

NEXSYS™ Upgrades

Comparison of the Features and Options available for the NEXSYS II and NEXSYS III-i

Whether rebuilding your locomotive or simply upgrading the electrical systems, the NEXSYS™ III-i gives you the best value in locomotive control. This microprocessor-based locomotive control system features a reliable and compact design, increased locomotive adhesion, advanced control options and integrated AESS technology that will significantly extend the life of your locomotive.

Benefits of NEXSYS III-i Functionality

Improved Adhesion & Tractive Effort

Up to 44% on dry rails* and up to 29% on wet rails* means better pulling power in any condition.

** Independent Testing by TTCL, a wholly owned subsidiary of AAR. Adhesion improvements are based on comparison to the Dash-2 OEM control system.*

Fast ROI through Significant Fuel Savings

Integrated SmartStart® functionality provides significant improvements in fuel efficiency and idle reduction.

Fleet Management & Troubleshooting

Advanced on-board and remote diagnostics allow for efficient performance management.

Proven Parts & Service

Improve reliability and eliminate extra modules with an integrated voltage regulator including battery charging & current limiting features.

Diagnostics, Connectivity & Reporting

Receive valuable information on locomotive health, performance, location, and diagnostics to advance maintenance planning, performance reporting, remote troubleshooting, and fleet efficiency.

Intelligent Modernization

Compact design increases free space in high voltage cabinet and optional modules allow for PTC communication or use with a daughter locomotive.

Enhanced Display with Multiple Options

Easy to read on-board diagnostic display.

Advanced Locomotive Reliability

Proven microprocessor technology replaces old modules for more reliable performance.

Improve locomotive adhesion, performance, diagnostics, and overall efficiency with the advanced, proven and reliable functionality of the NEXSYS™ III-i Control System from ZTR™.

Feature	NEXSYS™ II	NEXSYS™ III-i
Throttle Response Control	Included	Included
Main Alternator/Main Generator Traction Current Control	Included	Included
Main Alternator/Main Generator Current Regulation	Included	Included
Main Alternator/Main Generator & Traction Motor Voltage Limiting	Included	Included
Main Alternator/Main Generator Excitation Regulation	Included	Included
Sanding Control	Included	Included
Engine Temperature Control and Fan Cycling	Included	Included
Automatic Ground Relay Reset and Data Logging	Included	Included
Dynamic Brake Regulation *	Included	Included
Dynamic Brake Warning and Motor Field Protection	Included	Included
Grid Blower Protection*	Included	Included
Locked Wheel Detection*	Included	Included
Hump Control	Included	Included
Improved Features on the NEXSYS III-i		
<i>*See below for descriptions of the improvements over the NEXSYS II or the NEXSYS III-i Basic Specification for detailed descriptions.</i>		
KWH Recording	Included	Improved
Traction Motor Current Regulation	Included	Improved
On-board Operator Interface Display	Included	Improved
Excitation Rate Control	Included	Improved
Wheel Slip Detection and Control	Included	Improved
Fault Annunciation	Included	Improved
New Features on the NEXSYS III-i		
<i>*See NEXSYS III-i Basic Specification for detailed descriptions.</i>		
Low Voltage Regulation	Not Available	Included
Contactors Control	Not Available	Included
Automated Contactors Test	Not Available	Included
Axle Generator	Not Available	Included
Emergency Sand Disable	Not Available	Included
ZTR SmartStart® (AESS)	Not Available	Included
Integrated Locomotive Battery Saver System™ Functionality	Not Available	Included
Continuous Data Logger through Virtual Technician	Not Available	Included
Traction Motor Open Circuit Detection	Not Available	Included
Compressor Control	Not Available	Included
HMI Display Initiated Load Test	Not Available	Included
Automated Load Test	Not Available	Included
Operational Test Screens	Not Available	Included
NEXSYS Communication Module (NCM)	Not Available	Included

Optional Features of the NEXSYS™ III-i

*See NEXSYS III-i Options Specification for detailed descriptions.

NCM Options	Not Available	Optional
KickStart™ Supercapacitor Battery Assist Integration	Not Available	Optional
ZTR Integrated Locomotive Driver's (ILD) Display	Not Available	Optional
ZTR Locomotive Interface Gateway™ (LIG)	Not Available	Optional
ZTR EZPace™ Proven Slow Speed Control	Not Available	Optional
ZTR NEXSYS™ III-i Mother-Daughter Option	Not Available	Optional
InteLevel® Integrated Fuel Monitoring	Not Available	Optional
MR2 Monitoring for ZTR SmartStart® (AESS) Option	Not Available	Optional
HMI Dual Language (main HMI is included with the system)	Not Available	Optional
HMI Initiated Traction Motor Cutout (TMCO)	Not Available	Optional
Ground Current Monitoring	Not Available	Optional
Hardware Redundancies Reduction	Not Available	Optional
APU Integration	Not Available	Optional
Integrated Vigilance and Penalty Alerter Functionality	Not Available	Optional
Integrated EZPace Functionality	Not Available	Optional
Analog Load Meter Control	Not Available	Optional
Head of Train Integration	Not Available	Optional
CCBII/26 Integration	Not Available	Optional
Data cord Integration	Not Available	Optional
Analog Tester	Not Available	Optional
Additional Protection and Detection Options		
✓ Engine Parameter Monitoring	Not Available	Optional
✓ Elevation sensing and compensation	Not Available	Optional
✓ Companion Alternator Frequency and Voltage Monitoring	Not Available	Optional
✓ Engine RPM Monitoring	Not Available	Optional
✓ Aux. Gen Field Excitation Monitoring	Not Available	Optional

NEXSYS III-I Integration with ZTR™ Solutions

SmartStart® Ile	NCM	KickStart™	ZTR ILD™ Display	ZTR LIG™	ZTR EZPace™	NEXSYS III-i MD	InteLevel®
SmartStart, the most trusted start-stop (AESS) system in the industry, is proven to reduce emissions and lowering fuel costs for a fast ROI.	The NCM provides NEXSYS III-i diagnostics, reporting and remote communication for advanced fleet management and maintenance planning.	A proven supercapacitor, battery assist solution for advanced starting reliability and battery life extension.	An additional functional screen for NEXSYS III-i that conforms to the AAR specifications and provides significant added value to the driver.	Specifically designed to work with NEXSYS III-i, the ZTR LIG is available today and meets AAR standards for communication with the PTC network.	The ZTR EZPace™ is proven slow speed control functionality.	The NEXSYS III-i MD option can include the Daughter Kit (hardware), a Daughter Operational Cab and/or a Daughter Diagnostic Display and is quick and simple to install.	ZTR InteLevel® Fuel Monitoring System integration for +/- 3% accuracy and remote information on fuel fill, loss, usage and theft events.

Improvements to NEXSYS™ II Features

KWH Recording

The NEXSYS III-i has improved this feature to now allow for the logging of megawatt hours instead of just kilowatt hours over a user specified Start/Stop Date and Time.

Traction Motor Current Regulation

The NEXSYS III-i adds stall protection to its traction motor current regulation feature. At stall (zero speed), the control system will monitor current levels and duration. If current remains above a specified level for a period of time, the control system will suspend excitation and enforce a cool down period.

On-board Operator Interface Display

To advance operations, the NEXSYS III-i operator display now includes more features including:

- ✓ Main locomotive parameters (i.e. traction motor/alternator volts and amps, throttle, speed, grid amps and etc.)
- ✓ System health status (modules, transducers and etc.)
- ✓ Output-test and diagnostics (with “Diagnostics Mode” and Contactor Control option)
- ✓ Includes “diagnostics mode” during which system commissioning can be completed without use of a laptop
- ✓ Fault messages with date/time stamp with snapshot log
- ✓ 30 second data log in CSV format can be retrieved using ZTR software Virtual Technician™
- ✓ Crew messages annunciation
- ✓ Counters (wheel slip, sanding, faults and etc.) with reset option
- ✓ Real time diagnostic/troubleshooting information
- ✓ Megawatt-hour meter (trip and lifetime)
- ✓ Brief reports (detailed fuel savings, duty cycle, event logger etc.)*
- ✓ Load Test
- ✓ Automated Load Test
- ✓ Operational Test Screen

*Included with Integrated SmartStart® functionality

Excitation Rate Control

Improvement in algorithms over those used for the rate control feature found in NEXSYS II, allow for increased accuracy and smoother train operation with the NEXSYS III-i.

Wheel Slip Detection and Control

Core technology improvements, including advancements in processing power and enhanced algorithms, in the NEXSYS III-i provide precision in wheel slip detection and control for better adhesion and tractive effort.

Fault Annunciation

The fault logging feature in the NEXSYS III-i is automated and offers increased functionality and information for system faults. It can store up to 100 of the most recent independent fault events, with information on the 30 sections before and after a fault event. This is a vast improvement over the fault annunciation in NEXSYS II that only provide fault information for one fault at a time and provided no data for each fault.

**Other new features and options available on the NEXSYS III-i can be found in the NEXSYS III-i Basic Specification and Options Specification. Ask your ZTR representative for more information.*

About ZTR



Since 1987, ZTR Control Systems LLC, has been an industry leader in intelligent equipment management solutions for Locomotive Modernization and Equipment Monitoring. As locomotive modernization experts, ZTR helps railroads gain an additional 15-20 service years out of their locomotives. With thousands of locomotive system installations and over 180,000 assets monitored worldwide, ZTR's innovative locomotive modernization solutions and railway asset management solutions improve the performance and efficiency of ageing fleets to usher them into a new era of modernization.