



TECHNICAL MANUAL

Version 2
September 2026



This page has been deliberately left blank.

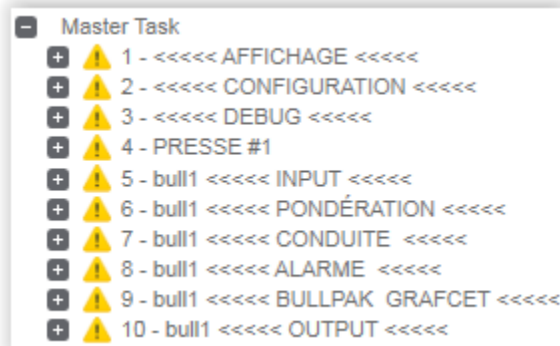
1	OVERVIEW	5
2	SoMachine Basic SOFTWARE.....	5
2.1	Sections of the program	5
2.2	Animation Tables.....	6
3	OPERATING MODE	7
3.1	Automatic	7
3.2	Manual (Installation)	8
4	SETTING	8
4.1	Operating Mode	8
4.2	Parameter.....	9
4.2.1	Bale Height	11
4.2.2	Save	11
5	TROUBLESHOOTING (DEBUG)	12
5.1.1	Ram held with door hooks (30 sec.)	12
5.1.2	Incidentally ejection door opening (45 sec)	12
5.1.3	“Bale Ready” on request	12
5.1.4	Cancel the “Bale Ready” mode.....	12
6	PILOT LIGHT	13
6.1	“Ready” (Alarm)	13
6.2	“Action” (Cycle Status)	14

This Bullpak baler new generation program is designed to adapt all the settings. No program changes are required. All you need is to adjust settings to activate/deactivate the selected options.

2 SoMachine Basic SOFTWARE

2.1 Sections of the program

The program is divided into several sections:



1 DISPLAY: Presents the setting instructions and the basic memory.

2 SETTING: Section controlling all the system setting options.

3 DEBUG: Section controlling all the available troubleshooting options.

4 BALER #1: Indicates the baler #1 start-up. This section is blank.

Bull1<<<<<<: This section covers the Bullpak #1

Bull2<<<<<<: This section covers the Bullpak #2 (DUO model)

5 INPUT: Bridge between the PLC physical inputs and internal bits.

6 WEIGHTING: Adds a filtering delay on several input signals.

7 OPERATION: Controls all the system modes.

8 ALARM: Check the different alarm conditions.

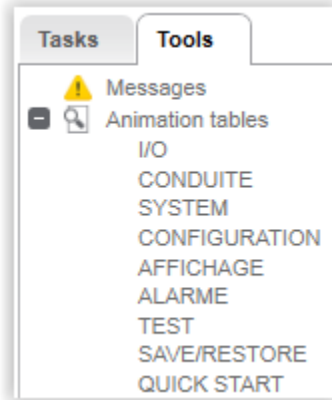
9 BULLPAK GRAFCET: Monitors the baler automatic operational sequence.

10 OUTPUT: Bridge between the PLC internal bits and physical outputs.

NOTE: Sections 5 to 10 are duplicated for the double baler.

2.2 Animation Tables

Animation tables are used to display and modify the bit or record status. Numerous tables are available for the main system information.



I/O: Indicates the PLC physical input and output status.

OPERATION: Displays the operating mode status.

SYSTEM: Indicates the system bit status, which is useful for the programmer.

SETTING: Displays all the adjustable settings.

DISPLAY: Presents the available general information.

ALARM: Indicates the alarm bit status.

TEST: Section dedicated to the program testing. It can be amended according to the situation.

SAVE/RESTORE: Indicates the PLC memory backup status.

QUICK START: Section used by the MDAP technicians for the system quick setup.

Semi-automatic Mode

1. Make sure that the Emergency Stop button **is not** activated.
2. Close the ejection door and the loading door.
3. Press the Action button.

NOTE: You can reset the safety relay by pressing the Action button.

Preparation Mode

4. If all the safety conditions are met and no alarm is triggered, the system will start its initialization process:
 - 4.1. Place the ram in upward position.
 - 4.2. Unlock the loading door.

Production Mode

5. Once the initialization process has started, the system remains in the production mode and the loading door will open to fill up the compaction chamber.
6. Close the loading door and press the Action button.
7. The “Action” pilot light will be on for 1 second to confirm the initial order.
8. The compacting cycle begins:
 - 8.1. Ram will move rearward
 - 8.2. Prior to such rearward motion, the system detects an “Almost Ready” bale mode at 0.1 sec. The system checks if the “bale ready” sensor is on. If not, the system will activate the “almost ready” bale bit and the “Action” pilot light will flash.
 - 8.3. Ram Motion Interruption.
 - 8.4. **Plastic Mode only:** Wait for the operator to press the “Action” button.
 - 8.5. Raise the ram in upward position.
 - 8.6. Open the loading door.
 - 8.7. Return to Step # 5

Closing Mode (Ejection)

9. If the following compacting cycles do not detect the “bale ready” mode, the system will initiate the closing mode and eject the bale.
10. During the last compacting cycle, the ram will stop above the bale.
11. The “Action” pilot light stays on.
12. The operator opens the ejection door.
13. The loading door opens.
14. The bale can be tied up.
15. Press the ejection button on the side of the control box.
16. Press for the first time the “Action” button to reset the safety relay (optional).
17. Keep holding the “Action” button for at least 2 seconds to activate the hydraulic pump.
18. Press the “Action” button to eject the bale.
19. The ram reaches the upward position OR the operator closes the ejection door.
20. End of closing and ejection modes.
21. The “Action” pilot light turns off.
22. Return to Step # 1 (semi-automatic mode).

3.2 Manual (Installation)

The manual mode is used by MDAP technicians during the baler installation. It allows raising and lowering the ram with a jumper:

Input:

COMPACT INSTALLATION (I0.7) = forces the ram to move downwards

OR

RETRACT INSTALLATION (I0.8) = forces the ram to move upwards

1. Lower the Bullpen (optional).
2. Press the ejection button on the side of the control box.
3. Press the “Action” button during 2 seconds to start the motion.
4. Release the “Action” button to stop the motion.
5. The pump stays on for 3 sec.

4 SETTING

There are two types of settings: one is for the cardboard/plastic operating mode and the other for the baler model. Each setting will be activated differently.

4.1 Operating Mode

The operator can choose between two (2) operating modes: the cardboard mode OR the plastic mode.

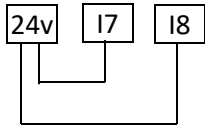
1. Press the Emergency Stop button.
NOTE: The setting shall be achieved within 8 seconds. Beyond that period, no change can be made.
2. Press the “Action” button during 5 sec.
3. The “Action” pilot light blink confirms the operating mode start-up.
4. The Emergency Stop button must be deactivated before implementing a new setting.

Code	Description
3 x 1-sec pulses	Plastic Mode
6 x 1-sec pulses	Cardboard Mode

NOTE: Following a power failure, the system will indicate the actual baler operating mode.

4.2 Parameter

The technician may set the parameters without using a computer. The setting activation can be performed by connecting two (2) installation jumpers between the 24V, I8, and I7 terminals:



Input:

COMPACT INSTALLATION (I0.7) **AND** RETRACT INSTALLATION (I0.8)

1. Install two (2) jumpers.
2. Press the “Emergency Stop” button.
3. Press the “Action #1” or “Action #2” button to select the baler.
4. When the selection is entered, it will activate the parameter #0.
5. To initiate the setting process, you must disengage the emergency stop, and then put it back on. The “Action” pilot light stops blinking to confirm the mode change.
6. Press the “Action” button the required number of times according to each parameter settings (refer to the chart below).
7. Disengage the emergency stop to save the parameter.
8. Press the emergency stop to continue to the next parameter.
9. Repeat steps 6-7-8 for each parameter settings. If no change is necessary OR to quickly reach the next parameter, repeat only steps #7-8.
10. When all parameters are entered, the system will return to step #0. Such step will activate the “Action” pilot light in order to display the flashing code for each instruction. A two-second delay marks the transition between each parameter and a four-second delay marks the beginning of parameter #1.
11. If the setting is invalid, repeat steps 5 to 10. Otherwise, remove the jumpers I7 and I8.

List of parameters

Parameter	Description	Unit
#0	Flashing Code Display	
#1	Loading Zone: Delay between the original position and 2-3 inches below the top of the ejection door.	1 pulse = 1 sec
#2	Breaking Bar Zone: Delay between the end of the loading zone and up to 6 inches below.	1 pulse = 1 sec
#4	Compacting Zone: Delay between the end of the breaking bar zone and the compacting cycle.	1 pulse = 1 sec.
#4	Low pressure: Pressure instruction used when ram returns to its original position.	1 pulse = 100 psi (Min. = 1,100 psi)
#5	High pressure: Pressure instruction used during the compacting cycle and bale ejection. NOTE: Set to 200 psi below the relief valve setting	1 pulse = 100 psi (Min. = 1,100 psi)
Note : <ul style="list-style-type: none"> - SoMachine: baler #1 MW411 to MW415, baler #1 MW461 to MW465 - No instruction must be set to 0. - Low pressure must be set below high pressure. 		

NOTE: When the setting is deactivated or invalid, the "Action" pilot light blinks (0.1s ON / 5s OFF) to notify the technician or operator.

4.2.1 Bale Height

Check the parameter setting according to the required bale height:

1. Empty the compactor (if possible) OR make sure that the ram is not slowed down by the material entering the breaking bar zone.
2. Initiate a normal compacting cycle.
3. Press the “Action” button during the whole compacting cycle.
4. When the ram enters the breaking bar zone, check for the “Action” pilot light.
5. When the “Action” pilot light is on, quickly press on the “Emergency Stop” button to stop the ram downward movement.
6. Measure the distance between the bottom of the compactor and the ram, from behind the machine OR by slightly opening the ejection door.
7. If height is inadequate, monitor the setting of parameters #1 and #2. Refer to the procedure stated at step 4.2.
8. When operating in real time, the “Bale Ready” detection will be activated if the pressure is high for at least 0.5 sec, when the ram reaches the end of the breaking bar zone.

4.2.2 Save

The PLC memory is automatically saved after each alarm or bale ejection. This way, the program update can be performed without reconfiguring the setting and losing any system history data.

IMPORTANT: Following the program update via a memory card or computer, you must verify if the setting is still valid.

1. Unplug the main power OR the control panel fuse.
2. Reconnect the main power.
3. Wait for the PLC to be fully functional.
4. Check if the “Action” pilot light blinks:
If yes: repeat the procedure in section 3.3.
If no: the setting is saved.

5 TROUBLESHOOTING (DEBUG)

Several troubleshooting tools are available for solving the most common problems. These tools cannot be incidentally activated. A series of actions is required or a delay has been added to secure their activation:

5.1.1 Ram held with door hooks (30 sec.)

1. Push and pull the Emergency Stop button to reset recent alarms.
2. Make sure that the “Ready” pilot light is steady.
3. Lower the Bullpen (optional).
4. Press the ejection button on the side of the control box.
5. Press the “Action” button during **30 sec.**
6. The “Action” pilot light is on for 1 sec.
7. Release the “Action” button.
8. The ram will move upward for 0.1 sec.

Note: Such action deactivates the ram upward position sensor. Therefore, if the sensor is too low and the ram rises above it, the system will be in an out-of-order position which means that only the compact installation mode may solve the problem OR if you force the sensor activation.

5.1.2 Incidentally ejection door opening (45 sec)

1. Close the loading door.
2. Open the ejection door.
3. Press the “Action” button during 45 sec.
4. The “Action” pilot light flash means that 30 seconds have elapsed.
5. If the pilot light remains lit, release the Action button.

5.1.3 “Bale Ready” on request

1. Start a compacting cycle.
2. Before the end of such compacting cycle (ram rearward motion), press the “Action” button until the ram stops completely.
3. The activated “Action” pilot light indicates that the ejection mode is on.

5.1.4 Cancel the “Bale Ready” mode

An emergency procedure can be performed when the operator wants to cancel the “Bale Ready” mode.

1. Press the Emergency Stop and Action buttons simultaneously.
2. Release the Emergency Stop and Action buttons simultaneously.
3. Repeat steps 1 & 2 five times.
4. The deactivated “Action” pilot light indicates that the “bale ready” is cancelled.

The system has two (2) pilot lights that display the system status according to the situation. Normally, the “Ready” pilot light refers to alarms and the “Action” pilot light indicates the cycle status.

6.1 “Ready” (Alarm)

In case of abnormal situations, the system triggers the alarm and any action is automatically cancelled. To reset the alarm, you must press and release the Emergency Stop button if the alarm remains on, the “Ready” pilot light flashes according to the actual error code. A 3-second pause indicates the end of the flashing code.

Code	Message	Description
Remains on	Secure System	The safety relay is ready.
Remains off	Safety Violation	The system safety has been breached.
1	Emergency Stop	The Emergency Stop is on.
2	Loading Door Open	The loading door opened during a compacting cycle.
3	Ejection Door Open	The ejection door opened: - Before the bale is complete. - After the bale ejection.
4	Lengthy Compacting / Return Cycle	The compacting OR return cycle is too long (3 sec. too long).
5		
6	Low PLC Battery (does not shutdown the system)	The PLC battery must be quickly replaced. (BR2032 3-Volt Model)
7	Loading door jammed	Loading must be open OR it is not well closed at the start of the cycle.
8	Overload	The overload relay of the hydraulic pump motor is at fault.

6.2 “Action” (Cycle Status)

The “Action” pilot light provides different information on the system status.

Code	Description
Remains on	The bale is ready to eject.
1s ON / 1s OFF Flash	The bale is almost ready.
1 x 0.5s Pulse	The “Action” button release indicates that it properly operates AND there is no alarm signal.
0.1s ON / 5s OFF Flash (Double Baler)	The “Action” button release indicates it properly operates AND there is no alarm signal. However, the baler will not immediately start its cycle and wait for the other baler’s end of cycle.
0.1s ON / 2s OFF Flash	The baler model is not set. Therefore, the system cannot operate. NOTE: For the double baler, the two (2) “Action” pilot lights will flash.
3 x 1s pulses	Following a power failure, the system indicates the baler operating status. 3 pulses = Plastic Mode 6 pulses = Cardboard Mode
6 x 1s pulses	