

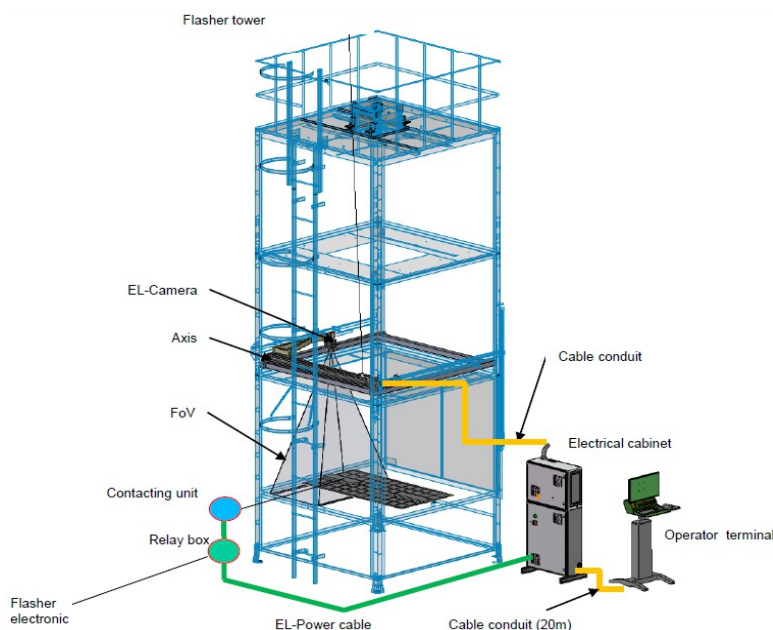
pi4_robotics

EL Module Inspection

- Flasher integrated -

EL Systems for Final Inspection of PV Modules

by pi4_robotics are designed for easy integration to existing flasher installations. Tower or tunnel design flashers may be equipped with high resolution automatic EL solutions made by pi4.



Software algorithms detect micro cracks, cracks and inactive cell areas automatically.

Customer quality rules may be implemented. For example quality class

- A : no cracks in all cells
- B : up to 3 cells with maximum 1 crack
- Failed : more than 3 cells with cracks

Further more the inactive cell area is calculated for each defect and may be included to quality rules.

In a further evaluation step crack growth caused by environmental stress during module life time may be assumed to estimate the worst case cell power loss.

Optional features data base storage of results, MES interface and **PV- Ident** a tool to make your modules traceable, are available.

System Features

- **Fully Automatic Inspection**
No permanent operator attention required
- **Three Software Packages**
visual inspection by operator, automatic defect search and annotation or fully automatic identification of defects like micro cracks, broken grid fingers and inactive areas
- **Software Classification**
Judgement of module quality according to customer specific quality rules
- **Power loss estimation**
defects in cells judged for their future power loss potential
- **Module Size**
up to 2000 x1400mm
- **Flasher Design**
tower or tunnel
- **High Optical Resolution**
up to 64 Mpixel (72 cells)
- **Short Cycle Time**
5 s to 20 s depending on model selected
- **Data Base Storage**
SQL data base and MES interface optional
- **PV- IDent** generation of ID

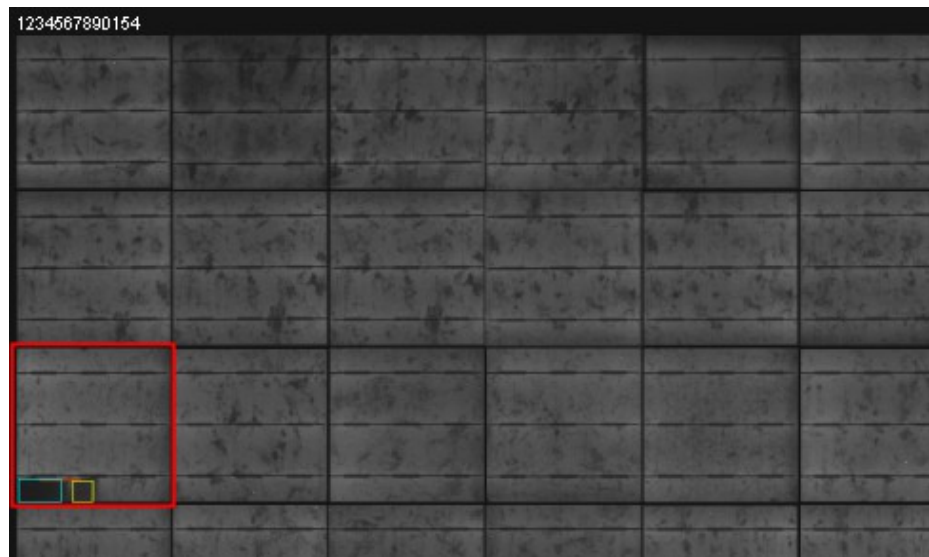
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Overview *pi4_robotics*

EL Module Inspection Systems in Flasher

EL Module Inspection System	Flasher EL 3105	Flasher EL 6420	Flasher EL 3110	Flasher EL 3120	Flasher EL 1512
Part No for module entering short edge leading	PBAES-S-MD0248	PBAES-S-MD0247	PBAES-S-MD0246	PBAES-S-MD0245	PBAES-S-MD0223
Module Size max.	2000 x 1000 mm	2000 x 1000 mm	2000 x 1000 mm	2000 x 1000 mm	2000 x 1400 mm
Optical Resolution:	31 Mpixel	64 Mpixel	31 Mpixel	31 Mpixel	15 Mpixel
Pixel Resolution	< 0.23 mm	< 0.17 mm	< 0.23 mm	< 0.23 mm	< 0.36 mm
Smallest defect detectable	> 0.5 mm ²	> 0.2 mm ²	> 0.5 mm ²	> 0.5 mm ²	> 1.2 mm ²
Cycle Time (without loading and unloading to flasher) :	5 s	20 s	10 s	20 s	12 s
Software Packages: (x indicates compatibility)					
Visual Inspection by Operator PBAES-S-MD0146		X		X	X
Defect Search and Annotation PBAES-S-MD0147	X	X	X	X	X
Fully Automatic Inspection PBAES-S-MD0148	X	X	X	X	X
Fully Automatic Inspection with classification PBAES-S-MD0219	X	X	X	X	X
Options:					
Data Base BYS0098	X	X	X	X	X
MES BYS0105	X	X	X	X	X
PVIdent PBAES0109	X	X	X	X	X



Sample Image made with pi4_Flasher EL 1512