

Synflow® Controller

Injection Molding Machine Interface

Installation and Wiring Instructions



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1 Introduction

Dear Customers,

We would like to take this opportunity to thank you for your decision to deploy a Synventive Synflow® Controller. We are proud to provide you with a high quality standard in Actuator Controller Systems. If you have any questions about the applications or the product, do not hesitate to contact us by phone or personally.

This manual is designed as a tool for installation, operation and maintenance of the Synflow IMM Interface and guideline for securing occupational health and safety in connection with the use of this system. You must carry out any work in compliance with the instructions contained herein. This manual contains essential information, arranged to ensure its general applicability to all Synflow® Controllers.

The employer is exclusively responsible for the protection of workers. The employer therefore has to inform the workers of the safe handling with machinery and its safety-related parts, to train them and to make sure that the machinery is only operated by trained, qualified personnel.

The employer has to provide the necessary personal protective equipment (PPE), such as protective gloves, hearing protection, protective shields etc. In no case does the documentation provided by Synventive release the employer from its obligations. Synventive does not assume any responsibility for harm done to people in spite of application of the provided documentation.

Synventive's recommendations regarding the use of certain Synventive products are based on our best knowledge, but do not release you from your obligation to carry out your own calculations and tests to ensure compatibility with the injection mold as well as to determine the product's compatibility with your technological process.

Yours faithfully,

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2 Safety Symbols and Procedures



Danger

Indicates an imminent hazardous situation which may result in death or serious injury.



Caution

Indicates a dangerous situation that may lead to a reversible injury.



Caution without the safety alert symbol

Indicates a hazardous situation, which if not avoided, could result in malfunction or material damage not related to personal injury.






Notice


Provides additional information on proper procedures and trouble-free labor without the possibility of personal injury.



Advice

Includes supplementary instructions for the correct and faultless operation of the Synflow® Controller system.


	General Warning		Electrical Warning		Potential Earth Ground
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	<p>WARNING Hazardous voltage inside. Disconnect power before opening. Service by trained personnel only. Consult manual.</p>	<p>Hazardous Voltage Inside.</p> <p>Disconnect power before opening.</p> <p>Service by trained personnel only.</p> <p>Consult Manual.</p>
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2.1 Qualified Persons

Installation, maintenance, repairs and operation of the Synflow® Controller System are to be performed by qualified persons.

As a professional, who can assess due to his/her technical training, in the sense of the accident prevention is experienced and knowledgeable of the relevant safety criteria and regulations of the Synflow® work to identify possible dangers and system faults.

	<p style="text-align: center;">Danger to life by Electric shock</p> <p>Serious personal injury or death can result from electrical contact. The electrical cables connected to the Synflow® Controller System, Injection Molding Machine and Hot-Runner are under high voltage. Electrical installations must be operated and maintained only by trained qualified electricians.</p>	
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2.2 General Safety Instructions for the Synflow® Controller

- Read all safety instructions.
- Failure to comply with the instructions may cause serious injury.
- Only approved and certified equipment rated for the application should be used with Synventive equipment.
- Only trained personnel shall have access in danger zones and access to electrical enclosure.
- Electrical terminals for attaching cables in the Synflow® system shall never come into contact with the coolant or hydraulic fluid. They could be short-circuited or a fire could occur, leading also to damage of the Synflow® system or injury to personnel.

3 Warranty Disclaimer

Failure to adhere to all instructions and procedures in the Synflow® User's Pre-Installation Reference may cause Damage to equipment or Injury to personnel.

Synventive Reserves the right to void equipment warranty!

4 Synflow® to Injection Molding Machine Interface Overview

For the Synflow® Controller system to run correctly and safely with an **I**njection **M**olding **M**achine (**IMM**) or press, status and control signals are needed for the two systems to communicate.

5 Synflow® Controller Interface Kit – SF3IMMCK01

The Synflow® 3 IMM Interface provides signals that can be used to inhibit injection for cases when SF3 Controller:

- Set to Idle (in order to prevent molding bad parts, which has previously occurred)
- Cycle not complete:
 - Pins do not fully open during a cycle
 - Pins do not fully close upon completing a cycle

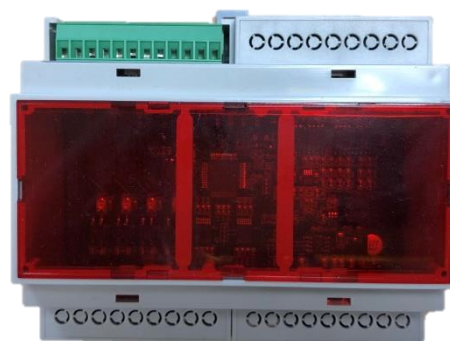
The Synflow® Controller Interface Kit contains all of the necessary parts to install the Controller Interface.

The kit contains all of the following items:

1. IMM Box

The IMM interface connector is a self-contained opto-isolated circuit that is interfaced to the IMM signals required to proper production and handle all of the safety alerts. All signals work on 24V.

The IMM Box can be mounted inside the IMM cabinet. The signals from the IMM are wired directly to the provided terminal strip on the box.



2. L-com DB9 Cable

The L-com male-to-male DB9 cable is used to connect the Synflow3 controller to the Box.

P/N: CSMN9MM-25



5.1 Mount IMM Box inside the Injection Molding Machine Cabinet

The IMM Box can be mounted on a DIN rail mounted inside the cabinet of the press, close to where the signals are available. Connect each required signal to the corresponding terminal block screw on the IMM Box.



5.2 Wiring Instructions

The IMM Box can support 8 channel discrete inputs and 8 channel discrete outputs. The discrete inputs/outputs are compatible to 24V signals. Currently IMM Box firmware enables 4 channels of the discrete outputs.

Channel1: **Pin Open State**. If any of the defined (calibrated) pins is open, the output is 24V. Only when all pins are closed, the channel output is 0V.

Channel2: **SF3 Alarm State**. If Synflow3 alarms (such as, Cycle Not Complete, etc.), the channel output is 24V. If the alarm condition is removed, the output is 0V.

Channel3: **SF3 Idle State**. If Synflow3 is in Idle state, the channel output is 24V. If in Run state, or Calibration state, the output is 0V.

Channel4: **Run no Alarm (Working State)**. If Synflow3 is in Run state and there is no alarm, the channel output is 24V. Otherwise the output is 0V.

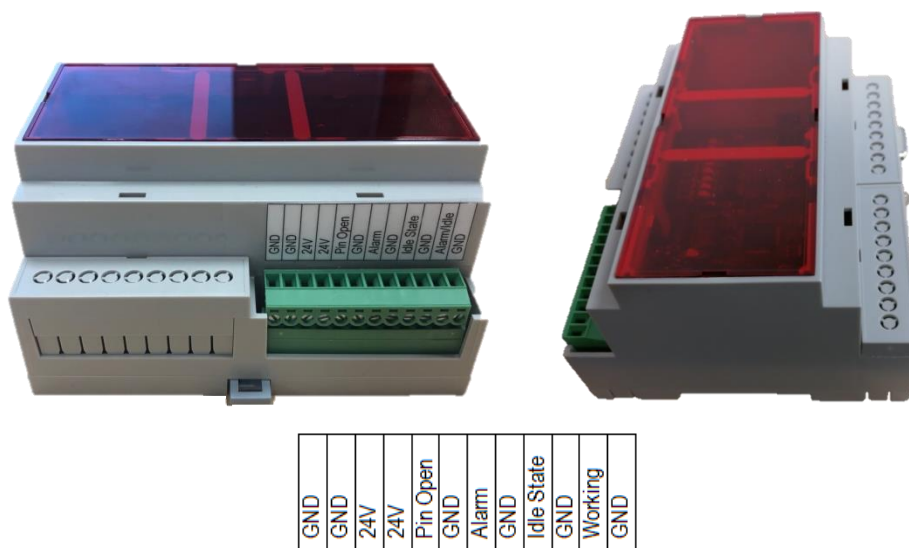
A 24V external power supply is required to support the output signals. The power supply current is 0.1A~1.0A , depending on the load, or the relay to be connected to the output connector J2, as showing below.

The power supply and the Channel outputs are wired to J2 of the IMM box as defined in the table:

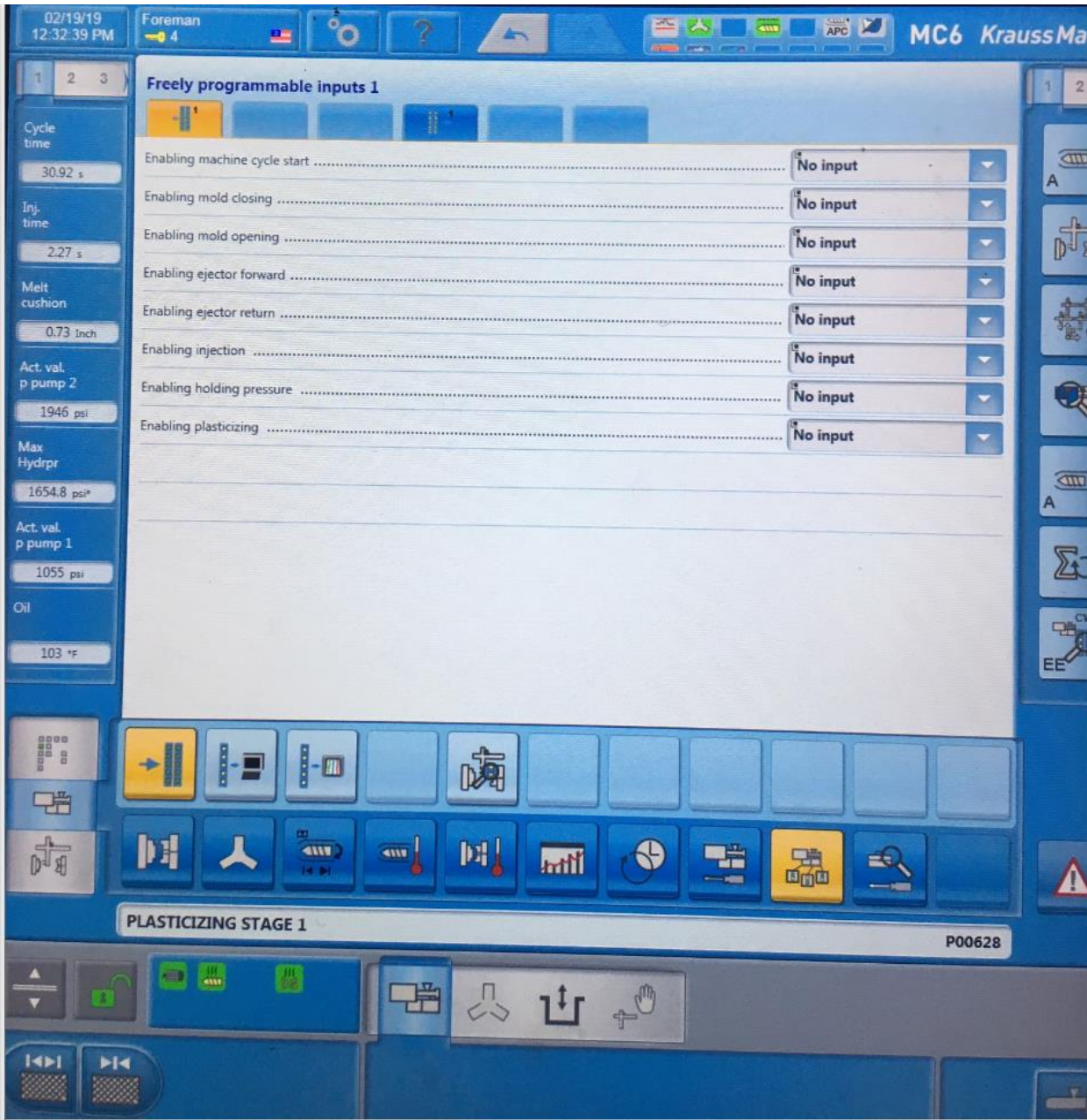
J2 Pin No.	Pin definition	Comment
1	GND	Connect to external power supply GND
2	GND	
3	24V	
4	24V	Connect to external power supply 24V
5	Output of Pin Open State	Output 24V when any pin is open. 0V if all pins are closed
6	GND	
7	Output of Alarm State	Output 24V when Synflow alarms. 0V if no alarm.
8	GND	
9	Output of Idle State	Output 24V when Synflow in Idle. 0V if not in Idle.
10	GND	
11	Working	Output 24V when in Run state and no alarms. 0V if not.
12	GND	

The load capacity of each Channel output is 24V, 0.5A. As an option, a relay (coil 24V, coil current < 0.5A) can be connected between a channel output and GND to drive a higher load. When a relay is to be connected, no EMF diode is required for the relay because the diode is designed inside the IMM box.

The IMM box can be connected to Synflow3 controller through digital communication by using a standard off-the-shelf serial cable. No hardware change is necessary for existing Synflow3 controller to support IMM box. However, the controller firmware needs to be upgraded.



The Working signal can be directly connected and configured in KraussMaffei IMM machine as in the picture below.



CONGRATULATIONS!

You have reached the end of the tests for the Synflow™ Interface to the Injection Molding Machine. If you have tested all of the interface signals that are applicable to your application, please schedule the start-up of your system with Synventive Service.

Thank you!