Integrating 3rd Party Accessories to Syrus and Pegasus Ecosystem

Overview

Syrus ecosystem allows integrations with multiple accessories, some of them made by DCT and others by 3rd party vendors. Until now you have not had the possibility to integrate your own accessory. Throughout DCT's constant evolution it has always pointed towards interoperability, which is why in this document we describe how you can bring your own accessories to Syrus and Pegasus ecosystem. We made the guide easy to follow for both technical and non-technical people.
The document will focus on an example integration with a Long Range RFID Reader.

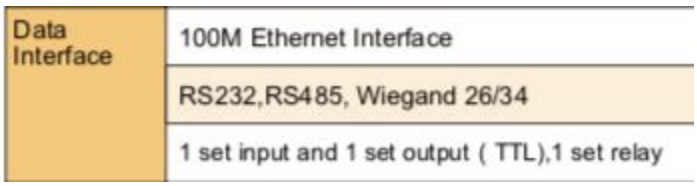
Considerations

We have two integrations levels: for Syrus users and Syrus + Pegasus users.
We recommend to use Syrus IoT Development Kit for all laboratory test.
At this time we only support RS-232 accessories preferably with ASCII output.
The baud rates supported by Syrus: 2400, 4800, 9600, 19200, 38400, 57600 and 115200 (default).
After the Syrus integration level is completed the data will be available on TAIP (TAIP is the Syrus device's protocol language).
After Syrus + Pegasus integration the data will available in a JSON format accessible via web http.
To receive data, Syrus must be connected to Pegasus or TCP/UDP Server.

Syrus Integration

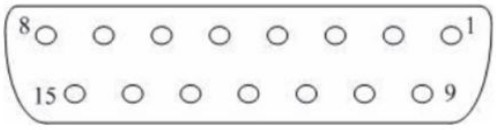
It is important to have the manual and protocol of your accessory, if it's your own development please document it as best as possible because it will be important for the next steps.

1. Check if your accessory supports RS232 protocol output:



2. Verify the pinout connection of your accessory to find TX and RX interface this information it's available on your user manual:

UHF Reader User Manual



DB15 GPIO Pin definitions								
pin	1	2	3	4	5	6	7	8
define	Out port 2	Out port 1	GND	RX(RS232)	TX(RS232)	GND	In Port2	In Port1
pin	9	10	11	12	13	14	15	
define	GND	A+(RS485)	B-(RS485)	GND	OFF	COM	ON	

3. Identify the protocol output of your accessory, this information is provided by the manufacturer and often it's described on the protocol manual:

RFID Reader Communication Protocol

3.2 Explanation on the reader communication interface

1. RS232: the Reader provides standard RS232 communication interface as the output port for data modulation. RS232 has 8 data bits format: 1 start bit and 1 stop bit, no parity bit. The default baud rate is 115200 bps. The interface supports the reader parameters configuration, software upgrading, demo program and all functions for series communication with development kit with functions package;

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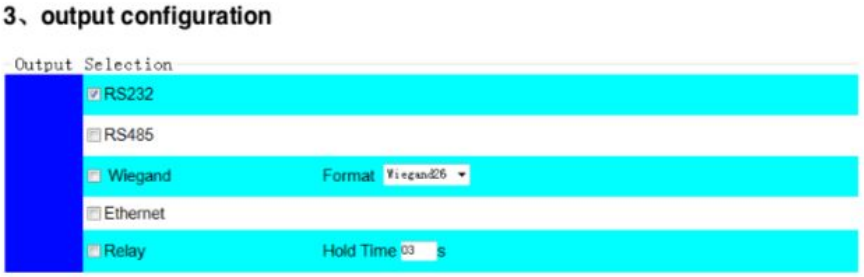
You should provide to DCT the message structure generated by your accessory, example:

Head	Addr	Len	Status	Respons e	...	Respons e	Check
0x0B	1 byte	n+2	1 byte	Byte 1		Byte n	cc

- Head is packet types field. Response frame packet type is fixed to 0x0B。
- Addr is the address of reader
- Len is packet length field，which indicates the number of bytes in the frame domain of Length。
- Status means the operating result from the command execution? 0 means correct operation，others mean error in the operation。
- Response is the data returned by response frame。
- Check is checksum field. The check area is defined as all bytes checksum of the last byte from packet type field to parameter field。When PC receives command frame, checksum needs to be calculated for error detection。

4. Configure your accessory to RS232 mode:



5. Connect Syrus to your PC using Serial or USB - Serial Interface. Configure Syrus to MDT (Mobile data terminal) mode by sending this message over Syrus Desk or Terminal:

>SMTP010150T\0D\0A\1B\FF;ROUTE=0<

If you are using Pegasus Gateway you can send the previous command via the device console.
If you want to know more information related to MDT command please visit the follow link.
Syrus MDT Mode

Important: After send this command Syrus stops to respond over serial interface If you want to connect again to Syrus Desk please send* **EXIT_COMMDATA *(as is) over Terminal software (make sure to do so at the correct baud rate, Syrus default baud_rate is 115200).*

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6. Connect Syrus and your accessory with TX, RX and GND cables according the next table:

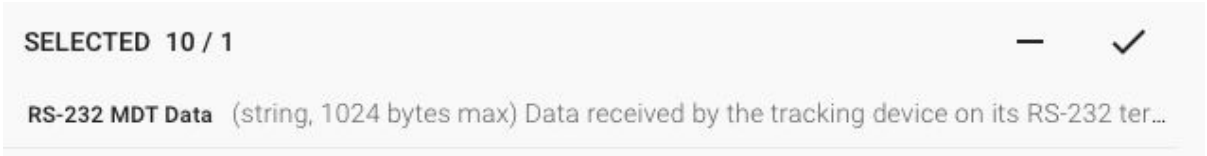
Syrus 3G & 3G Bluetooth

13	Orange	RS232 Tx	TX	OUT	Transmit Data
15	Purple	RS232 Rx	RX	IN	Receive Data.

Syrus SL3G

4	Brown	RS232 Tx	TX	OUT	Transmit Data.
6	Purple	RS232 Rx	RX	IN	Receive Data.

7. Send a message from your accessory to Syrus and verify on Pegasus Rawdata app or TCP/UDP Server if the message was transmitted.



You can also check this over the Pegasus API:

https://[pegsiteurl]/api/rawdata?vehicles=53&fields=$basic,rfi_id,ib,tx&from=2018-11-30&to=2018-12-01


```
{
    "system_time": "2018-08-19T17:07:41.169313",
    "code": 82,
    "cf_rssi": null,
    "rfi_id": null,
    "event_time": "2018-08-19T17:07:37",
    "vid": 53,
    "lon": -89.71092,
    "al": null,
    "label": "trckpnt",
    "tx": "\\02C80700DD696B00000048\\0D",
    "lat": 20.99386,
    "ib": null,
    "speed": 0,
    "id": 5308563126169,
    "event_hour": 17
}
```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8. An embeddable option on the Syrus firmware is only considered when the message that was transmitted was exactly according to the protocol manual of your accessory.

Firmware Integration

If the step 8 mentioned above is true then you must provide the next checklist to DCT Support <support@digitalcomtech.com> to perform Firmware Integration.

- User manual of your accessory.
- Protocol manual of your accessory.
- Message examples of your accessory transmitted by Syrus on MDT Mode.
- The Syrus you used to test (please send us the IMEI of the device) and the time of the tests
- Syrus pointing to a TCP/UDP Server or 3rd Party platforms must be redirected to our servers.
- One contact person to perform any test on firmware development.

After Syrus Firmware Integration

Once the firmware is released, TAIP instructions will available over DCT Support page and Syrus web manual and depending on the type of integration we will add fixed signals or extended EV format flags.

Here's an example:

The fixed Signal F32 was added to identify when an RFID Tag matched with one on the Authorized list, so you can trigger an event when this signal becomes true:

- **F32**: True when the ID of a detected RF id tag matches with one ID in the *Authorized ID list.*

The Extended EV format flag RI was added to report on every defined event the value of the last RFID Tag:

- RI: RF ID tag identification code. This tag depends on firmware plugins.

>REV782028486062+1959154-0990368300022132;**RI=19173270884452**;ID=357042066541096<

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Syrus + Pegasus Integration

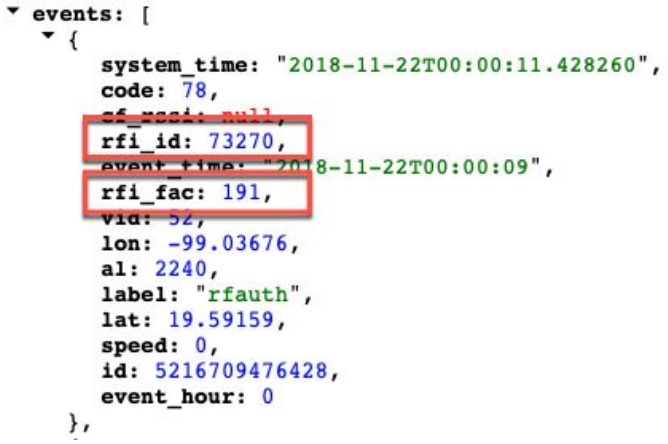
The previous steps are the same to this type of integration, but you also have the possibility to enhance your data with all the interoperability of Pegasus System so you can forward your data to external services like Azure, ERPs, CRM or other web servers or you can consult your data over APIs to deploy your own application.

At this point you can check Rawdata application on Pegasus Gateway and the new values will be available on the selection panel with the 367+ other.

Here's the difference between before and after integration:

Before you have raw values reported on TX field with all the unnecessary characters like /0D or /0A:

After the integration you have the right values on the right place:



Syrus 3G GPS m2m cloudconnect data for devices Pegasus GATEWAY
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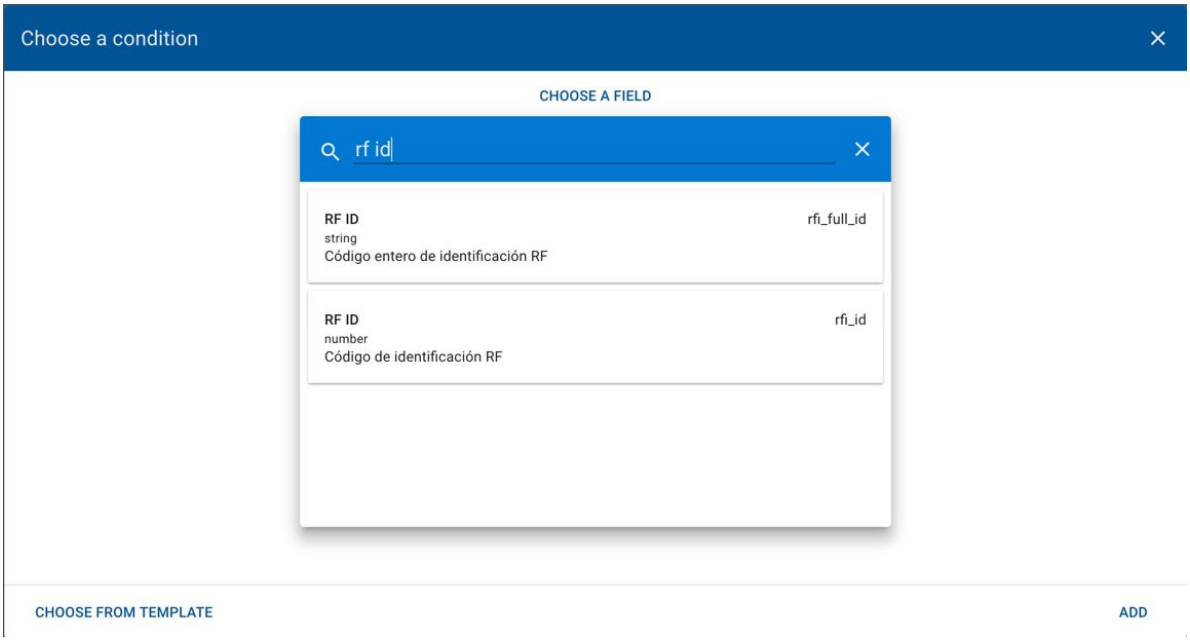
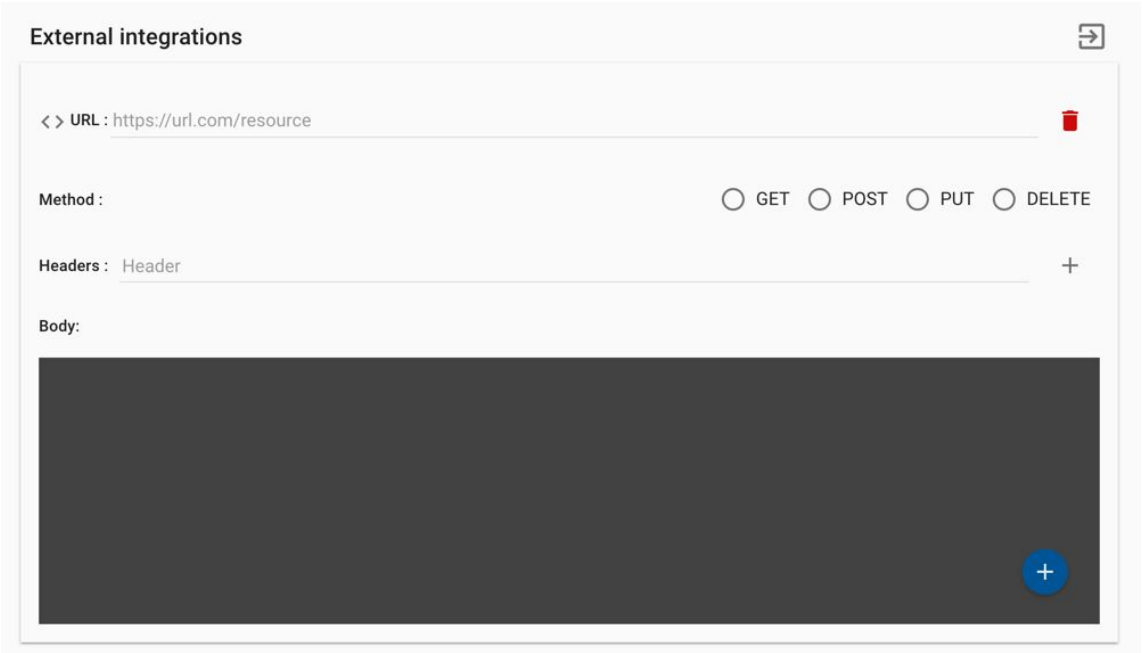
There are two options to send your accessory data to other system through Pegasus Interoperability.

1. Triggers with webhooks:



Which allow you to make any HTTP request when a condition is met.



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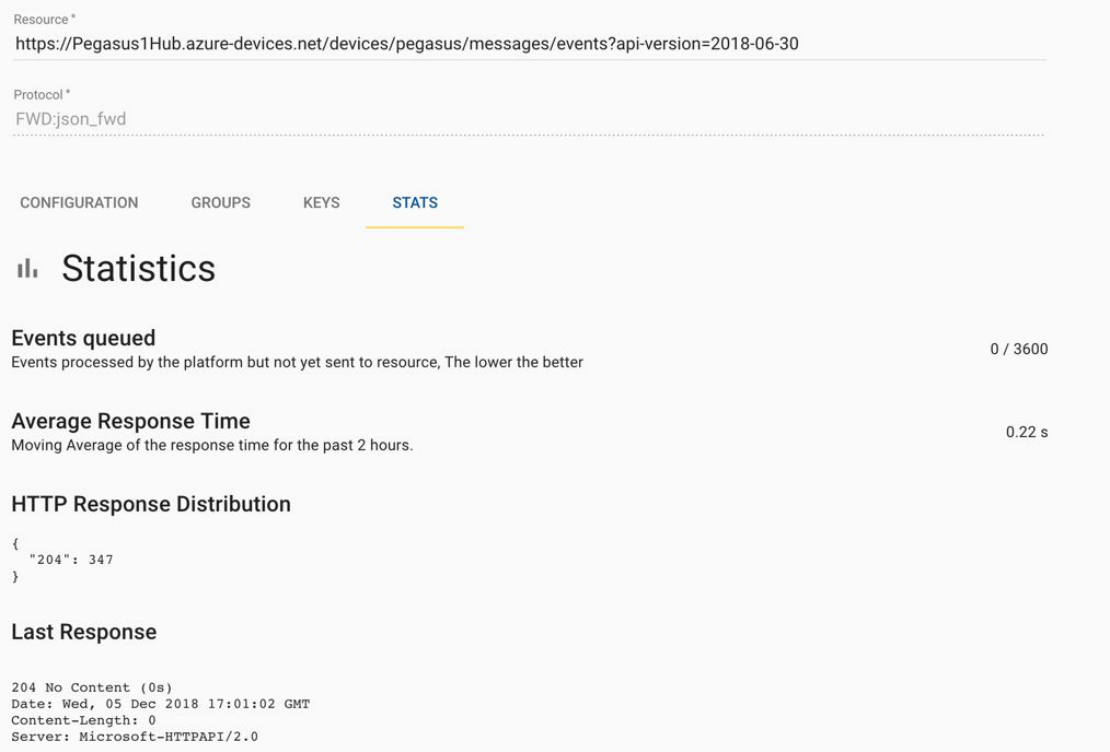
2. Realtime Forwarders:



For more information on how to create a forwarder, please visit the online documentation.

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