HITACHI
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# 臺北捷運環狀線（第一階段）
# 機電系統工程、軌道工程、自動收費系統工程
# TAIPEI CIRCULAR LINE (PHASE 1)
# E&M SYSTEM, TRACK WORKS, AFC SYSTEM
# CF610/CF611/CF617

## 附件十四
## OTC ICD 文件

## APPENDIX 14
## OTC ICD

| | |
|---|---|
| 檔名<br>File | 總頁數:<br>Total 50 |

| | |
|---|---|
| CONTRACT NUMBER: | |
| PROJECT NO: | |
| SA NUMBER: | |

| | |
|---|---|
| **CUSTOMER** | UFOC |
| **PLACE** | |

| | |
|---|---|
| **SYSTEM NAME** | **CMFT Server** |
| **NAME OF DOCUMENT** | OTC通訊規格 v2.5 |

| | | | | |
|---|---|---|---|---|
| Document Type | **TS** |  | 神 通 資 科<br>特殊系統事業群<br>系 統 設 計 處 | DOCUMENT NO.<br>**CMFT ICD - OTC_2.5.docx** |
| Security Class | **External** | | | |
| Base Line | **Design** | | | |
| Status | **Release** | | | |

# 目錄

# 1. INTERFACE DEFINITION

## 1.1 CODEPAGE OF TRANSPORT LAYER SDS

TETRA TL-SDS 的 CodePage 使用 ISO/IEC 8859-1 [40] Latin 1 (8-bit) alphabet.

## 1.2 CTM-UDH PROTOCOL

UDH Format

| TP-UD Octet | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Message |
|---|---|---|---|---|---|---|---|---|
| Hex | 0x06 | 0x08 | 0x04 | 0x00 | 0x04 | 0x02 | 0x01 | … |
| Meaning | UDH Length | IEI | IE Length | CSMS | | Total | Current | CTM SDSs |
| Value | 6 | 8 | 4 | 4 | | 2 | 1 | … |

**Fields:**

**UDH Length**

Length of User Data Header (UDL), in this case 06.

**IEI**

Information Element Identifier, equal to 08

| IEI (hex) | Meaning | Classification | Length | May repeat |
|---|---|---|---|---|
| 08 | Concatenated short message, 16-bit reference number | SMS Control | 4 | no |

**IE Length**

Length of the header, excluding the first two fields; equal to 04

**CSMS**

0000-FFFF, CSMS reference number, must be same for all the SMS parts in the CSMS. Big endian.

**Total**

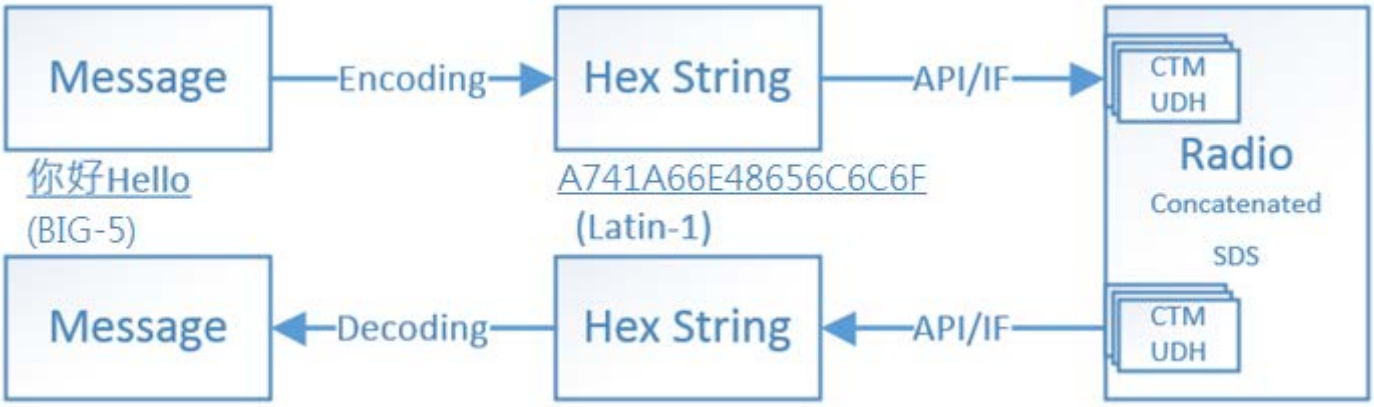
00-FF, total number of parts. The value shall remain constant for every short message which makes up the concatenated short message. If the value is zero then the receiving entity shall ignore the whole information element. In this case, two packets.

**Current**

00-FF, this part's number in the sequence. The value shall start at 1 and increment for every short message which makes up the concatenated short message. If the value is zero or greater than the value in Total field then the receiving entity shall ignore the whole information element. In this case, first of two packets.

## 1.3 MESSAGE ENCODING / DECODING

為避免 RS232(OTC-車機)的控制碼造成訊息被截斷，OTC-CMFT 在傳送 SDS 簡訊之前，需要將訊息內容由 byte array 轉換至 Hex 文字訊息再傳送，如 byte array (0xA741A66E48656C6C6F)需轉換為字串“A741A66E48656C6C6F”(Latin-1)，再透過 SDS 將“A741A66E48656C6C6F”(Latin-1)送出。
反之，當接收 SDS 訊息完成後，需先將字串“A741A66E48656C6C6F”轉換成 byte array(0xA741A66E48656C6C6F)，再進行封包訊息解析。




### 1.4 MESSAGES

每一則訊息由三個部分組成，Header、Packet 與 CRC Code.

| Header | Packet | CRC Code |
|---|---|---|

Header 包含傳送訊息的來源、線路與目標車站；用來指明訊息的來源與被控制的目標。

Packet 中的表示方式包含數字、字串或、位元或不固定類型的表示方式，在不同的訊息上的方式可能有所不同。

CRC Code 用以保護傳送的訊息是否完整，也防止訊息遭竄改。

### 1.5 PACKET RESPONSE CHECK

當任何命令封包(Command)送出後，需等待相對應的回應封包(ACK)，等待時間預設為 10 秒，當 10 秒後無法收得回應封包時，則需再度重送，重送次數也預設為 3 次，若 3 次後還是無法收得回應封包，則代表可能網路斷線或設備發生異常，此命令達下失敗，即可記錄該異常狀況。

### 1.6 CMFT TO OTC

CMFT 傳送至 OTC 的訊息清單，詳細定義於 4.1 CMFT TO OTC 章節中。

**CMFT to OTC Message Types**

| Function | Pack Num. | From OCC | |
|---|---|---|---|
| Common | 1 | 預設封包 | Default packet(Reset MCount, Ack OTC) |
| | 2 | 清除所有通話 | Reset OTC Intercom (reserved) |
| | 3 | 結束指定通訊 | Intercom (PA/PI/SI/CM)Terminate |
| | 9 | OCC Ack | OCC Ack(reserved) |
| PI | 31 | OCC 可以接聽 SI/PI 請求 | OCC Ready to answer SI/PI call |
| | 33 | 通話中加入 SI/PI | Join selected SI/PI into Intercom |
| | 34 | 通話中移除 SI/PI | Remove selected SI/PI from Intercom |
| Train Status | 41 | 要求列車狀態 | Train Status Request |
| | 42 | 要求設備版本 | OTC F/W & S/W Versions Request |
| | 43 | 回應 列車設備故障/恢復 | OTC Equipment fail / recovery ACK |
| | 44 | 回應 緊急告警 | Emergency Alarm ACK |
| | 46 | 要求控制盤狀態 | TRCP Status Request |
| PA | 51 | PA 廣播(口語) | PA Broadcast Oral Request |
| | 52 | PA 廣播(預錄) | PA Broadcast Pre-recorded Request |
| | 53 | 回應 PA 被中斷 | PA Interrupted ACK |
| SI | 62 | 回應 司機員設定接聽 PI 通話要求 | Driver Start to Answer PI Call ACK |
| | 63 | 回應 司機員與 PI 通話 | Driver Intercom with PI ACK |
| PIDS | 71 | 要求 PIDS 顯示訊息 | PIDS Message Display Request |
| | 72 | 要求 PIDS 中斷顯示訊息 | PIDS Message Interrupt Request |
| CM | 81 | 要求列車收音 | Car Monitor Request |

### 1.7 OTC TO CMFT

CMFT 傳送至 OTC 的訊息清單，詳細定義於 4.2 OTC TO CMFT 章節中。

**OTC to CMFT Message Types**

| Function | Pack Num. | From OTC | |
|---|---|---|---|
| Common | 101 | 預設封包 | Default packet(Reset MCount, Ack CFMT) |
| | 102 | OTC 無法執行/中斷 OCC 指令 | OTC [fail to execute]/Interrupted OCC command |
| | 109 | OTC Ack | OTC Ack(reserved) |
| PI | 131 | PI 要求被啟動 | PI Call Request Activated |
| | 132 | OTC 準備好要可以被 OCC 播號 | OTC ready to be called by OCC |
| | 133 | PI/SI 加入結果 | PI/SI Join Result |
| | 134 | PI/SI 移除結果 | PI/SI Remove Result |
| Train Status | 141 | 列車設備狀態(heartbeat) | Train Status 90s |
| | 142 | 列車設備版本 | OTC F/W & S/W Versions |
| | 143 | 列車設備故障/恢復 | OTC Equipment fail / recovery |
| | 144 | 緊急告警 | Emergency Alarm |
| | 146 | 控制盤狀態 | TRCP Status |
| PA | 151 | PA 準備結果(Oral) | [ACK]OTC PA(Oral) Environment Ready |
| | 152 | PA 執行結果(Pre-recorded) | [ACK]OTC PA(Pre-recorded) Execute Result |
| | 153 | PA 被中斷 | PA Interrupted |
| SI | 161 | SI 要求 OCC 通話 | SI Request Intercom with OCC |
| | 162 | 司機員設定接聽 PI 通話要求 | Driver Start to Answer PI Call |
| | 163 | 司機員與 PI 通話 | Driver Intercom with PI |
| PIDS | 171 | PIDS 顯示訊息 ACK | PIDS Message Ack |
| | 172 | PIDS 中斷顯示訊息 ACK | PIDS Message Interrupt Ack |
| CM | 181 | 列車收音環境準備 | Car Monitor Environment Ready |

# 2. MESSAGE FORMATS

本節介紹 CMFT 與 OTC 的訊息介面。所有封包中多位元的數字，將使用 little-endian 規則排序。

## 2.1 CMFT TO OTC MESSAGE HEADER

CMFT 傳送到 OTC 的表頭中，將指明發出訊息的設備，及訊息流水號。

**CMFT to OTC Message Header**

| FROM OCC | | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Server | 1 | | | Data Source |
| | Binary(Unsigned) | 1 | 1 | CMFT |
| | | 2 | 2 | Dispatcher |
| Console | 1 | | | Console ID |
| | Binary(Unsigned) | 0 | 0 | FET Server |
| | | 1 | 1 | BOCC FET Server |
| | | 2~9 | | Spare |
| | | 10 | 10 | CMFT Server |
| | | 11 | 11 | CMFT Console 1 |
| | | 12 | 12 | CMFT Console 2 |
| | | 13 | 13 | CMFT Console 3 |
| | | 14 | 14 | CMFT Console 4 |
| | | 15 | 15 | CMFT Console 5 |
| | | 16 | 16 | CMFT Console 6 |
| | | 17 | 17 | CMFT Console 7 |
| | | 18~49 | | Spare |
| | | 50 | 50 | BOCC CMFT Server |
| | | 51 | 51 | BOCC CMFT Console 1 |
| | | 52 | 52 | BOCC CMFT Console 2 |
| | | 53 | 53 | BOCC Virtual Console |
| | | 54~99 | | Spare |
| | | 100 | 100 | Dispatcher Server |
| | | 101 | 101 | Dispatcher Console 1 |
| | | 102 | 102 | Dispatcher Console 2 |
| | | 103~254 | | Spare |
| MCount | 2 | | | Message Count |
| | Binary(Unsigned) | 0~65535 | by design | Message serial number |

### 2.1.1 DEFAULT CMFT PACKET (MESSAGE 1)

本訊息為 CMFT 至 OTC 的基本格式，至少包含封包號碼(Packet Num.)與封包長度(Length)。

**CMFT to OTC Default CMFT Packet(Reset MCount, Ack OTC)**

本訊息用來命令 OTC 設備重置 MCount。當 CMFT 設備重啟需發送此命令 Model=1 至 OTC，以重置 OTC 的 MCount。此外，當 CMFT 收到 Message101 時需回傳 Model=2 代表 ACK 封包。

| Packet Name | Default CMFT Packet | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 1 | 1 | Default OCC packet |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 3 | 3 | Total length of the packet |
| Model | 1 | | | Packet Model |
| | Binary(Unsigned) | 1 | 1 | CMFT Command Reset MCount |
| | | 2 | 2 | CMFT Ack OTC Reset MCount |

### 2.1.2 RESET OTC INTERCOM (MESSAGE 2) (RESERVED)

本訊息用來命令OTC設備重置所有的通話;此訊息不會檢查要求的來源與既有的通訊來源是否相同，將使所有 OTC 已建立語音通道終止，用在發佈緊急廣播前，使緊急廣播得以建立。

**CMFT to OTC Reset OTC Intercom (reserved)**

| Packet Name | Reset OTC Intercom | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 2 | 2 | Force OTC to reset intercom status as normal. |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 2 | 2 | Total length of the packet |

### 2.1.3 INTERCOM (PA/PI/SI/CM) TERMINATE (MESSAGE 3)

本訊息用來命令 OTC 停止與本機(CMFT)的 PA/PI/SI/CM 通訊；此訊息 OTC 需要檢查要求的來源與既有的通訊來源是否相同。

**CMFT to OTC Intercom (PA/PI/SI/CM) Terminate**

| Packet Name | Intercom (PA/PI/SI/CM) Terminate | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 3 | 3 | Intercom (PA/PI/SI/CM) Terminate |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 2 | 2 | Total length of the packet |

### 2.1.4 OCC ACK(MESSAGE 9) (RESERVED)

當 CMFT 收到來自 OTC 的訊息，將回應本封包至 OTC；Mcount 為對應的 OTC MessageCount。

**CMFT to OTC OCC Ack (reserved)**

| Packet Name | OCC Ack (reserved) | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 9 | 9 | OCC Ack |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 4 | 4 | Total length of the packet |
| AckMcount | 2 | | | Message Count(From OTC) |
| | Binary(Unsigned) | 0~65535 | by design | Ack particular OTC Message. |

### 2.1.5 OCC READY TO ANSWER PI/SI CALL (MESSAGE 31)

當 CMFT 主控台 準備接聽 PI/SI 要求，將發送此封包至 OTC。

**CMFT to OTC OCC Ready to Answer PI/SI call**

| Packet Name | OCC Ready to Answer PI/SI call | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 31 | 31 | OCC ready to answer PI call |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 3 | 3 | Total length of the packet |
| D_PISI | 1 | | | ID of PI/SI |
| | Binary(Unsigned) | ref. OTC Equipment | | e.g. |
| | | Code: | | SI (TRCP)[ 5, 6] |
| | | OTC Equipment ID | | PI[41, 42, 43, … , 52] |
| | | Others | | Spare |
| | | | | |

### 2.1.6 JOIN SELECTED SI/PI INTO INTERCOM (MESSAGE 33)

當列車的 PI/SI 語音通道建立後，此封包可以將更多的 PI/SI 終端加入至以建立的語音通道中，使 CMFT 主控台可以與一個以上的 PI/SI 終端通訊。

**CMFT to OTC Join selected SI/PI into Intercom**

| Packet Name | Join selected SI/PI into Intercom | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 33 | 33 | Join SI/PI into current intercom |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 3 | 3 | Total length of the packet |
| D_PISI | 1 | | | ID of PI/SI |
| | Binary(Unsigned) | ref. | | e.g. |
| | | OTC Equipment | | SI (TRCP)[ 5, 6] |
| | | Code: OTC Equipment ID | | PI[41, 42, 43, … , 52] |
| | | Others | | Spare |

### 2.1.7 REMOVE SELECTED SI/PI FROM INTERCOM (MESSAGE 34)

當列車的 PI/SI 語音通道建立後，透過此封包停止與指定的 PI/SI 終端通訊。

**CMFT to OTC Remove selected SI/PI from Intercom**

<table>
<tr><td>Packet Name</td><td colspan="4">Remove selected SI/PI from Intercom</td></tr>
<tr><td colspan="2">Variable</td><td colspan="3">Values</td></tr>
<tr><td>Name</td><td>Bytes</td><td>No.</td><td>Choice</td><td>Name/Mean</td></tr>
<tr><td rowspan="2">Packet Num.</td><td>1</td><td></td><td></td><td>Packet Number</td></tr>
<tr><td>Binary(Unsigned)</td><td>34</td><td>34</td><td>Remove Selected SI/PI from intercom</td></tr>
<tr><td rowspan="2">Length</td><td>1</td><td></td><td></td><td>Packet Length</td></tr>
<tr><td>Binary(Unsigned)</td><td>3</td><td>3</td><td>Total length of the packet</td></tr>
<tr><td rowspan="4">D_PISI</td><td>1</td><td></td><td></td><td>ID of PI/SI</td></tr>
<tr><td rowspan="3">Binary(Unsigned)</td><td colspan="2">ref.</td><td>e.g.</td></tr>
<tr><td colspan="2">OTC Equipment</td><td>SI (TRCP)[ 5, 6]</td></tr>
<tr><td colspan="2">Code:<br>OTC Equipment ID</td><td>PI[41, 42, 43, … , 52]</td></tr>
<tr><td colspan="2">Others</td><td></td><td>Spare</td></tr>
</table>

### 2.1.8 TRAIN STATUS REQUEST (MESSAGE 41)

用以要求 OTC 設備狀態。CMFT 可主動向 OTC 取得設備狀況；如 CMFT 開機後主動詢問 OTC 設備狀況。

**CMFT to OTC Train Status Request**

| Packet Name | Train Status Request | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 41 | 41 | Train Status Request |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 2 | 2 | Total length of the packet |

### 2.1.9 OTC F/W & S/W VERSIONS REQUEST (MESSAGE 42)

用以要求設備版本。當 CMFT 第一次收到 OTC 設備狀況封包[Message 141]後主動詢問 OTC 設備版本狀況。

CMFT to OTC OTC F/W & S/W VERSIONS Request

| Packet Name | Train Status Request | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 42 | 42 | OTC F/W & S/W VERSIONS Request |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 3 | 3 | Total length of the packet |
| Mode | 1 | | | Version Mode Request |
| | Binary(Unsigned) | 1 | 1 | Audio Version |
| | | 2 | 2 | Text Version |
| | | 3 | 3 | S/W Version |

### 2.1.10 OTC EQUIPMENT FAIL / RECOVERY ACK (MESSAGE 43)

回應：列車設備故障/恢復

**CMFT to OTC EQUIPMENT FAIL / RECOVERY ACK**

| Packet Name | ACK | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 43 | 43 | OTC EQUIPMENT FAIL / RECOVERY ACK |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 4 | 4 | Total length of the packet |
| AckMcount | 2 | | | Message Count(From OTC) |
| | Binary(Unsigned) | 0~65535 | by design | Ack particular OTC Message. |

### 2.1.11 EMERGENCY ALARM ACK (MESSAGE 44)

回應：緊急告警

**CMFT to OTC EMERGENCY ALARM ACK**

| Packet Name | ACK | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 44 | 44 | EMERGENCY ALARM ACK |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 4 | 4 | Total length of the packet |
| AckMcount | 2 | | | Message Count(From OTC) |
| | Binary(Unsigned) | 0~65535 | by design | Ack particular OTC Message. |

### 2.1.12 TRCP STATUS REQUEST (MESSAGE 46)

用以要求 TRCP 的控制盤狀態。

**CMFT to OTC TRCP Status Request**

| Packet Name | TRCP Status Request | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 46 | 46 | TRCP Status Request |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 2 | 2 | Total length of the packet |

### 2.1.13 PA ORAL BROADCAST REQUEST (MESSAGE 51)

用於要求 OTC 準備廣播環境(口語)。

**CMFT to OTC PA Oral Broadcast Request**

| Packet Name | PA Oral Broadcast Request | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 51 | 51 | PA Broadcast Request |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 8 | 8 | Total length of the packet |
| AutoStop | 2 | | | Autostop PA broadcasting in choice seconds |
| | Binary(Unsigned) | 0 | 0 | Cant autostop |
| | | 1~65535 | by design | seconds |
| GTSI | 4 | | | Dynamic Group TSI |
| | Binary(Unsigned) | $0\sim2^{32}$ | by design | |

### 2.1.14 PA BROADCAST PRE-RECORDED REQUEST (MESSAGE 52)

用於要求 OTC 準備預錄廣播環境(Pre-recorded)。

**CMFT to OTC PA Pre-recorded Broadcast Request**

| Packet Name | PA Pre-recorded Broadcast Request | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 52 | 52 | PA Broadcast Request |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 10 | 10 | Total length of the packet |
| MessageId | 4 | | | Message Id |
| | Binary(Unsigned) | $0\sim2^{32}$ | by design | if message id equal 0 than interrupt the pre-recorded PA |
| Lang | 1 | | | 語系 |
| | Binary(Unsigned) | | Bit0 | 台語 0->Disable,1->Enable |
| | | | Bit1 | 英語 0->Disable,1->Enable |
| | | | Bit2 | 客語 0->Disable,1->Enable |
| | | | Bit3 | 國語 0->Disable,1->Enable |
| | | | Bit4~7 | Space |
| Type | 1 | | | Packet Length |
| | Binary(Unsigned) | 1 | 1 | 緊急 level |
| | | 2 | 2 | 宣導 level |
| | | 3 | 3 | 備用 1 |
| | | 4 | 4 | 備用 2 |
| Loop | 1 | | | 顯示次數 |
| | Binary(Unsigned) | 0~255 | by design | 255=∞ |
| Interval | 1 | | | 每次間隔秒數(SEC) |
| | Binary(Unsigned) | 0~255 | by design | |

### 2.1.15 PA INTERRUPTED ACK (MESSAGE 53)

回應：廣播被中斷

**CMFT to OTC PA INTERRUPTED ACK**

| Packet Name | ACK | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 53 | 53 | PA INTERRUPTED ACK |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 4 | 4 | Total length of the packet |
| AckMcount | 2 | | | Message Count(From OTC) |
| | Binary(Unsigned) | 0~65535 | by design | Ack particular OTC Message. |

### 2.1.16 DRIVER START TO ANSWER PI CALL ACK (MESSAGE 62)

回應：當車上設定 PI 來電由車上接聽時

**CMFT to OTC DRIVER START TO ANSWER PI CALL ACK**

| Packet Name | ACK | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 62 | 62 | DRIVER START TO ANSWER PI CALL ACK |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 4 | 4 | Total length of the packet |
| AckMcount | 2 | | | Message Count(From OTC) |
| | Binary(Unsigned) | 0~65535 | by design | Ack particular OTC Message. |

### 2.1.17 SERVICE INTERCOM WITH PI ACK (MESSAGE 63)

回應：當服務對講機接通 PI 通訊時

**CMFT to OTC SERVICE INTERCOM WITH PI ACK**

| Packet Name | ACK | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 63 | 63 | DRIVER INTERCOM WITH PI ACK |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 4 | 4 | Total length of the packet |
| AckMcount | 2 | | | Message Count(From OTC) |
| | Binary(Unsigned) | 0~65535 | by design | Ack particular OTC Message. |

### 2.1.18 PIDS MESSAGE (MESSAGE 71)

用於發送 PIDS 訊息。

**CMFT to OTC PIDS Message**

| Packet Name | PIDS Message | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 71 | 71 | PIDS Message |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 46 | 46 | Total length of the packet |
| Level | 1 | | | Message Level (L1 > 列車訊息 > L2) |
| | Binary(Unsigned) | 1 | 1 | Level 1 |
| | | 2 | 2 | Level 2 |
| Loop Count | 1 | | | Loop Count |
| | Binary(Unsigned) | 0~255 | by design | If Level=2,請參考此欄位; |
| Total | 1 | | | Total message count |
| | Binary(Unsigned) | 1~4 | by design | The max message is 4 parts. |
| Current | 1 | | | Current message index |
| | Binary(Unsigned) | 1~4 | by design | |
| Message Detail. | 40 | | | Message Detail |
| | BIG-5 | by design | by design | PIDS Message<br>the max of bytes is 40 bytes<br>if message < 40 bytes last Byte is 0x00.<br><br>1. if total value > 1 then begin to wait next message until current value is equal total value.<br>2. if total value equal current value then merge all message and send to PIDS.<br>3. the Level and loop count fields uses first message's content (current = 1). |

### 2.1.19 PIDS INTERRUPT MESSAGE (MESSAGE 72)

用於中斷 PIDS Level 1 (L1) 訊息。

**CMFT to OTC PIDS Interrupt Message**

| Packet Name | PIDS Message Interrupt | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 72 | 72 | PIDS Interrupt Message |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 3 | 3 | Total length of the packet |
| Message No | 1 | | | Message No |
| | Binary(Unsigned) | 0~255 | by design | |

### 2.1.20 CAR MONITOR REQUEST (MESSAGE 81)

用於要求建立列車收音。

**CMFT to OTC Car Monitor Request**

| Packet Name | Car Monitor Request | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 81 | 81 | Car Monitor Request |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 3 | 3 | Total length of the packet |
| D_PI | 1 | | | ID of Passenger Intercom |
| | Binary(Unsigned) | ref. | | e.g. |
| | | OTC Equipment | | PI[41, 42, 43, … , 52] |
| | | Code: | | |
| | | OTC Equipment ID | | |
| | | Others | | Spare |

## 2.2 OTC TO CMFT

本節描述所有 OTC 傳送至 CMFT 的訊息格式。

### 2.2.1 OTC TO CMFT EQUIPMENT ERROR TABLE

OTC 的設備故障或執行失敗原因表，用於傳送 Error Code 至 CMFT。

**OTC to CMFT Equip Error**

| Error Code | Reason | Description |
|---|---|---|
| 0 | Success | 成功 |
| 1 | UNDEFINE_ERROR | 尚未定義的錯誤 |
| 2 | USER_MANUALLY_CANCEL_SI_OCC_TALK | 捷運列車上工作人員手動取消 SI 與 OCC 的通話 |
| 3 | INVAILID_PI_PARAMETER_FROM_CMFT | CMFT 指令的 PI 參數錯誤 |
| 4 | INVALID_SI_PARAMETER_FROM_CMFT | CMFT 指令的指定的 SI 參數錯誤 |
| 5 | INVALID_CONSOLE_ID_FROM_CMFT | CMFT 指令的 Console ID 與目前列車上執行指令中的 Console ID 不符，指令無效 |
| 6 | INVALID_CANNED_MESSAGE_ID_FROM_CMFT | CMFT 指令的罐頭訊息 ID 不存在，無法播放對應的預錄罐頭語音及文字 |
| 7 | INVALID_REQUEST_FROM_CMFT | CMFT 下達不合宜的指令(例如：OTC 系統 IDLE 狀態時，收到中斷特定緊急對講機通話) |
| 8 | WRONG_SI_ID_FROM_CMFT | CMFT 指令的指定的 SI 裝置 ID 不匹配(車頭 TRIU->車尾 SI 或是 車尾 TRIU->車頭 SI) |
| 9 | OCC_PA_IS_ALREADY_ACTIVATED | 行控中心口語廣播已啟動(優先權低的指令無法執行或是會被中斷) |
| 10 | OCC_SI_IS_ALREADY_ACTIVAED | 行控中心正與工作人員進行通話(優先權低的指令無法執行或是會被中斷) |
| 11 | OCC_PI_IS_ALREADY_ACTIVAED | 行控中心正與緊急對講機通話(優先權低的指令無法執行或是會被中斷) |
| 12 | OCC_CAR_MONITOR_IS_ALREADY_ACTIVATED | 行控中心已啟動列車監聽功能，無法重覆啟動列車監聽功能 |
| 13 | SI_ORAL_PA_IS_ACTIVAED | 捷運列車上工作人員已啟動列車口語廣播(優先權低的指令無法執行或是會被中斷) |
| 14 | SI_PI_IS_ALREADY_ACTIVAED | 捷運列車上工作人員正與緊急對講機通話(優先權低的指令無法執行或是會被中斷) |
| 15 | FAIL_TO_CONNECT_TO_PI | OTC 與緊急對講機連線異常，指令無法正確下達至緊急對講機(PI) |
| 16 | FAIL_TO_CONNECT_TO_PIDS | OTC 與顯示器裝置連線異常，指令無法正確下達顯示器裝置(PIDS) |
| 17 | FAIL_TO_CONNECT_TO_TRCP | OTC 與 TRCP 面板裝置連線異常 |

### 2.2.2 OTC TO CMFT MESSAGE HEADER

OTC 傳送到 CMFT 的表頭中，將指明發出訊息的設備、車行方向、測試模式與訊息流水號。

**OTC to CMFT Message Header**

| FROM OTC | | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Train ID | 4 | | | Train ID (From ATS TID 班次) |
| | ASCII(ISO/IEC 646) | by design | by design | (Pad left ' ') last Byte is 0x00 |
| N_TROU | 1 | | | TROU ID |
| | Binary(Unsigned)) | ref. OTC Equipment ID | by design | e.g. TROU[1, 2] |
| DIR | 1 | | | Traveling Direction |
| | ASCII(ISO/IEC 646) | 0 | 0 | Up traveling |
| | | 1 | 1 | Down traveling |
| TestMode | 1 | | | Test Mode |
| | ASCII(ISO/IEC 646) | 0 | 0 | Not in test mode |
| | | 1 | 1 | In test mode |
| Mcount | 2 | | | Message Count |
| | Binary(Unsigned) | 0~65535 | by design | Message serial number |

### 2.2.3 DEFAULT OTC PACKET (MESSAGE 101)

本訊息為 OTC 至 CMFT 的基本格式，至少包含封包號碼(Packet Num.)與封包長度(Length)。

**OTC to CMFT Default OTC Packet (Reset MCount, Ack CMFT)**

本訊息用來通知 CMFT 設備重置 MCount。當 OTC 設備重啟需發送此命令 Model=1 至 CMFT，以重置 CMFT 的 MCount。此外，當 OTC 收到 Message1 時需回傳 Model=2 代表 ACK 封包。

| Packet Name | Default OTC Packet | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 101 | 101 | Default OTC packet |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 3 | 3 | Total length of the packet |
| Model | 1 | | | Packet Model |
| | Binary(Unsigned) | 1 | 1 | CMFT Command Reset MCount |
| | | 2 | 2 | CMFT Ack OTC Reset MCount |

### 2.2.4 OTC [FAIL TO EXECUTE]/INTERRUPTED OCC COMMAND (MESSAGE 102)

當 OTC 無法執行 CMFT 的命令，建立需要的語音通道時，需回覆 CMFT 並指明錯誤原因。

**OTC to CMFT OTC [fail to execute]/Interrupted OCC command**

| Packet Name | OTC [fail to execute]/Interrupted OCC command | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 102 | 102 | OTC [fail to execute]/Interrupte OCC command |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 6 | 6 | Total length of the packet |
| Console | 1 | | | Console ID |
| | Binary(Unsigned) | 0~255 | by design | Ack particular Console |
| Reason | 1 | | | Reason |
| | Binary(Unsigned) | 0~255 | by design | Please Ref OTC to CMFT Equip Error table |
| N_Target | 1 | | | N_Target |
| | Binary(Unsigned) | ref. OTC Equipment Code: OTC Equipment ID | | e.g.<br>SI (TRCP)[ 5, 6]<br>PI[41, 42, 43, … , 52] |
| | | by design | by design | Target Phone Number |
| CommType | 1 | | | Communication Type |
| | Binary(Unsigned) | 0 | 0 | N/A |
| | | 1 | 1 | SI |
| | | 2 | 2 | PI |
| | | 3 | 3 | PA |
| | | 4 | 4 | CM |
| | | 5 | 5 | PIDs |
| | | Others | | Spare |

### 2.2.5 OTC ACK (RESERVED) (MESSAGE 109)

當 OTC 收到來自 CMFT 的訊息，將回應本封包至 CMFT；Mcount 為對應的 CMFT MessageCount。

**OTC to CMFT OTC Ack (reserved)**

| Packet Name | [ACK]OTC Ack | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 109 | 109 | OTC Ack |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 5 | 5 | Total length of the packet |
| Console | 1 | | | Console ID |
| | Binary(Unsigned) | 0~255 | by design | Ack particular Console |
| AckMcount | 2 | | | Message Count(From CMFT) |
| | Binary(Unsigned) | 0~65535 | by design | Ack particular Message. |

### 2.2.6 PI CALL REQUEST ACTIVATED (MESSAGE 131)

當列車任何 PI 被啟動(PI Activated)或狀態改變後，OTC 需發送此訊息至 CMFT；而有任何 PI 狀態為 Activated 需持續發送此訊息(每 5 秒間隔發送)，直至所有 PI 的狀態變成 Not Activated 為止(被接聽 or 被清除)。

**OTC to CMFT PI Call Request Activated**

| Packet Name | PI Call Request Activated | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 131 | 131 | PI Call Request Activated |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 14 | 14 | Total length of the packet |
| D_PI 41 | 1 | | | Passenger Intercom 41 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |
| D_PI 42 | 1 | | | Passenger Intercom 42 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |
| D_PI 43 | 1 | | | Passenger Intercom 43 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |
| D_PI 44 | 1 | | | Passenger Intercom 44 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |
| D_PI 45 | 1 | | | Passenger Intercom 45 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |
| D_PI 46 | 1 | | | Passenger Intercom 46 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |
| D_PI 47 | 1 | | | Passenger Intercom 47 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |
| D_PI 48 | 1 | | | Passenger Intercom 48 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |
| D_PI 49 | 1 | | | Passenger Intercom 49 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |

| | | | | |
|---|---|---|---|---|
| D_PI 50 | 1 | | | Passenger Intercom 50 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |
| D_PI 51 | 1 | | | Passenger Intercom 51 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |
| D_PI 52 | 1 | | | Passenger Intercom 52 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |

update every 5 seconds or states changes

### 2.2.7 OTC READY TO BE CALLED BY OCC (MESSAGE 132)

用於 OTC 準備好可以被 OCC 播號。

**OTC to CMFT OTC Ready to be Called By OCC**

| Packet Name | [ACK]OTC Ready to Call OCC | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 132 | 132 | [ACK]OTC Ready to Call OCC |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 8 | 8 | Total length of the packet |
| Console | 1 | | | Console ID |
| | Binary(Unsigned) | 0~255 | by design | Ack particular Console |
| D_PISI | 1 | | | ID of PI/SI |
| | Binary(Unsigned) | ref. | | e.g. |
| | | OTC Equipment | | SI (TRCP)[ 5, 6] |
| | | Code: OTC Equipment ID | | PI[41, 42, 43, … , 52] |
| | | Others | | Spare |
| Ack Status | 1 | | | Console ID |
| | Binary(Unsigned) | 0 | 0 | OTC is ready |
| | | 1 | 1 | OTC can't be called by OCC |
| | | Others | | Spare |
| Error Code | 1 | | | Error code If OTC can't be called by OCC |
| | Binary(Unsigned) | 0~255 | by design | Please Ref Equip Error table |
| AckMcount | 2 | | | Message Count(From CMFT) |
| | Binary(Unsigned) | 0~65535 | by design | Ack particular Message. |

### 2.2.8 PI/SI JOIN RESULT (MESSAGE 133)

用於回應 PI/SI 加入結果

**OTC to CMFT PI/SI Join Result**

| Packet Name | PI/SI Join Result | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 133 | 133 | PI/SI Join Result |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 8 | 8 | Total length of the packet |
| Console | 1 | | | Console ID |
| | Binary(Unsigned) | 0~255 | by design | Ack particular Console |
| D_PISI | 1 | | | ID of PI/SI |
| | Binary(Unsigned) | ref. | | e.g. |
| | | OTC Equipment | | SI (TRCP)[ 5, 6] |
| | | Code: | | PI[41, 42, 43, … , 52] |
| | | OTC Equipment ID | | |
| | | Others | | Spare |
| Ack Status | 1 | | | Result Status |
| | Binary(Unsigned) | 0 | 0 | True |
| | | 1 | 1 | False |
| Error Code | 1 | | | Error code If OTC join PI/SI fail |
| | Binary(Unsigned) | 0~255 | by design | Please Ref Equip Error table |
| AckMcount | 2 | | | Message Count(From CMFT) |
| | Binary(Unsigned) | 0~65535 | by design | Ack particular Message. |

### 2.2.9 PI/SI REMOVE RESULT (MESSAGE 134)

用於回應 PI/SI 移除結果

**OTC to CMFT PI/SI Remove Result**

| Packet Name | PI/SI Remove Result | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 134 | 134 | PI/SI Remove Result |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 8 | 8 | Total length of the packet |
| Console | 1 | | | Console ID |
| | Binary(Unsigned) | 0~255 | by design | Ack particular Console |
| D_PISI | 1 | | | ID of PI/SI |
| | Binary(Unsigned) | ref. | | e.g. |
| | | OTC Equipment | | SI (TRCP)[ 5, 6] |
| | | Code: OTC Equipment ID | | PI[41, 42, 43, … , 52] |
| | | Others | | Spare |
| Ack Status | 1 | | | Result Status |
| | Binary(Unsigned) | 0 | 0 | True |
| | | 1 | 1 | False |
| Error Code | 1 | | | Error code If OTC join or remove PI/SI fail |
| | Binary(Unsigned) | 0~255 | by design | Please Ref Equip Error table |
| Ack Mcount | 2 | | | Message Count(From CMFT) |
| | Binary(Unsigned) | 0~65535 | by design | Ack particular Message. |

### 2.2.10 TRAIN STATUS 90S (MESSAGE 141)

列車的 OTC 設備狀態，定期每 90 秒更新。

**OTC to CMFT Train Status 90s**

| Packet Name | Train Status 90s | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 141 | 141 | Train Status 90s |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 19 | 19 | Total length of the packet |
| Master TROUID | 1 | | | Master TROU ID |
| | Binary(Unsigned) | ref. OTC Equipment Code: OTC Equipment ID | | e.g. TROU[1, 2] |
| | | Others | | Spare |
| TROU Position | 1 | | | Master TROU is installed in A/B car |
| | ASCII(ISO/IEC 646) | A | A | Installed in A car |
| | | B | B | Installed in B Car |
| | | Others | | Spare |
| S_CC | 1 | | | TRIU and CC connection status |
| | | | Bit 0 | TRIU 1 and CC connections |
| | | | Bit 1 | TRIU 2 and CC connections |
| | | | Bit 2~7 | Spare |
| | Bit-oriented coding | 0 | 0 | Normal |
| | | 1 | 1 | Fail |
| S_TROU | 1 | | | TROU Status ref. OTC Equipment Code: OTC Equipment ID |
| | | | Bit 0 | 4TOU-001/A OTC Equipment ID[1] |
| | | | Bit 1 | 4TOU-002/B OTC Equipment ID[2] |
| | | | Bit 2~7 | Spare |
| | Bit-oriented coding | 0 | 0 | Normal |
| | | 1 | 1 | Fail |
| S_TRIU | 1 | | | TRIU Status ref. OTC Equipment Code: OTC Equipment ID |
| | | | Bit 0 | 4TIU-001/A OTC Equipment ID[3] |
| | | | Bit 1 | 4TIU-002/B OTC Equipment ID[4] |
| | | | Bit 2~7 | Spare |
| | Bit-oriented coding | 0 | 0 | Normal |

| | | | | | |
|---|---|---|---|---|---|
| | | 1 | 1 | Fail | |
| S_TRCP | 1 | | | TRCP Status<br>ref. OTC Equipment Code: OTC Equipment ID | |
| | | | Bit 0 | 4TCP-001/A | OTC Equipment ID[5] |
| | | | Bit 1 | 4TCP-002/B | OTC Equipment ID[6] |
| | | | Bit 2~7 | Spare | |
| | Bit-oriented coding | 0 | 0 | Normal | |
| | | 1 | 1 | Fail | |
| S_PID | 4 | | | PID Status<br>ref. OTC Equipment Code: OTC Equipment ID | |
| | | | Bit 0 | 4PID-001/A | OTC Equipment ID[11] |
| | | | Bit 1 | 4PID-002/A | OTC Equipment ID[12] |
| | | | Bit 2 | 4PID-003/A | OTC Equipment ID[13] |
| | | | … | … | … |
| | | | Bit 23 | 4PID-024/D | OTC Equipment ID[34] |
| | | | Bit 24~31 | Spare | |
| | Bit-oriented coding | 0 | 0 | Normal | |
| | | 1 | 1 | Fail | |
| S_PI | 2 | | | PI Status.<br>ref. OTC Equipment Code: OTC Equipment ID | |
| | | | Bit 0 | 4PEI-001/A | OTC Equipment ID[41] |
| | | | Bit 1 | 4PEI-002/A | OTC Equipment ID[42] |
| | | | Bit 2 | 4PEI-003/A | OTC Equipment ID[43] |
| | | | … | … | … |
| | | | Bit 11 | 4PEI-012/D | OTC Equipment ID[52] |
| | | | Bit 13~15 | Spare | |
| | Bit-oriented coding | 0 | 0 | Normal | |
| | | 1 | 1 | Fail | |
| S_Nport | 1 | | | N-Port Status<br>ref. OTC Equipment Code: OTC Equipment ID | |
| | | | Bit 0 | 4NPT-001/A | OTC Equipment ID[71] |
| | | | Bit 1 | 4NPT-002/B | OTC Equipment ID[72] |
| | | | Bit 2 | 4NPT-003/C | OTC Equipment ID[73] |
| | | | Bit 3 | 4NPT-004/D | OTC Equipment ID[74] |
| | | | Bit 4~7 | Spare | |
| | Bit-oriented coding | 0 | 0 | Normal | |
| | | 1 | 1 | Fail | |
| S_Phone | 4 | | | OTC's Slave Phone Number | |
| | Binary(Unsigned) | 1~$2^{32}$ | by design | Only ISSI , Example 20001-20-466 get 20001 | |

### 2.2.11 OTC F/W & S/W VERSIONS (MESSAGE 142)

發送 OTC 的韌體與軟體版本給 OCC。

**OTC to CMFT OTC F/W & S/W Versions**

| Packet Name | OTC F/W & S/W Versions | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 142 | 142 | |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 32 | 32 | Total length of the packet |
| TROU Position | 1 | | | Master TROU is installed in A/B car |
| | ASCII(ISO/IEC 646) | A | A | Installed in A car |
| | | B | B | Installed in B Car |
| | | Others | | Spare |
| Mode | 1 | | | Version Mode Request |
| | Binary(Unsigned) | 1 | 1 | Audio Version |
| | | 2 | 2 | Text Version |
| | | 3 | 3 | S/W Version |
| V_PreDef Audio/Text/SW | 13 | | | Pre-Defined Audio/Text/SW Version 4TIU-001/A |
| | ASCII(ISO/IEC 646) | 00000000.000 | | CAN'T FIND |
| | | by design | by design | Format: yyyyMMdd.SN Example: 20121210.012 last Byte is 0x00 |
| V_PreDef Audio/Text/SW | 13 | | | Pre-Defined Audio/Text/SW Version 4TIU-001/B |
| | ASCII(ISO/IEC 646) | 00000000.000 | | CAN'T FIND |
| | | by design | by design | Format: yyyyMMdd.SN Example: 20121210.012 last Byte is 0x00 |
| Ack Mcount | 2 | | | Message Count(From CMFT) |
| | Binary(Unsigned) | 0~65535 | by design | Ack particular Message. |

### 2.2.12 OTC EQUIPMENT FAIL / RECOVERY (MESSAGE 143)

當設備狀態改變時，傳送設備的故障/恢復狀態至 CMFT。

**OTC to CMFTOTC Equipment Fail / Recovery**

| Packet Name | OTC Equipment Fail / Recovery | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 143 | 143 | OTC Equipment Fail / Recovery |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 5 | 5 | Total length of the packet |
| TROU Position | 1 | | | Master TROU is installed in A/B car |
| | ASCII(ISO/IEC 646) | A | A | Installed in A Car |
| | | B | B | Installed in B Car |
| | | Others | | Spare |
| D_Equipment | 1 | | | Target OTC equipment ID |
| | Binary(Unsigned) | ref. OTC Equipment Code: OTC Equipment ID | | e.g. TROU[1, 2] TRIU[3, 4] … |
| | | Others | | Spare |
| S_Eqiupment | 1 | | | OTC equipment status |
| | Binary(Unsigned) | 0 | 0 | Normal |
| | | 1 | 1 | Fail |
| | | Others | | Spare |

### 2.2.13 EMERGENCY ALARM (MESSAGE 144)

當列車緊急設備啟動時，傳送至 CMFT。

**OTC to CMFT Emergency Alarm**

| Packet Name | Emergency Alarm | | | | |
|---|---|---|---|---|---|
| Variable | | Values | | | |
| Name | Bytes | No. | Choice | Name/Mean | |
| Packet Num. | 1 | | | Packet Number | |
| | Binary(Unsigned) | 144 | 144 | Emergency Alarm | |
| Length | 1 | | | Packet Length | |
| | Binary(Unsigned) | 14 | 14 | Total length of the packet | |
| S_TRCP | 1 | | | TRCP Status | ref. OTC Equipment Code: OTC Equipment ID |
| | | | Bit 0 | 4TCP-001/A | OTC Equipment ID[5] |
| | | | Bit 1 | 4TCP-002/B | OTC Equipment ID[6] |
| | | | Bit 2~7 | Spare | |
| | Bit-oriented coding [76543210] | 0 | 0 | Normal | |
| | | 1 | 1 | Fail | |
| Smoke Sensors | 2 | | | Smoke Sensors | |
| | | | Bit 0 | Smoke Sensor ID 1 | ref. OTC Emergncy Alarm Code: OTC Alarm ID |
| | | | Bit 1 | Smoke Sensor ID 2 | |
| | | | Bit 2 | Smoke Sensor ID 3 | |
| | | | … | … | |
| | | | Bit 15 | Smoke Sensor ID 16 | |
| | Bit-oriented coding [76543210] | 0 | 0 | non active | |
| | | 1 | 1 | active | |
| EDOH | 3 | | | Emergency Door Open Handles | |
| | | | Bit 0 | Emergency Door Open Handle ID 1 | ref. OTC Emergncy Alarm Code: OTC Alarm ID |
| | | | Bit 1 | Emergency Door Open Handle ID 2 | |
| | | | Bit 2 | Emergency Door Open Handle ID 3 | |
| | | | … | … | |

| | | | | | |
|---|---|---|---|---|---|
| | | | Bit 11 | Emergency Door Open Handle ID 12 | |
| | | | Bit 12~23 | Spare | Spare |
| | Bit-oriented coding [76543210] | 0 | 0 | non active | |
| | | 1 | 1 | active | |
| ESH | 3 | | | Emergency Stop Handles | |
| | | | Bit 0 | Emergency Stop Handle ID 1 | ref. OTC Emergncy Alarm Code: OTC Alarm ID |
| | | | Bit 1 | Emergency Stop Handle ID 2 | |
| | | | Bit 2 | Emergency Stop Handle ID 3 | |
| | | | … | … | |
| | | | Bit 11 | Emergency Stop Handle ID 12 | |
| | | | Bit 12~23 | Spare | |
| | Bit-oriented coding [76543210] | 0 | 0 | non active | |
| | | 1 | 1 | active | |
| S_CC | 1 | | | TRIU and CC connection status | |
| | | | Bit 0 | TRIU 1 and CC connections | |
| | | | Bit 1 | TRIU 2 and CC connections | |
| | | | Bit 2~7 | Spare | |
| | Bit-oriented coding [76543210] | 0 | 0 | Normal | |
| | | 1 | 1 | Fail | |
| Unexpected DoorOpen | 1 | | | Unexpected Door Open | |
| | Binary(Unsigned) | 0 | 0 | Normal | |
| | | 1 | 1 | Abnormal | |
| | | Others | | Spare | |
| Unexpected | 1 | | | Unexpected Train Stop | |

| | | | | |
|---|---|---|---|---|
| TrainStop | | | | Between Stations |
| | Binary(Unsigned) | 0 | 0 | Normal |
| | | 1 | 1 | Situation: Immediate Emergency Stop |
| | | 2 | 2 | Situation: Unintended Stop |
| | | Others | | Spare |

### 2.2.14 TRCP STATUS (MESSAGE 146)

傳送 TRCP 控制盤的狀態至 CMFT。

**OTC to CMFT TRCP Status**

| Packet Name | TRCP Status | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 146 | 146 | TRCP Status |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 5 | 5 | Total length of the packet |
| TRCPID | 1 | | | TRCP ID |
| | Binary(Unsigned) | ref.<br>OTC Equipment Code:<br>OTC Equipment ID | | e.g.<br>TRCP[5, 6] |
| TRCP Function | 2 | | | TRCP Function Activated |
| | | | Bit 0 | Master |
| | | | Bit 1 | OCC |
| | | | Bit 2 | DEPOT |
| | | | Bit 3 | MAIN Line |
| | | | Bit 4 | PA |
| | | | Bit 5 | PI |
| | | | Bit 6 | S1 |
| | | | Bit 7 | S2 |
| | | | Bit 8 | S3 |
| | | | Bit 9 | S4 |
| | | | Bit 10 | PI Master |
| | | | Bit 11 | Enter |
| | | | Bit 12 | DMO |
| | | | Others | Spare |
| | Bit-oriented coding | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |

### 2.2.15 OTC PA (ORAL) ENVIRONMENT READY (MESSAGE 151)

回覆 CMFT，OTC 廣播環境準備結果(Oral)。

**OTC to CMFT OTC PA (ORAL) Environment Ready**

| Packet Name | [ACK]OTC PA Environment Ready | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 151 | 151 | [ACK]is OTC(Oral) PA Environment Ready |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 7 | 7 | Total length of the packet |
| Console | 1 | | | Console ID |
| | Binary(Unsigned) | 0~255 | by design | Ack particular Console |
| Ack Status | 1 | | | Ack Status |
| | Binary(Unsigned) | 0 | 0 | OTC is ready |
| | | 1 | 1 | OTC can't be called by OCC |
| | | Others | | Spare |
| Error Code | 1 | | | Error code If OTC can't be called by OCC |
| | Binary(Unsigned) | 0~255 | by design | Please Ref Equip Error table |
| AckMcount | 2 | | | Message Count(From CMFT) |
| | Binary(Unsigned) | 0~65535 | by design | Ack particular Message. |

### 2.2.16 OTC PA (PRE-RECORDED) EXECUTE RESULT (MESSAGE 152)

回覆 CMFT，OTC 預錄廣播執行結果(Pre-recorded)。

**OTC to CMFT OTC PA (PRE-RECORDED) Execute Result**

| Packet Name | [ACK]OTC PA Execute Result | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 152 | 152 | [ACK]is OTC PA(PRE-RECORDED) Execute result |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 7 | 7 | Total length of the packet |
| Console | 1 | | | Console ID |
| | Binary(Unsigned) | 0~255 | by design | Ack particular Console |
| Ack Status | 1 | | | Ack Status |
| | Binary(Unsigned) | 0 | 0 | The pre-recorded PA executed successfully. |
| | | 1 | 1 | OTC can't execute pre-recorded PA |
| | | Others | | Spare |
| Error Code | 1 | | | Error code, If OTC can't execute pre-recorded PA |
| | Binary(Unsigned) | 0~255 | by design | Please Ref Equip Error table |
| AckMcount | 2 | | | Message Count(From CMFT) |
| | Binary(Unsigned) | 0~65535 | by design | Ack particular Message. |

### 2.2.17 PA INTERRUPTED (MESSAGE 153)

當廣播的語音通道已建立，但被其他具更高優先權的需求中斷時，需發送此訊息至 CMFT 並指明原因。

**OTC to CMFT PA Interrupted**

| Packet Name | PA Interrupted | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 153 | 153 | PA Interrupted |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 4 | 4 | Total length of the packet |
| Console | 1 | | | Console ID |
| | Binary(Unsigned) | 0~255 | by design | To Console ID |
| Error Code | 1 | | | Error code |
| | Binary(Unsigned) | 0~255 | by design | Please Ref Equip Error table |

### 2.2.18 SI REQUEST INTERCOM WITH OCC (MESSAGE 161)

傳送 SI 需求至 CMFT。

**OTC to CMFT SI Request Intercom with OCC**

| Packet Name | SI Request Intercom with OCC | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 161 | 161 | SI Request Intercom with OCC |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 4 | 4 | Total length of the packet |
| D_TRCP | 1 | | | TRCP ID Activated |
| | Binary(Unsigned) | ref. OTC Equipment Code: OTC Equipment ID | | e.g. TRCP[5, 6] |
| | | Others | | Spare |
| D_Cabin | 1 | | | SI in Cabin |
| | ASCII(ISO/IEC 646) | A | A | In cabin A |
| | | B | B | In cabin B |
| | | Others | | Spare |

### 2.2.19 DRIVER START TO ANSWER PI REQUEST (MESSAGE 162)

當車上 PI 來電設定由車上接聽或該設定取消時，傳送此訊息至 CMFT。

**OTC to CMFT Driver start to answer PI request**

| Packet Name | Driver start to answer PI request | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 162 | 162 | Driver join the Conference |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 5 | 5 | Total length of the packet |
| D_TRCP | 1 | | | TRCP ID Joined |
| | Binary(Unsigned) | ref. OTC Equipment Code: OTC Equipment ID | | e.g. TRCP[5, 6] |
| | | Others | | Spare |
| D_Cabin | 1 | | | SI in Cabin |
| | ASCII(ISO/IEC 646) | A | A | In cabin A |
| | | B | B | In cabin B |
| | | Others | | Spare |
| D_Status | 1 | | | Driver setting to answer PI call |
| | Binary(Unsigned) | 0 | 0 | Not Activated (Cancel Setting) |
| | | 1 | 1 | Activated (Setting) |

### 2.2.20 DRIVER INTERCOM WITH PI (MESSAGE 163)

當車上設備接通 PI 通訊時，傳送由車上設備接聽的 PI 至 CMFT。

**OTC to CMFT DRIVER INTERCOM WITH PI**

| Packet Name | Driver Intercom with PI | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 163 | 163 | Driver Intercom with PI |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 16 | 16 | Total length of the packet |
| D_TRCP | 1 | | | TRCP ID |
| | Binary(Unsigned) | ref. OTC Equipment Code: OTC Equipment ID | | e.g. TRCP[5, 6] |
| | | Others | | Spare |
| D_Cabin | 1 | | | SI in Cabin |
| | ASCII(ISO/IEC 646) | A | A | In cabin A |
| | | B | B | In cabin B |
| | | Others | | Spare |
| D_PI 41 | 1 | | | Passenger Intercom 41 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |
| D_PI 42 | 1 | | | Passenger Intercom 42 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |
| D_PI 43 | 1 | | | Passenger Intercom 43 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |
| D_PI 44 | 1 | | | Passenger Intercom 44 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |
| D_PI 45 | 1 | | | Passenger Intercom 45 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |
| D_PI 46 | 1 | | | Passenger Intercom 46 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |
| D_PI 47 | 1 | | | Passenger Intercom 47 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |

| | | | | |
|---|---|---|---|---|
| | | 1 | 1 | Activated |
| D_PI 48 | 1 | | | Passenger Intercom 48 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |
| D_PI 49 | 1 | | | Passenger Intercom 49 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |
| D_PI 50 | 1 | | | Passenger Intercom 50 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |
| D_PI 51 | 1 | | | Passenger Intercom 51 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |
| D_PI 52 | 1 | | | Passenger Intercom 52 |
| | Binary(Unsigned) | 0 | 0 | Not Activated |
| | | 1 | 1 | Activated |

### 2.2.21 PIDS MESSAGE ACK (MESSAGE 171)

用於回應 PIDS 執行結果。

**OTC to CMFT PIDS Message ACK**

| Packet Name | PIDS Message ACK | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 171 | 171 | PIDS Message ACK |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 7 | 7 | Total length of the packet |
| Console | 1 | | | Console ID |
| | Binary(Unsigned) | 0~255 | by design | To Console ID |
| Ack Status | 1 | | | Ack Status |
| | Binary(Unsigned) | 1 | 1 | Receive ok<br>If receive message71 and current <= total then use the status |
| | | 2 | 2 | PIDS Message is ok<br>If send message to PIDS success then use the status |
| | | 3 | 3 | PIDS Message is Not ok<br>If send message to PIDS fail then use the status |
| | | Others | | Spare |
| Error Code | 1 | | | Error code If PIDS Message is Not ok |
| | Binary(Unsigned) | 0~255 | by design | Please Ref Equip Error table |
| AckMcount | 2 | | | Message Count(From CMFT) |
| | Binary(Unsigned) | 0~65535 | by design | Ack particular Message. |

### 2.2.22 PIDS MESSAGE INTERRUPT ACK (MESSAGE 172)

用於回應中斷 PIDS 執行結果。

**OTC to CMFT PIDS Message INTERRUPT ACK**

| Packet Name | PIDS Message ACK | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 172 | 172 | PIDS Message INTERRUPT ACK |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 7 | 7 | Total length of the packet |
| Console | 1 | | | Console ID |
| | Binary(Unsigned) | 0~255 | by design | To Console ID |
| Ack Status | 1 | | | Ack Status |
| | Binary(Unsigned) | 0 | 0 | PIDS Message INTERRUPT is ok |
| | | 1 | 1 | PIDS Message INTERRUPT is Not ok |
| | | Others | | Spare |
| Error Code | 1 | | | Error code If PIDS Message INTERRUPT is Not ok |
| | Binary(Unsigned) | 0~255 | by design | Please Ref Equip Error table |
| AckMcount | 2 | | | Message Count(From CMFT) |
| | Binary(Unsigned) | 0~65535 | by design | Ack particular Message. |

### 2.2.23 CAR MONITOR ENVIRONMENT READY (MESSAGE 181)

回覆 CMFT，OTC 列車收音環境準備結果。

**OTC to CMFT Car Monitor Environment Ready**

| Packet Name | Car Monitor Environment Ready | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| Packet Num. | 1 | | | Packet Number |
| | Binary(Unsigned) | 181 | 181 | Car Monitor Environment Ready |
| Length | 1 | | | Packet Length |
| | Binary(Unsigned) | 7 | 7 | Total length of the packet |
| Console | 1 | | | Console ID |
| | Binary(Unsigned) | 0~255 | by design | To Console ID |
| Ack Status | 1 | | | Ack Status |
| | Binary(Unsigned) | 0 | 0 | CM ENVIRONMENT is ready |
| | | 1 | 1 | CM ENVIRONMENT is Not ready |
| | | Others | | Spare |
| Error Code | 1 | | | Error code |
| | Binary(Unsigned) | 0~255 | by design | Please Ref Equip Error table |
| AckMcount | 2 | | | Message Count(From CMFT) |
| | Binary(Unsigned) | 0~65535 | by design | Ack particular Message. |

## 2.3 CRC CHECK SUM AND EOF

CRC 演算法 CRC16-CCITT:$C(x)=x^{16} + x^{12} + x^5 + x^0$。

**CRC Check sum And EOF**

| Packet Name | CRC Check Code(End of Information) | | | |
|---|---|---|---|---|
| Variable | | Values | | |
| Name | Bytes | No. | Choice | Name/Mean |
| CRC Code | 2 | | | CRC Check Code |
| | | by design | by design | CRC16-CCITT: $C(x)=x^{16} + x^{12} + x^5 + x^0$ |
| End of Information | 1 | | | End Of Information |
| | Binary(Unsigned) | 0~255 | 255 | End Of Information |

# 3. OTC EQUIPMENT CODE

## 3.1 EQUIPMENT AND CABLE CODING

參考文件

TC1-6A201-00-A - OTC System - Detailed Design

| Area code | | | | Part number | | | | | Series number | | | | Position |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1st Digit | 2nd Digit | 3rd digit | | PBS code | 1st Digit | 2nd Digit | 3rd digit | - | 1st Digit | 2nd Digit | 3rd digit | | 1st Digit |
| V | 0 | 0 | - | 4 | T | I | U | | 0 | 0 | 1 | / | A |

## 3.2 OTC EQUIPMENT CODE

| No. | Name | Position | OTC Equipment ID | OTC Equipment Code | Description |
|---|---|---|---|---|---|
| 1 | TROU | A | 1 | 4TOU-001/A | TROU 1 |
| | | B | 2 | 4TOU-002/B | TROU 2 |
| 2 | TRIU | A | 3 | 4TIU-001/A | TRIU 1 |
| | | B | 4 | 4TIU-002/B | TRIU 2 |
| 3 | TRCP | A | 5 | 4TCP-001/A | TRCP 1 |
| | | B | 6 | 4TCP-002/B | TRCP 2 |
| 4 | Spare | | | | |
| | | | | | |
| 5 | PIDs | A | 11 | 4PID-001/A | PID ID1 |
| | | | 12 | 4PID-002/A | PID ID2 |
| | | | 13 | 4PID-003/A | PID ID3 |
| | | | 14 | 4PID-004/A | PID ID4 |
| | | | 15 | 4PID-005/A | PID ID5 |
| | | | 16 | 4PID-006/A | PID ID6 |
| | | B | 17 | 4PID-007/B | PID ID7 |
| | | | 18 | 4PID-008/B | PID ID8 |
| | | | 19 | 4PID-009/B | PID ID9 |
| | | | 20 | 4PID-010/B | PID ID10 |
| | | | 21 | 4PID-011/B | PID ID11 |
| | | | 22 | 4PID-012/B | PID ID12 |
| | | C | 23 | 4PID-013/C | PID ID13 |
| | | | 24 | 4PID-014/C | PID ID14 |
| | | | 25 | 4PID-015/C | PID ID15 |
| | | | 26 | 4PID-016/C | PID ID16 |
| | | | 27 | 4PID-017/C | PID ID17 |
| | | | 28 | 4PID-018/C | PID ID18 |
| | | D | 29 | 4PID-019/D | PID ID19 |

| | | | | | |
|---|---|---|---|---|---|
| | | | 30 | 4PID-020/D | PID ID20 |
| | | | 31 | 4PID-021/D | PID ID21 |
| | | | 32 | 4PID-022/D | PID ID22 |
| | | | 33 | 4PID-023/D | PID ID23 |
| | | | 34 | 4PID-024/D | PID ID24 |
| 6 | PI | A | 41 | 4PEI-001/A | PI ID 1 |
| | | | 42 | 4PEI-002/A | PI ID 2 |
| | | | 43 | 4PEI-003/A | PI ID 3 |
| | | B | 44 | 4PEI-004/B | PI ID 4 |
| | | | 45 | 4PEI-005/B | PI ID 5 |
| | | | 46 | 4PEI-006/B | PI ID 6 |
| | | C | 47 | 4PEI-007/C | PI ID 7 |
| | | | 48 | 4PEI-008/C | PI ID 8 |
| | | | 49 | 4PEI-009/C | PI ID 9 |
| | | D | 50 | 4PEI-010/D | PI ID 10 |
| | | | 51 | 4PEI-011/D | PI ID 11 |
| | | | 52 | 4PEI-012/D | PI ID 12 |
| 7 | Ethernet Switch | A | 61 | 4MSW-001/A | Switch ID 1 |
| | | | 62 | 4MSW-002/A | Switch ID 2 |
| | | B | 63 | 4MSW-003/B | Switch ID 3 |
| | | | 64 | 4MSW-004/B | Switch ID 4 |
| | | C | 65 | 4MSW-005/C | Switch ID 5 |
| | | D | 66 | 4MSW-006/D | Switch ID 6 |
| 8 | N-Port | A | 71 | 4NPT-001/A | N-Port 1 |
| | | B | 72 | 4NPT-002/B | N-Port 2 |
| | | C | 73 | 4NPT-003/C | N-Port 3 |
| | | D | 74 | 4NPT-004/D | N-Port 4 |