ADLINK
Leading EDGE COMPUTING

Connecting the Unconnected

Data Extraction & Conversion DEX-100

Evolving Legacy Equipment-Based
Operations into Factories of the Future



www.adlinktech.com

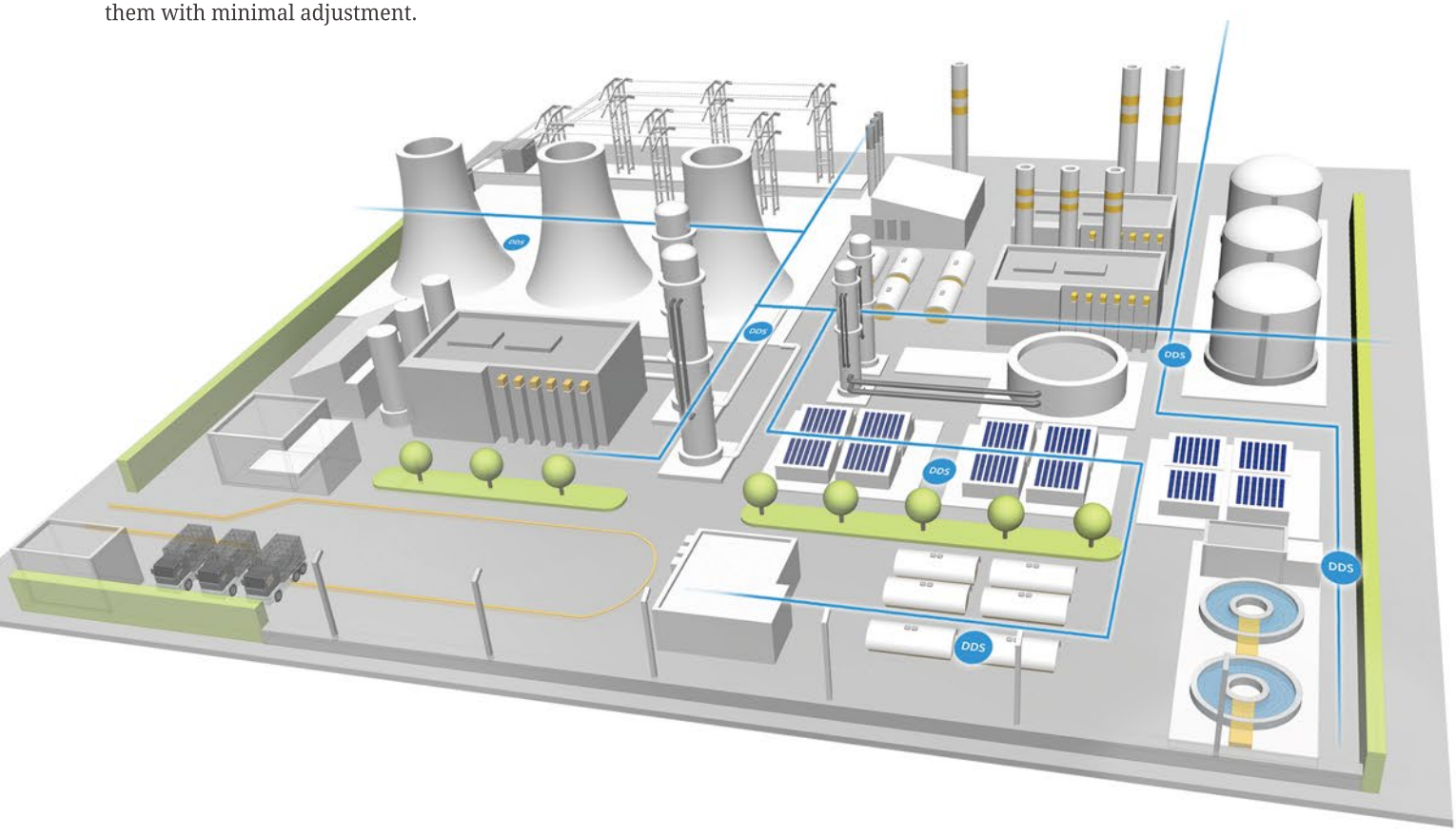
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ADLINK Offerings for Smart Manufacturing



In manufacturing operations, emerging Internet of Things (IoT) technology has ushered in the Industry 4.0 initiative, departing from conventional automated production to IoT-based intelligent automation, improving on semi-automated or standalone automatic machining to network-connected process based on M2M (machine to machine) and M2P (machine to person) communication.

ADLINK combines market-proven technology expertise with years of experience in automation, communication, and industrial computing. Pre-validated hardware and utility integration further enable OEMs to deliver solutions to the market faster and deploy them with minimal adjustment.



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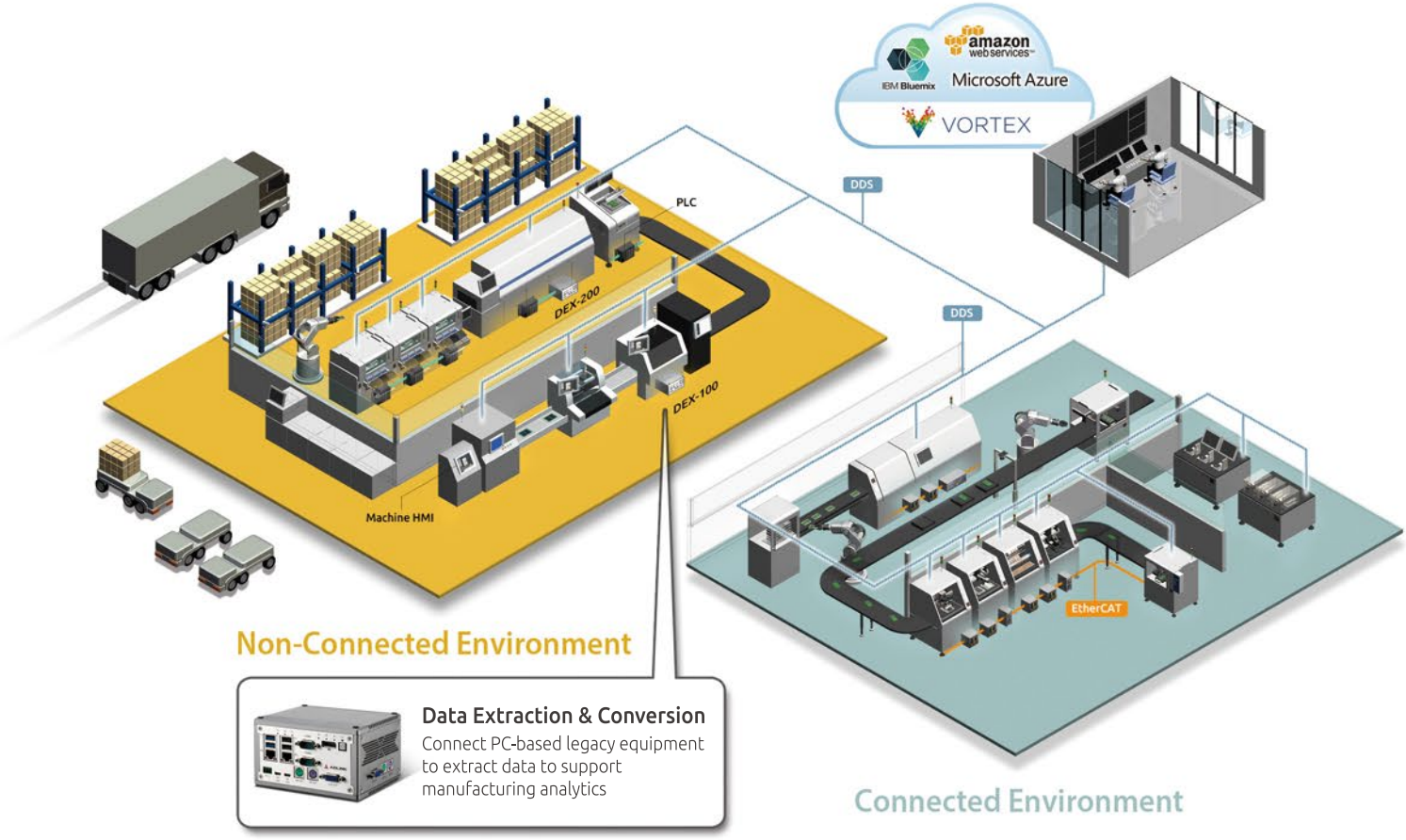
Connecting the Unconnected to Achieve the Factory of the Future

Currently, estimates show up to 85% of all installed factory machines are not connected, being unable to share information with other entitles in the network. Such distributed information, however, is fundamental in establishing a smart manufacturing environment. Even so, it is rarely practical for management to replace the unconnected assets, with such measures representing tremendous capital outlay

ADLINK's DEX-l00 intelligent data extraction system utilizes optical character recognition (OCR) and built-in frame grabber to capture and process legacy PC-based content via display, rendering originally fragmented data extraction methods into a unified solution. Collected data is distributed to all relevant network elements in real time, enabling connectivity as well as conversion solutions.

DEX-100





patent pending

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ADLINK DEX-100 Data Extraction & Conversion



Scalable for Universal Connectability

- One solution for all machine types, eliminating fragmented field bus and API, unstructured log files, and OS conflicts
- Unified legacy equipment protocols into standard interface via VGA/DVI output
- Quick deployment and minimal learning curve

Non-intrusive for Minimal Downtime

- Display content is output from the machine without affecting machine performance or stability
- No additional program installation required
- Quick Offline/Remote program debugging doesn't interfere with machine operation
- Quick integration minimizes downtime

Cost-effective Evolution to Smart Factory

- Existing machines are retained with enhanced IoT capability
- Legacy environments can reach Industry 4.0 functionality

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- *Scalable*
- *Non-intrusive*
- *Easy to Use*
- *Real-time Sharing*
- *Cost-effective*

Ease of Use

- Simple, fast system configuration, with no programming required
- Customizable user-end tools maximize operational efficiency.
- Built-in OT/IT protocol and M2M bridging

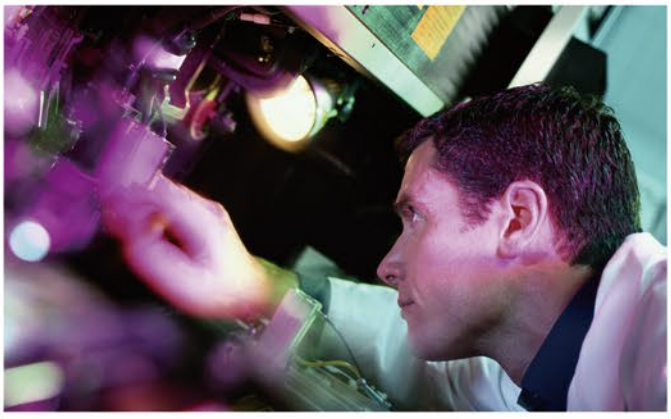
Real-time Data Sharing

- DDS enables real-time reliable, secure, and efficient data sharing
- Data transmitted to and from top floor applications and cloud maximize administrative advantage

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The ADLINK DEX-100 Solution

Delivering Legacy Manufacturing into the Future

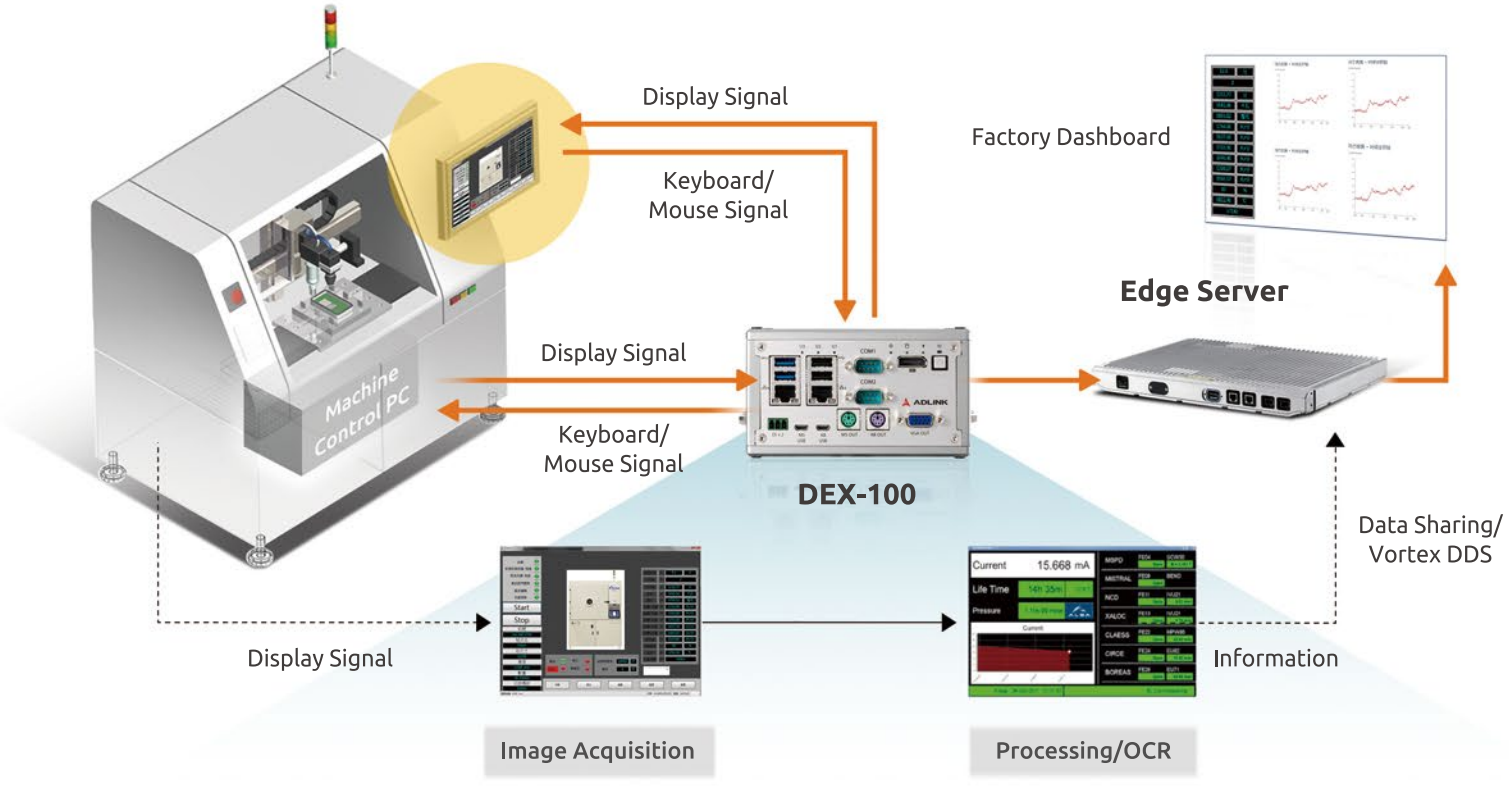


ADLINK's DEX-100 intelligent data extraction system with built-in frame grabber utilizes optical character recognition (OCR) to collect and process legacy PC-based display content, converging traditionally fragmented data extraction methods into a unified solution for all types of PC-based machines.

An easy-to-configure utility maps acquired real-time video content with no additional programming required, and provides a user-configured interface consolidating machine content of interest into a single predefined page. Unique offline script editing enables system setup offline from the target device, for little-to-no interference with operations.

Singularly effective interface extends M2M function with addition of devices such as barcode scanners and sensors, and simultaneous sharing of all collected data for distribution to anywhere in the network, via DDS (Data Distribution Services) protocol in real-time, enhancing reliability and efficiency. Remote control of pre-categorized IO-status, alarm, and data writing enable both horizontal and vertical OT/IT convergence.

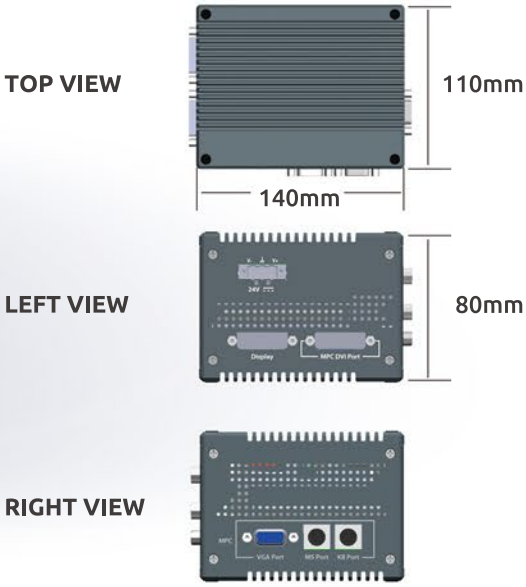
Optical Character Recognition Capability



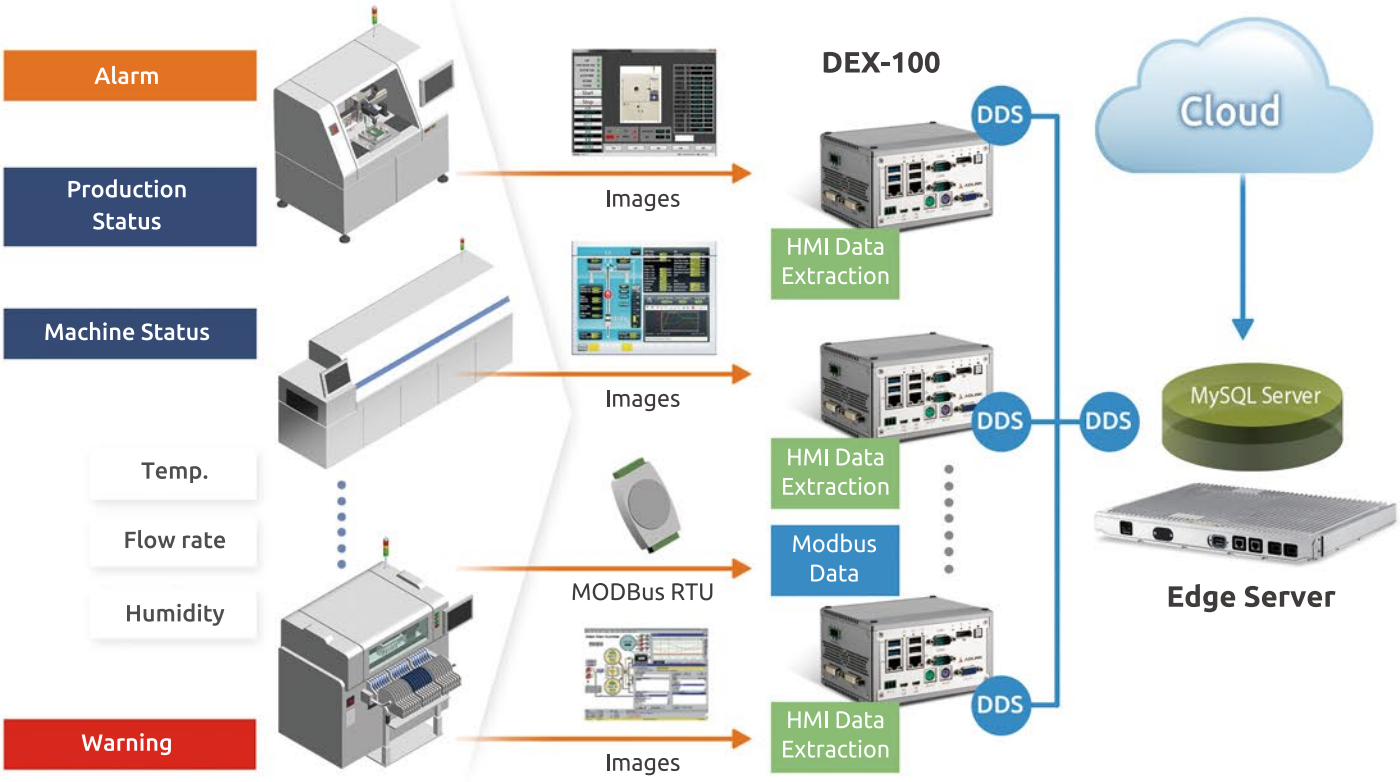
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Simple, Effective Machine Connection



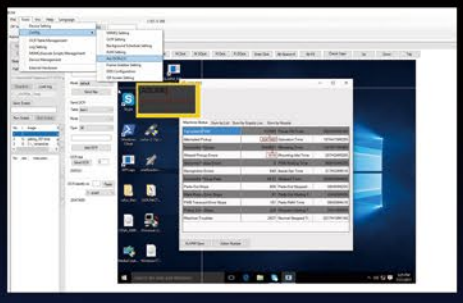


Unified Solution Meets the Needs of Brownfield Deployment

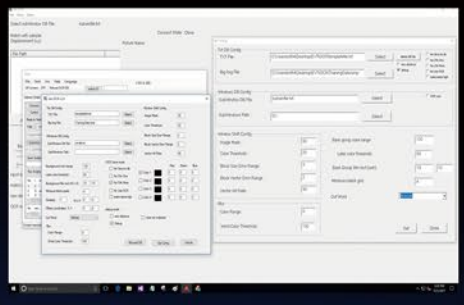


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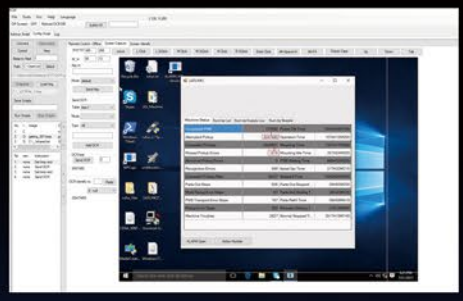
Simple, Effective Machine Connection



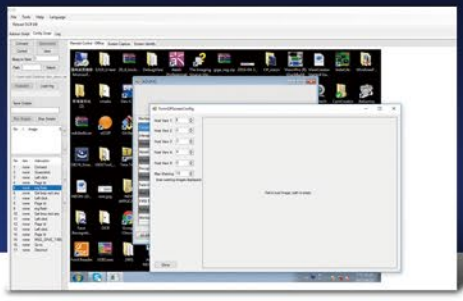
Tag Name Configuration Tool



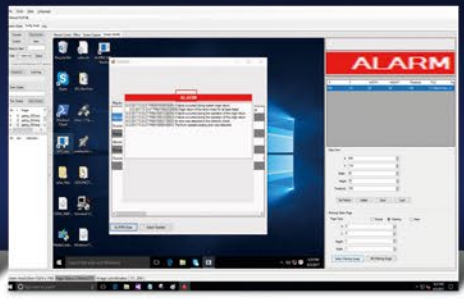
OCR Configuration Tool



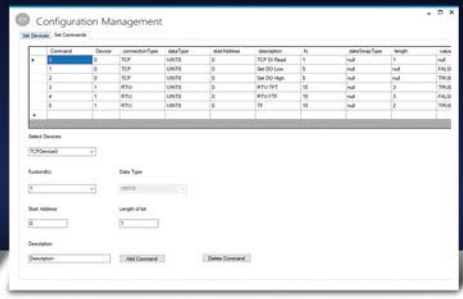
Script Configuration Tool



OP Screen Configuration Tool



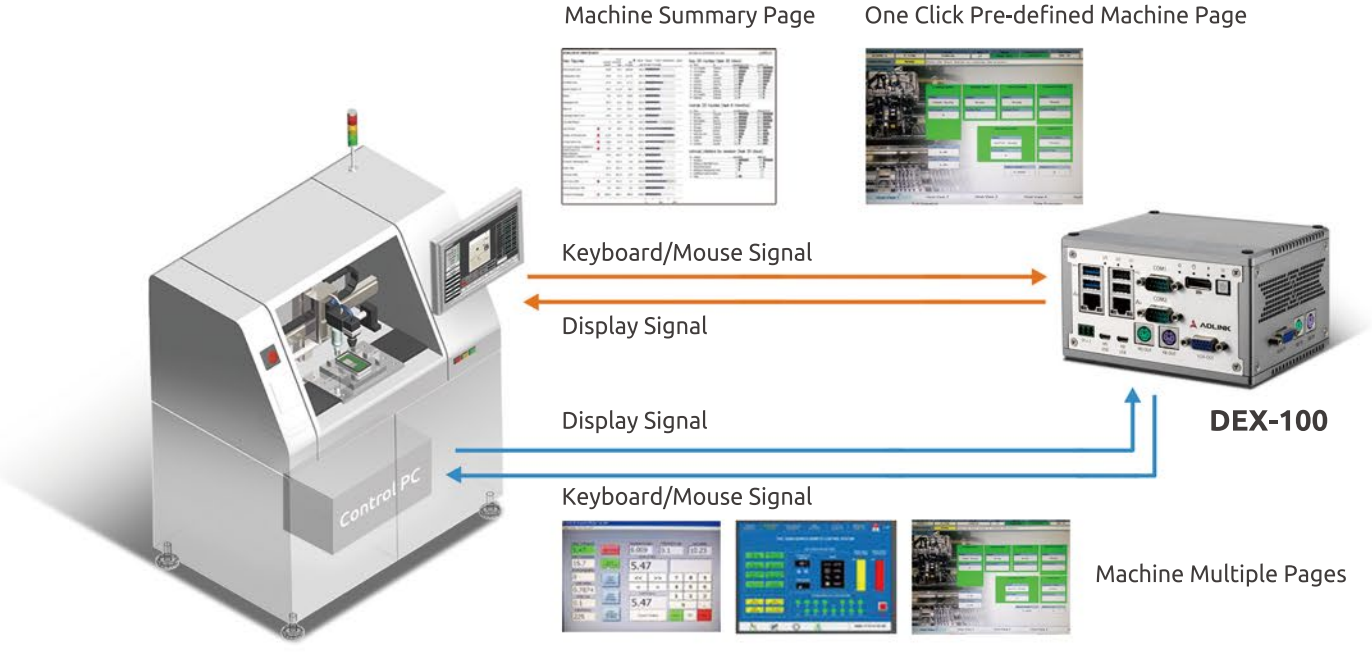
Page Identifier Tool



MODBus I/O Configuration Tool

Configuration Tools

The ADLINK DEX-100 provides easy-to-use configuration tools



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OP Screen

The DEX-100 enables simple configuration of a machine summary page to display all desired pre-defined machine tags at a glance, eliminating the need for navigation among multiple pages to locate relevant content. Pre-defined machine pages can also be opened through onscreen controls.

I/O Interface

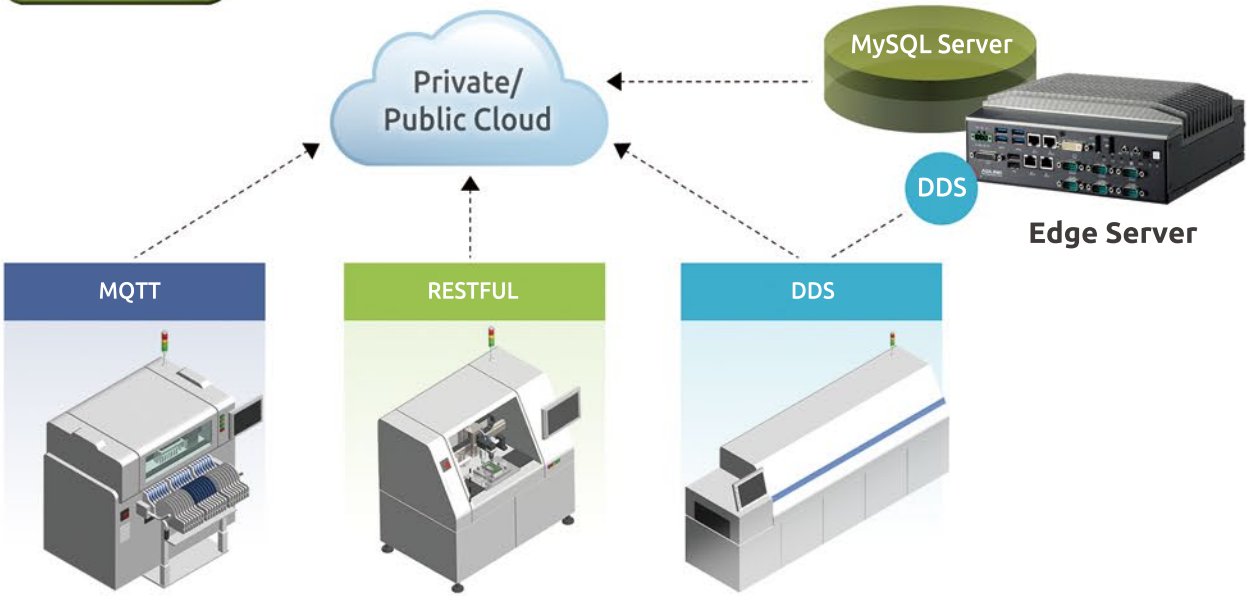
The DEX-100 provides a built-in dedicated input button for switching between Runtime and Full Control modes. Also supported is MODBus I/O connecting to sensors and actuators and supporting barcode scanner.

Machine to Machine

Dedicated DDS real-time pub/sub protocol enables reliable, efficient, and secure machine-to-machine communication.

Machine to Cloud

DDS, MQTT and RESTFUL to Cloud communication protocols are all supported, with content saved to edge server and database automatically via DDS.

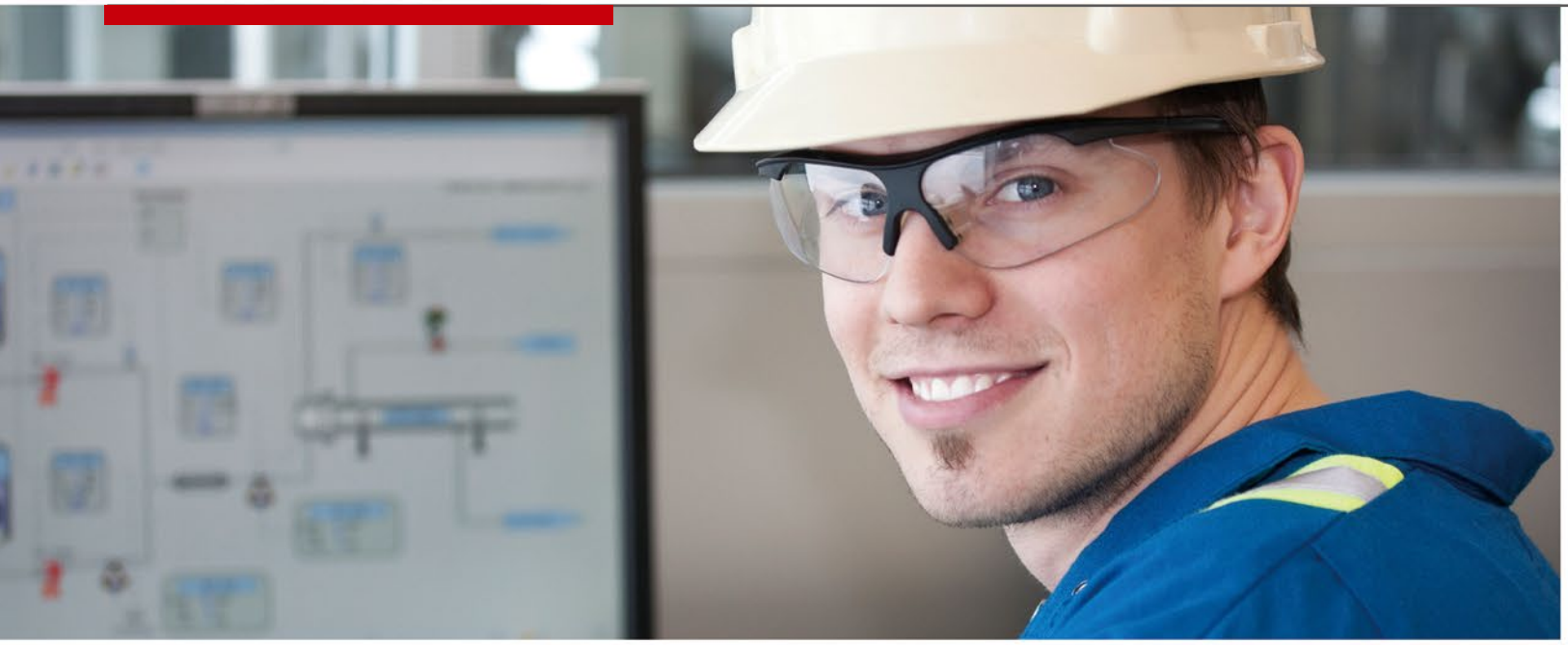


Cloud to Machine Control

The DEX-100's remote machine control is enabled by K/B and mouse signal, allowing start/stop/recipe control and even machine parameter changes to be achieved remotely.

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All in One Management Utility

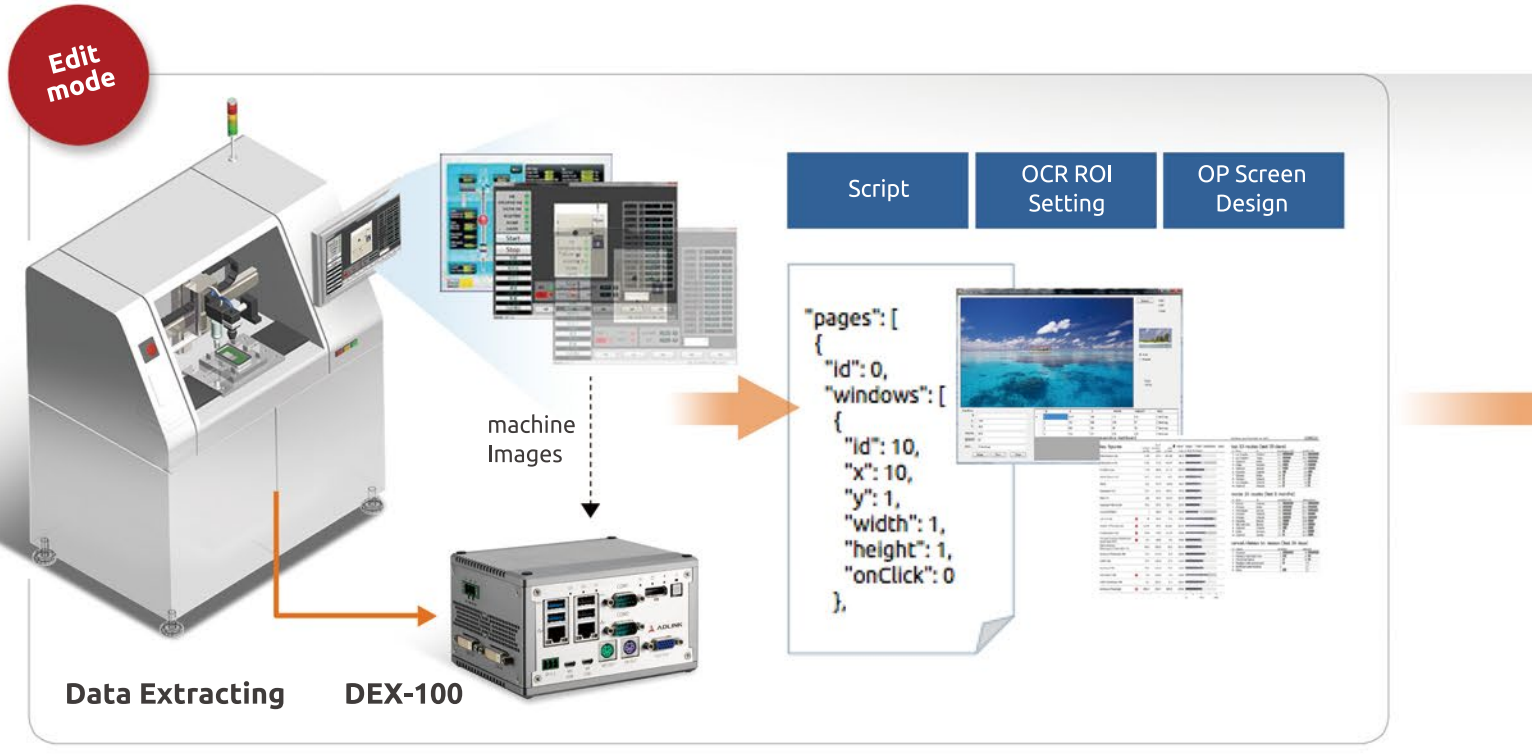


System Integration Management

Edit Mode
System setup and scripting

Edit Mode offline/online script editing provides

- Tag name assignment to ROI
- OCR Setting
- OP Screen Design
- Scripting Logic Control
- Testing and debugging



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Operation Management

Runtime Mode
Machine data extraction commences

Runtime Mode enables real-time extraction of

- Production Status
- Machine Status
- Environmental status
- Alarm/Warning messages

Switch Mode
Auto switching between Full control mode and Runtime mode

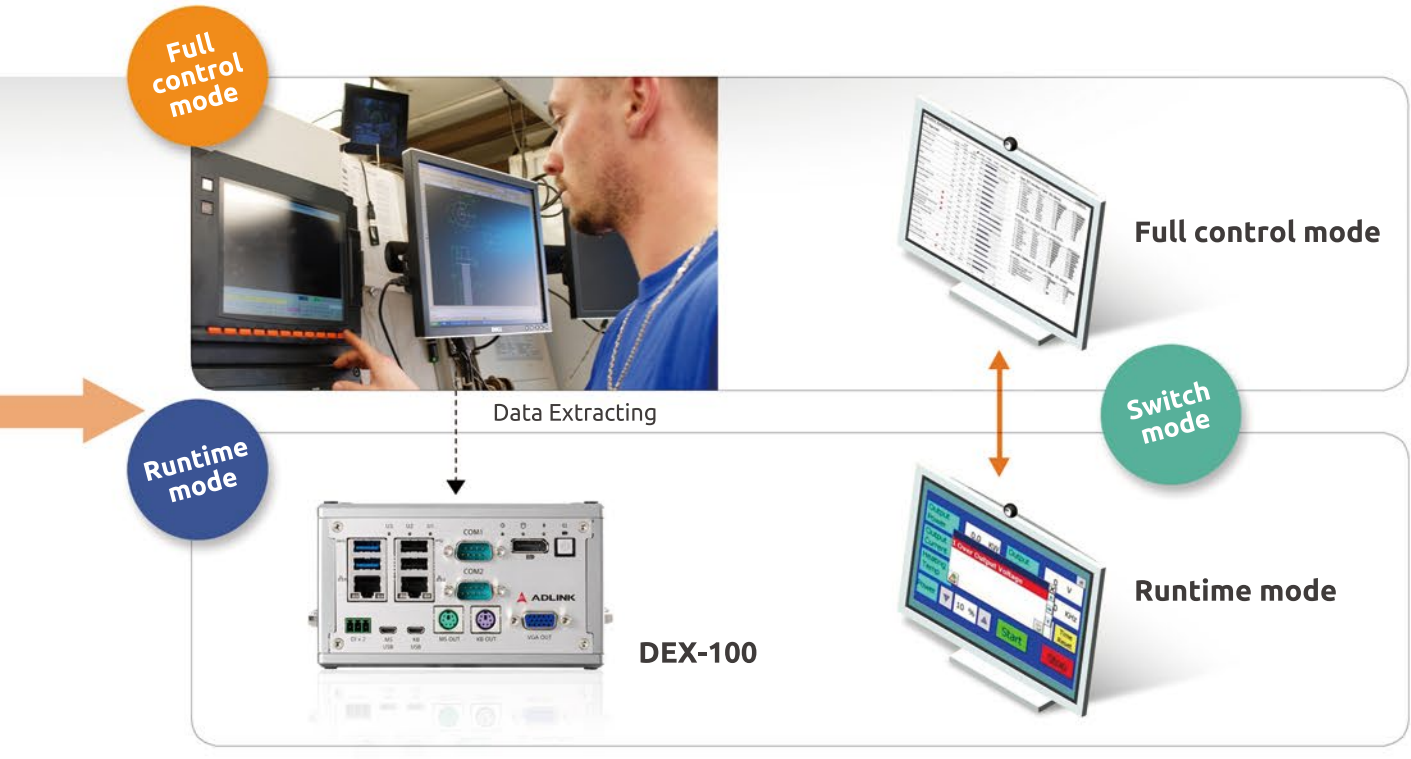
Switch Mode supports

- DI Switching enforce instant switching between modes
- Soft button switching, allowing reversion from Full Control mode to Runtime mode when keyboard/mouse idle for a specified time

Full Control Mode
OP management

Full Control Mode allows

- Full control of the machine



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DEX-100 Solution Examples



Problem: Desired information is located on different display pages, requiring switching between multiple pages for data extraction

Solution: The DEX-100 provides Auto Page Switching via mouse, configured by Auto Scripting.

Problem: During data extraction, constant display flicker from continuous page switching is distracting and disruptive.

Solution: While frame buffering acquired images for processing.DEX-100 can select and transmit only pages containing desired information are displayed.

Problem: When warning or alarm messages are issued, displayed content is blocked and data extraction interrupted.

Solution: The DEX-100 buffers the warning message to maintain monitor display until the message window is physically closed. At the same time, the DEX-100 closes the warning message on the controller PC, allowing data extraction to continue with no data loss.

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Problem: Physical keyboard/mouse output to access machine status may be required during active data extraction operation.

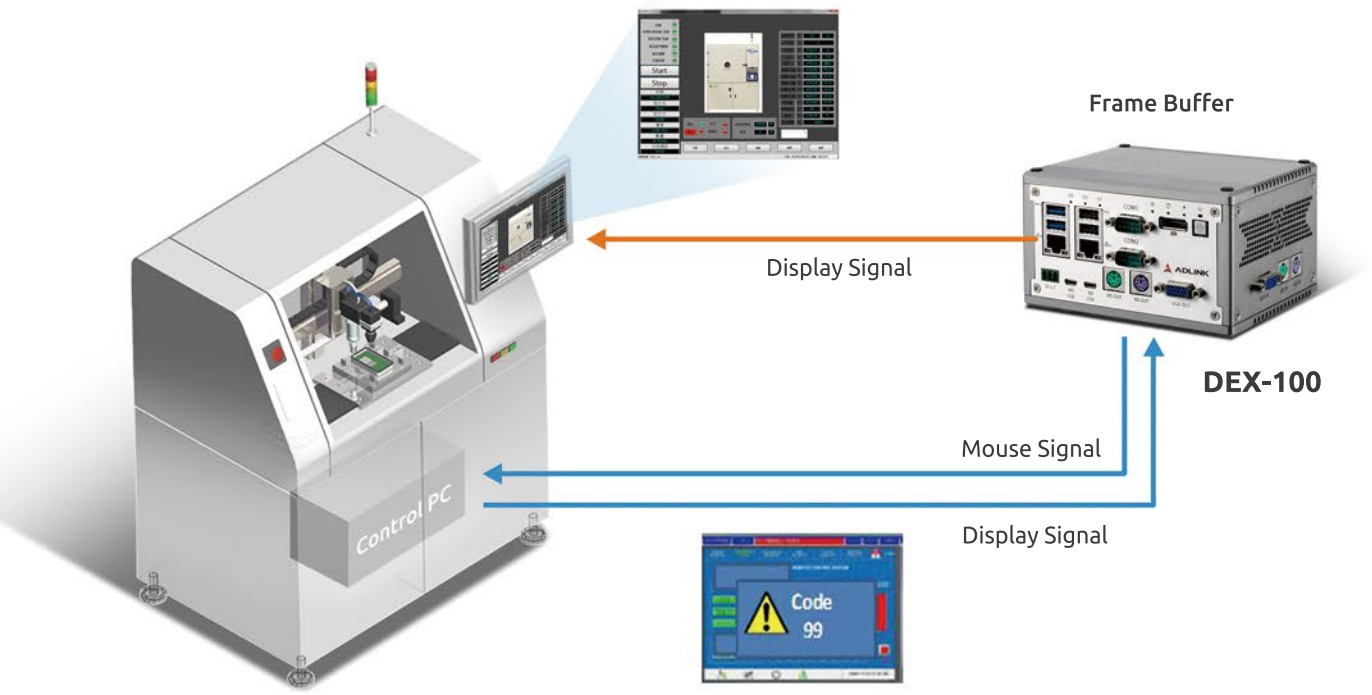
Solution: The DEX-100 acts as a bridge between physical keyboard/mouse and machine keyboard/mouse input signals. Actual intervention takes place on the DEX-100 side, and is then buffered while data extraction continues. When appropriate, the DEX-100 transmits the required action to the machine side, without affecting data extraction.

To reduce physical keyboard/mouse intervention, the OP Screen Summary Page and one-click machine page pre-definition reduce the frequency of physical machine navigation in Full Control mode.

Problem: As more machines become connected, network failure, security, and bandwidth all present significant challenges.

Solution: The DEX-100's Vortex DDS

- Increases system security and enhances data sharing in a reliable and timely manner
- Improves network bandwidth efficiency by up to 85% and enables simultaneous data transfer among multiple devices
- Buffers and saves unsent data as history in the event of network failure, and, upon recovery, automatically transmits the saved data to Edge Server automatically.



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DEX-100 Specification

System	
Processor	Quad-Core Intel Atom® Processor E3950
Operating System	Windows 10 IoT Enterprise 64
RAM	DDR3L 1066 4GB
Storage	128/256 GB SSD
I/O Interface	
2x GbE LAN (Intel® I210-IT)	
2x COM (2x RS-232/422/485)	
2x USB 2.0 + 2x USB 3.0 + 2x Micro USB-Type B	
2x PS/2 input+2x PS/2 output	
VGA input, DVI input *	
VGA output, DVI output,	
DisplayPort (For local DP display)	
2x isolated DI	
Power Supply	
DC Input	6-36 VDC
AC Input	Optional 40W AC/DC adapter
LED Indicators	Power/Storage/WDT
Mechanical	
Dimensions	140 (W) x 110 (D) x 80 (H) mm / 5.5(W) x 4.3 (D) x 3.1(H) inch
Weight	< 1 kg
Construction	Full aluminium alloy
Mounting	Wall mount, DIN rail
Communication	
Communication Protocol and Interface	DDS (Distributed Data Service), REST, MQTT *
Field Bus Communication	Modbus TCP and Modbus RTU
Environmental & Electrical	
Operating Temperature	Standard: 0 to 50°C
Storage Temperature	-40°C to 85°C
Humidity	approx. 95% @40°C (non-condensing)
Vibration	Operating 5 Grms, 5-500Hz, 3 axes w/ SD/ SSD
ESD	SSD ESD Contact +/-4 KV, Air +/-8 KV
Shock	Operating 100G, half sine 11 ms duration w/ SD/mSATA SSD
EMC	CE & FCC Class A (EN610006-4/EN61000-6-2)
Safety	UL by CB
Accessory package	
DEX-100 KB port External Cable x1	
DEX-100 MS port External Cable x1	
DEX-100 External VGA Cable x1	
DEX-100 External USB Cable x2	
AC-DC ADAPTER 40W x1	

Machine Output Display Resolution Support	640x480, 800x600, 1024x768, 1152x864, 1280x720,1280x768, 1280x800, 1280x1024, 1360x768, 1400x1050, 1600x1200, 1680x1050, 1920x1080

* call for availability

patent pending

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Utility Features

Data Extraction via Optical Character Recognition (OCR)

- Up to 500 tags
- Up to 30 extraction pages
- OCR speed 35ms/ROI*

  *OCR target ROI under 1080*768 screen resolution, 52X20 pixels, Windows default font @ 9 pt. Speed may vary with resolution and font size.

Script Generation

- Over 100 script commands supported
- Online and offline scripting supported (with Offline reducing machine interference)
- Pre-configured script loading for script deployment

Data Extraction and User Full Machine Control Modes switchable by user via Hard or Soft control
Event notification of machine alarm/warnings
Data extraction summary page supports up to 500 rows of data
Local Log File retained for up to 120 days

DEX-100 Data Extraction System Starter Kit

ADLINK's DEX-100 Starter Kit verifies your data extraction environment and accelerates deployment. The Starter Kit combines ADLINK's DEX-100, HMI simulator tool, RTU MODBUS, toggle switch, and LED indicator in one easy-to-use package.



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