



Transmach Systems Limited

Unit D1 Phoenix Industrial Estate,
Harrow,
HA12SP

26th February 2026

ITSO POST Compliance Certificate

Certificate Number: C-00200-3 (P2)
Product/Service Name: TM500 On-Bus ETM
Product Version No.: 1.24.13
ITSO Specification: Phase 2 of ITSO Specification version 2.1.5

Dear Parthiv,

ITSO received a request submitted by Transmach Systems Limited, for the certification of the TM500 (version 1.24.13). ITSO has found reasonable evidence that the submitted product/service complies to **Phase 2 of ITSO Specification version 2.1.5**, as indicated in the certification test report:

Test Report:
POST-1770978224 - Certification of Transmach TM500 On-Bus ETM

Your product/service will be included in the certified products list, published on ITSO website.

Please note that the present certification is subject to the following general terms and conditions along with conditions/constraints as detailed in Schedule B:

- i. The present certification is granted on the basis of the ITSO Certification and Compliance Policy, with its validity specified on the certificate page. For a product or service that utilises a valid ITSO certified sub-assembly, the certificate’s validity will correspond to the sub-assembly’s expiry date.
- ii. If the product is changed, Transmach Systems Limited must notify ITSO of this fact in writing by supplying the release notes. Any change in the product that may generate a different behaviour with respect to the ITSO TS 1000 Specification version 2.1.5 standards may be considered a major modification subject to a new evaluation in order to maintain the present certification.
- iii. The present certification granted to Transmach Systems Limited for the above referenced product is non-transferable to any other vendor.
- iv. When requested by an ITSO Licenced Operator, the ITSO Registered Supplier must supply a copy of the test report.

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Schedule A

The TM500 is certified for the following functions of the Phase 2 of ITSO Specification version 2.1.5, as indicated in the table below:

Phase 2 Functions									
IPE Features		Media Features					ISAM Features		HOPS
TYP14 IFR2	TYP16 IFR2	CDM7 SFR2	CMD9	CMD10	CMD11	CMD12	ISAM Query Function	EPOCH	HOPS to HOPS Seq#
✓	✓	✓	–	–	✓	✓	✓	✓	–

¹ Support for this media is optional.

The TM500 is an on-bus ETM with contactless card reader Gemini 2000 Orbit Crypto v1.0, that issues tickets and accepts ITSO cards.

The TM500 has been tested using the Unicard POST Kernel sub-assembly C00163-4 (P2), which holds certification to ITSO TS 1000 Specification version 2.1.5 - Full Phase 2.

The CMs supported by this device is shown in the following table:

CMD2	CMD4	CMD7 SFR1 ²	CMD7 SFR2	CMD9 ¹	CMD10 ¹	CMD11	CMD12
✓	✓	✓	✓	–	–	✓	✓

¹ Support for this media is optional.

² Support for backwards compatibility.



The IPEs supported by this device is shown in the following table:

IPE TYP	Create	Accept	Modify	Delete
TYP0 - Private Entity	–	–	–	–
TYP2 IFR1 - Stored Travel Rights	✓	✓	✓	✓
TYP2 IFR1 VGXRef1 – Stored Travel Rights	✓	✓	✓	✓
TYP2 IFR1 VGXRef2 – Stored Travel Rights	✓	✓	✓	✓
TYP3 - Loyalty Type 1	–	–	–	–
TYP4 - Charge to Account (CTA) Mode 1	–	–	–	–
TYP5 - Charge to Account (CTA) Mode 2	–	–	–	–
TYP14 IFR1 – Entitlement	–	✓	✓	✓
TYP14 IFR2 – Entitlement	✓	✓	✓	✓
TYP16 IFR1 – ITSO ID & Entitlement	–	✓	✓	✓
TYP16 IFR2 – ITSO ID & Entitlement	✓	✓	✓	✓
TYP17 IFR1 – Loyalty Typ2 2 (Centrally Accounted)	–	–	–	–
TYP22 IFR1 – Area Based Ticket	✓	✓	✓	✓
TYP22 IFR2 – Area Based Ticket	✓	✓	✓	✓
TYP22 IFR3 – Area Based Ticket	–	–	–	–
TYP23 IFR1 – Journey Ticket	✓	✓	✓	✓
TYP23 IFR2 – Journey Ticket	✓	✓	✓	✓
TYP23 IFR3 – Journey Ticket	–	–	–	–
TYP24 IFR2 - Journey Ticket with Reservation and Special Restriction	✓	✓	✓	✓
TYP25 - Travel Related Voucher	–	–	–	–
TYP26 - Open System Tolling	–	–	–	–
TYP27 - Period (Space Saving)	✓	✓	✓	N/A
TYP28 - Carnet (Space Saving)	✓	✓	✓	N/A
TYP29 IFR1 - Multi Journey Ticket (Space Saving)	✓	✓	✓	N/A
TYP29 IFR2 - Multi Journey Ticket (Space Saving)	✓	✓	✓	N/A
Transient Ticket Log FR 1	✓	✓	N/A	N/A
Transient Ticket Log FR 2	✓	✓	N/A	N/A
Transient Ticket Log FR 4	✓	✓	N/A	N/A



Schedule A (cont.)

The optional functionality supported by this device is shown in the following tables:

Actionlist ActionToTake (ATT) Supported															
1	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	–

LocDefType Supported														
202	203	204	205	206	207	208	209	210	211	212	255	216	217	218
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–

Hotlist Support				Storage	
Manually Block		Manually Unblock		Hotlist	Actionlist
✓		✓		100 MB	100 MB

Optional Messaging and Data Features					
List FR1 Receive 0Bxx	List FR2 Receive 0Bxx	UD Frames Generate 0Exx	UD Frames Receive 0Exx	UD Frames Generate 0Fxx	UD Frames Receive 0Fxx
		✓	✓	✓	✓

Miscellaneous					
ISAM Query Function 080A/080B	Supp. Data Message 0801	Additional Shell Data 0807	POST SET Notification 0809	Passback Violation Reporting 35	Auto-Renew Before Expiry
✓	✓	✓			



Schedule A (cont.)

Benchmarking Times

ITSO Test Ref and Title	Benchmark Time in ms
POST.0781 - Benchmark Test CMD2: IPE with Value Record Data Group Modification	383.0
POST.0085 - Benchmark Test CMD2: IPE with Transient Ticket Record Creation	274.7
POST.0097 - Benchmark Test CMD4	175.9
POST.0783 - Benchmark Test CMD7: IPE with Value Record Data Group Modification	266.8
POST.0117 - Benchmark Test CMD7: IPE with Transient Ticket Record Creation	238.9
POST.1468 - Benchmark Test CMD11 Static MIDs Profile2 (Normal): IPE with Value Record Data Group Modification	286.6
POST.1469 - Benchmark Test CMD11 Static MIDs Profile2 (Normal): IPE with Transient Ticket Record Creation	192.1
POST.1476 - Benchmark Test CMD11 Static MIDs Profile4 (XL): IPE with Value Record Data Group Modification	294.4
POST.1477 - Benchmark Test CMD11 Static MIDs Profile4 (XL): IPE with Transient Ticket Record Creation	222.5
POST.1478 - Benchmark Test CMD11 Random MIDs Profile 2 (Normal): IPE with Value Record Data Group Modification	277.7
POST.1479 - Benchmark Test CMD11 Random MIDs Profile 2 (Normal): IPE with Transient Ticket Record Creation	260.9
POST.1480 - Benchmark Test CMD11 Random MIDs Profile4 (XL): IPE with Value Record Data Group Modification	302.1
POST.1481 - Benchmark Test CMD11 Random MIDs Profile4 (XL): IPE with Transient Ticket Record Creation	279.4
POST.1482 - Benchmark Test CMD12 Non-Pseudo Profile 6: IPE with Value Record Data Group Modification	318.8
POST.1483 - Benchmark Test CMD12 Non-Pseudo Profile 6: IPE with Transient Ticket Record Creation	256.3
POST.1486 - Benchmark Test CMD12 Pseudo Profile 6: IPE with Value Record Data Group Modification	380.5
POST.1487 - Benchmark Test CMD12 Pseudo Profile 6: IPE with Transient Ticket Record Creation	316.8
POST.1502 - Benchmark Test CMD12 Non-Pseudo Profile 1: IPE with Value Record Data Group Modification	378.3
POST.1503 - Benchmark Test CMD12 Non-Pseudo Profile 1: IPE with Transient Ticket Record Creation	249.5
POST.1504 - Benchmark Test CMD12 Pseudo Profile 1: IPE with Value Record Data	446.0

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ITSO Test Ref and Title	Benchmark Time in ms
Group Modification	
POST.1505 - Benchmark Test CMD12 Pseudo Profile 1: IPE with Transient Ticket Record Creation	328.2
POST.1508 - Benchmark Test CMD12 Pseudo Profile 1: IPE with Value Record Data Group Modification - Mobile CMD12	489.8
POST.1509 - Benchmark Test CMD12 Pseudo Profile 1: IPE with Transient Ticket Record Creation - Mobile CMD12	356.2

Schedule B

List of conditions and/or constraints applied by ITSO:

The Transmach TM500 ETM does not support the following:

- The reversal of TrxReversal.
- Auto renew before the expiry of the current TYP22 pass.
- Auto renew before all stored tickets are consumed.

Image of TM500



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Certificate No. C-00200-3 (P2)

ITSO Certificate of Compliance

Supplier: **Transmach Systems Limited**

Product/service: **TM500 On-Bus ETM**

Version: **1.24.13**

This is to certify that the above product/service has been tested as required by ITSO for compliance against:

ITSO Specification: Phase 2 of ITSO Specification version 2.1.5

This product supports the functions: ITSO POST and communicates within an ITSO environment as listed in Schedule A of this Certificate.

This product may only be used by ITSO Licensed Members complying with the conditions and constraints listed in Schedule B.

Signed for and on behalf of ITSO: _____

Name: Darren Marshall-Sewell

Title: Technology Manager

Dated: 26th February 2026

Certificate Valid until: 25th February 2028

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