

C620 – Signalling

ATS COS Block Schematic

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 NR ☐ LO ☐ For information ☐
 DLR ☐ Other: _____

This document has been reviewed by the following individual for coordination, compliance, integration and acceptance and is acceptable for transmission to the above stakeholder for the above stated purpose.



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2b. Review by Stakeholder (if required):

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Document History

Rev. CRL	Date	Rev. SAP	Chapter	Reason for Issue:
1.0	2017-06-22	A	all	First version
2.0	2017-08-24	B	all	Considered comments from C620-PMC-02992
3.0	2017-12-18	C	2	Added Berth 0296 and deleted berth 0236 based on NAA3E-ESG-TQN-DRA-000076 (TQ NR 16-Aug-2017) Added Switches at Pudding Mill Lane Portal based on TD Stepping Tables – Stratford VDU (NAA3E-ESG-DRG-DRA-000120 A02)
4.0	2018-06-08	D	2 all	Added links (due to new signals, e. g. 115) to the GWML/CRL overlay area (labelled in purple)* Added internal/external naming of berth 0095 to the translation table Described internal/external naming
-	2018-10-23	E	2 1 Note	Considered findings from VPN test window 2 with Resonate for GWML ATS Interface, refer to CFX00405824. Changes are highlighted in red in the TC version of this document. Considered review comments Internal pre-release due to delivery of E04/001.
5.0	2019-01-24	F	All Note	Considered review comments The changes between Rev. SAP D and F are tracked in the TC version of this document.
6.0	2019-04-05	G	Chapter 2 Handover Figure 1	Error correction Better highlighted Updated
-	2019-08-08	H	All	Updated for P_D+10 (NKL fringe) Error correction GWML

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Rev. CRL	Date	Rev. SAP	Chapter	Reason for Issue:
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			All	The changes between Rev. SAP G and J are tracked in the TC version of this document.
8.0	2020-03-13	K	All	Update for TR2: CI and CIINTL configuration
			Chapter 2	Drawings corrected Removed 017B and 009C as requested by NR
			Chapter 1	New Section "Failure Scenarios"
9.0	2020-09-17	L	Chapter 1	CB/CC configuration changed
			Chapter 2	CFX00500242: renumbering berths for Abbey Wood Platform 4 (XR393) with a direct path to XR377 Error correction GWML fringe CFX00506556: connection between berths corrected
10.0	2020-12-03	M	Chapter 2	Berth Naming: <ul style="list-style-type: none"> CFX00515537: Error correction Victoria Dock Portal Arrow Drawings: <ul style="list-style-type: none"> CFX00514199: berth 371A CFX00514282: adjusted drawing as input for an ATS simulation tool (PS9 Simulator) CFX00514263: GWML and GEML parts Finding Review SRA

**Note: colour removed from drawings*

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List of References

Ref.	Document Code	SAG Number	SRA Number	Document Title
[R01]	C620-SIC-R2-DWG-CR001-50047, Rev. 9.0	A6Z00037389060, M	n/a	Crossrail Scheme Plans: Area 1 and 2
	C620-SIC-R2-DWG-CR001-50048, Rev. 10.0	A6Z00038251930, L		Area 3
	C620-SIC-R2-DWG-CR001-50049, Rev. 11.0	A6Z00037585953, P		Area 4
	C620-SIC-R2-DWG-CR001-50050, Rev. 9.0	A6Z00037727635, L		Area 5
	C620-SIC-R2-DWG-CR001-50051, Rev. 11.0	A6Z00037586032, N		Area 6
	C620-SIC-R2-DDE-CR001-00006, Rev. 6	A6Z00040614185, H		Area 7
[R02]	C620-SIC-R2-RSP-CR001-50025, Rev. 7.0	A6Z00035220843, J	n/a	DIR ATS-004-AGE C620/NR ATS Data Exchange GEML (CRL)
	C620-SIC-R2-RSP-CR001-50026, Rev. 6.0	A6Z00035220873, H	n/a	DIR ATS-005-ANK C620/NR ATS Data Exchange NKL (CRL)
	C620-SIC-R2-RSP-CR001-50024, Rev. 7.0	A6Z00035220836, G	n/a	DIR ATS-003-AGW C620/NR ATS Data Exchange GWML (CRL)
	C620-SIC-R2-RSP-CR001-50028, Rev. 6.0	A6Z00035220929, F	n/a	IRS ATS-008-TRU C620/NR TRUST (CRL)
[R03]	C620-SIC-R2-RSP-CR001-50105, Rev. 6.0	A6Z00037431456, H	n/a	ATS Engineering of Interlocking Area View
[R04]	C620-SIC-R2-RSP-CR001-50219, Rev. 5.0	A6Z00041759097, E	n/a	ATS Moving Block Berth Principle
[R05]	C620-SIC-R2-RSP-CR001-50217, Rev. 8.0	A6Z00041759149, J	n/a	ATS COS-MBB-Configuration

[R06]	C620-SIC-R2-RSP-CR001-50214, Rev. 7.0	A6Z00041759126, G	n/a	NR ATNS Berth Mapping Table
[R07]	This document	This document	This document	ATS COS Block Schematics
[R08]	C620-SIC-R2-LRG-CR001-50002, 7.0	A6Z00035019221, G	n/a	Project Abbreviations

Table 1 List of References

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1 Introduction

1.1 Purpose and Scope

This document is part of the implementation of the PS9-interface, which is the interface to exchange train stepping messages between CRL ATS and the GWML, GEML, NKL and TRUST (SMART) systems.

The structure of this implementation is shown in Figure 1. Main document for the software is "ATS Moving Block Berth Principle", [R04]. Within this document all values and rules are defined, which are fixed and cannot be changed by configuration. The values which can be configured, are described and defined in [R05], [R06] and [R07].

"ATS COS Block Schematic" [R07] defines the configuration of the NR Berths received from GWML, GEML, NKL and its relationships to the COS Berths, based on [R02], [R05] and [R06].

"ATS COS-MBB-Configuration" [R05] defines the configuration of the berths itself for the COS (e. g. how many, where to place, boarders), based on [R01]. The berths for the NR area are defined in the respective DIRs and cannot be changed.

"NR ATNS Berth Mapping Table" [R06] defines the mapping between the NR berths received via TD.net and the ATNS fields on CRL LWOD. These berths are given by NR and cannot be changed.

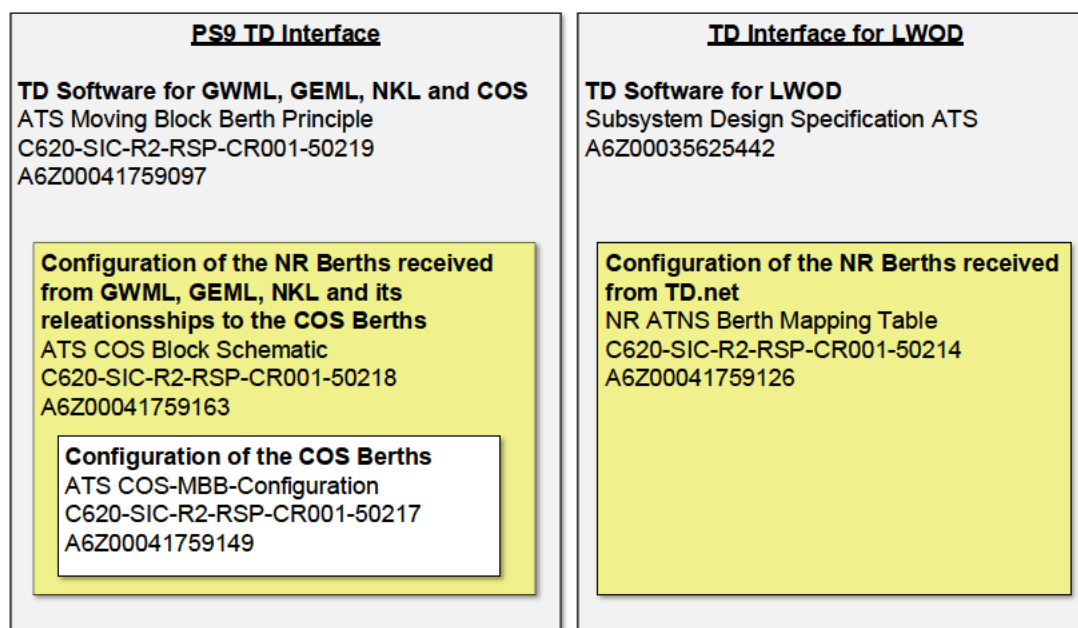


Figure 1 How to classify this Document

1.2 Terms and Abbreviations

All project specific abbreviations are listed in [R08]. In addition, the following terms and abbreviations are used in this document:

Term / Abbreviation	Explanation
DCC	Document Classification Code
GEML	Great Eastern Main Line
GWML	Great Western Main Line
NKL	North Kent Line
NR	Network Rail
PS9	Serial Train Describer interface for exchanging telegrams between <ul style="list-style-type: none"> GWML ATS – CRL ATS GEML ATS – CRL ATS, NKL ATS – CRL ATS and for transmitting telegrams to <ul style="list-style-type: none"> NR TRUST
SAG	Now refers to Siemens Mobility GmbH Note: As of August 1, 2018, the Mobility Division of Siemens AG has been transferred into Siemens Mobility GmbH.
SRA	Now refers to Siemens Mobility Limited Note: As of June 1, 2018, Siemens Rail Automation Holdings Ltd has been renamed to Siemens Mobility Limited.

Table 2 Terms and Abbreviations

1.3 Sources

The figures from section 2 are based on [R02] and [R05].

1.4 Assumptions

In this section all assumptions are listed.

1.4.1 Unique Berth Naming

There are differences in the internal and the external berth naming. This differentiation is necessary to have unique berth names for all berths inside the CRL ATS system.

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ATS will expect the external naming to be received from the adjacent systems and handle them internally with a different ID. The conversion table is shown on the last page. All affected berths are highlighted as well in orange in the respective figures.

1.4.2 Relationship to ATS Engineering of Interlocking Area View

Please be aware that this document differentiates to ATS Engineering of Interlocking Area View, [R03]. The Automatic Train Tracking for the Interfaces GWML, GEML, NKL and TRUST behaves differently to the Automatic Train Tracking for the CRL ATS. This means, on Vicos Views can be train number fields, which are not shown as berth in this document and vice versa.

Refer to [R04] for further details about this differentiation.

1.5 CI and CIINTL Configuration

For each fringe area a CI or a CIINTL flag can be configured. This defines which telegram format is used when transmitting data to the adjacent system. The setup required for CRL is:

- GWML: CIINTL
- GEML: CIINTL
- NKL: CI

1.6 CI and CY Configuration

For each fringe area there must be a configuration, how the initialisation shall be handled. A detailed explanation is listed in the subchapters below (caused by CFX00460459). The setup required for CRL is:

- GWML: CI and CY function
- GEML: CI and CY function
- NKL: CI function only

1.6.1 CI Function

ATT sends a CI message to the adjacent train describer when

- It receives the first non-CQ message following link restoration from an adjacent train describer, i.e. after start-up or connection loss
- Hint: In this case: ATT sends also CB and CC messages for all engineered transmit berths of the adjacent train describer

When ATT receives a CI message from the adjacent train describer

- It sends an Ack for the CI to the adjacent train describer
- It sends CB and CC messages for all engineered transmit berths of the adjacent train describer

1.6.2 CI and CY Function

CRL ATT sends a CI message to the adjacent train describer when it receives the first non-CQ message following link restoration from an adjacent train describer, i.e. after start-up or connection loss. Detailed telegram flow:

- CRL ATT to transmit CI (CIINTL) telegrams
- Adjacent Train describer to respond with CY
- CRL ATT to respond with CF
- Hint: no CB/CC telegrams required

If CRL ATT receives a CI message from the adjacent train describer

- CRL ATT sends an Ack for the CI to the adjacent train describer
- CRL ATT sends CY messages for all engineered receive berths of the adjacent train describer
- NR ATT will respond with CF
- Hint: no CB/CC telegrams required

1.7 Handover

Definition of handover berth from GWML/GEML DIR:

System 1 steps into the handover berth and System 2 steps out of it. System 1 transmits step from the previous berth into the handover berth to System 2. System 2 transmits either the step (CA) from the handover berth into the next berth, or a step (CA) of the handover berth to the 'COUT' berth back to System 1 if the next berth after the handover berth is not flagged for transmission to System 1.

- CRL ATT steps with CA telegram into Handover Berth
- NR ATT steps the HC out of the Handover Berth
- Hint: CRL ATT shall not delete the HC from the Handover Berth with a CA COUT telegram

1.8 Failure Scenario

If a connection to an adjacent train describer system fails, all HC shall remain at the last known position on the screens, as long as the connection is not restored. In Addition, the operator will get an alarm about this failure.

Parameter TimeOutTDDDeletion shall be set therefore to "0".

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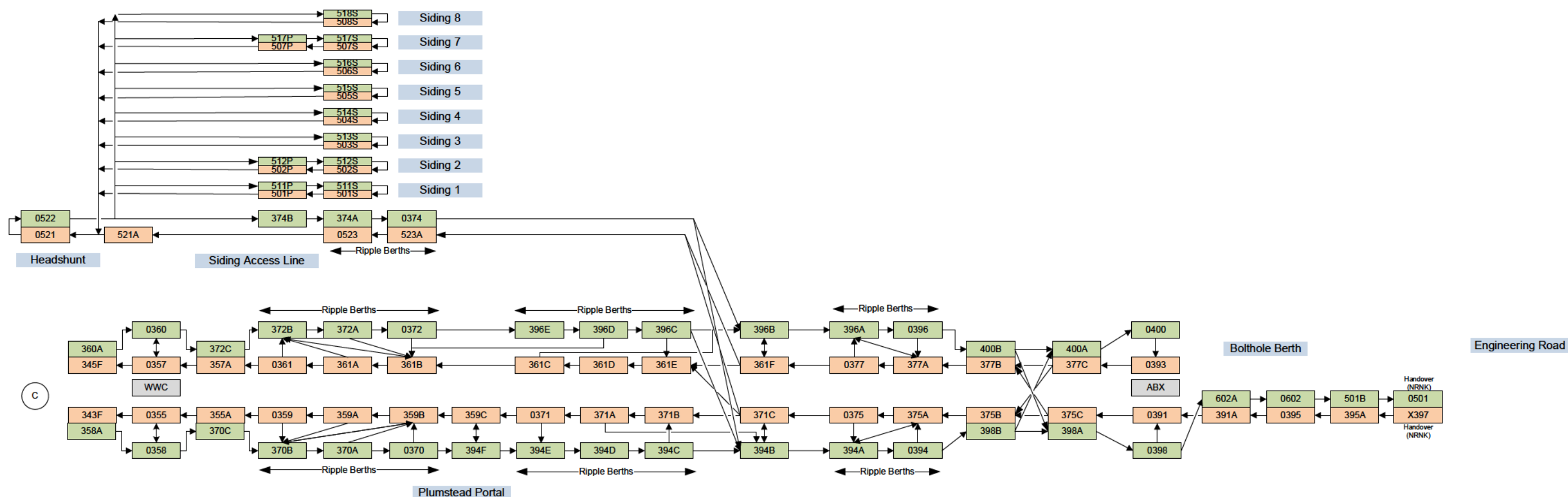


Figure 6 COS Block Schematic – Part E

The following translations of berths have to be considered:
Internal berth name -> external berth name:

S090 -> 0090
S092 -> 0092
095S -> 0095
S100 -> 0100
S106 -> 0106
S122 -> 0122
S124 -> 0124
S126 -> 0126
S144 -> 0144
S146 -> 0146
S310 -> 0310
S120 -> 0120