

### Field Communication Unit, FCU 2160

The Field Communication Unit (FCU) is a data concentrator that continuously polls data from field devices such as Radar Tank Gauges, Data Acquisition Units and Remote Display Units and stores them in a buffer memory. Whenever a request for data is received, the FCU can immediately send data from a group of tanks from the updated buffer memory.

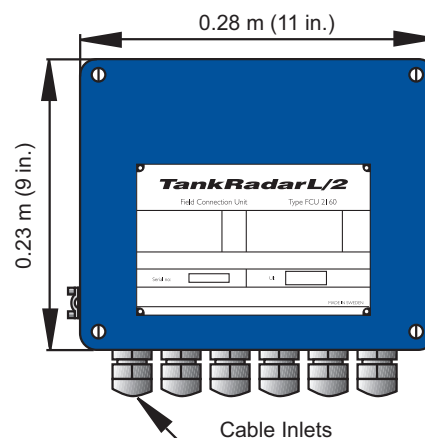
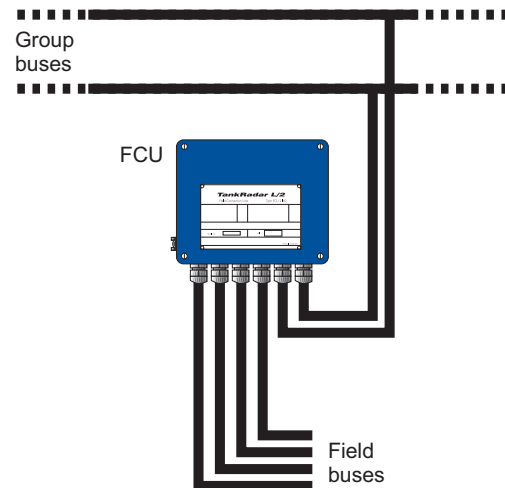
The FCU acts as a slave on the group bus and as a master on the field bus. The unit has six communication ports. The ports can be individually configured as either group bus ports or as field bus ports according to one of the alternatives below:

| Alternative | No. of field bus ports | No. of group bus ports |
|-------------|------------------------|------------------------|
| 1           | 4                      | 2                      |
| 2           | 3                      | 3                      |
| 3           | 2                      | 4                      |

An interface board can be connected for each communication port. These boards can be either FCM boards for the TRL2 Bus or FCI boards for RS485 communication. Two group bus ports can also be configured as RS232 by connecting a jumper connector instead of an FCM or FCI board. As standard the Field Communication Unit is delivered with six FCM boards and two RS232 jumper connectors.

Each device has an individual address on the field bus except for the RDU 40 which uses the same address as the RTG it is connected to.

Two FCU:s can be connected in parallel with one unit operational and one working as "hot" redundant backup for the other. The units are software monitored and the backup unit is automatically triggered and activated in case of primary unit failure. See page 44 for more information.



FCU 2160 Field Communication Unit.

### Technical Data for FCU 2160

|                                       |                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Explosion protection:</b>          | None                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Ambient operating temperature:</b> | -40 °C to 70 °C (-40 °F to 158 °F)                                                                                                                                                                                                                                                                                                                                         |
| <b>Power Supply:</b>                  | 115 or 230 VAC, +10% to -15%, 50-60 Hz, max. 10 W                                                                                                                                                                                                                                                                                                                          |
| <b>Ingress protection:</b>            | IP 65                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Communication:</b>                 | <div>Field bus ports: TRL2 Bus, modified Modbus protocol</div> <div>Number of RTG:s per field bus port: Max 8 is recommended</div> <div>Group bus ports: TRL2 Bus, RS232 or RS485, Modbus based protocol</div> <div>Group bus baud rate:H Programmable up to 19 200 Baud</div> <div>Host communication via group bus ports: Various protocols available, see page 47</div> |
| <b>Number of tanks per FCU:</b>       | Max 32 (max 8 per field bus is recommended)                                                                                                                                                                                                                                                                                                                                |



The FCU works as a data concentrator for a group of tanks ensuring fast data communication from the tanks to the control room.

### Field Communication Unit, FCU 2165/2175

The Field Communication Unit, FCU 2165/2175 is a data concentrator that continuously polls data from field devices such as radar and servo tank gauges from different vendors, Data Acquisition Units, I/O Modules, other FCU:s, Enraf® CIU:s etc and stores data in a buffer memory. Whenever a request for data is received from a host, the FCU can immediately send data from the updated buffer memory.

The FCU can service requests from a wide range of hosts/DCS systems such as Rosemount TankMaster®, Enraf® Entis, Yokogawa®, ABB®, Honeywell®, Foxboro® among others (it is possible to connect any system using the Modbus protocol). Each of the ports can be configured either as a master or slave connection, providing ultimate configuration flexibility.

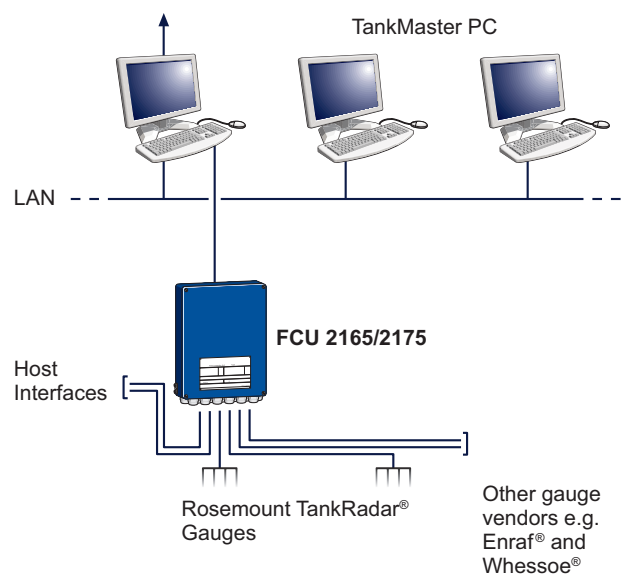
The FCU 2165 has 10 ports of which maximum 6 can be used as field bus ports. The FCU 2175 can be ordered with 8, 16, 24 or 32 ports. Port configuration flexibility along with the scalable solution make the FCU meet the needs of the small terminal operator to the largest refinery, also for the most demanding applications.

For applications requiring more capacity or when devices are distributed over a large area, multiple FCU:s can be used. Two FCU:s can also be connected in parallel with one unit operational and the other as a redundant backup. The backup unit is automatically activated in case of a primary unit failure (hot standby).

The number of devices per port varies between different manufacturers and may also have physical limitations imposed by the quality and length of field cables and distribution of devices. Maximum 256 devices can be supported by one FCU 2165/2175.



FCU 2165.



FCU 2175.

# TankRadar Rex

## Technical Data for FCU 2165 / 2175

|                                                   |                                                                                         |
|---------------------------------------------------|-----------------------------------------------------------------------------------------|
| <b>Explosion protection:</b>                      | None                                                                                    |
| <b>Ambient operating temperature:</b>             | -20 °C to 70 °C (-4 °F to 158 °F)                                                       |
| <b>Power Supply:</b>                              | 115 or 230 VAC, +10% to -15%, 50-60 Hz                                                  |
| <b>Power Consumption (max):</b>                   | 25 W (FCU 2165)<br>60 W (FCU 2175)                                                      |
| <b>Ingress protection:</b>                        | IP 65 (FCU 2165)<br>IP 21 (FCU 2175)                                                    |
| <b>Field bus / host ports:</b>                    | TRL2 Bus, Enraf BPM, Whessoe Current Loop, RS232, RS422, RS485 (additional will follow) |
| <b>Baud Rates:</b>                                | Programmable up to 38400                                                                |
| <b>Total number of gauges per field bus port:</b> | Dependent on vendor, consult factory                                                    |
| <b>Number of tanks / gauges per FCU:</b>          | Up to 256 (host dependant, 160 for TankMaster)                                          |
| <b>Dimensions:</b>                                | FCU 2165: 111x313x404 mm (4.37x12.32x15.91 in.)<br>FCU 2175: 19 in. (3U rack)           |

## Configuration Possibilities

|                                                                                                         |                                                                                                                    |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| <b>As a master (field bus) port the FCU can talk to a wide range of different tank gauges such as:</b>  | Rosemount TankRadar<br>Enraf® Servo and Radar<br>Whessoe® Servo and Level / Temperature Transmitter<br>Motherwell® |
| <b>As a slave port the FCU can service requests from a wide range of hosts using various protocols:</b> | TankMaster<br>Modbus RTU<br>Enraf® Entis                                                                           |
| <b>A range of drivers are also available for DCS systems such as:</b>                                   | Honeywell® TDC<br>Foxboro® I/A<br>ABB®<br>Yokogawa®                                                                |

The number of gauges on each field port is limited by the gauge vendor protocol and / or the electrical interface capability. Typically these are as follows:

| Equipment                                                                      | Electrical Interface         | Max Gauges / Interface         |
|--------------------------------------------------------------------------------|------------------------------|--------------------------------|
| <b>Rosemount</b><br>2900, 3900, Pro<br>FCU 2160                                | TRL2<br>RS232, RS485 or TRL2 | 8<br>32                        |
| <b>Enraf®</b><br>CIU 858<br>CIU 880<br>GPU or GPP protocol gauges<br>Microlect | RS232<br>RS232<br>BPM        | 30<br>50<br>10                 |
| <b>Whessoe®</b><br>WM 550 protocol gauges<br>WM 500 protocol gauges            | Current Loop<br>Current Loop | 32<br>256 (via 16 Outstations) |

*The FCU 2165/2175 can replace an Enraf Microlect or CIU unit.*