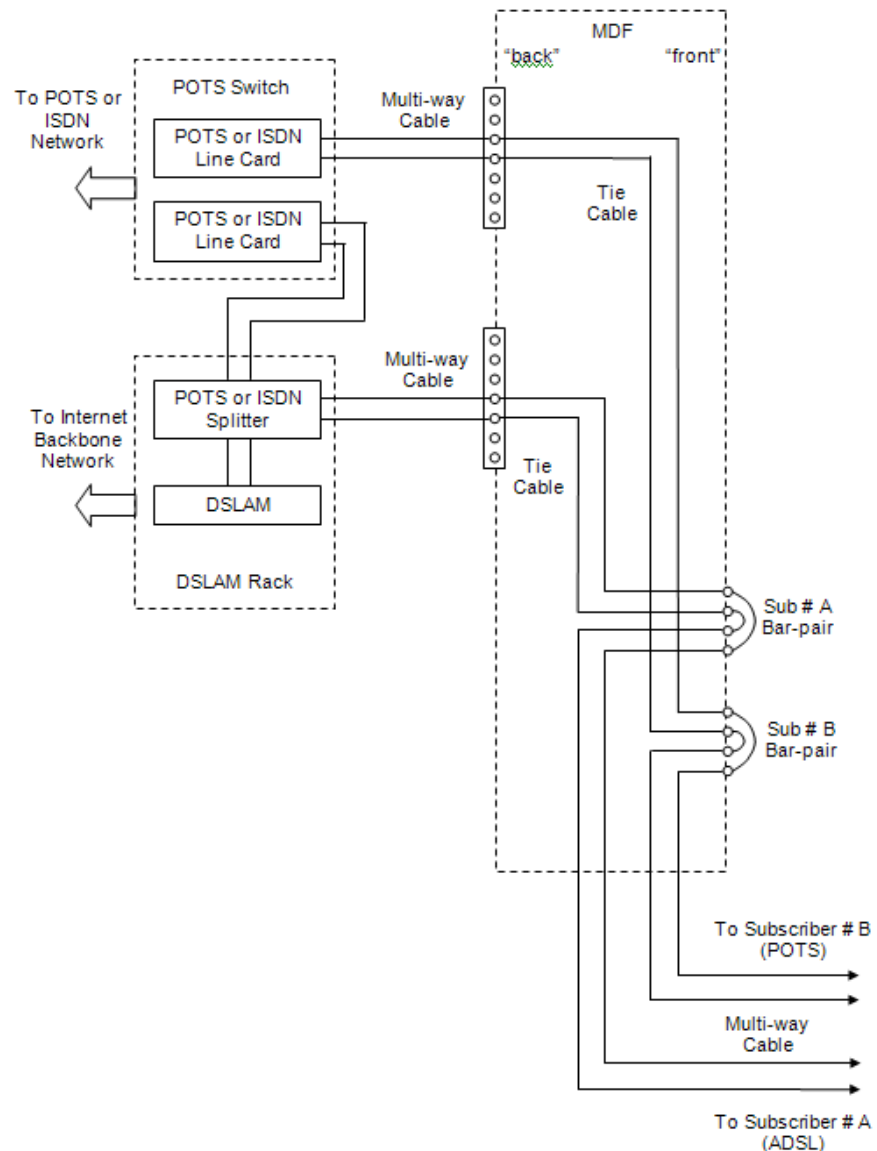
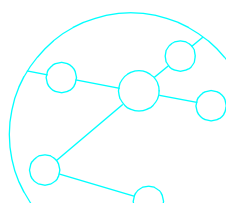


Figure 1 Simplified MDF Architecture.

SWITCHING A SUBSCRIBER TO ADSL

When an order to switch a subscriber to over ADSL is received, the following operations may be required...

- Identify the subscriber's bar-pair from a cross-reference of telephone numbers against vertical and horizontal MDF co-ordinates.
- Identify a spare port on a DSLAM multi-way connector block on the back of the MDF.



- Install a new piece of tie cable from the DSLAM connector to reach the subscriber's bar-pair.
- Disconnect the subscriber's line at the bar-pair.
- Disconnect the old POTS tie cable from the bar-pair.
- Connect the new ADSL tie cable to the bar-pair.
- Re-connect the subscriber's line at the bar-pair.
- Strip out the disused POTS tie cable.

(Details of working practices vary between organisations)

WHAT CAN GO WRONG?

A number of errors can occur during the switchover of a subscriber from POTS to ADSL. These include...

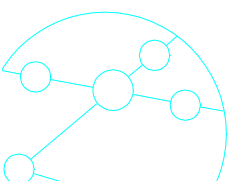
- Incorrect identification of the subscriber's bar-pair.
- Incorrect wiring at the DSLAM multi-way connector block.
- Broken tie cable.
- Bad joints.
- Short circuit.
- Only one side of the pair connected.
- DSLAM port not operational.
- DSLAM backhaul not correctly configured to provide connection to the Internet Service Provider (ISP).

The use of a very simple tester such as MC2+ can find all of the above faults and enable them to be quickly rectified before the subscriber becomes aware of them.

TESTING AT THE FRAME USING MC2+

MC2+ can help to avoid some of the potential problems listed above and to reduce the impact of others by rapid fault identification. It should be used at the beginning of the process to ensure that the subscriber's bar-pair has been correctly identified. It should also be used at the end of the process to confirm correct operation of the new installation before the subscriber is re-connected.

MC2+ is connected at the bar-pair as illustrated in Figure 2. The subscriber line is disconnected and the MC2+ is connected to the network side of the bar-pair.



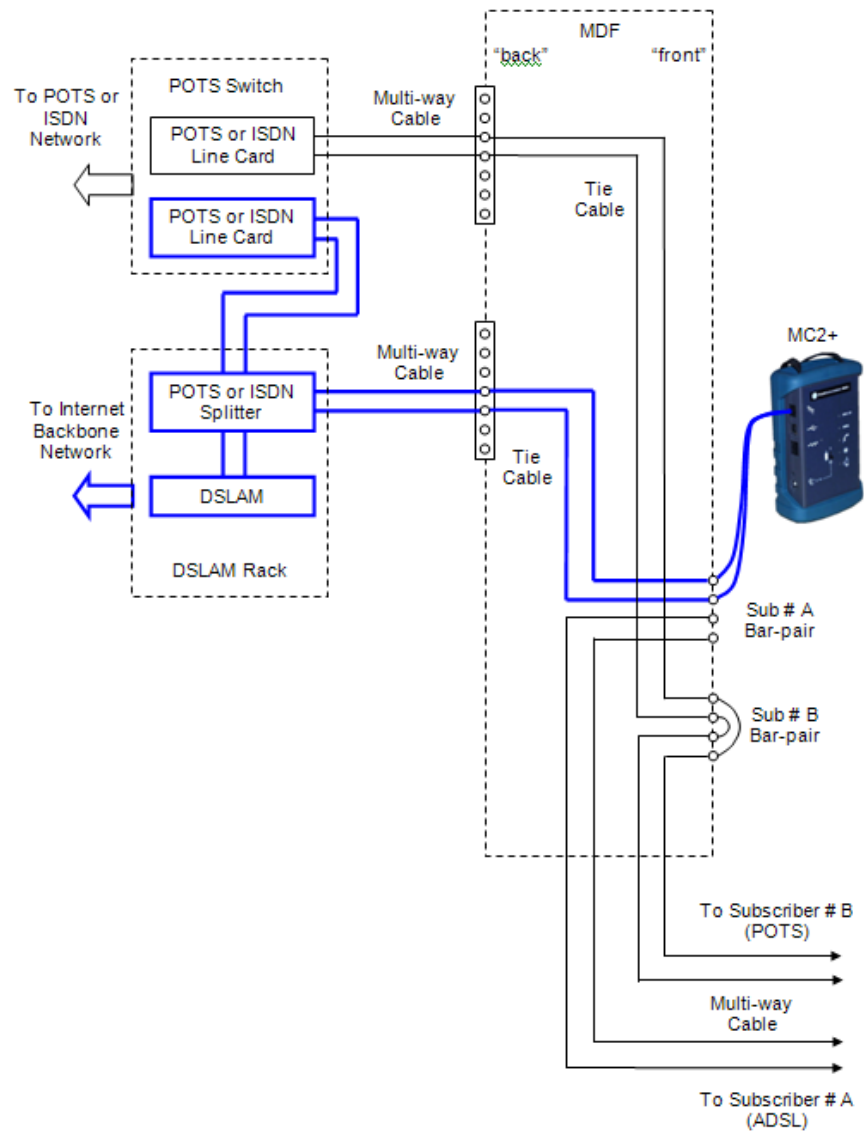
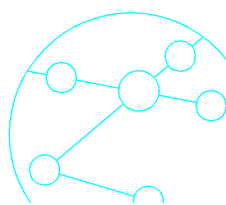


Figure 2 Frame Testing Using MC2+.

The identification of the subscriber's bar-pair can be checked even without switching the MC2+ on. As soon as it is connected to the circuit, the Line LED should light, indicating the presence of POTS or ISDN battery voltage on the line. If the subscriber's telephone number is then called (for example using a mobile phone), the MC2+ confirms correct connection by indicating the ringing voltage.

Once the installation of the new tie cable is complete, the MC2+ should be switched on. Flashing of the ADSL LED indicates that it is connected to an operational DSLAM port. If the ADSL LED continues to flash indefinitely, then there may be excessive noise, possibly caused by the old tie cable not being properly removed. When



the ADSL LED stops flashing and remains lit steadily, the MC2+ has achieved synchronisation with the DSLAM. It is sometimes possible to achieve synchronisation even if one side of the pair is not connected. In this case the ADSL LED will light, but the Line LED will be off. This fault needs to be corrected because the service will be unreliable when it is connected to the subscriber.

Finally, if the DSLAM is correctly configured and properly connected via the Internet backbone to the ISP, the PPP/IP LED on the MC2+ lights up to indicate correct connection and Internet access.

Table 1 lists some possible faults, the way that MC2+ indicates them, and recommended corrective actions.

<i>Fault</i>	<i>Line LED</i>	<i>ADSL LED</i>	<i>PPP/IP LED</i>	<i>Recommended Action</i>
Broken tie cable	OFF	OFF	OFF	Replace tie cable
Bad connection in tie cable	OFF	OFF	OFF	Check joints in tie cable
DSLAM multi-way cable fault	OFF	OFF	OFF	Replace cable
Faulty connection from splitter to POTS card	OFF	OFF	OFF	Replace cable
DSLAM not powered up	ON	OFF	OFF	Check DSLAM power
Old POTS tie cable not removed	ON	Flashing	OFF	Remove old POTS tie cable
No connection in one side of the pair	OFF	ON / Flashing	OFF	Check connections
Account not set up with ISP	ON	ON	OFF	Report problem to ISP
Internet backbone fault	ON	ON	OFF	Report problem to network group

Table 1 Fault Indications Using MC2+.

CONCLUSIONS

Managers of staff who work in MDFs face the challenge of responding to the increasing demand for new ADSL provisions and at the same time ensuring the best quality of service to their customers. To achieve this, their staff must be properly equipped, which means that they must have simple and reliable test tools.

MC2+ from Trend has been specifically designed for use in the MDF and is the only product on the market which can detect the majority of MDF-based faults without overpowering the user with technical features in excess of his real requirements.

