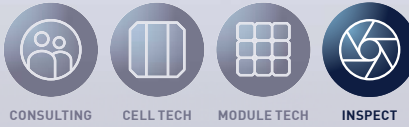


# GP COL-Q .SCAN/.CAM

INLINE OPTICAL INSPECTION SYSTEM FOR COLOUR INSPECTION,  
COLOUR INHOMOGENEITIES, LAYER THICKNESS  
AND COLOUR DEFECTS



CONSULTING CELL TECH MODULE TECH INSPECT

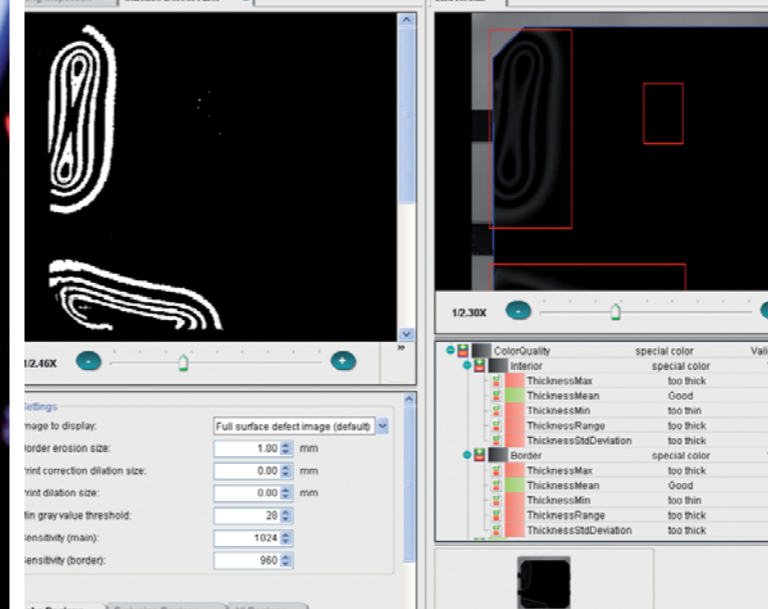
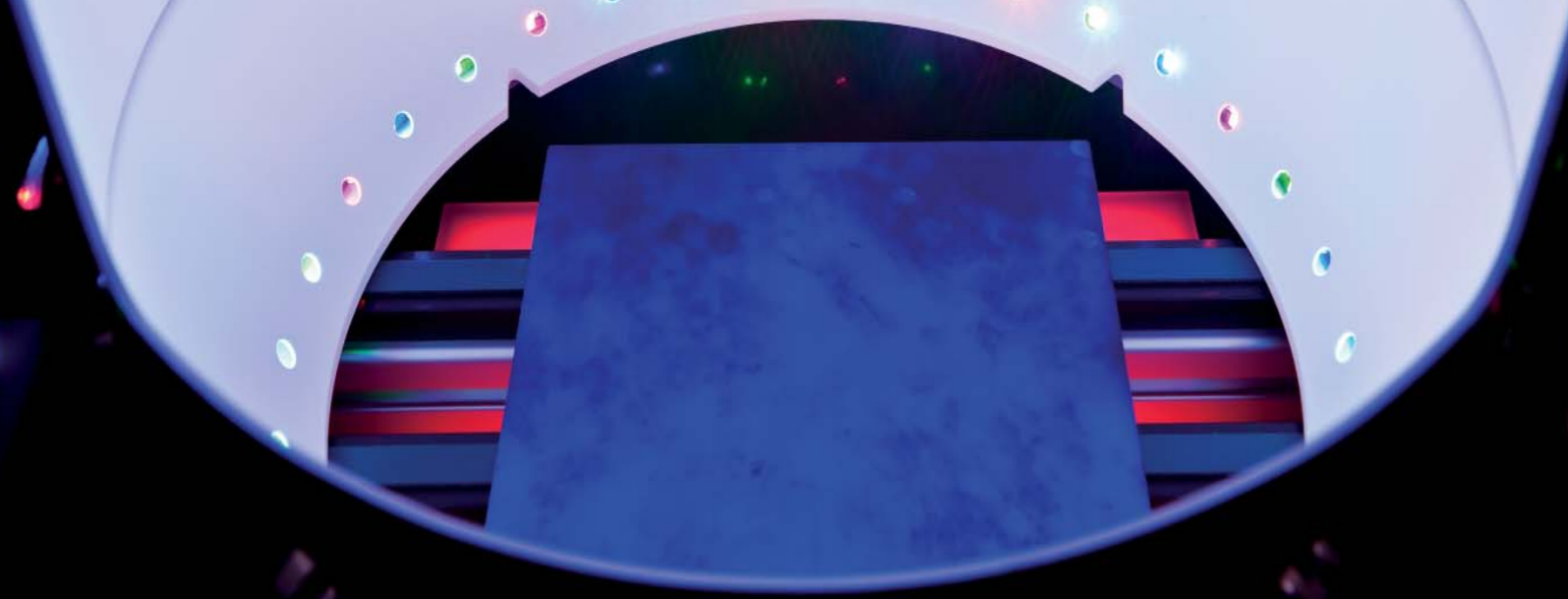


WAFER > TEXTURE > DIFFUSION > EDGE ISOLATION > AR COATING > GRID > FINAL CLASSIFICATION



# .GPsolar

INSPECT



## GP COL-Q .SCAN/.CAM

**SORTING AND CLASSIFICATION WITH CAMERAS FOLLOWING OPTICAL CRITERIA:  
FIND CONSTANT QUALITY IN EACH SORTING BIN, DAY-BY-DAY, EACH WEEK, EVERY YEAR.**

### SITUATION

Antireflection coating reduces optical and electrical losses. More light gets into the cell, and the solar cell surface is electronically passivated. To achieve this goal, thickness and composition of the layer have to be carefully controlled, and defects like debris, stains or inhomogeneous coating need to be sorted out. Only a wafer with a faultless coating can serve as a base for a high quality cell.

### DESCRIPTION

The GP COL-Q is an inline optical inspection system designed for checking colour and colour homogeneity as well as colour defects. The .Cam model is designed for stop measurements, whereas the .Scan model features a linescan camera and works on-the-fly.

The GP COL-Q system is the result of extensive engineering, fuelled by our long-term experience with solar cell processing and metrology, and valuable input from our customers. Software and hardware are designed to meet the requirements for gigawatt factories and large turn key suppliers. Whatever coating process and automation you choose, the GP COL-Q ensures that each wafer will be checked, and only good quality will remain in the process.

### SYSTEM FEATURES

The colour value of the coated layer correlates with the layer thickness, assuming a constant index of refraction. Fast and stable algorithms analyze the image to find stains and inhomogeneities. Results for the single inspection tasks are written to a database, where they are then used for classification according to the

FUNCTIONALITY	
Samples to be measured	> Mono- and multicrystalline wafers > Square or pseudo square
Wafer sizes	100 ... 156 mm
Camera model	> 2K / Linescan > 1M / Matrix
Defect resolution	80 µm / 160 µm
Measured features	Coating thickness, coating thickness variance, separate treatment of coating at wafer edges and border, color value
Limiting factors	Position tolerance 3 mm
Stand Still time	25 ms (.Cam)
Maximum belt speed	400 mm/s (.Scan)
Minimum cycle time	1 s

selected recipe. The proprietary illumination unit ensures outstanding homogeneity and isotropy of the light. Due to the isotropy of the illumination, grain boundaries in multi-crystalline silicon are nearly invisible and do not influence the measurement.

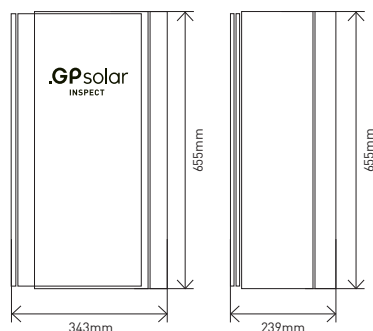
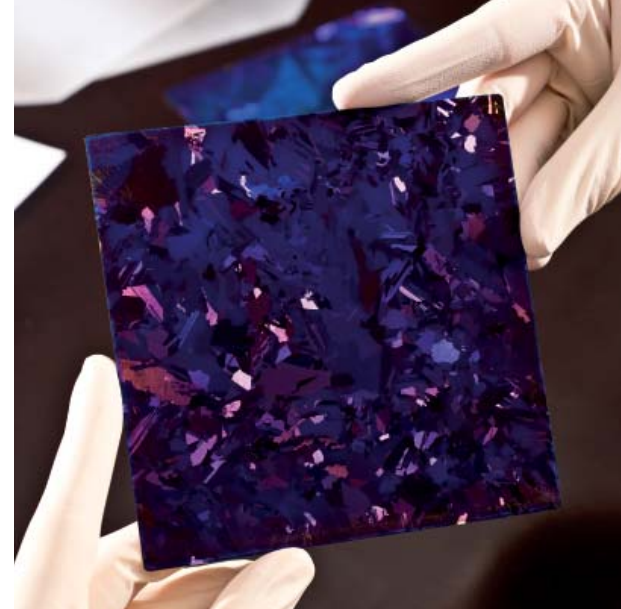
SYSTEM SPECIFICATION	
Machine interface (automation)	> Parallel I/O > Parallel I/O (combined with RS232 for WaferID info) > Profibus
Data interface (to factory network or automation)	XML via TCP/IP
Controller PC	> 19" industrial PC models with 4 HU > Optional integrated UPS and RAID
Power Module	19" module for 24V power supply (illumination)
System dimensions (W x H x D)	.Cam-Housing: 340 mm x 844 mm x 344 mm .Scan-Housing: 343 mm x 655 mm x 239 mm

### THE GP COL-Q HARDWARE ON A GLANCE

- > Cam matrix camera housing or .Scan linescan camera housing with optimized design for best maintenance access
- > Customized back light solutions for full edge inspection in most transport systems
- > Advanced camera holder
- > 19" Industrial controller PC with optimized air flow for high performance and reliability
- > Integrated UPS and RAID on demand
- > Separate 19" power rack for 12V/24V supply

### SOFTWARE ON A GLANCE

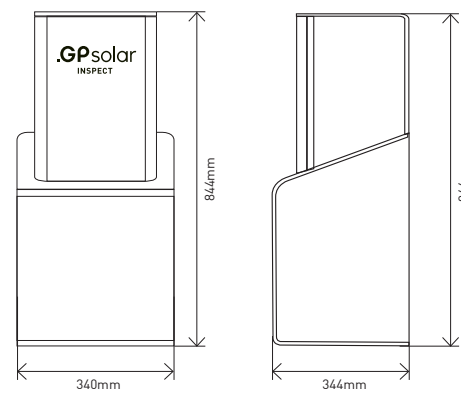
- > Modular software packages, structured in functional tasks - choose between full service or full control
- > Central recipe management and „copy exact“
- > Classification based on fast database access - virtually no limits in classification
- > Classification on a database - test changes offline before going online in production
- > Intuitive graphical user interface
- > Automated calibration routines and self verification
- > Wide range of protocols for automation handshake and MES connectivity



front view

side view

GP COL-Q .SCAN



front view

side view

GP COL-Q .CAM

ARTICLE NUMBER	DESCRIPTION
04.11.0004	GP COL-Q .Cam inspection module 1M matrix camera for STOP measurement, 19" controller PC, GP Com Card PIO, GP basic line software package (automation control, statistics functions and classification following predefined recipes)
04.11.0015	GP COL-Q .Scan inspection module 2K linescan camera for on-the-fly measurement, 19" controller PC, GP Com Card PIO, GP basic line software package (automation control, statistics functions and classification following predefined recipes)
CONTROLLER PC AND HARDWARE OPTIONS	
04.11.0309	GP Com Card Profibus
04.11.0304	19" TFT for GP Vision System
04.11.0305	GP 19" Power Rack 12V/24V
04.11.0306	UPS system (integrated in controller PC)
04.11.0307	RAID-system, hot-plug harddrive (integrated in controller PC)
SOFTWARE OPTIONS	
04.11.0402	GP Soft View Tool .net Visualize results and status of any system anywhere
04.11.0403	GP Calibration Set Vision with calibration mask Configure, check, verify and calibrate your GP COL-Q
04.11.0408	GP Central Recipe Tool .net Distribute recipes from one system to the other ("copy exact")

Note: some of the mentioned features are optional. All technical details are subject to change without prior notice.  
Only technical specifications in quotations and duty books are binding.

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