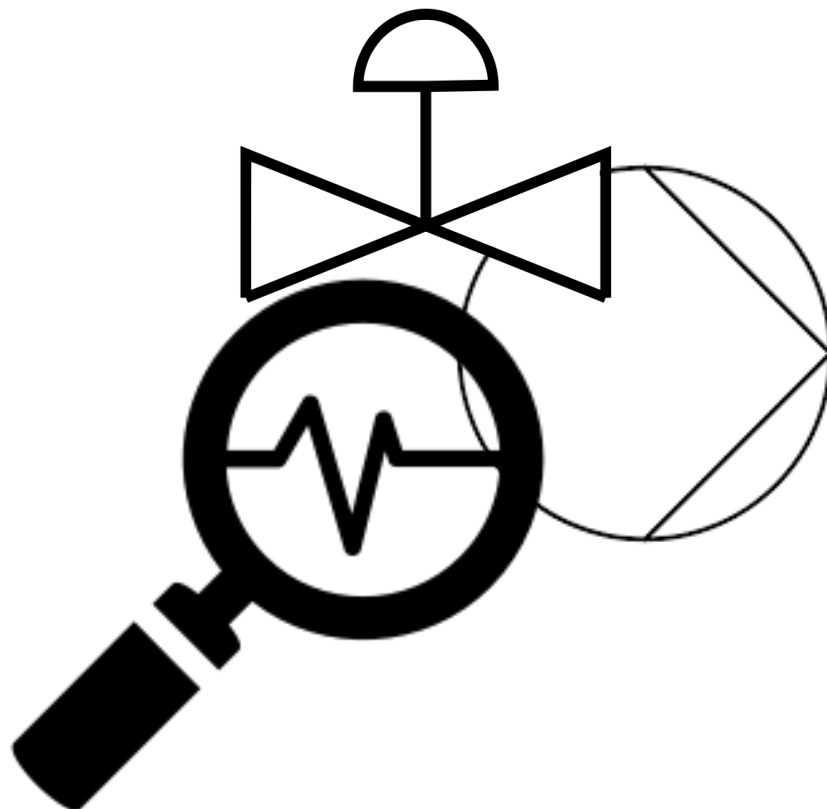




Control Module Alarms

Find and diagnose faults



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1 General

The BatchXpert system and its derivatives such as the "BatchXpert Compact" and "BatchXpert Micro" incorporate different Control Modules to model the Motors, Valves and Measurements connected to the system. Each of the Modules incorporates a "Failure" status and many modules additionally have a "Warning" or "Operational Warning Message" status. This manual serves as a guide for operating personnel to identify and resolve alarms in equipment and instrumentation.

However, the vast majority of failures still require the support of a trained Electrician and/or Mechanic to solve the problems. This manual is only used to identify errors and interpret messages from the BatchXpert system.

Any intervention to the facilities and/or instrumentation must be carried out under the internal regulations of the company, always complying with the use of PPE (Personal Protective Equipment) and safety regulations.

2 Interlocks/General Releases

BatchXpert systems are systems that are always adjusted to the needs of the plant and the customer. For this reason, there are many processes and interlocks that are specifically programmed for the project. However, there are certain general interlocks that are typically programmed by default in BatchXpert systems. The specified manual for your system should always be consulted. These points serve only as a guide.

2.1 Emergency Stop

If an emergency system shutdown is activated, all adjustment modules such as Motors, Valves, and Regulators are Locked. In general, all processes and actuators are stopped immediately until the emergency situation is resolved.

In some cases, the emergency stop system may be separated into Sections, where only the processes in the section where the emergency stop was triggered are blocked or stopped.

2.2 Pumps

The pump lock is usually separated to the "suction" side and the "pressure" side of the pump. In order for the system to allow a pump to run, a path to the "suction" side and a path to the "pressure" side must be open. In the event that one of the valves involved is in a fault status, it is considered as "Closed" and the pump is blocked.

To circumvent this blockage you can use the "Manual Release" function of the pump, which bypasses this functionality. At each moment a pump is running, a valid path to suction and pressure must be open.

2.3 Full Signal (LSH)

In general, if a "full" signal is activated, all valves and/or motors that can carry product or material into the pond or container are blocked so as not to overfill the system. These lockouts can sometimes be delayed by a timer depending on the implementation in the plant.

An exception to blockages are recirculation valves. These valves/pumps are generally not blocked with a "Signal Full" as they do not deliver new product to the containers, but operate based on the current contents.

The full signal can be implemented discreetly through a digital level detector, or through a continuous level measurement limit. If the container is incorporated into a caustic CIP cleaning process, the "full sensors" based on conductivity measurement are generally ignored, as the caustic soda tends to adhere to the sensor and activate it permanently.

2.4 Minimum Signals/Dry Run Protections (LSL)

This type of sensor is usually installed next to the suction side of a pump, which must be protected from dry running. In the event that this sensor marks "Lack of Fluid", it triggers its alarm after a delay of usually about 10 seconds, and stops the pump until the fault is confirmed by the operator.

2.5 Maintenance switches

Maintenance switches are usually installed in the field near the side of the equipment to be blocked, which are usually pumps or agitators. These switches are used to electrically turn off the equipment in order to carry out maintenance. If activated, the corresponding device and its attachment are immediately blocked.

In the case of pumps, the valves directly attached to the pump are additionally blocked, both on the suction side and also on the pressure side.

2.6 Men's Door/Key Lock

Personal Door Entry Switches to Containers are in many cases implemented as a switch directly on the doors of a container or as a key switch near the container to be locked. If such a sensor is activated, all inlet and outlet valves in and out of the container are blocked, as well as all agitators or pumps directly connected to the inside of the blocked container. All actuation elements or heating/cooling elements that may have an effect inside the container are also blocked.

2.7 Other Safety Sensors

In general, if there are additional safety devices, such as "Pull Cord's" or "Maintenance Switches", they lock the related equipment immediately and trigger their respective alarm.

2.8 Opt-Out Locks

In a process, there may be several actuators that must not be opened at the same time. An example of this is a water advance and a CIP advance, or the return of acid and caustic soda at a CIP Toilet station. In these cases, one actuator is locked once the other actuator is open. The other actuator can only be opened, once the first mark closed with its respective sensor.

3 Control Module Failures

This chapter describes the most common general computer failures and solutions. However, there are many possibilities of different faults, which are impossible to capture in a manual. For this reason, this manual should be considered as a guide to finding an error in the system. In general, it is always recommended to go to the assistance of an Electrician and/or a Mechanic to search, find and solve any failures in the system.

3.1 Emergency Stop

This message indicates that one of the system's emergency shutdowns has been activated. These shutdowns are implemented in such a way that they turn off all equipment for safety reasons and do not allow any motor, valve or other control element to be tampered with, while this error is active.



To normalize the situation, the indicated emergency stop must be reset and the falls must be reset from the screen with the corresponding "Reset Alarms" button. Only if the stop was successfully reset, it is possible to reset this alarm. If it cannot be reset, it means that the emergent stop system has not yet been fully restored.

Depending on the installation, it may be necessary to press a Reset button, which resets the emergency stop evaluation unit. If the system incorporates such a unit, it should always be reset independently of the BatchXpert system, before resetting the alarm on the display.

Note! In general, if this alarm is activated, the entire computer is locked and no operation can be carried out, either manually or automatically.

3.2 Valve Failure

The BatchXpert system supports valves that incorporate Valves with Closed Warning, Open Warning or Both. The system constantly monitors the status of the corresponding warning and triggers an alarm when the warning does not correspond to the expected status of the valve.

An alarm is usually triggered when a valve failed to close or open fully. In this case, the valve, especially the seals, should be checked. If the valve is working well, but it still does not mark open or closed correctly, the inductive sensor mounted on the valve should be reset.

Another reason may be that the valve does not have a compressed air supply, which should also be checked.

3.3 Motor/Pump Failure

Alarms on engines are usually caused because the equipment is missing the start confirmation. This drive confirmation is a signal that comes from the main contact and indicates that it is activated. Whenever a device is activated and the equipment is not blocked by an interlock, the system tries to activate the contact by activating the output of the PLC. The system then waits for a predefined time (usually 2 seconds) until the contact confirmation is activated, confirming the

activation of the equipment. If this activation does not reach the PLC, the system triggers the alarm for this device.

This indicates that a thermal jumped out of the respective pump. In this case, the pump should be checked with an electrician and a mechanic to ensure proper operation. One cause may be an overload of the pump, resulting in an increase in temperature or a clogging of the pump itself. In both cases, a check-up by an electrician and/or mechanic should be done.

Usually you can try to reset the thermal one more time, but if it jumps again you have to check the pump as there is a real problem with it.

3.4 Failure of an Analog Sensor

The analog input has exceeded its minimum or maximum limit. This means that a process value is outside of its normal operating range.

Another reason could be that the measuring device or its connection to the control system is faulty. Check the connection of the device and the control system, and the device for proper function.

One of the most common problems is that the current loop is not present. This usually happens when there is a cable break or electrical disconnect. This failure can also occur when the equipment that delivers the analog value is in trouble

3.5 Warning on an Analog Sensor

The analog input has exceeded its minimum or maximum warning limits. This means that a process value is outside of its normal operating range.

3.6 Failure of a digital sensor

A digital sensor is in its faulty state. In general, this means that an event has occurred that should be reviewed and corrected immediately.

3.7 Regulator Failure

The regulator has not reached its nominal value during normal operation or its minimum value or maximum operating limits have been exceeded. In this case, check the control circuit and its correctness

3.8 Warning on a Regulator

The regulator has exceeded its minimum or maximum warning limits. This means that a process value is out

3.9 Failure of a Counter

The counter has exceeded its minimum limit(s). This means that a process value is outside of its normal operating range.

Another reason may be that the counter has not received any impulse to count when it should have received a boost.

3.10 Warning on a Counter

The counter has exceeded its minimum or maximum warning limits. This means that a process value is out

3.11 Alarm in a Message

A generic alarm message from the PLC has been triggered. This message is a function of the application. Please refer to the documentation for more details about this alarm.

3.12 Warning in a Message



A generic PLC operation message has been activated. This message is a function of the application. Please refer to the documentation for more details about this alarm.

3.13 Alarm on a Unit

The Unit has triggered its alarm. This generally means that a process has exceeded its "Monitoring Time" and is thus outside the normal range of process duration. In essence, this indicates that the process step takes longer than anticipated by the recipe. This can have many causes, and the failed process should be reviewed.

In addition, consideration should be given to the potential effect on subsequent processes that a delay in one stage of the process may have.

3.14 Display shows communication failure to PLC

When these alarms appear on the display it   only means that it has no communication with the PLC, this can occur when the Ethernet cable is not connected to the HMI display or the PLC. Another possibility is that the PLC could be turned off.

4 Frequently asked questions

This section presents a collection of the most frequent problems and solutions that the operation and maintenance person may encounter with the system.

4.1 All Elements in an Area are on Alarm

Question:

Suddenly, all or many alarms went off for the entire plant or an area of the plant.

Answer:

Since it is unlikely that all of these elements are defective at the same time, the overall problem can be two main things:

- **24Vdc or 230Vac power supply is missing (if applicable)**
Since the voltage supply to the indicated area is missing, no sensor can work and therefore the system detects the malfunction. In this case, the responsible electrical panels for this area should be checked and the presence of all control voltages and/or force should be checked.
- **Communication to the "Decentralized Periphery" has been interrupted**
In the event that the sensors are connected via a communication such as "Profibus", "Profinet" or "Modbus" to the system, it should be checked that the entire communication link works without any problem. To check the operation, open the fieldbus diagnostic screen in the system and check that all stations are connected and communicated correctly. For more information, please refer to the BatchXpert System User Manual in the "FieldBus" chapter.

4.2 A sensor is faulty, but I have to keep producing

Question:

I have a faulty sensor, but I can't stop the line for maintenance. How can I continue production with the faulty sensor

Answer:

In the BatchXpert system it is possible to "Simulate" each signal obtained from the field. If the "Simulation" mode is activated on a control module, it ignores signals from the field, and allows the operator to set the desired value on the control module.

For information on how to activate the "Simulation" mode, please refer to the manual "Manual BatchXpert Movicon Touch panel"

4.3 I have an alarm that always goes off unnecessarily

Question:

I have an alarm that goes off unnecessarily, because of a problem in the field. How can I disable the alarm temporarily?

Answer:

In the BatchXpert system it is possible to "Ignore" each alarm generated by a control module. If "Ignore" mode is activated on a module, it does not trigger any more alarms.

For information on how to activate the "Ignore" mode, please refer to the manual "Manual BatchXpert Movicon Touch panel"

4.4 An analog measurement turns purple or red

Question:

An analog measurement changes to the color "Red" or "Lilac" and an error message is generated.

Answer:

That means that the measurement value is exceeding its warning value (purple) or its alarm value (red). Various warning levels and alarms can be configured for each of the analog measurements. If the current value of this measurement exceeds the set value, the measurement changes its color to alert the operator of this situation. This is only a visual warning to the operator, and it is up to the operator to decide whether this situation requires intervention or not.

4.5 All Control Modules are Locked

Question:

Suddenly, all control elements are blocked, and none of them light up in either Manual or Automatic.

Answer:

Most likely for this alarm is that if you have activated an "Emergency Stop" of the system, because these block all the computers connected to the system. The list of alarms should be checked in case it contains the "Emergency Stop" message, and if so, this error should be resolved.

4.6 A computer is locked and won't let me turn it on

Question:

I have an Engine/Valve that is being blocked and can't be turned on

Answer:

In this case, some module release condition is missing. All running conditions for the element must be checked and all functions must be ensured. If the device needs to be turned on, even though the interlock is activated, there is the possibility to activate the "Manual Release" mode. This mode ignores the interlock and allows the computer to be turned on, although the interlock is not met. However, this mode is only accessible to Administrators. Only a person with the administrator key can turn this mode on or off.