Introduction:

APCG–42 is Ashida OpenPro+ Series platform based on Linux, Used in Ashida automation products. APCG–42 gateway is widely used in various applications including simple Protocol converters, gateways, RTUs to centralized automation controllers. For centralized monitoring applications. APCG–42 efficiently performs the function of data Concentration from various Intelligent Electronic Devices (IEDs) over independent protocols.

Not to mention, the response time of these controllers enable them to be used for real time automation applications.

Features:

- Acts as a RTU/Data Concentrator to gather data from multiple slave devices or IED's.
- APCG–42 can be connected to Different IED's for acquiring inputs & performing control operations.
- Up to 100 nos. of IED's can be configured on IEC-61850.
- 4 nos. of masters can report on IEC-104.
- Customized operation using programming similar to PLC programming.
- Reporting to multiple Masters / Servers.
- Time synchronization using NTP / IEC-104.
- Flexible Protocol conversion.
- Redundant power supply for uninterrupted operation.

- Wide range Auxiliary Power Supply 24 – 230V AC/ DC.
- Communication on wide verity of protocols including:
  - IEC – 61850 (Server / Client).
  - MODBUS RTU/ TCP.
  - IEC 60870–5–101.
  - IEC 60870–5–103.
  - IEC 60870–5–104.
  - SPORT for Indian Railways.
  - DNP3.0 (Optional).
- 11 nos. of independent Serial Ports.
  - 1 nos. of RS232 Serial Port.
  - 10 nos. of RS485 Serial Port.
  - Separate Serial Port provided for maintenance / debugging.
- 5 nos. of 10/100 Mbps Ethernet Ports.
- 1 nos. of USB Port.
- 1 nos. of SD Card.
- Diagnostic LED's for health of serial & Ethernet interfaces & power supply availability.
- Watchdog available for self monitoring.
- Configuration upload/download, Offline configuration tool
- Online Data view
- Cyber Security as per IEC Standard.
- Extract Disturbance records from IED's on IEC-103 & IEC 61850 protocol.
- Offline Event Recording.
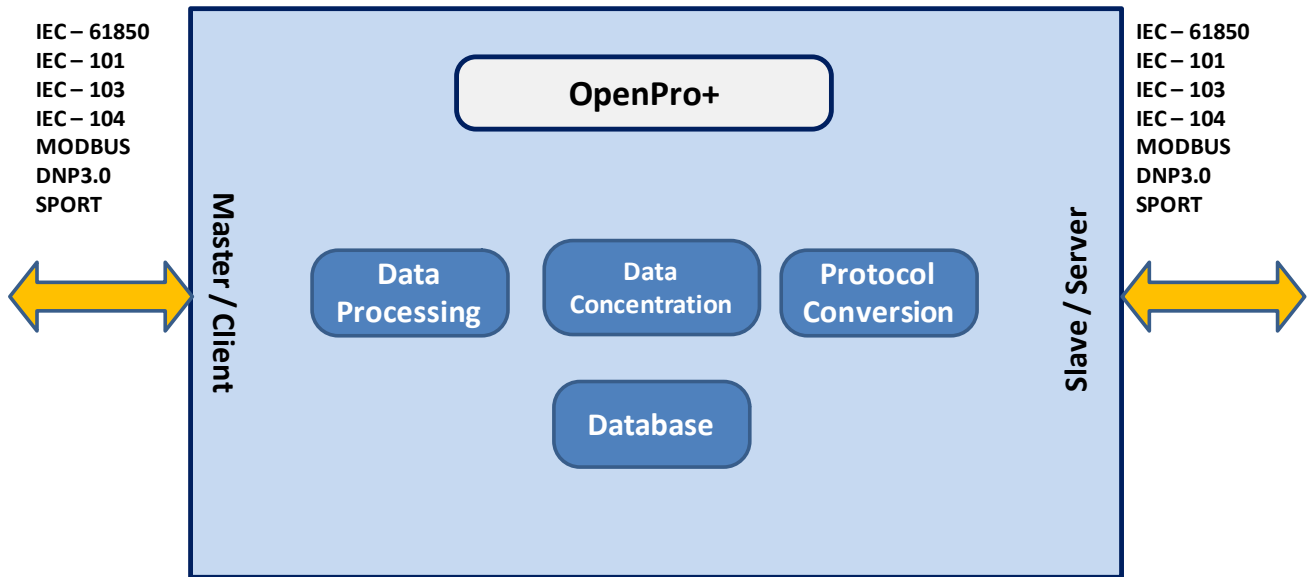- For additional I/O requirement, separate I/O module can be connected.

Application:

RTU / IED's Open Protocol	⟷	OpenPro+ Protocol Gateway	⟷	SCADA / LDC Open Protocol

The Disturbance Records from IED's can be extracted using OpenPro+ on FTP/SFTP protocol and view in Disturbance Record viewer.

RTU / IED's FTP / SFTP	⟷	OpenPro+ Protocol Gateway	⟷	SCADA / LDC FTP / SFTP

Description:

APCG–42 is an intelligent device that communicates with multiple slave or server devices & maintains a single database of the same in real time. This complied information can further be transmitted to master or server devices for monitoring & control. Programmable logic engine (PLC) enables using various gates for process automation.

IEC – 61850
IEC – 101
IEC – 103
IEC – 104
MODBUS
DNP3.0
SPORT

Master / Client

OpenPro+

Data Processing

Data Concentration

Protocol Conversion

Database

Slave / Server

IEC – 61850
IEC – 101
IEC – 103
IEC – 104
MODBUS
DNP3.0
SPORT

Technical Specifications:

Sr. No.	Parameters	Details
1.	Processor	: 32 Bit
2.	eMMC	: eMMC 8 Gb Flash Memory
3.	RAM	: 1024 Mb DDR3 SDRAM
4.	No. of Serial Port	: 11 nos.
5.	No. of Console Port	: 1 nos.
6.	No. of Ethernet Port	: 5 nos. (RJ45)
7.	Signal Indicators	: Power ON indication : TX, RX & Gnd for RS232 Port. : D+ & D- for RS485 Port. : Activity & Link for LAN Port.
8.	Power Input Rating	: 24 – 230V AC/DC

The APCG–42 consists of 1 nos. of RS232 and 10 nos. of RS485 ports, one console port for debug purpose and 5 nos. of Ethernet ports.

The following hardware module/ circuits are integrated to form the overall design for APCG-42 as per the hardware requirement specifications.

- SOM Card
- Main Board
- Isolated RS232 module
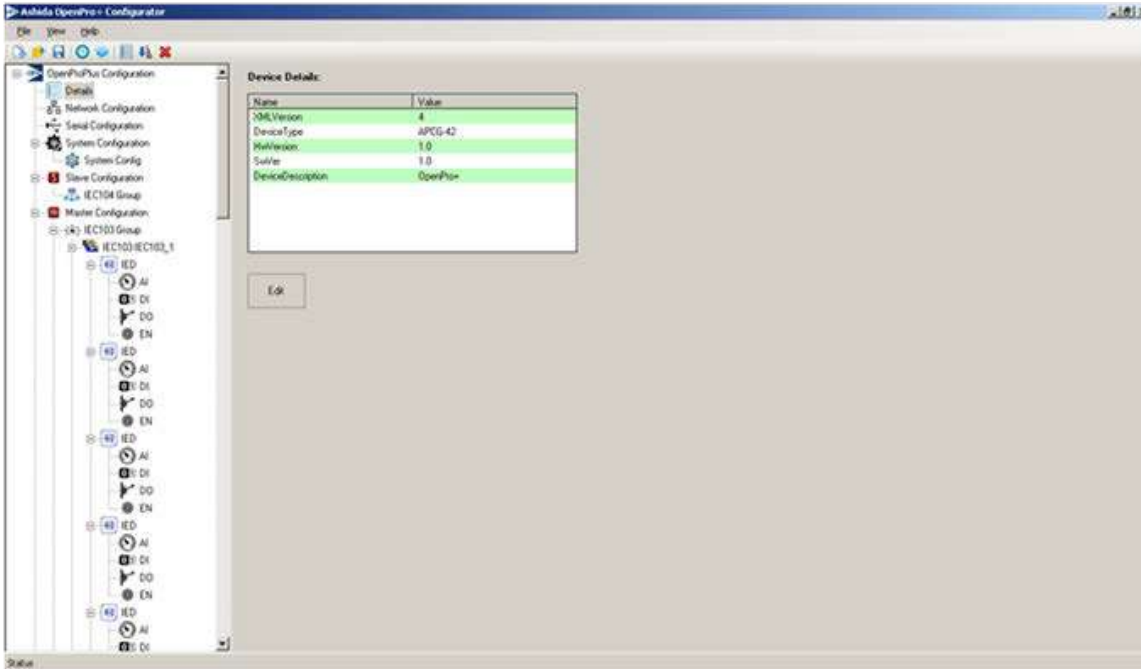- Isolated RS485 module
- Power Supply
- LED Indication module

These modules are organized with proper consideration of all safety aspect as per IEC60255-27.

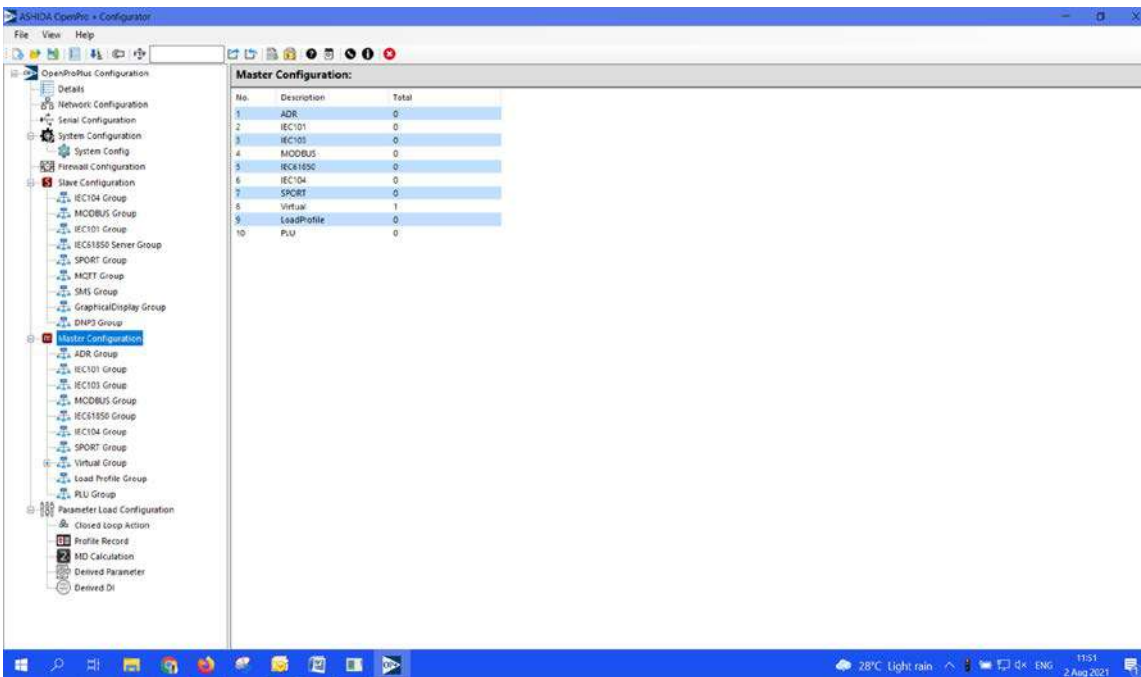The main features of the processor are as below

- Processor Speed: 866 MHz
- 2Mb serial boot flash
- 1024 Mb on board DDR3 SDRAM
- Ethernet: 5 nos.
- UART: 11 nos.
- ADC: 8 nos.
- SPI: 2 nos.
- I2C: 2 nos.
- Other interfaces: LCD, SPI, I2C, MC/SD, GPIO, PWM, JTAG, McASP & PRU.
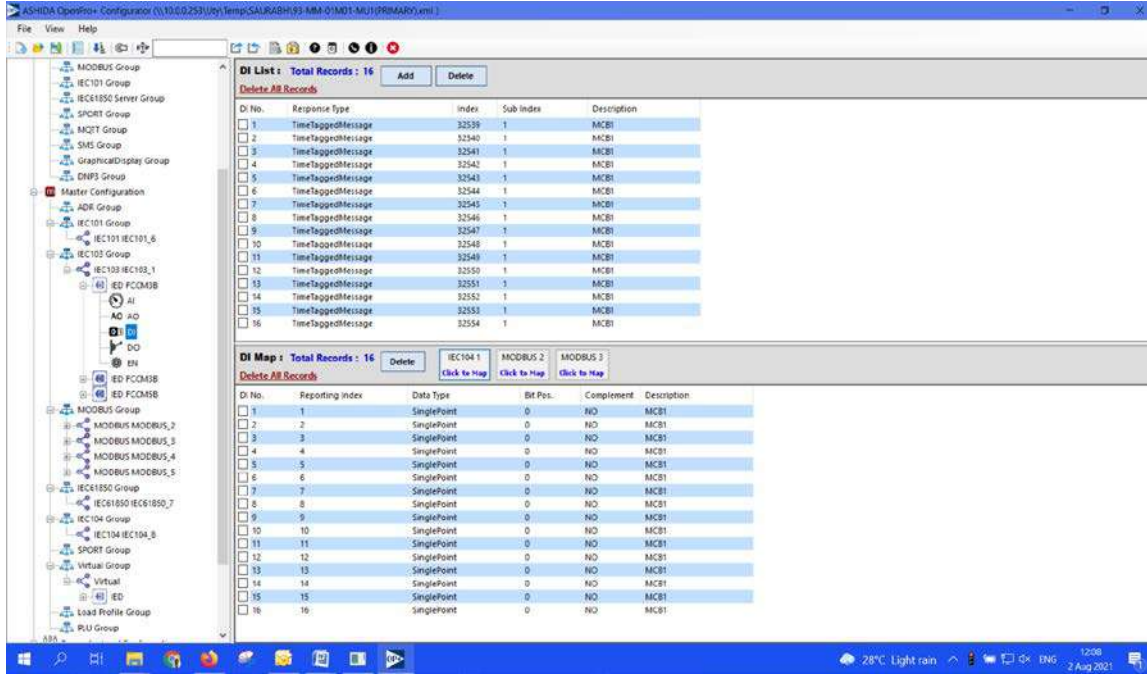
APCG–42 Configurator:

For APCG–42 to act like protocol gateway it has to be configured for protocol master and slave. This can be done with the help of OpenPro+ Configurator tool. By using OpenPro+ Configurator user can generate XML file, export/import IED templates, export INI file, do master/slave mapping, etc.
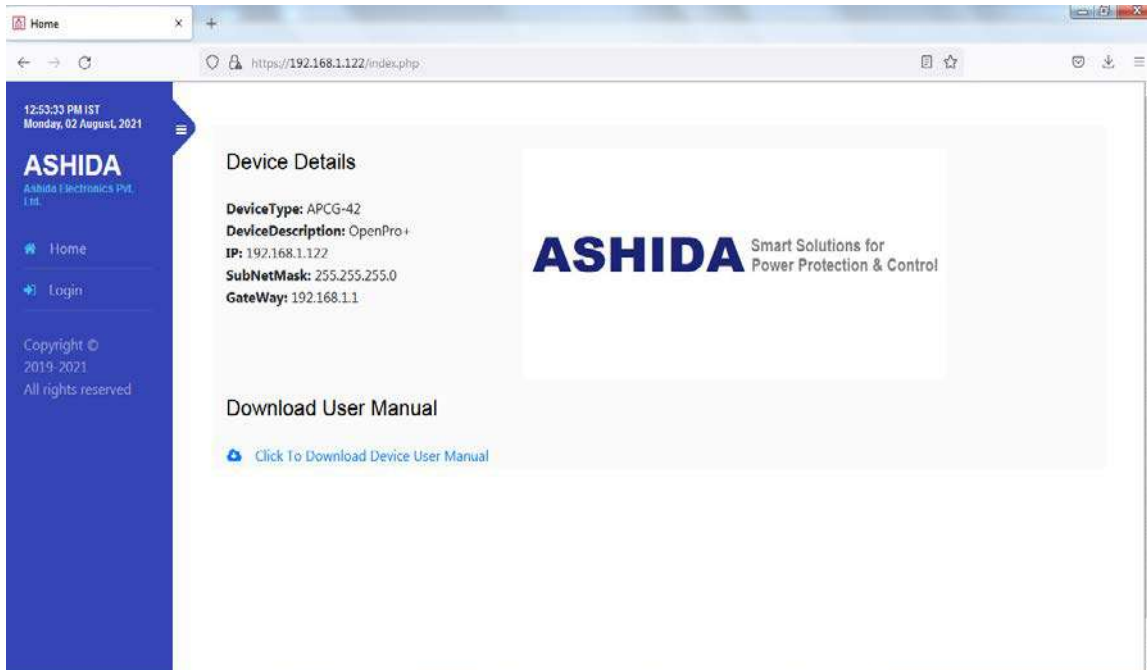
APCG–42 can be configured any protocol as Master/Slave. User can add multiple masters/slaves and configure its parameters. To make Master/Slave online mark it "Run".

By using OpenPro+ Configurator, user can add multiple Master/Slave & set their parameters like Analogue Input, Digital Input, Digital Output etc.
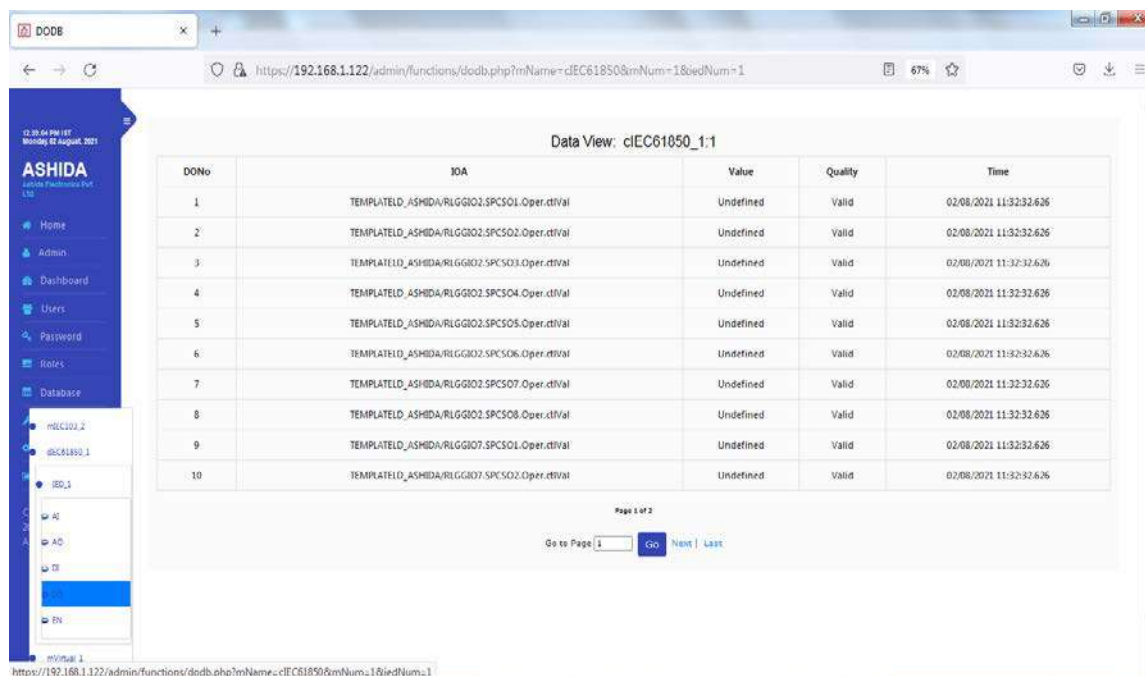

Open the Web browser, type APCG–42 IP address in address bar, the home page will open.

After login, the user can upload the configuration file in the APCG–42 or download the exiting configuration file from APCG–42. The Online Data can also be viewed.

Along with this use can download DR, App logs SOE event file from Configurator tool as well as Web UI.

Typical Tests Information:

Sr. No.	Tests	Standards
1.	Surge Immunity Test	: IEC 60870-2-1
2.	Electrical Fast Transient Burst Test	: IEC 60870-2-1
3.	Damped Oscillatory WAVE Test	: IEC 60870-2-1
4.	Electrostatic Discharge Test	: IEC 60870-2-1
5.	Radiated Electromagnetic Field Test	: IEC 60870-2-1
6.	Power Frequency Magnetic Field Test	: IEC 60870-2-1
7.	Conducted Disturbance induced by Radio Frequency field	: IEC 61000-4-6
8.	AC Ripple in dc supply	: IEC 61850-3 and IEC 61000-4-17
9.	voltage dips and short interruption	: IEC 61850-3 and IEC 61000-4-29
10.	Power Frequency Voltage with stand Test	: IEC 60870-2-1
11.	Impulse voltage withstand test	: IEC 60870-2-1
12.	Insulation Resistance test	: IEC 60255-27
13.	Dry heat	: IEC 60068-2-2
14.	Damp heat test	: IEC 60068-2-78

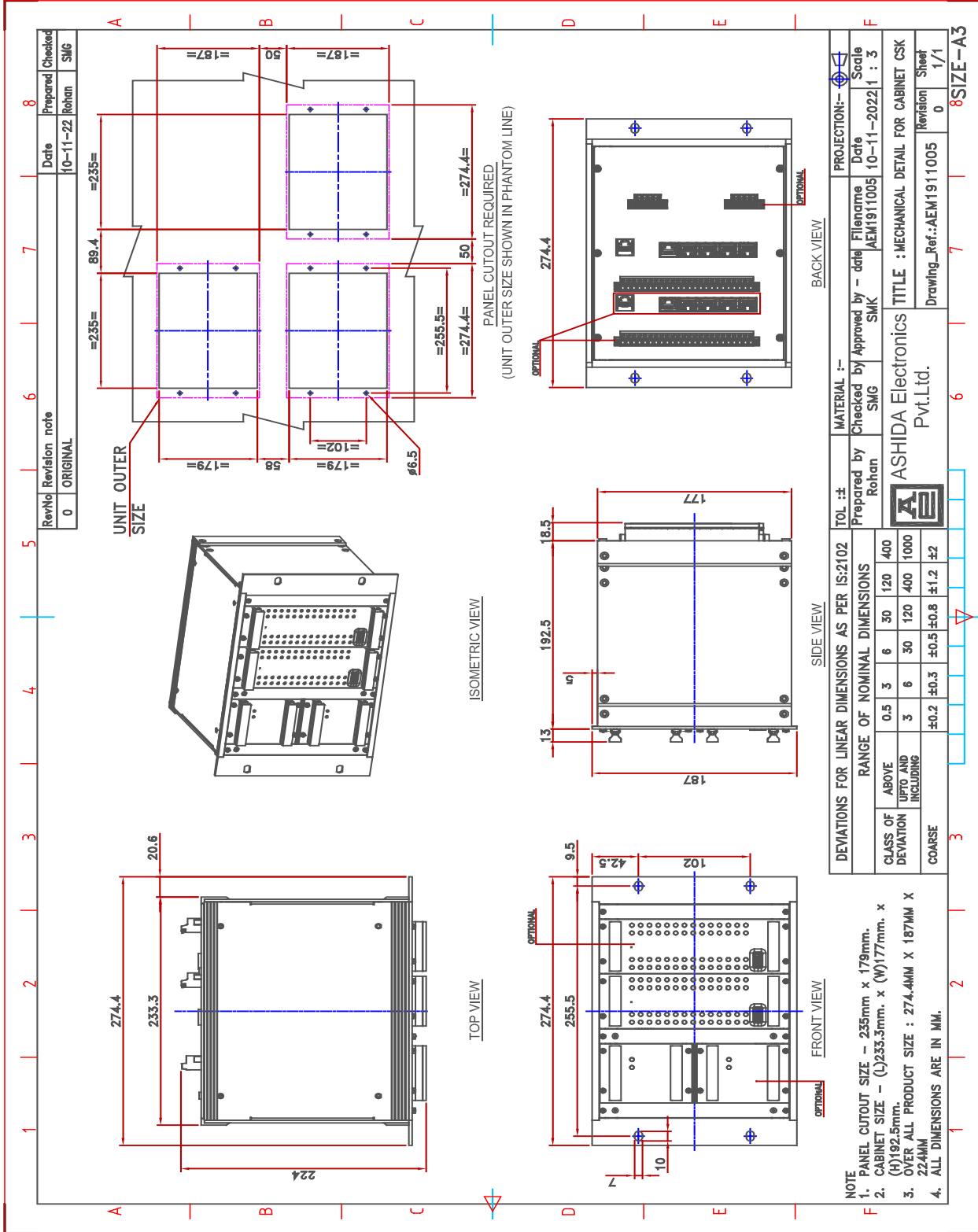| 15.	Cold test	: IEC 60068-2-1
16.	Damp heat test Cyclic	: IEC 60068-2-30

*NOTE – Detailed type test reports are available on request.

Drawings Information:

I.	Drawing References	: For Cabinet Type	- AEM1911005

Mechanical Dimensions:

Mechanical drawing showing UNIT OUTER SIZE, PANEL CUTOUT REQUIRED (UNIT OUTER SIZE SHOWN IN PHANTOM LINE), ISOMETRIC VIEW, BACK VIEW, SIDE VIEW, TOP VIEW, and FRONT VIEW.

NOTE
1. PANEL CUTOUT SIZE – 235mm x 179mm.
2. CABINET SIZE – (L)233.3mm. x (W)177mm. x (H)192.5mm.
3. OVER ALL PRODUCT SIZE : 274.4MM X 187MM X 224MM
4. ALL DIMENSIONS ARE IN MM.

TITLE : MECHANICAL DETAIL FOR CABINET CSK

Drawing_Ref.:AEM1911005

8SIZE–A3

	Date	Prepared	Checked
	10-11-22	Rohan	SMG

RevNo	Revision note		
0	ORIGINAL		

PROJECTION:-

Filename: AEM1911005
Date: 10-11-2022
Scale: 1 : 3
Revision: 0
Sheet: 1/1

MATERIAL :-

Prepared by: Rohan
Checked by: SMG
Approved by: SMK

ASHIDA Electronics Pvt.Ltd.

DEVIATIONS FOR LINEAR DIMENSIONS AS PER IS:2102

RANGE OF NOMINAL DIMENSIONS

CLASS OF DEVIATION	ABOVE	0.5	3	6	30	120	400
	UPTO AND INCLUDING	3	6	30	120	400	1000
	COARSE	±0.2	±0.3	±0.5	±0.8	±1.2	±2

TOL :±