Honeywell

Excel 50/500/800

LonWorks® MECHANISMS

HONEYWELL EXCEL 5000 OPEN SYSTEM

INTERFACE DESCRIPTION

EN0B-0270GE51 R0307

Manual abstract:

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06.xx and Excel 800 .....

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7 Compatibility of Excel 50/500/800 Controllers and Distributed I/O Modules.....
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8 Freely Programmable LonWorks Excel 50/500/800 Controllers .....
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58 EN0B-0270GE51 R0307 4 Excel 50/500/800 LONWORKS Mechanisms REVISION OVERVIEW The following pages have been changed from the previous issue of this document: page Throughout change The entire document has been updated to include Excel 800. 5 EN0B-0270GE51 R0307 Excel 50/500/800

LONWORKS Mechanisms EXCEL 5000 LONWORKS SYSTEM ARCHITECTURE Excel 50/500 Firmware Version 2.04.xx Beginning with Excel 50/500 firmware version 2.04.

xx, the capabilities of the controllers were greatly expanded: · Excel 500 controllers, including the XC5210C (whose CPU module features an expanded RAM) and the Excel 500 Smart controller (XCL5010), can now operate in open LONWORKS systems (see Table 3 and Table 4 on page 9 for definitions of the terms "open," "shared," and "local"). Distributed I/O modules were made LonMark-compliant and also capable of use in LONWORKS networks independently of Excel 500 controllers. Excel 50 controllers (which, in LONWORKS, could operate only with configurable applications) can now also be used as freely-programmable controllers. Freely-programmable Excel 50/500 controllers can now communicate with the Excel 10 family of controllers as well as with third-party LONWORKS devices. Excel 50/500 controllers now support standard LONWORKS NVs according to the LONMARK Interoperability Guidelines. Such NVs can be bound using any LONWORKS network management tool (LNS-based or non-LNS-based), and are also fully documented in the node's self-documentation. · · · · Building Management Functionality Table 1 summarizes the Building Management Functionality (BMF) available under firmware version 2.04.xx via either direct C-bus connection or dial-up. See also section "Dial-Up Access Options" on page 54.

Table 1. BMF via directly-connected C-Bus or via Dial-up (2.04.xx) BMF time programs access alarms access trends access parameters access application download firmware download1 bus-wide MMI 1 EBI dial-up / C-bus dial-up / C-bus dial-up / C-bus dial-up / C-bus dial-up / C-bus dial-up / C-bus C-bus SymmetrE dial-up / C-bus dial-up / C-bus dial-up / C-bus dial-up / C-bus dial-up / C-bus dial-up / C-bus C-bus XBS/XBSi dial-up / C-bus dial-up / C-bus dial-up / C-bus dial-up / C-bus dial-up / C-bus dial-up / C-bus C-bus With the exception of the controller currently operating via the modem. Fig. 1 presents the Excel 5000 architecture under firmware version 2.04.xx. Ethernet (TCP/IP) Enterprise Buildings Integrator XBS Internet Explorer SymmetrE direct hardwire connections dial-up group (=same bus name) of max. 30 controllers group (=same bus name) of max.

30 controllers group (=same bus name) of max. 30 controllers C-Bus XL50 w/ modem XC5010 XCL5010(CNEP) C-Bus XL50 w/ modem XL50 XL50 (CNEP) C-Bus XL50 w/ modem XL50 XL50 (CNEP) LonWorks (LonTalk) 3rd-party products XL10 FCU XL10 VAV XL10 Smart VAV XL10 Chilled Ceiling XL10 Hydronic XL10 CVAHU, UVC, I/O Smart I/O Module Distributed I/O Module FISS LION linear valves and actuators pressure/ temperature sensors inverters Fig. 1. Excel 5000 architecture (firmware version 2.04.

xx) EN0B-0270GE51 R0307 6 Excel 50/500/800 LONWORKS Mechanisms Excel 50/500 Firmware Version 2.06.xx and Excel 800 Beginning with Excel 50/500 firmware version 2.06.xx, and with Excel 800, the capabilities of the controllers were further expanded: · Besides such LONWORKS network management tools (LNS-based or non-LNSbased) as LonMaker for Windows, CARE, too, can now also be used to perform the LONWORKS binding of Honeywell and 3rd-party LONWORKS products.

In the case of Excel 50/500/800 controllers, Building Management Functionality is available via direct hardware connections to LONWORKS systems or via dialup to LONWORKS systems. See following section. · Building Management Functionality Table 2 summarizes the Building Management Functionality (BMF) available under firmware version 2.06.xx / 3.xx.xx via either direct LONWORKS connection oCL5010 XD50-FL, XD50-FCL XD50-FL-xxxx-yy , XD50-FCL-xxxx-yy2 1 2 CPU autobinding1 with XFL52x local local local XFL52xB local CARE LONWORKS binding not possible LM4W binding not possible not possible not possible not possible possible possible not possible not possible not possible not possible possible possible 2.

04.xx 2.06.

xx 2.04.xx 2.06.xx 2.00.xx 2.05.xx 2.06.
xx local/shared not possible local/shared not possible not possible not possible not possible not possible not possible possible not possible not possible possible The term "local" refers to an operating mode in which a maximum of 16 modules are assigned (automatically) to each controller and only a single controller is connected to each LONWORKS bus. The term "shared" means that a maximum of 16 modules are assigned (manually) to each controller, but that multiple controllers can be connected to a single LONWORKS bus. The term "open" refers to an open LONWORKS system, i.e. the use of CARE to generate a LONMARK-compliant external interface file (XIF) capable of providing NVs which can be bound to other devices (Excel 50 or Excel 10 controllers, third-party devices); further, the limitation of max.
16 modules per controller can also be exceeded. See also section "Determining the Operating Mode of a New LonWorks System" on page 41 for more-detailed information on these operating modes. 2 "xxxx-yy" stands for configurable applications, e.g. AH03-EN.
Table 4. Controller compatibility (LONMARK CPUs/application modules, date code later than week 44 in 2000) controller type XCL8010A2 open controller firmware LONWORKS functionality 3.00.xx 3.00.xx 2.00.xx 2.03.xx XC5010C, XCL5210C, XCL5010 2.

04.xx 2.04.xx 2.06.xx 2.06.xx 2.04.xx 2.
05.xx XD50-FL, XD50-FCL 2.04.xx 2.05.
xx 2.06.xx 2.06.xx 2.
00.xx 2.05.xx XD50-FL-xxxx-yy , XD50-FCL-xxxx-yy3 1 3 CPU autobinding1 with XFL52x XFL52xB CARE LONWORKS binding possible not possible not possible not possible not possible possible not possible not possible not possible possible not possible not possible not possible possible not possible LM4W binding possible not possible not possible possible possible possible not possible possible not possible possible not possible possible not possible possible not possible in use not in use not possible in use not in use in use not in use in use not in use in use not in use in use not in use in use not in use not possible not possible not possible not possible local local local local/shared local/shared not possible shared/open not possible not possible not possible open not possible not possible not possible not possible not possible not possible not possible not possible not possible not possible not possible not possible not possible not possible not possible 2.00.xx 2.05.xx 2.06.xx 2.

06.xx The term "local" refers to an operating mode in which a maximum of 16 modules are assigned (automatically) to each controller and only a single controller is connected to each LONWORKS bus. The term "shared" means that a maximum of 16 modules are assigned (manually) to each controller, but that multiple controllers can be connected to a single LONWORKS bus. The term "open" refers to an open LONWORKS system, i.e. the use of CARE to generate a LONMARK-compliant external interface file (XIF) capable of providing NVs which can be bound to other devices (Excel 50 or Excel 10 controllers, third-party devices); further, the limitation of max. 16 modules per controller can also be exceeded. See also section "Determining the Operating Mode of a New LonWorks System" on page 41 for more-detailed information on these operating modes. 2 3 The XCL8010A is likewise not capable of CPU autobinding with Excel 800 I/O modules. "xxxx-yy" stands for configurable applications.
9 EN0B-0270GE51 R0307 Excel 50/500/800 LONWORKS Mechanisms Table 5. Distributed I/O module compatibility Distributed I/O modules LONWORKS Functionality, by controller firmware version Excel 500 V2.04.xx 1 controller to which Dist. I/O modules are assigned on single LONWORKS bus; op. mode: local Full LONWORKS functionality: Multiple Dist. I/O modules and multiple controllers2 possible on single LONWORKS bus; op. mode: open Excel 500 Excel 800 V2.06.xx V3.
00.xx 1 controller to which Dist. I/O modules are assigned on single not supported LONWORKS bus; op. mode: local Full LONWORKS functionality: Multiple Dist. I/O modules and multiple controllers2 possible on single LONWORKS bus; op. mode: open Full LONWORKS functionality: Multiple Dist. I/O modules and multiple controllers possible on single LONWORKS bus; op. mode: open Excel 500 V2.00.xx to V2.

03.xx 1 controller to which Dist. I/O modules are XFL521, XFL522A, assigned on single XFL523, XFL524A LONWORKS bus; op. mode: local 1 controller to which Dist. I/O modules are assigned on single LONWORKS bus (to XFL521B, enable this backwardsXFL522B, compatible mode1 for XFL523B, XFL524B XFL52xB modules, press LONWORKS service pin while turning HEX switch); op. mode: local Full LONWORKS Full LONWORKS functionality: Multiple functionality: Multiple Dist. I/O modules and Dist. I/O modules and XFL821A, multiple controllers2 multiple controllers XFL822A, not possible not possible possible on single XFL823A, XFL824A possible on single LONWORKS bus; op. LONWORKS bus; op. mode: open mode: open 1 To cancel the backwards-compatible mode for XFL52xB modules (date code: 0044 or later), thus allowing full LONWORKS functionality, press and hold down the LONWORKS service pin for at least 3 seconds.
2 Excel 500 controller with Neuron 3120E5 chip required! NOTE: The compatibility of Distributed I/O Modules featuring manual overrides is not affected by the firmware version or the Neuron chip version. EN0B-0270GE51 R0307 10 Excel 50/500/800 LONWORKS Mechanisms FREELY PROGRAMMABLE LONWORKS EXCEL 50/500/800 CONTROLLERS Number of NVs supported Excel 50: The Excel 50's network interface can contain up to 46 NVs (in addition to the Node Object's NVs). The Excel 50 will reject applications having more than 46 NVs. In this case, the following system alarm will be issued: Alarm number: 61; alarm text: "Too many Globals" Excel 500: The Excel 500's network interface can contain up to 512 NVs (in addition to the Node Object's NVs). The Excel 500 supports 128 physical data-points (I/Os) and 256 pseudo datapoints.
Every data-point can be mapped to an input NV, or to an output NV, or to both. The data-points can be mapped to a maximum of 512 LONWORKS NVs. A theoretical maximum of 381 physical data-points (I/Os) are supported via NVs. Excel 800: The Excel 800's network interface can contain up to 512 NVs (in addition to the Node Object's NVs). The Excel 800 supports 381 data-points in a random mix of physical and pseudo data-points.
Every data-point can be mapped to an input NV, or to an output NV, or to both. The data-points can be mapped to a maximum of 512 LONWORKS NVs. Memory Requirements The memory requirements (in bytes) can be calculated by adding together the memory requirements attributable to the following individual items: Default texts On-line changes to the time program (ASPECD, descriptors, alarm texts, engineering units, status texts): The maximum memory allotted to default texts is 21,780 bytes All annual programs are automatically erased by the controller when they turn more than one year old.

The maximum memory allotted to on-line changes to the time program is 4,096 bytes. The first switching point requires 12 bytes, and each additional switching point with the same switching time requires another 6 bytes. A time interval with an exception day program in the annual program requires 9 bytes. A holiday with an exception day program in the holiday list requires 2 bytes. A today exception for a point requires 17 bytes. A day program requires 21 bytes X no. of switching points X 12.

Thus, the total time program requires 35 bytes + (size, in bytes, of all day programs) + (no. of today exceptions X 17 bytes) + (no. of time intervals with an exception X 9 bytes) + (no. of holidays with an exception X 2 bytes). Assuming one time program, five control loops, five switching tables, CARE (including RAL, RAP, RAT, RAZ) will require 10,000 bytes. Assuming several time programs, ten control loops, ten switching tables, CARE will require 20,000 bytes. NOTE: The use of complex ModAL XFMs can further boost that portion of the memory requirements attributable to the control loops. Data-points NVs Each data-point requires 67 bytes. Memory requirements depend upon the number of structural components (n) of each NV. The maximum memory allotted for all NVs is 2,048 bytes.

The NVdependent memory requirements can be calculated as follows: (number of NVs) X (3 bytes + (n X 3 bytes)) For example: Given 100 NVs with four structural components per NV: 100 X (3 bytes + (4 X 3 bytes)) = 1500 bytes The memory requirements of many-to-one bindings depends upon the number of NVs and the number of structural components (n) per NV. The maximum memory requirements due to all many-to-one bindings = 12,800 bytes. The actual memory requirements depend upon whether the NVs are analog or digital, and can be 11 The time program, itself The CARE application program Many-to-one (M-T-O) bindings EN0B-0270GE51 R0307 Excel 50/500/800 LONWORKS Mechanisms calculated as follows: no. of analog NVs X (9 bytes + no. of analog M-T-O X (4 bytes + 4 bytes)) + no.

of digital NVs X (9 bytes + no. of digital M-T-O X (4 bytes + 1 byte) Example: Given ten analog NVs and five digital NVs, each with 20 M-T-O, 10 X (9 bytes + 20 X (4 bytes + 4 bytes) + 5 X (9 bytes + 20 X (4 bytes + 1 byte) = 1690 + 545 = 2235 The maximum memory allotted for all many-to-one bindings is 12,800 bytes. The remote trend buffer Each trend entry requires 47 bytes. Centrals A, B, and C can each contain a maximum of 100 trend entries. Further, unused application memory (if any) can be allotted to Central A, thus enabling it to contain more than 100 trend entries.

The number of additional trend entries which central A can contain = (128 Kbytes application size in Kbytes) X 1,024 bytes / 47 bytes If the memory requirements amount to less than 110 KB, then the size is OK. If the memory requirements amount to between 110 and 128 KB and the RAL is greater than 18 KB (in which case RAL will run from the flash memory), then the size is OK. If the memory requirements amount to between 110 and 128 KB and the RAL is less than 18 KB and the rest of the application is less than 110 KB, then the size is OK. If the memory requirements amount to between 110 and 128 KB and the RAL is less than 18 KB and the rest of the application is greater than 110 KB, then the application is too large and must be reduced. If the memory requirements exceed 128 KB, then the application size must be reduced (e.g. by lowering the complexity of the application by reducing the number of or simplifying control loops). Size constraints, Excel 800 The application without RACL must not exceed 100 KB. The RACL must not exceed 128 KB. The application plus RACL must not exceed 192 KB.

Size constraints, Excel 50/500/600 Extending the Number of Physical I/Os using NVs General Excel 50 Typically, one NV will be needed for each physical input and two NVs for each physical output. It is possible to extend the number of physical I/Os to more than 22. This is done by mapping pseudo data-points to one or more of the 46 NVs, and then binding these NVs to physical I/Os on the LONWORKS network. This will allow for · 46 additional physical inputs, or · 23 additional physical outputs, or · a mixture of inputs and outputs. Excel 500 It is possible to extend the number of physical I/Os to more than 128. This is done by mapping pseudo data-points to one or more of the 512 NVs, and then binding these NVs to physical I/Os on the LONWORKS network. Note that the 256 pseudo-points available must be split between usage for the application (e.g. set-points or 3rd-party LONWORKS integration) and usage for additional physical I/Os. Typically, these pseudo-points are split equally between the two usages.

This will allow for · 125 additional physical inputs, or · 62 additional physical outputs, or · a mixture of inputs and outputs. Excel 800 It is possible to have a maximum of about 200 physical LONWORKS I/Os. Otherwise, the same principles regarding extending the number of physical I/Os and splitting usage apply as described above for Excel 500. EN0B-0270GE51 R0307 12 Excel 50/500/800 LONWORKS Mechanisms Node Object NVs Fig. 4 presents controller Node Object NVs, categorized according to whether they are mandatory or optional and listing optional configuration properties.

Controller Node Object type no. 0 nviRequest nviRequest input input NV 1 SNVT_obj_request NV 0 SNVT_obj_request mandatory Network Variables output NV 1 nvoStatus SNVT_obj_status nviInUse nviRequest input input UNVT_uword NV 1 NV 7 SNVT_obj_request output NV 8 nvoAlarm UNVT_alarm optional Network Variables nvoLocalTime output NV 10 USNVT_time_stamp output NV 11 nvoDayOfWeek SNVT_date_day nciHrtBtRcv nviRequest input input SNVT_time_sec NV 1 NV 2 SNVT_obj_request nroPgmVer nviRequest output input UNVT_pgm_id NV 1 NV 6 SNVT_obj_request nciHrtBtSnd nviRequest input input SNVT_time_sec NV 1 NV 3 SNVT_obj_request nviRequest nciLocation input input SNVT_str_asc NV 1 NV 4 SNVT_obj_request optional configuration properties nroOsVersion nviRequest output input SNVT_str_asc NV 1 NV 9 SNVT_obj_request nviRequest nciDeviceName input input SNVT_str_asc NV 1 NV 5 SNVT_obj_request nviRequest input nciXL500BusSetup input NV 12 UNVT_XL500BusSetup NV 1 SNVT_obj_request Fig. 4. Controller node object NVs Table 6 presents information on the LONWORKS Node Object NVs in each LONWORKS Excel 50/500 controller. 13 EN0B-0270GE51 R0307 Excel 50/500/800 LONWORKS Mechanisms Table 6.

Node Object NVs (left) NV NV Index 0 nviRequest Field object_id NV Type SNVT_obj_request RQ_NORMAL RQ_DISABLED RQ_UPDATE_STATUS RQ_SELF_TEST RQ_UPDATE_ALARM RQ_REPORT_MASK 0 1 2 3 4 5 States / engineering units + range Value nviRequest object_request SNVT_obj_request 1 nvoStatus SNVT_obj_status 10 to 150 seconds 2 nciHrtBtRcv SCPTmaxRcvTime (SNVT_time_sec) 10 to 150 seconds Initialized by CARE (90s default) 3 nciHrtBtSnd SCPTmaxSendTime (SNVT_time_sec) SCPTlocation (SNVT_str_asc) SCPToemType (SNVT_str_asc) id major_ver minor_ver bug_ver node_type UNVT_pgm_id UNVT_pgm_id UNVT_pgm_id UNVT_pgm_id UNVT_pgm_id UNVT_uword NO_ALARM ALARM_WARM_BOOT ALARM_RACL_ERROR ALARM_POWER_FAIL ALARM_APPLICATION_STOPPED RETURN_TO_NORMAL 0 to 3000 0 to 12 0 to 31 0 to 23 0 to 59 0 to 59 DAY_SUN DAY_MON DAY_TUE DAY_WED DAY_THU DAY_FRI DAY_SAT DAY_NUL 0 to 99 Initialized by CARE (60s default) empty string initialized from controller name in application (unless changed by a LONWORKS tool) Initialized by CARE 0 0 0 0 initialized to 65,535 at startup 0 1 2 3 4 128_U 4 5 6 nciLocation nciDeviceName nroPgmVer nroPgmVer nroPgmVer nroPgmVer nroPgmVer 7 nviInUse 8 nvoAlarm UNVT_alarm 9 10 nroOsVersion nvoLocalTime nvoLocalTime nvoLocalTime nvoLocalTime nvoLocalTime nvoLocalTime year month day hour minute second SNVT_str_ascii SNVT_time_stamp SNVT_time_stamp SNVT_time_stamp SNVT_time_stamp SNVT_time_stamp SNVT_time_stamp 11 nvoDayOfWeek SNVT_date_day 12 nciXL500BusSetup nciXL500BusSetup nciXL500BusSetup nciXL500BusSetup nciXL500BusSetup nciXL500BusSetup nciXL500BusSetup nciXL800BusSetup? message code bus ID controller no.

heartbeat domain dom. ID length dom. ID value BYTE BYTE BYTE BYTE BYTE BYTE BYTE 0 1 2 3 4 5 6 0xFF 0x4D 0xFF 0xFF 0x14 seconds 0x00 0xFF / unused 0 EN0B-0270GE51 R0307 14 Excel 50/500/800 LONWORKS Mechanisms Table 3. Node Object NVs (right) Comments This input NV belongs to the Node Object and provides the mechanism for requesting a particular object within a node. See above, but for object status. This output NV reports the status of the controller upon request through nviRequest. If bound, a change of data will be sent. If not bound, the data is updated internally, only, and can be polled. This is the configuration property used to control the maximum time that elapses after the last update to certain NVs before these input NVs adopt their default values.

@@@@@@If the polling also fails, the data-point mapped to this NV is set to NO RESPONSE and the invalid value (if specified) is adopted. If the value of nciHrtBtRcv is changed using a LONWORKS network management tool, and if the application is saved to Flash memory, the value is saved as well. This is the configuration property used to control the maximum time that expires before the controller automatically sends the current values of certain NVs, even if its value did not change. This provides a heartbeat output NV that can be used by the destination objects to ensure that the node is still healthy. CARE can set whether an NV is to be sent periodically, and all mapped NVs are sent in this way by default. If the value of nciHrtBtSnd is changed using a LONWORKS network management tool, and if the application is saved to Flash memory, the value is saved as well. Contains an empty string of 31 bytes that can be used to store installation location information. Controller or application module name (up to 18 characters). If it is changed by a LONWORKS network management tool, the name in the application changes too, and if the application is saved to Flash memory, the name is saved as well. Program version ID identifies the LONWORKS application running in each controller (unique for each controller).
Also called network interface program ID. not used not used not used not used This is initialized to 0xFFFF at start-up. It is then set by an engineering tool or other supervisory node that is "logged-on" to the node to prevent concurrent access by two such devices. When the updating of a node's configuration is finished, the initial value is restored. This input NV is stored in RAM and is lost after a restart.
When bound, this output NV will be sent whenever a system or application alarm condition occurs. Alarm values 5 through 127 are for application alarms, where data-point alarms are mapped to nvoAlarm using CARE (TRUE for alarm status and FALSE for OK status, with application alarm number assigned). The alarm is added to RETURN_TO_NORMAL (128) when the alarm condition is no longer true. Contains the controller firmware version number. The current local time of the controller, updated every minute (seconds field always equals 0).
When the real-time clock of the controller is changed, it may take up to one minute until that change is reflected in the output NV. See above. See above. See above. See above. See above. Updated with the current day enumerator, typically at midnight. When the real-time clock of the controller is changed, it may take up to one minute until that change is reflected in the output NV. The message code can be changed in the event of trouble with 3 -party devices. The bus ID distinguishes between virtual C-buses (0x00 = physical C-bus active, 0xFF = initialized by controller).

The controller number is the same as the C-bus controller number (0x00 = communication disabled, 0xFF = initialized by controller). The heartbeat is the time between wink messages. st nd The domain is a flag (0 = 1 domain or 1 = 2 domain). nd The domain ID length is valid only for the 2 domain. nd The domain ID value is valid only for the 2 domain. rd 15 EN0B-0270GE51 R0307 Excel 50/500/800 LONWORKS Mechanisms Activating and Configuring LonWorks plus BMF With XL50/500 firmware 2.06.xx and higher, and with Excel 800, the node object will support the configuration property nciXL500BusSetup. This configuration property defines whether the XL50/500/800 supports · · C-bus and/or standard LONWORKS or LONWORKS plus Building Management Functionality (which employs the complete LONTALK protocol, including telegrams of the type "explicit message"). In the event that you opt for LONWORKS plus BMF, global points should not be used; instead, you should use NVs for communication between Excel 50/500/800 controllers. The purpose of this restriction is to limit the traffic load on the LONWORKS bus by avoiding frequent message updating and broadcast messaging in the Excel 50/500/800 controllers. CARE-related actions When creating an application using CARE 4.01.03 and higher (or, for Excel 800, CARE 7.2.
xx), you will be called upon to define each individual bus (i.e. group of max. 30 controllers with the same bus ID) as communicating either by means of Cbus and standard LONWORKS on one hand or by means of LONWORKS plus BMF on the other. This is done in CARE by clicking the (automatically generated) name of each individual bus appearing beneath "Bus", going to the "Properties" pane, and selecting the desired radio button: Select either "C-Bus" for C-bus and standard LONWORKS or "LON-Bus" for LONWORKS plus BMF, as appropriate.
If you choose "LON-Bus", CARE will then automatically do the following two things: · · Lizard ensure that the LONWORKS bus contains not more than 30 controllers; ensure that no two buses in the same LONWORKS network have the same bus ID. If you have created a configurable Excel 50 application using Lizard, you must define the bus ID using either one of the following two procedures: · · setting the bus ID during the MMI's start-up sequence or using EBI, Excelon, or any LON tool to edit the "bus ID" byte in the configuration property nciXL500BusSetup. NOTE: Downloading an application created using CARE 4.01.03 will overwrite the results of any such procedure. Table 7. nciXL500BusSetup attribute Message Code bus ID controller number heartbeat domain domain ID length domain ID value LonWorks Bus ID priority handling type BYTE BYTE BYTE BYTE BYTE default 0x4D 0xFF 0xFF remark changeable in case of trouble with 3rd party devices distinguish virtual C-buses 0x00 = physical C-bus active 0xFF = initialized by controller same as C-bus Controller no. 0x00 = communication disabled 0xFF = initialized by controller time between wink messages flag, 0=1st domain or 1=2nd domain only for 2nd domain only for 2nd domain 0x14 sec 0x00 0xFF / BYTE unused BYTE[6] 0 Excel 800 and Excel 50/500 firmware 2.06.00 through 2.

06.03: The LONWORKS Bus ID setting residing in the controller has priority over and will override any LONWORKS Bus ID setting set using CARE.

*XL50/500 firmware 2.06.04: The LONWORKS Bus ID setting set using CARE has priority over and will override any LONWORKS Bus ID setting residing in the controller. EN0B-0270GE51 R0307 16 Excel 50/500/800 LONWORKS Mechanisms Standard NVs Table 8 list the standard LONWORKS NVs (SNVTs) supported for mapping. From controller firmware version 2.06.xx onwards, NVs having a SNVT index of 132 and higher are also supported. Table 8. Supported SNVTs SNVT index 1 2 3 4 5 6 7 8 9 11 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 38 39 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 name SNVT_amp SNVT_amp_mil1 SNVT_angle SNVT_angle_vel SNVT_btu_kilo SNVT_btu_mega SNVT_char_ascii SNVT_count SNVT_count_inc SNVT_date_day SNVT_elec_kwh SNVT_elec_whr SNVT_flow SNVT_flow_mil SNVT_length SNVT_length_kilo SNVT_length_micr SNVT_length_mil SNVT_lev_cont SNVT_lev_disc SNVT_mass SNVT_mass_kilo SNVT_mass_mega SNVT_mass_mil SNVT_power SNVT_power_kilo SNVT_ppm SNVT_press SNVT_res SNVT_res_kilo SNVT_sound_db SNVT_speed SNVT_speed_mil SNVT_str_asc SNVT_telcom SNVT_temp SNVT_vol SNVT_vol_kilo SNVT_vol_mil SNVT_volt SNVT_volt_dbmv SNVT_volt_kilo SNVT_volt_mil SNVT_amp_f SNVT_angle_f SNVT_angle_vel_f SNVT_count_f SNVT_count_inc_f SNVT_flow_f SNVT_length_f SNVT_lev_cont_f SNVT_mass_f SNVT_power_f SNVT_ppm_f 17 units/description amps milliamps rads rads per sec thousands of BTU's millions of BTU's ASCII characters event count event count day names kilowatt-hours watt-hours liters per second milliliters per second meters kilometers microns millimeters percentage level names grams kilograms tons milligrams watts kilowatts parts per million kilopascals ohms kilo-ohms decibels meters / second millimeters / second used in Node Object telecomm state names degrees Celsius liters kiloliters milliliters volts decibels*millivolts kilovolts millivolts amps rads rads per second dimensionless dimensionless liters per second meters percentage grams watts parts per million resolution 0.1 A 0.1 mA 0.01 rad 0.1 rad/sec 1 KBTU 1 MBTU 1 character 1 1 1 1 kWh 0.*
1 Wh 1 l/sec 1 ml/sec 0.1 m 0.1 km 0.1 microns 0.1 mm 0.
5 % 1 0.1 g 0.1 kg 0.1 ton 0.1 mg 0.1 W 0.1 kW 1 ppm 0.1 kPa 0.1 Ohm 0.1 kOhm 0.

01 dB 0.1 m/s 0.001 m/s 1 0.1 °C 0.1 liter 0.1 kl 0.1 ml 0.1 V 0.1 db mV 0.1 kV 0.
1 mV 1A 1 rad 1 rad/sec 1 1 float value 1m 1% 1 float value float value invalid value 0x7FFF 0x7FFF 0xFFFF 0x7FFF 0xFFFF 0xFFFF 0xFFFF 0x7FFF 0xFF 0xFFFF 0xFFFF 0xFFFF 0xFFFF 0xFFFF 0xFFFF 0xFFFF 0xFFFF 0xFF 0xFF 0xFFFF 0xFFFF 0xFFFF 0xFFFF 0xFFFF 0xFFFF 0x7FFF 0xFFFF 0xFFFF 0x7FFF 0xFFFF 0xFFFF 0xFF 0xFFFF 0xFFFF 0xFFFF 0xFFFF 0x7FFF 0x7FFF 0x7FFF 0x7FFF 0x7F000000 0x7F000000 0x7F000000 0x7F000000 0x7F000000 0x7F000000 0x7F000000 0x7F000000 0x7F000000 0x7F000000 EN0B-0270GE51 R0307 Excel 50/500/800 LONWORKS Mechanisms SNVT index 59 60 61 62 63 64 65 66 67 68 69 70 71 72 75 76 77 78 79 81 82 84 85 87 91 92 93 95 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 115 116 117 118 119 120 121 122 123 124 125 126 EN0B-0270GE51 R0307 name SNVT_press_f SNVT_res_f SNVT_sound_db_f SNVT_speed_f SNVT_temp_f SNVT_time_f SNVT_vol_f SNVT_volt_f SNVT_btu_f SNVT_elec_whr_f SNVT_config_src SNVT_color SNVT_grammage SNVT_grammage_f SNVT_freq_f SNVT_freq_hz SNVT_freq_kilohz SNVT_freq_milhz SNVT_lux SNVT_lev_percent SNVT_multiplier SNVT_time_stamp SNVT_zerospan SNVT_elapsed_tm SNVT_muldiv SNVT_obj_request SNVT_obj_status SNVT_switch SNVT_override SNVT_pwr_fact SNVT_per_fact_f SNVT_density SNVT_density_f SNVT_rpm SNVT_hvac_emerg SNVT_angle_deg SNVT_temp_p SNVT_temp_setpt SNVT_time_sec SNVT_hvac_mode SNVT_occupancy SNVT_area SNVT_hvac_overid SNVT_hvac_status SNVT_angle_deg SNVT_scene SNVT_scene_cfg SNVT_setting SNVT_evap_state SNVT_therm_mode SNVT_defr_mode SNVT_defr_term SNVT_defr_state SNVT_time_min SNVT_time_hour SNVT_ph SNVT_ph_f 18 units/description resolution invalid value 0x7F000000 0x7F000000 0x7F000000 0x7F000000 0x7F000000 0x7F000000 0x7F000000 0x7F000000 0x7F000000 0x7F000000 0xFF 0xFFFF 0x7F000000 0x7F000000 0xFFFF 0xFFFF 0xFFFF 0xFFFF 0x7FFF 0xFFFF Per NV field Per NV field Per NV field Per NV field 0xXXFF 0xFF 0x7FFF 0x7F000000 0xFFFF 0x7F000000 0xFFFF 0xFF 0x7FFF 0x7FFF Per NV field 0xFFFF 0xFF 0xFF 0xFFFF 0xFF 0xFF 0x7FFF Per NV field Per NV field Per NV field 0xFF 0xFF 0xFF 0xFF 0xFF 0xFFFF 0xFFFF 0x7FFF 0x7F000000 Pascals float value ohms float value decibels float value meters per second float value degrees Celsius float value seconds float value liters float value volts float value British Thermal Units float value watt-hours float value dimensionless (defining selfinstallation) structured grams / sq. meter 0.1 g/m2 grams / sq. meter float value Hertz float value Hertz 0.1 Hz kilohertz 0.
1 kHz megahertz 0.1 mHz lux 1 lux % of full-scale / ppm 0.005 --structured structured structured structured structured structured structured, but mapped with a single data-point dimensionless 1 multiplier 0.00005 multiplier float value kilograms / meter3 0.5 kg/m3 3 kilograms / meter float value revolutions / minute 1 emergency mode 1 names degrees of arc 0.
02 deg degrees Celsius 0.01 °C structured seconds 0.1 sec HVAC mode names 1 occupancy mode 1 names square millimeters 200 mm2 structured structured degrees of arc 0.02 deg structured structured structured evaporation states 1 thermostat mode 1 names defrost mode names 1 defrost termination 1 names defrost state names 1 minutes 1 hours 1 acidity 0.001 pH acidity (pH) float value Excel 50/500/800 LONWORKS Mechanisms SNVT index 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 sensor readings of mechanical pumpset sensor readings of SNVT_pump_sensor mechanical vacuum pumps SNVT_pumpset_sn 1 1 ----name SNVT_tod_event SNVT_smo_obscur SNVT_fire_test SNVT_temp_ror SNVT_fire_init SNVT_fire_indcte SNVT_earth_pos SNVT_reg_val_ts SNVT_volt_ac SNVT_amp_ac units/description for inputs, only current state is read percentage smoke obscuration fire initiator types ° Celsius / min type names type names 1 0.001% (0 to 5%) 0.5 °C/min 1 1 resolution invalid value 0xFFFFFFFF 0xFFFF --0x7FFF FN_NUL FI_NUL ----0xFFFF 0xFFFF direction of latitude, structured register value volts (a.c.) amperage (a.c.*

*) bit fields 1V 1A SNVT_turbidity SNVT_turbidity_f SNVT_elec_kwh_l SNVT_temp_diff_p Nephelometric Turbidity Units Nephelometric Turbidity Units kilowatt-hours degrees C 0.001 NTU float value 1_kWh 0.01 °C 0xFFFF --0x7FFFFFFF 0x7FFF SNVT_pos_ctrl SNVT_enthalpy SNVT_gfci_status SNVT_motor_state SNVT_pumpset_mn structured kilojoules/kg names of ground fault circuit interrupter names of mechanical motor status of main features of pumpset 0.01 kJ/kg 1 1 1 ---0x7FFF GFCI_NUL MOTOR_NUL --- 160 161 SNVT_flow_p cubic meters / hour 0.01 m3/h 0xFFFF 162 163 SNVT_valve_mode valve mode names 1 VALVE_NUL 164 165 SNVT_state_64 64 bits single bits ?? *The XL50/500 supports a special version of SNVT_reg_val_ts (SNVT index: 137) called SNVT_reg_val_ts_XL500, which provides separate bytes instead of the value of the bit fields.*

Via a special XFM (available from CARE) these bytes can be separated into bit values. 1 The Excel 50/500 controller always converts units to the basic unit, i.e. milliamps to amps. As a consequence, the SNVT_amp_mil will show amps on the datapoint side (mapped datapoint).

Network Interface Program ID The program ID of the network interface is provided in the XIF. The XIF itself is determined by the application programmed in CARE. Along with the application translation, CARE will create the XIF automatically. 19 EN0B-0270GE51 R0307 Excel 50/500/800 LONWORKS Mechanisms During CARE engineering; the program ID can be changed by changing its last byte in the data-point editor. The default setting of the last byte of the program ID represents the controller number.

External Network Interface File (XIF) CARE 3.0 or higher will create a XIF (External Interface File) for each application engineered. This file contains the interface description required by a LONWORKS network management tool for installation and binding. The following file formats are provided: 1. 2. One file in ASCII format for import into LonMaker for Windows. One file in binary format for download into the controller's Neuron chip for later upload from the controller's Neuron chip by LonMaker for Windows, when the controller is online and the application is running. A device template for commissioning LONWORKS controllers can be created either by importing the XIF or by uploading online from the controller. The maximum number of different XIF files per LONWORKS network is 255. Binding and Mapping NVs Binding Binding is the process by which NVs from different nodes are connected to each other for passing data on the LONWORKS bus. This is achieved, online with the controller, using a LONWORKS network management tool (LNS-based or non-LNSbased) such as LonMaker for Windows. Typically, the output NV of one node is bound to the input NV of another node. Fig. 5 depicts the binding of an output NV with an input NV. DEVICE A output NV input NV DEVICE B Fig.

5. NV binding Mapping Mapping is the process by which Honeywell Excel 5000 controller data-points are connected internally with NVs. This is performed during CARE engineering. Fig. 6 depicts the mapping of an input NV with the data-point of an Excel 50/500/800 controller. Excel 50/500/800 Controller input NV data point Fig. 6. Data-point mapping Binding Options In addition to the simple one-to-one binding relationship shown in Fig. 5, LONWORKS technology also allows the following other binding relationships to be established. Many-to-one binding For example, it is allowed to bind several output NVs to a single input NV.

This is referred to as a many-to-one relationship (see Fig. 7). 20 EN0B-0270GE51 R0307 Excel 50/500/800 LONWORKS Mechanisms DEVICE A output NV Excel 50/500/800 Controller DEVICE B output NV input NV DEVICE C output NV Fig. 7. Many-to-one binding (allowed) NOTE: A maximum of 64 output NVs can be bound to a single input NV.

IMPORTANT: Although the many-to-one binding is created online with a LONWORKS network management tool, for proper memory allocation, the binding must be specified during CARE engineering. If the user tries to make more many-toone bindings than specified during CARE engineering (a maximum of 64 many-to-one bindings are allowed), an MTO BINDING FAILED alarm will be issued. One-to-many binding It is also allowed to bind a single output NV to multiple input NVs of other LONWORKS devices (so-called "one-to-many" binding) as long as no two of these multiple input NVs are bound to the same LONWORKS device (see Fig. 8). Excel 50/500/800 Controller output NV DEVICE A input NV DEVICE B input NV Fig.

8. One-to-many binding (supported) Turnaround binding Excel 50/500 controllers do not support turnaround binding (in which an output NV rd is bound to an input NV of the same device; see also Fig. 9). In the case of 3 -party controllers, however, turnaround binding is supported, though only from CARE 7.01 onwards. 21 EN0B-0270GE51 R0307 Excel 50/500/800 LONWORKS Mechanisms DEVICE A input NV output NV Fig. 9. Turnaround binding (not supported) Alias binding Alias binding (in which both a copy and the original of a node's output variable are bound to input variables of another node; see Fig. 10) is not supported. However, such copies (which have the same data as the original output variable, but which may have their own address table entries and selectors) can be bound to input variables of differing nodes (equivalent to making "one-to-many" bindings).

Excel 50/500/800 Controller output NV alias NV input NV DEVICE A x input NV Fig. 10. Alias binding (not supported) Workaround for alias binding The following workaround can be used in place of alias binding. During CARE engineering, it is possible (using the IDT control icon) to establish a logical relationship between one data-point (called the trigger data-point; data-point A in Fig. 11) and other data-points (called triggered data-points; data-points 1, 2, and 3 in Fig. 11). After being connected in this fashion, when the trigger data-point is updated, it will automatically switch (i.e. trigger) the triggered data-points. Excel 50/500/800 Controller data point 1 data point A data point 2 data point 3 output NV output NV output NV input NV input NV input NV DEVICE A Fig.

11. Workaround for alias binding (supported) Mapping Options It is allowed to map a single input NV with multiple data-points (see Fig. 12).

EN0B-0270GE51 R0307 22 Excel 50/500/800 LONWORKS Mechanisms Excel 50/500/800 Controller data point max. input NV data point ave.

data point min. Fig. 12. Mapping a single NV with multiple data-points (allowed) It is also allowed to map a single data-point with both a single input and a single output NV (so-called "double-mapping"; see Fig. 13).

This feature also makes it possible to convert NVs of one type into NVs of another type. Excel 50/500/800 Controller input NV type "x" data point output NV type "y" Fig. 13. Double-mapping a data-point (allowed) It is not allowed to map a single data-point with multiple input or output NVs (see Fig. 14). input NV Excel 50/500/800 Controller X data point output NV X output NV input NV input NV X X output NV Fig. 14. Mapping a single data-point with multiple NVs (not allowed) It is allowed to map multiple data-points with multiple fields of a structured NV (see Fig. 15). 23 EN0B-0270GE51 R0307 Excel 50/500/800 LONWORKS Mechanisms Excel 50/500/800 Controller data point 1 nviX.

field1 nviX.field2 nviX.field3 data point 3 data point 2 Excel 50/500/800 Controller data point 1 nviX.field1 data point 2 data point 3 nviX.field2 nviX.field3 Fig. 15. Mapping multiple data-points with different fields of a structured NV (allowed) It is not allowed to map multiple data-points with a single field of a structured NV (see Fig.

16). Excel 50/500/800 Controller nviX.
field1 nviX.field2 nviX.field3 x x data point 1 data point 2 data point 3 Excel 50/500/800 Controller data point 1 data point 2 data point 3 x x nviX.field1 nviX.field2 nviX.
field3 Fig. 16. Mapping multiple data-points with a single field of a structured NV (not allowed) EN0B-0270GE51 R0307 24 Excel 50/500/800 LONWORKS Mechanisms The name and the index of mapped NVs can be displayed on an MMI like datapoint attributes. If no NVs are mapped, blanks will be displayed in the index field and in the name field. Excel 800 / CARE 7.
2.xx and CARE 4.0, Controller Firmware Version 2.06.xx Automatic manual override mapping With Excel 800 and CARE 7.2.xx, as well as with Excel 50/500 and CARE 4.0 and controller firmware version 2.06.xx and higher, there is an additional type of datapoint mapping called "automatic manual override mapping".

In automatic manual override mapping, both output control and manual override feedback are effected via a single data-point. Automatic manual override mapping functions only with NVs of the type "SNVT_Switch". Further, it is supported only for: · · · · Excel 800 / CARE 7.2.xx XL500, firmware version 2.04.xx / CARE 3.xx and XL50/500, firmware version 2.06.xx / CARE 4.
xx Those Distributed I/O modules and Smart I/O modules equipped with both digital outputs and manual overrides (i.e. the XFL524B, as well as the XFC2D and XFC3D). With automatic manual mapping, during CARE engineering, you map the "value" attribute of one of the controller's data-points to one of the controller's output NVs. During CARE autobinding, the following steps are then automatically performed: · CARE binds the aforementioned output NV to an input NV (previously specified by the user during CARE engineering) of one of the I/O modules assigned to the controller.
CARE generates a new input NV for the controller and binds it to the output NV of the I/O module. · If the module's manual override switch is now operated, that output NV of the module containing information about the status of the I/O module's manual override switch is updated and sent to the new input NV. The new input NV activates the data-point's "manual value" attribute. Excel 50/500/800 Controller invalid output NV manual value data point auto/manual flag DEVICE A (e.g.
XL10) input NV auto value input NV output NV Fig. 17. Automatic manual override mapping Automatic auto/manual mapping With Excel 800 and CARE 7.2.xx, as well as with Excel 50/500 and CARE 4.0 and controller firmware version 2.06.xx and higher, there is an additional type of datapoint mapping called "automatic auto/manual mapping." It can be used to enable an NV to be overridden and the corresponding value to be displayed all via a single data-point. If the data-point's "auto/manual flag" attribute has been set (by using the MMI to put the data-point into the "manual" mode) to the "manual" value, the datapoint will be in the "manual" mode, and the "manual value" attribute's value is sent; if its "auto/manual flag" attribute has been set to the "auto" value, the data-point will be in the "auto" mode, and the invalid value is sent.

This mapping is activated during CARE engineering by selecting "auto" for the invalid match for the output NV of the Excel 50/500 controller. 25 EN0B-0270GE51 R0307 Excel 50/500/800 LONWORKS Mechanisms Excel 50/500/800 Controller invalid output NV manual value data point auto/manual flag DEVICE A (e.g. XL10) input NV auto value input NV output NV Fig. 18. Automatic auto/manual mapping Data Priority of NVs and Data-Points This section describes the priority between the NVs and the data-points in the application. The value of a valid input NV always has priority over the value from a sensor or switch wired directly to the controller or the values from the internal control algorithm or time program. When an input NV is not bound and its value is invalid, then the value is ignored and the value from the local sensor/switch, the control algorithm, or the time program is written to the data-point. When an input NV is not bound and has valid data, then the data is written to the mapped data-point. The data-point will then be in the "manual" mode, and values from the internal algorithm, time program, or local sensor/switch are ignored.
When an input NV is bound and its value is invalid, then this value is ignored and the value from the local sensor/switch, the control algorithm, or the time program is written to the data-point. When an input NV is bound and has valid data, then this data is written to the mapped data-point. The data-point will then be in the "auto" mode, and values from the internal algorithm, time program, or local sensor/switch are ignored. When an input NV is bound and reports NO RESPONSE (sending device or communication failure), then the predefined invalid value (if specified) is written to the mapped data-point. If no invalid value has been specified, the mapped data-point will retain the last value.
The data-point will then be in the "auto" mode, and values from the internal algorithm, time program, or local sensor/switch are ignored. Table 9 summarizes this information: Table 9. Data-point updates according to status of input NV status of input NV bound, valid value bound, invalid value bound, no response unbound, valid value unbound, invalid value data-point access NV value written to "auto value" attribute internal value from local I/O, control algorithm, time program no response, predefined invalid value from CARE manual mode, NV value written to "manual value" attribute auto mode, internal value from local I/O, control algorithm, time program EN0B-0270GE51 R0307 26 Excel 50/500/800 LONWORKS Mechanisms Data-Point Types for NV Mapping Table 10 lists the various different types of data-points for which mapping is allowed. All hardware modules (XF52xx, XFL52xx, and XFCxx) are supported for NV mapping. Table 10.
Data-point types supported for NV mapping data-point type (CARE) analog input analog input analog output AO_3_pos digital input digital output digital output pseudo analog pseudo digital pseudo multistage subtype (CARE attribute text) Slow AI Fast AI n/a n/a 2-state DI or DO 2-state DI or DO Pulse on DO/DI card n/a 2-state n-state Boardless Data-Points Under some circumstances, you may wish to create a data-point which has the characteristics of a physical data-point but which is also mapped with a LONWORKS NV. This can be accomplished by mapping a data-point with an NV, but not assigning it to any I/O board or Distributed I/O module. As a result, the NV will have to be bound using a LONWORKS network management tool (e.g. LonMaker for Windows or CARE 4.

xx). In such a case, the board number of the data-point's technical address will be 64 and no BOARD MISSING alarm will be issued for that data-point. CARE lists these points as 91. Conversion of Data-Points to NVs When mapping analog points to analog SNVTs, a linear characteristic can be defined. A nonlinear relationship can be defined by a look-up table.

In the look-up table, a conversion for each discrete value or point stage is defined. Example: A multistage digital data-point is mapped with an output NV: Table 11. @@This can drastically reduce the number of controller NVs required. @@@@19 below. @@max. value, min. value, etc.) Fig. 19. @@The NV-Booster® mechanism is illustrated in Fig.
@@input NV data point ave. data point min. DEVICE B output NV DEVICE C output NV Fig. 20. @@@@device, e.
g. XCL5010) can be activated or deactivated for every NV. @@@@@@@@@@@@@@@@@@These bit fields cannot be mapped with multiple data-points. @@@@@@@@@Rather, the binding information exists only in the CARE application. As a consequence, if you wish to re-establish bindings, you will have to download the CARE application.
Excel 800 and CARE 7.2.xx / Excel 50/500 and CARE 4.xx with Firmware Version 2.06.04 Restoration by means of flashing For Excel 800 and (from firmware 2.06.04 onwards) for Excel 50/500, the application (including the LONWORKS bindings) can be restored remotely (i.e. over the LONWORKS network) by means of flashing.

To restore the application (including the LONWORKS bindings) by means of flashing using CARE 4.xx in the online mode, proceed as follows: 1) In the node object, select nviRequest / SNVT_obj_request 2) Then set the value to "RQ_PROGRAM" This will flash the application (including the LONWORKS bindings). CARE 4.xx flashing Verifying CARE 4.x flashing You can verify if the application has been flashed as follows: 1) In the node object, select nvoStatus / SNVT__obj_status 2) Select the bit-field "programming mode". Value ="1" means application has been flashed. Value ="0" means application not flashed (e.g. due to a controller reset). EN0B-0270GE51 R0307 30 Excel 50/500/800 LONWORKS Mechanisms EXCELON flashing To restore the application (including the LonWorks bindings) by means of flashing using EXCELON in the online mode, proceed as follows: 1) In the node object, select nviRequest 2) Write "0; 15" (RQ_PROGRAM - Enable programming of special configuration properties) This will flash the application (including the LonWorks bindings). After the flashing is finished, the values will return to "0; 2" (RQ_UPDATE_STATUS - Report object status) Verifying EXCELON flashing You can verify if the application has been flashed as follows: 1) In the node object, select nvoStatus 2) Check Byte 4: -> "0; 0; 0; 0; 0" : Application is not in flash or does not match application in RAM -> "0; 0; 0; 8; 0" : Application in flash matches application in RAM -> "0; 0; 0; 4; 0" : Flash EPROM fault (e.g. flash defect) NOTE: After firmware download, a one-time flashing is required in order to ensure that nvoStatus shows the correct status. 31 EN0B-0270GE51 R0307 Excel 50/500/800 LONWORKS Mechanisms System Alarms Defined for LONWORKS Applications The following system alarms are defined for LONWORKS applications: Table 13. Alarm descriptions alarm no.
alarm text explanation 1. Hardware configuration file (.kfx file) was not completely downloaded. HW config. failure 2.*
Different modules are plugged in with the same address (set using the rotary HEX switch) in the required hardware configuration; the board number is stated. 3. Application containing NV mapping was rejected by target controller because target does not have 3120E5 Neuron chip. 61 Too many Globals NV Bindings lost MTO Binding failed The controller rejected an application with too many NVs: Excel 50: max. 46 NVs; Excel 500: max. 512 NVs The network interface has been changed using CARE, and the changed application has been downloaded. All bindings are now lost. The user has tried to make more many-to-one bindings during controller runtime than were specified during CARE engineering. 56 115 129 EN0B-0270GE51 R0307 32 Excel 50/500/800 LONWORKS Mechanisms DISTRIBUTED I/O MODULES Handling with Excel 50/500 Firmware Version 2.04.

xx Operating Modes of Distributed I/O Modules It is important to remember the following definitions: Local The term "local" refers to an operating mode in which a maximum of 16 Distributed I/O modules are connected to a single host Excel 50/500 controller via a LONWORKS bus, and in which no other devices co-exist on that bus. In the local operating mode, the Distributed I/O modules are assigned to their host Excel 50/500 controller automatically, and autobinding is performed. The term "shared" means that, aside from the host Excel 500 controller and its Distributed I/O modules, other devices (which may include other Excel 500 controllers with their own Distributed I/O modules, Excel 50 or Excel 10 controllers, or thirdparty devices) co-exist on the LONWORKS bus. In the shared operating mode, autobinding may still be used for the NVs of a maximum of 16 Distributed I/O modules assigned (manually) exclusively to the host Excel 500 controller. NOTE: It is recommended that you use CARE to assign the Distributed I/O modules to the host Excel 500 controller (i.e. to enter the Distributed I/O modules' Neuron IDs). The alternative is to assign them using the MMI. Open The term "open" refers to an interoperable LONWORKS system in which CARE has been used to generate a LONMARK-compliant external interface file (XIF) capable of providing NVs which can be bound to other devices (which may include other Excel 500 controllers with their own Distributed I/O modules, Excel 50 or Excel 10 controllers, or third-party devices). In the open operating mode, the NVs of the Distributed I/O modules exceeding 16 must be bound manually using a LONWORKS network management tool (an LNS-based tool capable of using Honeywell plug-ins is recommended).
The shared and the open operating modes can be in effect simultaneously. In this case, autobinding is performed for the NVs of a maximum of 16 Distributed I/O modules, while the data-points of additional Distributed I/O modules must be mapped with shared NVs, and the NVs of the additional Distributed I/O modules must be bound manually (e.g. using an LNS-based tool). Shared Combined shared and open Autobinding (Excel 500, only) When Distributed I/O modules are used exclusively by Honeywell Excel 500 controllers, it is possible to automatically bind their NVs to the controller.
This is referred to as "autobinding." In autobinding, each controller on the bus finds the Distributed I/O modules assigned to it and binds the required NVs. IMPORTANT: Autobinding does not work across routers. Distributed I/O modules must be located within the same router segment as the controller to which their NVs are to be bound.

However, autobinding is possible across repeaters.

IMPORTANT: The autobound NVs of a controller are not visible to a LONWORKS network management tool, and there is hence no danger that a careless user will attempt to re-bind them. However, the NVs of the Distributed I/O modules are visible to a LONWORKS network management tool. Any attempt to re-bind the autobound NVs of Distributed I/O modules will corrupt the autobindings. In such a case, the Excel 500 controller will restore the autobindings automatically, but there will be numerous system and application alarms as a result. If, prior to autobinding, the Distributed I/O modules have been accessed by a LONWORKS network management tool, the modules will remain in the "configured" mode. In this state, they cannot be found by the controller during autobinding they do not appear in the list of modules on the controller MMI. Such modules must be decommissioned using the EN0B-0270GE51 R0307 33 Excel 50/500/800 LONWORKS Mechanisms LONWORKS network management tool, or the LONWORKS service pin must be pressed for at least three seconds. If an Excel 500 controller operating in the shared/open mode is deleted from the LonMaker project, all of its bindings will also be deleted. In this case, the Excel 500 controller will restore all of the autobindings (if any) automatically after 3 minutes (provided that no bindings are performed or changed in LonMaker in the meantime), but there will be numerous system and application alarms as a result. Assignment (Excel 500, only) There are two methods of assigning Distributed I/O modules to a particular Excel 500 controller.

Recommended assignment method The Ideal approach is to know the Neuron IDs of the Distributed I/O modules at the time of CARE engineering, thus enabling you to enter the Neuron ID during CARE terminal assignment. When this is done, every module will be fully identified and assigned automatically by the Excel 500 controller after the application is downloaded. If the Neuron ID is not available at the time of CARE engineering, it will be possible to correctly assign the Distributed I/O modules to their controller(s) only after having downloaded the application. In this case, assignment is performed via the MMI. This procedure is described in detail in the XI581/XI582 User Guide, EN2B-126. IMPORTANT: It is essential that Distributed I/O modules not be assigned simultaneously via different MMIs. When assigning Distributed I/O modules using the alternative method, the assignments must be made on only one MMI at a time so as to avoid competing network accesses. If this is disregarded, this will result in contradictory and unreliable assignments. There will be incomplete Distributed I/O module lists displayed, and the danger exists that one controller will take away an existing assignment from another controller. Regardless of which of these two assignment methods is employed, assignment requires that the modules' rotary HEX switches be set according to the CARE terminal assignment Priority of Distributed I/O Module Assignments Assignments made via an MMI always have priority over assignments made using CARE. Thus, in the event of a conflict (e.g. when the Neuron ID entered using CARE differs from the Neuron ID entered via the MMI), the assignment carried out using the MMI will have priority. Flashing of Distributed I/O Module Assignment The Distributed I/O module assignment that was made during CARE engineering or via the controller MMI must be saved to Flash memory manually. When Distributed I/O module assignment has been made during the test mode, the assignments are saved in Flash memory automatically.

These assignments can be reused for the application after the application has been downloaded (the MMI's assignment dialog will offer the option of keeping the existing assignment). Controller Reset IMPORTANT: A controller reset will erase the Distributed I/O module assignment. After a reset, one of the following procedures must be performed. · Restore the application (including the assignments) from Flash (this is the simplest method). · Restore the assignments during the "start-up" sequence (this requires somewhat more effort because all of the modules are searched on the LonWorks network automatically) · Download the application and re-assign the Distributed I/O modules (this method requires the most effort because it must be done manually). Alternate assignment method EN0B-0270GE51 R0307 34 Excel 50/500/800 LONWORKS Mechanisms Manual Binding There are several cases in which it is necessary to manually bind the NVs of Distributed I/O modules to their respective controller(s). This is done using a LONWORKS network management tool (e.g. LonMaker for Windows). More than 16 modules per Excel 50/500 Autobinding can be used to bind the NVs of a maximum of 16 Distributed I/O modules per controller, only. If the application requires more than 16 Distributed I/O modules per controller, you must use CARE to allocate those additional NVs requiring mapping with data-points, and you will also have to use a LONWORKS network management tool to bind the NVs of the additional modules to the controller. Binding of NVs of other devices to Distributed I/O modules When the NVs of other devices on the LONWORKS bus (other than the host Excel 50/500 controller) require binding to Distributed I/O modules, autobinding cannot be used. A LONWORKS network management tool (e.g. LonMaker for Windows) is required to (manually) bind all of the Distributed I/O modules' NVs.

It is possible to preserve the autobinding by mapping the data-point with a second NV. However, the second NV must then be bound (using a LONWORKS network management tool) to another LONWORKS device (see Fig. 21). While this method preserves autobinding, it does require one controller NV more than if all the binding is performed using a LONWORKS network management tool (e.g. LonMaker for Windows). Double-mapping a data-point Excel 50/500 Controller DISTRIBUTED I/O MODULE output NV input NV data point output NV binding (e.g. autobinding or LM4W binding) data point mapping binding (e.g.

LM4W binding) to another LonWorks device Fig. 21. Mapping with a second NV for binding to LONWORKS devices Use of E-Vision IMPORTANT E-Vision cannot be used. Handling with Excel 50/500 Firmware Version 2.06.

xx and CARE 4.xx In combination Excel 50/500 controller firmware 2.06.xx, CARE 4.xx allows Honeywell devices and/or third-party LONWORKS devices to be automatically bound without having to use LM4W or any other LONWORKS network management/binding tool.

Upgrading applications Excel 50/500 controller firmware version 2.04.xx applications (including Excel 500 controller auto-binding) can be upgraded to firmware version 2.06.xx. This reduces the amount of LONWORKS network engineering required should you then extend the LONWORKS system (i.e. add controller[s] and Distributed I/O modules). To upgrade applications from version 2.