start-up manual

Advantech™ WISE-4050 LAN

ENGEL

be the first

WARNING!

Improper use of the machine can lead to severe injury to persons and damage to equipment!
You must read this instruction manual carefully and familiarize yourself with the safety precautions before operating the system or carrying out any maintenance.
You must ensure that the persons carrying out the activities on the machine have read and understood the relevant sections and chapters of the instruction manual.

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Version: G/11/101/8/1

Printing date:**21.12.2023**
Language: English

Translation of original instruction manual

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Advantech™ WISE-4050 LAN

These installation instructions describe the configuration of the 'Advantech(tm) WISE-4050 LAN' hardware (called the 'IoT device' below) for connecting injection molding machines to the ENGEL e-connect portal.

The IoT device is connected via four inputs to digital signal outputs of the injection molding machine and transfers the information from the injection molding machine to the Cloud.

Installation and commissioning steps, such as the cabling as well as the power supply, must be carried out in an expert manner by correspondingly trained and qualified personnel.

Should you have any questions on the machine interface, please contact the machine manufacturer.

1 Hardware

WISE-4050 LAN - 4DI/4DO Modbus Ethernet I/O - Advantech
(Source: Advantech)

WISE-4050 LAN is a product of:

Advantech Co., Ltd.,
No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 114519, Taiwan
Tel: 0800-777-111886-2-7732-3399
https://www.advantech.com

Further information (manuals, certificates, etc.) can be downloaded from the manufacturer's web site.

1.1 power supply

Connect a power supply (10 - 30 V DC) to the +Vs and -Vs contacts of the IoT device.

1.2 Network connection

The IoT device must be connected to the internet. When modifying the network settings for the first time we recommend connecting a laptop directly to the IoT device by means of an RJ-45 network cable. The default IP address of the IoT device is 10.0.0.1. In order to modify the network settings, the connected computer must also have an IP address in the range of 10.0.0.x.

Network settings

- Call up the configuration page of the IoT device in a browser
  - Configuration page in the state of delivery: http://10.0.0.1/config
  - User name: root
  - Password: 00000000
- On the start page scroll to 'Network Information'. Click 'Go to Configuration' or use the menu item 'Configuration' to change to the 'Network'. Change the settings for the network configuration in accordance with your company specifications.

After the network settings have been modified successfully, connect the IoT device to your company network by means of an RJ-45 network cable.

Information

With immediate effect the configuration page of the IoT device can only be accessed via the IP address set by you!

1.3 Digital inputs

In order for live production information to be displayed in the system, the injection molding machine must supply specific information via the digital outputs to the inputs DI0 to DI3 of the IoT device.

1.3.1 Status information

The first two digital inputs require a continuous signal that display the online or respectively production status of the machine. Every TRUE/FALSE status change in any direction is interpreted as a status change and is recorded.

Input	Meaning	Explanation
DI0	ONLINE OFFLINE	Indicates the ’On’status of the connected machine. A TRUE signal means ONLINE, FALSE means OFFLINE. In order to supply useful information, the machine interface should not only signal its own ’Power On’status via this line, but also communicate whether the machine itself is switched on. Whether this status information is meaningful depends on the ability of the master computer of the machine to determine a meaningful ONLINE/OFFLINE state of the machine and to transfer it.
DI1	PRODUCING NOT PRODUCING	Indicates whether the machine is producing. A TRUE signal is interpreted as PRODUCING. This status should always be signaled when the machine is in the production state ’Production’. A FALSE signal means that the machine is NOT PRODUCING ist (the machine has a different production state than the ’Production’ state). As with the ONLINE/OFFLINE status, the question whether the PRODUCING/NOT PRODUCING status information is meaningful depends on the ability of the master computer of the machine to correctly determine the current production state of the machine at any time and to transfer it.

1.3.2 Counter information

The third and fourth digital input requires information on the production cycles. This information is used by the application to calculate and display the produced good parts and reject moldings, under consideration of the mold cavity.

In order to supply meaningful data to the counter, the machine has to supply the following data after each production cycle:

- Whether a cycle has been completed
- Whether good parts or reject moldings resulted from production

ENGEL e-connect portal supports two different signaling methods in order to detect good and bad production cycles. The system processes both signaling methods correctly as long as the right signaling method has been configured at the IoT device (see 2.1 Machine and connection configuration in the e-connect).

Alternate signaling
After each completion of a good production cycle at the machine, this information is transferred to the IoT device by the third digital input (DI2). A bad cycle is signaled via the fourth digital input (DI3). Machines with 'Alternate signaling' must therefore transfer a TRUE signal (a status change from FALSE to TRUE) to one of the two inputs, but never to both at the same time, in the case of good and bad cycles.

Input	Meaning	Explanation
DI2	GOOD CYCLE	Signals the completion of a good production cycle in which one good part or several good parts were manufactured, depending on the mold cavity. All the parts produced during this cycle are counted as good parts. The good parts counter is incremented at the receipt of a TRUE signal on this input.
DI3	BAD CYCLE	Signals the completion of a bad production cycle in which one reject molding or several reject moldings were manufactured, depending on the mold cavity. All the parts produced during this cycle are counted as rejects. The rejects counter is incremented at the receipt of a TRUE signal on this input.

Concurrent Signaling
After each completion of a production cycle the information 'Cycle completed' is signaled by means of a TRUE signal, meaning a status change from FALSE to TRUE, to the input DI2 (CYCLE COMPLETED).

If a FALSE signal is active at the input DI3 at the same time, the cycle is evaluated as good, and all the parts produced during this cycle are counted as good parts. If the input is TRUE, the cycle is evaluated as bad, and all the parts produced during this cycle are counted as rejects.

Input	Meaning	Explanation
DI2	CYCLE COMPLE-TED	Signals the completion of a cycle and initiates the evaluation of the part quality via the input DI3.
DI3	BAD CYCLE INDI-CATOR	A TRUE signal at this input indicates that the cycle just completed was bad. All the parts produced during this cycle are evaluated as rejects. If a FALSE signal is present, all the parts produced during this cycle are evaluated as good parts.

2 Configuration

Some settings are required in order to use the machine data via the IoT device in the e-connect portal.

2.1 e-connect

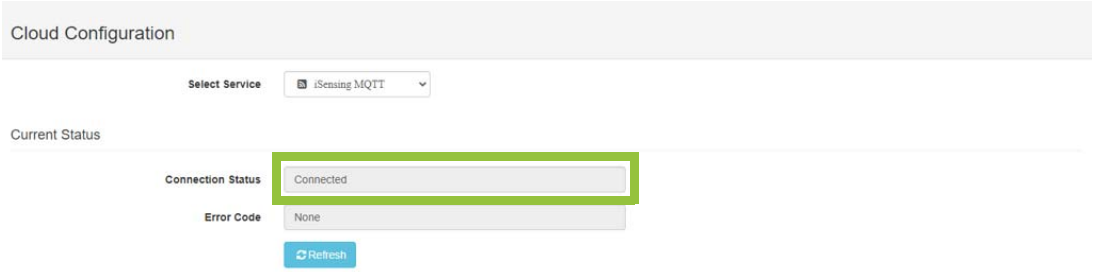
1. Log into the e-connect portal under https://portal.engelglobal.com/.
2. Navigate to the ’machine park’
   In order to start the IoT device configuration, ensure in the e-connect portal that the machine is listed as equipment in the "machine park".
3. Go to the ’Equipment Management’ and select the desired machine on the left-hand side in the location structure.
4. Click the ’Add connection’ button in the **[Connection status]** tab.
5. Select the ’IoT device’ as the devices type and click **[Next]**.
6. Enter the 12-digit MAC address of the IoT device under ’MAC address’. This is specified on the rear of the device.
7. Define a password.
8. Furthermore specify which signal acquisition method (Concurrent or Alternate) is possible on the basis of the machine signals [See Counter information on page 5.]
9. Note down all the parameters and settings of the dialog (URL, port, MAC address and password) so that the ’Cloud connection’ can be configured easily in the next step.

2.2 Cloud-connection

Connect the IoT device with the MQTT broker in the settings. To do so, open the configuration page of the IoT device, IP address of the IoT device [See Network settings on page 4.]

1. Select the ’Cloud’ tab under ’Configuration’.
2. In the ’Cloud Configuration’ select the service ’iSensing MQTT’. If this option is not available, first install the most recent firmware for the IoT device directly from Advantech(tm).
3. Enter the following settings in the configuration page:
   - MQTT Host Name: Copy the ’URL’ from Section 2.1 e-connect.
   - Port Number: Copy the ’Port’ from Section 2.1 e-connect.
   - SSL Secure: Enable
   - WebSocket: Disable
   - User name: Enter the entered ’MAC address’ from Section 2.1 e-connect.
   - Password: Enter the password selected in Section 2.1 e-connect.
   - Heartbeat-frequency (sec): 60
   - Publish QoS: 2
   - Subscribe QoS: 2
   - Publish Retain: Enable
   - Will Retain: Enable
4. In the MQTT Data Recovery section enter all the inputs (0 - 3) for DI.

5. Confirm your entries with ’Submit’.
6. Ensure that the connection status is ’Connected’.



2.3 Sending data

Carry out the following settings so that data can be sent to the MQTT broker:

1. Switch to ’Advanced’ -> ’Data Logger’.
2. In the ’Data Configuration’ tab under ’Log Data’ -> ’Channel Fields’ -> ’DI’ -> activate all the input channels (0 to 3) for ’Log Enabled’ ’Change of State’
3. In the ’Logger Configuration’ tab under ’Memory Storage’, activate ’I/O Log’ and ’System Log’
4. In the ’Logger Configuration’ tab under ’Push Notification (JSON format)’:
   - Activate ’I/O Log’
   - Activate ’Push MAC Address’
   - Activate ’Push Timestamp’
   - Set the ’Timestamp Format’ to ’Local Date and Time (GMT)’

2.4 Time, Time Zone, and Daylight Saving Time

The calibration of the time is decisive in order for the data packets to be processed correctly:

1. In the ’Configuration’ menu item change to ’Time Sync’.
2. Select ’SNTP’ ’as the Time Synchronization Method’.
3. In the ’Primary SNTP Server’ field enter a random time server, for example ’time.google.com’.
4. Leave the ’SNTP Time Polling Interval’ at 30 seconds.
5. Save settings.
6. In the ’Configuration’ menu item change to ’Time & Date’.
7. Set the correct time zone in the ’Local Time’ tab under ’Time Zone’.
8. Optional: Set the changeover between Daylight Saving Time and standard time in the ’Daylight Saving Time’.
9. Save settings.

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