

TECHNICAL INSTRUCTION

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NETWORK RAIL - SIGNAL ENGINEERING

SMARTLOCK – SMS & SMTH Items

Relevant Standards: NR/L3/SIG/10663 & NR/L3/SIG/11231

Purpose

This Technical Instruction provides SMS and SMTH supplements in support of the operational pilot of a SMARTLOCK computer based interlocking at Three Bridges ASC (Panel 7 area)

Scope

This instruction applies only to the SMARTLOCK installation at Three Bridges ASC.

Background

Signalling Solutions Limited (SSL) will be introducing the new ALSTOM Computer Based Interlocking – SMARTLOCK, onto Network Rail Infrastructure for Pilot operation at Three Bridges ASC. This will be for the three SSIs controlling Horsham area (HORSTHRB, HORSDORK, and HORSBILL).

As a pre requisite for the operational pilot, the Signalling Maintenance Specification and Signalling Maintenance Test Plans included in this Technical Instruction require to be published.

Compliance Requirements

Immediate compliance is mandated

Staff to be Briefed

The attached Maintenance Documents are required to be briefed to all Signalling Maintenance Technical staff who may be called upon to carryout or manage maintenance tasks on the SMARTLOCK interlocking.

Expiry

This TI will remain in force until the content is published in NR/L3/SIG/10663 and NR/L3/SIG/11231.

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Documents

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Signal Maintenance Specifications are provided in IS14 and the service frequencies to be applied for the SMS tasks are as follows:

NR/SMS Ref	Service	Interval
IS00	SMARTLOCK Information	
IS14	Daily	Daily
IS14	Regular	Monthly
IS14	A	Quarterly
IS14	B	Annually

The necessary Signal Maintenance Testing instructions are:

Test Plan Ref.	Description
SL01	Replace a SMARTLOCK CIXL I/O Module
SL02	Replace a SMARTLOCK CIXL Computing Module
SL03	Replace a SMARTLOCK CIXL Main PSU
SL04	Replace a SMARTLOCK TICC Front End Module
SL05	Replace a SMARTLOCK TICC Gateway Module
SL06	Replace a SMARTLOCK Support Server
SL07	Replace a SMARTLOCK Client PC

Use of these test Plans should be recorded as normal in the SMT Logbook.

A Test Plan is not provided here for DLMS and LDTs housed within the Tracksides Interface Communications Cubicle (TICC). The existing Test Plan for SSI (NR/SMTH/Part 4/SS02) shall be used for these items.



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NR/SMS/IS00 (supplement) - Electronic Interlockings : General

SMARTLOCK Electronic Interlockings

General

SMARTLOCK is a computer-based interlocking, designed specifically as a successor to SSI. The system offers updated facilities for the maintainer and improved application engineering tools for test and incident analysis. The system retains the trackside communications architecture from SSI.

A SMARTLOCK interlocking can take the place of one or more existing SSIs, with no need to replace the trackside infrastructure.

Every SMARTLOCK Interlocking requires the following sub-systems as a minimum:

- a Central Interlocking (CIXL);
- one or two Trackside Interface Communications Cubicles (TICCs);
- a Support System (SSys).

The CIXL provides a 2-out-of-3 safety computer configured to execute the interlocking logic rules. This also contains the I/O required to communicate with the signallers control system and with the TICC.

The TICC is responsible for managing the trackside communications and contains up to four pairs of gateways and their associated front ends. The TICC also accommodates pairs of SSI Datalink Modules (DLMs) or Long Distance Terminals (LDTs)

The SSys comprises a dual redundant server (SSer) and one or more client terminals, in addition to a time source and switches and routers for the networks in the system. The Support system provides the diagnostic, logging and technician control facilities via local client terminals located in the SCC or connected by a LAN within the signalling centre, a printer and where required remote client terminal facilities.

The trackside interface to the signalling objects is by use of SSI technology, i.e. DLMS, LDTs, Signal Modules and Points Modules.

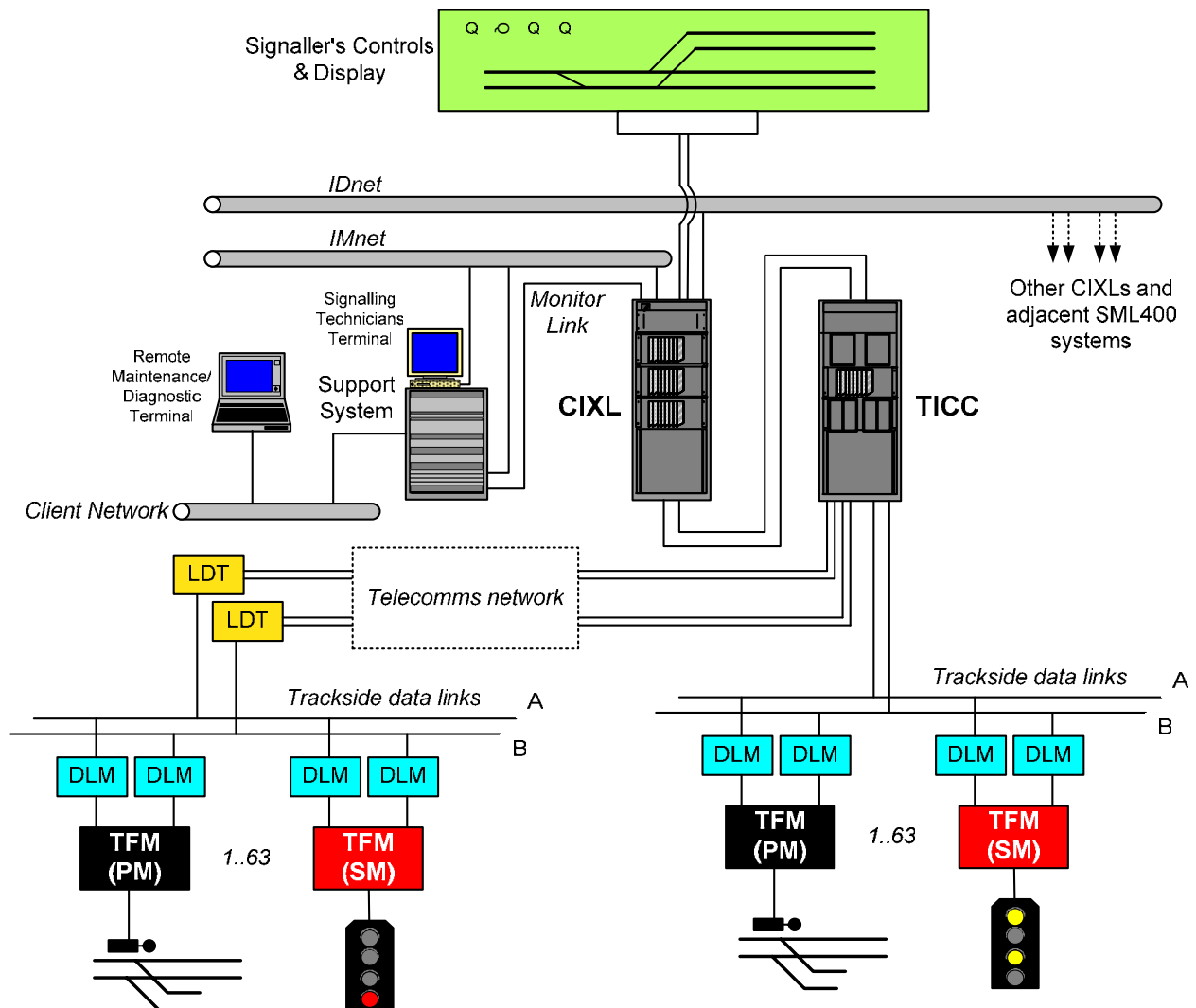
Communication between field equipment is via trackside data links.

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Typical SMARTLOCK Interlocking



NR/SMS IS14 - SMARTLOCK Electronic Interlockings

Includes: CIXL and TICC and SSys.

For lineside TFM, DLM and Datalinks refer to NR/SMS EL21

General

This NR/SMS covers all SMARTLOCK systems for first line maintenance only. All other equipment at the installation is covered by its own relevant NR/SMS.

More information on this system can be found in the ALSTOM Transport, SMARTLOCK System and Subsystem Description, SMARTLOCK Maintenance Manual, SMARTLOCK Operation Manual and SMARTLOCK HMI Operation Manual.

Caution

Do not use an Avometer (or any similar meter) on the Ohms x 100 range on the SMARTLOCK system. The 15V d.c. output from the meter on this range will damage electronic circuits. Similarly, do not use any form of buzzer or lamp for continuity testing on the system.

DAILY SERVICES

1. Support System

- 1.1 Using any client terminal, *check* that the three coloured health indicator is correctly animated.
- 1.2 *Check* system status by examining the Alarms List for any outstanding faults. Investigate, rectify and record any faults as necessary. Liaise with NRIFC if action is required.
- 1.3 On completion of tasks, log off from the terminal.
- 1.4 *Clean* and tidy the work area as required.

REGULAR SERVICES

2. Support System

- 2.1 *Check* for correct event recording by examining current data from the support server.
- 2.2 *Check* that the NTP server was last synchronised with MSF within the last week. Investigate, rectify and record any defects as necessary. Liaise with NRIFC if action is required.
- 2.3 *Check* that clocks of both Support Servers are in line with the broadcast time and date displayed on the NTP time server. Rectify any defects as necessary.
- 2.4 *Check* for correct operation of the KVM switch by selecting each of the Support Servers and the local client and gateway PCs.

3. Remote Client

- 3.1 *Check* for correct operation of the remote client terminal by logging on to the system. Rectify or escalate any defects as required.
- 3.2 On completion, log off.

4. Central Interlocking

- 4.1 *Check* for correct operation of the cooling fans. Investigate and rectify any faults as necessary.

SERVICE A

5. Support System

- 5.1 *Check* all printers' output for legibility. If necessary, replace printer consumables following instructions in printer manufacturer's handbook.
- 5.2 *Check* the air-cooling vent filters are clean. If necessary Clean or replace the filter in accordance with manufacturer's instructions.
- 5.3 *Check* that the cooling fans are rotating.
- 5.4 *Check* for correct operation of the graphical event replay facilities by downloading a period of logged data and performing a replay.
- 5.5 *Clean/dust* Client Terminal keyboards and VDU screens and Signaller's Alarm Screen as required, using a soft cloth moistened with a detergent solution. Wring out the cloth before use to remove excess detergent solution. Ensure moisture does not enter equipment apertures and is dried off surfaces as soon as possible using a dry lint-free cloth. Do not use abrasive cleaners or pads.

6. Remote Client

- 6.1 *Clean/dust* keyboards and VDU screens and router as required, using the method described in 5.5.

SERVICE B

7. Support System

- 7.1 *Examine* the equipment, terminals, cables and cable connectors. Particularly look for security, physical damage, overheating and arcing. Repair as necessary.
- 7.2 Where the equipment is cubicle mounted, *clean* the outside of the cubicle as required, using the method described in 5.5. *Dust* the inside of the cubicle as required, using a dry lint-free cloth.

8. Central Interlocking

- 8.1 *Examine* the equipment, terminals, cables and cable connectors. Particularly look for security, physical damage, overheating and arcing. Repair as necessary.
- 8.2 *Clean* the outside of the cubicle as required, using the method described in 5.5. *Dust* the inside of the cubicle as required, using a dry lint-free cloth.

9. Trackside Interface Communications Cubicle

- 9.1 *Examine* the equipment, terminals, cables and cable connectors. Particularly look for security, physical damage, overheating and arcing. Repair as necessary.
- 9.2 *Clean* the outside of the cubicle as required, using the method described in 5.5. *Dust* the inside of the cubicle as required, using a dry lint-free cloth.

10. Functional Spares Assembly

- 10.1 Where provided, *check* for correct operation of all spares using the functional spares assembly
- 10.2 *Clean* the outside of the cubicle as required, using the method described in 5.5. *Dust* the inside of the cubicle as required, using a dry lint-free cloth.

11. Function Tests

Perform EMERGENCY SIGNALS ON CONTROL TEST, SMS/TEST/060(SMARTLOCK).