# ONE MACHINE FOR ALL MATERIALS WITH AUTOMATIC LAYER DETECTION.

Complex material combinations require increasingly flexible, high-performance drilling units. An important requirement of drilling machines is their ability to detect different material layers during the drilling process – this requirement is fulfilled by LÜBBERING electronic Advanced Drilling Units (L.ADU electronic).

In the aerospace industry, wings and the fuselage are increasingly being manufactured from CFRP (carbon fibre reinforced plastic) or material layers of CFRP and titanium, CFRP and aluminium or CFRP, aluminium and titanium. L.ADU electronic was developed specially for large drill holes in these sensitive combinations.

When machining CFRP, the quality of the drilling or milling machines and cutting tool plays a particular role as the material can lead to a high level of wear on the cutting tool due to abrasions.
This effect is critical mainly because the drilling results when working with CFRP must fulfil the highest quality requirements.

- **Large holes in sensitive combinations**
  Adaptive Drilling Performance: automatic spindle speed adjustment due to automatic material detection of stacks
- **Significant reduction of drilling cycle times**
  through cutter breakthrough sensor
- **Optimised and constant cutting speeds**
  through ground spindle
- **Time saving**
  by one-shot drilling | reaming and countersinking
- **Emergency stop**
  through button


In order to maintain the diameter tolerances, for instance, it is often necessary to integrate a reaming process as well. Countersinking is often carried out after drilling or reaming.

With the adaptive drilling performance, the L.ADU electronic can be used to make drill holes through different layers of material in a matter of seconds, as the speed of the L.ADU electronic can be automatically adapted to the material (see feed force diagram).

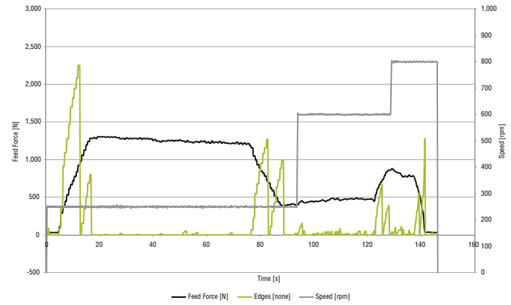
The integrated thrust sensor detects the cutter breakthrough of the material and adjusts the feed force to allow the drilling cycles to be considerably reduced compared to conventional drilling.

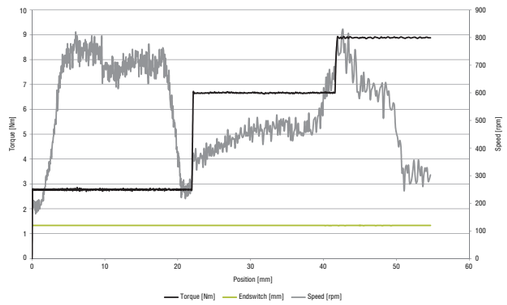
Besides extremely high drilling speed, the machine enables holes of up to 1 inch to be drilled in the under-carriage mounting.

In addition to special functions such as adaptive drilling performance and the thrust sensor, the speed can be infinitely adjusted, thus allowing for the cutting parameters to be adjusted at any time.

As the first supplier of L.ADU electronic, LÜBBERING shows the process parameters in a graph, analyses these parameters and adjusts them, if required, thereby achieving an optimum drilling process.

- **Overload protection**
  by controlled spindle speed and torque
- **Process information**
  by LC display and signal lights
- **Serial interface**
  for setup and maintenance
- **Full traceability of process data**
  via Feed Force and Position/Torque diagrams




Online presentation of the process parameters: LÜBBERING is the only supplier of Advanced Drilling Units that shows all data of a drilling process with L.ADU electronic in a graph, analyses the data, adjusts where required, thereby achieving an optimum drilling process. Typical values are: feed force, speed, torque and endswitch.

# FOR BIG DRILLINGS IN BIG MATERIAL STACKS: L.ADU ELECTRONIC 520.

Besides extremely high drilling speed, the machine enables holes of up to 1 inch to be drilled in the undercarriage mounting.

In addition to special functions such as adaptive drilling performance and the thrust sensor, the speed can be infinitely adjusted, thus allowing for the cutting parameters to be adjusted at any time.

As the first supplier of L.ADU electronic, LÜBBERING shows the process parameters in a graph, analyses these parameters and adjusts them, if required, thereby achieving an optimum drilling process.

- **Different types of locking systems available**
- **Servo electronic driven positive feed unit**
- **Thrust sensor**
  detects the cutter breakthrough
- **Onboard electronic control unit (microcontroller)**
- **Spindle**
  - Rpm: freely adjustable
  - CW and CCW possible
  - Fast forward and fast retract function

Watch the video of L.ADU electronic



# L.ADU electronic 520

| MATERIAL *(also as multi stack)* | Titanium | Aluminium | CFRP |
|---|---|---|---|
| DRILL HOLE SIZE | ≤ 32 mm | ≤ 45 mm | ≤ 45 mm |

*CSK = countersinking

## L.ADU basis 520

Weight: 10 kg

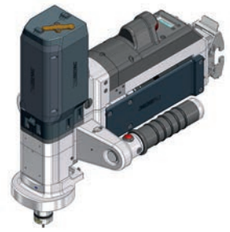
Motor type: electronical servo motor

Nominal power: ≤ 2.8 kW (peak)

Power supply: 400 VAC/16 A

Spindle speed: 50 – 2,500 rpm

Feed rate: 0.05 mm/rev - 0.15 mm/rev



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## L.ADU locking system



Taperlock (TPL)

Twist Lock (TL)

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## L.ADU option

| | | |
|---|---|---|
| **MQL System** |  |  |
| **Lifting handle** |  |  |
| **Extraction manifold** |  |  |
| **Cable protection** |  |  |