प्लाज़्मा अनुसंधान संस्थान
Institute for Plasma Research

Technical Brochure

CE CERTIFIED SIGNAL CONDITIONING MODULES
(OptoSIGN™)

Projects & Technology Transfer Section
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CE CERTIFIED SIGNAL CONDITIONING MODULES
(OptoSIGN™)

INTRODUCTION

Signal Conditioning Modules (SCM) are used for interfacing different sub systems to data acquisition & control system providing optical isolation. It also reduces EMI Interferences i.e. provides minimal emission & better immunity from conductive or radiative coupling. SCMs having generic specification to match various similar application.

These SCMs are compatible with POF (Plastic Optic Fiber)/HCS (Hard core silica) cable. Input & output interface are from front however these modules gets biasing voltage from backplane of Modules. It is tested up to 75meter length of POF cable. It includes three types of SCMs:

- Fast Analog Tx-Rx Module (FA)
- Normal Analog Tx-Rx Module (NA)
- Digital Tx-Rx Module (DTR)

Selection of voltage level of TTL/24V for Input & output signals is available for DTR module with inverting & non-inverting configuration. FA and NA modules input and output voltage level is 0-10V. All modules are interchangeable with respect to position.

These SCMs are CE certified against EMC directive (IEC 61000-6-2, IEC 61000-6-4, IEC 61000-4-16 & IEC 61000-4-18), LV directive (IEC 62368-1:2018), RoHS directive and Environmental standards. Functional testing of all SCMs are completed at ICRH, ITER-India, IPR lab and ready to interface with experiment facility.

APPLICATIONS

It can be used to interface between sub systems with high probability of EMI interference like, High Voltage Power Supply, High Power RF amplifiers, Gyrotron Systems, Klystron Systems, Electron Beam Systems, Particle accelerator Systems etc.

TECHNICAL SPECIFICATION OF OptoSIGN™

1. SCM Chassis:

- Chassis Dimension → 3U, 19" Rack mountable, Depth: 482 mm
- Model No. →
  i. II-SCU:3U:2206-02/FAM:09,NAM:00,DM:00
  ii. II-SCU:3U:2206-01/FAM:00,NAM:09,DM:00
  iii. II-SCU:3U:2206-03/FAM:00,NAM:00,DM:09
- Weight → ~9kg
- AC Input Voltage → 230V AC/50Hz
- AC Input Current → Max. 1.5A

2. SCM Backplane:

- Board size → L: 435mm, H: 55mm
- Modules → 9 nos. of any type of SCM

3. Fast Analog Tx-Rx Module:

- Tx/Board → Input: 2 channel/0-10V; Output: 2 optical Tx (1.2MHz-3.5MHz)
- Rx/Board → Input: 2 optical Rx (1.2MHz-3.5MHz); Output: 2 channel/0-10V
- Board Size → H:133.35mm(3U), W:40.30mm (9T), D:280mm
- Frequency Response → 3-dB BW >200kHz
- Response Time → Less than 5μs
- Linearity → Better than 0.1%
- Resolution → 1mV
- Ripple → Less than 10mVp-p at full scale
- Module/Chassis → 9 Nos.
- Signal I/P & O/P Connector Type → 4 pin Lemo-connector

4. Normal Analog Tx-Rx Module:

- Tx/Board → Input: 2 channel/0-10V; Output: 2 optical Tx (1.0MHz-2.0MHz)
- Rx/Board → Input: 2 optical Rx (1.0MHz-2.0MHz); Output: 2 channel/0-10V

- Board Size → H:133.35mm(3U), W:40.30mm (9T), D:280mm
- Frequency Response → 3-dB BW >5kHz
- Response Time → Less than 100µs
- Linearity → Better than 0.1%
- Resolution → 1mV
- Ripple → Less than 10mVp-p at full scale
- Module/Chassis → 9 Nos.
- Signal I/P & O/P Connector Type → 4 pin Lemo-connector

5. Digital Tx-Rx Module:

- Tx/Board → Input: 4 channel/TTL(0-5V) or 0-24V; Output: 4 optical Tx
- Rx/Board → Input: 4 optical Rx ; Output: 4 channel/TTL(0-5V) or 0-24V
- Board Size → H:133.35mm(3U), W:40.30mm (9T), D:280mm
- Logic Level → Inverting/Non-Inverting selectable through DIP switch
- Response Time → Less than 400ns for TTL
- Module/Chassis → 9 Nos.
- Signal I/P & O/P Connector Type → 8 pin Lemo-connector

INFRASTRUCTURE REQUIRED

- PCB Fabrication
- SMD and through hole component soldering and de-soldering facility
- SMD component mounting facility
- Functional testing facility and required equipment i.e. Function Generator, Oscilloscope, Calibrator, Multimeter etc.

MAJOR COMPONENTS OF SCM

Major components include, passive components (resistors, capacitors, inductors etc..), active components (OP-AMP ICs, Transistors etc.), SMPS, EMI filter, MOV, 3U chassis with facia. These components are easily available in Indian market with IEC standards & RoHS compliance.

HUMAN RESOURCE REQUIRED

- One Electronics/I&C/EC engineer
- One electronics/EC/I&C technical assistant

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