EL Module Inspection Systems by *pi4*

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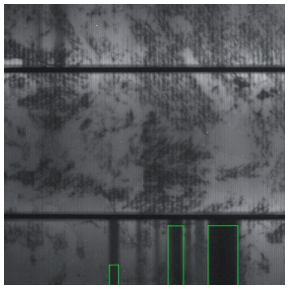
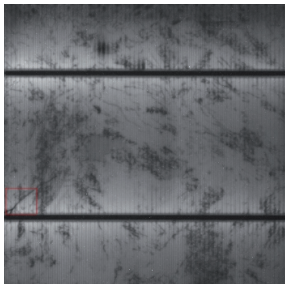
EL Module Inspection Systems for PV Modules

by *pi4* are designed for installation in automated production lines or for using offline. Inspection may be implemented before or after lamination.

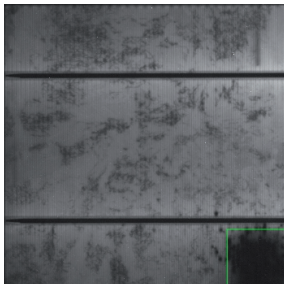
EL images are evaluated either visually by the operator, or fully automatically by comprehensive algorithms of the advanced software *pi4_control*.



Grid Finger Breakage



Micro Crack



Inactive Area

Optional features such as database storage of results, MES interface, dark IV curve evaluation, and **PV-IDent™**, a tool that makes your modules traceable, are available.

System Features:

Inline or Offline Systems
manual loading of panels, or fully automatic loading and contacting available

Choice of Application
before or after lamination, laminates or framed panels

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 others

Adjustable to Panel Size
up to 1652 x 1100 mm

Low Conveyor Level
adjustable up to 900 mm

Panel Feeding
short or long edge leading

High Optical Resolution
up to 0.17 mm per pixel

Short Cycle Time
10s to 90s depending on model selected

Data Base Storage
SQL data base and MES interface optional

Dark IV Curve Evaluation

PV-IDent™: generation of ID code from EL images and storage as compact data set

Overview EL Module Inspection Systems by *pi4*

EL Module Inspection System	Automatic High Speed	Automatic High Speed	Automatic	Automatic	Automatic	Economic	Economic	Basic	Basic
System design for application	Inline	Inline	Inline	Inline	Inline	Offline	Offline	Offline	Offline
Item no. for module entering with short edge leading	PBAES-S-MD0132	PBAES-S-MD0150	PBAES-S-MD0134	PBAES-S-MD0192	PBAES-S-MD0136	PBAES-S-MD0138	PBAES-S-MD0140	PBAES-S-MD0142	PBAES-S-MD0144
Item no. for module entering with long edge leading	PBAES-S-MD0133	PBAES-S-MD0151	PBAES-S-MD0135	PBAES-S-MD0193	PBAES-S-MD0137	--	--	--	--
Module size min.	1000 x 645 mm oder 4x6 Zellen	1000 x 645 mm oder 4x6 Zellen	1000 x 645 mm oder 4x6 Zellen	1000 x 645 mm oder 4x6 Zellen	1000 x 645 mm oder 4x6 Zellen	1000 x 645 mm oder 4x6 Zellen	1000 x 645 mm oder 4x6 Zellen	1000 x 645 mm oder 4x6 Zellen	1000 x 645 mm oder 4x6 Zellen
Module size max.	1970 x 1040 mm oder 6x12 Zellen	1970 x 1040 mm oder 6x12 Zellen	1970 x 1040 mm oder 6x12 Zellen	1970 x 1040 mm oder 6x12 Zellen	1970 x 1040 mm oder 6x12 Zellen	1970 x 1040 mm oder 6x12 Zellen	1970 x 1040 mm oder 6x12 Zellen	1970 x 1040 mm oder 6x12 Zellen	1970 x 1040 mm oder 6x12 Zellen
Optical resolution	72 Mpixel	72 Mpixel	72 Mpixel	72 Mpixel	72 Mpixel	72 Mpixel	72 Mpixel	8.6 Mpixel	4.3 Mpixel
Pixel resolution	< 0.14 mm	< 0.14 mm	< 0.14 mm	< 0.14 mm	< 0.14 mm	< 0.14 mm	< 0.14 mm	< 0.6 mm	< 1.5 mm
Smallest defect detectable	> 0.1 mm²	> 0.1 mm²	> 0.1 mm²	> 0.1 mm²	> 0.1 mm²	> 0.1 mm²	> 0.1 mm²	--	--
Cycle time (incl. loading and unloading of module)	10 s	28 s	45 s	70 s	90 s	Manual loading	Manual loading	Manual loading	Manual loading
Cycle time (inspection only)	4 s	25 s	25 s	50 s	70 s	30 s	60 s	3 s	3 s
Software Packages: (x indicates compatibility)									
Visual inspection by operator PBAES-S-MD0146								X	X
Defect search and annotation PBAES-S-MD0147						X	X		
Fully automatic inspection PBAES-S-MD0148	X	X	X	X	X	X	X		
Options:									
Database BYS0098	X	X	X	X	X	X	X	X	X
MES link BYS0105	X	X	X	X	X	X	X	X	X
Dark IV (without temperature compensation) PBAES0107	X	X	X	X	X	X	X	X	X
Dark IV (with temperature compensation) PBAES0107	X	X	X	X	X	X	X	X	X
PV-IDent™ PBAES0109	X	X	X	X	X	X	X		