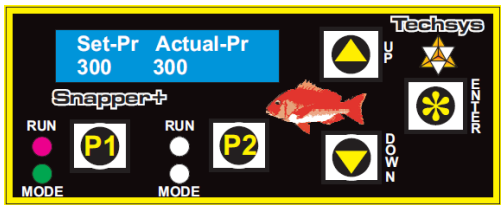
Snapper+

Techsys Corporation

Main Features. (Version 4310.00 Onwards)

- An industry proven dedicated pump control system designed to operate as a constant pressure, variable flow control system.
- Complete control package.
  - Connect power via suitably rated circuit breaker, wire in the pumps and attach the pressure tube.
- Supplied equipment.
  - SNAPPER+ controller
  - Eaton, Vacon, ABB or Danfoss Variable Frequency Drive (Other brands available)
  - IP21, IP54 or IP65 Enclosure Versions
  - Fan forced ventilation on enclosed (switchboard) version.
  - 25Bar pressure transducer 4-20mA with 3x over pressure capability.



- Constant Level or Constant Flow also available
- Capable of operating up 1 or 2 pumps.
  - Main Pump only- VFD
  - Jockey + Main Pump – Jockey Pump options are:- DOL, Soft Start OR Separate VFD
  - Main + Lag Pump – Lag Pump options are:- DOL OR Soft Start
- Real English Menus with a 2 Line 16 characters LCD Display.
- Pump enabled and run indicators.
- Easy navigation menu system with password access control.
- For clarity Menus disappear when an option or function is not selected or required.
- Whilst tuning the actual pressure is displayed along side the value of the adjustment to facilitate rapid evaluation of any change.
- Simple push button actions to enable/disable or manually operate each pump.
- Inbuilt settable time clock.
- Remote Control capability via digital input or telemetry.
- SCADA Compatible Modbus/RS485 for remote data acquisition, download or control.
- Capable of up to 7 externally activated set pressures for changing duties.
- Capable of 7 time activated set pressures.
- User selectable timed activated outputs that can be associated to a time activated pressure settings.
- Data protection or user entry via access code.
- Eight programmable inputs for user selectable functions with adjustable delay.
- Two programmable voltage free outputs for BMS interfacing or user selectable output functions.
- Temporary mute of the buzzer on key press actions for silent operation.
- Friction Loss Compensation.
  - Linear, exponential or none.
- Continuous display of the pressure and setpoint.
- User selectable decimal placement for pressure and flow readings. Allows the user to have setting such as PSI with greater resolution. EG 20.3 PSI
- Simple scaling and zeroing for all types of sensors or transducers.
- Optional backup pressure transducer with auto change over on detection of a faulty transducer.
- Data logs for local or remote viewing.
  - Total system flow. (Calculated or Actual)
  - Current average flow rate (Calculated or Actual)
  - Average pressure since last start.
  - Highest pressure recorded
  - Resettable Hours runs and pump starts for each pump
  - Status of all inputs or outputs.
  - Local temperature of controller.
  - Communications status.

- Fault logging.
- User adjustable Low Pressure Setting with adjustable delay which performs a Low Pressure Shutdown.
- User adjustable Cut In (Restart) Pressure setting.
- User adjustable High Pressure setting with adjustable delay which performs a High Pressure Shutdown.
- High pressure shutdown displays the pressure that exceeded the limit until the system is reset.
- Continuously displays the current flow rate.
    - If a flow meter is attached it will be actual flow.
    - If there is no flow meter it will be based on calculated flow.
- Individual pump fault protection option with adjustable delay.
- Individual pump protection option with auto-resetting and adjustable delay.
- User adjustable next pump In (ON) delay timer
- User adjustable next pump Out (OFF) delay timer
- System Restart Delay Timer.
- System No Flow Input with adjustable timer.
    - Two possible uses for system No Flow Input
        - System loss of prime.
        - Detection of possible standby or sleep condition.
- Configuration Backup and Restore.
    - A complete backup of settings and system configuration including sensor scaling can be implemented at any time and then restored if unconfirmed or doubtful changes have been made.
- Eight individual set points activated by time or external signal.
    - Each of the extra setpoints can be activated by the activation of an input.
    - Each of the extra setpoints can be activated by a start and stop time from the internal clock.
    - Each one of the timed Set Points can also have one of the Programmable Outputs operating at the same time. Typically used to operate valves for different systems.
- Specialised Control algorithms that are ultra responsive to minimise overpressure occurrences for critical applications.
- Pipe Fill Mode- Elimination of water hammer at start-up.
    - Operator adjustable settings to determine at what point pipe fill should be initiated during a restart.
    - Operator adjustable time for pipe filling which automatically stages all pumps to coincide with the overall time.
    - Automatic resumption of pressure control if pipe was only partially empty.
    - Settings to prevent cavitation during the initial stages of pipe fill or when using turbines or bore pumps it facilitates the movement of water past the motor or bearings.
        - Jump duration- This sets how long it takes for the first pump to get to the jump speed before commencing the actual pipe fill sequence.
        - Jump Final Speed- This specifies the final speed of the first pump after the jump duration time.
- Flow Meter Support.
    - Digital output meters
    - Analogue output meters.
        - A digital output pulsed flow meter or Analogue output meter can be connected to log/monitor flow and also used to determine any no flow condition for normal standby mode or faults such as loss of prime.
- Optional Knob style Set Point adjustment available for ease of use.
- Programmable Start and Stop times for system operation.

- Options for zero pump displacement detection- Fixed Frequency or Pump Shut Off Head.
  - The entry of a Shutoff head allows the minimum pump speed to be automatically calculated from the current set point and is essential for multiset point control when the set points vary dramatically.
  - Fixed minimum pump speed is sometimes desirable to enforce a greater overlap between pumps or preset the change over point between pumps.
  - Accurate zero displacement or minimum frequency is also required to determine when the system should be placed on standby or sleep mode.
- Relative or fixed pressure settings.
  - Low pressure shut down. This setting can be a fixed or relative a value.
    - Relative mode. The Low pressure will be a percentage of the current set point. As the set point changes the Low Pressure will then change.
    - Fixed mode. Low pressure will remain constant regardless of the current set point.
  - Cut In Pressure, High pressure limit and High pressure shutdown. (Relative settings)
    - These settings are all set as a percentage of the current set point. The actual value calculated by from the % of set point is also shown to make it easy to use.
- Optional independent Jockey pump.
  - A full set of independent settings available for Jockey pump operation.
- Soft Pause Input.
  - Used to ramp the system down slowly. Typically used in conjunction with an irrigation controller to turn off the system at the end of a cycle. Pause is displayed when Pause is activated.
  - Two options available.
    - Pause all pumps including the Jockey pump.
    - Pause the main pumps and allow the Jockey pump to run.
- Low Level Input option.
  - Used with floats or similar. Displays "Paused - Low-Level".
- Optional Access Code Features
  - Selectable Access code functions.
    - Three different Levels-
    - Menu adjustments only.
    - Pumps only.
    - All.
- Industry standard sensor interface
    - 4-20mA
- Telemetry
  - The SNAPPER+ is capable of communicating with an external telemetry system based on digital Inputs and/or Outputs from other devices.
  - A serial communications port is provided for direct connection to SCADA or BMS system for access to the SNAPPER+ operating parameters. This is via RS485 MODBUS RTU protocol. A full list of registers addresses can be provided.
- Digital Outputs
  - The SNAPPER+ has 2 programmable outputs that can be selected for a variety of functions. They are rated to 5 amps 240VAC with change over contacts.
- Digital Inputs
  - All inputs can be configured to operate as contact closure = ON or Contact Open = ON (Inverted).
  - The SNAPPER+ has 8 programmable voltage free inputs that can be selected for a variety of functions.

Outline of available menus.

- System set pressure & Actual current pressure
- Current system flow rate & speed of the pump currently under VFD control.
  - Fault History menu.
    - Readouts for the last five (5) faults with time and date stamp.
  - Pump Data Log.
    - Total system flow..
    - Average flow rate.
    - Average pressure.
    - Highest pressure reading.
    - Hour Run counters for each pump.
    - Pump Start counters for each pump.
    - Total starts in the last hour.
    - Status of all inputs and outputs.
    - Controller temperature.
    - Communications status monitor.
  - Settings.
    - Low pressure shutdown.
    - Cut In (Restart) pressure.
    - System Set Point.
    - High Pressure Limit.
    - High Pressure Shutdown.
    - Pump flow rate or Flow meter.
    - Friction Loss Compensation.
    - Seven (7) optional pressure setpoints.
    - Pressure trips for activating digital outputs.
    - Flow trips for activating digital outputs.
  - Tuning.
    - Pump minimum frequency or maximum shut off head.
    - Response rate and tuning parameters.
    - Pump rotation options.
    - Selection of High Pressure restarts.
    - Standby or sleep settings.
  - Timing.
    - Low pressure shutdown delay.
    - Cut In (Restart) delay.
    - High Pressure Shutdown delay.
    - Next pump ON delay.
    - Pump OFF delay.
    - Main Pump Restart delay.
    - Standby or sleep settings.
    - Jockey Pump fallback delay.
    - Individual and System NO Flow input delay.
    - Delays for general inputs.
    - Pressure trip and flow trip delay for activating digital outputs.
    - System Start & Stop time of day.
  - Configuration.
    - Operating mode. - (Pressure or Level or Flow)
    - Number of pumps on the system.
    - Pump minimum frequency option.
    - Pressure display resolution decimal points.
    - Flow display resolution decimal points.
    - Pressure transducer zero and scaling.
    - Flow Meter zero and scaling.
    - Backup pressure transducer zero and scaling.
    - Modes for determining sleep or standby.
    - Jockey Pump fallback enable/disable.
    - Time and date.
    - Activation of friction loss compensation.
    - User Access Code.

        - Serial communications settings.
        - Type of flow reading.
        - Pump manual run options.
    - Pump Definition.
        - Configuration for each pump.
            - Jockey.
            - Duty
    - Jockey Pump.
        - Type of jockey pump.
            - DOL. .
        - Cut In pressure.
        - Cut Out
        - Flow rate.
        - Response rate and tuning parameters.
        - Run ON time after a main pumps start.
        - Restart delay..
    - Outputs (2) Both individually programmable to one of the options below.
        - Operation in conjunction with Timed Set Points 1-8
        - Shutdown Fault.
        - Low Pressure Fault.
        - High Pressure Fault.
        - Any Alarm.
        - Pump 1-2 Run.
        - Pump 1-2 Fault.
        - System Paused.
        - Any Pump Shutdown.
        - Any Pump Running.
        - No Flow Shutdown.
        - All Pumps Running.
        - VFD Fault.
        - Pressure Trip 1.
        - Pressure Trip 2.
        - Alternate Trip.
        - Flow trip.
        - Jockey Pump Run.
        - All pumps running.
        - Aux Output 1-3.
    - Inputs (8) All individually programmable to one of the options below.
      (All inputs can have Non-Inverted or Inverted logic)
        - Soft Pause.
        - Soft Pause JP Run.
        - Emergency Stop.
        - Pump 1-2 Protect(Pause)
        - Pump 1-2 Stop.
        - Pump 1-2 Manual Run.
        - Fire Mode.
        - Cycle pumps.
        - Reset.
        - No Flow.
        - Aux Input 1-3.
        - Pump 1-6 Fault(Stop)
        - Flow Meter Pulse Input.
        - Low Level Pause.

- Analogue Inputs.
  - Input 1 & 2
    - Mode selection
      - Control Pressure
      - Flow
      - Set Point Input (Potentiometer)
      - Disabled
  - Input 2 Only
    - Mode selection
      - Backup Pressure
      - (Plus same options as Input 1)
- Pipe Fill Mode.
  - ON or OFF.
  - Initial speed ramp time.
  - Final ramp speed.
  - Pipe fill time
  - Pipe fill activation settings
- Time of day setpoints.
  - Start and Stop times for Setpoints 2 – 8
- Restore Options.
  - Create a backup copy of configuration and settings.
  - Restore form the most recent backup copy of the configuration and settings.

Controller Specifications.

- Size.
  - 10.5CM Wide x 9CM High x 6CM Deep
- Weight.
  - 250 Grams
- Standard supply voltage.
  - 24VDC +/- 10%
- Optional supply voltage.
  - 18VAC
- Power consumption.
  - 3W Typical

All options are available with every controller. Some options will require extra hardware or connection/s to perform the desired task.