L&W AUTO LINE

L&W Autoline Base Unit

OPERATING INSTRUCTIONS

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Original instructions

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SAFETY INFORMATION

All personnel that use and maintain this system must have the necessary knowledge and training to minimize risk of injury and damage.

All adjustments, settings, calibration routines and service not described in this manual must be performed by ABB specialist-trained personnel.

All covers must be in place during normal operation. The equipment has moving parts that are operated pneumatically and/or electrically. Incorrect handling can cause serious injury by pinching and cutting.

Always read the instructions carefully before operating the equipment. Any use other than described in this manual is to be considered as misuse. The following notations are used to emphasize important and critical instructions:

**NOTE**
This label is used for instructions that are important but not related to hazards.

**WARNING**
This label is used to indicate potential risk of severe injury or damage if the warning is ignored.
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1 Introduction

L&W Autoline is a complete system for fast and accurate paper quality measurements. It is mainly used in paper mills, but also at pulp mills, R&D centers, converting, and more. Several testing modules are available and L&W Autoline is configured to suit the paper grades produced. L&W Autoline is mainly designed to test cross-direction profiles, but testing machine-direction profiles and smaller sheets is also possible. The operator simply inserts the sample and the system swiftly does everything, from sample preparation to final reel report. Sample cutting, measurements, data storage, compiling reports, and information distribution are done without operator involvement. Each module that can be included in L&W Autoline has its own operating instructions.

The operating instructions in this manual apply to L&W Autoline Base Unit (601), which is the base unit for automatic measurement of profile strips, done by measuring modules in the system.

A variety of modules can be inserted into the unit to obtain the desired functionality for different customers.

L&W Autoline Base Unit feeds the sample throughout the system, and supplies electrical power and compressed air to the measuring modules mounted in the system. The Autoline PC software communicates with the respective module's control board. The Autoline PC software controls the feed mechanism for the sample, the various modules, and collects and processes the measurement results.

L&W Autoline Base Unit is available in two versions:

- L&W Autoline L (Code 601L), which can include up to 13 modules
- L&W Autoline S (Code 601S), which can include up to 6 modules

1.1 Measurement method

L&W Autoline Base Unit measures various properties of profile test strips, taken across the machine direction. The test strips are to be prepared with one of the recommended devices, such as L&W Profile Sample Cutter (Code 148) or L&W Sample Trimmer (Code 149) with these measurements:

<table>
<thead>
<tr>
<th>Sample type</th>
<th>Width</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strip</td>
<td>297–302 mm</td>
<td>N/A</td>
</tr>
</tbody>
</table>

A test is done as follows:

1. The sample strip is put in the sample holder on the left side of L&W Autoline Base Unit.
2. The sample strip is put in parallel with a paper straightener and fastened with a clamp.
3. The clamp feeds the front edge of the sample strip into the system. When a measurement is started, the clamp feeds the strip to the first measurement position.
4. Measurement and feeding of the sample strip are done automatically, in accordance with the selected measuring program.
5. When all measurements on the strip are completed, the strip is discharged from the system.
A second sample strip can be queued during measurement. During a measurement of a strip, the next strip can be prepared.
2 System description

Front view

<table>
<thead>
<tr>
<th>Number</th>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sample holder</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Touch-screen on adjustable arm</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Top hood, for ABB certified service</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Transparent front cover</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Doors</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Adjustable foot (total of two)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Lockable wheel (total of four)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Air nozzle (not shown in the illustration)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Air filter</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Compressed air supply equipment</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Buttons to adjust transparent front cover speed</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Emergency stop</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Main ON/OFF switch</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Clamp (not shown in the illustration)</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Feeding table</td>
<td></td>
</tr>
</tbody>
</table>
Side view

1. ABB Service, only to be used by certified ABB service technicians
2. LAN – Data Exchange
3. Air inlet
4. Power supply
3 Installation

L&W Autoline Base Unit must be installed in an air conditioned laboratory and must be connected to compressed air and electric power supplies. The system can also be connected to an external network to transmit measurement data, and to download grade and measurement series definitions.

3.1 Connections

Four connections are located at the left side of L&W Autoline Base Unit:

- **ABB Service.** This port is connected to the internal network of L&W Autoline Base Unit. This port is only for ABB service personal during diagnostic and calibration services and must not be connected to an external device or network. If this port is connected, ABB takes no responsibility regarding security or safety.

- **LAN – Data Exchange.** This port is used for external data communication and can be connected to an external device or network.

- **Air inlet.** See 3.3 Connecting the compressed air supply.

- **Power supply.** See 3.2 Connecting the AC power.

3.2 Connecting the AC power

**NOTE**
This must be prepared according to local regulations.

Connect L&W Autoline Base Unit to the AC power supply at a central socket. Make sure that these conditions are met before connections are made:

- The power supply voltage is in accordance with the rating plate on the equipment.
- The power supply is connected to a residual-current device.
- The power supply cable is sufficiently long to let the system to be rolled out at minimum 1 meter away from the nearest wall.
- The power supply is well stabilized and transient-free with protective earth.

3.3 Connecting the compressed air supply

Connect the system to a supply of filtered and dry compressed air at a pressure of 0.6–1.0 MPa. The rated air consumption is 700 Nl/min for L&W Autoline L and 400 Nl/min for L&W Autoline S. Make sure that the supply hose is sufficiently long to enable the system to be rolled out to a distance of minimum 1 meter from the nearest wall.

To ensure reliability and proper system functions, the recommended air quality is to correspond to ISO 8573-1 Class 2-4-3.

Regulators with pressure gauges, filter, and compressed air main valve are located on the inside of the door at the far left of the system.

3.3.1 Main valve

From the main valve, the compressed air flows to a regulator with filter and water collector. The regulator is to be preset to approximately 0.6 MPa.
The compressed air supply can be shut off from the main valve. When the valve is closed (OFF), the air system in L&W Autoline Base Unit is not pressurized.

3.3.2 Paper feed pressure

The air that actuates the paper feed pressure roller is controlled by a separate regulator. For thin paper grades, set the pressure to a minimum of 0.2 MPa. The end feeding wheel contact pressure is adjusted by the air pressure regulator. For thicker grades, increase the pressure until reliable feed is obtained.

3.3.3 Measurement air

The compressed air is used as measurement air in the system to measure the roughness and air permeance is filtered in an additional fine filter.
4 Operating the system

4.1 Using the main ON/OFF switch

When the system is turned OFF, the whole system is shut down.

To turn the system on or off, use the ON/OFF switch.

4.2 Using the emergency stop

**NOTE**
The emergency stop must only be used to prevent injury.

The emergency stop shuts off the power supply to L&W Autoline Base Unit, together with the compressed air supply to some of the instruments.

To use the emergency stop, push the red knob.

To reset the emergency stop:

1. Turn the red knob so that the middle part becomes green.
2. Wait a while until the system is ready.

4.3 Software

All operator interactions with the instruments are done from the touch-screen. All measurements are automatic.

The touch-screen is divided into three parts (from top to bottom):

- System configuration, see 4.3.1 System configuration
- Data views, see 4.3.2 Data views
- Testing field, shows the ongoing and prepared tests and includes the symbol 🧪, which is used to create a measurement profile and start measurements, see 4.4 Testing

4.3.1 System configuration

These submenus are available to the left of the touch-screen below the heading **Configuration**:

<table>
<thead>
<tr>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts</td>
<td>To add, change, or remove users, and to change passwords</td>
</tr>
<tr>
<td>Instruments</td>
<td>To show all instruments and to add, edit, disable, and remove instruments</td>
</tr>
<tr>
<td>Instrument types</td>
<td>To show all included instruments and to edit or remove commands</td>
</tr>
<tr>
<td>Programs</td>
<td>To show all programs and to add, edit, disable, and remove programs</td>
</tr>
<tr>
<td>Paper machines</td>
<td>To show all paper machines and to add, edit, disable, and remove paper machines</td>
</tr>
<tr>
<td>Properties</td>
<td>To show all properties and their values for the included instruments</td>
</tr>
<tr>
<td>Grades</td>
<td>Represent a defined mask that can be put on top of the measured data, defines properties that are related to the target values of a given profile</td>
</tr>
<tr>
<td>Import properties</td>
<td>To show properties for the included instruments</td>
</tr>
</tbody>
</table>
The upper right corner of the touch-screen includes the diagnostics symbol, see 4.3.3 Accessing an instrument.

4.3.2 Data views

These views are available:

<table>
<thead>
<tr>
<th>Data view</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trending Numeric</td>
<td>Shows data trends in tabular format</td>
</tr>
<tr>
<td>Trending Graphic</td>
<td>Shows data trends as graphs</td>
</tr>
<tr>
<td>Custom Trend</td>
<td>Shows data trends as separate graphs as specified by the operator</td>
</tr>
<tr>
<td>Summary Numeric</td>
<td>Shows data in tabular format</td>
</tr>
<tr>
<td>CD Graphs</td>
<td>Shows data as graphs</td>
</tr>
<tr>
<td>Overlay</td>
<td>Shows data trends as superimposed graphs as specified by the operator</td>
</tr>
</tbody>
</table>

For more information, see 5 Data export.

4.3.3 Accessing an instrument

To access an instrument:

1. Select the applicable instrument name, for example Autoline Tensile.

The main menus for the instrument are shown:

<table>
<thead>
<tr>
<th>Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instrument info</td>
<td>To show information for the instrument</td>
</tr>
<tr>
<td>Check</td>
<td>To show instrument-specific options for the instrument</td>
</tr>
<tr>
<td>Notes</td>
<td>To show notes made for the instrument</td>
</tr>
<tr>
<td>Status log</td>
<td>To show status log for the instrument</td>
</tr>
</tbody>
</table>

3. Select Check.

The transparent front cover goes up and the instrument-specific options are shown. Details are provided in the Operating Instructions for the individual instruments.

4.4 Testing

NOTE
To prevent that the paper gets stuck, make sure that strips of heavier grades have no excessive curl.

The universal sample holder, on the left side of L&W Autoline Base Unit, can be configured in several ways to work with many different paper grades.

4.4.1 Testing a profile strip

To test a profile strip:

1. Put the rolled-up sample strip (297–302 mm wide) in the sample holder, so that the top side of the strip faces upwards when the front edge is fed into the system.
2. Put the strip between the edges of the feeding table.
3. Align the sample against the front edge towards you and fasten it in the clamp. Make sure that the strip is straight and securely fastened in the clamp, otherwise the paper can get stuck during the test.

4. Select on the touch-screen to create a measurement profile.

5. Enter information for the paper machine, the reel number, and the measuring program.

6. Select Create.
   Information about the measurement profile is shown.

7. Select to start the test.
   The clamp feeds the strip to the first measurement to be done in accordance with the selected measuring program. The front edge of the strip is then drawn by the clamp, between the instruments through the system.

   When the test is completed, the strip is discharged from the system. It is recommended to put a collecting container at the right-hand end of the bench to collect the tested strips.

4.5 Preparing one or more tests

Several tests can be prepared or transferred to the PC and shown in the Testing field.

To prepare one or more tests:

1. Select on the touch-screen to create a measurement profile.

2. Enter information for the paper machine, the reel number, and the measuring program to be used for the test.

3. Select Create.
   Information about the measurement profile is shown.
4. Repeat steps 1–3 for each other test you want to prepare.

4.5.1 Example with available options

This illustration shows an example of the Testing field when one test is in progress, while three other tests have been prepared in the software:

These are the available options:

<table>
<thead>
<tr>
<th>Option</th>
<th>See</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use the Queue function</td>
<td>4.5.2 Using the Queue function.</td>
</tr>
<tr>
<td>Use the Pause function</td>
<td>4.5.3 Using the Pause function.</td>
</tr>
<tr>
<td>Prepare one or more tests in the software</td>
<td>4.5 Preparing one or more tests.</td>
</tr>
<tr>
<td>Wait until the ongoing test is completed</td>
<td></td>
</tr>
</tbody>
</table>

4.5.2 Using the Queue function

You can in advance prepare a test and start it before an ongoing test is completed. You can also remove a test that has been prepared.

To use the Queue function:

1. Prepare a test, see 4.5 Preparing one or more tests.
2. During an ongoing test, prepare a new sample strip according to step 1 in 4.4.1 Testing a profile strip.
3. Wait until the ongoing test is almost completed and the clamp is moved to the feeding table.
4. Feed the strip under the clamp.
5. Select for the new test.

To remove a test that has been prepared in the software, select Remove from queue.

4.5.3 Using the Pause function

You can always pause or stop an ongoing test.

To use the Pause function:

1. Select to pause the ongoing test. The transparent hood goes up.
2. In the new window that is shown, select Continue to continue the test or Cancel to stop the test.
   If you select Cancel, the sample strip is fed through the system and then discharged from the system.
5 Data export

Measured data can be exported from L&W Autoline Base Unit. Measurement reports can be exported into the formats AL1, XML, CSV, PDF, and Excel.

A measurement file can be exported the regular way and through shortcuts.

5.1 Exporting a profile from Autoline the regular way

When a measurement is completed, its data is found in four views: Summary Numeric, Trending Numeric, CD Graphs, and Trending Graphic.

To export a profile:

1. Select a reel number.
   • For the Summary Numeric and CD Graphs views: the real number is centered in the middle of the touch-screen.
   • For the Trending Numeric and Trending Graphic views: the reel numbers are shown in the top row of a table.
   An export window is shown with a drop-down list. (This window is also a profile edit window.)
2. Select Export.
   The available export formats are shown in a drop-down list.
3. Select the format to be exported.

5.2 Export shortcuts

5.2.1 Exporting a file to an Excel sheet

To export a file into an Excel sheet, a faster way is as follows:

1. Select a reel number in one of the views as in 5.1 Exporting a profile from Autoline the regular way.
2. Select Excel in the export window.

5.2.2 Exporting a file to a PDF

PDF files contain program, paper machine, timestamp, and grade in the heading area, then each property with graphic/numeric as mean value, maximum value, minimum value, and standard deviation.

The system can generate all the views in PDF format.

1. Select PDF to the right of the touch-screen.
   • For the Summary Numeric and CD Graphs views: the PDF file name becomes <reel ID>_<paper machine>_<type of view>.
   • For the Trending Numeric and Trending Graphic views: the PDF file name becomes trending_numeric or trending_graphic.

   The PDF file name is shown in a new window.
2. Select Save to save the file.
6 Maintenance

During normal operation, all modules in the system are covered by a transparent front cover, which is locked for safety reasons. When opened, the automatic instrument air supply to the instrument is shut off.

**NOTE**
Carefully read the SAFETY INFORMATION in the beginning of this manual.

6.1 Maintenance intervals

It is recommended to check the instrument regularly. The maintenance interval depends on environmental conditions and use. For specific recommendations, contact your local ABB support for Lorentzen & Wettre products.

<table>
<thead>
<tr>
<th>Recommended interval</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>When necessary</td>
<td>Clean the transparent front cover with a damped microfiber cloth. Do not use any solvent or alcohol.</td>
</tr>
<tr>
<td></td>
<td>See 5.2 Raising and lowering the transparent front cover.</td>
</tr>
<tr>
<td></td>
<td>See 5.3.1 Using the air nozzle.</td>
</tr>
<tr>
<td></td>
<td>See 5.3.2 Cleaning the clamp</td>
</tr>
</tbody>
</table>

6.2 Raising and lowering the transparent front cover

All control of the transparent front cover over the measuring modules must be done using the touch-screen.

6.3 Cleaning the system

6.3.1 Using the air nozzle

A cleaning air nozzle is connected on the left side behind the front doors. Use the nozzle to clean the optical sensors of the system, PPS measuring heads, reference films, and so on.

To open the nozzle, bend the tip down. To close it, release the tip.
6.3.2 Cleaning the clamp

Some paper grades can result in deposits accumulating on the belt, which causes the samples to slip. If this occurs, use the air nozzle to clean the clamp.

6.4 Moving the system

If it is necessary to move the L&W Autoline Base Unit, use the wheels.

| NOTE |
| Use the wheels only for short distances on a smooth surface. |

L&W Autoline Base Unit has four wheels and two feet. To gain access to the rear of the system, for example, raise the two adjustable feet at the front and then move the system a short distance if needed. A 17 mm wrench is included in the case.

During measurements the system must stand on its two feet. After the system is moved, check that it is level. If necessary, adjust the feet.
# 7 Troubleshooting

<table>
<thead>
<tr>
<th>Issue</th>
<th>Possible cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit does not respond (or similar)</td>
<td>Communication problem or software-related issue</td>
<td>Most faults can be solved by rebooting the complete unit, by switching it off and on with the power button.</td>
</tr>
<tr>
<td>System is down</td>
<td>Emergency stop is not reset</td>
<td>Do a check of the emergency stop.</td>
</tr>
<tr>
<td></td>
<td>Fuses are faulty</td>
<td>Contact a certified ABB Lorenzon &amp; Wettre service technician.</td>
</tr>
<tr>
<td>Paper jam</td>
<td>Paper is stuck in the system</td>
<td>Remove or adjust the paper.</td>
</tr>
<tr>
<td>Transparent front cover moves too fast or too slow</td>
<td>Setting of the front cover speed is incorrect</td>
<td>Adjust the speed with the four knobs on the panel behind the left door.</td>
</tr>
<tr>
<td>End wheel does not work as expected</td>
<td>End wheel is dirty</td>
<td>Clean the end wheel and adjust the pressure.</td>
</tr>
<tr>
<td>Middle part of the emergency stop does not become green when the knob is turned</td>
<td>System is not ready yet</td>
<td>Wait until the system is ready.</td>
</tr>
<tr>
<td></td>
<td>Knob is faulty</td>
<td>Contact a certified ABB Lorentzen &amp; Wettre service technician.</td>
</tr>
</tbody>
</table>
## 8 Technical specification

<table>
<thead>
<tr>
<th>L&amp;W Autoline Base Unit – Code 601</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System</strong></td>
</tr>
<tr>
<td>Inclusive</td>
</tr>
<tr>
<td>Transport fixation</td>
</tr>
<tr>
<td><strong>Rated voltage</strong></td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
</tr>
<tr>
<td><strong>Rated power</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Power consumption</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Instrument air</strong></td>
</tr>
<tr>
<td><strong>Rated air consumption</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Capacity</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Dimensions (W x D x H)</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Standard width of a module</strong></td>
</tr>
<tr>
<td><strong>Weight</strong></td>
</tr>
<tr>
<td><strong>IP rating</strong></td>
</tr>
</tbody>
</table>

\(^{(1)}\) Maximum power consumption under normal conditions  
\(^{(2)}\) Average power consumption during measurements  
\(^{(3)}\) Power consumption when no measurement is done
9 Accessories

Case with accessories for L&W Autoline Base Unit:

1. Adapter ⅝" to 10 mm
2. Wrench 17 mm
3. Glass fuses 2 A and 5 A
4. O-rings
5. Fuse for PF4 2 A
6. Allen key set
7. Bits holder
Waste Electronics and Electrical Equipment (WEEE)

This product is labelled with this symbol in accordance with European Directive 2012/19/EU, to indicate that it must not be disposed with your other household waste. Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

In the European Union
Please contact your local ABB representative who will inform you about the take-back of the product. Small products (and small amounts) might be taken back by your local collection facilities.

In countries outside the European Union
Please contact your local authorities and ask for the correct method of disposal.

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