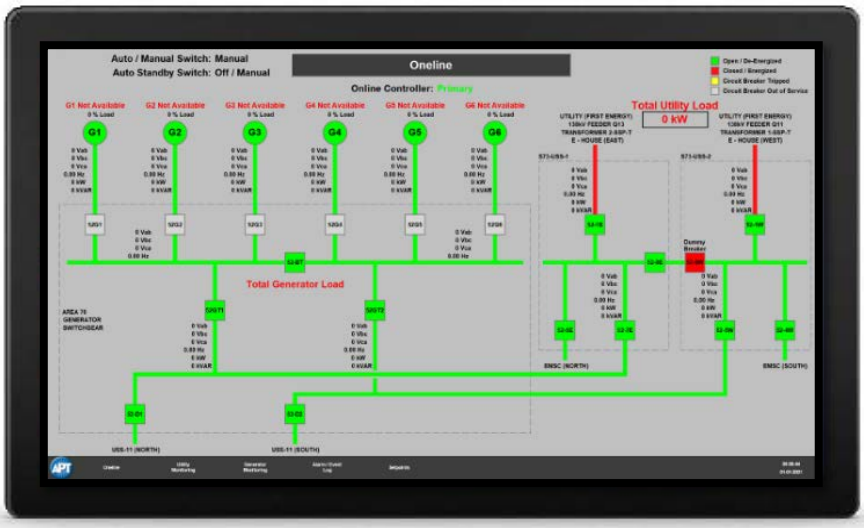
ADVANCED POWER TECHNOLOGIES

SCADA Human-Machine Interface (HMI) System for Master Control & Remote Access of Switchgear



APTView
Switchgear SCADA Master Control System

Solutions Brochure

www.apt-power.com
433 N. 36th Street
Lafayette, IN 47905
(765) 446-2343

SAFE SMART SERVICEABLE SWITCHGEAR & ENGINEERED POWER SYSTEM SOLUTIONS

MADE IN THE USA

ALN: 559 Rev. 03

APTView for Switchgear Master Control

Figure 1: APTView HMI integrated into 480V, 3000A Automatic Generator Paralleling Switchgear

Figure 2: Look for APTView Enabled labels on our Switchgear Models

Human-Machine Interface (HMI) - Line-up Integrated or Isolated

- **APTView** is the industry's most flexible Switchgear Supervisory Control and Data Acquisition (SCADA) HMI Power System Management Software
- Capability to **remotely** perform power system troubleshooting
- **Free,** unlimited users, software licensing for **both** secure remote **monitoring** & remote **control** software allows easy access on multiple device platforms such as:
  - Windows, Android, Apple, & More
- Be in the Know!
  - See Power System Status in real time graphically either right at the operator interface on the master control panel, or remotely via network computers or a Smartphone or internet connected Smart tablet
- Make Changes on the Go!
  - Remote control allows operators to make changes to time delays and trip setpoints without standing in front of the master control HMI
- Send supervised automatic load transfer commands from anywhere **securely**
- Human-Machine Operator Interface:
  - APT industrial computer (AiPC) equipped with the **powerful** APTView Control & Monitoring Software
  - **20"** color **touchscreen**
  - Provides SCADA graphical user interface (GUI) for control and monitoring of the MCP functions
  - Secure access anywhere to:
    - System One-Line
    - Storage of all monitored data **every minute** with date and time stamp
    - Email notifications sent upon any alarm condition
    - Adjustable setpoints and modes of operation
    - Allows operators to adopt system operation to a facility's **dynamic** needs for critical power performance

*Due to continued product improvement, products delivered may differ from what is pictured.
*Optional Equipment Features Are Often Shown in Most Figures.
*Option Availability Subject to Product Series.

Operational & External Interfacing

Figure 3: Isolated Utility Intertie Master Control Panel with HMI Viewable Digital Metering Gauges and Analog Metering Gauges

Figure 4: APTView HMI Home Screen

APTView is the Only Way to View Your Power!

- Interfacing Overview:
  - APTView provides the most **feature-filled** interface for all APT Automatic Generator Paralleling Switchgear, APT Automatic Transfer Switchgear, APT Advanced Power System Control Modules, and most **3rd party controllers** via following native interfaces:
    - Modbus TCP/IP Ethernet, Modbus RTU, or Modbus ASCI serial via RS-485 or RS-232
    - Analog Voltage interfaces:
      - 0-5 VDC
      - +/- 10 VDC
      - 0-3 VDC
      - 0-10 VDC
      - +/- 5 VDC<+/- 3 VDC, etc.
    - Analog Current interfaces:
      - 4-20mA, 0-20mA
    - Microprocessor controlled potentiometer
    - Digital Signals:
      - 24VDC, 48VDC, 125VDC, 120VAC, etc.
  - Custom Interfaces to 3rd party devices are not native, but available upon request with provided information.
- Modbus TCP/IP Ethernet, via copper or fiber optic cable, to integrate and seamlessly interface with a higher-level distributed control system (DCS), or building management system (BMS)/external building automation system (BAS):
  - Information from APTView/Master **Programmable Logic Controller (PLC)** of switchgear power parameters are available from the central PLC in MODBUS TCP/IP format and presented through an Ethernet or optional fiber optic port for an **easy**, single point of communication
  - Retrieve various electrical parameters, including generator and utility real and reactive power. frequency, and line to line voltages. Tell us about any additional parameters and **we can make it happen**!

*Due to continued product improvement, products delivered may differ from what is pictured.
*Optional Equipment Features Are Often Shown in Most Figures.
*Option Availability Subject to Product Series.

Interface Designed for Your Use

Figure 5: Stand-alone Fully Isolated Master Control Panel with 20” Touchscreen Human Machine Interface Screen

Figure 6: APTView Power System Trending Chart Comparing Power System Source Parameters

Human-Machine Graphical User Interface

- **Historical** power system trending shows an up to the minute, graphical power system **usage** data
- Compare source output, find when outages happen, and see system response **easily**
- APT’s Industrial Personal Computer (AiPC) is an industry leader in power and reliability utilizing the following specifications:
  - Windows10 Operating System
  - Minimum 8GB of RAM
  - Minimum 128GB Solid State Drive (SSD)
  - 20” Active matrix TFT LCD Touch Display
    - Shows **state-of-the-art** graphical display of power usage
    - Smartphone-compatible
  - Native resolution of 1920 x 1080
  - Wide angle aspect ratio 16:9
  - Viewing angle of 178°(h) x 178°(w)
  - Horizontal Scan Rate: 30 - 82 kHz
  - Vertical Scan Rate: 50 - 75 Hz
  - 3000:1 Contrast
  - Number of colors: 16.7 million
  - +10-point multi-touch Projected Capacitive (PCAP) with thru-glass capabilities that pass UL-60950 & IK-07 **Impact** Testing
  - Operating Temperature:
    - 0°C to 40°C (32°F to 104°F)
  - Operating Humidity (non-condensing):
    - 20% to 80%
  - Larger Display’s available upon request

*Due to continued product improvement, products delivered may differ from what is pictured.
*Optional Equipment Features Are Often Shown in Most Figures.
*Option Availability Subject to Product Series.

Secure Graphical System Interface

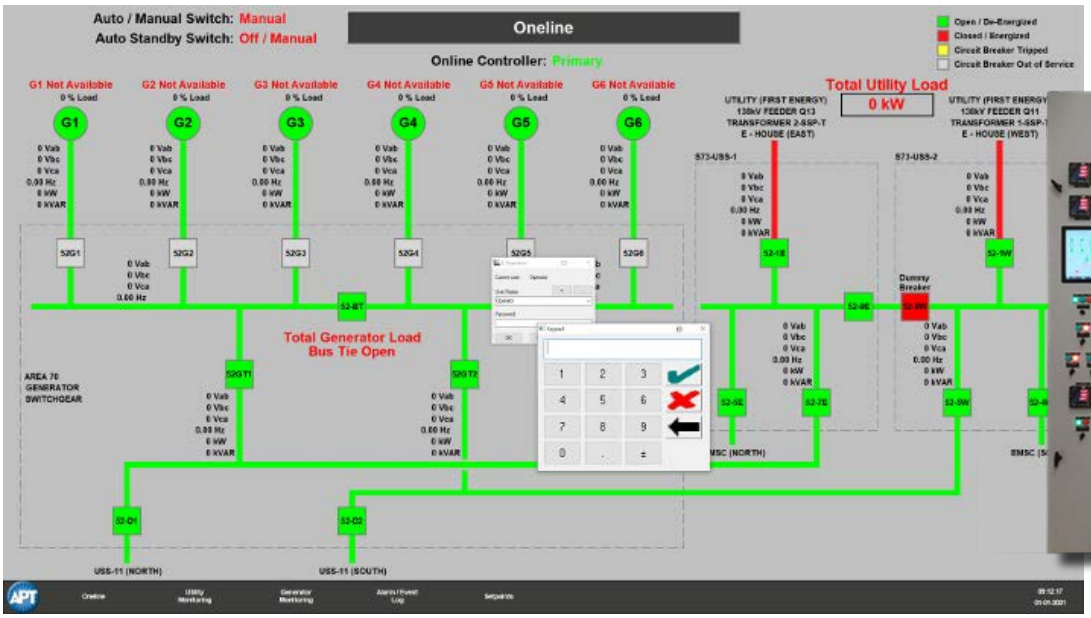


Figure 8: Overall System One-Line with User/Password Protection for Setpoint Control

Figure 7: Stand-alone Fully Isolated Master Control Panel (MCP-Series) showing One-Line

Forget Mimic Bus… Look at the Live, Active Bus

- **Graphically** view a system one-line to see the status of circuit breaker positions for source(s), tie(s), and feeder(s).
- See **real-time** power production, power import, power export, and power delivery of individual generator and utility sources.
- We take power system security seriously. In order to control the pickup and trip functions of the system, APTView has a **multi-layer security** platform to allow customer specified operators to have certain privileges and high-level operators have reserved administrative privileges.
- View real-time power-flow of source power to the facility loads. Are your producing power from generators or are you buying power from the utility? Find out in an instant!
- View and **control** multiple tie circuit breakers all from a single one-line interface.
- **Green** indicates that a bus/source is **not energized**.
- **Red** indicates that the bus/source is **energized**, and voltage is sensed at the shown location, or the circuit breaker is closed – allowing power to flow.
- Limit what certain operators can do through usernames and password **protection**.

Visual Metering & Alarms

Figure 10: Switchgear Isolated Master Control Panel (MCP-Series) with APTView

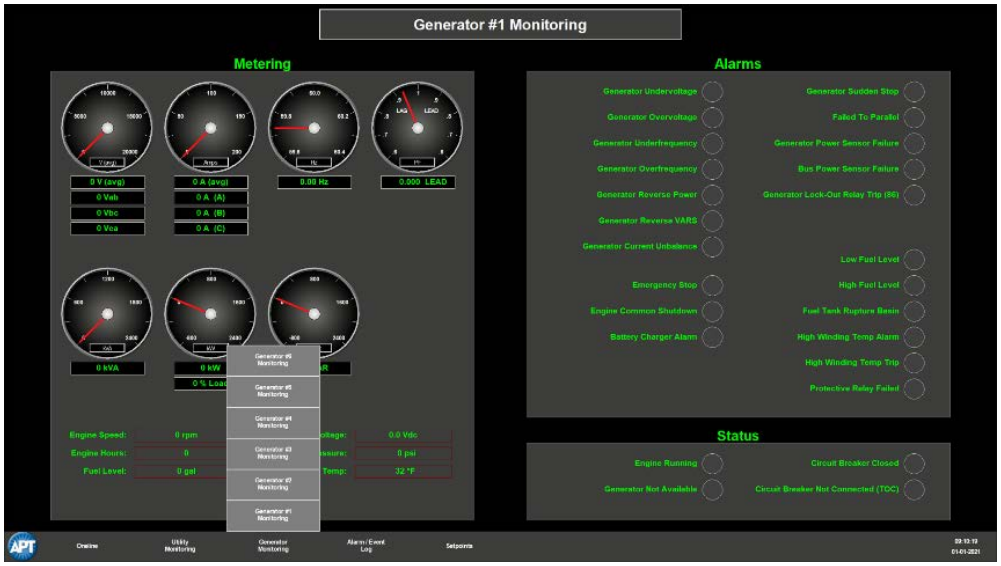


Figure 9: APTView Digital Meter Gauges and Digital Alarm Notifications

Metering, Setpoints, & Alarms

- **Digital** display of **metering** parameters in **analog** gauge **format** such as:
  - Line Voltage
  - Phase voltage
  - Frequency
  - Power Factor
  - Apparent Power
  - Real Power
  - Reactive Power
  - And more as Requested!
- Digital viewing of alarm conditions for any parameter with a red digital indicator
- Digital setpoint & time delay control for automatic transfer, load add, load shed, and more!
- Alarm logging with date & time stamp to record when a failure or non-normal state occurs.

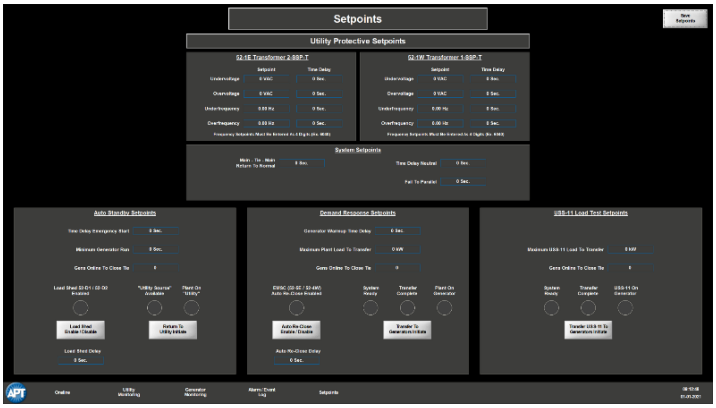


Figure 11: APTView Setpoints Viewing & Control

Figure 12: APTView Alarms/Event Log

*Due to continued product improvement, products delivered may differ from what is pictured.
*Optional Equipment Features Are Often Shown in Most Figures.
*Option Availability Subject to Product Series.

Isolated MCP w/Integrated APTView HMI

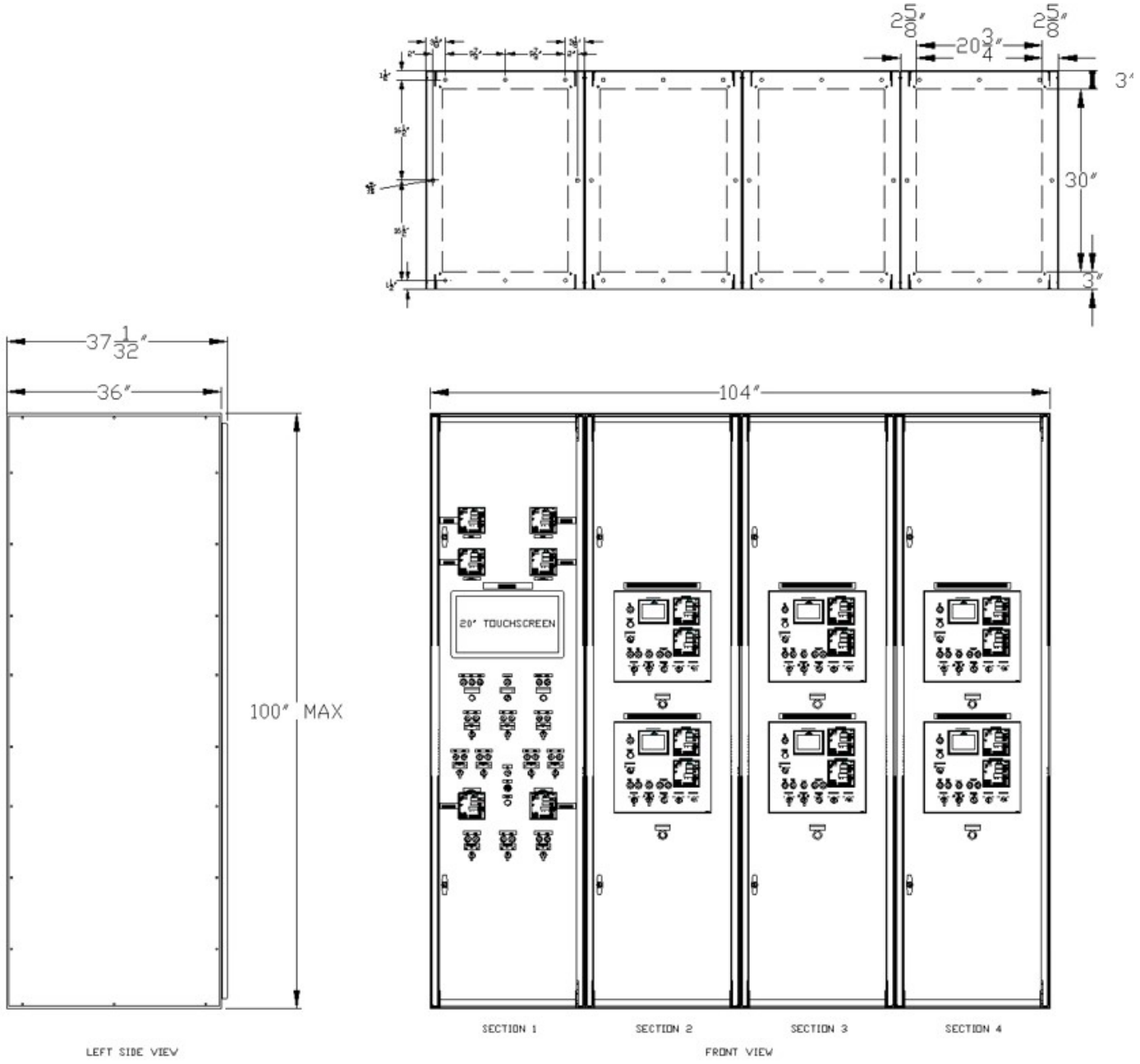


Figure 13: Isolated Remote Operator Master Control HMI Station Sample Dimensions

*Due to continued product improvement, products delivered may differ from what is pictured.
*Optional Equipment Features Are Often Shown in Most Figures.
*Option Availability Subject to Product Series.

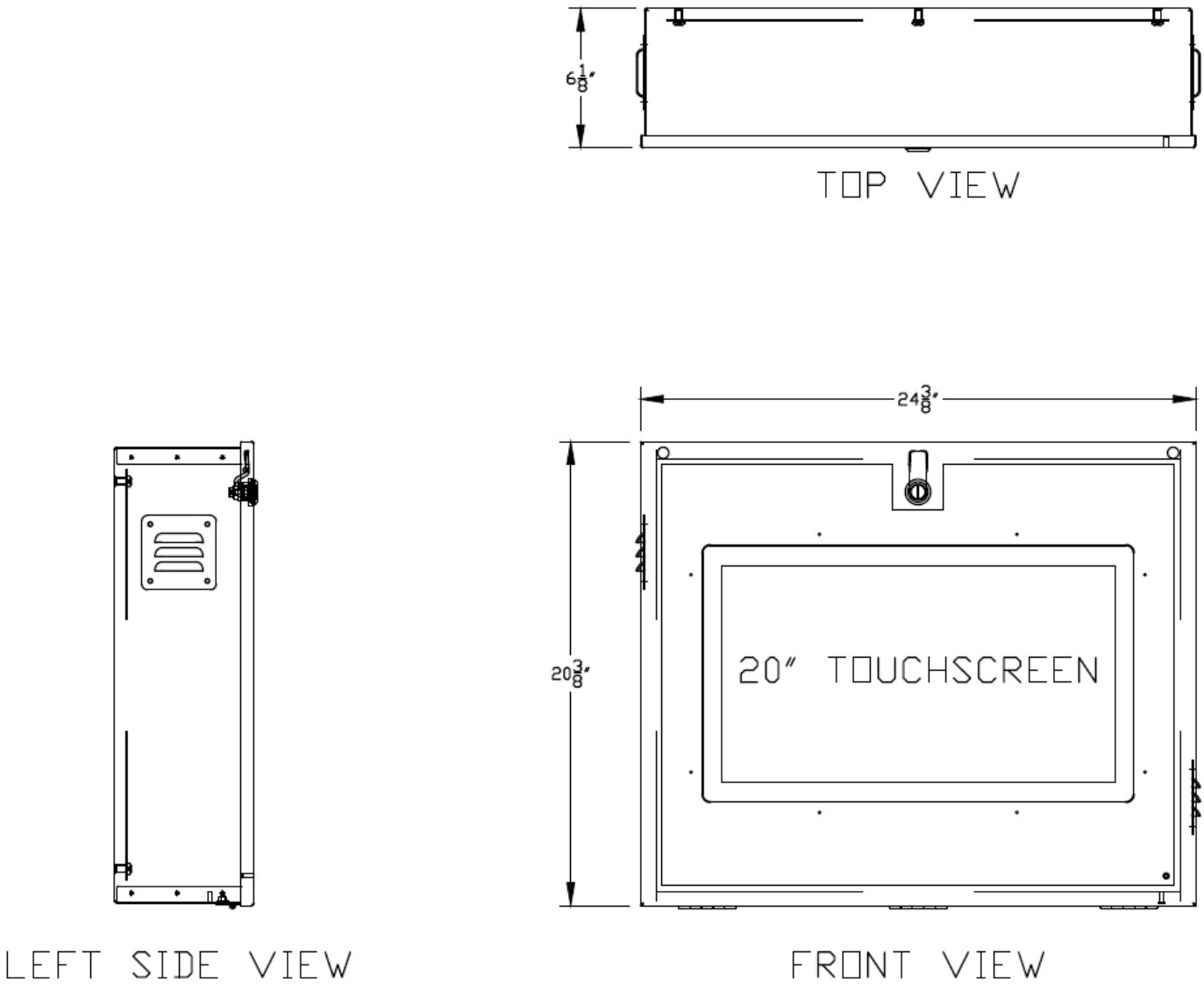


Figure 14: Isolated Remote Operator Master Control HMI Station Sample Dimensions

About Advanced Power Technologies



Advanced Power Technologies (APT) is on the cutting edge of the latest engineered power system smart technologies, as it relates to microgrid & storage management, renewable & conventional energy source deployment, demand peak shaving, and facility back-up and co-generation power systems. Located in the central United States and headquartered in Lafayette, Indiana with solutions development engineers around the country, APT provides domestic and international products and services to industry leading companies from around the world. APT engineers have decades of power system experience from working with some of the largest companies in industry. Over the last two decades, we have produced successful solutions for hundreds of large-scale electric power projects involving utility/generator paralleling, transfer, peak shaving, and distribution. We pride ourselves in providing electrical power systems that are engineered and custom built, utilizing state-of-the-art technologies to fit our customer's exact needs. The core of our business is low & medium voltage engineered power systems for a wide range of indoor & outdoor applications, such as:

- Utility(ies) and Generator(s) Paralleling/Transfer/Peak Shaving/Distribution Switchgear
- Microgrids, Microgrid Master Control Panels, SCADA systems
- Containerized Battery Energy Storage Systems (BESS)
- Photovoltaic (PV) Solar Power Collection/Distribution & Renewable Energy Storage Systems
- Low & High Resistance Grounding Systems, Grounding Systems for Photovoltaic Effective Grounding
- High Efficiency Combined Heat and Power Switchgear & Control Systems (CHP, Co-generation)
- Outdoor Walk-In Electrical Houses (E-Houses) & Skid-Mounted Switchgear
- Motor Control Centers & Motor Control Switchgear
- Automatic & Manual Load Transfer Switchgear
- Bypass/Isolation & Power Distribution Circuit Breaker Switchboards
- Generator/Loadbank Quick Connection Switchgear, Switchboards, & Tap Boxes
- Industrial Control Panels

Please see our product webpages on www.apt-power.com for product brochures and relevant information. Actual products may look different from images shown on the website and in brochures, based on actual specifications.
APT cares and understands that each power system is different. We will evaluate various solutions to develop the best solution for a site. APT focuses on our ability to a combine several traditional pieces of equipment/functionality into as little of a footprint possible. This saves on space, the cost of equipment, cost of installation, and accomplishes the most optimal/state-of-the-art design your facilities. APT's desires to foster and grow a culture of continued open communication with each customer. Let APT be your source to provide fully engineered power system equipment solutions for the full customer facility on time, on or under budget, and in the smallest footprint possible. We are always available to assist customers and engineers representing customers in the development of complex power solutions for all facility types.