The JciMetasys Driver

The JciMetasys driver allows Johnson Controls Metasys equipment to interface with North. The driver can provide values to and accept values from a Metasys network automation engine (NAE) when requested. Available for Commander and ObSys.

This document relates to JciMetasys driver version 2.0, previously called JcsMsN2.

Please read the *Commander Manual* or *ObSys Manual* alongside this document, available from *www.northbt.com*

Contents

Compatibility with Metasys System

The JciMetasys driver allows Johnson Controls Metasys equipment to interface with North. The driver can provide values to and accept values from a Metasys network automation engine (NAE) when requested.

On the Metasys Network, a single master controller, typically the NAE, requests values from multiple devices on the N2 Bus. The JciMetasys driver appears as a device on the N2 Bus, capable or responding to the NAE.

The driver requires an RS485 connection, via an RS232/485 adapter, to the N2 Bus (Fig. 1).

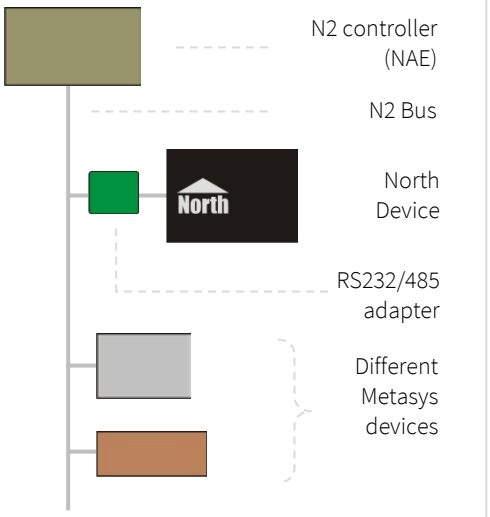

Fig. 1 Metasys N2 Bus to North device

Equipment

Any controller supporting the Johnson Controls Inc. Metasys N2 protocol, that can request internal values from a device, should be compatible with the driver.

Values

The driver presents values from the North device's Essential Data as internal object types to the NAE. Essential Data contains 640 values on Commander and 1280 values on ObSys. Access to these values can be controlled by configuring privilege levels within the driver.

The following Metasys N2 point types are supported by the driver:

Point type	Data type	Commands	Suitable for Essential Data types
Internal Float (ADF)	32-bit IEEE floating point number	Read, Write/override	Float, Number
Internal Integer (ADI)	16-bit signed integer -32767…32767	Read, Write/override	Number
Internal Byte (BYT)	8-bit unsigned integer, 0…255	Read, Write/override	NoYes, OffOn, ENum

Values from Essential Data may be accessed using any of the supported point types. A single address range is used for all types, in the range 1…256. This means the first object in Essential Data may be accessed as ADF1, ADI1, or BYT1.

Value and reliability status are supported for each point type. Override release is not supported.

A single device on the N2 Bus can have up to 256 values, which is less than the number of values held by Essential Data. So the driver can provide access to all values in Essential Data, the JciMetasys driver can be configured to occupy multiple device addresses on the N2 Bus.

Once configured, use the driver's Point Map object (ED) for a full list of points available to the NAE from Essential Data, along with suggested point type.

Prerequisites

All devices on the N2 Bus must be configured with a unique device address.

An RS232-485 adapter is required and should be set to 9600 baud, 10 bits.

The Essential Data module should be configured, with access security levels set if required.

Using the Driver

On ObSys, the JciMetasys driver is pre-installed. On Commander, the JciMetasys driver is not pre-installed, and must be downloaded. Once started, you will need to set up the driver before you can make requests to it from the Metasys NAE.

Making the Cable

RS485 Devices

Connect the North device COM port to an RS232 to RS485 adapter.

Using the RS485 cable specification (Fig. 2), connect the RS485 adapter to the N2 Bus.

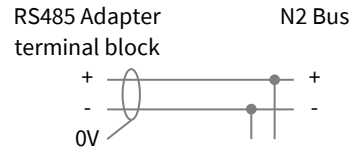

Fig. 2 RS485 adapter to Metasys N2 cable

RS485 adapters are available from North, order code MISC/RS232/485.

Starting the Interface

To start an interface using the JciMetasys driver, follow these steps:

- → **Start Engineering** your North device using ObSys
- → Navigate to **Configuration, Interfaces,** and set an unused **Interface** to 'JciMetasys' to start the particular interface
- → Navigate to the top-level of your North device and re-scan it

The driver setup object (Mc), labelled **JCI Metasys Setup**, should now be available.

Setting up the Driver

To set up the driver, follow these steps:

- → Navigate to the **JCI Metasys Setup** object (Mc). For example, if you started interface 1 with the driver earlier, then the object reference will be 'M1'
- → Set **RS232 COM Port** (RS.COM) to select the serial port number on the North device the N2 Bus is connected to
- → Set **N2 Address: First Device** with the first address to use on the N2 Bus
- → If required, set **Essential Data Objects per Device**. The maximum is 256, but you could set this to a multiple of Essential Data's Page x Object Layout object (O.UD.PO).
- → By default, write actions from the N2 Bus are allowed, and full access to Essential Data is provided. This level of access from the N2 Bus can be managed from the **Security** object (S).

Checking Communications

After configuring Essential Data, the driver will automatically provide information when requested. Check the **Initialized on N2 Bus** object (DS) has a value 'yes'.

Use **Point Map** object (ED) for a full list of points available to the NAE. This can be exported to a CSV file using the North engineering tool.

Object Specifications

Once an interface is started, one or more extra objects become available within the top-level object of the device. As with all North objects, each of these extra objects may contain sub-objects, (and each of these may contain sub-objects, and so on) - the whole object structure being a multi-layer hierarchy. It is possible to navigate around the objects using the ObSys Engineering Software.

Each object is specified below, along with its sub-objects.

Device Top-Level Objects

When an interface is started using the JciMetasys driver, the objects below become available within the top-level object of the device. For example, if interface 1 is started, then the object reference 'M1' becomes available.

Description	Reference	Type
JCI Metasys Setup Set up the JciMetasys driver, started on interface *c* (*c* is the interface number)	Mc	Fixed Container: On the Commander platform this will be *[CDM v20\JciMetasys v20]* On the ObSys platform this will be *[OSM v20\JciMetasys v20]*

JCI Metasys Setup

Object Type: [OSM v20\JciMetasys v20]
Object Type: [CDM v20\JciMetasys v20]

The JciMetasys driver contains the following objects:

Description	Reference	Type
RS232 Com Port	RS.COM	Obj\Num: 0…8; Adjustable
N2 Address: First Device Address of first device on N2 Bus, within the driver. '0' will disable the interface	N2.SA	Obj\Num: 0, 1…255; Adjustable
N2 Address: Last Device Calculated address of last device on N2 Bus, within the driver	N2.EA	Obj\Num: 0…255
N2 Maximum Devices Maximum number of addresses the driver can use on the N2 Bus	N2.MA	Obj\Num: 1…32; Adjustable
Essential Data Objects per Device Number of Essential Data objects to use per address on the N2 Bus. You could make this value a multiple of the Essential Data Page x Object Layout object value.	OPD	Obj\Num: 1…256; Adjustable
Initialized on N2 Bus Indicates that any device within the driver has been initialized by the NAE	DS	Obj\NoYes
Security Control access to Essential Data from the N2 Bus	S	Fixed Container: On the Commander platform this will be *[CDM v20\JciMetasys v20\Security]* On the ObSys platform this will be *[OSM v20\JciMetasys v20\Security]*
Point Map List of points available to the NAE on the N2 Bus. Useful for documentation.	ED	Fixed Container: On the Commander platform this will be *[CDM v20\JciMetasys v20\Data]* On the ObSys platform this will be *[OSM v20\JciMetasys v20\Data]*

Security

Object Type: [OSM v20\JciMetasys v20\Security]
Object Type: [CDM v20\JciMetasys v20\Security]

Security Areas and Levels

Within the North security model, there are eight security areas. Security areas could be actual areas in a building, but are normally functional areas – for example, 'environmental control' and 'North engineering' areas would allow a user to have different privileges in controlling set points and engineering Commanders.

Typically, a user is assigned a privilege level in each of the eight areas. The level is in the range zero to seven, seven being the most powerful. When a user wishes to pass a door, his/her privilege level in the door's area is checked against the minimum required for that area – and then either allowed to pass, or rejected.

The engineer must decide the use of the eight areas. The engineer must also decide the power of the privilege levels. Most systems use only a few levels per area: 0=None, 1=Guest, 2=User, 7=Administrator.

As an example, imagine a page of values in Essential Data. The page needs a user to have a minimum privilege level of 2 in area 1 before it can be viewed. The page is available in a Web browser that checks users with a security database. User A has privilege level 7 in area 1 – she can view the page. User B has privilege level 5 in area 1 – he can also view the page. User C has privilege level 1 in area 1 – she cannot view the page.

The example continues: within this page of values in Essential Data is a temperature set point object. Users need a minimum privilege level of 6 in area 1 to adjust it – therefore User A can adjust the set point, but User B cannot.

Specifying Access Security

Essential Data has Access Security objects to control who can view a page, and who can adjust an adjustable object.

Each Access Security object has a two-digit value. Each controls the access to a particular feature - such as viewing the page, or adjusting the value. The two-digit value is made up of the area digit (1-8), followed by the minimum privilege level (1-7) – for example, if the minimum privilege level is 6 in area 2, then the two digit value is 26. If the value is 00, then no security checks are made.

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The Database Privilege Levels object contains a privilege level for each of the eight security areas, representing a virtual user. The JciMetasys driver uses these to control access to Essential Data when reading or adjusting a value.

Description	Reference	Type
Enable Write from N2	WE	Obj\NoYes; Adjustable
Privilege Level in Area *x* The area, *x*, can be in the range 1…8	P*x*	Obj\Num; Adjustable; Default: 7 Range: 0 (no access)…7 (highest privilege level)
Last Read Message Reports the last read message received by the interface from the N2 bus	LR	Obj\Text
Last Write Message Reports the last write command received by the interface from the N2 bus	LW	Obj\Text

Point Map

Object Type: [OSM v20\JciMetasys v20\Data]
Object Type: [CDM v20\JciMetasys v20\Data]

The Point Map object describes the points available to the NAE from Essential Data.

Description	Reference	Type
Network Points Available Total number of points available to the NAE	OC	Obj\Num: 0…1280
Point *x* The point number, *x*, is in the range 1…640 on Commander and 1…1280 on ObSys	*Ox*	Fixed Container: On the Commander platform this will be *[CDM v20\JciMetasys v20\Data\Object]* On the ObSys platform this will be *[OSM v20\JciMetasys v20\Data\Object]*

Point

Object Type: [OSM v20\JciMetasys v20\Data\Object]
Object Type: [CDM v20\JciMetasys v20\Data\Object]

A Point object contains details for a network point available to the NAE.

Description	Reference	Type
Label Label from Essential Data page and object	L	Obj\Text
N2 Device Address Address of device on N2 Bus	N2	Obj\Num: 0, 1…255
Network Point Type Suggested point type to use on the NAE to access the value: Internal float (ADF), Internal integer (ADI), or Internal byte (BYT). The driver uses a single address range for all types, so any supported internal point type may be used.	T	Obj\ENum: 0…7 Values: 0=Not available, 5=ADF, 6=ADI, 7=BYT
Network Point Address Point address of internal float, integer, or byte.	I	Obj\Num: 0, 1…256
Adjustable Indicates if value is adjustable from NAE	A	Obj\NoYes
Value Value from Essential Data	V	Obj\Text
Units Value units from Essential Data. Not available to NAE	U	Obj\Text: max. 8 chars
Unreliable Reliability of value	R	Obj\NoYes

Driver Versions

Version	Build Date	Details
1.0	21/10/1996	Driver released for Compass platform. Driver name JCSMSN2
1.1	28/07/1999	Redesigned to use internal list of points rather than Compass transfer table.
1.1	02/04/2000	Resolved issue with reliability not updating when value written from Metasys
1.1	24/01/2003	Modification to check reliability flag when reading from driver
2.0	04/06/2020	Renamed driver to JciMetasys and made available for Commander platform. Redesigned to use Essential Data rather than internal list of points. Supports multiple devices to expose full range of objects in Essential data. Added default privilege levels for accessing Essential Data

Next Steps…

If you require help, contact support on 01273 694422 or visit *www.northbt.com/support*

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