NTX Series
Product Comparison

minsait ACS

An Indra company

www.acspower.com

	NTX-20	NTX-200	NTX-220	NTX-240	NTX-260
Function					
Primary design application	Pole-top/pad-mount switch automation; small substation installations	Small substation installations with medium serial and Ethernet port requirements Some legacy Minsait ACS and 2nd source upgrade applications	Medium to large substation installations, and installations with larger serial and Ethernet port requirements Some legacy Minsait ACS and 2nd source upgrade applications	Small to large substation installations, with large serial and Ethernet port requirements for data concentration/integration applications. No local I/O other than for legacy Minsait ACS and 2nd source upgrade applications to adapt to legacy I/O interfaces.	Very large substation or power plant installations, with very large serial and Ethernet port requirements. Heavy-duty data concentration/protocol translator applications. Some legacy Minsait ACS and 2nd source upgrade applications.
Replaces	NTU-7575 base	Fully-expanded NTU-7575 and small Connex 60/Connex 30	Smaller Connex 30 and larger Connex 60 gateway, and smaller I/O capacity for Connex 30	Connex 60 or Connex 30 data concentrator/ protocol translation applications	Fully-loaded Connex 30 plus
Mechanical					
Carrier/card file dimensions	200 x 108 x 70 mm (8" x 4.25" x 2.75") module	42 HP wide, 3 U high (9" w x 5.25" h x 12" d) Half card file Optional: 84 HP wide (19") for rack mounting	84 HP wide, 3 U high (19" w x 5.25" h x 12" d) Full card file	42 HP wide, 3 U high (9" w x 5.25" h x 12" d) Half card file Optional: 84 HP wide (19") for rack mounting	84 HP wide, 3 U high (19" w x 5.25" h x 12" d) Full card file Optional: front access front- or rear-mount double card file 19" w x 10.5" h x 9" d
Carrier/card file mounting	35 mm DIN rail	Bottom or flush surface panel Optional: front/rear access for rack	19" rack or bottom mount (front/rear module access)	Bottom (front/rear module access) or rear mount (front access only) panel or optional 19" rack mount	19" rack or bottom mount (front/rear module access) or optional 19" front/rear mount double card file, front access only
Expansion analog/ digital card file with separate binary output controller available	No	No	Yes 84 HP wide, 3 U high (19" w x 5.25" h x 12" d) for large I/O installations and some upgrade scenarios; 12 I/O slots per expansion chassis DNP3/IP interfaces with built-in 2-port Ethernet switch		

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Power supply					
Mounting and input voltages available	Internal 18-36 VDC (24 VDC nominal) @ 10 watts Optional: external 220 VAC/230 VDC, 115 VAC/125 VDC, 48 VDC to 24 VDC 120/230 VAC with 24 hour battery backup	Card file mounted 24 VDC, 48 VDC, 125 VDC/VAC, 250VDC/VAC 120 VAC, with 12 to 18 hour battery backup	Card file mounted 24 VDC, 48 VDC, 125 VDC/VAC, 250VDC/VAC 120 VAC, with 12 to 18 hour battery backup	Card file mounted 24 VDC, 48 VDC, 125 VDC/VAC, 250VDC/VAC 120 VAC, with 12 to 18 hour battery backup	Card file mounted 24 VDC, 48 VDC, 125 VDC/VAC, 250VDC/VAC 120 VAC, with 12 to 18 hour battery backup
DC input power monitor	No	Yes, 100ths of volts	Yes, 100ths of volts	Yes, 100ths of volts	Yes, 100ths of volts
Base card file slot capacity					
Node system mid-plane MB slots	N/A	4 slots	5 slots	5 slots	8 slots
I/O mid-plane MB slots	N/A	3 slots	6 slots	N/A	8 slots
Expansion analog and digital card file capacity	N/A	N/A	For large I/O local or distributed installations and some legacy Minsait ACS and 2nd source upgrade scenarios 12 analog and/or digital input modules per card file, for a maximum of up to 192 analog, 384 binary or any combination of expansion modules per card file With separate binary output controller option, 256 control relay outputs supported per expansion chassis Includes power supply and dual 10/100 BaseT Ethernet server interfaces Expansion chassis additions limited only by DNP3/IP connectivity available (64 IP per Ethernet gateway) and the NTX gateway capacity of approximately 14,000 database points Includes board temperature monitor analog value in milli-degrees C.		

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System controller node					
Router/gateway maximum	1	1	1	1	1
Isolated RS-232 or RS-485 serial ports	2 9-pin DTE	2 EIA 561 RJ45	2 EIA 561 RJ45	2 EIA 561 RJ45	2 EIA 561 RJ45
Physical 10/100 BaseT Ethernet ports	1	1	1	1	1
Configurable Virtual Ethernet ports	15	15	15	15	15
IRIG-B time code reader (unmodulated)	N/A	1	1	1	1
NMEA 0183 Garmin satellite clock interface	1	1	1	1	1
NTP supported via Ethernet	Yes	Yes	Yes	Yes	Yes
Database capacity	14,000 points	14,000 points	14,000 points	14,000 points	14,000 points
CPU	32-bit ARM9E RISC microprocessor with DSP extensions				
Firmware updates	Downloadable encrypted firmware updates to flash memory utilizing NTX Explorer Software Tool.				
Operating system	Embedded Linux® (not user-accessible, for secure operating conditions)				

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PLC application supported					
NTX Logic	Programmable Logic Controller (PLC) application that runs on the NTX System Controller platform with a Run-Time license. The NTX Logic supports all of the standard IEC 61131 and IEC 61499 control program languages as well as Flow Chart.				
IEC 61131 and IEC 61499 languages supported	SFC: Sequential Function Chart IL: Instruction Lists		FBD: Function Block Diagram FC: Flow Chart		LD: Ladder Diagram ST: Structured Text
Ethernet Quad-serial gateway node					
Maximum installed	N/A	3	4; no I/O; 1 slot for control output; 1 slot for optional expanded I/O interfaces	4; no I/O; 2 slots used for legacy I/O interfaces	7; no I/O; 2 slots used for I/O interfaces
Isolated EIA 561 RJ45 RS-232 or RS-485 serial ports each	N/A	4	4	4	4
Physical Ethernet ports each	N/A	1	1	1	1
Configurable Virtual Ethernet ports each	N/A	63	63	63	63
Database capacity each	N/A	14,000 points	14,000 points	14,000 points	14,000 points
CPU	N/A	32-bit ARM9E RISC microprocessor with DSP extensions			
Operating System	N/A	Embedded Linux® (not user-accessible, for secure operating conditions)			
Board temperature monitor analog point	N/A	Yes; milli-degrees C			

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Total NTX system ports supported					
Isolated serial ports	2	14	18; no control & DA050235 I/O controller used	18; no I/O; 2 node slots used for legacy I/O interfaces	30; no I/O; 2 node slots used for I/O interfaces
Serial port baud rates	Configurable from 300 to 115.2K baud per port				
Serial port configurations	9-pin isolated RS-232 with or without hand-shakes or RS-485 (4-wire); configurable per port	EIA 561 RJ45 isolated RS-232 with or without handshakes or RS-485 (4-wire); configurable per port			
Current serial protocols supported	Secondary modern (DNP3, Level 3, ACS7000, IEC 60870-5-101, Modbus RTU); legacy (Harris 6000, L&G8979, SC1801, SCOMd, ACS7000). Primary (DNP3; Level 2++, Modbus RTU, Cooper 2179) IED protocols supported Configurable per port (F/W PO5-0091)	Secondary modern (DNP3, Level 3, ACS7000, IEC 60870-5-101, Modbus RTU; Legacy (Harris 6000, L&G 8979, SC1801, SCOMd) Primary (DNP3; Level 3, ACS7000, IEC 60870-5-101, Modbus RTU, Cooper 2179) IED protocols supported Configurable per port (F/W PO5-0098 and PO5-0105) Additional Ethernet/quad serial gateways can support L&N Conitel secondary C2020 and C300 (with SOE) protocols (F/W PO5-0106) and a special Detroit Edison Protocol Suite (PO5-0094)			
Analog modem support	Bell 202 external modem	Card file mounted Bell 202 modem; 2-wire or 4-wire communications interfaces with optical isolated Transmit Key (PTT) output Uses one analog or digital input module slot NTX-240: Bell 202 external modem			
Physical 10/100 BaseT Ethernet ports	1	4	5; no control & DA050235 I/O controller used	5; no I/O	8; no I/O
Virtual Ethernet ports	7	196	259	259	448
IP protocols supported	DNP3, Level 3, IEC 60870-5-104 and Modbus RTU client, server or multiples of both				

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Local binary inputs supported					
Binary contact inputs maximum	Base 16 plus 4 expansion binary input modules, DIN rail-mounted (groups of 8 inputs each) 48 points maximum Isolated 18-36 VDC contact wetting	Depending on I/O controller utilized (see below)	Depending on I/O controller utilized (see below)	Depending on I/O controller utilized (see below)	Depending on I/O controller utilized (see below)
With DA050230 I/O controller	N/A	Maximum of 3 slots (96 points maximum with no analog inputs) Isolated 24 VDC contact wetting Use for legacy Minsait ACS and 2nd source upgrades where local I/O slots can be used for analog, digital inputs or required Bell 202 modems	N/A	N/A	N/A
With DA050235 I/O controller	N/A	N/A	32 point binary input modules, card file mounted Maximum of 6 slots (192 points maximum with no analog inputs) Isolated 24 VDC contact wetting Use for legacy Minsait ACS and 2nd source upgrades where local I/O slots can be used for analog, digital inputs or required Bell 202 modems	N/A	N/A

	NTX-20	NTX-200	NTX-220	NTX-240	NTX-260
Local binary inputs supported (continued)					
With DA050210 I/O controller	N/A	Can be used for legacy Minsait ACS and 2nd source upgrades where base I/O slots can be used for any required Bell 202 modems Can support 3 internal card file or external card file modules, but not both at the same time Supports Minsait ACS DIN rail binary modules with up to 8 modules (256 points) Card file mounted binary modules only with up to 16 modules (512 points) supported Includes board temperature monitor analog value in milli-degrees C	Can be used for legacy Minsait ACS and 2nd source upgrades or very large I/O installations Can support 6 internal card file or external card file modules, but not both at the same time Supports Minsait ACS DIN-Rail binary modules with up to 8 32-point modules (256 points) Card file mounted: maximum of 16 modules (512 points) Includes board temperature monitor analog value in milli-degrees C	For legacy Minsait ACS or 2nd source upgrades Can support external card file modules Can support maximum of 512 binary input points Card file mounted Can support a maximum of 256 binary inputs using Minsait ACS DIN rail binary input modules Includes board temperature monitor analog value in milli-degrees C	Can be used for legacy Minsait ACS and 2nd source upgrades or very large I/O installations Can support 8 internal card file or external card file modules, but not both at the same time Supports Minsait ACS DIN rail binary input modules with up to 8 32-point binary input modules (256 points) Card file mounted: maximum of 16 modules (512 points) Includes board temperature monitor analog value in milli-degrees C
Maximum inputs with expansion card file(s)	N/A	N/A	Large I/O installations and legacy Minsait ACS or 2nd source upgrades may require expansion card files, with up to 384 binary input points maximum per expansion chassis (12 I/O slots each) Multiple expansion card files supported Uses the DA050210 I/O controller for the interface to the installed I/O modules and DA050212/ DA050211 termination for the 10/100 BaseT Ethernet connectivity to an NTX Gateway Ethernet port Includes board temperature monitor analog value in milli-degrees C		

	NTX-20	NTX-200	NTX-220	NTX-240	NTX-260
Local binary inputs supported (continued)					
Optional contact wetting	Optional externally supplied 48/130 VDC contact wetting with external dropping resistors	Optional externally supplied 24/48/130 VDC contact wetting with external DIN mounted terminal block module, DA040312 Includes second layer of optical isolation with all binary inputs fully bi-polar Removable compression terminal blocks for up to #12 AWG wire	Optional externally supplied 24/48/130 VDC contact wetting with external DIN mounted terminal block modules, DA040312 Includes second layer of optional isolation with all binary inputs fully bi-polar Removable compression terminal blocks for up to #12 AWG wire	Legacy Minsait ACS or 2nd source upgrades will use existing digital input contact wetting	Optional externally supplied 24/48/130 VDC contact wetting with external DIN mounted terminal block module, DA040312 Includes second layer of optical isolation with all binary inputs fully bi-polar Removable compression terminal blocks for up to #12 AWG wire
Standard customer terminations	DIN rail module and expansion module compression terminal blocks #12 wire maximum	Card file mounted modules: DIN rail-mounted external terminal block module; 1 per 16 digital inputs Includes LED contact state indicators for each input point #12 wire maximum	Card file mounted modules: DIN rail-mounted external terminal block module; 1 per 16 digital inputs Includes LED contact state indicators for each input point #12 wire maximum	Legacy Minsait ACS or 2nd source upgrades will use existing I/O terminations	Card file mounted modules: DIN rail-mounted external terminal block module; 1 per 16 digital inputs Includes LED contact state indicators for each input point #12 wire maximum
Input current limits	8 mA closed contact; <4 mA open contact	8 mA closed contact; <4 mA open contact	8 mA closed contact; <4 mA open contact	Will use existing legacy I/O terminations	8 mA closed contact; <4 mA open contact
Input isolation	Optically isolated	Optically isolated	Optically isolated	Will use existing optically isolated legacy I/O terminations	Optically isolated
Binary inputs, configurable per point	Binary with time (SOE[1]), binary without time (Status), or Form A or two consecutive as Form C counters [1] Protocol dependent if supported				
Binary Form A or Form C counters	Configurable for count per contact transition or count per contact full cycle Default: count per contact transition				

	NTX-20	NTX-200	NTX-220	NTX-240	NTX-260
Local binary inputs supported (continued)					
Binary input debounce filter	Fixed debounce filter; changed contact must be in the same state for 4 consecutive millisecond scans before declaring the point change	Adjustable bounce filter; changed contact must be in the same state for configurable (0-25) consecutive millisecond scans before declaring the point change on a per point basis Default: 5 Ms			
Binary input chatter filter	N/A	If enabled, provides a chatter period of 0 to 65535 milliseconds and a chatter filter change limit of 1 to 32 changes Both configurable on a per point basis Default: disabled			
Binary input sense mode	Non-invert or invert on a per point basis Default: non-invert				
Binary input scan period & event resolution	1 millisecond				
Change buffers	256 events				
Local DC analog inputs supported					
DC analog inputs maximum	6 expansion DC analog input modules 35 mm DIN rail-mounted (groups of 6 inputs each) 36 points maximum	Depending on I/O controller utilized (see below)	Depending on I/O controller utilized (see below)	Depending on I/O controller utilized (see below)	Depending on I/O controller utilized (see below)
With DA050230 I/O controller	N/A	16 DC analog input modules, card file mounted Maximum of 3 slots (groups of 16 inputs each; 48 points maximum with no binary inputs)	N/A	N/A	N/A

	NTX-20	NTX-200	NTX-220	NTX-240	NTX-260
Local DC analog inputs supported (continued)					
With DA050235 I/O controller	N/A	N/A	16 DC analog input modules, card file mounted Maximum of 6 slots (groups of 16 inputs each; 96 points maximum with no binary input points)	N/A	N/A
With DA050210 I/O controller	N/A	Can be used for legacy Minsait ACS and 2nd source upgrades where base I/O slots can be used for any required Bell 202 modems. Can support internal card file or external card file modules, but not both at the same time Up to 16 DIN mounted or card file mounted modules (256 points) supported Includes board temperature monitor analog value in milli-degrees C	Can be used for legacy Minsait ACS and 2nd source upgrades or very large I/O installations The base 6 I/O slots can be used for any required I/O or Bell 202 modems Can support internal card file or external card file modules, but not both at the same time 16 point analog input modules Maximum of 16 DIN mounted or card file mounted modules (256 points) supported Includes board temperature monitor analog value in milli-degrees C	Can be used for legacy Minsait ACS and 2nd source upgrades Can support a maximum of 256 DIN rail or card file analog input points Includes board temperature monitor analog value in milli-degrees C	Can be used for legacy Minsait ACS and 2nd source upgrades or very large I/O installations The base 8 I/O slots can be used for any required I/O or Bell 202 modems Can support internal card file or external card file modules, but not both at the same time 16 point analog input modules Maximum of 16 DIN or card file mounted modules (256 points) supported Includes board temperature monitor analog value in milli-degrees C
Maximum inputs with expansion card file(s)	N/A	N/A	Large I/O installations and legacy Minsait ACS or 2nd source upgrades may require expansion card files with up to 192 points maximum supported per expansion chassis (12 I/O slots each). Uses the DA050210 I/O controller for the interface to the installed I/O modules and also DA050212/DA050211 termination module for the 10/100 Base T Ethernet connectivity to an NTX Gateway Ethernet port. Includes board temperature monitor analog value in milli-degrees C		

	NTX-20	NTX-200	NTX-220	NTX-240	NTX-260
Local DC analog inputs supported (continued)					
Standard customer terminations	Analog input expansion module compression terminal blocks #12 wire maximum	Card file mounted modules: 35 mm DIN rail-mounted; external compression terminal block module (1 per 8 analog inputs) #12 wire maximum	Card file mounted modules: 35 mm DIN rail-mounted external compression terminal block module (1 per 8 analog inputs) #12 wire maximum	Legacy Minsait ACS or 2nd source upgrades will use existing I/O terminations	Card file mounted modules: 35 mm DIN rail-mounted external compression terminal block module (1 per 8 analog inputs) #12 wire maximum
Standard input range	0 ± 1 mA	0 ± 1 mA	0 ± 1 mA	0 ± 1 mA	0 ± 1 mA
Optional input ranges	4-20 mA, 0 ± 1.5 mA, 0 ± 2 mA, 0 + 500mvdc, etc.	4-20 mA, 0 ± 1.5 mA, 0 ± 2 mA, 0 ± 5 VDC, etc.	4-20 mA, 0 ± 1.5 mA, 0 ± 2 mA, 0 ± 5 VDC, etc.	4-20 mA, 0 ± 1.5 mA, 0 ± 2 mA, 0 ± 5 VDC, etc.	4-20 mA, 0 ± 1.5 mA, 0 ± 2 mA, 0 ± 5 VDC, etc.
A/D resolution	16-bit	16-bit	16-bit	16-bit	16-bit
Supports scaling to engineering units	N/A	Yes, with 32-bit floating point calculations of FSEU/32767 ± offset	Yes, with 32-bit floating point calculations of FSEU/32767 ± offset	Yes, with 32-bit floating point calculations of FSEU/32767 ± offset	Yes, with 32-bit floating point calculations of FSEU/32767 ± offset
Analog Accuracy	0.1%; -10°C to 70°C (14°F to 158°F)	0.1%; -10°C to 70°C (14°F to 158°F)	0.1%; -10°C to 70°C (14°F to 158°F)	0.1%; -10°C to 70°C (14°F to 158°F)	0.1%; -10°C to 70°C (14°F to 158°F)
Multiplexing hardware	Differential - all solid-state (CMOS FET)	Differential - all solid-state (CMOS FET)	Differential - all solid-state (CMOS FET)	Differential - all solid-state (CMOS FET)	Differential - all solid-state (CMOS FET)
Common mode rejection	85 dB @ 0 to 60 Hz	85 dB @ 0 to 60 Hz	85 dB @ 0 to 60 Hz	85 dB @ 0 to 60 Hz	85 dB @ 0 to 60 Hz
Normal mode rejection	>70 dB @ 60 Hz	>70 dB @ 60 Hz	>70 dB @ 60 Hz	>70 dB @ 60 Hz	>70 dB @ 60 Hz
Isolation between inputs	10 m Ω	10 m Ω	10 m Ω	10 m Ω	10 m Ω

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Local DC analog outputs supported					
DC analog outputs maximum	2 DC analog output modules, 35 mm DIN rail-mounted : (requires booster 5 VDC logic supply for 3 to 16 channels in module groups of 1 or 4 output channels)	35 mm DIN rail-mounted 1 to 16 DC Analog Outputs in module groups of 1 or 4 Output Channel Modules.	35 mm DIN rail-mounted 1 to 16 DC Analog Outputs in module groups of 1 or 4 Output Channel Modules.	35 mm DIN rail-mounted 1 to 16 DC Analog Outputs in module groups of 1 or 4 Output Channel Modules.	35 mm DIN rail-mounted 1 to 16 DC Analog Outputs in module groups of 1 or 4 Output Channel Modules.
DC analog output range	Isolated 4-20 mA per module/channel				
Isolation	Galvanic				
D/A resolution	16-bit				
Output impedance	25 m Ω				
Analog accuracy	0.1%; -10°C to 70°C (14°F to 158°F)				
Local control outputs supported					
SBO relay capacity	24	24	256 relays (less one quad-gateway)		
With DA050240 output controller	N/A	N/A	256 relays (less one quad-gateway) and for legacy Minsait ACS and 2nd source RTU control interfaces Can be equipped with more than 1 output controller 128 relays only with NTX-240 front access card file		
Momentary relay module contact types (DIN rail- and panel-mounted)	4 relays each, one Form X @ 10 amp, 150 VDC; 8 relays each with one Form A and one Form B @ 10 amp, 32 VDC/277 VAC or 8 relays each with one Form C @ 5 amp, 32 VDC/277 VAC		6 relays each, one Form X or two Form C @ 20 amp, 150 VDC; 8 relays each, one Form X @ 10 amp, 150 VDC; 16 relays each, one Form A and one Form B @ 10 amps, 32 VDC/277 VAC		
Latch relay module contact types (DIN rail-mounted)	4 relays each, one Form C @ 10 amp, 32 VDC/277 VAC (2 addresses per relay)		8 relays each, one Form C @ 10 amp, 32 VDC/277 VAC (2 addresses per relay) 19" rack mounting or bottom card file panel mounting (with module removal clearance)		
External local/ remote switch	Removable jumpers; optional external switch	Built into card file rear panel or termination module			

	NTX-20	NTX-200	NTX-220	NTX-240	NTX-260
Local control outputs supported (continued)					
Relay coil voltage	24 VDC using optically isolated high-current drivers				
Control sequence	Internal select-before-operate				
Control flags available	Control system enable, control system failed	Binary output controller on-line, X output error, Y output error, control system busy, local mode			
Enclosures available					
Enclosures and ratings	Various sizes NEMA 12 (indoor) and NEMA 4 (outdoor) cabinets Floor mounting or wall mounting with rear-access only available				
Mounting	35 mm DIN rail	Bottom card file (with module removal clearance), flush/semi-flush through panel or 19" rack/wall cabinet mounting DIN rail-mounted analog and digital input terminal block modules, control output modules, and analog output modules external to card file	DIN rail-mounted analog and digital input terminal block modules, control output modules, and analog output modules external to card file	Bottom front/rear access card file (with module removal clearance) or front only card file rear panel mounting Optional 19" rack mounted	19" rack mounting or bottom card file panel mounting (with front DIN rail-mounted analog and digital input terminal block modules, control output modules, and analog output modules external to card file
I/O protection certifications					
Input voltage	Internal noise < 1.5% of input voltage (certified to IEEE Standard C37.1-1994) Input voltage range > ± 15% of nominal				
Inputs and outputs	IEEE SWC protected (certified to ANSI/IEEE C37.90.1-2002) Impulse voltage protected (certified to IEC 255-5 Standards)				

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Environmental specifications					
Operating temperature	-10°C to 70°C (14°F to 158°F)				
With heater option	To -30°C (-22°F)				
Humidity	10% to 95% non-condensing				
NTX Explorer configuration/monitor software					
Platform	Microsoft® Windows® (XP/WIN7/WIN8 with administration rights)				
Accessibility	File transfer from the PC to the NTX, or from the NTX to the PC via a micro-USB serial connection to the NTX USB maintenance port Where permitted, via the Ethernet® WAN				
User interface	Keyboard and mouse-driven menus and views emulate Microsoft® Windows® Explorer				
PC serial interface	Mini-USB to USB interface port cable				
Firmware updates	USB thumb drive port				
Monitor parameters	Input and output state/values; control relay or IED tests, selective tracing of internal network traffic Manually modify analog, counter or binary data values for on-line simulation testing of all inputs On-line IED communications statistics Customer-enabled for either local or remote WAN access (can be disabled)				

