**Support of IPC-Hermes-9852**

Date:

Machine Declaration

Manufacturer:

Machine Type:

Version:

Additional Information

Line Requirement

Company:

SMT Line:

Additional Information

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# Introduction

With IPC-HERMES-9852 it is mainly possible to transfer a lightweight digital twin of the board (board data) along with the physical board transfer.

This document is the detailed manufacturer's declaration of the IPC-HERMES-9852 capabilities of its machines. This information is required for planning a Hermes-supported production line. It contains

* supported Hermes-Version
* supported Configuration
* supported Features
* Handling of Board attributes

### Hermes Version

Version 1.0 contains the basic Board transfer along with Board data (Board attributes). In versions above 1.0 new Feature, Setups and Board attributes will be added. See extended release notes. But the only specification of the version number is not sufficient to for a planning of a Hermes- supported production line.

### Configurations

The basic configuration for a machine in the production line is one Hermes connection at every physical interface to a neighbor machine. A machine in-between the line, for example, has to setup one connection to the upstream machine and one connection to the downstream machine. In Versions above 1.0 more advanced configurations are possible.

### Features

With versions above 1.0 some new features (functions) can optionally be supported. They usually refer to new Hermes messages that must be supported by the connected machines and to which they must react correctly.  
**Rule:** A feature between 2 connected machines is only working, if both machines support this feature.

### Board attributes

The majority of Board attributes are optional. That means they must not necessarily be part of the board data during the board handover.   
**Rule:** The machine shall be able to receive all (in the certain version) specified optional attributes and at least forward them to the next downstream machine unaltered.

Note: In reverse this means the machine with the lowest supported version defines the maximum possible Hermes data in the production line.

Not all Board attributes are important to the vendor machines. In the support list attributes are marked:

If an Board attribute is received by the machine, …  
[p] Attribute will be passed on downstream unaltered.  
[r] Machine reacts to this attribute, if configured.  
[u] Machine updates this attribute, if changes have been made.   
[ru] Machine reacts if configured and updates when changed.

# Affected machines

{List of machines, series, ect.}

# Support list

### Hermes Version

{V1.x}

### Configurations

|  |  |  |  |
| --- | --- | --- | --- |
| **Configuration** | **support** | **min. required Version** | **additional notes** |
| Multi lane transportation |  | 1.0 | Number of lanes: {n} |
| Reverse transportation |  | 1.1 | Number and description of interfaces with reverse transportation: {n: Gate X, Gate Y, …} |
| Hermes vertical |  | 1.2 | Hermes-specified connection to a supervisory system |

### Features

|  |  |  |  |
| --- | --- | --- | --- |
| **Feature** | **support** | **min. required Version** | **description** |
| CheckAliveResponse |  | 1.1 | Extended function for the detection of communication interruptions. |
| BoardForecast |  | 1.1 | Function to adjust the machine while starting new production at the beginning of the line. |
| QueryBoardInfo |  | 1.1 | Function to request the board data at the upstream machine after manual reinsertation of a board to the machine. |
| SendBoardInfo |  | 1.1 | Function to send recent board data to downstream machine after their request because of manual reinsertion of a board at the downstream machine. |
| QueryWorkOrderInfo |  | 1.2 | Hermes vertical function, Request work order data from a supervisory machine when the board is first inserted into the line or after manual reinsertion. |
| BoardArrived |  | 1.2 | Hermes vertical function to send board data to a supervisory machine after arriving to the machine. |
| BoardDeparted |  | 1.2 | Hermes vertical function to send board data to a supervisory machine after the board was leaving. |
| ReplyWorkOrderInfo |  | 1.4 |  |
| Command |  | 1.4 | Function to adjust the machine while starting new production at the beginning of the line. |

### Board attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Board attribute** | **support** | **min. required Version** | **additional notes, supported string length (Bytes)** |
| FailedBoard | [p] [r] [u] [ru] | 1.0 |  |
| ProductTypeId | [p] [r] [u] [ru] | 1.0 | {String of 2kB} |
| FlippedBoard | [p] [r] [u] [ru] | 1.0 |  |
| TopBarcode | [p] [r] [u] [ru] | 1.0 |  |
| BottomBarcode | [p] [r] [u] [ru] | 1.0 |  |
| Length | [p] [r] [u] [ru] | 1.0 |  |
| Width | [p] [r] [u] [ru] | 1.0 |  |
| Thickness | [p] [r] [u] [ru] | 1.0 |  |
| TopClearanceHeight | [p] [r] [u] [ru] | 1.0 |  |
| BottomClearanceHeight | [p] [r] [u] [ru] | 1.0 |  |
| Weight | [p] [r] [u] [ru] | 1.1 |  |
| WorkOrderId | [p] [r] [u] [ru] | 1.2 |  |
| BatchId | [p] [r] [u] [ru] | 1.3 |  |
| SubBoards | [p] [r] [u] [ru] | 1.4 |  |
| Route | [p] [r] [u] [ru] | 1.4 |  |
| Action | [p] [r] [u] [ru] | 1.4 |  |

# HERMES release notes

**Version 1.0** Released 03/2017

|  |  |
| --- | --- |
| **Configurations** |  |
| Basic configuration | Board takeover from an upstream machine and/or Board handover to a downstream machine along with the related board data. |
| Multi lane transport | Independent board transfer on multiple transport lanes via the same gate(s). |

|  |  |
| --- | --- |
| **Board attributes** |  |
| FailedBoard | {Pass, Fail, unknown} |
| ProductTypeId |  |
| FlippedBoard | {Top-side-up, Bottom-side-up, unknown} |
| TopBarcode |  |
| BottomBarcode |  |
| Length | in mm |
| Width | in mm |
| Thickness | in mm |
| TopClearanceHeight | in mm |
| BottomClearanceHeight | in mm |

**Version 1.1** Released 05/2018

|  |  |
| --- | --- |
| **New configurations** |  |
| Reverse Transportation | Enable reversal transportation, extended setup to enable sending a board to a machine where it once came from. ServiceDescription-InterfaceId neccasary, Additional Hermes ports per physical interface. |

|  |  |
| --- | --- |
| **New board attributes** |  |
| Weight | in kg |

|  |  |
| --- | --- |
| **New features** |  |
| CheckAliveResponse | Extended function for the detection of communication interruptions. |
| BoardForecast | Function to adjust the machine while starting new production at the beginning of the line. |
| QueryBoardInfo | Function to request the board data at the upstream machine after manual reinsertation of a board to the machine. |
| SendBoardInfo | Function to send recent board data to downstream machine after their request because of manual reinsertion of a board at the downstream machine. |

**Version 1.2** Released 02/2019

|  |  |
| --- | --- |
| **New configurations** |  |
| Hermes vertical | Enable a supervisory machine to connect to the Hermes interface of the machine. |

|  |  |
| --- | --- |
| **New attributes** |  |
| WorkOrderId |  |

|  |  |
| --- | --- |
| **New features** |  |
| QueryWorkOrdeInfo | Hermes vertical function, Request work order data from a supervisory machine when the board is first inserted into the line or after manual reinsertion. |
| BoardArrived | Hermes vertical function to send board data to a supervisory machine after arriving to the machine. |
| BoardDeparted | Hermes vertical function to send board data to a supervisory machine after the board was leaving. |

**Version 1.3** Released 03/2021

|  |  |
| --- | --- |
| **New board attributes** |  |
| BatchId |  |

**Version 1.4** Released 11/2021

|  |  |
| --- | --- |
| **New board attributes** |  |
| SubBoards | Add list of SubBoards with Position, Barcode and State note: amount of data is very limited. |
| Route | Routing parameter, Usage has to be part of the production line planning at customer side.  Also necessary when connecting a flipping unit to the inspection machine. |
| Action | Action parameter to adjacent downstream machine, Usage has to be part of the production line planning at customer side.  Also necessary when connecting a flipping unit to the inspection machine. |

|  |  |
| --- | --- |
| **New features** |  |
| ReplyWorkOrderInfo | Extended function for the detection of communication interruptions. |
| Command | Function to adjust the machine while starting new production at the beginning of the line. |