ELECTRONIC

ENERGY

ELECTRONICS for ENERGY

CLIMATE COMMITMENT

ENERGY

Masermic offers state of the art electronic systems and software for Renewable Energy applications from engineering till commissioning and maintenance , in a close partnership with the market needs and climate commitment :

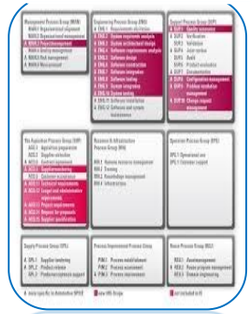
- ⇒ **Concentrated Solar Power _ CSP**
- ⇒ **Photovoltaic Solar Energy _ PV**

Smart Renewable Energy Technologies for Changing Times

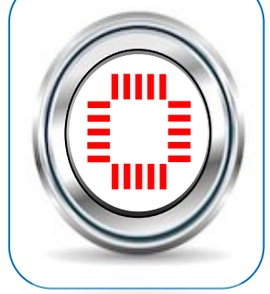
CLIMATE COMMITMENT

OFFER CAPABILITIES

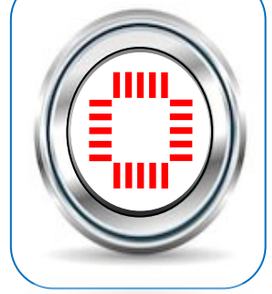
Solar Field Engineering



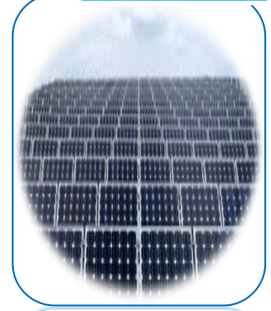
Electronic Engineering



Electronic Manufacturing



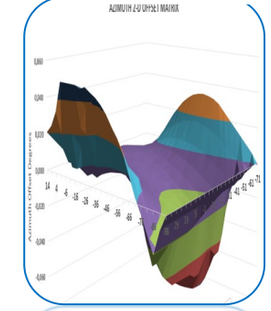
Electric Installation



Commissioning

Technical Support

Innovation



Solar Field Engineering

- ⇒ Solar Field Communications network.
- ⇒ Solar Field Power Grid.
- ⇒ Solar Field Instrumentation.
- ⇒ Solar Field Software/Hardware Management System.

Electronic Hard/soft systems for Solar Field applications :

- ⇒ Collectors Electronic Control System.
- ⇒ Solar Field Communication Network.
- ⇒ Solar Field Power Grid.
- ⇒ Solar Field Software/Hardware Management System.

ELECTRONIC ENGINEERING
ELECTRONIC MANUFACTURING

ELECTRONIC SYSTEMS FOR ENERGY

STANDARDS

Standard and custom requirements compliance based in the specific market regulations.

Lloyd's Register

Certificate of Approval

This is to certify that the Management System of:

Microelectrónica Maser, S.L.

Pol. Kurutz Gain, 6A, 20850 Mendaro, Gipuzkoa, Spain

has been approved by LRQA to the following standards:

ISO 9001:2015

Gilles Bessiere - Area Technical Manager

Issued by: Lloyd's Register Quality Assurance España, S.L.U.

for and on behalf of: Lloyd's Register Quality Assurance Limited

Current issue date: 21 February 2019
Expiry date: 10 March 2022
Certificate identity number: 10174267

Original approval(s):
ISO 9001 – 11 March 2010

Approval number(s): ISO 9001 – 0038050

The scope of this approval is applicable to:

Design, manufacturing and commercialization of electronic products for, automation, energy, environmental, transport and health sectors

UKAS MANAGEMENT SYSTEMS 001

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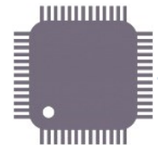
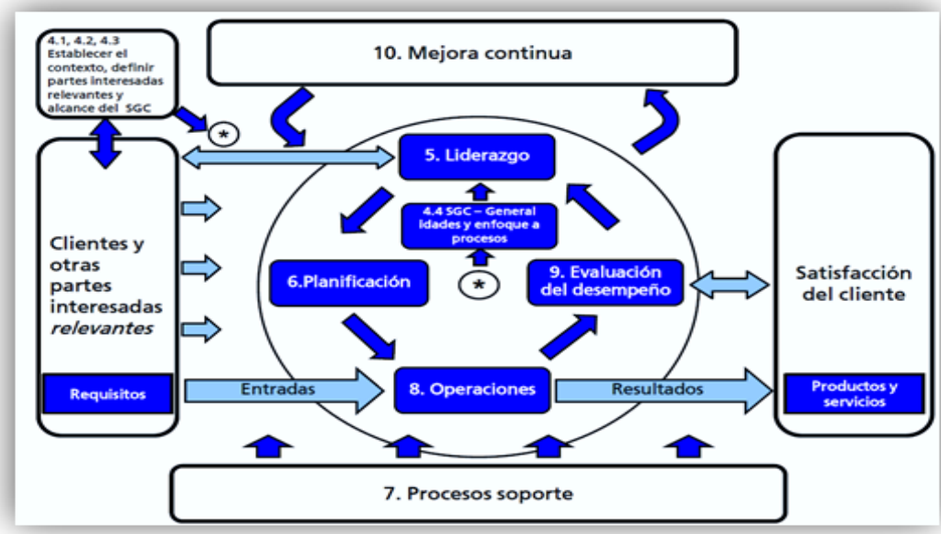


CONTROL ELECTRONICS

POWER ELECTRONICS

COMMUNICATIONS

SOFTWARE



CE

R & D CAPABILITIES

Masermic participates in the principal R&D framework programs in Basque Country, Spain and Europe, driving the R&D outcomes to the Renewable Energy market applications.

Masermic has a skilled and experienced engineering team as well as advanced hardware & software tools to develop state of the art electronic systems.

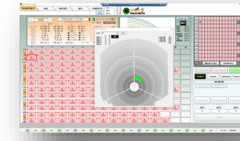
ENERGY

iECU 20 : Control System for solar field collectors.

iSCS 20 : Solar Field management software.

iCAL 20 : Solar Field collectors calibration system.

iRF 20 : Solar Field wireless communication network.



REFERENCES

Project: **CSP _ SOLAR THERMOELECTRIC 50 MW POWER PLANT**
Technology: CPC _ PARABOLIC TROUGH TECHNOLOGY
Scope : Electric _ Electronic _ Communications _ Software
Location: Spain

Project: **CSP _ SOLAR THERMOELECTRIC 50 MW POWER PLANT**
Technology: CPC _ PARABOLIC TROUGH TECHNOLOGY
Scope : Electric _ Electronic _ Communications _ Software
Location: Spain

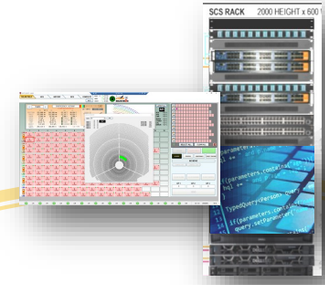
Project: **CSP _ SOLAR THERMOELECTRIC 50 MW POWER PLANT**
Technology: STELLIO _ HELIOSTAT TECHNOLOGY
Scope: Electric _ Electronic _ Communications _ Software.
Location: China

Projects: **CSP _ SOLAR THERMOELECTRIC POWER PLANTS**
Technology: CPC _ PARABOLIC TROUGH TECHNOLOGY
Scope : Electric _ Electronic _ Communications _ Software
Location: Spain _ Israel

Projects: **CSP _ SOLAR THERMOELECTRIC POWER PLANTS**
Technology: STELLIO _ HELIOSTAT TECHNOLOGY
Scope : Electric _ Electronic _ Communications _ Software
Location: Spain _ Germany

Solar Field Turnkey solution : Electric, Electronic, Software .

CLIMATE COMMITMENT

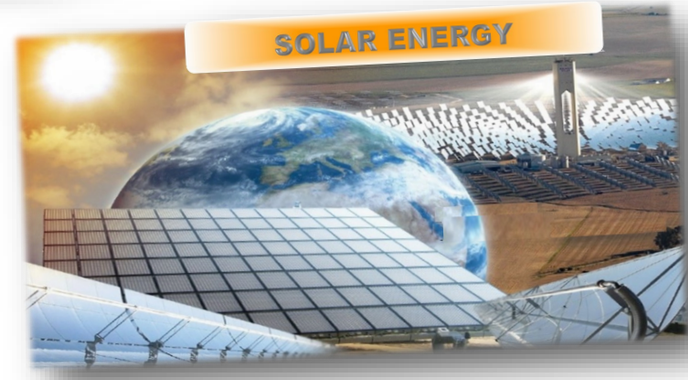


iSCS 20

SCADA_ Solar Field Management System

iECU 20

Electronic controller for collectors



iHUB 20

Ethernet-Serial Com Interface

iLOC 20

Local Controller cabinet

iSU 20

Surges Protection_ Serial Com

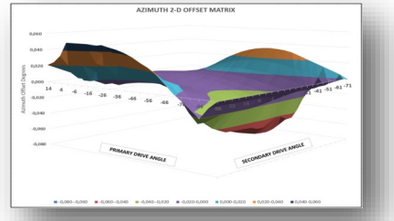
iFA 20

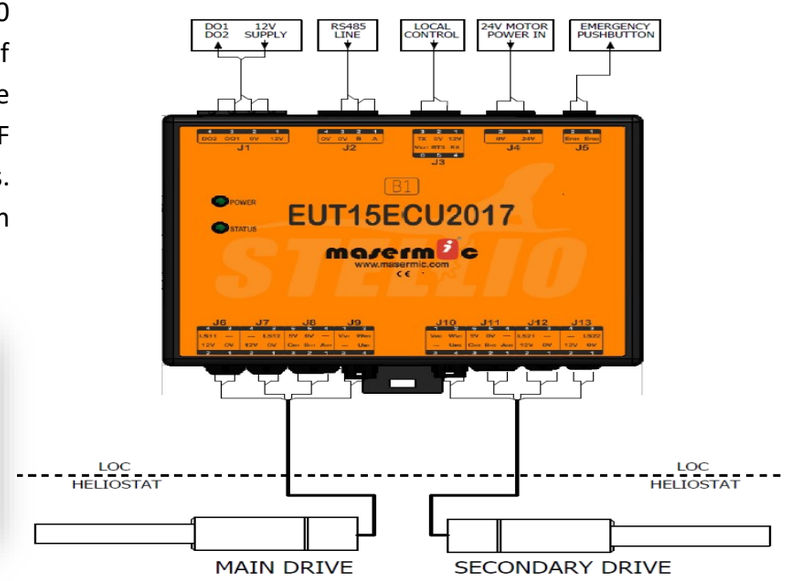
Power Supply, LOC Controller

iECU 20 . Solar field collectors electronic controller

The iECU20 control is an advanced solution for heliostats automation, tracking and calibration based in advanced algorithms and state of the art electronic technology.

The efficient and reliable design of the iECU20 impacts in the costs reduction and reliability of the solar field Communication Network and the Power Grid architecture as well as in the SF operation performance and maintenance tasks. Developed and assembled in compliance with automotive standards.





HARDWARE :

- ◊ Digital I/O _ Power driver for 2 linear actuators _ Communication line
- ◊ Integrated power drivers for a more reliable and efficient control of heliostat actuators
- ◊ Speed / Power regulation
- ◊ Average Power consumption while tracking < 12 W. Night mode, power consumption < 1 W
- ◊ Electrical surge protection

SMART AUTO ADAPTIVE HELIOSTAT TECHNOLOGY :

- ⇒ Heliostat automation
- ⇒ Advanced algorithms : Automation _ Tracking _ Calibration _ Diagnosis
- ⇒ Communication with SCS and Solar field com network
- ⇒ Auto Adaptive technology for improved tracking accuracy :
  - ◊ Axis alignment
  - ◊ Self-weight deflections
  - ◊ Drive elongations. _ Backlash effect
  - ◊ Piston Rod Rotation Temperature effects
  - ◊ Optical Centre displacement
  - ◊ Mechanical manufacturing tolerances
  - ◊ Power consumption / Low thermal loses generation

SOFTWARE :

- ◊ Automatic heliostat setting up and calibration
- ◊ Solar tracking algorithm refresh rate < 100 msec
- ◊ Time/date synchronization precision < 10 msec
- ◊ Solar field monitoring refresh rate < 2 seconds
- ◊ Remote ECU firmware updating rate < 2 minutes
- ◊ Industrial communication protocol:
  - RS485—Modbus RTU
- ◊ Autadaptive calibration for each heliostat during lifetime

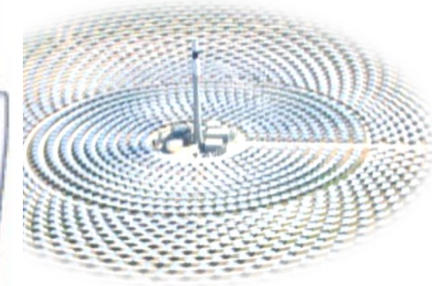
iHUB 20. Interface Ethernet-Serial

The iHUB20 Communication Interface Ethernet - Serial , is an advanced solution for the interconnection and interface of the Solar Field collectors with the Central Server –SCS– and the collectors controller –LOC- .

The design of the iHUB20 impacts significantly in the solar field Communication Network reliability and flexibility , being a key module in the Solar Field Com Network. Developed and assembled in compliance with automotive standards .

SOFTWARE :

- ◊ Heliostat status refresh rate < 25 msec
- ◊ Time/date synchronization precision < 10 msec
- ◊ Remote EUT20 HUB firmware updating rate < 2 minutes
- ◊ Industrial communication protocol:
  - RS485—Modbus RTU
  - Ethernet —Modbus TCP



SMART AUTO ADAPTIVE HELIOSTAT TECHNOLOGY :

- ◊ Data Interface : SCS - LOC Heliostat.
- ◊ Com interface : Ethernet –RS485.
- ◊ Operational Data storage (registers, errors, ...)

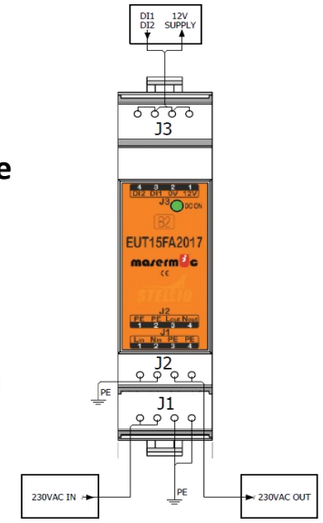
HARDWARE :

- ◊ 2 Digital Inputs _ 2 Digital Outputs
- ◊ 3 RS485 Communication Interface ports
- ◊ 2 Ethernet Communication Interface ports

iFA 20. iECU20 Controller Power Supply

The iFA20 module is a power supply module designed for the safe energizing process of the iECU20 module.

Main features are related to : High immunity to transients , power surges protection and low electromagnetic emission . Developed and assembled in compliance with automotive standards .



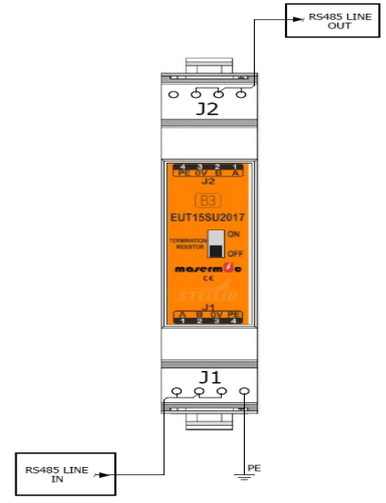
HARDWARE :

- Universal AC input / Full range
- Protections: Short Circuit / Overload / Over voltage
- Comply with EN61000-6-4 industrial immunity level
- Surge Protection IEC 61000-4-5 Level 4
- Inrush Current Limiter

iSU 20. Surges Protection

The iSU Surges Protection module protects the RS485 serial communication line.

Designed to provide protection to voltage transients induced by lightning and other transient voltage events over the serial communication lines. Developed and assembled in compliance with automotive standards .



HARDWARE :

- Surge Protection for RS-485 Communication Line.
- High surge current rating up to 25KA, 8/20µs
- Overcurrent and overvoltage protection
- High Speed Transient Blocking Unit in each RS485 Line

* Termination resistor for impedance matching in the RS485 line, to reduce voltage reflections that can cause the receiver to misread logic levels.

iLOC 20 . Local Controller cabinet

Local Controller turnkey cabinets for CSP and PV collectors.

Standard & Custom solutions : Engineering, Manufacturing, Commissioning and Maintenance.

HARDWARE :

- Standard cabinet size: 500*400 mm. IP65/67
- iECU controller
- iFA power supply
- iSU serial com line surges protection.
- Power supply 250W-24Vcc for collectors actuators powering
- Electrical protections
- Emergency pushbutton
- Temperature sensor.
- Cable glands: inputs/outputs.

SOFTWARE :

- Collector automation
- Automating setting up and calibration
- Remote connectivity for iECU firmware and parameters updating
- Registers the history of each collectors within the solar field as part of the maintenance strategy and traceability
- Local and remote communication for : Setting up , Commissioning and Maintenance

iSCS 20 . Solar Field Software Management System

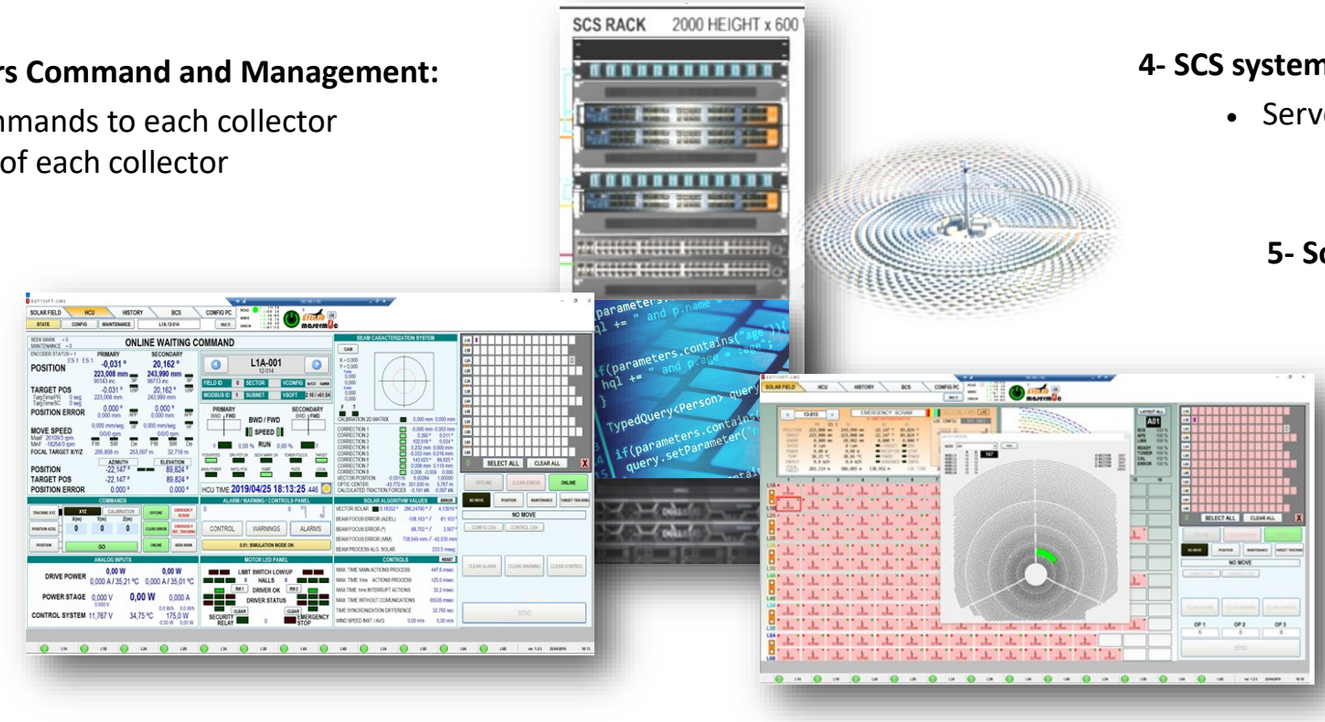
iSCS20 Scada as main hardware/software system for the solar field : Management , Monitoring and Data Analysis.

I- Solar Field Monitoring:

- Collectors operation
- Power Grid
- Communications Network
- Solar Field statistics

2- Solar Field Collectors Command and Management:

- Operational Commands to each collector
- Parametrization of each collector
- Calibration



3- Solar Field Collectors Online Data Storage:

- Setting Up parameters related to each collector
- Operational data of each collector during the cycle life

4- SCS system Redundancy and Backup Management:

- Servers System safety and reliability

5- Solar Field Collectors Calibration:

- Collectors Automatic Calibration
- Calibration statistics

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