SEMI PV35.1-0215
MEDIA INTERFACE SPECIFICATIONS FOR A HORIZONTAL COMMUNICATION BETWEEN EQUIPMENT

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NOTICE: This Document is no longer supported by the global technical committee. It has been replaced by SEMI A1.1.

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1 Purpose

1.1 The purpose of this Subordinate Standard is to provide Ethernet based media interface specifications for SEMI PV35, Specification for Horizontal Communication between Equipment for Photovoltaic Fabrication System, (hereinafter referred to as PV35 HC) that are commonly usable between control entities such as programmable logic controllers (PLCs) or personal computers (PCs) from different suppliers regardless of their different fieldbus supports. A factory in which PV35 HC would be applied generally uses PLCs and PCs for equipment control.

2 Scope

2.1 This Subordinate Standard covers 'Media Interfaces' portion of communication tiers which is shown in Figure 3 in PV35 HC.

2.1.1 This Subordinate Standard covers Ethernet based Media Interface specifications which uses TCP.

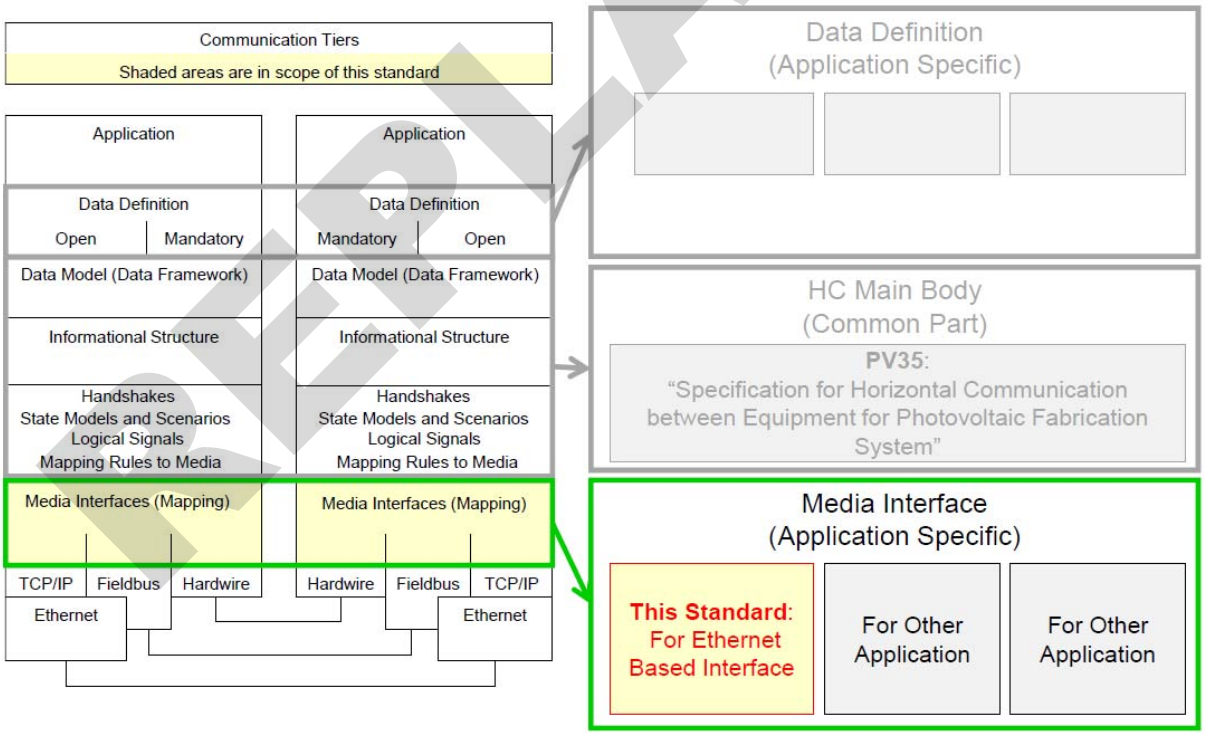

Figure 1
Position of This Subordinate Standard on HC Tiers

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2.1.2 This Subordinate Standard covers interface specifications that are used between fabrication components such as a unit, equipment or a cluster of equipment, which are used as independent entities to form a fabrication line from material transportation perspective. This Subordinate Standard does not care about interface specification between equipment in a cluster.

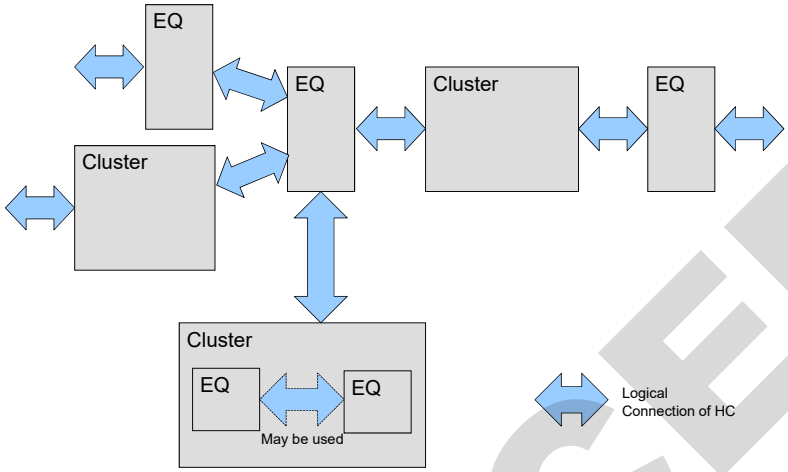

Figure 2
Logical Connection of HC

NOTICE: SEMI Standards and Safety Guidelines do not purport to address all safety issues associated with their use. It is the responsibility of the users of the Documents to establish appropriate safety and health practices, and determine the applicability of regulatory or other limitations prior to use.

3 Referenced Standards and Documents

3.1 *SEMI Standards and Safety Guidelines*

SEMI PV35 — Specification for Horizontal Communication Between Equipment for Photovoltaic Fabrication System

3.2 *IEEE Standard*[1]

IEEE 802.3 — Ethernet

3.3 *IETF Document*[2]

IETF RFC 793 — Transmission Control Protocol

NOTICE: Unless otherwise indicated, all documents cited shall be the latest published versions.

4 Terminology

4.1 *Abbreviations and Acronyms*

4.1.1 *CB* — communication block

4.1.2 *DB* — data block

4.1.3 *DH* — data handshake

4.1.4 *DR* — data receiver

[1] Institute of Electrical and Electronics Engineers, 3 Park Avenue, 17th Floor, New York, NY 10016-5997, USA; Telephone: +1.212.419.7900, Fax: +1.212.752.4929, http://www.ieee.org

[2] The IETF documents can be obtained from The Network Information Center, Network Solution, 14700 Park Meadow Drive, Suite 200, Chantilly, VA 22021, USA.

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4.1.5 *DS* — data sender

4.1.6 *EQ* — equipment

4.1.7 *GD* — general data

4.1.8 *HC* — horizontal communication

4.1.9 *MD* — material data

4.1.10 *MH* — material handshake

4.1.11 *PC* — personal computer

4.1.12 *PLC* — programmable logic controller

4.1.13 *PV* — photovoltaic

4.1.14 *RB* — read block

4.1.15 *WB* — write block

4.2 *Definitions*

4.2.1 *communication block (CB)* — an informational block in HC Controller, which is used to communicate data blocks between HC controllers. One PV35 HC 'Line' has one communication block. One communication block consists of one Line CB and one or more Track CB(s).

4.2.2 *data block (db)* — a group of data which represents PV35 HC communication signals which shall be transferred at a same time as one Ethernet packet for synchronization purpose. There are two types of data blocks; one is 'Line DB' for 'Line Information' another is 'Track DB' for 'Track Information.'

4.2.3 *HC controller* — a controller which is a node of Ethernet and performs communication per PV35 HC in equipment. In general, PLC or PC is used as HC controller.

4.2.4 *Line CB* — a part of communication block which contains Line Information including GD. Line CB consists of Line RB and Line WB.

4.2.5 *Line DB* — a data block which contains Line Information signals including GD.

4.2.6 *Line RB* — a part of Line CB which receives data in Line DB from other equipment.

4.2.7 *Line WB* — a part of Line CB which contains the data to be sent as Line DB to other equipment.

4.2.8 *Track CB* — a part of communication block which contains Track Information including MD for one Track. One Track shall have one Track CB. Each Track CB consists of Track RB and Track WB.

4.2.9 *Track DB* — a data block which contains Track Information signals including MD for one Track.

4.2.10 *Track RB* — a part of Track CB which receives data in Track DB from other equipment.

4.2.11 *Track WB* — a part of Track CB which contains the data to be sent as Track DB to other equipment.

4.3 The terminology in SEMI PV35 shall be referred to for the following definitions.

4.3.1 *Data Handshake*

4.3.2 *General Data*

4.3.3 *Line*

4.3.4 *Line Information*

4.3.5 *Logical Signal*

4.3.6 *Material Data*

4.3.7 *Material Handoff Handshake*

4.3.8 *Material Handshake*

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4.3.9 *Mode Resolution*

4.3.10 *Port*

4.3.11 *Track*

4.3.12 *Track Information*

5 Requirements

5.1 This section defines the data block structure.

5.1.1 *Relationship Between PV35 HC Signals and Data Block* — PV35 HC signals consists of one Line Information and one or more Track Information according to its hardware. Line Information consists of general data (GD) and data handshake (DH) signals, and Track Information consists of material data (MD) and material handshake (MH) signals. Signals in Line Information or Track Information need to be transferred at a same time to manage the timing among them. So, signals for Line Information and Track Information are transferred in one DB as Line DB and Track DB accordingly. One Track uses one Track DB.

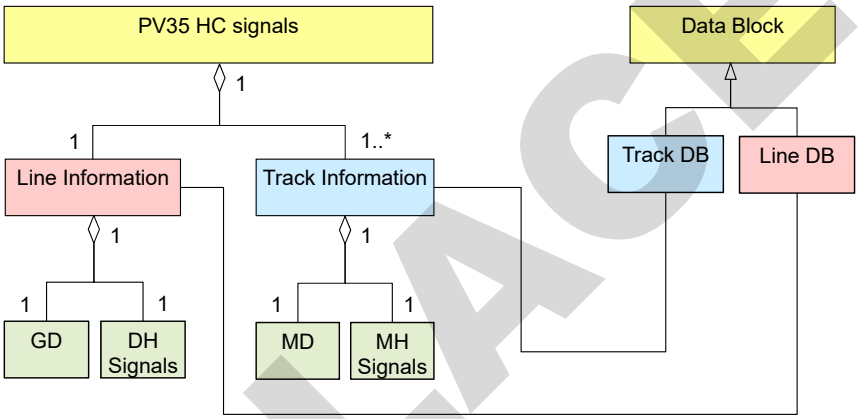

Figure 3
The Relation Between Data Block and PV35 HC Signals

5.1.2 *Communication Block Structure* — Line DB and Track DB need to be bi-directional to perform communication per PV35 HC. Line DB is sent from Line WB and received by Line RB in Line CB, and Track DB is sent from Track WB and received by Track RB in Track CB. CB consists of Line CB and Track CBs.

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