

Ref	NR/GN/SIG/19054-8
Issue	2
Date	01 December 2009

8	DATA LINK MODULE (DLM)	1
8.1	Functional Description of Module	2
8.1.1	Types of Data Link	2
8.2	Module Details	2
8.3	Module Variants	4
8.3.1	Spec. BR1904 for Mkl and MkII DLMs	4
8.3.2	Spec BR1904A for MkIII DLMs	4
8.3.3	Spec. WS1904B for MkIIIA DLMs	5
8.4	Known Problems	6
8.4.1	Anomalous Pulse problems due to Overshoot	6
8.4.2	Open-circuit Line Termination Resistor	6
8.4.3	Anomalous Pulse problems due to Hardware Fault	6

8.1 Functional Description of Module

DLMs are used to provide signal conditioning and matching at current loop interfaces. They are used between a Central Interlockings (CI) and each associated Internal Data Link (IDL) and Trackside Data Link (TDL), between an LDT and TDL, and between groups of TFMs and a TDL. Pairs of DLMs connected back-to-back are used as repeaters in TDLs. Rules for SSI scheme design can be found in SSI8500 Chapter D [\[Ref 3\]](#).

8.1.1 Types of Data Link

There are two types of Data Links, these being the Trackside Data Link (TDL) and Internal Data Link (IDL). Both these links carry safety information, and thus are vital links, and are duplicated to improve availability. All information is protected by at least two levels of coding (Hamming & Manchester II) and includes the Interlocking Identity number.

Trackside Data Link (TDL)

The TDL is the CI's connection to its associated TFMs, separate duplicated Data Links being required for each CI. Each TDL uses a dedicated twisted-pair cable, over which data is transmitted at baseband in half-duplex at 20 kb/s; the maximum length of this link is 10 km, but this can be extended to 40 km by using repeaters.

The distance that a TDL covers can be extended further by passing it over a telecoms transmission system; this is known as a Long Line Link (LLL). When a LLL is used, the Long distance terminals, used to interface the SSI to the telecoms transmission system, add a Control Centre Identity for additional security.

Internal Data Link (IDL)

The IDL is used to transfer information between CIs at a Control Centre and is duplicated for availability. Each IDL uses a dedicated twisted pair cable over which information is transmitted at baseband in half duplex at 20 kb/s. Each Data Link is arranged in a star connected form, and as the name implies can be used solely inside the building housing the CIs. Each CI in turn broadcasts a message onto the IDL which all other CIs monitor. The message contains the sending CI's identity number together with fifteen bytes of information. Each monitoring CI determines from this number and the byte order which bytes of information are addressed to it.

8.2 Module Details

A DLM is mounted on trackside equipment case racking or within the CI Cubicle. The front of the module has a 50-way connector, a manufacturer's

Ref	NR/GN/SIG/19054-8
Issue	2
Date	01 December 2009

plate and 1 indicator for 'Power'. The power supply to the module is 110 Va.c. or 12 Vd.c.

The Power indicator is illuminated when 110Vac (BX110) input voltage, or when 12 Vd.c. (B12) input voltage is applied to the module. Separate connections are provided for each supply.

These modules do not contain any software.

Both Westinghouse and ALSTOM have manufactured SSI DLMs.



Westinghouse MkIII



ALSTOM MkIII (SS2003)